PROJECT MANUAL

MAINTENANCE BUILDING #730 (RE-BID)

AGENCY
SAN BERNARDINO INTERNATIONAL AIRPORT AUTHORITY
1601 East 3rd Street, Suite 100, San Bernardino, CA, 92408

August 2017

PROJECT ENGINEER:

Miller Architectural Corporation
1177 Idaho Street, Suite 200
Redlands, CA 92374
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STRUCTURAL CALCULATIONS
San Bernardino International Airport Authority  
Notice Inviting Bids

Prospective bidders are hereby notified that the San Bernardino Airport Authority ("AGENCY" or "Agency") will receive sealed bid proposals for the Maintenance Building 730 (RE-BID).

The complete Bid shall be submitted in a sealed envelope with the Bidder’s name, the project name, project number, and the words "Sealed Bid - Do Not Open" clearly marked on the outside of the mailing envelope. Bids may not be submitted by facsimile or electronic telecommunication. Bids submitted via USPS or other courier service must have the project name and project number and the words "Sealed Bid - Do Not Open" clearly marked on the outside of the mailing envelope.

All Bids shall be submitted by delivery to the AGENCY at the address provided below and will be received until 2:00 PM on Monday, September 18, 2017. Bids will be publicly opened and read at that time. Any bids received after the specified date and time will be rejected and returned unopened. The address for delivery of Bids is:

San Bernardino Airport Authority  
Attention: Clerk of the Board  
1601 E. 3rd Street, Suite 100  
San Bernardino, California 92408

The selected CONTRACTOR shall construct all improvements in accordance with the project plans and specifications and the request for proposals specific to this bid package. Time for completion is 120 calendar days.

Any questions or communications shall be in writing. Written questions regarding details of the project will be accepted until September 13, 2017. Written questions must be directed to Myriam Beltran, Manager, San Bernardino Airport Authority at mbeltran@sbdairport.com.

Contract Documents may be obtained from the AGENCY at 1601 E. 3rd Street, San Bernardino, California 92408, upon payment of a $350.00 nonrefundable fee and are also available for free download on the AGENCY's website, www.sbiaa.org. Make all checks payable to "San Bernardino Airport Authority." A full list of all requirements regarding this project can be found in the project specifications. All information, addendums, and notices regarding this Project will be posted to the AGENCY website. It is the sole responsibility of all perspective respondents to check the website for any pertinent information that may be issued.

A mandatory pre-bid meeting will be held at 1601 E. 3rd Street, San Bernardino, CA 92408 on Wednesday August 29, 2017 at 10:00 AM.

Each Bidder must be licensed in the State of California and qualified to perform the Work described in the project specifications. Pursuant to Public Contract Code Section 3300, the CONTRACTOR must possess the following classification of CONTRACTOR's license: CLASS "A".

Project: San Bernardino International Airport Authority  
Maintenance Building #730 (RE-BID)
No contractor or subcontractor may be awarded a contract for public work on a public works contract unless registered with the Department of Industrial Relations pursuant to Labor Code section 1725.5. Each Bidder, and each subcontractor listed by the Bidder in the bid proposal, must be registered and qualified to perform public work pursuant to Labor Code § 1725.5.

Each proposal must be accompanied by a certified or cashier’s check or bid bond for ten percent (10%) of the maximum amount of the bid. Said check shall be made payable to the San Bernardino Airport Authority and when delivered with a proposal, shall constitute a guaranty that Bidder will, if an award is made to them in accordance with the terms of said Bidder’s proposals: execute a contract on the AGENCY’s standard form, together with Labor Code Certification thereon; furnish contract performance and payment bonds with a corporate surety or sureties satisfactory to the AGENCY, each for not less than one-hundred percent (100%) of total bid price; furnish certificates of insurance evidencing that all insurance coverage required by the contract has been secured.

This is a “public work” project and each CONTRACTOR to whom a contract is awarded must pay the prevailing rates and post copies thereof at the job site. In addition, it is also the responsibility of each CONTRACTOR to follow all requirements of the State of California Labor Code as it relates to public works contracts. Before work can begin on a public works contract, the CONTRACTOR shall submit a Public Works Contract Award Information Form (DAS 140) to an applicable apprenticeship program that can supply apprentices to the site of the public work. The CONTRACTOR must request dispatch of required apprentices from an Apprenticeship Program for each apprenticeable craft or trade by giving the Apprenticeship Program. The CONTRACTOR is to use a Request for Dispatch of an Apprentice Form (DAS 142) to submit his/her written request.

Bidders are hereby notified that the prevailing rate of per diem wages, as determined by the Director of Industrial Relations, applicable to the work to be done for the locality in which the work is to be performed in compliance with Section 1773 of the Labor Code of the State of California are on file in the AGENCY’s principal office at the address listed above and will be made available to any interested party upon request.

This project is subject to compliance monitoring and enforcement by the Department of Industrial Relations.

The AGENCY reserves the right to accept or reject any or all proposals, to waive any irregularity or to award the contract to other than the lowest bidder consistent with the award of the contract to the lowest responsible bidder. Bidder may not withdraw their bid for one hundred and twenty (120) days after bid opening.

San Bernardino International Airport Authority
San Bernardino, California

By:_________________________________________
Jennifer Ferris, Secretary of the Commission
INFORMATION FOR BIDDERS

1. BIDDING DOCUMENTS AND BID PREPARATION: Bidding Documents consist of the Bidding Requirements and the Contract Documents. The Bidding Requirements consist of the Notice Inviting Bids, Information for Bidders, the Bid Form (including Attachments described herein), and Bid Cover Sheet. The Contract Documents consist of the form of Agreement between the Agency and CONTRACTOR, Conditions of the Contract (General, General Project Requirements and other Conditions), Drawings, Specifications, and all Addenda issued prior to the execution of the Contract.

Bids shall be prepared on the Bid Form (including all attachments), and shall be submitted at such time and place as is stated in the Notice Inviting Bids. The Bid is a complete and properly executed proposal to do the Work for the sums stipulated therein, prepared and submitted in accordance with the Bidding Documents. All blanks in the Bid form must be appropriately filled in.

2. PROJECT: CONTRACTOR’s Bid must include everything necessary for and incidental to executing and completing all Work for the Project named below, as described in the Notice Inviting Bids, the Summary of the Work, and the Contract Documents.

MAINTENANCE BUILDING #730 RENOVATION

3. ADDENDA: Addenda are written or graphic instruments issued by the AGENCY prior to the execution of the Contract to modify or interpret Bidding Documents by additions, deletions, clarifications or corrections. Addenda issued during the bidding period shall be included in the Bid and will be made a part of the Contract. Bidders shall list in the Bid Form each Addendum received. Addenda will be issued as follows:

   A. Addenda will be prepared and issued at the option of the AGENCY and will be posted to the agency website no less than 72 hours prior to the bid date. It is the sole responsibility of each bidder to check for addenda at the agency website. Addenda will NOT be sent to each plan holder or prospective bidder.

   B. Any Addendum containing any material changes, additions or deletions issued less than 72 hours from the Bid Due Date will cause the Bid Due Date and time to be extended so as to provide a minimum of 72 hours between the issuance of the Addenda and the Bid closing. No extension will be given for non-material Addenda.

   C. Bidders shall be responsible for confirming they are in receipt of all Addenda.
4. **BID SECURITY:** As stipulated in the Notice Inviting Bids, each Bid shall be accompanied by a cashier’s check made payable to the AGENCY or a satisfactory Bid bond in favor of the AGENCY, executed by the BIDDER and a California-admitted surety company as Surety, in an amount not less than ten (10%) of the Base Bid. The check or Bid bond shall be given as a guarantee that the BIDDER will execute the contract if it is awarded to it, in conformity with the contract documents, and will provide the surety bonds as specified in these Bidding Requirements and the Contract Documents within ten (10) calendar days after notification of the AGENCY’s award of the contract to the Bidder. In case of refusal or failure to execute the Agreement and to provide the bonds and other documents within ten (10) calendar days of the award, the, cashier’s check or Bid bond, as the case may be, shall be forfeited to the AGENCY, as liquidated damages.

5. **BIDS:** Bids to receive consideration shall be made in compliance with the following instructions:

   A. Bids shall be prepared and delivered in accordance with the Notice Inviting Bids and on the approved Bid Form.

   B. Bids shall be for the elements of the Work listed on the Bid Form, and shall contain no recapitulation of work to be performed. Proposals other than those specifically requested will not be considered.

   C. Bids shall provide stipulated sums that include all items of expense necessary for completion of the Work of the Contract.

   D. In the event of a discrepancy between the written amount of the Bid Price and the numerical amount of the Bid Price, the written amount of the Bids shall govern.

   E. Bidders shall carefully examine and understand the Contract Documents, including drawings, specifications, Scope of Work, and all forms contained in the Project Manual, and shall visit the site of the Work and fully inform themselves as to all existing conditions and limitations.

6. **SIGNATURE:** The Bid must be signed in the name of the Bidder and must bear the signature in longhand of the person or persons authorized to sign the Bid on behalf of the Bidder. All signatures shall be in ink.

7. **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 can result in the AGENCY’s rejection of the Bid as not being responsive to the Notice Inviting Bids. No oral, facsimile (FAX) or telephonic modification of any Bid submitted will be considered.

8. **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.

9. **WITHDRAWAL OF BIDS:** Any Bidder may withdraw its Bid, either personally or by...
written notice at any time prior to the scheduled Bid Due Date. No Bid, once opened and read, may be withdrawn for a period of one hundred twenty (120) consecutive calendar days after the Bid Opening Date unless authorized in writing by the AGENCY.

10. OPENING OF BIDS: Bids shall be opened and publicly read aloud at the time and place stipulated in the Notice Inviting Bids. Upon the opening of Bids, the AGENCY will post the name and amount of the apparent lowest Bidder (“Low Bidder Notice”) on the Agency’s web site. The posting of the Low Bidder Notice shall not constitute an award of the contract by the Agency nor shall such posting preclude a further review of all Bids as provided herein and only the issuance of a Notice of Award as provided in Section 13 shall constitute an award of the contract.

11. AGENCY RIGHTS: AGENCY may investigate the qualifications of any Bidder under consideration inclusive of, but not limited to, the information provided in the bid submittal. AGENCY may require confirmation of information furnished by the Bidder, and require additional evidence of qualifications to perform the Work. AGENCY reserves the right to:

A. Reject any or all of the Bids, at its discretion, including multiple Bids if the multiple Bids are prejudicial to the interests of AGENCY or to other Bidders;

B. Reject any Bid that, in the opinion of AGENCY, is so unbalanced in comparison to other Bids received and/or to AGENCY's internal estimates that it does not accurately reflect the cost to perform the Work;

C. Cancel the entire Bid;

D. Issue subsequent Bids;

E. Appoint evaluation committees to review Bids;

F. Seek the assistance of outside technical experts to evaluate Bids;

G. Disqualify the Bid(s) upon evidence of collusion with intent to defraud or other illegal practices on the part of the Bidder(s);

H. Waive any errors or informalities in any Bid, to the extent permitted by law;

I. Award a Contract without interviews, discussions, or negotiations, as permitted by the single Bid process;

J. AGENCY may prior to or after Contract award delete any Bid line item at the line item Bid price. If AGENCY elects to delete any Bid line Item prior to award of Contract, the method of determining the lowest Bidder shall be in compliance with Public Contract Code Section 20103.8. If AGENCY elects to delete any Bid line item after award, it shall be done pursuant to a Change Order.

K. The Notice Inviting Bids does not commit the AGENCY to enter into a contract, nor does it obligate the AGENCY to pay any costs incurred in preparation and submission of Bids or in anticipation of a contract.
12. RESPONSIBILITY CRITERIA: Responsibility is the apparent ability of the Bidder to successfully meet and complete the requirements of the Contract. The AGENCY reserves the right to consider the financial responsibility and general competency of each Bidder, as well as its reputation within the industry. AGENCY may request that the apparent low Bidder provide a financial statement, audit if necessary, including the Bidder's latest balance sheet and income statement. The AGENCY expects that each Bidder will fully and truthfully disclose all information required of the Bidder by the Bid Documents. The prospective Bidder, in order to be evaluated by the AGENCY as being a responsible CONTRACTOR, may be requested to confirm the following responsibility criteria:

A. Has or can secure adequate financial resources to perform the contract;

B. Is able to meet the performance or delivery schedule of the contract, taking into consideration other business commitments; and

C. Has a satisfactory record of performance. A CONTRACTOR seriously deficient in current contract performance, considering the number of contracts and extent of the deficiencies, is presumed not to meet this requirement unless the deficiencies are beyond its control or there is evidence to establish its responsibility notwithstanding the deficiencies. Evidence of such satisfactory performance record should show that the CONTRACTOR:

1. Has a satisfactory record of integrity in its dealings with government agencies and with subcontractors, and is otherwise qualified to receive an award under applicable laws and regulations;

2. Has the necessary organization, experience, satisfactory safety record, accounting and operational controls and technical skills or the ability to obtain them;

3. Has the necessary production, construction, and technical equipment and facilities or the ability to obtain them; and

4. Has an adequate safety record in performance of other construction projects.

13. AWARD OF CONTRACT OR REJECTION OF BIDS:

A. After the Bids for the contemplated Work have been opened and read, as provided in the Notice Inviting Bids, the Bids will be compared upon the basis of the sum of the totals of the items stated in the schedule of prices, as calculated from the given estimated quantities and the unit prices or lump sum amounts submitted. The AGENCY will issue to the lowest responsive bid by a responsible Bidder a "Notice of Award" within one hundred twenty (120) days after the opening of Bids.
B. No Bidder may withdraw its Bid during this 120-day period. AGENCY will return the bid security, except any guarantees which have been forfeited, to the respective Bidders whose Bids they accompanied, within sixty (60) days after the Contract is awarded to the successful BIDDER, or rejection of all Bids, or upon receipt of a written request for return received after the period set forth herein.

C. Within ten (10) days after the issuance of the “Notice of Award”, the successful Bidder shall post the Performance and Payment Bonds, provide certificates of insurance, and return executed copies of the Agreement, Bonds and required attachments to the Agreement to the AGENCY.

D. Before the award of the Contract by AGENCY, any Bidder shall furnish, upon request of AGENCY, a recent statement of financial condition, previous construction experience, information on owned equipment and/or information regarding the specific use and availability of equipment on the subject project, and such additional information as may be requested by AGENCY. Failure by a BIDDER to furnish the information requested shall be considered sufficient grounds for rejection of the Bid.

E. Qualified bids are not acceptable to the AGENCY. Bids with qualifications or omissions will be rejected without consideration as non-responsive.

F. Until such time as the Contract has been awarded as provided below, the AGENCY reserves the right to reject any or all Bids, and to reject Bids not suitable to their best interest. If, in the judgment of AGENCY, a Bid is unbalanced, non-responsive or if the Bidder is not responsible, it shall be considered sufficient grounds for rejection of the entire Bid.

G. The Contract shall be deemed awarded upon satisfaction of all of the following: (1) the AGENCY’s issuance of a Notice of Award to the successful BIDDER, (2) the BIDDER’s compliance with all of the requirements of this Section 13, including delivering to the AGENCY executed copies of the Agreement, Bonds and required attachments to the Agreement, and (3) the issuance by the AGENCY of a Notice to Proceed under the Contract. Notwithstanding any prior approval by the AGENCY, the Contract shall not be deemed awarded until all of the above requirements have been satisfied.

14. FILING OF BID PROTESTS: This Section sets forth the procedure and remedies concerning submittal and consideration of all protests received by AGENCY with respect to the Invitation for Bids (IFB). By submitting a Bid, each Bidder hereby agrees and understands that the Bidder must comply with these protest procedures and exhaust all administrative remedies set forth herein prior to the initiation of any type of related legal action. Upon the express written agreement of the parties, this protest procedure can also be used to resolve issues surrounding the AGENCY’s determination of a Bidder as not responsible. The following terms as used in this Section shall have the following meanings:

“Protest” shall mean a written objection by an interested party or affected party to (i) the requirements or specifications contained in the IFB (solicitation protest); or (ii) a proposed award recommendation (award protest).

“Days” shall mean calendar days, unless otherwise specified.

“Interested Party” shall mean all Bidder or prospective Bidders on a procurement.
“Solicitation Protest Statement” shall mean a written objection during the bid solicitation phase of the procurement, which shall be submitted prior to the Bid due date as specified herein.

“Award Protest Statement” shall mean a written objection to the award of the Contract, which shall be submitted with five (5) days after opening of the Bids, as specified herein.

“File or Submit” shall refer to the date of receipt by AGENCY.

“Affected Parties” shall mean a Bidder on a procurement, whose direct economic interest would be affected by a submitted protest.

Specific procedures and requirements are as follows:

A. Solicitation Phase Protest. The purpose of the IFB is to obtain competitive Bids from interested Bidders. Any interested party who has reason to believe that a free and open competition has not taken place or that a particular specification or requirement is impractical, unduly restrictive, or ambiguous may advise the AGENCY of its concerns by submitting a detailed Solicitation Protest Statement in accordance with the requirements set forth below in this Section A.

(1) Contents and Requirements

A Solicitation Protest Statement must be submitted to AGENCY’s Manager of Capital Projects identified in the IFB via electronic mail (email) by 4:00p.m. (Pacific Time zone) no less than fifteen (15) days prior to the Bid due date, and must contain all of the following to be considered:

a) The name, address, and telephone number of the protestor;

b) The Project Name and Project Number of the IFB being protested;

c) A detailed statement setting forth the grounds for protest, which shall include, in sufficient detail to establish the merits of the protest, all the factual and legal documentation in support of the protest; and

d) The desired resolution to the protest.

If the submitted Solicitation Protest Statement does not comply with the requirements set forth herein, then it will not be considered for evaluation and will be returned to the protestor. The Solicitation Protest Statement shall not be amended after filing, and AGENCY will not consider any unsolicited information provided after filing. Any argument not raised in the Solicitation Protest Statement shall be deemed waived, including as a part of the award protest. Failure to file the Solicitation Protest Statement within the time period specified herein shall constitute a waiver of the right to protest the specifications or requirements of the IFB.

Solicitation Protest Statements are public documents, and AGENCY will provide copies of the Solicitation Protest Statements to any interested person upon written request.
(2) Evaluation and Determination

No hearing will be held on the protest. AGENCY’s Manager of Capital Projects, or designee, will review all material submitted, conduct an investigation of the facts, and may, but need not, request other Bidders to submit statements or arguments regarding the protest. AGENCY’s Manager of Capital Projects, or designee, may in his/her sole discretion, discuss the protest with the protestor.

AGENCY’s Manager of Capital Projects, or designee, shall issue a final written decision regarding any solicitation protest to each Bidder prior to Bid opening. The written decision will cite any actions that will or will not be taken in response to the Solicitation Protest Statement. The decision of the Manager of Capital Projects concerning the Solicitation Protest Statement shall be final, and there shall be no further administrative recourse.

B. Award Protest

(1) Contents and Requirements

Following the opening of the Bids any affected party, who has reason to believe that a free and open competition has not taken place in the Bid opening, evaluation of the Bids, and award recommendation, is permitted to protest AGENCY’s award of the Contract by submitting the Award Protest Statement to the AGENCY’s Manager of Capital Projects no later than 4:00p.m. (Pacific Time zone) on the fifth day after the AGENCY’s posting of the Low Bidder Notice on the AGENCY’s website. The Award Protest Statement must be submitted timely and contain all of the following to be considered:

a) The name, address and telephone number of the protestor;

b) The Project Name and Project Number of the IFB being protested;

c) The AGENCY action or recommendation that is being protested;

d) The name(s) of all affected parties;

e) A detailed statement setting forth the grounds, legal authority and facts in support of the protest, including all documents and evidence;

f) Each and every ground on which the protestor bases the protest by specific references to parts of the IFB, which shall be attached as exhibits;

g) Each and every reason that all other affected parties who may be in line for the purchase or Contract award should not be awarded the purchase or Contract;

h) A clear statement of the relief requested and the statutory or case law basis for such relief; and

i) Signed and sworn by a principal of the protestor.

If the submitted Award Protest Statement does not comply with the requirements set forth herein, then it will not be considered for evaluation, and will be returned to the protestor. The Award Protest Statement shall not be amended after filing, and the AGENCY will not
consider any unsolicited information provided after filing. Any argument not raised in the Award Protest Statement shall be deemed waived.

Award Protest Statements are public documents. AGENCY will notify the affected parties when a protest has been submitted, and will provide copies of the Protest Statements to the affected parties as soon as is reasonably practical.

(2) Evaluation and Determination

The affected parties may file responsive statements in support of or in opposition to the protest within three (3) business days after the receipt of the Award Protest Statement from AGENCY. The Manager of Capital Projects, or designee, shall review the facts and all submittals relative to the Award Protest Statement and shall issue a written decision setting forth the basis for such decision. The written decision will be issued to the protestor and to all affected parties.

Unless otherwise required by law, no evidentiary hearing or oral argument shall be provided, except in the sole discretion of the Manager of Capital Projects, or designee. In the event a hearing is conducted, the Manager of Capital Projects, or designee, shall issue written notice to the protestor and affected parties identifying the date and time for the hearing, along with rules concerning the hearing.

C. Delay in Award

Execution of any proposed contract shall be delayed pending the resolution of the protest unless one or more of the following conditions is present:

1. The items or services being procured are urgently required;
2. Delivery or performance will be unduly delayed by failure to make award promptly; or
3. Failure to make prompt award will otherwise cause undue harm to AGENCY.

D. No Limitation on Remedies

Nothing contained herein shall be construed to act as a limitation on AGENCY's choice of remedies or confer any right upon any interested party or affected party to a remedy.

E. Basis for Choice of Remedy

In determining the appropriate remedy, the AGENCY shall consider all the circumstances surrounding the IFB and/or award, including, but not limited to:

1. The seriousness of any deficiency found to exist in the contracting process;
2. The effect of the action on the competitive process;
3. Any urgency surrounding the Contract requirement; and
4. The effect that implementing the remedy will have on the AGENCY.
F. Remedies

If the AGENCY determines that the award or proposed award was not made in accordance with applicable statutes, regulations, policies and/or procedure, the AGENCY, in its sole discretion, may grant any of the following remedies or any other remedy it deems appropriate:

1. Prior to award, AGENCY may issue a new solicitation, make a new selection/award recommendation, or award the Contract consistent with applicable statutes, regulations, policies and procedures;

2. In its sole discretion, take no further action; or

3. Take any other action that is permitted by law to promote compliance.

15. AGREEMENT: The Agreement form (contract) which the successful Bidder as CONTRACTOR will be required to execute is included in the Bid Package and shall be carefully examined by the Bidder prior to submitting its proposal. At time of award, copies of the Agreement form and Attachments for final execution will be forwarded to CONTRACTOR.

Do not submit with the Bid copies of the Agreement or Bond Forms that are in the Bid Package.

16. INTERPRETATION OF PLANS, DRAWINGS AND DOCUMENTS: If any person contemplating submitting a Bid for the proposed Work is in doubt as to the true meaning of any part of the Bidding or Contract Documents, or finds discrepancies in or omissions from those documents, that person shall submit to the AGENCY a written request for an interpretation or correction thereof. The person submitting the request shall be responsible for its prompt delivery. Any interpretations of proposed documents will be made only by an Addendum duly issued, and a copy of such Addendum will be posted on the AGENCY’s web site. AGENCY will not be responsible for any other explanation or interpretation of documents. Bidders are cautioned to accept interpretations in writing only.

The AGENCY will respond to written/faxed inquiries received at least eight (8) days before the scheduled Bid Opening Date for which, in its sole judgment, a response is in the best interest of the AGENCY. Where such interpretation or clarification requires a change in the Bid Documents, the AGENCY will prepare and issue an Addendum to the Bid Documents. The AGENCY will not be bound by, and Bidder shall not rely upon, any oral interpretation or clarification of the Bid Documents.

17. SUBCONTRACTORS: Bidders are hereby notified that the AGENCY will not recognize subcontractors as having any function in the Work other than as employees of the prime CONTRACTOR. Bidders shall refer to the General Conditions with reference to employees and to the Bidding Requirements and General Conditions with reference to subcontractors. The Bidders shall be responsible for subcontractors having read the General Conditions, General Project Requirements, and for being familiar with terms and conditions of the Contract Documents as said terms and conditions may affect their work, prior to submitting their Bid.
18. **LISTING SUBCONTRACTORS:** Each Bidder shall submit a list of the proposed subcontractors on the project as required by the Subletting and Subcontracting Fair Practices Act (Public Contract Code Sec. 4100 et seq.) on the forms provided with the Bidding Requirements. The business location, phone number, and license number are required for each subcontractor proposed or the Bid will be deemed non-responsive.

19. **DRAWINGS AND PROJECT MANUALS FURNISHED:** The AGENCY will furnish the successful Bidder with two (2) complete sets of the Drawings and Project Manuals pertinent to work for construction purposes. Additional copies required may be purchased for an amount equal to printing costs. Bidders are hereby notified that all such Drawings and Project Manuals are the property of the AGENCY and are loaned to the successful Bidder for duration of the Work. Any re-use of these documents, in whole or in part, for any purpose, is prohibited.

20. **TIME FOR COMPLETION:** Time is of the essence in execution of the Contract for this Work. Bidder shall refer in its bid to acceptance of the time of execution.

21. **LIABILITY AND PROPERTY INSURANCE:** Bidder’s attention is specifically directed to requirements of the General Conditions and the General Project Requirements, with reference to liability and property insurance, and to the provisions in the Agreement for progress payments, hold harmless agreement, final payment, subsurface hazardous materials encountered and liquidated damages.

22. **WORKERS' COMPENSATION:** In accordance with the provisions of Section 3700 of the Labor Code, CONTRACTOR shall secure the payment of compensation to its employees. Prior to performing work under this contract, CONTRACTOR shall sign and file with AGENCY the "Certificate Regarding Workers Compensation," which includes the following: "I am aware of the provisions of §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 code, and I will comply with such provisions before commencing the performance of the work of this contract."

23. **HOLD HARMLESS AGREEMENT:** To the fullest extent permitted by law, the CONTRACTOR agrees to and does hereby indemnify, defend and hold harmless the AGENCY and each of their officers, agents, employees, and consultants (including the AGENCY’s architects and engineers) from every claim or demand made and every liability, loss, damage, or expense of any nature whatsoever (including, but not limited to attorneys’ fees and costs including fees of consultants) which may be incurred by reason of:

   A. Liability for damage for death or bodily injury to persons or injury to property sustained by the CONTRACTOR or any other person, firm or corporation employed by the CONTRACTOR upon or in connection with the work called for in this agreement, except for liability for damages referred to above which result from the sole negligence or willful misconduct of the AGENCY, or each of their officers, agents or independent CONTRACTORs who are directly employed by the AGENCY or for defects in design furnished by such persons.

   B. Any injury to or death of persons or damage to property sustained by any person, firm or corporation, including the AGENCY, arising out of, or in any way connected with the work covered by this agreement, whether on or off AGENCY
property, except for liability for damages which result from the sole negligence or willful misconduct of the AGENCY, and each of their officers, employees, agents or independent CONTRACTORs who are directly employed by the AGENCY or for design defects furnished by such persons.

C. Any dispute between CONTRACTOR and CONTRACTOR’s subcontractors, suppliers and sureties, including, but not limited to, stop notice actions.

The CONTRACTOR, at its own expense, cost, and risk, shall defend any and all actions, suits, or other proceedings that may be brought or instituted against the AGENCY, and each of their officers, agents, employees or consultants on any such claim, demand or liability and shall pay or satisfy any judgment that may be rendered against the AGENCY, and each of their officers, agents or employees in any action, suit or other proceedings as a result thereof.

24. EXAMINATION OF SITE AND CONTRACT DOCUMENTS: Each Bidder shall visit the site of the proposed work and become fully acquainted with the conditions relating to the construction project so that he may fully understand the facilities, difficulties and environmental restrictions affecting the execution of the work under the contract. Bidders shall thoroughly examine and be familiar with the Contract Documents including the environmental permits that dictate the mitigation measure that must be enacted and maintained by the CONTRACTOR during the project. The failure or omission of any Bidder to obtain or examine any Contract Documents, Addenda, environmental permits, forms, instruments, or other documents, or to visit the site and acquaint themselves with existing conditions, shall in no way relieve any Bidder from obligations with respect to its Bid or to the Contract. The submission of a Bid will be taken by the AGENCY as evidence of compliance with all requirements of this section.

25. ANTI-DISCRIMINATION: It is the policy of the AGENCY that in connection with all work performed under contracts, there shall be no discrimination against any prospective or active employee engaged in the work because of race, color, ancestry, national origin, religious creed, sex, age, medical conditions, sexual orientation or marital status. The CONTRACTOR agrees to comply with applicable Federal and California laws including, but not limited to, the California Fair Employment Practice Act, beginning with Government Code 12900 and Labor Code 1735. In addition, the CONTRACTOR agrees to require like compliance by any subcontractors employed for the work by the CONTRACTOR.

26. NO TELEPHONE AVAILABILITY: Bidders are advised that on the Bid Due Date telephones WILL NOT be available at the AGENCY for use by Bidders, their sub-contract bidders, or other representatives.

27. LICENSE REQUIRED: Pursuant to Section 7028.15 of the Business and Professions Code and Section 3300 of the Public Contract Code, all Bidders must possess proper licenses for performance of this Contract. At the time of bid, and for the duration of the Contract, if awarded, CONTRACTORs shall possess a valid City of San Bernardino business license and a valid California CONTRACTOR’s license for the Class identified in the Notice Inviting Bids and the bid package scope of work in order to perform the specified Bid Package of Work. Subcontractors must possess the appropriate licenses for each specialty subcontracted. CONTRACTORs must verify license requirements of local jurisdictions.

28. CERTIFICATIONS AND OTHER ATTACHMENTS TO BID FORM: All Bidders are required to execute and submit with their bids the following certifications, affidavits, and other attachments to the Bid Form:
1. Bidder’s Non-collusion Affidavit, identified herein as Attachment No. 1 to Bid Form as required by Public Contract Code, Section 7106.

2. Site Visit Certification, identified herein as Attachment No. 2 to Bid Form.

3. CONTRACTOR Information Sheets, identified herein as Attachment No. 3 to Bid Form.

4. Proposed Subcontractors, identified herein as Attachment No. 4 to Bid Form.

5. Bid Bond Form, identified herein as Attachment No. 5 to Bid Form.

6. Bidder References and Responsibility Information, identified herein as Attachment No. 6 to Bid Form.

7. Supplemental Bid Information, identified herein as Attachment No. 7 to Bid Form.

29. **CERTIFICATIONS AND OTHER ATTACHMENTS TO AGREEMENT:** Prior to execution of the AGREEMENT, the successful Bidder shall submit the following certifications:

1. Certificate Regarding Worker’s Compensation, identified herein as Attachment No. 1 to Agreement.

2. Drug-Free Work Place Certification, identified herein as Attachment No. 2 to Agreement.

3. CONTRACTOR Prevailing Wage Compliance Certification, identified herein as Attachment No. 3 to Agreement.

4. Faithful Performance Bond Form, identified herein as Attachment No. 4 to Agreement.

5. Payment Bond Form, identified herein as Attachment No. 5 to Agreement.

6. Company Information Sheets, identified herein as Attachment No. 6 to Agreement.

7. General CONTRACTOR Project Contact Information, identified herein as Attachment No. 7 to Agreement.

8. Guarantee, identified herein as Attachment No. 8 to Agreement.

9. Form W-9 Request for Taxpayer Identification Number and Certification, identified herein as Attachment No. 8 to Agreement.

All Bidders are advised to retain the certifications until the successful Bidder has been confirmed and an Agreement for the work has been executed.

30. **CERTIFICATIONS REQUIRED PRIOR TO COMMENCING WORK:** Prior to commencing work on the Project, the successful Bidder shall submit the following certifications:

A. Criminal Records Check Certification Form (Only if requested by AGENCY).

B. Proof of Worker’s Compensation and liability insurance.
31. **BID DEPOSIT RETURN:** Bid Security of three or more low Bidders, the number being at the discretion of the AGENCY, will be held for one hundred twenty (120) consecutive calendar days or until sixty (60) days after the AGENCY’s issuance of a Notice of Award and the posting by the successful Bidder of the bonds and certificates of insurance required and return of executed copies of the Agreement, whichever first occurs, at which time the deposits will be returned. Bid Security of other Bidders will be returned after opening of the Bids.

32. **WAGE RATES, TRAVEL AND SUBSISTENCE:**

   (a) The prevailing rate of per diem wages, as determined by the Director of Industrial Relations, applicable to the work to be done for the locality in which the work is to be performed in compliance with Section 1773 of the Labor Code of the State of California are on file in AGENCY’s principal office at the address listed in the Notice Inviting Bids and will be made available to any interested party upon request. Once awarded, the CONTRACTOR shall obtain copies of the above-referenced prevailing wage sheets and post a copy of such wage rates at appropriate, conspicuous, weatherproof points at the Site. The general prevailing rate of per diem wages can also be located on the internet at the following web address: [www.dir.ca.gov](http://www.dir.ca.gov)

   (b) Any worker employed to perform work on the Project and the specified work is not covered by any classification listed in the published general prevailing wage rate determinations or per diem wages determined by the Director of the Department of Industrial Relations, shall be paid not less than the minimum rate of wages specified therein for the classification which most nearly corresponds to the employment of such person in such classification.

   (c) Holiday and overtime work, when permitted by law, shall be paid for at the rate set forth in the prevailing wage rate determinations issued by the Director of the Department of Industrial Relations or at least one and one-half (1/2) times the specified basic rate of per diem wages, plus employer payments, unless otherwise specified in the contract documents or authorized by law.

   (d) It is the CONTRACTOR's responsibility to ensure that the appropriate prevailing rates of per diem wages are paid for each classification, both for the CONTRACTOR's employees and for all subcontractors’ employees.

33. **LABOR COMPLIANCE:** Any CONTRACTOR to whom a contract for the Work is awarded by the AGENCY shall comply with the provisions of the California Labor Code, including, without limitation, the obligation to pay the general prevailing rates of wages in the locality in which the Work is to be performed in accordance with Sections 1773.1, 1774, 1775 and 1776 of the California Labor Code and the obligation to comply with Section 1777.5 of the California Labor Code governing employment of apprentices. The CONTRACTOR shall further comply with the requirements of Section 1771.4 of the California Labor Code to furnish directly to the Labor Commissioner on a monthly basis the records specified in Section 1776 of the California Labor Code.

34. **IN-ELIGIBLE CONTRACTORS:** CONTRACTORs and subcontractors that are ineligible to bid or work on public works project pursuant to Section 1777.1 or 1777.7 of the California Labor Code may not bid on the Work and any bid submitted by an ineligible CONTRACTOR or which contains work to be performed by an ineligible subcontractor will be rejected by the AGENCY.

**END OF DOCUMENT**
BID COVER SHEET

BID DUE: September 18, 2017 @ 2:00 PM

PROJECT NAME: Maintenance Building #730 (RE-BID)

THE WORK UNDER THIS BID IS A PROJECT OF: San Bernardino International Airport Authority

BIDDER/CONTRACTOR:

BIDDER TELEPHONE & CONTACT PERSON

CONTENTs MUST INCLUDE: (Please Check Each Box)

Attachments:

☐ 1 - Bidder’s Non-collusion Affidavit
☐ 2 - Site Visit Certification
☐ 3 – Company Information Sheet
☐ 4 - Proposed Subcontractors
☐ 5 - Bid Bond Form
☐ 6 - Bidder References & Responsibility Information
☐ 7 - Supplemental Bid Information

SUBMIT BID TO: CLERK OF THE BOARD
SAN BERNARDINO INTERNATIONAL AIRPORT AUTHORITY
1601 EAST, 3RD STREET, SUITE 100, SAN BERNARDINO CA, 92408

Each Bidder/CONTRACTOR must complete the information on this sheet and affix this sheet to the outside of their bid envelope by gluing or taping.
BID FORM

TO: San Bernardino International Airport Authority, acting by and through its Governing Board, herein called the “AGENCY.”

FROM: (Proper Name of Bidder)

1. Pursuant to and in compliance with your Notice Inviting Bids and the other documents relating thereto, the undersigned Bidder, having familiarized himself/herself with the terms of the Contract and the Contract Documents, the environmental permit requirements, the local conditions affecting the performance of the Contract and the cost of the work at the place where the work is to be done, hereby proposes and agrees to perform within the time stipulated, the Work of the Contract, including all of its component parts, and the furnishing of all materials and equipment required to be incorporated in and form a permanent part of the work; the furnishing of tools, equipment, supplies, transportation, utilities, facilities, labor, superintendence and services required to perform and complete the work; bonds, insurance and submittals; and including the assumption of all obligations, duties and responsibilities necessary to the successful completion of the Contract, including its acceptance by the AGENCY.

2. ADDENDA

The undersigned has thoroughly examined any and all Addenda (if any) issued during the bid period and is thoroughly familiar with all contents thereof and acknowledges receipt of the following Addenda: (Bidder to list all addenda)

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3. BID AMOUNTS

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The undersigned Bidder agrees to achieve Final Completion of the Work and all Major Milestones within the Contract Time set forth in the Contract Documents.
Note: Allowances are for the sole use of the AGENCY.

4. ALTERNATES: (If applicable) The following amounts shall be added to or deducted from the Base Bid at the AGENCY’s option. Refer to Section 01030 Alternates for description of work. **None**

* Line out “add” or “deduct” depending on which is not applicable. However, any other method or designation which clearly identifies the nature of the item shall also be acceptable. In the absence of any clear indication of the additive or deductive nature of the item, it will be assumed that the item is intended to be deductive in nature.

5. TIME FOR COMPLETION: The entire Project shall be completed within 120 **consecutive calendar days**. Bidder acknowledges liability for liquidated damages in the amount as stipulated herein for each calendar day of delay.

6. AGENCY’S RIGHT TO REJECT: It is understood that the AGENCY reserves the right to reject this bid and that the bid shall remain open to acceptance and is irrevocable for a period of **one hundred twenty (120) days**.

7. BID SECURITY: The required bid security in the amount of not less than ten percent (10%) of the bid is attached hereto.

8. PROPOSED SUBCONTRACTORS: The required list of proposed subcontractors is attached hereto. Bidder understands and acknowledges that all subcontractors providing goods and services in excess of $100,000.00 must be bonded in accordance with the Subletting and Subcontracting Fair Practices Act.

9. NONCOLLUSION AFFIDAVIT: The required notarized Bidder’s Non-collusion Affidavit is attached hereto.

10. SITE VISIT CERTIFICATION: The required Site Visit Certification is attached hereto.

11. CONTRACTOR INFORMATION SHEETS: The required CONTRACTOR Information Sheets are attached hereto.

12. CRIMINAL BACKGROUND CHECK CERTIFICATION: The required Criminal Background Check Certification will be submitted prior to CONTRACTOR commencing work on the project (only if requested) in accordance with the Notice Inviting Bids.

13. FAITHFUL PERFORMANCE AND PAYMENT BOND: It is understood and agreed that if Bidder is providing goods and services in excess of $25,000.00 and written notice of the acceptance of this bid is mailed or delivered to the undersigned after the opening of the bid, and within the time this bid is required to remain open, or at any time thereafter before this bid is withdrawn, the undersigned will execute and deliver to the AGENCY a fully executed Form of Agreement (Contract) in the form attached hereto in accordance with the bid as accepted, and that it will also furnish and deliver to the AGENCY three (3) executed copies of a Faithful Performance Bond and a separate Payment Bond as specified, and certificates of insurance, all within ten (10) calendar days after receipt of notification of the acceptance. Bidder further agrees that the work under the Contract
will be commenced by the Bidder, if awarded the Contract, on the date to be stated in the AGENCY’s “Notice to Proceed” and will be completed within the time specified in the Contract documents.

14. **PROPER ADDRESS:** Notice of Award of Contract or other correspondence should be addressed to the undersigned at the address stated below.

________________________________________________________________________

________________________________________________________________________

15. **NAME(S) OF PRINCIPALS:** Principals of the Bidder’s company are:

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

(IMPORTANT NOTICE: If Bidder is a corporation, state legal name of corporation, as well as names of the president, secretary treasurer, and general manager thereof; if a partnership, state true name of firm, also names of all individual partners composing firm; if an individual, state names in full.)

16. The undersigned bidder declares that the bidder is licensed in the State of California as required by the Business and Professional Code in accordance with the act providing for registration of CONTRACTORs and the documentation of licensure is as follows:

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If the bidder is a joint venture, each member of the joint venture must include the above information.

Bidder certifies that the above-mentioned license(s) entitle(s) Bidder to provide the work required by the Contract, that such license will be in full force and effect throughout the duration of work under this Contract, and that any and all subcontractors to be employed for the work will have appropriate licenses.

17. **FORFEITURE OF SECURITY:** In the event the Bidder to whom the Notice of Award of Contract is given fails or refuses to post the required bonds and return executed copies
of the Form of Agreement with all required attachments within ten (10) calendar days from the date of the Notice of Award, the AGENCY may declare the Bidder’s bid deposit or bond forfeited as liquidated damages

18. ASSIGNMENT OF RIGHTS, TITLE AND INTEREST IN CAUSES OF ACTION: Pursuant to Section 4552 of the Government code, in submitting a bid to the AGENCY, the bidder offers and agrees that if the bid is accepted, it will assign to AGENCY 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.

19. IRCA: The bidder hereby certifies that it is, and at all times during the performance of work hereunder will be, in full compliance with the provisions of the Immigration Reform and Control Act of 1986 ("IRCA") in the hiring of its employees and the bidder shall indemnify, hold harmless and defend the AGENCY against any and all actions, proceedings, penalties or claims arising out of the bidder’s failure to comply strictly with the IRCA.

20. FINANCIAL STATEMENTS: It is understood and agreed that if requested by the AGENCY, the Bidder will furnish a notarized financial statement, references and other information required by the AGENCY sufficiently comprehensive to permit an appraisal of bidder’s ability to perform the work of the Contract.

21. LIQUIDATED DAMAGES: The undersigned hereby warrants that all work shall be completed within 120 consecutive calendar days from the date specified on the Notice to Proceed issued by the AGENCY. Time is of the essence. The undersigned agrees that failure to complete the work or any scheduled activity within the time set forth herein will result in the imposition of liquidated damages for each consecutive calendar day of delay in the amount of $1,000.00/calendar day.

22. CHANGE ORDER REQUESTS: Bidder understands and agrees that all change order requests must be submitted in the form set forth in the Contract Documents. The amount of allowable charges submitted pursuant to a change order shall be limited to the charges allowed by the Conditions of the Contract. Indirect costs, consequential and incidental costs, project management costs, extended home office and field office overhead, administrative costs and profit and other charges not specifically authorized by the Contract Conditions will not be allowed.
The following documents must be submitted with this Bid Form.

1. Bidder’s Non-Collusion Affidavit
2. Site Visit Certification
3. Company Information Sheets
4. Proposed Subcontractors
5. Bid Bond
6. Bidder References and Responsibility Information
7. Supplemental Bid Information

The undersigned declares and certifies under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

__________________________________________________
Name of Corporation, Partnership or Sole Proprietor

__________________________________________________
Address

Telephone:_________________________________________

__________________________________________________
Proper Name of Bidder Empowered to Sign On Behalf of the Corporation, Partnership or Sole Proprietor

__________________________________________________
Signature of Bidder

NOTE: If bidder is a corporation, the legal name of the corporation shall be set forth above together with the signature of authorized officers of agents and the document shall bear the corporate seal; if bidder is a partnership, the true name of the firm shall be set forth above together with the signature of the partner or partners authorized to sign contracts on behalf of the partnership; and if bidder is an individual, his or her name and signature shall be placed above.
ATTACHMENT NO. 1 TO BID FORM

BIDDERS’ NONCOLLUSION AFFIDAVIT
/Public Contract Code Section 7106/

State of California

County of __________________

__________________________________________, being first duly sworn, deposes and says that he or she is the __________________________________________ of ____________________________, the party making the foregoing bid, that the bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization or corporation; that the bid is genuine and not collusive or sham; that the bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid, and has not directly or indirectly colluded, conspired, connived or agreed with any bidder or anyone else to put in a sham bid or that anyone shall refrain from bidding; that 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 or to secure any advantage against the public body awarding the contract of anyone interested in the proposed contract, that all statements contained in the bid are true; and, further, that the bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, or paid, and will not pay, any fee to any corporation, partnership, company association, organization, bid depository, or to any member or agent thereof to effectuate a collusive or sham bid.

__________________________________________

CONTRACTOR

__________________________________________

Signature of Officer

__________________________________________

Typed Name of Officer

Subscribed and sworn to (or affirmed) before me this _____ day of __________________________, 20____.

__________________________________________

Notary Public

My Commission Expires: _____________
ATTACHMENT NO. 2 TO BID FORM

SITE VISIT CERTIFICATION

I certify that I have visited the site of the proposed work and have fully acquainted myself with the conditions relating to construction, permitting requirements, environmental restrictions, mitigation measures required, and labor required to complete this project in accordance with the Contract Documents. I fully understand the facilities, difficulties and restrictions associated with the execution of the work under contract.

I certify under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

I fully indemnify the SAN BERNARDINO INTERNATIONAL AIRPORT AUTHORITY and all of its officers, agents, employees and consultants from any damage or omissions, related to conditions that could have been identified during my visit to the site.

________________________________________
Signature of Bidder

________________________________________
Typed Name of Bidder

SUBSCRIBED BEFORE ME on this _____ day of ___________________, 20____.

________________________________________
Notary Public

My Commission Expires: ________________

Project: San Bernardino International Airport Authority
Maintenance Building #730 Renovation

Site Visit Certification

00120
Bid Issuance Set
Page 1 of 1
ATTACHMENT NO. 3 TO BID FORM

COMPANY INFORMATION SHEET

DECLARATION

I declare under penalty of perjury under the laws of the State of California I have completed this Company Information Sheet and that the information contained herein is factual and accurate as of the date completed.

Completed and executed this _____ day of ______, 20xx, in __________________, _______.

By: ____________________________________________
Print Name: ______________________________________
Print Title: ________________________________________

LEGAL NAME OF COMPANY: ____________________________

ADDRESS: __________________________________________

TELEPHONE: ______________________ EMAIL: ____________

CALIFORNIA CONTRACTORS LICENSE NUMBER: ______________

DEPARTMENT OF INDUSTRIAL RELATIONS REGISTRATION NUMBER: ______________

TYPE OF BUSINESS (Check One):

[ ] CORPORATION [ ] LIMITED LIABILITY COMPANY
[ ] PARTNERSHIP [ ] JOINT VENTURE
[ ] INDIVIDUAL
[ ] INDIVIDUAL DOING BUSINESS UNDER A FIRM NAME
[ ] OTHER________________________________________

STATE OF INCORPORATION OR FORMATION:

________________________________________

PRINCIPALS/OFFICERS/PARTNERS/AGENCY OF COMPANY

(List All Principals/Officers/Partners [including Joint Venture Partners, Managing Partner], as well as investors/investment companies):

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[PLEASE ATTACH ADDITIONAL SHEETS AS NECESSARY IN ORDER TO PROVIDE ALL REQUESTED INFORMATION.]
IDENTIFICATION OF PRINCIPAL(S)/OFFICER(S)/REPRESENTATIVE(S) OF COMPANY – Execution of Legal Documents:
The Company has authorized and hereby designates the following individual(s) to execute legal documents on behalf of Company, including but not limited to contract documents, proposals and related documents:

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IDENTIFICATION OF PRINCIPAL(S)/OFFICER(S)/REPRESENTATIVE(S) OF COMPANY – Representative and/or Management Capacity:
The Company has authorized and hereby designates the following individual(s) to serve in a representative and/or management capacity on behalf of Company relating to the concerned project, contract document, lease document, development document, or any other legal document or agreement, including but not limited to manager, project manager, site manager, etc.

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[PLEASE ATTACH ADDITIONAL SHEETS AS NECESSARY IN ORDER TO PROVIDE ALL REQUESTED INFORMATION.]
ATTACHMENT NO. 4 TO BID FORM

PROPOSED SUBCONTRACTORS

In compliance with the Subletting and Subcontracting Fair Practices Act (Public Contract Code commencing at Section 4100) and any amendments thereof, each Bidder shall set forth below:

(a) The name, the location of the place of business, and California contractor license number of each subcontractor who will perform work or labor or render service to a prime CONTRACTOR in or about the construction of the work or improvement, or a subcontractor licensed by the State of California, who, under subcontract to a prime CONTRACTOR, specially fabricates and installs a portion of the work or improvement according to the Contract Documents in an amount in excess of one-half of 1 percent of the prime CONTRACTOR’s total bid or, in the case of bids or offers for the construction of streets or highways, including bridges, in excess of one-half of 1 percent of the prime contractor’s total bid or ten thousand dollars ($10,000), whichever is greater.

Any information requested by the officer, department, board or commission concerning any subcontractor who the prime CONTRACTOR is required to list under this subdivision, other than the subcontractor’s name, description of work, and location of business, may be submitted by the prime CONTRACTOR up to 24 hours after the deadline established by the officer, department, board or commission for receipt of bids by prime CONTRACTORs.

(b) The portion of the work which will be done by each subcontractor.

General CONTRACTORs bidding this work shall require, pursuant to Public Contract code article 4108, all subcontractors providing labor and materials in excess of $100,000.00 to supply an original signature and fully executed 100% Faithful Performance and 100% Payment Bond. All general CONTRACTORs bidding on this work must specify this requirement for subcontractor bonds in their written or published request for subcontractor bids. Failure to comply with this requirement shall not preclude CONTRACTOR from complying with the subcontractor bonding requirements.
### DESIGNATION OF SUBCONTRACTORS

<table>
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<tr>
<th>Portion of Work</th>
<th>Subcontractor Name</th>
<th>Phone Number &amp; Address of Business</th>
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**NAME OF BIDDER**

Signature: ________________________________

Title: ________________________________

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**Project:** San Bernardino International Airport Authority  
Maintenance Building #730 Renovation

---

**Proposed Subcontractors**

00140  
Bid Issuance Set  
Page 2 of 2
ATTACHMENT NO. 5 TO BID FORM

BID BOND FORM

KNOW ALL PERSONS BY THESE PRESENTS, that we ____________________________
as CONTRACTOR/PRINCIPAL and ____________________________, as Surety, an admitted Surety insurer pursuant to Code of Civil Procedure, Section 995.120, legally doing business in California at ____________________________, are held and firmly bound unto the SAN BERNARDINO INTERNATIONAL AIRPORT AUTHORITY, hereinafter called the AGENCY, in the penal sum of TEN PERCENT (10%) OF THE TOTAL AMOUNT OF THE BID of the CONTRACTOR/PRINCIPAL submitted to the said AGENCY for the work described below for the payment of which sum is 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 whereas the CONTRACTOR/PRINCIPAL has submitted the accompanying bid dated _____________, 20____, for construction of the project known as:

______________________________ PROJECT

NOW THEREFORE, the CONTRACTOR/PRINCIPAL shall not withdraw said bid within one hundred twenty (120) calendar days after said opening; and the CONTRACTOR/PRINCIPAL, when given Notice of Award, shall within ten (10) calendar days after the prescribed forms are presented to him for signature, return executed copies of the Agreement to the AGENCY, in accordance with the bid as accepted and give bond with good and sufficient surety or sureties, as may be required, for the faithful performance and proper fulfillment of such contract and for the payment for labor and materials used for the performance of the contract or in the event of the withdrawal of said bid within the period specified or the failure to enter into such contract and give such bonds within the time specified, the CONTRACTOR/PRINCIPAL shall pay the AGENCY the difference between the amount specified in said bid and the amount for which the AGENCY may procure the required work and/or supplies of the latter amount be in excess of the former, together with all costs incurred by the AGENCY in again calling for bids, then the above obligation shall be void and of no effect, otherwise to remain in full force and effect.

Surety, for value received, 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 the specifications.

In the event suit is brought upon this bond by the AGENCY and judgment is recovered, CONTRACTOR/PRINCIPAL and Surety shall pay all costs incurred by the AGENCY in such suit, including a reasonable attorney’s fee to be fixed by the court.
IN WITNESS WHEREOF the above-bound parties have executed this instrument under their several seals this _____ day of ________________, 2014 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)

CONTRACTOR/PRINCIPAL

By: (Signature)

__________________________

Print Name

(Corporate Seal)

SURETY

By: (Signature)

__________________________

Print Name

Title

__________________________

Address

__________________________

Telephone No.

(Attach Attorney-in-Fact Certificate)

(Attach All-Purpose Notary Acknowledgment for Surety Signature)
ATTACHMENT NO. 6 TO BID FORM

BIDDER REFERENCES AND RESPONSIBILITY INFORMATION

GENERAL INFORMATION REQUIRED FROM BIDDER

The AGENCY expressly reserves the right to reject the bid of any bidder who, upon investigation, has been determined to fail to complete similar contracts in a timely fashion or in a satisfactory matter. Such rejection would, if applicable, be based upon the principal that the bidder is “non-responsible” and poses a substantial risk of being unable to complete the work in a cost-effective, professional and timely manner.

In performing the above-described responsibility determination, the AGENCY reserves the right to utilize, and bidder agrees to provide AGENCY with all possible sources of information in assisting AGENCY to make its determination, including, but not limited to: inquiries to regulatory state Boards and agencies; Dun and Bradstreet credit reports; bidder’s most recent financial statements (unaudited and audited, as requested by AGENCY); inquiries to companies and public entities for which the bidder has previously performed work; reference checks and examination of all public records.

The bidder must also demonstrate knowledge of similar project experience and construction techniques and should possess a working ability to perform similarly-sized construction work for a public agency. This knowledge and ability shall be shown by furnishing the names, current phone numbers, address, points of contact and scope of work of at least three (3) public agency customers served within the past three (3) years with requirements similar to the needs of the SAN BERNARDINO INTERNATIONAL AIRPORT AUTHORITY.

FAILURE TO FURNISH THE REFERENCES AND OTHER INFORMATION AS REQUESTED (IN THE COMPLETE FORMAT REQUIRED) MAY CAUSE YOUR BID TO BE REJECTED AS NON-RESPONSIVE.

The Bidder shall furnish the following information. Failure to comply with this requirement will render the proposal non-responsive and may cause its rejection. Additional sheets may be attached if necessary. “You” or "your" as used herein refers to the bidder's firm and any of its officer, directors, shareholders, parties and principals.

Firm name and address:

________________________________________________________________________
________________________________________________________________________

Telephone: ____________________________
1. Type of firm: (Check one)

Individual ____ Partnership ____ Corporation ____ Joint Venture ____

CONTRACTOR's License: Primary class _____________________

License No. ___________ Expiration Date: _______________

Supplemental classifications held, if any, and license number(s) and expiration date(s):

__________________________________________________________________________

No payment shall be made for work or material under the contract unless and until the Registrar of CONTRACTORs verifies to the AGENCY that the CONTRACTOR was properly licensed at the time the contract was awarded and CONTRACTOR continues to be so licensed throughout the term of the Contract. Any CONTRACTOR not so licensed is subject to penalties under the law.

The AGENCY is required to verify license prior to awarding a bid. State law generally provides it is a misdemeanor to submit a bid to a public agency without having a license.

Have you ever been licensed under a different name or different license number? _____. If Yes, give name and license number. ________________________________

Names and titles of all officers of the firm:

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

Number of years as a CONTRACTOR in construction work of this type: ________________

Person who inspected site of the proposed work for your firm:

Name and Title: ___________________________________________________________

Date of Inspection: _________________________________

How many years’ experience in similar type of construction and project size work has your organization had?

(a) as a general CONTRACTOR? ________________

(b) as a subcontractor? ________________________
Has your firm or any of its principals defaulted so as to cause a loss to a surety? _____ If the answer is "Yes", give dates, name and address of surety and details.

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

Have you been assessed liquidated damages for any project in the past three years? If Yes, explain: ____________________________
________________________________________________________________________

Have you been in litigation on a question relating to your performance on a contract during the past three years? _____ If Yes, explain, and provide case name and number:
________________________________________________________________________

Have you ever failed to complete a project in the last three years? _____ If so, give Agency and details:
________________________________________________________________________

List the names, addresses and telephone numbers of three Architects or Engineers whose jobs you have worked on in the past three years.

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15. Do you now or have you ever had any direct or indirect business, financial or other connection with any official, employee or consultant of the AGENCY or Architect/Engineer? _____ If so, please elaborate.
________________________________________________________________________
REFERENCE INFORMATION REQUIRED FROM BIDDER

The following information should contain persons or entities familiar with the Bidder's Work:

1. Name of Agency: ____________________________________________
   Agency Address and Telephone: ________________________________
   Contact Person: ____________________________________________
   Type of Construction Project: _________________________________
   Contract Amount: __________________________________________

2. Name of Agency: ____________________________________________
   Agency Address and Telephone: ________________________________
   Contact Person: ____________________________________________
   Type of Construction Project: _________________________________
   Contract Amount: __________________________________________

3. Name of Agency: ____________________________________________
   Agency Address and Telephone: ________________________________
   Contact Person: ____________________________________________
   Type of Construction Project: _________________________________
   Contract Amount: __________________________________________

I certify and declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct. Executed this _____ day of _____________, 2014, State of _______________________, City of _______________________, County of _______________________.

________________________________________
Signature

________________________________________
Title
ATTACHMENT NO. 7 TO BID FORM

SUPPLEMENTAL BID INFORMATION

-ALLOWANCES-

The Bidders shall include in the base bid of the project all the allowances listed below. These allowances shall be included in the total base bid, written in numbers and spelled out in words on item 3 of the Bid Form.

None.

The lowest Bid shall be determined by the lowest Total Base Bid value indicated under item 3 of the bid form. The value listed on the bid form shall INCLUDE all allowances.
AGREEMENT BETWEEN AGENCY AND CONTRACTOR

THIS AGREEMENT made in three (3) copies on this ______________, BY AND BETWEEN SAN BERNARDINO INTERNATIONAL AIRPORT AUTHORITY, San Bernardino County, California, hereinafter called the AGENCY and ____________________________________________________________, hereinafter called the CONTRACTOR.

(CONTRACTOR's License No. ___________).

WITNESSETH: That the AGENCY and CONTRACTOR for the considerations hereinafter named agree as follows:

ARTICLE 1 - SCOPE OF THE WORK: CONTRACTOR shall perform within the time set forth in Article 2 of this Agreement and shall furnish all labor, materials, equipment, tools, utility services, and transportation and perform and complete all work required in connection with the construction as indicated on the drawings and as described in the Project Manual for the complete project at:

_________________________________________
PROJECT

and shall do everything required by the Agreement, the General Conditions of the Contract for Construction, General Project Requirements, Technical Specification Sections and Drawings and Addenda, all of which are incorporated herein by reference and made a part of this Agreement.

ARTICLE 2 - TIME FOR PROJECT COMPLETION: All work under this Contract shall be completed within a period of _____ consecutive calendar days commencing with the Start Date indicated in the written Notice to Proceed received from the AGENCY and all work under this contract shall be performed in accordance with construction schedule and completed on or before completion date.

ARTICLE 3 - THE AGREEMENT SUM: The AGENCY shall pay the CONTRACTOR for the performance of this Contract, subject to the additions and deductions provided herein, the sum of:

($) __________________________

ARTICLE 4 - PROGRESS PAYMENTS: Based upon Applications for Payment submitted to the Architect by the CONTRACTOR and Certificates for Payment issued by the Architect, the AGENCY shall make progress payments on account of the Agreement Sum to the CONTRACTOR as provided in Article 9 of the General Conditions and General Project Requirements.

ARTICLE 5 - RETENTION OF SECURITIES: Pursuant to Public Contract Code 7201 the retention amount withheld is five percent (5%) of the total value of the contract or work performed. Pursuant to Public Contract Code Section 22300, CONTRACTOR has the option to deposit securities with an escrow agent approved by the AGENCY as a substitute for retention earnings withheld by the AGENCY to ensure performance.
ARTICLE 6 - HOLD HARMLESS AGREEMENT: To the fullest extent permitted by law, the CONTRACTOR agrees to and does hereby indemnify, defend and hold harmless the AGENCY and each of their officers, agents, employees, and consultants (including the AGENCY’s architects and engineers) from every claim or demand made and every liability, loss, damage, or expense of any nature whatsoever (including, but not limited to attorneys’ fees and costs including fees of consultants) which may be incurred by reason of:

A. Liability for damage for death or bodily injury to persons or injury to property sustained by the CONTRACTOR or any other person, firm or corporation employed by the CONTRACTOR upon or in connection with the work called for in this agreement, except for liability for damages referred to above which result from the sole negligence or willful misconduct of the AGENCY, or each of their officers, agents or independent CONTRACTORs who are directly employed by the AGENCY or for defects in design furnished by such persons.

B. Any injury to or death of persons or damage, loss or theft of any property, sustained by any person, firm, or corporation, including the AGENCY, arising out of, or in any way connected with the work covered by this Agreement, whether said injury or damage occurs either on AGENCY property or not, except for liability for damages which result from the sole negligence or willful misconduct of the AGENCY, its officers, employees, agents or independent CONTRACTORs who are directly employed by the AGENCY, or for defects in design furnished by such persons.

C. Any dispute between CONTRACTOR and CONTRACTOR’S subcontractors, suppliers, sureties, including, but not limited to, any stop notice actions.

The CONTRACTOR, at its own expense, cost, and risk, shall defend any and all actions, suits, or other proceedings that may be brought or instituted against the AGENCY, and each of their officers, agents, employees or consultants on any such claim, demand or liability and shall pay or satisfy any judgment that may be rendered against the AGENCY, and each of their officers, agents or employees in any action, suit or other proceedings as a result thereof.

ARTICLE 7 – PREVAILING WAGES

A. Wage rates for this project shall be in accordance with the General Wage Determination Made By the Director of Industrial Relations Pursuant To California Labor Code, Part 7, Chapter 1, Article 2, Sections 1770, et seq., for San Bernardino County. Wage rates shall conform to those posted in the AGENCY Office.

B. The following labor code sections are hereby referenced and made a part of this agreement and are set forth in detail in the General Conditions:

1. Section 1735, Anti-Discrimination Requirements.
2. Section 1775, Penalty for Failure to Comply with Prevailing Wage Rates.
4. Section 1777.5 and 1777.6, Apprenticeship Requirements.
5. Section 1810 and 1811, Working Hour Restrictions.
6. Section 1813, Penalty for Failure to Pay Overtime.
7. Section 1815, Overtime Pay.
C. The CONTRACTOR shall provide Certified Payroll to the AGENCY upon written request, or if so requested by the AGENCY with each Application for Payment. If AGENCY has previously required Certified Payroll Records to be provided with each Application for Payment then submission of Certified Payroll Records as well as all related or subsequent requests for supporting documents made by the AGENCY shall be a condition precedent to receipt of progress, final, and or/retention payments on the Project. If the AGENCY has requested or otherwise required Certified Payroll Records the AGENCY may withhold any portion of the progress and/or final payments up to and including the entire payment until the Certified Payroll Records requirements is met by the CONTRACTOR. If the CONTRACTOR is determined to have failed to pay workers in compliance with the applicable prevailing wage sections of the Labor Code the AGENCY shall continue to withhold progress, final, or retention payments until sufficient funds have been withheld for payment of wages to workers and all applicable penalties.

D. The CONTRACTOR shall further comply with the requirements of Section 1771.4 of the California Labor Code to furnish directly to the Labor Commissioner on a monthly basis certified payroll records and other records specified in Section 1776 of the California Labor Code.

E. Forfeiture for Failure to Comply with Written Record Request. The CONTRACTOR shall have ten (10) days in which to comply subsequent to receipt of a written notice requesting Certified Payroll Records or supporting documents. In the event that the CONTRACTOR fails to comply within the 10-day period, he or she shall, as a penalty to the AGENCY forfeit one hundred dollars ($100) per day under Labor Code 1776 for each calendar day, or portion thereof, for each worker, until strict compliance is effectuated. Upon the request of the Division of Apprenticeship Standards ("DAS") or the Department of Labor Standards and Enforcement ("DLSE"), these penalties shall be withheld from progress payments then due. A CONTRACTOR is not subject to a penalty assessment pursuant to this section due to the failure of a subcontractor to comply with this section.

F. Mandatory Attendance at Pre-Job Conference: CONTRACTOR and subcontractors are required to attend the AGENCY’s Pre-Job Conference. At the Pre-Job Conference, Labor Compliance requirements will be explained and reviewed. CONTRACTOR and subcontractors are required to sign the sign in sheet to verify attendance of the Pre-Job Conference.

G. CONTRACTOR acknowledges that this project is subject to compliance monitoring and enforcement by the Department of Industrial Relations.

ARTICLE 8 - RECORD AUDIT: In accordance with Government Code, Section 8546.7, records of both the AGENCY and the CONTRACTOR shall be subject to examination and audit by the Auditor General for a period of three (3) years after final payment.

ARTICLE 9 – REGISTRATION FOR PUBLIC WORKS AND CERTIFICATIONS:

A. CONTRACTOR acknowledges that this is a contract for a “public work”. Applicable to
No contractor or subcontractor may be awarded a contract for public work on a public works project unless registered with the Department of Industrial Relations pursuant to Labor Code section 1725.5. CONTRACTOR and all subcontractors are required to be registered and qualified pursuant to California Labor Code Section 1725.5 to perform work on public works projects at all times during the term of this Contract. CONTRACTOR certifies to AGENCY that CONTRACTOR and all subcontractors performing work on the project are registered and qualified to work on public works contracts.

B. Certifications of compliance with requirements for Worker’s Compensation (Attachment No. 1 to Agreement), Drug-Free Work Place (Attachment No. 2 to Agreement), and Prevailing Wage Certification (Attachment No. 3 to Agreement) are hereby made a part of this Agreement.

C. CONTRACTOR shall post on the job site all notices as prescribed by applicable regulations.

ARTICLE 10 - FINAL PAYMENT: Final payment, constituting the entire unpaid balance of the Agreement Sum together with all retentions shall be paid by the AGENCY to the CONTRACTOR in accordance with Article 9 of the General Conditions and will be paid within 60 days after completion of the Work as defined in California Public Contract Code § 7107.

ARTICLE 11 – CONTRACTOR’S FAILURE TO PROCURE COMPLETION OF PROJECT: In the event said CONTRACTOR fails to furnish tools, equipment, or labor in the necessary quantity or quality, or fails to prosecute the work or any part thereof contemplated by this Agreement in a diligent and workmanlike manner, and if the CONTRACTOR for a period of two (2) calendar days after receipt of written demand from AGENCY to do so, fails to furnish tools, equipment, or labor in the necessary quantity or quality, and to prosecute said work and all parts thereof in a diligent and workmanlike manner, or after commencing to do so within said two (2) calendar days, fails to continue to do so, then the AGENCY may exclude the CONTRACTOR from the premises, or any portion thereof, and take possession of said premises or any portion thereof, together with all material and equipment thereon, and my complete the work contemplated by this Agreement or any portion of said work, either by furnishing the tools, equipment, labor or material necessary, or by letting the unfinished portion of said work, or the portion taken over by the AGENCY to another CONTRACTOR, or by a combination of such methods. In any event, the procuring of the completion of said work, or the portion thereof taken over by the AGENCY, shall be a charge against the CONTRACTOR, and may be deducted from any money due or becoming due to CONTRACTOR from the AGENCY, or the CONTRACTOR shall pay the AGENCY the amount of said charge, or the portion thereof unsatisfied. The sureties, provided for under this Agreement shall become liable for payment should CONTRACTOR fail to pay in full any said cost incurred by the AGENCY.

ARTICLE 12 – INSURANCE: CONTRACTOR shall take out, prior to commencing the work, and maintain, during the life of this Agreement, insurance in accordance with Article 11 of the General Conditions and with the limits shown below. CONTRACTOR shall require all subcontractors, if any, whether primary or secondary, to take out and maintain insurance in accordance with the limits shown in General Conditions, Article 11.

General Liability Insurance for injuries including accidental death and property damage in an amount not less than $1,000,000.00 per occurrence and $2,000,000 in the aggregate. The policy coverage shall include (i) premises operations and mobile equipment, (ii) products and completed operations, (iii) broad form property damage (including completed operations), (iv) explosion, collapse and underground hazards, (v) personal injury, and (vi) contractual liability.

Automobile liability insurance (owned, non-owned, hired) with limits of not less than $1,000,000
per occurrence and $2,000,000 in the aggregate, and 1,000,000 property damage.

Worker’s Compensation Insurance as required by applicable state law including employer’s liability limits of not less than $1,000,000.00

Umbrella Excess Liability Insurance with limits of not less than $2,000,000. The umbrella policy shall apply to bodily injury/property damage, personal injury/advertising injury and shall include a “dropdown” provision providing primary coverage for any liability not covered by the primary policy. The coverage shall also apply to automobile liability.

Insurance Covering Special Hazards: The following special hazards shall be covered by rider or riders to above-mentioned public liability insurance or property damage insurance policy or policies of insurance, or by special policies of insurance in amounts as follows:

- Automotive and truck where operated in amounts as above
- Material hoist where used in amounts as above

ARTICLE 13 – CONTRACTOR’S LICENSE: CONTRACTOR must possess a CLASS “A” CONTRACTOR’s License, issued by the State of California, which is current and in good standing.

ARTICLE 14 – CORPORATION IN GOOD STANDING: If CONTRACTOR is a corporation or other legal entity, the undersigned hereby represents and warrants that such entity is duly formed in good standing, and authorized to conduct business in the State of California, and that __________________________ whose title is __________________________ is authorized to act for and bind the corporation.

ARTICLE 15 – PROVISIONS REQUIRED BY LAW: Each and every provision of law and clause required by law to be inserted in this Agreement shall be deemed to be inserted herein and the Agreement shall be read and enforced as though it were included herein, and if through mistake or otherwise any such provision is not inserted, or is not currently inserted, then upon application of either party the Agreement shall forthwith be physically amended to make such insertion or correction.

ARTICLE 16 - LIQUIDATED DAMAGES: Pursuant to Government Code Section 53069.85, if Work is not completed within the Contract Time or in strict accordance with the Project Schedule, It is understood, acknowledged and agreed that the AGENCY will suffer damage. It is therefore agreed that the CONTRACTOR will pay the AGENCY the sum of $xxxx.00 for each and every calendar day of delay beyond the Contract Time, or beyond any completion schedule, construction schedule or Project milestones established in or pursuant to the Project Schedule, or beyond the time indicated in the PROJECT Schedule for any individual contract activity. CONTRACTOR expressly understands, acknowledges and agrees that such liquidated damages can and shall be imposed if the CONTRACTOR does not meet each and every aspect of any activity schedule, completion schedule, construction schedule or Project milestones established in or pursuant to the default by reason of delays, the acceptance of such work and/or payment(s) shall in no respect constitute a waiver or modification of any provisions regarding Contract Time, a completion schedule, the Project Schedule or liquidated damages. In the event the same is not paid, the CONTRACTOR further agrees that the AGENCY may deduct the amount thereof from any money due or that may become due the CONTRACTOR under the Agreement. This Article does not exclude recovery of damages under provisions of the Agreement Documents.

ARTICLE 17 – COMPONENT PARTS OF THE AGREEMENT: The Agreement entered into by this Agreement consists of the following Agreement Documents, all of which are component parts of the Agreement as if herein set out in full or attached hereto:

Project: San Bernardino International Airport Authority
Maintenance Building #730 Renovation

Agreement between AGENCY and CONTRACTOR
00200
Bid Issuance Set
Page 5 of 9
ARTICLE 18 - BACKGROUND CHECK: CONTRACTOR agrees to comply with a criminal background check of all employees upon request. CONTRACTOR shall conduct criminal background check of all employees and sub-CONTRACTORs employees. CONTRACTOR must provide the AGENCY with a list of all employees providing services pursuant to this Agreement, and designate to which sites they will be assigned. Failure to comply with this law may result in, at AGENCY’s sole discretion, termination of this Agreement.

ARTICLE 19 - DOCUMENT CONTROL PROGRAM: CONTRACTOR may be required (if implemented on this project) to utilize the AGENCY’S established standard, centralized, Internet-based document control program to record, attach, track and manager Transmittals, Requests for Information (RFIs), Submittals, Daily Reports, Meeting Minutes, Punch Lists and other documents as required. Software and training for the CONTRACTOR’s document coordinator and managers will be provided by the AGENCY at no charge to the CONTRACTOR.

ARTICLE 20 - CONFLICT OF INTEREST – AGENCY REPRESENTATIVES. CONTRACTOR acknowledges that the AGENCY uses ethical business practices in the selection of its CONTRACTORS and in its other contracting practices. CONTRACTOR certifies that neither it nor its employees or agents have, with an intent to establish or maintain a business relationship with the AGENCY or any department thereof, provided any gift or sponsorship having a value of more than a fifty and 00/100 dollar ($50.00) value, in total or aggregated total, to: (i) any person working on behalf of the AGENCY involved in the negotiation of this Agreement; (ii) any member of any department of the AGENCY procuring items or services from the CONTRACTOR under this Agreement; and/or (iii) any person with authority to negotiate this or any other contract on behalf of the AGENCY. Further, CONTRACTOR certifies that neither it nor its employees or agents shall at any time in the future, with an intent to establish or maintain a business relationship with the AGENCY or any department thereof, provide any gift or sponsorship having more than a fifty and 00/100 dollar ($50.00) value, in total or aggregated total, to: (i) any person working on behalf of the AGENCY involved in the negotiation of this Agreement; (ii) any member of any department of the AGENCY procuring items or services from the CONTRACTOR under this Agreement; and/or (iii) any person with authority to negotiate this or any other contract on behalf of the AGENCY.

The CONTRACTOR acknowledges the obligations as set forth in this Article by the initials of the agent signing on behalf of the CONTRACTOR appearing below:
ARTICLE 21 - CONFLICT OF INTEREST – CAMPAIGN CONTRIBUTIONS: The CONTRACTOR represents and warrants that it has reviewed and is familiar with the governing provisions of the California Government Code and the regulations promulgated thereunder by the Fair Political Practices Commission (“FPPC”) regarding campaign contributions to appointed members of the governing body of the AGENCY. The CONTRACTOR further represents and warrants that neither the CONTRACTOR, nor any number of individuals employed by the CONTRACTOR or other contractors and Subcontractors of the CONTRACTOR, or any others acting on behalf of or in concert with the CONTRACTOR, have contributed to: (i) any member of the governing body of the AGENCY, (ii) any election committee of any member of the governing body of the AGENCY, (iii) any “friends of” election committee of any member of the governing body of the AGENCY, or (iv) any political action committee (“PAC”) representing, acting with or on behalf of any member of the governing body of the AGENCY, an amount in the aggregate of more than Two Hundred Fifty and 00/100 Dollars ($250.00) within the period commencing twelve (12) months prior to the date of the official action by the governing body of the AGENCY to approve this Agreement. The CONTRACTOR covenants and warrants that for the period of time commencing as of the date of the approval of this Agreement by the governing body of the AGENCY and for ninety (90) calendar days thereafter, similarly no such campaign and/or fund-raising contributions aggregating in excess of $250.00 from the CONTRACTOR and other contractors and Subcontractors of the CONTRACTOR, or others action on behalf of or in concert with the CONTRACTOR, when aggregated with campaign contributions paid pursuant to the preceding sentence for the prior twelve (12) month period, shall be made to any member of the governing body who participated in the official action to approve this Agreement. Such $250.00 limitation shall apply for the period of time commencing twelve (12) months prior to the date of the official action of the governing body of the AGENCY to approve this Agreement and for ninety (90) calendar days thereafter and all such campaign contributions within said fifteen (15) month period of time shall be aggregated for purposes of the FPPC rules and regulations. Any breach of this Article, whether intentional or unintentional, shall be deemed to be a material breach of this Agreement.

The CONTRACTOR acknowledges the obligations as set forth in this Article by the initials of the agent signing on behalf of the CONTRACTOR appearing below:

(Initial here)

ARTICLE 22 - FAIR POLITICAL PRACTICES COMMISSION FORMS AND FILINGS: The provisions of this Article shall apply to the CONTRACTOR, its employees and/or agents providing or supervising the services to the AGENCY as set forth in this Agreement. The CONTRACTOR acknowledges and represents that the CONTRACTOR is aware of the requirements of the Fair Political Practices Commission (“FPPC”) of the State of California, including the statutory requirements and the rules and regulations promulgated pursuant thereto, and the obligations and duties of third party contractors such as the CONTRACTOR to complete and timely submit the required FPPC reporting forms.

By the execution and acceptance of this Agreement with the AGENCY, the CONTRACTOR hereby agrees that no later than the first day of April (April 1) of each calendar year, or any other date as designated by AGENCY legal counsel or the Clerk of the Board, the CONTRACTOR shall submit, and/or cause its employees and/or agents providing or supervising the services to the AGENCY as set forth in this Agreement to submit, to the Clerk of the Board any reporting form or filing published and/or required by the FPPC which AGENCY legal counsel or the Clerk of the Board should deem appropriate and so
request of the CONTRACTOR, properly and fully completed in accordance with the instructions of the FPPC, which instructions shall be provided to CONTRACTOR by the Clerk of the Board, identifying the appropriate and necessary economic disclosures of the CONTRACTOR, its employees and/or agents who perform services by, through or on behalf of the CONTRACTOR to the AGENCY pursuant to this Agreement.

Further, the CONTRACTOR recognizes that it is neither the duty nor the responsibility of the AGENCY, its staff and/or legal counsel to review or seek additional information from the CONTRACTOR as to any information submitted to the AGENCY in the required FPPC reporting forms. The CONTRACTOR further understands that the CONTRACTOR, its principals, shareholders, and certain employees and/or agents could be subjected to fines and civil penalties imposed by the FPPC in the event any documentation submitted by the CONTRACTOR is deemed to be inadequate either by the FPPC or any other State or local prosecutorial office. Under some circumstances, such inadequacies for failure to comply with the FPPC requirements may also involve criminal sanctions.

The CONTRACTOR shall further defend, indemnify and hold harmless the AGENCY, its officers, employees, representatives, and agents, for any and all violations by the CONTRACTOR regarding FPPC reporting compliance requirements that result in any liability or financial loss to the AGENCY, its officers, employees, representatives, and agents, by reason of the failure of the CONTRACTOR to comply with the provisions of this Article, including staff costs, attorney fees and any and all other costs as may be incurred by the AGENCY, its officers, employees, representatives, and agents due to any alleged violations of the FPPC reporting requirements by the CONTRACTOR.

The CONTRACTOR acknowledges the obligations as set forth in this Article by the initials of the agent signing on behalf of the CONTRACTOR appearing below:

(Initial here)

ARTICLE 23 - CONTRACTOR INTERESTS ADVERSE TO THE AGENCY: CONTRACTOR hereby represents that it has no interests adverse to the AGENCY or its individual member entities, at the time of execution of this Agreement. CONTRACTOR hereby agrees that, during the Term of this Agreement, the CONTRACTOR shall not enter into any agreement or acquire any interests detrimental or adverse to the AGENCY or its individual member entities. Additionally, CONTRACTOR hereby represents and warrants to AGENCY that CONTRACTOR and any partnerships, individual persons or any other party or parties comprising CONTRACTOR, together with each subcontractor who may hereafter be designated to perform services pursuant to this Agreement, do not have and, during the Term of this Agreement, shall not acquire any property ownership interest, business interests, professional employment relationships, contractual relationships of any nature or any other financial arrangements relating to the AGENCY, property over which the AGENCY has jurisdiction or any members or staff of the AGENCY that have not been previously disclosed in writing to AGENCY, and that any such property ownership interests, business interests, professional employment relationships, contractual relationships or any nature or any other financial arrangements will not adversely affect the ability of the CONTRACTOR to perform the services to the AGENCY as set forth in this Agreement.

ARTICLE 24 - CONFIDENTIALITY OF MATERIALS AND INFORMATION: The CONTRACTOR shall keep confidential all reports, survey notes and observations, information, and data acquired or generated in performance of the services set forth in the Scope of Services, which the AGENCY designates confidential. None of such designated confidential materials or information may be made available to any person or entity, public or private, without the prior written consent of the AGENCY. CONTRACTOR shall safeguard and not disclose confidential information of the AGENCY including any of the
following: (a) patient, trademark or copyright information; (b) personnel information; (c) matters of a technical nature; (d) matters of a business nature; and, (e) other information of a similar nature which is not generally disclosed by the AGENCY, referred to collectively hereafter as “Confidential Information.” CONTRACTOR further agrees not to use Confidential Information except as may be necessary to perform the services identified in this Agreement for the AGENCY. Upon termination or expiration of this Agreement, or otherwise as requested by the AGENCY, CONTRACTOR shall promptly deliver all Confidential Information to the AGENCY, if any, in whatever form, that may be in CONTRACTOR’s possession or control.

ARTICLE 25 – ENTIRE AGREEMENT: The complete Agreement as set forth in Article 1 of this Agreement constitutes the entire Agreement of the parties. No other agreements, oral or written, pertaining to the work to be performed, exists between the parties. This Agreement can be modified only by an amendment in writing, signed by both parties and pursuant to action of the Governing Board of the AGENCY.

(SAN BERNARDINO INTERNATIONAL AIRPORT AUTHORITY)

CONTRACTOR

By: ________________________________

Date: ______________________________

Address

______________________________

Official Seal

(AGENCY)

By: ________________________________

Date: ______________________________

Address

______________________________

Official Seal

Project: San Bernardino International Airport Authority Maintenance Building #730 Renovation

Agreement between AGENCY and CONTRACTOR

00200

Bid Issuance Set

Page 9 of 9
ATTACHMENT NO. 1 TO AGREEMENT

CERTIFICATE REGARDING WORKERS’ COMPENSATION

Every employer, 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 the State of California.

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 its employees.

C. For all political subdivisions of the State, including each member of a pooling arrangement under a joint exercise of powers agreement (but not the State itself), by securing from the Director of Industrial Relations, a certificate of consent to self-insure against workers’ compensation claims which certificate may be given upon furnishing proof satisfactory to the Director of Industrial Relations of ability to administer workers’ compensation claims properly, and to pay workers’ compensation claims that may become due to its employees. On or before May 31, 1979, a political subdivision of the State, which on December 31, 1978, was uninsured for its liability to pay compensation, shall file a properly completed and executed application for a certificate of consent to self-insure against workers’ compensation claims. The certificate shall be issued and be subject to the provisions of Section 3702 of the Labor Code.

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

CONTRACTOR

______________________________
Signature

______________________________
Printed Name

______________________________
Official Title

Project: San Bernardino International Airport Authority
Maintenance Building #730 Renovation

Certificate Regarding Workers’ Compensation

00210
Bid Issuance Set
Page 1 of 1
ATTACHMENT NO. 2 TO AGREEMENT

DRUG-FREE WORKPLACE CERTIFICATION

This Drug-Free Workplace Certification form is required from all successful bidders pursuant to the requirements mandated by Government Code, Section 8350 et seq. the Drug-Free Workplace Act of 1990. The Drug-Free Workplace Act of 1990 requires that every person or organization awarded a contract or grant for the procurement of any property or service from any public agency must certify that it will provide a drug-free workplace by doing certain specified acts. In addition, the Act provides that each CONTRACTOR or grant awarded by a public agency may be subject to suspension of payments or termination of the contract or grant and the CONTRACTOR or grantee may be subject to debarment from future contracting, if the contracting agency determines that specified acts have occurred.

I acknowledge that I am aware of the provisions of Government Code Section 8350 et seq. and hereby certify that I will adhere to the requirements of the Drug-Free Workplace Act of 1990. I also understand that if the AGENCY determines that I have either (A) made a false certification herein, or (B) violated this certification by failing to carry out the requirements of Section 8355, that the contract awarded herein is subject to termination, suspension of payments, or both. I further understand that, should I violate the terms of the Drug-Free Workplace Act of 1990, I may be subject to debarment in accordance with the requirements of Section 8350 et seq.

__________________________________________
CONTRACTOR Signature

__________________________________________
Printed Name

__________________________________________
Official Title

Date: __________________________

---

Project: San Bernardino International Airport Authority
       Maintenance Building #730 Renovation

Drug-Free Workplace Certification

00220
Bid Issuance Set
Page 1 of 1
ATTACHMENT NO. 3 TO AGREEMENT

CONTRACTOR PREVAILING WAGE COMPLIANCE CERTIFICATION

To: Inland Valley Development Agency
1601 East 3rd Street, San Bernardino, CA 92408

I hereby certify that I will comply with the State of California Public Works Contract Requirements and Department of Industrial Relations Wage Orders regarding wages, benefits, on site audits with 48-hour notice, payroll records and apprentice and trainee employment requirements.

______________________________
CONTRACTOR

______________________________
CONTRACTOR’S PRINCIPAL’S SIGNATURE

______________________________
DATED
ATTACHMENT NO. 4 TO AGREEMENT

FAITHFUL PERFORMANCE BOND FORM

KNOW ALL PERSONS BY THESE PRESENTS:

THAT WHEREAS, the SAN BERNARDINO INTERNATIONAL AIRPORT AUTHORITY (hereinafter referred to as “AGENCY”) has awarded to ____________________________, hereinafter designated as the “CONTRACTOR/PRINCIPAL” an agreement for the work described as follows:

____________________________________________________
(Hereinafter referred to as the “Public Work”)

WHEREAS, the work to be performed by the CONTRACTOR/PRINCIPAL is more particularly set forth in that certain contract for the said Public Work dated ________, incorporated herein by this reference; and

WHEREAS, the CONTRACTOR/PRINCIPAL is required by said Contract to perform the terms thereof and to furnish a bond for the faithful performance of said contract.

NOW, THEREFORE, we, ________________ , the undersigned CONTRACTOR/PRINCIPAL and ________________________________, Surety, a corporation organized and duly authorized to transact business under the laws of the State of California, are held and firmly bound unto the AGENCY in the sum of ________________________________, DOLLARS ($ ____________), said sum being not less than one hundred percent (100%) of the total amount payable by the said AGENCY under the terms of the said Contract, for which amount well and truly to be made, we bind ourselves, our heirs, executors and administrators, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that, if the bounded CONTRACTOR/PRINCIPAL, his or its heirs, executors, administrators, successors or assigns, shall in all things stand to and abide by, and well and truly keep and perform the covenants, conditions and agreements in the said Contract and any alteration thereof made as therein provided, on his or its part, to be kept and performed at the time and in the manner therein specified and in all respects according to their intent and meaning; and shall faithfully fulfill the one-year guarantee of all materials and workmanship; and shall indemnify and save harmless the AGENCY, its officers and agents, as stipulated in said Contract, then this obligation shall become null and void; otherwise it shall be and remain in full force and effect. In case suit is brought upon this bond, the said Surety will pay to AGENCY a reasonable attorney’s fee to be fixed by the Court.

As a condition precedent to the satisfactory completion of the contract, the above obligation shall hold good for a period of one (1) year or longer if required by the Contract.
Documents after the acceptance of the work by AGENCY, during which time if CONTRACTOR/PRINCIPAL shall fail to make full, complete, and satisfactory repair and replacements and totally protect the AGENCY from loss or damage made evident during this period from the date of completion of the work, and resulting from or caused by defective materials or faulty workmanship, the above obligation in penal sum thereof shall remain in full force and effect. The obligations of Surety hereunder shall continue so long as any obligation of CONTRACTOR/PRINCIPAL remains.

Whenever CONTRACTOR/PRINCIPAL shall be, and is declared by the AGENCY to be, in default under the contract, the AGENCY having performed the AGENCY’s obligations thereunder, the Surety shall promptly remedy the default, or shall promptly, at the AGENCY’s option:

1. Complete the contract in accordance with its terms and conditions; or

2. Obtain a bid or bids for completing the contract in accordance with its terms and conditions, and upon determination by Surety of the lowest responsive and responsible bidder, arrange for a contract between such bidder and the AGENCY, and make available as work progresses sufficient funds to pay the cost of completion less the balance of the contract price, but not exceeding, including other costs and damages for which Surety may be liable hereunder, the amount set forth above. The term “balance of the contract price” as used in this paragraph shall mean the total amount payable to CONTRACTOR/PRINCIPAL by the AGENCY under the contract and any modifications thereto, less the amount previously properly paid by the AGENCY to the CONTRACTOR/PRINCIPAL.

Surety expressly agrees that the AGENCY may reject any CONTRACTOR or subcontractor which may be proposed by Surety in fulfillment of its obligations in the event of default by the CONTRACTOR/PRINCIPAL.

Surety shall not utilize CONTRACTOR/PRINCIPAL in completing the contract nor shall Surety accept a bid from CONTRACTOR/PRINCIPAL for completion of the work if the AGENCY, when declaring the CONTRACTOR/PRINCIPAL in default, notifies Surety of the AGENCY’s objection to CONTRACTOR’s/PRINCIPAL’s further participation in the completion of the work.

No right of action shall accrue on this bond to or for the use of any person or corporation other than the AGENCY named herein or the successors or assigns of the AGENCY. Any suit under this bond must be instituted within the applicable statute of limitations period.

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

No final settlement between the AGENCY and the CONTRACTOR/PRINCIPAL shall abridge the right of any beneficiary hereunder whose claim may be unsatisfied.
CONTRACTOR/PRINCIPAL and Surety agree that if the AGENCY is required to engage the services of any attorney in connection with the enforcement of this bond, each shall pay the AGENCY’s reasonable attorney’s fees incurred, with or without suit, in addition to the above sum.

IN WITNESS WHEREOF, we have hereunto set our hands and seals this _____ day of ________________, 20__.  

CONTRACTOR/PRINCIPAL:

________________________________________
Name

By: _____________________________________

Signature: _______________________________

SURETY:

________________________________________

Signature: _______________________________

The rate of premium on this bond is $____________ per thousand. The total amount of premium charges, $_______________________________.

(The above must be filled in by corporate attorney.)

IMPORTANT: Surety companies executing Bonds must possess a certificate of authority from the California Insurance Commissioner authorizing them to write surety insurance defined in Section 105 of the California Insurance Code, and if the work or project is financed, in whole or in part, with federal grant or loan funds, must also appear on the Treasury Department’s most current list (Circular 750 as amended).
THIS IS A REQUIRED FORM

Any claims under this bond may be addressed to:

(Name and Address of Surety)

______________________________

______________________________

(Name and Address of Agent or Representative for service of process in California, if different from above)

______________________________

______________________________

(Telephone number of Surety and Agent or Representative for service of process in California)

______________________________

STATE OF CALIFORNIA

COUNTY OF _________________,

On this ______ day of ________________________, in the year 20___, before me, ________________________, a Notary Public in and for said state, personally appeared ________________________, known to me to be the person whose name is subscribed to the within instrument as the Attorney-In-Fact of the ________________________, (Surety) acknowledged to me that he subscribed the name of the ________________________, (Surety) thereto and his own name as Attorney-In-Fact.

______________________________

Notary Public in and for said State

(SEAL)

Commission expires: ________________

NOTE: A copy of the Power-of-Attorney to local representatives of the bonding company must be attached hereto.
ATTACHMENT NO. 5 TO AGREEMENT

PAYMENT BOND FORM

KNOW ALL PERSONS BY THESE PRESENTS:

THAT WHEREAS, the SAN BERNARDINO INTERNATIONAL AIRPORT AUTHORITY (hereinafter referred to as “AGENCY”) has awarded to ____________________________, hereinafter designated as the “CONTRACTOR/PRINCIPAL” an agreement for the work described as follows:

________________________________________________

(Hereinafter referred to as the “Contract”)

WHEREAS, said CONTRACTOR is required to furnish a bond in connection with said Contract, pursuant to Section 9550 et seq. of the California Civil Code.

NOW, THEREFORE, we, ____________________________, the undersigned CONTRACTOR/PRINCIPAL and ____________________________, a corporation organized and existing under the laws of the State of California, and duly authorized to transact business under the laws of the State of California as Surety, are held and firmly bound unto the SAN BERNARDINO INTERNATIONAL AIRPORT AUTHORITY and to any and all persons, companies or corporations entitled to file stop notices under Section 9100 of the California Civil Code in the sum of ____________________________, DOLLARS, ($ ___________), said sum being not less than one hundred percent (100%) of the total amount payable by the said AGENCY under the terms of the said Contract, for which payment well and truly to be made, we bind ourselves, our heirs, executors, successors, administrators and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH that if, said CONTRACTOR/PRINCIPAL, his/her or its heirs, executors, administrators, successors, or assigns, or a subcontractor, shall fail to pay any person or persons named in Civil Code Section 9100 or fail to pay for any materials, or other supplies, used in, upon, for, or about the performance of the work contracted to be done, or for any work or labor thereon of any kind, or for amounts due under the Unemployment Insurance Code, with respect to work or labor thereon of any kind, or shall fail to deduct, withhold and pay over to the Employment Development Department, any amounts required to be deducted, withheld and paid over by Section 13020 of the Unemployment Insurance Code with respect to work or labor thereon of any kind, then said Surety will pay for the same, in or to an amount not exceeding the amount hereinabove set forth, and also will pay in case suit is brought upon this bond, such reasonable attorney’s fees as shall be fixed by the court, awarded and taxed as provided in Division 4, Part VI, Title III, Chapter 5 (commencing at Section 9550) of the California Civil Code.
This bond shall inure to the benefit of any of the persons named in Section 9100 of the California Civil Code, so as to give a right of action to such person or their assigns in any suit brought upon this bond.

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

IN WITNESS WHEREOF, we have hereunto set our hands and seals this __________day of ______________________, 20___.

CONTRACTOR/PRINCIPAL:

________________________________________
Name

By: ______________________________________

Signature _________________________________

SURETY:

________________________________________

By: ______________________________________
Attorney-In-Fact

Signature: _________________________________

IMPORTANT: Surety companies executing Bonds must possess a certification of authority from the California Insurance Commissioner authorizing them to write surety insurance defined
in Section 105 of the California Insurance Code, and if the work or project is financed, in whole or in part, with federal grant or loan funds, must also appear on the Treasury Department’s most current list (Circular 570 as amended).

THIS IS A REQUIRED FORM

(Name and Address of Surety)  

(Name and Address of Agent or Representative for service of process in California if different from above)  

(Telephone number of Surety and Agent or Representative for service of process in California)  

STATE OF CALIFORNIA  
COUNTRY OF ___________________

On this _____ day of ______________________, in the year 20___ before me, ____________________________, a Notary Public in and for said state, personally appeared ____________________________, known to me to be the person whose name is subscribed to the within instrument as the Attorney-In-Fact of the (Surety) acknowledged to me that he subscribed the name of the (Surety) thereto and his own name as Attorney-In-Fact.

Notary Public in and for said State

(SEAL)

Commission expires: ______________________

NOTE: A copy of the Power-of-Attorney to local representatives of the bonding company must be attached hereto.
ATTACHMENT NO. 6 TO AGREEMENT

COMPANY INFORMATION SHEET

DECLARATION

I declare under penalty of perjury under the laws of the State of California I have completed this Company Information Sheet and that the information contained herein is factual and accurate as of the date completed.

Completed and executed this ___ day of ___, 20___, in __________________, _______

[day] [month] [city] [state]

By: __________________________________________
Print Name: ____________________________________
Print Title: ____________________________________

LEGAL NAME OF COMPANY: _______________________________________

ADDRESS: _______________________________________________________

TELEPHONE: ________________________ EMAIL: _______________________

TYPE OF BUSINESS (Check One):

[ ] CORPORATION [ ] LIMITED LIABILITY COMPANY

[ ] PARTNERSHIP [ ] JOINT VENTURE

[ ] INDIVIDUAL

[ ] INDIVIDUAL DOING BUSINESS UNDER A FIRM NAME

[ ] OTHER

STATE OF CALIFORNIA CONTRACTOR’S LICENSE: _______________________

DEPARTMENT OF INDUSTRIAL RELATIONS REGISTRATION NUMBER: ______________

STATE OF INCORPORATION OR FORMATION:

_____________________________________________________________________

PRINCIPALS/OFFICERS/PARTNERS/AGENCYCS OF COMPANY

(List All Principals/Officers/Partners [including Joint Venture Partners, Managing Partner], as well as investors/investment companies):

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[PLEASE ATTACH ADDITIONAL SHEETS AS NECESSARY IN ORDER TO PROVIDE ALL REQUESTED INFORMATION.]
**IDENTIFICATION OF PRINCIPAL(S)/OFFICER(S)/REPRESENTATIVE(S) OF COMPANY – Execution of Legal Documents:**

The Company has authorized and hereby designates the following individual(s) to execute legal documents on behalf of Company, including but not limited to contract documents, proposals and related documents:

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**IDENTIFICATION OF PRINCIPAL(S)/OFFICER(S)/REPRESENTATIVE(S) OF COMPANY – Representative and/or Management Capacity:**

The Company has authorized and hereby designates the following individual(s) to serve in a representative and/or management capacity on behalf of Company relating to the concerned project, contract document, lease document, development document, or any other legal document or agreement, including but not limited to manager, project manager, site manager, etc.

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[PLEASE ATTACH ADDITIONAL SHEETS AS NECESSARY IN ORDER TO PROVIDE ALL REQUESTED INFORMATION.]
COMPANY INFORMATION SHEET
SUBCONTACTOR/VENDOR
[One form must be submitted for each listed sub-CONTRACTOR or vendor]

DECLARATION

I declare under penalty of perjury under the laws of the State of California I have completed this Company Information Sheet and that the information contained herein is factual and accurate as of the date completed.

Completed and executed this _____ day of ________, 20__, in __________________, _______.

By: __________________________________________________________________________
Print Name: _____________________________________________________________________
Print Title: _____________________________________________________________________

LEGAL NAME OF COMPANY: _________________________________________________

ADDRESS: ____________________________________________________________________

TELEPHONE: ______________________ EMAIL: ________________________________

TYPE OF BUSINESS (Check One):

[ ] CORPORATION  [ ] LIMITED LIABILITY COMPANY
[ ] PARTNERSHIP  [ ] JOINT VENTURE
[ ] INDIVIDUAL
[ ] INDIVIDUAL DOING BUSINESS UNDER A FIRM NAME
[ ] OTHER

STATE OF CALIFORNIA CONTRACTOR’S LICENSE: __________________

DEPARTMENT OF INDUSTRIAL RELATIONS REGISTRATION NUMBER: _____________

STATE OF INCORPORATION OR FORMATION:

__________________________________________________________________________

PRINCIPALS/OFFICERS/PARTNERS/AGENCY OF COMPANY

(List All Principals/Officers/Partners [including Joint Venture Partners, Managing Partner], as well as investors/investment companies):

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[PLEASE ATTACH ADDITIONAL SHEETS AS NECESSARY IN ORDER TO PROVIDE ALL REQUESTED INFORMATION.]

Project: San Bernardino International Airport Authority
Maintenance Building #730 Renovation

Company Information Sheet

00260
Bid Issuance Set
Page 3 of 4
IDENTIFICATION OF PRINCIPAL(S)/OFFICER(S)/REPRESENTATIVE(S) OF COMPANY – Execution of Legal Documents:
The Company has authorized and hereby designates the following individual(s) to execute legal documents on behalf of Company, including but not limited to contract documents, proposals and related documents:

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IDENTIFICATION OF PRINCIPAL(S)/OFFICER(S)/REPRESENTATIVE(S) OF COMPANY – Representative and/or Management Capacity:
The Company has authorized and hereby designates the following individual(s) to serve in a representative and/or management capacity on behalf of Company relating to the concerned project, contract document, lease document, development document, or any other legal document or agreement, including but not limited to manager, project manager, site manager, etc.

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[PLEASE ATTACH ADDITIONAL SHEETS AS NECESSARY IN ORDER TO PROVIDE ALL REQUESTED INFORMATION.]
ATTACHMENT NO. 7 TO AGREEMENT
GENERAL CONTRACTOR PROJECT CONTACT INFORMATION

Company Name: ____________________________________________________________

Mailing Address: __________________________________________________________
________________________________________________________________________
________________________________________________________________________

Delivery Address, if different: ______________________________________________
________________________________________________________________________
________________________________________________________________________

COMPANY CONTACTS

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<tr>
<th>Department</th>
<th>Name &amp; Title</th>
<th>Phone</th>
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<td>RFI’s:</td>
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24-Hour Emergency Contact

Name: __________________________________________
Title: __________________________________________
Phone #: _________________________________________
Pager #: _________________________________________
ATTACHMENT NO. 8 TO AGREEMENT

GUARANTEE

To: SAN BERNARDINO INTERNATIONAL AIRPORT AUTHORITY

Project: ____________________________________________

We hereby guarantee all the work we will perform, install or construct, both labor and materials, on the above Project (whether listed below or not) and guarantee that such work will be done in accordance with the Project Drawings, Specifications, and other Contract Documents, and that the Work as installed/constructed will fulfill the requirements included in the Contract Documents.

The undersigned agrees to repair or replace, at no cost to the AGENCY, any or all of such work, together with any other adjacent work which may be displaced/damaged in connection with such replacement, that may prove to be defective in workmanship or material within the Guarantee Period, ordinary wear and tear and unusual abuse or neglect excepted.

The Guarantee Period shall commence on the date of completion as specified in the Notice of Completion approved by the AGENCY Board and shall continue for the longer of: (a) a period of one (1) year; (b) a period in excess of one (1) year, as specified or required in any Section of the Contract Documents; (c) the duration of a manufacturer’s guarantee extending beyond one (1) year.

In the event of the undersigned's failure to comply with the above mentioned conditions within a reasonable period of time, as determined by the AGENCY, but not later than ten (10) days after being notified in writing by the AGENCY of defects requiring correction pursuant to this guarantee, the undersigned authorizes the AGENCY to proceed to have said defects repaired/corrected and made good at the expense of the undersigned, which will pay all costs and charges therefore upon demand.

General CONTRACTOR or Subcontractor: ________________________________

Name of Authorized Person to Sign for the above: ________________________________

Signature of Authorized Person: ___________________________________________
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GENERAL CONDITIONS

1.1 BASIC DEFINITIONS

1.1.1 THE CONTRACT DOCUMENTS
The Contract Documents consist of the Agreement between SAN BERNARDINO INTERNATIONAL AIRPORT AUTHORITY (hereafter referred to as the “AGENCY”) and CONTRACTOR (hereinafter the Agreement), Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Bid Package Scope of Work, addenda issued prior to bid, instructions to bidders, notice to bidders and the requirements contained in the Bid Documents, all bid documents submitted, all requirements and mitigation measures outlined in associated permits from regulatory agencies, other documents listed in the Agreement and Modifications issued after execution of the Contract. A Modification is a written amendment to the Contract signed by both parties, a Change Order, a Construction Change Directive or a written order for a minor change in the Work issued by the AGENCY. The Contract Documents are complementary, and each obligation of the CONTRACTOR, subcontractors, and material or equipment suppliers in any one shall be binding as if specified in all.

1.1.2 THE CONTRACT
The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations or agreements, either written or oral. The Contract may be amended or modified only by a written Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind between the AGENCY and any subcontractor or sub-subcontractor or between any persons or entities other than the AGENCY and the CONTRACTOR.

1.1.3 THE WORK
The Work shall include all labor, materials and equipment necessary for the CONTRACTOR to fulfill all of its obligations pursuant to the Contract Documents. It shall include the initial obligation of any CONTRACTOR or subcontractor, who performs any portion of the Work, to visit the Site of the proposed Work, a continuing obligation after the commencement of the Work to fully acquaint and familiarize itself with the conditions as they exist and the character of the operations to be carried on under the Contract Documents, and make such investigation as it may see fit so that it shall fully understand the facilities, physical conditions, and restriction attending the Work under the Contract Documents. Each such CONTRACTOR or subcontractor shall also thoroughly examine and become familiar with the Drawings, Specifications, and associated bid documents.

1.1.4 THE SITE
The “Site” refers to the grounds of the Project as defined by the Contract Documents and includes any and all lands affected by the performance of the Work. Specifically, “onsite” shall refer to the area bounded by the property lines as identified by the Agency's Field Engineer. “Offsite” shall refer to any area outside of the defined property lines.

1.1.5 THE PROJECT
The Project is the total construction of the Work performed in accordance with the Contract Documents in whole or in part and which may include construction by the AGENCY or by separate CONTRACTORS.

1.1.6 THE DRAWINGS
The Drawings are graphic and pictorial portions of the Contract Documents prepared for the Project and approved changes thereto, wherever located and whenever issued, showing the design, location and scope of the Work, generally including plans, elevations, sections, details, schedules and diagrams as drawn or approved by the AGENCY.
1.1.7 THE SPECIFICATIONS
The Specifications are that portion of the Contract Documents consisting of the written requirements for material, equipment, construction systems, instructions, quality assurance standards, workmanship and performance of related services.

1.1.8 THE PROJECT MANUAL
The Project Manual is the volume usually assembled for the Work, which may include, without limitation, the bidding requirements, sample forms, Conditions of the Contract and Specifications.

1.2 EXECUTION, CORRELATION AND INTENT

1.2.1 THE PROJECT MANUAL

1.2.1.1 Documents Complementary and Inclusive. The Contract Documents are complementary and are intended to include all items required for the proper execution and completion of the Work. Any item of work mentioned in the Specifications and not shown on the Drawings, or shown on the Drawings and not mentioned in the Specifications, shall be provided by CONTRACTOR as if shown or mentioned in both.

1.2.1.2 Coverage of the Drawings and Specifications. The Drawings and Specifications generally describe the work to be performed by CONTRACTOR. Generally, the Specifications describe work which cannot be readily indicated on the Drawings and indicate types, qualities, and methods of installation of the various materials and equipment required for the Work. It is not intended to mention every item of Work in the Specifications, which can be adequately shown on the Drawings, or to show on the Drawings all items of Work described or required by the Specifications even if they are of such nature that they could have been shown. All materials or labor for Work, which is shown on either by the Drawings or the Specifications (or is reasonably inferable there from as being necessary to complete the Work), shall be provided by the CONTRACTOR whether or not the Work is expressly covered in either the Drawings and/or the Specifications. It is intended that the Work be of sound, quality construction, and the CONTRACTOR shall be responsible for the inclusion of adequate amounts to cover installation of all items indicated, described or implied in the portion of the Work to be performed by them.

1.2.1.3 Conflicts. In the event there is a discrepancy between the various Contract Documents, the AGENCY/CONTRACTOR Agreement shall control. Without limiting CONTRACTOR’s obligation to identify conflicts for resolution by the AGENCY in accordance with Section 1.2.15, it is intended that the more stringent, higher quality and greater quantity of Work shall apply.

1.2.1.4 Conformance With Laws. Each and every provision of law required by law to be inserted in this Contract shall be deemed to be inserted herein, and the Contract shall be read and enforced as though it were included herein, and if through mistake or otherwise any such provision is not inserted, or is not correctly inserted, then upon application of either party the Contract shall be amended in writing to make such insertion or correction.

1.2.1.5 Ambiguity. Before commencing any portion of the Work, CONTRACTOR shall carefully examine all Drawings and Specifications and other information given to CONTRACTOR as to materials and methods of construction and other Project requirements. CONTRACTOR shall immediately notify AGENCY ARCHITECT/ENGINEER and AGENCY in writing of any perceived or alleged error, inconsistency, ambiguity or lack of detail or explanation in the Drawings and Specification in the manner provided herein. If the CONTRACTOR or its subcontractors, material or equipment suppliers or any of their officers, agents, and employees performs, permits or causes the performance of any Work under the Contract Documents, which it knows or should have known to be in error, inconsistent, or ambiguous, or not sufficiently detailed or explained, CONTRACTOR shall bear any and all costs arising there from including, without limitation, the cost of correction thereof without increase or adjustment to the Contract Price or the time for performance. If CONTRACTOR performs, permits, or causes the performance of any Work under the Contract Documents prepared by or on behalf of CONTRACTOR which is in error, inconsistent or ambiguous
or not sufficiently detailed or explained, CONTRACTOR shall bear any and all resulting costs, including, without limitation, the cost of correction, without increase to or adjustment in the Contract Price or the time for performance. In no case shall any subcontractor proceed with the Work if uncertain without the CONTRACTOR's written direction and/or approval.

1.2.2 ADDENDA AND DEFERRED APPROVALS

1.2.2.1 Addenda. Addenda shall govern over all other Contract Documents. Subsequent addenda issued shall govern over prior addenda only to the extent specified.

1.2.3 SPECIFICATION INTERPRETATION

1.2.3.1 Approval means written authorization by AGENCY or the AGENCY’s authorized representative for specific applications.

1.2.3.2 As Shown, Etc. Where “as shown,” “as indicated,” “as detailed,” or words of similar import are used, reference is made to the Drawings accompanying the Specifications unless otherwise stated. Where “as directed,” “as required,” “as permitted,” as authorized,” “as accepted,” “as selected,” or words of similar import are used, the direction, requirement, permission, authorization, approval, acceptance or selection by AGENCY is intended unless otherwise stated.

1.2.3.3 Project is the planned undertaking as provided for in the Project documents by AGENCY and CONTRACTOR.

1.2.3.4 Provide. “Provide” means “provided complete in place,” that is, furnished, installed, tested and ready for operation and use.

1.2.3.5 General Conditions. The General Conditions and General Project Requirements are a part of each and every section of the Specifications.

1.2.3.6 Abbreviations. In the interest of brevity, the Specifications are written in an abbreviated form and may not include complete sentences. Omission of words or phrases such as “CONTRACTOR shall,” “shall be,” etc., are intentional. Nevertheless, the requirements of the Specifications are mandatory. Omitted words or phrases shall be supplied by inference in the same manner as they are when a “note” occurs on the Drawings.

1.2.3.7 Plural. Words in the singular shall include the plural whenever applicable or the context so indicates.

1.2.3.8 Metric. The Specifications may indicate metric units of measurement as a supplement to U.S. customary units. When indicated thus: 1” (25 mm), the U.S. customary unit is specific, and the metric unit is nonspecific. When not shown with parentheses, the unit is specific. The metric units correspond to the “International System of Units” (SI) and generally follow ASTM E 380, “Standard for Metric Practice.”

1.2.3.9 Work of the CONTRACTOR or Subcontractor includes labor or materials (including, without limitation, equipment, fixtures and appliances) or both, incorporated in, or to be incorporated in the construction covered by the complete Contract Documents.

1.2.3.10 Standard Specifications. Any reference to standard specifications of any society, institute, association, or governmental authority, including CAL Trans is a reference to the organization’s standard specifications, which are in effect at the date of the CONTRACTOR's proposal. If applicable specifications are revised prior to completion of any part of the Work, the CONTRACTOR may perform such Work in accordance with the revised specifications. The standard specifications, except as modified in the Specifications for the Project, shall have full force and effect as though printed in the Specifications. AGENCY will furnish, upon request, information as to how copies of the standard specifications referred to may be obtained.
1.2.3.11 Absence of Modifiers. In the interest of brevity, the Contract Documents frequently omit modifying words such as “all” and “any” and articles such as “the” and “an,” but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.

1.2.4 RULES OF DOCUMENTS INTERPRETATION

A. In the event of conflict within the drawings, the following rules shall apply:

1. General notes, when identified as such, shall be incorporated into other portions of drawings.
2. Schedules, when identified as such, are complementary with other notes and other portions of drawings including those identified as general notes.
3. Larger scale drawings shall take precedence over smaller scale drawings.
4. Figured, derived or numerical dimensions shall govern. At no time shall the CONTRACTOR base construction on scaled drawings.

B. Specifications shall govern as to materials, workmanship and installation procedures.

C. In the case of disagreement or conflict between or within standards, specifications, and drawings, the more stringent, higher quality and greater quantity of work shall apply.

1.3 AGENCYSHIP AND USE OF AGENCY ARCHITECT/ENGINEER’S DRAWINGS, SPECIFICATIONS AND OTHER DOCUMENTS

The Drawings, Specifications and other documents prepared by an AGENCY ARCHITECT/ENGINEER on behalf of the AGENCY are instruments of the services of the AGENCY ARCHITECT/ENGINEER and its consultants and are the property of the AGENCY. The CONTRACTOR may retain one contract record set. Neither the CONTRACTOR nor any subcontractor, sub-subcontractor, or material or equipment supplier shall own or claim a copyright in the Drawings, Specifications and other documents prepared by the AGENCY ARCHITECT/ENGINEER, and unless otherwise indicated the AGENCY ARCHITECT/ENGINEER shall be deemed the author of them. All copies of them, except the CONTRACTOR’s record set, shall be returned or suitably accounted for to the AGENCY, upon request upon completion of the work. The Drawings, Specifications, and other documents prepared by the AGENCY ARCHITECT/ENGINEER and copies thereof furnished to the CONTRACTOR, are for use solely with respect to this Project. They are not to be used by the CONTRACTOR or any subcontractor, sub-subcontractor or material or equipment supplier on other projects or for additions to this Project outside the scope of the work without the specific written consent of the AGENCY and the AGENCY ARCHITECT/ENGINEER. The CONTRACTOR, subcontractors, sub-subcontractors and material or equipment suppliers are granted a limited license to use and reproduce applicable portions of the Drawings, Specifications, and other documents prepared by the AGENCY ARCHITECT/ENGINEER appropriate to and for use in the execution of their work under the Contract Documents. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with this Project is not to be construed as publication in derogation of the AGENCY’s property interest or other reserved right.
ARTICLE 2
AGENCY

2.1 DEFINITION

The term “AGENCY” means the SAN BERNARDINO INTERNATIONAL AIRPORT AUTHORITY and or SAN BERNARDINO INTERNATIONAL AIRPORT AUTHORITY as identified as such in the Agreement. The AGENCY is referred to throughout the Contract Documents as if singular in number. The term “AGENCY” means the AGENCY or the AGENCY’s authorized representative.

2.2 INFORMATION AND SERVICES REQUIRED OF THE AGENCY

2.2.1 FINANCING AND FUNDING

At the request of the CONTRACTOR, the AGENCY will, prior to execution of the Agreement and promptly from time to time thereafter, furnish to the CONTRACTOR reasonable evidence that financial arrangements have been made to fulfill the AGENCY’s obligations under the Contract.

2.3 AGENCY’S RIGHT TO STOP THE WORK

If the CONTRACTOR fails to correct work, which is not in accordance with the requirements of the Contract Documents as required by paragraph 12.2, or persistently fails to carry out Work in accordance with the Contract Documents, the AGENCY, after providing notice pursuant to paragraph 2.4, by written order signed personally or by an agent specifically so empowered by the AGENCY in writing, may order the CONTRACTOR to stop the Work or any portion thereof, until the cause of such order has been eliminated. The right of the AGENCY to stop the Work shall not give rise to a duty on the part of the AGENCY to exercise this right for the benefit of the CONTRACTOR or any other person or entity, except to the extent required by Article 6.

2.4 AGENCY’S RIGHT TO CARRY OUT THE WORK

If the CONTRACTOR defaults or neglects to carry out the Work in accordance with the contract Documents and fails (within a two (2) calendar day period after receipt of written notice or the time period expressly stated in the written notice from the AGENCY) to commence and continue correction of such default or neglect with diligence and promptness, the AGENCY may correct such deficiencies without prejudice to other remedies the AGENCY may have. In such case, the CONTRACTOR will be invoiced the cost to correct such deficiencies, including compensation for additional professional and internally generated services and expenses made necessary by such default, neglect or failure. The invoice amount shall be deducted from the next payment due the CONTRACTOR. If payments then or thereafter due the CONTRACTOR are not sufficient to cover such amounts, the CONTRACTOR shall pay the difference to the AGENCY.

2.5 AGENCY’S RIGHT TO TERMINATE AGREEMENT

A. If the CONTRACTOR refuses or fails to complete the work or any separable part thereof with such diligence as will insure its completion within the time specified or any extension thereof, or fails to complete said work within such time, or if the CONTRACTOR should file a petition for relief as a debtor, or should relief be ordered against CONTRACTOR as a debtor under Title 11 of the United States Code, or if CONTRACTOR should make a general assignment for the benefit of its creditors, or if a receiver should be appointed on account of its insolvency, or if it should refuse or should fail to supply enough properly skilled workers or proper materials to complete the work in the time specified, or if CONTRACTOR should fail to make prompt payment to subcontractors for materials or labor, or persistently disregards laws or ordinances or instructions of AGENCY, or if CONTRACTOR or its subcontractors should otherwise be guilty of a violation of any
provision of this Agreement, then AGENCY may, without prejudice to any other right or remedy, serve written notice upon CONTRACTOR and its surety of AGENCY’s intention to terminate this Agreement. Such notice shall contain the reasons for such intention to terminate, and unless within three (3) calendar days after the service of such notice such condition or violation shall cease and satisfactory arrangements for the correction thereof be made to AGENCY, this Agreement shall upon the expiration of said three (3) calendar days, cease and terminate. In such case, CONTRACTOR shall not be entitled to receive any further payment until work is finished to AGENCY’s satisfaction.

B. In the event of any such termination, AGENCY shall immediately serve written notice thereof upon surety and CONTRACTOR, and surety shall have the right to take over and perform this Agreement, provided, however, that if surety within five (5) calendar days after service upon it of said notice of termination does not give AGENCY written notice of its intention to take over and perform this Agreement or does not commence performance thereof within seven (7) calendar days after date of serving such notice of termination by AGENCY on surety, AGENCY may take over the work and prosecute same to completion by Agreement or by any other method it may deem advisable for the account and at the expense of CONTRACTOR, and CONTRACTOR and its surety shall be liable to AGENCY for any excess cost or other damages occasioned by the AGENCY thereby. Time is of the essence in this Agreement. If the AGENCY takes over the work as hereinabove provided, the AGENCY may, without liability for so doing, take possession of and utilize in completing the Work such materials, supplies, equipment and other property belonging to the CONTRACTOR as may be on the site of the work and necessary therefore.

C. If the expense of finishing the Work, including compensation for additional architectural or engineering work, managerial, and administrative services, shall exceed the unpaid balance of the Agreement, CONTRACTOR shall pay the difference to AGENCY. Expense incurred by AGENCY as herein provided, and damage incurred through CONTRACTOR’s default, shall be certified to AGENCY by AGENCY ARCHITECT/ENGINEER. If the unpaid balance under the Agreement shall exceed expense of finishing the work, including compensation for additional architectural or engineering work, managerial and administrative services, such excess shall be paid to CONTRACTOR.

D. Should the AGENCY determine that environmental considerations mandate that the Work not go forward, AGENCY may notify CONTRACTOR that this Agreement is terminated due to environmental conditions and AGENCY shall only be obligated to pay CONTRACTOR for the work that the CONTRACTOR had performed at the time of notification of termination of this Agreement for environmental considerations.

E. In the event that sufficient funds are not appropriated to complete the Project or the AGENCY determines that sufficient funds are not available to complete the Project, AGENCY may terminate or suspend the completion of the Project at any time by giving written notice to the CONTRACTOR. In the event that the AGENCY exercises this option, the AGENCY shall pay for any and all work and materials completed or delivered onto the site and the value of any and all work then in progress and orders actually placed which cannot be canceled up to the date of notice of termination. The value of work and materials paid for shall include a factor of 15% for the CONTRACTOR’s overhead and profit and there shall be no other costs or expenses or lost profit paid to CONTRACTOR. All work, materials and orders paid for pursuant to this provision shall become the property of the AGENCY. AGENCY may, without cause, order CONTRACTOR in writing to suspend, delay or interrupt the Project in whose, or in part for such period of time as AGENCY may determine. Adjustment shall be made for increases in the cost of performance of the Agreement caused by suspension, delay or interruption.

F. AGENCY reserves the right to terminate this Agreement should the AGENCY determine not to proceed because of the discovery of hazardous or unknown conditions.
CONTRACTOR shall only receive payment for all Work performed to the date of termination.

G. The foregoing provisions are in addition to and not in limitation of any other rights or remedies available to the AGENCY.

ARTICLE 3
THE CONTRACTOR

3.1 DEFINITION
The CONTRACTOR is the person or entity identified as such in the Agreement and is referred to through the Contract Documents. The term “CONTRACTOR” means the CONTRACTOR or the CONTRACTOR’s authorized representative. CONTRACTOR is and shall at all times be deemed to be an independent CONTRACTOR and shall be wholly responsible for the manner in which it performs the services required of it by the terms of the Project documents. Nothing herein contained shall be construed as creating the relationship of employer and employee, or principal and agent, between the AGENCY and CONTRACTOR or any of CONTRACTOR’s agents or employees. To the extent that any portion of the Work is provided with the CONTRACTOR’s own forces, any reference to subcontractors shall be equally applicable to the CONTRACTOR.

3.2 SUPERVISION AND CONSTRUCTION PROCEDURES
3.2.1 CONTRACTOR
The CONTRACTOR shall supervise and direct the Work using the CONTRACTOR’s best skill and attention. The CONTRACTOR shall be solely responsible for and have control over construction means, methods, techniques, sequences, procedures and coordinating all portions of the Work under the contract, unless Contract Documents give other specific instructions concerning these matters. If any of the Work is performed by CONTRACTORs retained directly by the AGENCY, CONTRACTOR shall be responsible for the coordination and sequencing of the Work of those other CONTRACTORs so as to avoid any impact on the Project Schedule pursuant to the requirements of Article 6. Specific duties of the CONTRACTOR shall be in accordance with Title 24 of the California Code of Regulations.

3.2.2 CONTRACTOR LICENSING
CONTRACTORS are required by law to be licensed and regulated by the CONTRACTORS State License Board. Any CONTRACTOR not so licensed is subject to penalties under the law, and the contract will be considered void pursuant to Section 7028.7 of the Business and Professions Code. Any questions concerning a CONTRACTOR may be referred to the Registrar, CONTRACTORS State License Board, 3132 Bradshaw Road, P.O. Box 2600, Sacramento, CA 95826.

3.2.3 CONTRACTOR RESPONSIBILITY
The CONTRACTOR shall be responsible to the AGENCY for acts and omissions of the CONTRACTOR’s employees, subcontractors, material and equipment suppliers and their agents, employees, invitees and other persons performing portions of the Work under direct or indirect contract with the CONTRACTOR or any of its subcontractors. CONTRACTOR, its agents and employees shall not be entitled to any rights or privileges of AGENCY employees and shall not be considered AGENCY employees. AGENCY shall be permitted to monitor the activities of the CONTRACTOR to determine compliance with the terms of the Contract Documents. 2.2.2

3.2.3.1 SITE SURVEY
When required by the scope of the Project, the CONTRACTOR will furnish, at its expense, a legal description and a land survey of the site, giving, as applicable, grades and lines of streets, alleys, pavements, adjoining property, rights-of-way, restrictions, easements, encroachments, zoning, deed restrictions, boundaries and contours of the site. Surveys to determine locations of construction, grading and site work shall be also be provided by the CONTRACTOR.

3.2.3.2 **SOILS (NOT A PART)**

Test borings and soils reports for the Project have been made for the AGENCY to indicate the subsurface materials that might be encountered at particular locations on the Project. The AGENCY has made these documents available to the CONTRACTOR and the CONTRACTOR has studied the results of such test borings and information that it has as to the subsurface conditions and site geology as set forth in the test borings and soils reports. The AGENCY does not assume any responsibility whatsoever with respect to the sufficiency or accuracy of the borings made, or of the logs of the test borings, or of other investigations, or of the soils reports furnished pursuant hereto, or of the interpretations to be made beyond the location or depth of the borings. There is no warranty or guarantee, either express or implied that the conditions indicated by such investigations, borings, logs, soil reports or other information are representative of those existing throughout the site of the Project, or any part thereof, or that unforeseen developments may not occur. At the AGENCY’s request, the CONTRACTOR shall make available to the AGENCY the results of any site investigation, test borings, analyses, studies or other test conducted by or in the possession of the CONTRACTOR or any of its agents. Nothing herein contained shall be deemed a waiver by the CONTRACTOR to pursue any available legal right or remedy it may have at any time against any 3rd party who may have prepared any report and/or test relied upon by the CONTRACTOR.

3.2.3.2 **EXISTING UTILITY LINES; REMOVAL, RELOCATION**

**Removal, Relocation.** The AGENCY assumes the responsibility for removal, relocation, and protection of existing utilities located on the site at the time of commencement of construction under this Contract with respect to any such utility facilities, which are not identified in the Drawings and Specifications made part of the invitation to bid. However, it is the responsibility of the CONTRACTOR to pothole and take reasonable caution when excavating in areas where it is likely utilities may be present. The CONTRACTOR shall not be assessed for liquidated damages for delay in completion of the Project caused by failure of the AGENCY to provide for removal or relocation of such utility facilities.

**Assessment.** These subparagraphs shall not be construed to preclude assessment against the CONTRACTOR for any other delays in completion of the Work. Nothing in these subparagraph shall be deemed to require the AGENCY to indicate the presence of existing service laterals or appurtenances whenever the presence of such utilities on the site can be inferred from the presence of other visible facilities, such as buildings, or meter junction boxes on or adjacent to the site.

**Notification.** If the CONTRACTOR, while performing work under this Contract, discovers utility facilities not identified by the AGENCY in the Contract plans or specifications, CONTRACTOR shall immediately notify the AGENCY and the utility company in writing.

**Underground Utility Clearance.** It shall be CONTRACTOR’s sole responsibility to timely notify all public and private utilities serving the site prior to commencing Work. As part of the work to be performed, CONTRACTOR shall provide the notices and proceed in accordance with Government Code Sections 4216.2, 4216.3 and 4216.4 and pay all fees charged pursuant to Government Code Section 4216 et seq.

3.2.4 **OBLIGATIONS NOT CHANGED BY AGENCY ARCHITECT/ENGINEER’S ACTIONS**
The CONTRACTOR shall not be relieved of obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the AGENCY ARCHITECT/ENGINEER in the AGENCY ARCHITECT/ENGINEER’s administration of the Contract or by tests, inspections, or approvals required or performed by persons other than the CONTRACTOR.

3.2.5 ACCEPTANCE/APPROVAL OF WORK

The CONTRACTOR shall be responsible to determine when any completed portions of the Work already performed under this Contract or provided pursuant to Article 6 are suitable to receive subsequent work thereon.

3.2.6 CHANGE IN NAME AND NATURE OF CONTRACTOR’S LEGAL ENTITY

Before CONTRACTOR makes any change in the name or legal nature of the CONTRACTOR’s entity, CONTRACTOR shall first notify the AGENCY in writing and cooperate with AGENCY in making such changes as the AGENCY may request in the Project documents.

3.3 SUPERINTENDENT

3.3.1 FULL TIME SUPERINTENDENT

During progress of the Work, CONTRACTOR shall keep on the work site a competent full-time Superintendent satisfactory to AGENCY. The Superintendent shall be in attendance at the Project site during performance of the Work. Superintendent shall represent CONTRACTOR and all directions or communications given to Superintendent shall be as binding as if given to CONTRACTOR. Before commencing the Work herein, CONTRACTOR shall give written notice to the AGENCY of the name, qualifications and experience of such Superintendent. If Superintendent is found unsatisfactory by the AGENCY, CONTRACTOR shall replace the Superintendent with one acceptable to the AGENCY. The Superintendent shall not be changed except with the written consent of AGENCY, unless a superintendent proves to be unsatisfactory to CONTRACTOR and ceases to be in its employ, in which case, CONTRACTOR shall notify AGENCY and AGENCY ARCHITECT/ENGINEER in writing and replace said Superintendent with one acceptable to the AGENCY.

3.3.2 STAFF

The CONTRACTOR and each subcontractor shall furnish a competent and adequate staff as necessary for the proper administration, coordination, supervision and superintendence of its portion of the Work; organize the procurement of all materials and equipment so that the materials and equipment will be available at the time they are needed for the Work; and keep an adequate force of skilled and fit workers on the job to complete the Work in accordance with all requirements of the Contract Documents. Supervisory staff as designated in the AGREEMENT must be provided anytime work is being performed by CONTRACTOR or Subcontractor.

3.3.3 RESPONSIBILITY FOR ACTS AND OMISSIONS

CONTRACTOR shall be responsible to the AGENCY for acts and omissions of CONTRACTOR’s employees, subcontractors, material and equipment suppliers and their agents, employees, invitees or other persons performing portions of the Work under direct or indirect contract with the CONTRACTOR or any of its subcontractors.

3.3.4 SUBSEQUENT WORK
CONTRACTOR shall be responsible to determine when any completed portions of the Work already performed under this Agreement are suitable to receive subsequent work thereon.

3.3.5 RIGHT TO REMOVE

AGENCY shall have the right, but not the obligation, to require the removal from the Project of any superintendent, staff member, agent or employee of any CONTRACTOR, subcontractor, material or equipment supplier, etc., for any cause.

3.4 LABOR AND MATERIALS

3.4.1 CONTRACTOR TO PROVIDE

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

3.4.2 QUALITY

Unless otherwise specified, all materials and equipment to be permanently installed in the Project shall be new and shall be of such quality as required to satisfy the standards of the Contract Documents. The CONTRACTOR shall, if requested, furnish satisfactory evidence as to kind and quality of all materials and equipment. All labor shall be performed by workers skilled in their respective trades, and shall be of such quality so that work in accordance with the standards of construction set forth in Contract Documents will result.

3.4.3 REPLACEMENT

Any work, materials or equipment, which do not conform to these requirements or the standards set forth in the Contract Documents, may be disapproved and rejected by the AGENCY, in which case, they shall be removed and replaced by the CONTRACTOR.

3.4.4 DISCIPLINE

The CONTRACTOR shall enforce strict discipline and good order among the CONTRACTOR’s employees and other persons carrying out the Contract in accordance with paragraph 5.5.1 including, but not limited to, subcontractors and material or equipment suppliers retained for the Project. The CONTRACTOR shall not permit employment of unfit persons or persons not skilled in tasks assigned to them.

3.4.5 ORDERS

The CONTRACTOR shall, after issuance of the Notice to Proceed by AGENCY, place orders for materials and/or equipment as specified or approved by the submittal process so that delivery of same may be made without delays to the work. CONTRACTOR shall, upon demand from the AGENCY, furnish documentary evidence showing that orders have been placed.

3.4.6 NONCONFORMING WORK OR MATERIALS

Any work, materials or equipment which do not conform to these requirements or the standard set forth in the Project documents, may be disapproved and rejected by the AGENCY, in which case they shall be removed and replaced by the CONTRACTOR. All expenses, incidental to the procuring of said materials and/or equipment shall be paid for by the CONTRACTOR.
3.5 **WARRANTY**

The CONTRACTOR warrants to the AGENCY that material and equipment furnished under the Contract will be of good quality and new unless otherwise required or permitted by the Contract Documents, that the Work will be free from defects not inherent in the quality required or permitted and that the Work will conform to the requirements of the Contract Documents. Work not conforming to these requirements, including substitutions not properly approved and authorized, shall be considered defective. The CONTRACTOR’s warranty does not cover damage or defect caused by abuse, modifications not executed by the CONTRACTOR, improper or insufficient maintenance, improper operation or normal wear and tear under normal usage. If required by the AGENCY ARCHITECT/ENGINEER, the CONTRACTOR shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

3.6 **TAXES**

CONTRACTOR will pay all applicable federal, state and local taxes on all materials, labor or services furnished by it, and all taxes arising out of its operations under the Contract Documents. AGENCY is exempt from Federal Excise Tax and a Certificate of Exemption shall be provided upon request.

3.7 **PERMITS, FEES AND NOTICES**

3.7.1 **PAYMENT**

The CONTRACTOR shall initiate and pursue the application process for obtaining all permits and licenses (including all required AGENCY signatures) necessary for the prosecution of the work, including utility fees.

AGENCY will reimburse CONTRACTOR the actual documented cost of such permits and fees, with no overhead or profit added. No reimbursement will be allowed for fees associated with City or County business licenses, disposals, trucking, etc.

3.7.2 **COMPLIANCE**

The CONTRACTOR shall comply with and give notices required by any law, ordinance, rule, regulation and lawful order of public authorities bearing on performance of the Work.

3.7.3 **CONTRACT DOCUMENTS**

CONTRACTOR shall supervise and direct the Work competently and efficiently, devoting such attention thereto and applying such skills as may be necessary to perform the Work in accordance with the Project documents. CONTRACTOR shall carefully study and compare all Project documents, plans, drawings, specifications and other instructions and shall at once report to AGENCY any error, inconsistency or omission which CONTRACTOR or its employees may discover. The CONTRACTOR represents itself to AGENCY as a skilled, knowledgeable and experienced CONTRACTOR. The CONTRACTOR shall be liable to the AGENCY for damage resulting from errors, inconsistencies or omissions in the Project documents that the CONTRACTOR recognized and which CONTRACTOR knowingly failed to report and which a similarly skilled, knowledgeable and experienced CONTRACTOR would have discovered.
3.7.4 **RESPONSIBILITY**

The CONTRACTOR shall verify all indicated dimensions before ordering materials or equipment or before performing Work. The CONTRACTOR shall take field measurements, verify field conditions and shall carefully compare such field measurements and conditions and other information known to the CONTRACTOR with the Project documents before commencing Work. Errors, inconsistencies or omissions discovered shall be reported to the AGENCY at once. Upon commencement of any item of work, the CONTRACTOR shall be responsible for dimensions related to such item of work and shall make any corrections necessary to make work properly fit at no additional cost to AGENCY. This responsibility for verification of dimensions is a non-delegable duty and may not be delegated to subcontractors or agents.

3.8 **ALLOWANCES**

3.8.1 **CONTRACT SUM**

The CONTRACTOR shall include in the Contract Sum all allowance stated in the Contract Document. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the AGENCY may direct.

3.8.2 **SCOPE**

3.8.2.1 *Prompt Selection.* Materials and equipment under an allowance shall be selected promptly by the AGENCY to avoid delay to the Work.

3.8.2.2 *Cost.* Allowances shall cover the cost to the CONTRACTOR of materials and equipment delivered at the site and all required taxes, less applicable trade discounts, etc.

3.8.2.3 *Cost.* CONTRACTOR’s costs for unloading and handling at the Site, labor, installation costs, overhead, profit and other expenses contemplated for stated allowance amounts shall be included in the allowances.

3.8.2.4 *Contract Sum Adjustment.* Whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect the difference between actual cost and the allowances under paragraph 3.8.2.2 and the change in the CONTRACTOR’s costs under paragraph 3.8.2.3.

3.9 **CONTRACTOR’S CONSTRUCTION SCHEDULES**

3.9.1 **REQUIREMENTS**

The Contract shall submit a project schedule to the AGENCY for approval within five (5) days of issuance of the Notice To Proceed.

3.10 **DOCUMENTS AND SAMPLES AT THE SITE**

The CONTRACTOR shall maintain at the Site for the AGENCY one applicable copy of California Building Code Titles 19 and 24 and a record copy of the Drawings, Specifications, addenda, change orders and other modifications, in good order and marked currently to record changes and selections made during construction. In addition, the CONTRACTOR shall maintain at the Site approved shop drawings, product data, samples and similar required submittals. These documents shall be available to the AGENCY and shall be delivered to the AGENCY upon completion of the Work. CONTRACTOR shall be acquainted with and shall comply with the provisions of said regulations as they relate to the Contract. (See particularly the Duties of CONTRACTOR, 24 California Code of Regulations, Section 4343.) CONTRACTOR shall also be acquainted with and comply with all California Code of Regulations provisions relating to conditions of the Work, particularly Titles 8 and 17.
3.11 SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

3.11.1 SUBMITTALS DEFINED

3.11.1.1 Shop Drawings. The term “shop drawings” as used herein means drawings, diagrams, schedules, and other data, which are prepared by CONTRACTOR, subcontractors, manufacturers, suppliers or distributors illustrating some portion of the Work, and includes: illustrations, fabrication, erection, layout and setting drawings; manufacturer’s standard drawings; schedules; descriptive literature, instructions, catalogs, and brochures; performance and test data including charts; writing and control diagrams; and all other drawings and descriptive data pertaining to materials, equipment, piping, duct and conduit systems, and methods of construction as may be required to show that the materials, equipment or systems and their position conform to the requirements of the Contract Documents. The CONTRACTOR shall obtain and submit with the shop drawings all seismic and other calculations and all product data from equipment manufacturers. “Product data” as used herein are illustrations, standard schedules, performance charts, instructions, brochures, diagrams and other information furnished by the CONTRACTOR to illustrate a material, product or system for some portion of the Work. As used herein, the term “manufactured” applies to standard unit usually mass-produced, and “fabricated” means items specifically assembled or made out of selected materials to meet individual design requirements.

Shop drawings shall establish the actual detail of all manufactured or fabricated items, indicate proper relation to adjoining work, amplify design details of mechanical and electrical systems and equipment in proper relation to physical spaces in the structure, and incorporate minor changes of design or construction to suit actual conditions.

3.11.1.2 Samples. The term “samples” as used herein are physical examples furnished by CONTRACTOR to illustrate materials, equipment or quality and includes natural materials, fabricated items, equipment, devices, appliances or parts thereof as called for in the Specifications, and any other samples as may be required by the AGENCY ARCHITECT/ENGINEER to determine whether the kind, quality, construction, finish, color and other characteristics of the materials, etc., proposed by the CONTRACTOR conform to the required characteristics of the various parts of the Work. All Work shall be in accordance with the approved samples.

3.11.1.3 CONTRACTOR’S Responsibility. CONTRACTOR shall obtain and shall submit all required shop drawings and samples in accordance with CONTRACTOR’S “Schedule for Submission of Shop Drawings and Samples” as required in Division 1 of the Specifications with such promptness as to cause no delay in its own Work or in that of any other CONTRACTOR or subcontractor but in no event later than thirty-five (35) calendar days after the Notice of Award, unless noted otherwise. No extensions of time will be granted to CONTRACTOR or any subcontractor because of its failure to have shop drawings and samples submitted in accordance with the schedule. Each subcontractor shall submit all shop drawings, samples and manufacturer’s descriptive data for the review of the AGENCY, the CONTRACTOR and the AGENCY ARCHITECT/ENGINEER through the CONTRACTOR. By submitting shop drawings, product data and samples, the CONTRACTOR or submitting party (if other than CONTRACTOR) represents that it has determined and verified all materials, field measurements, catalog numbers, related field construction criteria, and other relevant data in connection with each such submission, and that it has checked, verified and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents. At the time of submission, any deviation in the shop drawings, product data or samples from the requirements of the Contract Documents shall be narratively described in a transmittal accompanying the submittal. However, submittals shall not be used as a means of requesting a substitution, the procedure for which is defined in paragraph 3.11.4, “Substitutions.” Review by AGENCY and AGENCY ARCHITECT/ENGINEER shall not relieve the CONTRACTOR or any subcontractor from its responsibility in preparing and submitting proper shop drawings in accordance with the Contract Documents. CONTRACTOR’S review and approval of shop drawings shall include the following stamp:
“The Prime CONTRACTOR has reviewed and approved the construction criteria and has also made written notation regarding any information in these shop drawings that does not conform to the Project Contract Documents. The Prime CONTRACTOR shall verify actual dimensions. This shop drawing has been coordinated with the Contract Documents, and all other Shop Drawings within this Prime CONTRACTOR’s scope of work. The duty of coordination has not been delegated to the prime CONTRACTOR’s subcontractors, material suppliers, the AGENCY ARCHITECT/ENGINEER or the Engineers.

3.11.4 Extent of Review. In reviewing shop drawings, the AGENCY ARCHITECT/ENGINEER will not verify dimensions and field conditions. The AGENCY ARCHITECT/ENGINEER will review and approve shop drawings, product data and samples for aesthetics and for conformance with the design concept of the Work and the information given in the Contract Documents. The AGENCY ARCHITECT/ENGINEER’s review shall neither be construed as a complete check nor relieve the CONTRACTOR, subcontractor, manufacturer, fabricator or supplier from responsibility for any deficiency that may exist or from any departures or deviations from the requirements of the Contract Documents unless the CONTRACTOR has, in writing, called the AGENCY ARCHITECT/ENGINEER’s attention to the deviations at the time of submission. The AGENCY ARCHITECT/ENGINEER’s review shall not relieve the CONTRACTOR or subcontractors from responsibility for errors of any sort in shop drawing or schedules, for proper fitting of the Work or from the necessity of furnishing any Work required by the Contract Documents, which may not be indicated on shop drawings when reviewed. CONTRACTOR and subcontractors shall be solely responsible for any quantities, which may be shown on the shop drawings.

3.11.2 DRAWING SUBMISSION PROCEDURE

3.11.2.1 Transmittal Letter and Other Requirements. All shop drawings must be properly identified with the name of the project and dated and each lot submitted must be accompanied by a letter of transmittal referring to the name of the Project and to the Specification section number for identification of each item clearly stating in narrative form, as well as “clouding” on the submissions, all qualifications, departures or deviations from the Contract Documents, if any. Shop drawings, for each section of the Work, shall be numbered consecutively, and the numbering system shall be retained throughout all revisions. All subcontractor submissions shall be made through the CONTRACTOR. Each drawing shall have a clear space for the stamps of AGENCY ARCHITECT/ENGINEER and CONTRACTOR. Only shop drawings required to be submitted by the Contract Documents shall be reviewed. All submittals are to be forwarded to the AGENCY.

3.11.2.2 Copies Required. Each submittal shall include one (1) legible, reproducible sepia and seven (7) legible prints of each drawing, including fabrication, erection, layout and setting drawings, and such other drawings as required under the various sections of the specifications until final acceptance thereof is obtained. Subcontractor shall submit copies, in an amount as requested by the CONTRACTOR, of: manufacturers’ descriptive data for materials, equipment and fixtures, including catalog sheets showing dimensions, performance, characteristics and capacities; wiring diagrams and controls; schedules; all seismic calculations and other calculations; and other pertinent information as required.

3.11.2.3 Corrections. The CONTRACTOR shall make any corrections required by AGENCY ARCHITECT/ENGINEER and shall resubmit as required by AGENCY ARCHITECT/ENGINEER 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 required by the AGENCY ARCHITECT/ENGINEER on previous submissions. Professional services required for more than one (1) re-review of required submittals of shop drawings, product data, or samples are subject to charge to the CONTRACTOR pursuant to paragraph 4.4.
3.11.2.4  **Approval Prior to Commencement of Work.** No portion of the Work requiring a shop drawing or sample submission shall be commenced until the submission has been reviewed by AGENCY and approved by AGENCY ARCHITECT/ENGINEER unless specifically directed in writing by the AGENCY. All such portions of the Work shall be in accordance with approved shop drawings and samples.

3.11.2.5  **Responsibility for Errors.** The AGENCY ARCHITECT/ENGINEER’s review shall not relieve the CONTRACTOR or any subcontractors from responsibility for errors of any sort in shop drawings or schedules, for proper fitting of the work, nor from the necessity of furnishing any work required by the Project documents which may not be indicated on shop drawings when reviewed. CONTRACTOR and subcontractors shall be solely responsible for any quantities which may be shown on the shop drawings.

3.11.3  **SAMPLE SUBMISSIONS PROCEDURE**

3.11.3.1  **Samples Required.** In case a considerable range of color, graining, texture, or other characteristics may be anticipated in finished products, a sufficient number of samples of the specified materials shall be furnished by the CONTRACTOR to indicate the full range of characteristics, which will be present in the finished products; and products delivered or erected without submittal and approval of full range samples shall be subject to rejection. Except for range samples and unless otherwise called for in the various sections of the specifications, samples shall be submitted in duplicate. All samples shall be marked, tagged or otherwise properly identified with the name of the submitting party, the name of the project, the purpose for which the samples are submitted and the date and shall be accompanied by a letter of transmittal containing similar information, together with the specification section number for identification of each item. Each tag or sticker shall have clear space for the review stamps of CONTRACTOR and AGENCY ARCHITECT/ENGINEER.

3.11.3.2  **Labels and Instructions.** Samples of materials, which are generally furnished in containers bearing the manufacturers descriptive labels and printed application instructions, shall, if not submitted in standard containers, be supplied with such labels and application instructions.

3.11.3.3  **AGENCY ARCHITECT/ENGINEER’s Review.** The AGENCY ARCHITECT/ENGINEER will review and, if appropriate, approve submissions and will return them to the CONTRACTOR with the AGENCY ARCHITECT/ENGINEER’s stamp and signature applied thereto, indicating the appropriate action in compliance with the AGENCY ARCHITECT/ENGINEER’s standard procedures.

3.11.3.4  **Record Drawings and Annotated Specifications.** The CONTRACTOR will prepare and maintain on a current basis an accurate and complete set of record drawings showing clearly all changes, revisions and substitutions during construction, including, without limitation, field changes and the final location of all mechanical equipment, utility lines, ducts, outlets, structural members, walls, partitions and other significant features, and annotated specifications showing clearly all changes, revisions and substitutions during construction. A copy of such record drawings and annotated specifications will be delivered to AGENCY in accordance with the schedule prepared by CONTRACTOR. In the event of a specification that allows CONTRACTOR to elect one of several brands, makes, or types of material or equipment, the annotations shall show which of the allowable items the CONTRACTOR has furnished. The CONTRACTOR will update the record drawings and annotated specifications as often as necessary to keep them current but no less often than weekly. The record drawings and annotated specifications shall be kept at the site and available for inspection by the AGENCY & AGENCY ARCHITECT/ENGINEER.

On completion of the CONTRACTOR’s portion of the work and prior to application for final payment, the CONTRACTOR will provide one complete set of record drawings and annotated specifications to the AGENCY. Certifying them to be a complete and accurate reflection of the actual construction conditions of the work.
3.11.3.5 Equipment Manuals. CONTRACTOR shall obtain and furnish three (3) complete sets of manuals containing the manufacturers’ instructions for maintenance and operation of each item of equipment and apparatus furnished under the contract documents and any additional data specifically requested under the various sections of the specifications for each division of the work. The manuals shall be arranged in proper order, indexed, and placed in three-ring binders. At the completion of its work, the CONTRACTOR shall certify, by endorsement thereon, that each of the manuals is complete, accurate, and covers all of its work. Prior to submittal of CONTRACTOR’s application for final payment, and as a further condition to its approval by the AGENCY ARCHITECT/ENGINEER, each subcontractor shall deliver the manuals, arranged in proper order, indexed, endorsed, and placed in three-ring binders, to the CONTRACTOR, who shall assemble these manuals for all divisions of the work, review them for completeness and submit them to the AGENCY.

3.11.3.6 Agency’s Property. All shop drawings and samples submitted shall become the AGENCY’s property.

3.11.4 SUBSTITUTIONS

3.11.4.1 One Product Specified. Unless the specifications state that no substitution is permitted, whenever in the contract documents any specific article, device, equipment, product, material, fixture, patented process, form, method or type of construction is indicated or specified by name, make, trade name or catalog number, with or without the words “or equal,” such specification shall be deemed to be used for the purpose of facilitating description of material, process or article desired and shall be deemed to be followed by the words “or equal.” CONTRACTOR may, unless otherwise stated, offer any material process or article, which shall be substantially equal or better in every respect to that so indicated or specified and will completely accomplish the purpose of the contract documents.

3.11.4.2 Two or More Products Specified. When two or more acceptable products are specified for an item of the work, the choice will be up to the CONTRACTOR. CONTRACTOR shall utilize the same product throughout the project. If the required notice is not provided and an “or equal” substitution is requested, the AGENCY, at its sole discretion, may refuse to consider the substitution unless the product specified is no longer commercially available. If the AGENCY allows the substitution to be proposed despite the lack of proper notice, the CONTRACTOR will be invoiced by the AGENCY for the professional fees incurred by the AGENCY ARCHITECT/ENGINEER or AGENCY ARCHITECT/ENGINEER’s consultants in reviewing the proposed substitution.

3.11.4.3 Substitution Request Form. Requests for substitutions of products, materials, or processes other than those specified must be made on the substitution request form available from the AGENCY ARCHITECT/ENGINEER within five (5) calendar days of the date of the Notice to Award. Consideration of substitution does not modify the project schedule regarding shop drawing submission date. Any requests submitted after the five (5) calendar days will not be considered, except as noted in paragraph 3.11.4.2 or at the sole discretion of the AGENCY. A substitution request must be accompanied by evidence as to whether or not the proposed substitution: is equal in quality and serviceability to the specified item; will entail no changes in detail and construction of related work; will be acceptable in consideration of the required design and artistic effect; will provide no cost disadvantage to AGENCY; and will require no excessive or more expensive maintenance, including adequacy and availability of replacement parts. The burden of proof of these facts shall be upon the CONTRACTOR. The CONTRACTOR shall furnish with its request all drawings, specifications, samples, performance data, calculations, and other information as may be required to assist the AGENCY ARCHITECT/ENGINEER and the AGENCY in determining whether the proposed substitution is acceptable. The final decision shall be the AGENCYs. AGENCY may condition its approval of the substitution upon delivery to AGENCY of an extended warranty or other assurances of adequate performance of the substitution. All risks of delay due to the division of the state AGENCY ARCHITECT/ENGINEER’s, or any other...
governmental agency having jurisdiction, approval of a requested substitution shall be on the requesting party.

3.11.4.4 **List of Manufacturers and Products Required.** The subcontractor shall prepare and submit to the CONTRACTOR within thirty-five (35) calendar days of Notice of Award, comprehensive lists, in quadruplicate, of the manufacturers and products proposed for the project, including information on materials, equipment, and fixtures required by the contract documents, as may be required for CONTRACTOR’s or AGENCY ARCHITECT/ENGINEER’s preliminary approval. Approval of such lists of products shall not be construed as a substitute for the shop drawings, manufacturer’s descriptive data and samples, which are required by the contract documents, but rather as a base from which more detailed submittals shall be developed for the final review of the CONTRACTOR and the AGENCY ARCHITECT/ENGINEER.

3.11.5 **DEFERRED APPROVALS OF SUBSTITUTIONS**

Deferred approvals shall be submitted and processed pursuant to the requirements of Division 1 of the specifications. All risks of delay due to the AGENCY ARCHITECT/ENGINEER or any other governmental agency having jurisdiction, approval of a deferred approval shall be on the requesting party.

3.12 **CUTTING AND PATCHING**

3.12.1 **SCOPE**

The CONTRACTOR shall be responsible for cutting, fitting or patching required to complete the work or to make its parts fit together properly. Refer to individual scope of work sheets for more detailed information.

3.12.2 **CONSENT**

The CONTRACTOR shall not damage or endanger a portion of the work or fully or partially completed construction of the AGENCY or separate CONTRACTORs by cutting, patching, or otherwise altering such construction, or by excavation. The CONTRACTOR shall not cut or otherwise alter such construction by the AGENCY or a separate CONTRACTOR except with written consent of the AGENCY and of such separate CONTRACTOR; such consent shall not be unreasonably withheld. The CONTRACTOR shall not unreasonably withhold from the AGENCY or a separate CONTRACTOR the CONTRACTOR’s consent to cutting or otherwise altering the work. All cutting shall be done promptly. And all repairs shall be made as necessary.

3.12.3 **STRUCTURAL MEMBERS**

New or existing structural members and elements, including reinforcing bars and seismic bracing, shall not be cut, bored, or drilled except by written authority of the AGENCY ARCHITECT/ENGINEER. Work done contrary to such authority is at the CONTRACTOR’s risk, subject to replacement at its own expense and without reimbursement under the contract. Agency approvals shall be obtained by the AGENCY ARCHITECT/ENGINEER, not by the CONTRACTOR.

3.12.4 **SUBSEQUENT REMOVAL**

Permission to patch any areas or items of the work shall not constitute a waiver of the AGENCY’s or the AGENCY ARCHITECT/ENGINEER’s right to require complete removal and replacement of the areas of items of the work if, in the opinion of the AGENCY ARCHITECT/ENGINEER or the AGENCY, the patching does not satisfactorily restore quality and appearance of the work or does not otherwise conform to the contract documents.
3.13 CLEANING UP

3.13.1 CONTRACTOR’S RESPONSIBILITY

The CONTRACTOR at all times shall keep the site and surrounding area free from accumulation of waste material or rubbish caused by operations under the contract. The site shall be maintained in a neat and orderly condition. All crates, cartons, paper and other flammable waste materials shall be removed from work areas and properly disposed of at the end of each day. The CONTRACTOR shall remove from and about the site the waste materials, rubbish, tools, construction equipment, machinery and materials no longer required for the work.

3.13.2 FAILURE TO CLEANUP

If the CONTRACTOR fails to clean up as provided in the contract documents, the AGENCY may do so, and the cost thereof shall be invoiced to the CONTRACTOR and deducted from the next progress payment. Each subcontractor shall have the responsibility for the cleanup of its own work. If the subcontractor fails to clean up, the CONTRACTOR may do so and back-charge the subcontractor.

3.13.3 CONSTRUCTION BUILDINGS

When directed by the AGENCY or the AGENCY ARCHITECT/ENGINEER, CONTRACTOR and subcontractor shall dismantle temporary structures, if any, and remove from the site all construction and installation equipment, fences, scaffolding, surplus materials, rubbish and supplies belonging to CONTRACTOR or subcontractor. If the CONTRACTOR does not remove the tools, equipment, machinery and materials within fifteen (15) calendar days after completion of its work, then they shall be deemed abandoned and the AGENCY can dispose of them for its own benefit in whatever way it deems appropriate.

3.14 ACCESS TO WORK

The CONTRACTOR shall provide the AGENCY, the AGENCY ARCHITECT/ENGINEER and the inspector, access to the work in preparation and progress wherever located.

3.15 ROYALTIES AND PATENTS

3.15.1 PAYMENT AND INDEMNITY

The CONTRACTOR shall pay all royalties and license fees. The CONTRACTOR shall defend suits or claims of infringement of patent rights and shall hold the AGENCY and the AGENCY ARCHITECT/ENGINEER harmless from loss on account thereof but shall not be responsible for such defense or loss when a particular design, process, or product of a particular manufacturer is required by the contract documents. However, if the CONTRACTOR has reason to believe the required design, process, or product is an infringement of a patent, the CONTRACTOR shall be responsible for such loss unless such information is promptly furnished to the AGENCY ARCHITECT/ENGINEER.

3.15.2 REVIEW

The review by the AGENCY ARCHITECT/ENGINEER of any method of construction, invention, appliance, process, article, device or material of any kind shall be for its adequacy for the work and shall not be an approval for the use by the CONTRACTOR in violation of any patent or other rights of any person or entity.
3.16 INDEMNIFICATION

3.16.1 SCOPE: CONTRACTOR

To the fullest extent permitted by law, the CONTRACTOR agrees to and does hereby indemnify, defend and hold harmless the AGENCY and each of their officers, agents, employees, and consultants (including the AGENCY’s architects and engineers) from every claim or demand made and every liability, loss, damage, or expense of any nature whatsoever (including, but not limited to attorneys’ fees and costs including fees of consultants) which may be incurred by reason of:

A. Liability for damage for death or bodily injury to persons or injury to property sustained by the CONTRACTOR or any other person, firm or corporation employed by the CONTRACTOR upon or in connection with the work called for in this agreement, except for liability for damages referred to above which result from the sole negligence or willful misconduct of the AGENCY, or each of their officers, agents or independent CONTRACTORs who are directly employed by the AGENCY or for defects in design furnished by such persons.

B. Any injury to or death of persons or damage to property sustained by any person, firm or corporation, including the AGENCY, arising out of, or in any way connected with the work covered by this agreement, whether on or off AGENCY property, except for liability for damages which result from the sole negligence or willful misconduct of the AGENCY, and each of their officers, employees, agents or independent CONTRACTORs who are directly employed by the AGENCY or for design defects furnished by such persons.

C. Any dispute between CONTRACTOR and CONTRACTOR’s subcontractors, suppliers and sureties, including, but not limited to, stop notice actions.

The CONTRACTOR, at its own expense, cost, and risk, shall defend any and all actions, suits, or other proceedings that may be brought or instituted against the AGENCY, and each of their officers, agents or employees on any such claim, demand or liability and shall pay or satisfy any judgment that may be rendered against the AGENCY, and each of their officers, agents or employees in any action, suit or other proceedings as a result thereof.

3.16.2 SCOPE: SUBCONTRACTORS

3.16.2.1 Indemnity.

To the fullest extent permitted by law, the subcontractors shall indemnify, defend and hold harmless the AGENCY and each of their officers, agents, employees, and consultants (including the AGENCY’s architects and engineers) from every claim or demand made and every liability, loss, damage, or expense of any nature whatsoever (including, but not limited to attorneys’ fees and costs including fees of consultants) which may be incurred by reason of:

A. Liability for damage for death or bodily injury to persons or injury to property sustained by the subcontractor or any other person, firm or corporation employed by the subcontractor upon or in connection with the work called for in this agreement, except for liability for damages referred to above which result from the sole negligence or willful misconduct of the AGENCY, or each of their officers, agents or independent CONTRACTORs who are directly employed by the AGENCY or for defects in design furnished by such persons.

B. Any injury to or death of persons or damage to property sustained by any person, firm or corporation, including the AGENCY, arising out of, or in any way connected with the work covered by this agreement, whether on or off AGENCY property, except for liability for damages which result from the sole negligence or willful misconduct of the AGENCY, and each of their officers, employees, agents or independent CONTRACTORs who are directly employed by the AGENCY or for design defects furnished by such persons.
C. Any dispute between subcontractor and the CONTRACTOR, including, but not limited to, stop notice actions.

The subcontractor, at its own expense, cost, and risk, shall defend any and all actions, suits, or other proceedings that may be brought or instituted against the AGENCY, and each of their officers, agents, employees or consultants on any such claim, demand or liability and shall pay or satisfy any judgment that may be rendered against the AGENCY, and each of their officers, agents or employees in any action, suit or other proceedings as a result thereof.

3.16.2.2 Joint and Several Liability. In the event more than one subcontractor is connected with an accident or occurrence covered by this indemnification, then all such subcontractors shall be jointly and severally responsible to each of the indemnities for indemnification, and the ultimate responsibility among such indemnifying subcontractors for the loss and expense of any such indemnification shall be resolved without jeopardy to any indemnity. The provisions of the indemnity provided for herein shall not be construed to indemnify any party claiming indemnification for its own negligence if not permitted by law or to eliminate or reduce any other indemnification or right which any indemnity has by law or equity.

3.16.3 NO LIMITATION

The CONTRACTOR's and the subcontractor's obligation to indemnify and defend the indemnities hereunder shall include, without limitation, any and all claims, damages, and costs: for injury to persons and property and death of any person; for breach of any warranty, express or implied; for failure of the CONTRACTOR or the subcontractor to comply with any applicable governmental law, rule, regulation or other requirement; and for products installed in or used in connection with the work.

ARTICLE 4

ADMINISTRATION OF THE CONTRACT

4.1 AGENCY ARCHITECT/ENGINEER

4.1.1 DEFINITION

The AGENCY ARCHITECT/ENGINEER is the person lawfully licensed to perform architectural and engineering services on the agency's behalf or an entity lawfully practicing these services identified as such in the agreement and is referred to throughout the contract documents as if singular in number. The term "AGENCY ARCHITECT/ENGINEER" means the AGENCY ARCHITECT/ENGINEER or the AGENCY ARCHITECT/ENGINEER's authorized representative, and shall also refer to all engineering consultants under the AGENCY ARCHITECT/ENGINEER's direction and control.

4.1.2 MODIFICATION

Duties, responsibilities, and limitations of authority of the AGENCY ARCHITECT/ENGINEER as set forth in the contract documents shall not be restricted, modified, or extended without written consent of the AGENCY and AGENCY ARCHITECT/ENGINEER. Consent shall not be unreasonably withheld.

4.1.3 TERMINATION

In the case of the termination of the AGENCY ARCHITECT/ENGINEER, the AGENCY may appoint an AGENCY ARCHITECT/ENGINEER or another construction professional or may perform such functions with its own licensed professional personnel. The status of the replacement AGENCY ARCHITECT/ENGINEER under the contract documents shall be that of the former AGENCY ARCHITECT/ENGINEER.
4.2 AGENCY ARCHITECT/ENGINEER’S ADMINISTRATION OF THE CONTRACT

4.2.1 STATUS

The AGENCY ARCHITECT/ENGINEER will provide administration of the contract as described in the contract documents and will be the AGENCY’s representative during construction, until final payment is due, and during the one (1) year period following the commencement of any warranties. The AGENCY ARCHITECT/ENGINEER will advise and consult with the AGENCY. The AGENCY ARCHITECT/ENGINEER will have authority to act on behalf of the AGENCY only to the extent provided in the contract documents, unless otherwise modified by in writing in accordance with other provisions of the AGENCY/AGENCY ARCHITECT/ENGINEER agreement. The AGENCY ARCHITECT/ENGINEER will have all responsibilities and power established by law including California Code of Regulations, Title 24.

4.2.2 SITE VISITS

The AGENCY ARCHITECT/ENGINEER will visit the site at intervals necessary in the judgment of the AGENCY ARCHITECT/ENGINEER or as otherwise agreed by the AGENCY and the AGENCY ARCHITECT/ENGINEER in writing to become generally familiar with the progress and quality of the completed work and to determine in general if the work is being performed in a manner indicating that the work, when completed, will be in accordance with the contract documents. However, the AGENCY ARCHITECT/ENGINEER will not be required to make exhaustive or continuous on-site inspections to check quality or quantity of the work. On the basis of its on-site observations, the AGENCY ARCHITECT/ENGINEER will keep the AGENCY informed of the progress of the work.

4.2.3 LIMITATIONS OF CONSTRUCTION RESPONSIBILITY

The AGENCY ARCHITECT/ENGINEER shall not have control over, charge of, or be responsible for construction means, methods, techniques, schedules, sequences or procedures, fabrication, procurement, shipment, delivery, receipt, installation or for safety precautions and programs in connection with the work, since these are solely the CONTRACTOR's responsibility under the contract documents. The AGENCY ARCHITECT/ENGINEER shall not be responsible for the CONTRACTOR's, subcontractors', material or equipment suppliers’ or any other person’s schedules or failure to carry out the work in accordance with the contract documents. The AGENCY ARCHITECT/ENGINEER shall not have control over or charge of acts or omissions of the CONTRACTOR, subcontractors, their agents or employees, or any other persons or entities performing or supplying portions of the work. The CONTRACTOR shall not be relieved of obligations to perform the work in accordance with the contract documents either by activities or duties of the AGENCY ARCHITECT/ENGINEER in the AGENCY ARCHITECT/ENGINEER's administration of the contract documents, or by tests, inspections, or approvals required or performed by persons other than the CONTRACTOR. The AGENCY ARCHITECT/ENGINEER’s duties shall not extend to the receipt, inspection and acceptance on behalf of the AGENCY of furniture, furnishings and equipment at the time of their delivery to the premises and their installation.

4.2.4 COMMUNICATIONS FACILITATING CONTRACT ADMINISTRATION

Except as otherwise provided in the contract documents or when direct communications are warranted by special circumstances, the AGENCY and the CONTRACTOR shall communicate directly. Where direct communication is necessary between the AGENCY and the CONTRACTOR, AGENCY shall be promptly informed and shall receive copies of all written communications. Communications by and with the AGENCY ARCHITECT/ENGINEER’s consultants shall be through the AGENCY and then through the AGENCY ARCHITECT/ENGINEER. Communications by and with subcontractors and material or equipment suppliers shall be through the CONTRACTOR.
4.2.5 PAYMENT APPLICATIONS

Pursuant to Article 9, based on the AGENCY ARCHITECT/ENGINEER's observations, the CONTRACTOR's applications for payment and the Inspector's approval, the AGENCY ARCHITECT/ENGINEER will review and make recommendations to the AGENCY regarding the amounts due the CONTRACTOR on the certificates for payment.

4.2.6 REJECTION OF WORK

In addition to the rights, duties and obligations of the inspector under this article, the AGENCY ARCHITECT/ENGINEER may recommend to the AGENCY that the AGENCY reject work which does not conform to the contract documents. Whenever the AGENCY ARCHITECT/ENGINEER considers it necessary or advisable to achieve the intent of the contract documents, the AGENCY ARCHITECT/ENGINEER may recommend to the AGENCY that the AGENCY require additional inspection or testing of the Work, whether or not such work is fabricated, installed, or completed. However, neither this authority of the AGENCY ARCHITECT/ENGINEER nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the AGENCY ARCHITECT/ENGINEER to the CONTRACTOR, subcontractors, material and equipment suppliers, their agents or employees or other persons performing portions of the work.

4.2.7 CHANGE ORDERS

The AGENCY ARCHITECT/ENGINEER will prepare change orders and construction change directives and may authorize minor changes in the work as provided in paragraph 7.1.2.

4.2.8 WARRANTIES UPON COMPLETION

The AGENCY ARCHITECT/ENGINEER in conjunction with the inspector will conduct field reviews of the work to determine the date of completion, shall receive and forward to the AGENCY for the AGENCY’s review and records written warranties and related documents required by the contract and assembled by the CONTRACTOR, and will issue a final certificate for payment when the AGENCY believes the work has been completed in compliance with the requirements of the contract documents. The handling by the AGENCY of such warranties, maintenance manuals, or similar documents shall not diminish or transfer to the AGENCY any responsibilities or liabilities required by the contract documents of the CONTRACTOR or other entities, parties, or persons performing or supplying the work.

The AGENCY ARCHITECT/ENGINEER will conduct a field review of the CONTRACTOR’s comprehensive list of items to be completed or corrected (final punch list) and one (1) follow-up field review if required. The cost incurred by the AGENCY for further field reviews or the preparation of further punch lists by the AGENCY ARCHITECT/ENGINEER shall be invoiced to the CONTRACTOR and deducted from the final payment.

4.2.9 INTERPRETATION

The AGENCY ARCHITECT/ENGINEER will interpret and decide matters concerning performance under and requirements of the contract documents on written request of either the AGENCY or the CONTRACTOR. The AGENCY ARCHITECT/ENGINEER’s response to such a request will be made with reasonable promptness, while allowing sufficient time in the AGENCY ARCHITECT/ENGINEER’s professional judgment, to permit adequate review and evaluation of the request.

4.2.10 ADDITIONAL INSTRUCTIONS

4.2.10.1 AGENCY ARCHITECT/ENGINEER’s Interpretations and Decisions. Interpretations and decisions of the AGENCY ARCHITECT/ENGINEER will be consistent with the
intent of and reasonably inferable from the contract documents and will be in writing or in the form of drawings. When making such interpretations and decisions, the AGENCY ARCHITECT/ENGINEER will endeavor to secure faithful performance by both the AGENCY and the CONTRACTOR, and will not show partiality to either. The AGENCY ARCHITECT/ENGINEER will not be liable for the result of interpretations or decisions so rendered in good faith. The work shall be executed in conformity with and the CONTRACTOR shall do no work without, approved drawings, AGENCY ARCHITECT/ENGINEER’s clarifying instructions and/or submittals.

4.2.10.2 Typical Parts and Sections. Whenever typical parts or sections of the work are completely detailed on the drawings and other parts or sections, which are essentially of the same construction are shown in outline only, the complete details shall apply to the work which is shown in outline.

4.2.10.3 Dimensions. Dimensions of work shall not be determined by scale or rule. Figured dimensions shall be followed at all times. If figured dimensions are lacking on drawings, AGENCY ARCHITECT/ENGINEER shall supply them on request. The AGENCY ARCHITECT/ENGINEER’s decisions on matters relating to aesthetic effect will be final if consistent with the contract documents.

4.3 INSPECTOR OF RECORD

4.3.1 GENERAL

Unless otherwise noted in the project specifications, the inspector(s) of record shall be the inspector assigned to the project by the agency having jurisdiction for quality control/assurance, code compliance, and fire/life/safety over the project.

4.3.3 INSPECTOR’S AUTHORITY TO REJECT OR STOP WORK

The inspector shall have the authority to reject work that does not comply with the provisions of the contract documents. In addition, the inspector may stop any work, which poses a probable risk of harm to persons or property. The CONTRACTOR shall instruct its employees, subcontractors, material and equipment suppliers, etc., accordingly. The absence of any stop work order or rejection of any portion of the work shall not relieve the CONTRACTOR from any of its obligations pursuant to the contract documents.

4.4 RESPONSIBILITY FOR ADDITIONAL CHARGES INCURRED BY THE AGENCY FOR PROFESSIONAL SERVICES

If at any time prior to the completion of the requirements under the contract documents, through no fault of its own, the AGENCY is required to provide or secure additional professional services for any reason by any act of the CONTRACTOR, the CONTRACTOR shall be invoiced by the AGENCY for any costs incurred for any such additional services, which costs shall be deducted from the next progress payment. Such invoicing shall be independent from any other AGENCY remedies. If payment, then or thereafter, due to the CONTRACTOR are not sufficient to cover such amounts, the CONTRACTOR shall pay the difference to the AGENCY. Additional services shall include, but shall not be limited to, the following:

A. Services made necessary by the default of the CONTRACTOR.

B. Services made necessary due to the defects or deficiencies in the work of the CONTRACTOR.

C. Services required by failure of the CONTRACTOR to perform according to any provision of the contract documents.
D. Services in connection with evaluating substitutions of products, materials, equipment, subcontractors proposed by the CONTRACTOR, and making subsequent revisions to drawings, specifications and providing other documentation required (except for the situation where the specified item is no longer manufactured or available).

E. Services for evaluating and processing claims submitted by the CONTRACTOR in connection with the work outside the established change order process.

F. Services required by the failure of the CONTRACTOR to prosecute the work in a timely manner in compliance within the specified time of completion.

G. Services in conjunction with the testing, adjusting, balancing and startup of equipment other than the normal amount customarily associated for the type of work involved.

H. Services in conjunction with more than one (1) re-review of required submittals of shop drawings, product data and samples.

4.5 CLAIMS AND DISPUTES

4.5.1 DEFINITION

A claim is a demand or assertion by one of the parties seeking, as a matter of right, adjustment or interpretation of contract terms, payment of money, extension of time, or other relief with respect to the terms of the contract. The term “claim” also includes other disputes and matters in question between the AGENCY and the CONTRACTOR arising out of or relating to the contract documents. Claims must be made by written notice. The responsibility to substantiate claims shall rest with the party making the claim.

4.5.2 DECISION OF AGENCY ARCHITECT/ENGINEER

Claims, including those alleging an error or omission by the AGENCY ARCHITECT/ENGINEER, shall be referred initially to the AGENCY ARCHITECT/ENGINEER for review. A decision by the AGENCY ARCHITECT/ENGINEER, as provided in paragraph 4.6.4, shall be required as a condition precedent to mediation of a claim between the CONTRACTOR and the AGENCY as to all such matters arising prior to the date final payment is due, regardless of whether such matters relate to execution and progress of the work, or the extent to which the work has been completed. The decision by the AGENCY ARCHITECT/ENGINEER in response to a claim shall not be a condition precedent to mediation in the event: if the position of AGENCY ARCHITECT/ENGINEER is vacant; the AGENCY ARCHITECT/ENGINEER has not received evidence or has failed to render a decision within agreed time limit; the AGENCY ARCHITECT/ENGINEER has failed to take action required under paragraph 4.6.4 within thirty (30) calendar days after the claim is made, forty-five (45) calendar days have passed after the claim has been referred to the AGENCY ARCHITECT/ENGINEER; or the claim relates to a stop notice claim.

4.5.3 TIME LIMIT ON CLAIMS

Claims by either party must be made within ten (10) calendar days after occurrence of the event giving rise to such claim or within ten (10) calendar days after the claimant first recognizes the condition giving rise to the claim, whichever is later. Claims must be made by written notice. An additional claim made after the initial claim has been implemented by change order will not be considered. The failure of the CONTRACTOR to provide the required notice shall constitute an express waiver of any right to assert such claim, whether affirmatively or defensively.

4.5.4 CONTINUING CONTRACT PERFORMANCE
Pending final resolution of a claim including mediation, arbitration, or litigation, unless otherwise agreed to in writing, the CONTRACTOR shall proceed diligently with performance of the contract, and the AGENCY shall continue to make any undisputed payments in accordance with the contract.

4.5.5 CLAIMS FOR CONCEALED OR UNKNOWN CONDITIONS

4.5.5.1 Trenches or Excavations Less Than Four (4) Feet Below The Surface. If conditions are encountered at the site which are subsurface or otherwise concealed physical conditions, which differ materially from those indicated in the contract documents or unknown physical conditions of an unusual nature, which differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the contract documents, then notice by the observing party shall be given to the other party promptly before conditions are disturbed and in no event later than twenty-one (21) calendar days after first observance of the conditions. The AGENCY ARCHITECT/ENGINEER will promptly investigate such conditions, and if they differ materially and cause an increase or decrease in the CONTRACTOR’s cost of, time required for or performance of any part of the work, will recommend an equitable adjustment in the contract sum, contract time, or both. If the AGENCY ARCHITECT/ENGINEER determines that the conditions at the site are not materially different from those indicated in the contract documents and that no change in the terms of the contract is justified, the AGENCY ARCHITECT/ENGINEER shall so notify the AGENCY and the CONTRACTOR in writing, stating the reasons. Claims by either party in opposition to such determination must be made within ten (10) calendar days after the AGENCY ARCHITECT/ENGINEER has given notice of the decision. If the AGENCY and the CONTRACTOR cannot agree on an adjustment in the contract sum or the contract time, the adjustment shall be referred to the AGENCY ARCHITECT/ENGINEER for initial determination, subject to other proceedings pursuant to paragraph 4.6.

4.5.5.2 Trenches or Excavation Greater Than Four (4) Feet Below The Surface. Pursuant to Public Contract Code § 7104, when any excavation or trenching extends greater than four (4) feet below the surface:

A. The CONTRACTOR shall promptly, and before the following conditions are disturbed, notify the public entity, in writing, of any:

   (1) material that the CONTRACTOR believes may be material that is hazardous waste, as defined in section 25117 of the Health and Safety Code, that is required to be removed to a Class I, Class II or Class III disposal site in accordance with the provisions of existing law.

   (2) subsurface or latent physical conditions at the site differing from those indicated.

   (3) unknown physical conditions at the site of any unusual nature, different materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the contract.

B. The public entity shall promptly investigate the conditions, and if it finds that the conditions do materially so differ, or do involve hazardous waste and cause a decrease or increase in the CONTRACTOR’s cost of, or the time required for, performance of any part of the work shall issue a change order under the procedures described in the contract.

C. In the event that a dispute arises between the public entity and the CONTRACTOR whether the conditions materially differ or involve hazardous waste, or cause a decrease or increase in the CONTRACTOR’s cost of, or time required for performance of any part of the work, the CONTRACTOR shall not be excused from any scheduled completion date provided for by the contract, but shall proceed with
all work to be performed under the contract. The CONTRACTOR shall retain any and all rights provided either by contract or by law which pertain to the resolution of disputes and protests between the contracting parties.

4.5.6 CLAIMS FOR ADDITIONAL COST

If the CONTRACTOR wishes to make claim for an increase in the contract sum, written notice as provided herein shall be given before proceeding to execute the work. Each claim for additional cost must include any claim for additional time and its associated costs. Prior notice is not required for claims relating to an emergency endangering life or property arising under paragraph 10.4.1. If the CONTRACTOR believes additional cost is involved for reasons, including, but not limited to the following: a written interpretation from the AGENCY ARCHITECT/ENGINEER, an order by the AGENCY to stop the work where the CONTRACTOR was not at fault, a written order for a minor change in the work issued by the AGENCY ARCHITECT/ENGINEER, failure of payment by the AGENCY, termination of the contract by the AGENCY, the AGENCY’s suspension of the work or other reasonable grounds, a claim shall be filed in accordance with the procedure established herein.

4.5.7 CLAIMS FOR ADDITIONAL TIME

4.5.7.1 Notice and Extent of Claim. If the CONTRACTOR wishes to make a claim for an increase in the contract time, written notice as provided herein shall be given. The CONTRACTOR’s claim shall include the cost associated with the extension and effect of delay on progress of the work. In the case of a continuing delay, only one (1) claim is necessary.

4.5.7.2 Adverse Weather Claims. If adverse weather conditions are the basis for a claim for additional time, such claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated, and had an adverse effect on the scheduled construction. All extensions of time granted for adverse weather conditions will be non-compensable.

4.5.7.3 No Reservation Allowed. In no event will the CONTRACTOR be allowed to reserve its rights to assert a claim for time extension later than as required by paragraph 4.5.3 unless the AGENCY agrees in writing to allow such reservation.

4.5.8 INJURY OR DAMAGE TO PERSON OR PROPERTY

If either party to the contract suffers injury or damage to person or property because of an act or omission of the other party, any of the other party’s employees or agents, or others for whose acts such party is legally liable, written notice of such injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding twenty-one (21) calendar days after first observance. The notice shall provide sufficient detail to enable the other party to investigate the matter. If a claim for additional cost or time related to this claim is to be asserted, it shall be made as provided in paragraphs 4.5.6 or 4.5.7.

4.6 RESOLUTION OF CLAIMS AND DISPUTES

4.6.1 AGENCY ARCHITECT/ENGINEER’S REVIEW

The AGENCY ARCHITECT/ENGINEER will review claims and take one or more of the following preliminary actions within ten (10) calendar days of receipt of a claim: request additional supporting data from the claimant; submit a schedule to the parties indicating when the AGENCY ARCHITECT/ENGINEER expects to take action; reject the claim in whole or in part, stating reasons for rejection; recommend approval of the claim by the other party; or suggest a compromise. The AGENCY ARCHITECT/ENGINEER may also, but is not obligated to, notify the surety, if any, of the nature and amount of the claim.
4.6.2 DOCUMENTATION IF RESOLVED

If a claim has been resolved, the AGENCY ARCHITECT/ENGINEER will prepare or obtain appropriate documentation.

4.6.3 ACTIONS IF NOT RESOLVED

If a claim has not been resolved, the party making the claim shall, within ten (10) calendar days after the AGENCY ARCHITECT/ENGINEER’s preliminary response, take one or more of the following actions: submit additional supporting data requested by the AGENCY ARCHITECT/ENGINEER; modify the initial claim; or notify the AGENCY ARCHITECT/ENGINEER that the initial claim stands.

4.6.4 AGENCY ARCHITECT/ENGINEER’S WRITTEN DECISION

If a claim has not been resolved after consideration of the foregoing and of other evidence presented by the parties or requested by the AGENCY ARCHITECT/ENGINEER, the AGENCY ARCHITECT/ENGINEER will notify the parties in writing that the AGENCY ARCHITECT/ENGINEER’s decision will be made within seven (7) calendar days. Upon expiration of such time period, the AGENCY ARCHITECT/ENGINEER will render to the parties its written decision relative to the claim, including any change in the contract sum or contract time or both. The AGENCY ARCHITECT/ENGINEER may, but is not obliged to, notify the surety’s assistance in resolving the controversy.

4.7 ALTERNATE DISPUTE RESOLUTION OF CLAIMS OF $375,000.00 OR LESS

4.7.1 CLAIMS LESS THAN $375,000.00

Notwithstanding any other provision herein, claims of $375,000.00 or less shall be resolved pursuant to the alternative dispute resolution procedures set forth in Public Contract Code § 20104, et seq. “Claim” for this purpose means a separate demand by the CONTRACTOR for a time extension, payment of money or damages arising from work done by or on behalf of the CONTRACTOR pursuant to the contract, for which payment is expressly provided, or the CONTRACTOR is otherwise entitled to, or an amount the payment of which is disputed by the AGENCY.

4.7.2 SUBMISSION OF CLAIMS LESS THAN $375,000.00

The CONTRACTOR shall submit its claim of $375,000.00 or less to the AGENCY in writing, within the time frames established under paragraph 4.5.3, but no later than before the final payment is made. The AGENCY shall respond within the time provided by statute. If the CONTRACTOR disagrees with the response or the AGENCY fails to respond within the time permitted. The CONTRACTOR shall notify the AGENCY of the disagreement in writing within fifteen (15) calendar days from the date of the response or expiration of the time permitted to respond and demand a meet-and-confer conference as detailed in paragraph 4.8.1. The AGENCY shall schedule a meet-and-confer conference within thirty (30) calendar days of the demand. If not resolved at the meet-and-confer conference, then the claim shall be submitted to mediation pursuant to the procedures set forth in paragraph 4.9. If the dispute is not resolved at the mediation, the CONTRACTOR may initiate a civil action as set forth in Public Contract Code § 20104 et seq.

4.7.3 TIME LIMITS NOT EXTENDED

Nothing in subdivision (a) of Public Contract Code § 20104.2 shall extend the time limit or supersede the notice requirements provided in this contract for filing claims by the CONTRACTOR.

4.8 DISPUTE RESOLUTION OF CLAIMS IN EXCESS OF $375,000.00

Project: San Bernardino International Airport Authority
Maintenance Building #730 Renovation
As a condition precedent to the initiation of litigation and subsequent to the fulfillment of the claims procedures established in paragraph 4.5 of this Article, disputes in excess of a total value of $375,000.00 shall first be submitted to mediation pursuant to the procedures set forth in paragraph 4.9.

4.8.1 MEET AND CONFER CONFERENCE

Following action by the AGENCY ARCHITECT/ENGINEER under Paragraph 4.6, the parties will attempt in good faith to resolve any controversy or claim arising out of or relating to this Agreement promptly by negotiations between senior executives of the parties who have authority to settle the controversy. The party disputing the AGENCY ARCHITECT/ENGINEER’s action shall give the other party written notice of the dispute. Within ten (10) calendar days after delivery of said notice, executives of both parties shall meet at a mutually acceptable time and place, and thereafter as often as they reasonably deem necessary, to exchange relevant information and to attempt to resolve the dispute. If the matter has not been resolved within twenty (20) calendar days of the disputing party’s notice, or if the party receiving such notice will not meet within ten (10) calendar days, either party may initiate mediation of the controversy or claim under paragraph 4.9.

4.9 MEDIATION PROCEDURES.

4.9.1 NEGOTIATIONS BEFORE MEDIATION

Negotiations to resolve disputes before mediation is initiated are for settlement purposes only and are not binding.

4.9.2 MEDIATION

4.9.2.1 Authorization. In the event of a dispute or issue that cannot be resolved by negotiation, the AGENCY and the CONTRACTOR agree to attempt to resolve the matter by mediation. Said mediation is voluntary, non-binding, and intended to provide an opportunity for the parties to evaluate each other’s cases and arrive at a mutually agreeable solution. These provisions relating to voluntary mediation shall not be construed or interpreted as mandatory arbitration.

4.9.2.2 Initiation of Mediation. Either party may initiate mediation by notifying the other party or parties in writing.

4.9.2.3 Request for Mediation. A request for mediation shall contain a brief statement of the nature of the dispute or claim and the names, addresses and phone numbers of all parties to the dispute or claim, and those, if any, who will represent them in the mediation.

4.9.2.4 Selection of Mediator. Within fourteen (14) calendar days after execution of the contract for construction, the parties will meet-and-confer to select an appropriate mediator agreeable to all parties and two (2) alternate mediators, who will serve for the entire project. If the parties cannot agree on a mediator, they hereby agree to accept a mediator appointed by a recognized association such as the American Arbitration Association.

4.9.2.5 Qualifications of a Mediator. Any mediator selected shall have expertise in the area of the dispute and be knowledgeable in the mediation process. No person shall serve as a mediator in any dispute in which that person has any financial or personal interest in the result of the mediation. Before accepting an appointment, the prospective mediator shall disclose any circumstances likely to create a presumption of bias or prevent a prompt meeting with the parties. Upon receipt of such information, the parties shall meet and confer and decide whether to select another mediator.

4.9.2.6 Vacancies. If any mediator shall become unable or unwilling to serve, the first alternate mediator shall be selected unless the parties agree otherwise.
4.9.2.7 **Representation.** Any party may be represented by persons of its choice, who shall have full authority to negotiate. The names and addresses of such persons shall be communicated in writing to all parties and to the mediator.

4.9.2.8 **Time and Place of Mediation.** The mediator shall set the time of each mediation session. The mediation shall be held at any convenient location agreeable to the mediator and the parties, as the mediator shall determine. All reasonable efforts will be made by the parties and the mediator to schedule the first session within thirty (30) calendar days after initiation of mediation.

4.9.2.9 **Identification of Matters in Dispute.** At least ten (10) calendar days before the first scheduled mediation session, each party shall provide the mediator a brief memorandum setting forth its position with regard to the issues that need to be resolved. At the discretion of the mediator such memoranda may be mutually exchanged by the parties.

At the first session, the parties will be expected to produce all information reasonably required for the mediator to understand the issue presented. The mediator may require each party to supplement such information.

4.9.2.10 **Authority of Mediator.** The mediator does not have authority to impose a settlement on the parties but will attempt to assist the parties in reaching a satisfactory resolution of their dispute. The mediator is authorized to conduct joint and separate meetings with the parties and to make oral and written recommendations for settlement. Whenever necessary, the mediator may also obtain expert advice concerning technical aspects of the dispute, provided the parties agree and assume the expenses of obtaining such advice. Arrangements for obtaining such advice shall be made by the mediator or the parties, as the mediator shall determine.

The mediator is authorized to end the mediation whenever, in the mediator's judgment, further efforts at mediation would not contribute to a resolution of the dispute between the parties.

4.9.2.11 **Privacy.** Mediation sessions are private. The parties and their representatives may attend mediation sessions. Other persons may attend only with the permission of the parties and with the consent of the mediator.

4.9.2.12 **Confidentiality.** Confidential information disclosed to a mediator by the parties or by witnesses in the course of the mediation shall not be divulged by the mediator. All records, reports or other documents received by a mediator while serving as mediator shall be confidential. The mediator shall not be compelled to divulge such records or to testify in regard to the mediation in any adversary proceeding or judicial forum. The parties shall maintain the confidentiality of the mediation and shall not rely on, or introduce as evidence in any arbitration, judicial or other proceedings: views expressed or suggestions made by the other party with respect to the possible settlement of the dispute; statements made by the other party or parties to the mediator; and whether the other party had or had not indicated willingness to accept a proposal for settlement made by the mediator.

4.9.2.13 **No Stenographic Record.** There shall be no stenographic record of the mediation.

4.9.2.14 **Termination of Mediation.** The mediation shall be terminated: by the execution of a settlement agreement by the parties; by a written declaration of the mediator to the effect that further efforts at mediation are no longer worthwhile; or by a written declaration of a party or parties to the effect that the mediation proceedings are terminated.

4.9.2.15 **Exclusion of Liability.** No mediator shall be a necessary party in judicial proceedings related to the mediation. No mediator shall be liable to any party for any act or omission in connection with any mediation conducted hereunder.
4.9.2.16 **Interpretation and Application of These Mediation Provisions.** The mediator shall interpret and apply these mediation provisions insofar as they relate to the mediator's duties and responsibility.

4.9.2.17 **Expenses.** The expenses of witnesses for each party shall be paid by the party producing the witnesses. All other expenses of the mediation, including, required travel and other expenses of the mediator, the expenses of any witness called by the mediator, and the cost of any proofs or expert advice produced at the direct request of the mediator, shall be borne equally by all parties to the mediation.

**ARTICLE 5**

**SUBCONTRACTORS**

5.1 **DEFINITIONS**

5.1.1 **SUBCONTRACTOR**

A subcontractor is a person or entity, who has a contract with the CONTRACTOR to perform a portion of the work at the site. The term subcontractor is referred to throughout the contract documents as if singular in number and means a subcontractor or an authorized representative of the subcontractor. The term "subcontractor" does not include a separate CONTRACTOR or subcontractors of a separate CONTRACTOR.

5.1.2 **SUB-SUBCONTRACTOR**

A sub-subcontractor is a person or entity who has a direct or indirect contract with a subcontractor to perform a portion of the work at the site. The term “sub-subcontractor” is referred to throughout the contract documents as if singular in number and means a sub-subcontractor or an authorized representative of the sub-subcontractor.

5.1.3 **SPECIALTY CONTRACTORS**

If a subcontractor is designated as a “specialty CONTRACTOR” as defined in § 7058 of the Business and Professions Code, all of the work outside of that subcontractor's specialty shall be performed in compliance with the Subletting and Subcontracting Fair Practices Act, Public Contract Code § 4100, et seq.

5.2 **AWARD OF SUBCONTRACTS AND OTHER CONTRACTS FOR PORTIONS OF THE WORK**

5.2.1 **ASSIGNMENT OR SUBSTITUTION - CONSENT OF AGENCY**

In accordance with Public Contract Code § 4107 and 4107.5, no CONTRACTOR whose bid is accepted shall, without the written consent of the AGENCY; substitute any person or entity as a subcontractor in place of the subcontractor designated in the original bid; permit any such subcontractor to be assigned or transferred, or allow it to be performed by any person or entity other than the original subcontractor listed in the original bid; sublet or subcontract any portion of the work in excess of one-half of one percent (.5%) of the CONTRACTOR's total bid as to which its original bid did not designate a subcontractor. Any assignment or substitution made without the prior written consent of the awarding authority shall be void, and the assignees shall acquire no rights in the contract. Any consent, if given, shall not relieve CONTRACTOR or its subcontractors from their obligations under the terms of the contract documents.

5.2.2 **GROUNDS FOR SUBSTITUTION**
Pursuant to Public Contract Code § 4107 and the procedure set forth therein, no CONTRACTOR whose bid is accepted may request to substitute any person or entity as a subcontractor in place of a subcontractor listed in the original bid except in the following instances:

A. When the subcontractor listed in the bid after having a reasonable opportunity to do so, fails or refuses to execute a written contract when that written contract for the scope of work specified in the subcontractor’s bid and the price specified in the subcontractor’s bid, when that written contract, based upon the general terms, conditions, plans and specifications for the project involved or the terms of that subcontractor’s written bid, is presented to the subcontractor by the prime CONTRACTOR;

B. When the listed subcontractor becomes bankrupt or insolvent;

C. When the listed subcontractor fails or refuses to perform his or her subcontract;

D. When the listed subcontractor fails or refuses to meet the bond requirements of the prime CONTRACTOR set forth in Public Contract Code § 4108.

E. When the CONTRACTOR demonstrates to the awarding authority, or its duly authorized officer, subject to the further provisions of Public Contract Code § 4107.5, that the name of the subcontractor was listed as the result of inadvertent clerical error;

F. When the listed subcontractor is not licensed pursuant to the CONTRACTOR’s license law; or

G. When the awarding authority or its duly authorized officer, determines that the work being performed by the listed subcontractor is substantially unsatisfactory and not in substantial accordance with the plans and specifications or the subcontractor is substantially delaying or disrupting the progress of the work.

H. When the listed subcontractor is ineligible to work on a public works project pursuant to Section 1777.1 or 1777.7 of the Labor Code.

I. When the awarding authority determines that a listed subcontractor is not a responsible CONTRACTOR.

5.2.2.1 **No Change in Contract.** Any substitutions of subcontractors shall not result in any increase in the contract sum or result in the granting of any extension of time for the completion of the project.

5.2.2.2 **Substitution Due to Clerical Error.** The CONTRACTOR, as a condition of asserting a claim of inadvertent clerical error in the listing of a subcontractor, shall, pursuant to Public Contract Code § 4107.5, within two (2) working days after the time of the prime bid opening by the awarding authority, give written notice to the awarding authority and copies of such notice to both the subcontractor it claims to have listed in error, and the intended subcontractor who had bid to the CONTRACTOR prior to bid opening. Any listed subcontractor who has been notified by the CONTRACTOR in accordance with the provisions of this section as to an inadvertent clerical error, shall be allowed six (6) working days from the time of the prime bid opening within which to submit to the awarding authority and to the CONTRACTOR written objection to the CONTRACTOR’s claim of inadvertent clerical error.

In all other cases, the CONTRACTOR must make a request in writing to the awarding authority for the substitution of a subcontractor, giving reasons therefore. The awarding authority shall mail a written notice to the listed subcontractor giving reasons for the proposed substitution. The listed
subcontractor shall have five (5) working days from the date of such notice within which to file with the awarding authority written objections to the substitution.

Failure to file written objections pursuant to the provisions of this section within the times specified herein shall constitute a waiver of objection to the substitution by the listed subcontractor and, where the ground for substitution is an inadvertent clerical error, an agreement by the listed subcontractor that an inadvertent clerical error was made.

If written objections are filed, the awarding authority shall give five (5) days' notice to the CONTRACTOR and to the listed subcontractor of a hearing by the awarding authority on the CONTRACTOR’s request for substitution as provided in Public Contract Code § 4107. The determination by the awarding authority shall be final.

5.3 SUBCONTRACTUAL RELATIONS

By appropriate agreement, written where legally required for validity, the CONTRACTOR shall require each subcontractor, to the extent of the work to be performed by the subcontractor, to be bound to the CONTRACTOR by terms of the contract documents, and to assume toward the CONTRACTOR all obligations and responsibilities, which the CONTRACTOR, by the contract documents, assumes toward the AGENCY and the AGENCY ARCHITECT/ENGINEER. Each subcontract agreement shall preserve and protect the rights of the, AGENCY and the AGENCY ARCHITECT/ENGINEER under the Contract documents with respect to the work to be performed by the subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies, and redress against the CONTRACTOR that the CONTRACTOR, by the contract documents, has against the AGENCY. Where appropriate, the CONTRACTOR shall require each subcontractor to enter into similar agreements with sub subcontractors.

The CONTRACTOR shall make available to each proposed subcontractor, prior to the execution of the subcontract agreement, copies of the contract documents to which the subcontractor will be bound. Upon written request of the subcontractor, the CONTRACTOR shall identify to the subcontractor the terms and conditions of the proposed subcontract agreement, which may be at variance with the contract documents. Subcontractors shall similarly make copies of applicable portions of such documents available to their respective proposed sub subcontractors.

5.4 CONTINGENT ASSIGNMENT OF SUBCONTRACTS

Each subcontract agreement for a portion of the work is assigned by the CONTRACTOR to the AGENCY provided that:

   A. Assignment is effective only after termination of the contract with the CONTRACTOR by the AGENCY for cause pursuant to Article 14 and only for those subcontract agreements which the AGENCY accepts by notifying the subcontractor in writing; and

   B. Assignment is subject to the prior rights of the Surety, if any, obligated under any bond relating to the contract.

5.5 SUBCONTRACTOR’S RESPONSIBILITIES

Every subcontractor is bound to the following provisions, unless specifically noted to the contrary in the subcontractor’s contract subject to the limitations of paragraph 5.3 above.

5.5.1 SUPERVISION BY SUBCONTRACTORS
Subcontractors shall efficiently supervise their work, using their best skill and attention. Each of them shall carefully study and compare all drawings specifications, and other instructions, shall at once report to CONTRACTOR any error or omission which any of them may discover, and shall subsequently proceed with the work in accordance with instructions from the CONTRACTOR concerning such error or omission. Each subcontractor shall be fully responsible for and shall bear the full risk of loss of all of its property.

5.5.2 DISCIPLINE AND ORDER

Each subcontractor shall at all times enforce strict discipline and good order among its subcontractors, material or equipment suppliers or their agents, employees and invitees and shall establish and maintain surveillance over the activities of each of the foregoing to minimize any disturbance, damage, pollution or unsightly conditions relative to property areas adjacent to or in the vicinity of the site. The subcontractor shall not employ on the work any unfit person or anyone not skilled in the task assigned. The CONTRACTOR shall have the right to remove from the work any employee of a subcontractor for any reason including, without limitation, incompetence or carelessness.

5.5.3 DEFECTS DISCOVERED

Should the proper and accurate performance of the work depend upon the proper and accurate performance of other work not included in its contract, each subcontractor shall use all necessary means to discover any defect in such other work and shall allow the CONTRACTOR, the AGENCY ARCHITECT/ENGINEER or other subcontractors as CONTRACTOR elects a reasonable amount of time to remedy such defects. If the subcontractor should proceed with its work, it shall be considered to have accepted such other work, unless the subcontractor shall have proceeded pursuant to instructions in writing by the CONTRACTOR over its written objection.

5.5.4 SUBCONTRACTOR INFORMATION

Each subcontractor shall submit to the AGENCY, the CONTRACTOR, or the AGENCY ARCHITECT/ENGINEER, as the case may be, promptly when requested by any of the foregoing, information with respect to the names, responsibilities and titles of the principal members of its staff, the adequacy of the subcontractor’s equipment and the availability of necessary materials and supplies. Subcontractor shall fully cooperate with CONTRACTOR in its periodic review of the adequacy of subcontractor’s supervision, personnel and equipment and the availability of necessary materials and supplies and shall promptly comply with the requirements of the CONTRACTOR with respect thereto.

5.5.5 TEMPORARY STRUCTURES

Each subcontractor shall furnish at its expense its own temporary facilities and storage except those specifically agreed to be furnished to it by the CONTRACTOR in the subcontract agreement. Subcontractor’s material storage rooms and field offices, etc., will be placed in locations designated by the AGENCY. When it becomes necessary due to the progress of the project for the subcontractor to relocate its field operations, it will do so in an expeditious manner and at no additional cost to CONTRACTOR or AGENCY. The construction of material storage rooms and field offices, etc., will be of fire resistive material only, such as concrete or gypsum block, rated drywall or sheet metal.

5.5.6 CHARGES TO SUBCONTRACTOR

Each subcontractor may be subject to the CONTRACTOR’s reasonable charges for hoisting, repair to other work caused by the fault or negligence of subcontractor, removal of subcontractor’s rubbish and clean-up occasioned by subcontractor.
5.5.7 FINES IMPOSED

Subcontractor shall comply with and pay any fines or penalties imposed for violation of any applicable law, ordinance, rule, regulation, environmental impact report mitigation requirement and lawful order of any public authority, including, without limitation, all OSHA and California OSHA requirements and those of other authorities having jurisdiction of the safety of persons or property.

5.5.8 PROJECT SIGNS

Each subcontractor shall not display on or about the project any sign, trademark, or other advertisement. The AGENCY will permit a single project sign, which shall be subject to the AGENCY’s prior and sole discretion and approval, as to all matters including, without limitation, size, location, material, colors, style and size of printing, logos and trademarks (if any), text, and selection of names to be displayed.

5.5.9 REMEDIES FOR FAILURE TO PERFORM

Without limitation of any other right or remedy available to CONTRACTOR under the contract documents or at law, should: the subcontractor fail to perform its portion of the work in a skilled and expeditious manner in accordance with the terms of the contract documents with sufficient labor, materials, equipment and facilities; delays the progress of the job or otherwise fail in any of its obligations; or either a receiver is appointed for the subcontractor or the subcontractor is declared to be bankrupt or insolvent and such appointment, bankruptcy or insolvency proceedings or declaration is not set aside within thirty (30) calendar days, then the CONTRACTOR, upon three (3) calendar days’ notice to the subcontractor (subject to the requirements of Public Contract Code § 4107), may provide such labor, materials or perform such work.

5.5.10 DISPUTES NOT TO AFFECT WORK

In the event of any dispute as to whether or not any portion of the work is within the scope of the work to be performed by a subcontractor, or any dispute as to whether or not the subcontractor is entitled to a change order for any work requested of it, the subcontractor shall continue to proceed diligently with the performance as required by the CONTRACTOR. Regardless of the size or nature of the dispute, the subcontractor shall not under any circumstances cease or delay performance of its portion of the work during the existence of the dispute. The CONTRACTOR shall continue to pay the undisputed amounts called for under the subcontract agreement during the existence of the dispute. Any party stopping or delaying the progress of the work because of a dispute shall be responsible in damages to the AGENCY, the AGENCY ARCHITECT/ENGINEER, and the CONTRACTOR for any losses suffered as a result of the delay.

5.5.11 APPLICATION FOR PAYMENT

CONTRACTOR agrees to advise the subcontractor if any documentation in connection with the subcontractor’s application for payment has not been accepted or is in any way unsatisfactory.

5.5.12 COMPLIANCE WITH PROCEDURES

Each subcontractor shall comply with all procedures established by the CONTRACTOR for coordination among the AGENCY, the AGENCY’s consultants, AGENCY ARCHITECT/ENGINEER, CONTRACTOR and the various subcontractors for coordination of the work with all local municipal authorities, government agencies, utility companies and any other agencies with jurisdiction over all or any portion of the work. The subcontractor shall cooperate fully with all of the foregoing parties and authorities.
5.5.13  **ON-SITE RECORD KEEPING**

Subcontractor shall comply with all on-site record keeping systems established by the CONTRACTOR and shall, upon the request of the CONTRACTOR, provide the CONTRACTOR with such information and reports as the CONTRACTOR may deem appropriate. Without limitation of the foregoing, the subcontractor shall assemble all required permits and certificates so that they are readily accessible at the site.

5.5.14  **NON-EXCLUSIVE OBLIGATIONS**

The specific requirements of Article 5 are not intended to exclude the obligation of the subcontractor to comply with any of the other provisions of the general conditions and the other contract documents which are relevant to the proper performance of its portion of the work.
ARTICLE 6

CONSTRUCTION BY AGENCY OR BY SEPARATE CONTRACTORS

6.1 AGENCY’S RIGHT TO PERFORM CONSTRUCTION AND TO AWARD SEPARATE CONTRACTS

6.1.1 AGENCY’S RIGHTS

The AGENCY reserves the right to perform work related to the project with the AGENCY’s own forces and to award separate contracts in connection with other portions of the project or other construction or operations on the site under conditions of the contract identical or substantially similar to these including those portions related to insurance and waiver of subrogation. The project will be performed with multiple prime CONTRACTORS. Notwithstanding anything to the contrary in the Contract Documents, CONTRACTOR shall have the absolute obligation to work cooperatively with the Agency and all other CONTRACTORS, subcontractors, suppliers and other entities working on any portion of the project or performing any operations on or off the Site, including, but not limited to, those provided for in the Project Schedule.

6.1.2 DESIGNATION AS CONTRACTOR

When separate contracts are awarded for different portions of the project or other construction or operations on the site, the term “CONTRACTOR” in the contract documents in each case shall mean the CONTRACTOR who executes each separate AGENCY/CONTRACTOR agreement.

6.1.3 CONTRACTOR DUTIES

The CONTRACTOR shall have overall responsibility for coordination and scheduling of the activities of the AGENCY’s own forces and of each separate CONTRACTOR with the work of the CONTRACTOR, who shall cooperate with them. The CONTRACTOR shall participate with other separate CONTRACTORS and the AGENCY in reviewing their construction schedules when directed to do so.

6.1.4 OBLIGATIONS

Unless otherwise provided in the contract documents, when the AGENCY performs work related to the project with the AGENCY’s own forces, the AGENCY shall be deemed to be subject to the same obligations, and to have the same rights, which apply to the CONTRACTOR under the general conditions, including, without excluding others, those stated in Article 3, this Article 6 and Articles 10, 11 and 12.

6.2 MUTUAL RESPONSIBILITY

6.2.1 DELIVERY AND STORAGE

The CONTRACTOR shall afford the AGENCY and separate CONTRACTORS reasonable opportunity for delivery and storage of their materials and equipment and performance of their activities, and shall connect and coordinate the separate CONTRACTORS’ construction and operations with theirs as required by the contract documents.

6.2.2 NOTICE BY CONTRACTOR

If part of the CONTRACTOR’s work depends upon proper execution or results from work by the AGENCY or a separate CONTRACTOR, the CONTRACTOR shall, prior to proceeding with that portion of the work, promptly report to the AGENCY ARCHITECT/ENGINEER apparent discrepancies or defects in such other construction that would render it unsuitable for such proper execution and results. Failure of the CONTRACTOR to so report shall constitute an
acknowledgment that the AGENCY’s or separate CONTRACTOR’S completed or partially completed construction is fit and proper to receive the CONTRACTOR’S work, except as to defects not then reasonably discoverable.

6.2.3 COSTS INCURRED

Costs, expenses and damages caused by delays, improperly timed activities, defective construction or damages to another’s work shall be borne by the party responsible. The AGENCY shall deduct said costs from the CONTRACTOR’s next progress payment.

6.2.4 CORRECTION OF DAMAGE

The CONTRACTOR shall promptly remedy damage wrongfully caused by the CONTRACTOR to completed or partially completed construction or to property of the AGENCY or separate CONTRACTORS. Failure to do so will be grounds for deduction of costs from CONTRACTOR’S next progress payment.

6.3 AGENCY’S RIGHT TO CLEAN UP

If a dispute arises among the CONTRACTOR, separate CONTRACTORS, and the AGENCY as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish as described in paragraph 3.13, the AGENCY may clean up and allocate the cost among those responsible as the AGENCY determines to be just.

ARTICLE 7

CHANGES IN THE WORK

7.1 CHANGES

7.1.1 NO CHANGES WITHOUT AUTHORIZATION

There shall be no change whatsoever in the drawings, specifications, or in the work without an executed change order, construction change directive, or order by the AGENCY or authorized representative for a minor change in the work as herein provided. The AGENCY shall not be liable for the cost of any extra work or any substitutions, changes, additions, omissions, or deviations from the drawings and specifications unless the same shall have been authorized by and the cost thereof approved in writing by change order or executed construction change directive. No extension of time for performance of the work shall be allowed hereunder unless claim for such extension is made at the time changes in the work are ordered, and such time duly adjusted in writing in the change order. The provisions of the contract documents shall apply to all such changes, additions, and omissions with the same effect as if originally embodied in the drawings and specifications. Notwithstanding anything to the contrary in this Article 7, all change orders shall be prepared and issued by the AGENCY ARCHITECT/ENGINEER and shall become effective when executed by the AGENCY, the AGENCY ARCHITECT/ENGINEER and the CONTRACTOR and, if required, approved by the AGENCY governing board.

7.1.2 AGENCY ARCHITECT/ENGINEER AUTHORITY

The AGENCY ARCHITECT/ENGINEER will have authority to order minor changes in the work not involving any adjustment in the contract sum, an extension of the contract time, or a change, which is inconsistent with the intent of the contract documents. Such changes shall be effected by written change order and shall be binding on the AGENCY and the CONTRACTOR. The CONTRACTOR shall carry out such written orders promptly.
7.2 **CHANGE ORDERS (“CO”)**

A CO is a written instrument prepared by the CONTRACTOR and signed by the AGENCY, the CONTRACTOR, and the AGENCY ARCHITECT/ENGINEER stating their agreement upon all of the following:

A. A change in the work;
B. The amount of the adjustment in the contract sum, if any; and
C. The extent of the adjustment in the contract time, if any.

7.3 **CONSTRUCTION CHANGE DIRECTIVES (“CCD”)**

7.3.1 **DEFINITION**

A CCD is a written order prepared by the AGENCY ARCHITECT/ENGINEER and signed by the AGENCY and the AGENCY ARCHITECT/ENGINEER, directing a change in the work and stating a proposed basis for adjustment, if any, in the contract sum or contract time, or both. The AGENCY may by CCD, without invalidating the contract, order changes in the work within the general scope of the contract consisting of additions, deletions or other revisions within, the contract sum and contract time being adjusted accordingly.

7.3.2 **USE TO DIRECT CHANGE**

A CCD shall be used in the absence of agreement on the terms of a CO.

7.4 **REQUEST FOR INFORMATION (“RFI”)**

7.4.1 **DEFINITION**

An RFI a written request prepared by the CONTRACTOR asking the AGENCY or AGENCY ARCHITECT/ENGINEER to provide additional information necessary to clarify an item, which the CONTRACTOR feels is not clearly shown or called for in the drawings or specifications or to address problems which have arisen under field conditions.

7.4.2 **SCOPE**

The RFI shall reference all the applicable contract documents including specification section, detail, page numbers, drawing numbers, and sheet numbers, etc. the CONTRACTOR shall make suggestions and/or interpretations of the issue raised by the RFI. An RFI cannot modify the contract cost, contract time or the contract documents.

7.4.3 **RESPONSE TIME**

The AGENCY or AGENCY ARCHITECT/ENGINEER must respond to an RFI within fourteen (14) calendar days after receiving such request. If the AGENCY ARCHITECT/ENGINEER’s response results in a change in the work, then such change shall be effected by a written CO or CCD. If the AGENCY ARCHITECT/ENGINEER cannot respond to the RFI within fourteen (14) calendar days, the AGENCY ARCHITECT/ENGINEER shall notify the CONTRACTOR, with a copy to the inspector and the AGENCY, of the amount of time that will be required to respond.
7.4.4 COSTS INCURRED

The CONTRACTOR shall be invoiced by the AGENCY for any costs incurred for professional services, which shall be deducted from the next progress payment, if an RFI requests an interpretation or decision of a matter where the information sought is equally available to the party making such request.

7.5 REQUEST FOR PROPOSAL (“RFP”)

7.5.1 DEFINITION

An RFP is a written request prepared by the AGENCY or AGENCY ARCHITECT/ENGINEER asking the CONTRACTOR to submit to the AGENCY and the AGENCY ARCHITECT/ENGINEER an estimate of the effect of a proposed change on the contract price and the contract time.

7.5.2 SCOPE

An RFP shall contain adequate information, including any necessary drawings and specifications, to enable CONTRACTOR to provide the cost breakdowns required by paragraph 7.7. The CONTRACTOR shall not be entitled to any additional compensation for preparing a response to an RFP, whether ultimately accepted or not.

7.6 CHANGE ORDER REQUEST (“COR”)

7.6.1 DEFINITION

A COR is a written request prepared by the CONTRACTOR asking the AGENCY and the AGENCY ARCHITECT/ENGINEER to incorporate a proposed change called for in an RFP or a claim per paragraph 7.7.6 into a CO.

7.6.2 CHANGES IN PRICE

A COR shall include breakdowns per paragraph 7.7 to validate any change in contract price due to proposed change or claim.

7.6.3 CHANGES IN TIME

A COR shall also include any additional time required to complete the project. Any additional time requested shall not be the number of days to make the proposed change, but must be based upon the impact to the project schedule as defined in paragraph 3.9 and Division 1 of the specifications.

7.7 COST OF CHANGE ORDERS

7.7.1 SCOPE

Within ten (10) calendar days or such lesser period of time as may be required by AGENCY after a request is made for a change that impacts the contract sum or the contract time, the CONTRACTOR shall provide to the AGENCY and the AGENCY ARCHITECT/ENGINEER in writing an estimate of the effect of the proposed CO upon the contract price and the actual cost of construction, which shall include a complete itemized cost breakdown of all labor and material showing actual quantities, hours, unit prices, wage rates, required for the change and the effect upon the contract time of such CO. Changes may be made by AGENCY by an appropriate written CO, or, at the AGENCY’s option, such changes shall be implemented immediately upon the CONTRACTOR’s receipt of an appropriate written CCD.
7.7.2 DETERMINATION OF COST

The amount of the increase or decrease in the contract price resulting from a CO, if any, shall be determined in one or more of the following ways as applicable to a specific situation:

Value of any such extra work, change or deduction shall be determined at the sole discretion of the AGENCY in the following ways:

1. Acceptable lump sum proposal from CONTRACTOR properly itemized and supported by sufficient substantiating data to permit evaluation. Estimates for lump sum proposals shall be limited to direct expenditures necessitated specifically by the subject extra work and shall be segregated into categories, which follow those outlined in article 7.7.2.3. In addition, the CONTRACTOR and subcontractor will be paid a lump sum for overhead, profit, and bond. Such lump sum shall conform to the percentages outlined in article 7.7.2.3 E. For added or omitted work by subcontractors, the CONTRACTOR shall furnish to the AGENCY the subcontractor's detailed estimate of the cost for labor, material, and equipment, including the markup by the subcontractor for overhead and profit. Such estimate of cost shall be signed by the subcontractor. The same requirement shall apply to any sub-subcontractor or material supplier.

2. By unit prices as utilized in CONTRACTOR's original bid and incorporated into contract documents or fixed by subsequent agreement between AGENCY and CONTRACTOR. Unit prices shall include all necessary labor, material, overhead, profit and applicable taxes.

3. Time and material. Force account for direct costs for labor, material, and equipment rental plus markups for overhead and profit for prime CONTRACTOR, subcontractor and sub-subcontractors as applicable. The following outline shall be utilized for all time and material and lump sum proposals.

   A. Labor: attach itemized direct hourly rates in accordance with certified payroll records times total hours expended. Separately show dollar amount for employer-paid payroll taxes/insurance benefits. Enter total as direct labor time.

   B. Material: attach receipts, invoices or itemized quantity and unit costs plus tax and delivery. Enter total as material item.

   C. Equipment: attach receipts, invoices or tear tickets indicating unit costs and total hours or loads charged, (small tools with a value of less than five hundred dollars ($500.00) are to be included in markup). Enter total as equipment rental time.

   D. SUBTOTALS (lines A + B + C)

   E. The allowance for the combined overhead and profit included in the total cost to the AGENCY shall be based on the following schedules.

      Schedule 1. Twenty percent (20%) combined overhead and profit, of the total estimated costs of the extra work to be performed. All subcontracted work included within the total estimated costs shall not exceed ten percent (10%) combined overhead and profit of the work performed by the subcontractor. This schedule #1 shall apply to all changes totaling less than five hundred dollars ($500.00).
Schedule 2. Fifteen percent (15%) combined overhead and profit, of the total estimated costs of the extra work to be performed.

All subcontracted work included within the total estimated costs shall not exceed ten percent (10%) combined overhead and profit of the work performed by the subcontractor. This schedule #2 shall apply to all changes totaling more than five hundred dollars ($500.00) but less than seven thousand five hundred dollars ($7,500.00).

Schedule 3. Ten percent (10%) combined overhead and profit of the total estimated costs of the extra work to be performed.

All subcontracted work included within the total estimated costs shall not exceed ten percent (10%) combined overhead and profit of the work performed by the subcontractor.

This schedule #3 shall apply to all changes totaling more than seven thousand five hundred dollars ($7,500.00), but less than fifteen thousand dollars ($15,000.00).

Schedule 4. Five percent (5%) combined overhead and profit, of the total estimated costs of the extra work to be performed.

All subcontracted work included within the total estimated costs shall not exceed five percent (5%) combined overhead and profit of the work performed by the subcontractor.

This schedule #4 shall apply to all changes totaling more than fifteen thousand dollars ($15,000.00).

The combined overhead and profit allowances referenced in schedules 1 through 4 are to include the following costs: home office overhead, off-site supervision, change order preparation, negotiation/research, time delays, project interference and disruption, additional guarantee and warranty durations, on site supervision, additional temporary protection, additional construction facilities, additional material handling costs, additional safety equipment costs and small tools with a daily rental rate of less than two hundred and fifty dollars ($250.00).

F. SUBTOTAL (lines D + E)

G. GENERAL CONTRACTOR’S BOND (NTE 1% line F)

H. GENERAL CONTRACTOR’S INSURANCE (NTE 1% line F)

I. TOTAL CHANGE ORDER REQUEST (lines F + G + H)

7.7.3 AMOUNT OF CREDIT

The amount of credit to be allowed by the CONTRACTOR to the AGENCY for a deletion or change which results in a net decrease in the contract sum shall be actual net cost. When both additions and credits covering related work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

It is expressly understood that the value of such extra work or changes, as determined by any of the aforementioned methods, expressly includes any and all of the CONTRACTOR's costs and expenses, both direct and indirect, resulting from additional time required on the project or resulting from delay to the project.
7.7.4 DISCOUNTS, REBATES AND REFUNDS

For purposes of determining the cost, if any, of any change, addition or omission to the work hereunder, all trade discounts, rebates, refunds and all returns from the sale of surplus materials and equipment shall accrue and be credited to the CONTRACTOR, and the CONTRACTOR shall make provisions so that such discounts, rebates, refunds, and returns may be secured, and the amount thereof shall be allowed as a reduction of the CONTRACTOR’s cost in determining the actual cost of construction for purposes of any change, addition, or omissions in the work as provided herein.

7.7.5 ACCOUNTING RECORDS

With respect to portions of the work performed by CO’S and CCDs on a time and materials, unit-cost, or similar basis, the CONTRACTOR shall keep and maintain cost accounting records satisfactory to the AGENCY, which shall be available to the AGENCY on the same terms as any other books and records the CONTRACTOR is required to maintain under the contract documents.

7.7.6 NOTICE REQUIRED

If the CONTRACTOR desires to make a claim for an increase in the contract price, or any extension in the contract time for completion, it shall give the AGENCY and the AGENCY ARCHITECT/ENGINEER written notice thereof within ten (10) calendar days after the occurrence of the event giving rise to the claim, together with detailed estimates of the impact on the contract price and/or the contract time. This notice shall be given by the CONTRACTOR before proceeding to execute the work, except in an emergency endangering life or property, in which case the CONTRACTOR shall proceed in accordance with paragraph 10.3 hereof. No claim shall be considered unless made in accordance with this subparagraph; however, the mere presentation of such claim shall not establish the validity of the cause giving rise to such claim, or of the extension of the contract time, and/or the increase in the contract price. CONTRACTOR shall proceed to execute the work even though the adjustment has not been agreed upon. Any change in the contract price or extension of the contract time resulting from such claim shall be authorized by a CO.

7.7.7 APPLICABILITY TO SUBCONTRACTORS

Any requirements under this Article 7 shall be equally applicable to CO’S or CCDs issued to subcontractors by the CONTRACTOR to the same extent required of the CONTRACTOR.

ARTICLE 8

TIME

8.1 DEFINITIONS

8.1.1 CONTRACT TIME

Unless otherwise provided, contract time is the period of time, including authorized adjustments, allotted in the contract documents for completion of the work for the entire project.

8.1.2 NOTICE TO PROCEED

The date of commencement of the work is the date established in the notice to proceed. The date shall not be postponed by the failure to act of the CONTRACTOR or of persons or entities for whom the CONTRACTOR is responsible.
8.1.3 DAYS

The term "day" as used in the contract documents shall mean calendar day unless otherwise specifically defined.

8.2 HOURS OF WORK

8.2.1 SUFFICIENT FORCES

CONTRACTORs and subcontractors shall furnish sufficient forces to ensure the prosecution of the work in accordance with the construction schedule.

8.2.2 PERFORMANCE DURING WORKING HOURS

Work shall be performed during regular working hours except that in the event of an emergency or when required to complete the work in accordance with job progress, work may be performed outside of regular working hours with the advance written consent of the AGENCY. Regular working hours shall be from 7:00 a.m. to 4:00 p.m., Monday through Friday. However, all work shall comply with local ordinance for hours of work.

8.2.3 LABOR CODE APPLICATION

As provided in Article 3 (commencing at § 1810), Chapter 1, Part 7, Division 2 of the Labor Code, eight (8) hours of labor shall constitute a legal day's work. The time of service of any worker employed at any time by the CONTRACTOR or by any subcontractor on any subcontract under this contract, upon the work or upon any part of the work contemplated by this contract, is limited and restricted to eight (8) hours during any one calendar day and forty (40) hours during any one calendar week, except as hereinafter provided. Notwithstanding the provision hereinafter set forth, work performed by employees of CONTRACTORS in excess of eight (8) hours per day and forty (40) hours during any one week shall be permitted upon this public work provided that compensation for all hours worked in excess of eight (8) hours per day at not less than one and one-half (1-1/2) times the basic rate of pay.

CONTRACTOR shall pay to the AGENCY a penalty of twenty-five dollars ($25.00) for each worker employed in the execution of this contract by the CONTRACTOR, or by any subcontractor, for each calendar day during which such worker is required or permitted to work more than eight (8) hours in any calendar day and forty (40) hours in any one (1) calendar week, in violation of the provisions of article 3 (commencing at § 1810), Chapter 1, Part 7, Division 2 of the Labor Code, unless compensation for the workers so employed by CONTRACTOR is not less than one and one-half (1-1/2) times the basic rate of pay for all hours worked in excess of eight (8) hours per day.

8.2.4 COSTS FOR AFTER HOURS INSPECTIONS

If the work done after hours is required by the contract documents to be done outside the CONTRACTOR's or the inspector's regular working hours, the costs of any inspections, if required to be done outside normal working hours, shall be borne by the AGENCY.

If the AGENCY allows the CONTRACTOR to do work outside regular working hours for the CONTRACTOR's own convenience, the costs of any inspections required outside regular working hours shall be invoiced to the CONTRACTOR by the AGENCY and deducted from the next progress payment.

If the CONTRACTOR elects to perform work outside the inspector's regular working hours, costs of any inspections required outside regular working hours shall be invoiced to the CONTRACTOR by the AGENCY and deducted from the next progress payment.
8.2.5 **TIME FOR COMMENCEMENT BY SUBCONTRACTORS**

Unless otherwise provided in the contract documents, all subcontractors shall commence their work within two (2) consecutive business days after notice to them by the CONTRACTOR and shall prosecute their work in accordance with the progress of the work.

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**8.3 PROGRESS AND COMPLETION**

**8.3.1 TIME OF THE ESSENCE**

Time limits stated in the contract documents and durations stated in the Project Schedule are of the essence of the contract. By executing the Agreement, the CONTRACTOR confirms that the contract time and schedule durations are a reasonable period for performing the work.

**8.3.2 NO COMMENCEMENT WITHOUT INSURANCE**

The CONTRACTOR shall not knowingly, except by agreement or instruction of the AGENCY, in writing, commence operations on the site or elsewhere prior to the effective date of insurance required by Article 11 to be furnished by the CONTRACTOR. The date of commencement of the work shall not be changed by the effective date of such insurance.

**8.3.3 EXPEDITIOUS COMPLETION**

The CONTRACTOR shall proceed expeditiously with adequate forces and shall achieve completion within the contract time and schedule durations.

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**8.4 EXTENSIONS OF TIME - LIQUIDATED DAMAGES**

**8.4.1 EXCUSABLE DELAY**

The CONTRACTOR shall not be charged for liquidated damages, as set forth in the Agreement, because of any delays in completion of the work due to unforeseeable causes beyond the control and without the fault or the negligence of CONTRACTOR, including, but not restricted to, acts of god, acts of public enemy, acts of government, acts of the AGENCY or anyone employed by it, acts of another CONTRACTOR in performance of a contract (other than this contract) with the AGENCY, fires, floods, epidemics, quarantine restrictions, strikes, unusually severe weather or delays of subcontractors due to such causes.

**8.4.2 NOTICE BY CONTRACTOR REQUIRED**

The CONTRACTOR shall within seven (7) calendar days of beginning of any such delay (unless AGENCY grants in writing a further period of time to file such notice prior to the date of final payment under the contract) notify the AGENCY in writing of causes of delay. AGENCY will then ascertain the facts and extent of the delay and grant an extension of time for completing the work when, in its judgment, the findings of fact justify such an extension. The AGENCY’s findings of fact thereon shall be final and conclusive on the parties. Extensions of time shall apply only to that portion of the work affected by the delay and shall not apply to other portions of the work not so affected. The sole remedy of CONTRACTOR for extensions of time under paragraph 8.4.1 shall be an extension of the contract time at no cost to the AGENCY.

**8.4.3 CONDITIONS FOR EXTENSION OF TIME**

If the CONTRACTOR is delayed at any time in progress of the work by an act or neglect of the AGENCY, the AGENCY ARCHITECT/ENGINEER, an employee of either or of a separate CONTRACTOR employed by the AGENCY, by changes ordered in the work, by labor disputes, fire, unusual delay in deliveries, unavoidable casualties or other causes beyond the CONTRACTOR’s control, by delay authorized by the AGENCY pending arbitration, or by other causes which the AGENCY ARCHITECT/ENGINEER determines may justify delay, then the contract time shall be extended by change order for such reasonable time as the AGENCY
ARCHITECT/ENGINEER may determine. Claims relating to time extensions shall be made in accordance with applicable provisions of Article 7.

ARTICLE 9
PAYMENTS AND COMPLETION

9.1 CONTRACT SUM

The contract sum is stated in the agreement and, including authorized adjustments, is the total amount payable by the AGENCY to the CONTRACTOR for performance of the work under the contract documents.

9.2 COST BREAKDOWN

9.2.1 REQUIRED INFORMATION

In addition to the bid schedule, on forms approved by the AGENCY, the CONTRACTOR shall furnish the following:

A. Within ten (10) calendar days of the award of the contract, a detailed breakdown of each lump sum item indicated in the bid schedule shall be provided in the form of a schedule of values. CONTRACTOR’s overhead and profit shall be apportioned over each line item or separate activity of the Schedule of Values. The amount of overhead and profit apportioned to each line item or separate activity shall be proportionate to the line item percentage of the overall contract amount.

9.2.2 AGENCY APPROVAL REQUIRED

The AGENCY shall review all submissions received pursuant to paragraph 9.2.1 in a timely manner. All submissions must be approved by the AGENCY before becoming the basis of any payment.

9.3 APPLICATIONS FOR PAYMENT

9.3.1 PROCEDURE

On or before the twenty-fifth (25th) day of each calendar month during the progress of the portion of the work for which payment is being requested, the CONTRACTOR shall submit to the AGENCY an itemized application for payment for operations completed in accordance with the schedule of values. All work will be billed on the AGENCY’s standard pay application.

9.3.2 PURCHASE OF MATERIALS AND EQUIPMENT

As the CONTRACTOR is required to order, obtain, and store materials and equipment sufficiently in advance of its work at no additional cost or advance payment from AGENCY, to assure that there will be no delays, payment by the AGENCY for stored material shall be made only in unusual circumstances where the AGENCY ARCHITECT/ENGINEER specifically recommends, and AGENCY specifically approves, the payment in writing. If payments are to be made on account of materials and equipment not incorporated in the work, but delivered and suitably stored at the site or at some other location agreed upon in writing by the AGENCY, the payments shall be conditioned upon submission by the CONTRACTOR, subcontractor, or vendor of bills of sale and such other documents satisfactory to the AGENCY ARCHITECT/ENGINEER and the AGENCY to establish the AGENCY’s title to such materials or equipment free of all liens and encumbrances, and
otherwise protect the AGENCY’s interest, including, without limitation, provision of applicable insurance and transportation to the site. All stored items shall be inventoried, specified by identification numbers (if applicable), released to the AGENCY by sureties of the CONTRACTOR and the subcontractor and, if stored “off-site” stored only in a bonded warehouse or other location suitable to the Agency.

9.3.3 WARRANTY OF TITLE

The CONTRACTOR warrants that title to all work covered by an application for payment will pass to the AGENCY no later than the time of payment. The CONTRACTOR further warrants that upon submittal of an application for payment all work for which certificates for payment have been previously issued and payments received from the AGENCY shall, to the best of the CONTRACTOR’s knowledge, information and belief, be free and clear of liens, claims, security interests, or encumbrances in favor of the CONTRACTOR, subcontractors, material and equipment suppliers or other persons or entities making a claim by reason of having provided labor, materials and equipment relating to the work.

9.4 REVIEW OF PROGRESS PAYMENT

9.4.1 APPROVAL

The AGENCY will, within seven (7) days after receipt of the CONTRACTOR’s application for payment, either approve such payment or notify the CONTRACTOR in writing of the AGENCY ARCHITECT/ENGINEER’s or inspector’s reasons for withholding approval in whole or in part as provided in paragraph 9.5.1. AGENCY, or AGENCY ARCHITECT/ENGINEER, has the discretion to require from CONTRACTOR any of the following information with the application for payment: (i) certified payroll covering the period of the previous application for payment; (ii) unconditional waivers and releases from all subcontractors/suppliers for which payment was requested under the previous application for payment; or (iii) material invoices, evidence of equipment purchases, rentals and other support and details of cost, including conditional releases.

9.4.2 AGENCY ARCHITECT/ENGINEER’S REVIEW

The review of the CONTRACTOR’s application for payment by the AGENCY ARCHITECT/ENGINEER is based on the AGENCY ARCHITECT/ENGINEER’s observations at the site and the data comprising the application for payment that the work has progressed to the point indicated and that, to the best of the AGENCY ARCHITECT/ENGINEER’s knowledge, information, and belief, the quality of the work is in accordance with the contract documents. The foregoing representations are subject to an evaluation of the work for conformance with the contract documents, to results of subsequent tests and inspections, to minor deviations from the contract documents correctable prior to completion, and to specific qualifications expressed by the AGENCY ARCHITECT/ENGINEER. The issuance of a certificate for payment will further constitute a representation that the CONTRACTOR is entitled to payment in the amount certified. However, the review by the AGENCY ARCHITECT/ENGINEER will not be a representation that the AGENCY ARCHITECT/ENGINEER has:

A. Made exhaustive or continuous on-site inspections to check the quality or quantity of the work;

B. Reviewed construction means, methods, techniques, sequences or procedures;

C. Reviewed copies of requisitions received from subcontractors, material and equipment suppliers and other data requested by the AGENCY to substantiate the CONTRACTOR’s right to payment; or
D. Made an examination to ascertain how or for what purpose the CONTRACTOR has used money previously paid on account of the contract sum.

9.4.3 INVOICE GENERATION, COMPLETION AND RETURN

The billing process outlined below shall supersede any other billing procedures contained in the project specifications.

Based on billing percentages approved by the AGENCY, AGENCY ARCHITECT/ENGINEER and the Inspector of Record (if applicable), individual CONTRACTOR billings will be generated by the CONTRACTOR.

Upon receipt, CONTRACTORS are required to make five (5) copies of the billing, wet sign all copies as indicated, and return the billings to the AGENCY within three (3) days of the date received for further processing.

Important Note: Billings must be returned to the AGENCY office within the specified time frame. It is strongly recommended that CONTRACTORS use one of the following delivery methods:

- Hand delivered
- Express mail (overnight) to street address
- U.P.S. next day service
- Federal Express next day service

9.5 DECISIONS TO WITHHOLD PAYMENT

9.5.1 REASONS TO WITHHOLD PAYMENT

The AGENCY may decide to withhold payment in whole, or in part, to the extent reasonably necessary to protect the AGENCY if, in the AGENCY’s opinion, the representations to the AGENCY required by paragraph 9.4.2 cannot be made. The AGENCY may withhold payment, in whole, or in part, to such extent as may be necessary to protect the AGENCY from loss because of:

A. Defective work not remedied;

B. Stop notices filed, unless the CONTRACTOR at its sole expense provides a bond or other security satisfactory to the AGENCY in the amount of at least one hundred twenty-five percent (125%) of the claim, in a form satisfactory to the AGENCY, which protects the AGENCY against such claims;

C. Liquidated damages assessed against the CONTRACTOR;

D. Reasonable doubt that the work can be completed for the unpaid balance of any contract price or by the completion date;

E. Damage to the AGENCY, another CONTRACTOR, or subcontractor;

F. Unsatisfactory prosecution of the work by the CONTRACTOR;

G. Failure to store and properly secure materials;

H. Failure of the CONTRACTOR to submit on a timely basis, proper and sufficient documentation required by the contract documents, including, without limitation, monthly progress schedules, shop drawings, submittal schedules, schedule of values, product data and samples, proposed product lists, executed change orders and verified reports;
I. Failure of the CONTRACTOR to maintain record drawings;

J. Erroneous estimates by the CONTRACTOR of the value of the work performed, or other false statements in an application for payment;

K. Unauthorized deviations from the contract documents; or

L. Failure of the CONTRACTOR to prosecute the work in a timely manner in compliance with established progress schedules and completion dates.

M. Failure to provide information when requested in accordance with Article 9.4.1. above.

9.5.2 WRITTEN REASONS FOR WITHHOLDING PROVIDED

Upon request of the CONTRACTOR whose payment is deferred, the CONTRACTOR shall be given a written copy of AGENCY’s reasons for withholding payment.

9.5.3 PAYMENT AFTER CURE

When the grounds for declining approval are removed, payment shall be made for amounts withheld because of them. No interest shall be paid on any retainage or amounts withheld due to the failure of the CONTRACTOR to perform in accordance with the terms and conditions of the contract documents.

9.6 PROGRESS PAYMENTS

9.6.1 PAYMENTS TO CONTRACTOR

Within thirty (30) calendar days after receipt of an undisputed and properly submitted request for payment, CONTRACTOR shall be paid a sum equal to ninety-five percent (95%) of the value of the work performed up to the last day of the previous month, less the aggregate of previous payments. For purposes of this article, a payment request is not considered late if payment is beyond thirty (30) calendar days if the payment request is delayed due to an audit inquiry by the financial officer of the AGENCY or any county or government agency included in the processing of the payment request. The value of the work completed shall be an estimate only, no inaccuracy or error in said estimate shall operate to release the CONTRACTOR, or any bondsman, from damages arising from such work or from enforcing each and every provision of this contract and the AGENCY shall have the right subsequently to correct any error made in any estimate for payment.

Payment of CONTRACTORS. It is understood by the Parties that the AGENCY, subject to the approval of its governing board, may elect to cause and to establish a CONTRACTOR Payment Trust Account (“TCP/Trust Account”) at no additional cost to the AGENCY for the purpose of making payments, subject to the AGENCY’S approval, to all CONTRACTORS. The AGENCY will then remit an amount adequate for payment of all Trade CONTRACTOR payments to the (“Trustee”) of the TCP/Trust Account, who will then make progress payments to the various CONTRACTORS for the Project, pursuant to the applicable Trade Contract. It is agreed by the Parties that interest, if any, earned on deposits in the TCP/Trust Account shall ensure to the benefit of the AGENCY.

The CONTRACTOR shall not be entitled to have any payment requests processed, or be entitled to have any payment made for work performed, so long as any lawful or proper direction given by the AGENCY concerning the work, or any portion thereof, remains incomplete. At any time after fifty percent (50%) of the work has been completed, if the AGENCY, by action of its governing body, finds that satisfactory progress is being made, the AGENCY may make any of the remaining
payments in full for actual work completed or may withhold any amount up to five percent (5%) thereof as the AGENCY may find appropriate based on the CONTRACTOR’s progress.

9.6.2 PAYMENTS TO SUBCONTRACTORS

No later than seven (7) calendar days after receipt, pursuant to Public Contract Code 7107, the CONTRACTOR shall pay to each subcontractor, out of the amount paid to the CONTRACTOR on account of such subcontractor’s portion of the work, the amount to which said subcontractor is entitled, reflecting percentages actually retained from payments to the CONTRACTOR on account of such subcontractor’s portion of the work. The CONTRACTOR shall, by appropriate agreement with each subcontractor, require each subcontractor to make payments to sub-subcontractors in a similar manner.

9.6.3 PERCENTAGE OF COMPLETION OR PAYMENT INFORMATION

The AGENCY will, on request, furnish to a subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the CONTRACTOR, and action taken thereon by the AGENCY, on account of portions of the work done by such subcontractor.

9.6.4 NO OBLIGATION FOR SUBCONTRACTOR PAYMENT

The AGENCY shall have no obligation to pay, or to see to the payment of, money to a subcontractor except as may otherwise be required by law.

9.6.5 PAYMENT TO SUPPLIERS

Payment to material or equipment suppliers shall be treated in a manner similar to that provided in paragraphs 9.6.2, 9.6.3 and 9.6.4.

9.6.6 PAYMENT NOT CONSTITUTING APPROVAL OR ACCEPTANCE

An approved request for payment, a progress payment or partial or entire use or occupancy of the project by the AGENCY shall not constitute acceptance of work not in accordance with the contract documents.

9.6.7 JOINT CHECKS

AGENCY shall have the right, if necessary for the protection of the AGENCY, to issue joint checks made payable to the CONTRACTOR and subcontractors and/or material or equipment suppliers. The joint check payees shall be responsible for the allocation and disbursement of funds included as part of any such joint payment. In no event shall any joint check payment be construed to create any contract between the AGENCY and a subcontractor of any tier, any obligation from the AGENCY to such subcontractor, or rights in such subcontractor against the AGENCY.

9.7 COMPLETION OF THE WORK

9.7.1 CLOSEOUT PROCEDURES

When the CONTRACTOR considers that the work, or a portion thereof which the AGENCY agrees to accept separately, is complete, the AGENCY ARCHITECT/ENGINEER shall prepare and submit to the AGENCY a comprehensive list of minor items to be completed or corrected (punch list). The CONTRACTOR and/or its subcontractors shall proceed promptly to complete and correct items on the list. 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. Upon receipt of the AGENCY ARCHITECT/ENGINEER’s list, the AGENCY will make an inspection to determine whether the work or designated portion thereof, is complete.
If the AGENCY’s inspection discloses any item, whether or not included on the AGENCY ARCHITECT/ENGINEER’s list, is not completed in accordance with the requirements of the contract documents, the CONTRACTOR shall, before AGENCY’s issuance of the notice of completion, complete or correct such item. The CONTRACTOR shall then submit a request for an additional inspection by the AGENCY to determine completion. When the work, or designated portion thereof, is complete, the AGENCY will prepare a notice of completion which shall establish the date of completion, establish the responsibilities of the AGENCY and CONTRACTOR for security, maintenance, heat, utilities, damage to the work and insurance and fix the time within which the CONTRACTOR shall finish all items on the list accompanying the notice of completion. Warranties required by the contract documents shall commence on the date of completion of the work or designated portion thereof, unless otherwise provided in the notice of completion. The notice of completion shall be submitted to the AGENCY and the CONTRACTOR for their written acceptance of responsibilities assigned to them in such notice.

9.7.2 PAYMENT UPON COMPLETION

Upon completion of the work, or designated portion thereof, and upon application by the CONTRACTOR, the AGENCY shall make payment reflecting adjustment in retainage, if any, for such work, or portion thereof, as provided in the contract documents.

9.7.3 COSTS OF MULTIPLE INSPECTIONS

More than two (2) requests of the AGENCY to make inspections required under paragraph 9.7.1 shall be considered an additional service of AGENCY ARCHITECT/ENGINEER and all subsequent costs will be invoiced to CONTRACTOR and withheld from remaining payments.

9.8 PARTIAL OCCUPANCY OR USE

9.8.1 AGENCY’S RIGHTS

The AGENCY may occupy or use any completed or partially completed portion of the work at any stage. The AGENCY and the CONTRACTOR shall agree in writing to the responsibilities assigned to each of them for payments, security, maintenance, heat, utilities, damage to the work, insurance, the period for correction of the work, and the commencement of warranties required by the contract documents.

9.8.2 INSPECTION PRIOR TO OCCUPANCY OR USE

Immediately prior to such partial occupancy or use, the AGENCY, the CONTRACTOR, and the AGENCY ARCHITECT/ENGINEER 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.

9.8.3 NO WAIVER

Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the work shall not constitute acceptance of the work not complying with the requirements of the contract documents.

9.9 COMPLETION AND FINAL PAYMENT

9.9.1 FINAL INSPECTION

CONTRACTOR shall immediately upon receipt of the punch list, initiate work on all items therein related to CONTRACTOR’s work and diligently complete the same. Upon receipt of CONTRACTOR’s written notice that all of the punch list items have been fully completed and the work is ready for final inspection and acceptance, AGENCY ARCHITECT/ENGINEER shall inspect the work and shall submit to CONTRACTOR, and AGENCY a final inspection report noting the
work, if any, required in order to complete the work in accordance with the contract documents. Absent unusual circumstances, this report shall consist of the punch list items not yet satisfactorily completed.

Upon completion of the work contained in the final inspection report, the CONTRACTOR shall so notify the AGENCY, who shall again inspect such work. If the AGENCY finds the work contained in such final inspection report acceptable under the contract documents and, therefore, the work fully completed, it shall so notify CONTRACTOR, who shall then submit to the AGENCY ARCHITECT/ENGINEER its final application for payment.

Upon receipt and approval of such final application for payment, the AGENCY ARCHITECT/ENGINEER shall issue a final certificate of payment stating that to the best of its knowledge, information, and belief and on the basis of its observations, inspections and all other data accumulated or received by the AGENCY ARCHITECT/ENGINEER in connection with the work, such Work has been completed in accordance with the contract documents. The AGENCY shall thereupon inspect such work and either accept the work as complete or notify the AGENCY ARCHITECT/ENGINEER and the CONTRACTOR in writing of reasons why the work is not complete. Upon acceptance of the work of the CONTRACTOR as fully complete (which, absent unusual circumstances, will occur when the punch list items have been satisfactorily completed), the AGENCY shall record a notice of completion with the county recorder, and the CONTRACTOR shall, upon receipt of payment from AGENCY, pay the amounts due subcontractors within seven (7) days.

9.9.2 RETAINAGE

Pursuant to Public Contract Code 7201 the retention amount withheld is five percent (5%) of the total value of the contract or work performed. The retainage, less any amounts disputed by the AGENCY or which the AGENCY has the right to withhold, shall be paid after approval of the AGENCY of the AGENCY ARCHITECT/ENGINEER’s certificate of payment referred to in paragraph 9.9.1, after the satisfaction of the conditions set forth in paragraph 9.9, and no later than sixty (60) calendar days after the acceptance of the work and recording of the notice of completion by AGENCY. No interest shall be paid on any retainage, or on any amounts withheld due to a failure of the CONTRACTOR to perform, in accordance with the terms and conditions of the contract Documents, except as provided to the contrary in any escrow agreement between the AGENCY and the CONTRACTOR pursuant to Public Contract Code § 22300.

9.9.3 PROCEDURES FOR APPLICATION FOR FINAL PAYMENT

The application for final payment shall be accompanied by the same details as set forth in paragraph 9.3, and in addition, the following conditions must be fulfilled:

A. A full and final waiver or release of all stop notices in connection with the work shall be submitted by CONTRACTOR, including a release of stop notice in recordable form, together with (to the extent permitted by law) a copy of the full and final waiver of all stop notices or a stop notice release bond from a surety acceptable to the AGENCY as defined by the contract documents, including a release of stop notice in recordable form, in connection with the work obtained by CONTRACTOR from each person to receive a payment thereunder, which waivers of stop notice shall be in a form as approved by AGENCY.

B. The CONTRACTOR shall have made, or caused to have been made, all corrections to the work which are required to remedy any defects therein, to obtain compliance with the contract documents or any requirements of applicable codes and ordinances or to fulfill any of the orders or directions of AGENCY required under the contract.
C. Each subcontractor shall have delivered to the CONTRACTOR all written guarantees, warranties, applications and bonds required by the Contract documents for its portion of the work.

D. The CONTRACTOR shall deliver to the AGENCY reproducible final record drawings and annotated specifications showing the CONTRACTORS work as built, with the CONTRACTOR's certification of the accuracy of the record drawings and annotated specifications, all guarantees, and operation and maintenance instructions for equipment and apparatus.

E. AGENCY ARCHITECT/ENGINEER shall have issued a final certificate of payment.

F. The CONTRACTOR shall have delivered to the AGENCY all manuals and materials required by the contract documents.

G. The CONTRACTOR shall have removed or caused to be removed, all waste materials and rubbish from and about the site, as well as all tools, construction equipment, machinery, surplus material, scaffolding equipment and any other similar materials of the CONTRACTOR or any subcontractor, shall have cleaned or caused to be cleaned, all glass surfaces and shall have left the work broom-clean, except as otherwise provided in the contract documents.

9.10 **SUBSTITUTION OF SECURITIES**

In accordance with §22300 of the Public Contract Code, the AGENCY will permit the substitution of securities for any monies withheld by the AGENCY to ensure performance under the contract. At the request and expense of the CONTRACTOR, securities equivalent to the amount withheld shall be deposited with the AGENCY, or with a state or federally chartered bank in California as the escrow agent, who shall then pay such monies to the CONTRACTOR. Upon satisfactory completion of the contract, the securities shall be returned to the CONTRACTOR.

Securities eligible for investment under this section shall include those listed in Government Code §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 the CONTRACTOR and the AGENCY.

The CONTRACTOR shall be the beneficial Agency of any securities substituted for monies withheld and shall receive any interest thereon.

The escrow agreement used for the purposes of this section shall be the form set forth in Public Contract Code § 22300.

**ARTICLE 10**

**PROTECTION OF PERSONS AND PROPERTY**

10.1 **SAFETY PRECAUTIONS AND PROGRAMS**

10.1.1 **CONTRACTOR RESPONSIBILITY**

The CONTRACTOR shall have responsibility for initiating, maintaining, and supervising all safety precautions and programs in connection with the performance of the contract. Each CONTRACTOR shall designate a responsible member of its organization whose duties shall include loss and accident prevention, and who shall have the responsibility and full authority to enforce the program. This person shall attend meetings with the representatives of the various subcontractors employed to ensure that all employees understand and comply with the programs.
Refer also to specification Section 01 52 00 CONTRACTOR’s safety for additional safety requirements. In the event that sections differ, the most stringent safety practice will be enforced.

10.1.2 CONTRACTOR NOTICES

The CONTRACTOR shall give notices and comply with applicable laws, ordinances, rules, regulations and lawful orders of public authorities bearing on the safety of persons or property or their protection from damage, injury or loss.

10.1.3 SAFETY BARRIERS AND SAFEGUARDS

The CONTRACTOR shall erect and maintain, as required by existing conditions and performance of the contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards, promulgating safety regulations and notifying AGENCY and users of adjacent sites and utilities.

10.1.4 USE OR STORAGE OF HAZARDOUS MATERIALS

When use or storage of explosives, other hazardous materials or equipment, or unusual methods are necessary for execution of the work, the CONTRACTOR shall exercise utmost care and carry on such activities under supervision of properly qualified personnel. The CONTRACTOR shall notify the AGENCY and AGENCY ARCHITECT/ENGINEER any time that explosives or hazardous materials are expected to be stored on site. Location of storage shall be coordinated with the AGENCY, AGENCY ARCHITECT/ENGINEER and local fire authorities.

10.2 PROTECTION OF WORK AND PROPERTY

10.2.1 PROTECTION FROM ELEMENTS

The CONTRACTOR and subcontractors shall continuously protect the work, the AGENCY’s property, and the property of others, from damage, injury or loss arising in connection with operations under the contract documents. The CONTRACTOR and subcontractors shall make good any such damage, injury or loss, except such as may be solely due to, or caused by, agents or employees of the AGENCY.

10.2.2 PROTECTION FOR ELEMENTS

The CONTRACTOR will remove all mud, water or other elements as may be required for the proper protection and prosecution of its work. The CONTRACTOR shall at all times provide heat, coverings, and enclosures necessary to maintain adequate protection against weather so as to preserve the work, materials, equipment, apparatus and fixtures free from injury or damage.

10.2.3 SHORING AND STRUCTURAL LOADING

The CONTRACTOR shall not impose structural loading upon any part of the work under construction or upon existing construction on or adjacent to the site in excess of safe limits or loading such as to result in damage to the structural, ?, mechanical, electrical or other components of the work. The design of all temporary construction equipment and appliances used in construction of the work and not a permanent part thereof, including, without limitation, hoisting equipment, cribbing, shoring and temporary bracing of structural steel, is the sole responsibility of the appropriate CONTRACTOR. All such items shall conform with the requirements of governing codes and all laws, ordinances, rules, regulations and orders of all authorities having jurisdiction. The CONTRACTOR shall take special precautions, such as shoring of masonry walls and temporary tie bracing of structural steel work, to prevent possible wind damage during construction of the work. The installation of such bracing or shoring shall not damage or cause damage to the
work in place or the work installed by others. Any damage which does occur shall be promptly repaired by the CONTRACTOR at no cost to the AGENCY.

10.2.4 CONFORMANCE WITHIN ESTABLISHED LIMITS

The CONTRACTOR and subcontractors shall confine their construction equipment, the storage of materials and the operations of workers to the limits indicated by laws, ordinances, permits and the limits established by the AGENCY ARCHITECT/ENGINEER and shall not unreasonably encumber the premises with construction equipment or materials.

10.2.5 SUBCONTRACTOR ENFORCEMENT OF RULES

Subcontractors shall enforce the AGENCY and the CONTRACTOR’s instructions, laws and regulations regarding signs, advertisements, fires, smoking, the presence of liquor and the presence of firearms by any person at the site.

10.2.6 SITE ACCESS

The CONTRACTOR and the subcontractors shall use only those ingress and egress routes designated by the AGENCY ARCHITECT/ENGINEER, observe the boundaries of the site designated by the AGENCY, park only in those areas designated, which areas may be on or off the site, and comply with any parking control program established by the AGENCY such as furnishing license plate information and placing identifying stickers on vehicles.

10.2.7 PROTECTION OF MATERIALS

The CONTRACTOR and the subcontractors shall receive, count, inspect for damage, record, store and protect construction materials for the work and promptly send to the CONTRACTOR evidence of receipt of such materials, indicating thereon any shortage, change or damage (failure to so note shall constitute acceptance by the subcontractor of financial responsibility for any shortage).

10.3 EMERGENCIES

10.3.1 EMERGENCY ACTION

In an emergency affecting the safety of persons or property, the CONTRACTOR shall take any action necessary, at the CONTRACTOR’S discretion, to prevent threatened damage, injury or loss. Additional compensation or extension of time claimed by the CONTRACTOR on account of an emergency shall be determined as provided in Article 7.

10.3.2 ACCIDENT REPORTS

The CONTRACTOR shall promptly report in writing to the AGENCY ARCHITECT/ENGINEER all accidents arising out of or in connection with the work, which caused death, personal injury, or property damage, giving full details and statements of any witnesses. In addition, if death, serious personal injuries, or serious property damages are caused, the accident shall be reported immediately by telephone or messenger to the AGENCY ARCHITECT/ENGINEER.

10.4 HAZARDOUS MATERIALS

10.4.1 DISCOVERY OF HAZARDOUS MATERIALS

In the event the CONTRACTOR encounters or suspects the presence on the site material reasonably believed to be asbestos, polychlorinated biphenyl (“pcb”), or any other material defined as being hazardous by § 25249.5 of the California Health and Safety Code, which has not been rendered harmless, the CONTRACTOR shall immediately stop work in the area affected and report the condition to the AGENCY and the AGENCY ARCHITECT/ENGINEER in writing, whether or not such material was generated by the CONTRACTOR or the AGENCY. The work in the affected area
shall not thereafter be resumed, except by written agreement of the AGENCY and the CONTRACTOR, if in fact the material is asbestos, polychlorinated biphenyl (pcb) or other hazardous material, and has not been rendered harmless. The work in the affected area shall be resumed only in the absence of asbestos, polychlorinated biphenyl (pcb) or other hazardous material, or when it has been rendered harmless by written agreement of the AGENCY and the CONTRACTOR.

10.4.2 HAZARDOUS MATERIAL WORK LIMITATIONS

In the event that the presence of hazardous materials is suspected or discovered on the site, the AGENCY shall retain an independent testing laboratory to determine the nature of the material encountered and whether corrective measures or remedial action is required. The CONTRACTOR shall not be required pursuant to Article 7 to perform without consent any work in the affected area of the site relating to asbestos, polychlorinated biphenyl (pcb), or other hazardous material, until any known or suspected hazardous material has been removed, or rendered harmless, or determined to be harmless by AGENCY, as certified by an independent testing laboratory and/or approved by the appropriate government agency.

10.4.3 INDEMNIFICATION BY FOR HAZARDOUS MATERIAL NOT CAUSED BY CONTRACTOR

In the event the presence of hazardous materials on the project site is not caused by the CONTRACTOR, AGENCY shall pay for all costs of testing and remediation, if any. In addition, AGENCY shall defend, indemnify and hold harmless the CONTRACTOR and its agents, officers, directors and employees from and against any and all claims, damages, losses, costs and expenses incurred in connection with, or arising out of, or relating to the performance of the work in the area affected by the hazardous material.

10.4.4 INDEMNIFICATION BY CONTRACTOR FOR HAZARDOUS MATERIAL CAUSED BY CONTRACTOR

In the event the hazardous materials on the Project site is caused by the CONTRACTOR, the CONTRACTOR shall pay for all costs of testing and remediation, if any, and shall compensate the AGENCY for any additional costs incurred as a result of CONTRACTOR’s generation of hazardous material on the Project site. In addition, the CONTRACTOR shall defend, indemnify and hold harmless the AGENCY and its agents, officers, and employees from and against any and all claims, damages, losses, costs and expenses incurred in connection with, arising out of or relating to, the presence of hazardous material on the Project site.

10.4.5 TERMS OF HAZARDOUS MATERIAL PROVISION

The terms of this hazardous material provision shall survive the completion of the work and/or any termination of this contract.

ARTICLE 11

INSURANCE AND BONDS

11.1 CONTRACTOR’S LIABILITY INSURANCE

11.1.1 INSURANCE REQUIREMENTS

Before the commencement of the work, the CONTRACTOR shall purchase from and maintain, in a company or companies lawfully authorized by the State of California, Department of Insurance, to do business in California either i) as admitted carriers or ii) as approved for the List of Eligible Surplus Line Insurers (“LESLI”), insurance as set forth under this Article 11 and as amended by the
General Project Requirements. For Liability and Workers’ Compensation insurance, the insurance provider must also have an A.M. Best Rating of A VIII. The insurance shall protect the CONTRACTOR and AGENCY from claims set forth below, which may arise out of or result from the CONTRACTOR’s operations under the contract and for which the CONTRACTOR may be legally liable, whether such operations are by the CONTRACTOR, by a subcontractor, by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:

A. Claims for damages because of bodily injury, sickness, disease, or death of any person other than the CONTRACTOR’s employees;
B. Claims for damages insured by usual personal injury liability coverage, which are sustained by a person as a result of an offense directly or indirectly related to employment of such person by the CONTRACTOR or by another person;
C. Claims for damages because of injury or destruction of tangible property, including loss of use resulting there from, arising from operations under the contract documents;
D. Claims for damages because of bodily injury, death of a person, or property damage arising out of the ownership, maintenance, or use of a motor vehicle, all mobile equipment, and vehicles moving under their own power and engaged in the work;
E. Claims involving blanket contractual liability applicable to the CONTRACTOR’s obligations under the contract documents, including liability assumed by and the indemnity and defense obligations of the CONTRACTOR and the subcontractors; and claims involving completed operations, independent Contractors’ coverage, and broad form property damage, without any exclusions for collapse, explosion, demolition, underground coverage, or excavating.

F. Insurance Limits

1. CONTRACTOR’s Liability Insurance
   a. Worker’s Compensation
      State: California Statutory
      Voluntary Compensation Same as State Workers
      (by any exempt entities): Compensation
      Employer’s Liability Statutory
      Benefits required by union $1,000,000.00 Each accident
      labor contracts: As applicable
   b. General Liability Insurance covering all operations performed by or on behalf of the CONTRACTOR providing coverage for bodily injury and property damage with limits of not less than the amounts set forth below per occurrence (can be combined single limit (CSL). The policy coverage shall include (i) premises operations and mobile equipment, (ii) products and completed operations, (iii) broad form property damage (including completed operations), (iv) explosion, collapse and underground hazards, (v) personal injury, and (vi) contractual liability.
      1. Bodily Injury:
         $ 1,000,000.00 Each Occurrence
         $ 2,000,000.00 Aggregate
         Or such great amounts as specified in the Agreement
      2. Property Damage:
         $ 1,000,000.00 Each Occurrence
         $ 2,000,000.00 Aggregate
Or such great amounts as specified in the Agreement

3. Products and Completed Operations Insurance shall be maintained for a minimum period of one (1) year after final payment and the CONTRACTOR shall continue to provide evidence of such coverage to the AGENCY on an annual basis during the aforementioned period.

4. Property Damage Liability Insurance shall include coverage for the following hazards:

X X (Explosion)
X C (Collapse)
X U (Underground)

5. Contractual Liability (Hold Harmless Coverage): Include in CSL Form

a. Bodily Injury:

$ 1,000,000.00 Each Occurrence
$ 2,000,000.00 Aggregate

Or such great amounts as specified in the Agreement

b. Property Damage:

$ 1,000,000.00 Each Occurrence
$ 2,000,000.00 Aggregate

Or such great amounts as specified in the Agreement

6. Personal Injury (with Employment Exclusion deleted, if applicable):

$1,000,000.00 per occurrence
Aggregate subject to CSL Aggregate

7. If the General Liability policy includes a General Aggregate, such General Aggregate shall be not less than $2,000,000.00. Policy shall be endorsed to have General Aggregate apply to this Project only: No

If CONTRACTOR's Contract (Total Bid Price) is expected to be more than $500,000.00, the following excess liability coverage is required:

a. Umbrella Excess Liability:

$ 2,000,000.00 (or such greater amount as provided in the Agreement) over primary insurance

$ 10,000.00 Retention

b. Automobile Liability (owned, non-owned, hired):

1. Bodily Injury: $1,000,000.00 CSL

$ 1,000,000.00 Each Person
$ 1,000,000.00 Each Accident
2. Property Damage:

$1,000,000.00 Each Occurrence

11.1.2 PUBLIC LIABILITY AND PROPERTY DAMAGE INSURANCE

11.1.2.1 CONTRACTOR’s Responsibility. CONTRACTOR shall take out and maintain during the life of this Agreement such public liability and property damage insurance as shall protect CONTRACTOR and AGENCY from all claims for personal injury, including accidental death, to any person (including, as to AGENCY, injury or death to CONTRACTOR’S or subcontractor’s employees), as well as from all claims for property damage arising from operations under this Agreement, in amounts as set forth in the General Project Requirements and stated in the Agreement.

11.1.2.2 Proof of Insurance. CONTRACTOR shall submit proof of insurance and shall provide certificates and endorsements for AGENCY approval. Such endorsements shall be submitted concurrently with the Project documents.

11.1.3 SUBCONTRACTOR INSURANCE REQUIREMENTS

The CONTRACTOR shall either include subcontractors of all tiers as insureds under its policies or the CONTRACTOR shall furnish separate certificates and endorsements for each subcontractor of all tiers to the AGENCY for review and approval. A “claims made” or modified “occurrence” policy shall not satisfy the requirements of paragraphs 11.1.1 or 11.1.2.

11.1.4 ADDITIONAL INSURED ENDORSEMENT REQUIREMENTS

The CONTRACTOR shall name, on any policy of insurance required under paragraphs 11.1.1 and 11.1.2, the AGENCY, as additional insured. Subcontractors of all tiers shall name the CONTRACTOR, the AGENCY as additional insured. The additional insured endorsement included on all such insurance policies shall state that the coverage is afforded the additional insured with respect to claims arising out of operations performed by or on behalf of the insured. If the additional insureds have other insurance which is applicable to the loss, such other insurance shall be on an excess or contingent basis. The amount of the insurer’s liability shall not be reduced by the existence of such other insurance.

11.2 WORKERS’ COMPENSATION INSURANCE

During the term of this contract, the CONTRACTOR shall provide workers’ compensation insurance for all of the CONTRACTORS employees engaged in work under this contract on or at the site of the Project and, in case any of the CONTRACTOR’s work is sublet, the CONTRACTOR shall require subcontractors of all tiers to provide workers’ compensation insurance for all the subcontractor’s employees engaged in work under the subcontract. Any class of employee or employees not covered by a subcontractor’s insurance shall be covered by the CONTRACTOR’s insurance. In case any class of employees engaged in work under this contract on or at the site of the Project is not protected under the workers compensation laws, the CONTRACTOR shall provide or cause a subcontractor to provide adequate insurance coverage for the protection of those employees not otherwise protected. The CONTRACTOR shall file with the AGENCY certificates of insurance as required under paragraph 11.5 and in compliance with Labor Code § 3700.

11.3 BUILDER’S RISK “ALL RISK” INSURANCE

11.3.1 COURSE OF CONSTRUCTION INSURANCE REQUIREMENTS
AGENCY is to provide coverage in the amount of the full value of the project for losses due to fire, vandalism and theft with a maximum deductible of five thousand dollars ($5,000) per loss. Each CONTRACTOR is responsible for a share of the deductible proportionate to its portion of the total loss. Any portions of CONTRACTOR’S work and materials stored offsite are not to be covered under such insurance. In addition, CONTRACTOR is required to provide evidence that stored materials are covered under a separate policy. Property and equipment owned by CONTRACTOR or others which are not to be installed in the project are not afforded coverage by the AGENCY’s insurance. The CONTRACTOR shall be responsible for the securing and maintaining of fire insurance and other insurance on any tool, equipment, or supplies which are expected to remain its property. Coverage under the AGENCY’s policy is not construed to extend to earthquake, flood, pollution, and other commonly excluded perils.

11.3.2 CONSENT OF INSURER FOR PARTIAL OCCUPANCY OR USE

Partial occupancy or use in accordance with Article 9 shall not commence until the insurance company providing property insurance has consented to such partial occupancy or use by endorsement or otherwise. The AGENCY and the CONTRACTOR shall take reasonable steps to obtain consent of the insurance company and shall not, without mutual consent, take any action with respect to partial occupancy or use that would cause cancellation, lapse, or reduction of the insurance.

11.4 OTHER INSURANCE

The CONTRACTOR shall provide all other insurance required to be maintained under applicable laws, ordinances, rules, regulations, or other conditions of the Contract between the AGENCY and the CONTRACTOR.

11.5 PROOF OF CARRIAGE OF INSURANCE

The CONTRACTOR shall not commence work nor shall it allow any subcontractor to commence work under this contract until all required insurance, certificates, and additional insured endorsements have been delivered in duplicate to the AGENCY for approval subject to the following requirements:

A. Certificates of insurance shall state in particular those insured, the type of insurance, limits of liability, location and operation to which the insurance applies, the expiration date, and cancellation and reduction notices, and shall provide that such insurance shall not be terminated or expire without thirty (30) days written notice to the AGENCY.

B. Certificates of insurance shall clearly state that the AGENCY is named as additional insured under the General Liability policy described in the certificate, using an additional insured endorsement certificate or another form with similar language, and that such insurance policy shall be primary and non-contributory to any insurance or self-insurance maintained by the AGENCY. The CONTRACTOR and its subcontractors (whereas separate policies are provided) shall submit the appropriate certificates of insurance along with the additional insured endorsement for the AGENCY’S approval.

C. CONTRACTOR and its subcontractors of all tiers (whereas separate policies are provided) shall also include an endorsement to the Commercial General Liability policy which states that the General Liability Aggregate Limit is specifically designated to this construction project.

D. The CONTRACTOR and its subcontractors of all tiers (whereas separate policies are provided) shall provide a certified copy of any insurance policy required under this section upon written request of the AGENCY.
11.6 COMPLIANCE

In the event of the failure of any CONTRACTOR to furnish and maintain any insurance required by this Article 11, the CONTRACTOR shall be in default under the contract and AGENCY has the right but not the obligation or duty to cancel the contract or obtain insurance if it deems necessary and any premiums paid by the AGENCY will be promptly reimbursed by the CONTRACTOR or AGENCY’s payments to the CONTRACTOR will be reduced to pay for AGENCY’s purchased insurance. Compliance by CONTRACTOR with the requirement to carry insurance and furnish certificates or policies evidencing the same shall not relieve the CONTRACTOR from liability assumed under any provision of the contract documents, including, without limitation, the obligation to defend and indemnify and hold harmless the AGENCY and the AGENCY ARCHITECT/ENGINEER.

11.7 PERFORMANCE AND PAYMENT BONDS

11.7.1 BOND REQUIREMENTS

Unless otherwise specified in the General Project Requirements, prior to commencing any portion of the work, the CONTRACTOR shall apply for and furnish separate payment and performance bonds for its portion of the work which shall cover 100% faithful performance of and payment of all obligations arising under the contract documents and/or guaranteeing the payment in full of all claims for labor performed and materials supplied for the work.

To the extent, if any, that the contract price is increased in accordance with the contract documents, the amount of the bonds provided by the CONTRACTOR shall be increased automatically and accordingly and the CONTRACTOR shall promptly deliver satisfactory evidence of such increase to the AGENCY. To the extent available, the bonds shall further provide that no change or alteration of the contract documents (including, without limitation, an increase in the contract price, as referred to above), extensions of time, or modifications of the time, terms, or conditions of payment to the CONTRACTOR will release the surety. If the CONTRACTOR fails to furnish the required bond, the AGENCY may terminate the contract for cause.

11.7.2 SURETY QUALIFICATION

Only bonds executed by admitted surety insurers as defined in Code of Civil Procedure § 995.120 shall be accepted. Surety must be a California-admitted surety and listed by the U. S. Treasury with a bonding capacity in excess of the Project cost.

11.8 WAIVER OF SUBROGATION RIGHTS.

The CONTRACTOR shall require the carriers of required coverages to waive all rights of subrogation against the AGENCY and its officers, employees, agents, volunteers, contractors and subcontractors. All general or auto liability insurance coverage provided shall not prohibit the CONTRACTOR and CONTRACTOR’S employees or agents from waiving the right of subrogation prior to a loss or claim. The CONTRACTOR hereby waives all rights of subrogation against the AGENCY.

ARTICLE 12

UNCOVERING AND CORRECTION OF WORK

12.1 UNCOVERING OF WORK

12.1.1 UNCOVERING WORK FOR REQUIRED INSPECTIONS
If a portion of the work is covered contrary to the inspector’s request, the AGENCY ARCHITECT/ENGINEER’s request, or to requirements specifically expressed in the contract documents, it must, if required in writing by the inspector or the AGENCY ARCHITECT/ENGINEER, be uncovered for the inspector’s or the AGENCY ARCHITECT/ENGINEER’s observation and be replaced at the CONTRACTOR’s expense without change in the contract sum or time.

12.1.2 COSTS FOR INSPECTIONS NOT REQUIRED

If a portion of the work has been covered which the inspector or the AGENCY ARCHITECT/ENGINEER has not specifically requested to observe prior to its being covered, the inspector or the AGENCY ARCHITECT/ENGINEER may request to see such work, and it shall be uncovered by the CONTRACTOR. If such work is in accordance with the contract documents, costs of uncovering and replacement shall, by appropriate change order, be charged to the AGENCY. If such work is not in accordance with the contract documents, the CONTRACTOR shall pay such costs unless the condition was caused by the AGENCY or a separate CONTRACTOR, in which event the AGENCY shall be responsible for payment of such costs to the CONTRACTOR.

12.2 CORRECTION OF WORK

12.2.1 CORRECTION OF REJECTED WORK

The CONTRACTOR shall promptly correct the work rejected by the inspector or the AGENCY upon recommendation of the AGENCY ARCHITECT/ENGINEER or failing to conform to the requirements of the contract documents, whether observed before or after completion and whether or not fabricated, installed or completed. The CONTRACTOR shall bear the costs of correcting the rejected work, including additional testing, inspections and compensation for the inspector’s or the AGENCY ARCHITECT/ENGINEER’s services and expenses made necessary thereby.

12.2.2 ONE YEAR WARRANTY CORRECTIONS

If, within one (1) year after the date of AGENCY’s acceptance of the work as complete under paragraph 9.9.1 or a designated portion thereof, or by terms of an applicable special warranty required by the Contract documents, any of the work is found to be not in accordance with the requirements of the contract documents, the CONTRACTOR shall correct it promptly after receipt of written notice from the AGENCY to do so unless the AGENCY has previously given the CONTRACTOR a written acceptance of such condition. This period of one (1) year shall be extended with respect to portions of the work first performed after completion by the period of time between completion and the actual performance of the work. This obligation under this Section 12.2.2 shall survive acceptance of the work under the contract and termination of the contract. The AGENCY shall give such notice promptly after discovery of the condition.

12.2.3 REMOVAL OF NONCONFORMING WORK

The CONTRACTOR shall remove from the site portions of the work, which are not in accordance with the requirements of the contract documents and are not corrected by the CONTRACTOR or accepted by the AGENCY.

12.2.4 AGENCY’S RIGHTS IF CONTRACTOR FAILS TO CORRECT

If the CONTRACTOR fails to correct nonconforming work within a reasonable time, the AGENCY may correct it in accordance with paragraph 2.4.1. In addition, if the CONTRACTOR does not proceed with correction of such nonconforming work within the time fixed by written notice from the inspector, and the AGENCY may remove it and store the salvageable materials or equipment at the CONTRACTOR’s expense. If the CONTRACTOR does not pay costs of such removal and storage within ten (10) calendar days after written notice, the AGENCY may, upon ten (10) additional calendar days written notice, sell such material or equipment at auction or at private sale and shall account for the proceeds thereof, after deducting costs and damages that should have
been borne by the CONTRACTOR, including compensation for the AGENCY ARCHITECT/ENGINEER’s services and expenses made necessary thereby. If such proceeds of sale do not cover costs, which the CONTRACTOR should have borne, the CONTRACTOR shall be invoiced for the deficiency. If payments then or thereafter due the CONTRACTOR are not sufficient to cover such amount, the CONTRACTOR shall pay the difference to the AGENCY.

In addition to work not in conformance, if the CONTRACTOR fails to perform the contractual scope of the CONTRACTOR’s work in conformance with the project schedule, and said failure to perform is detrimental to the project completion, the AGENCY reserves the right to complete the work in question upon written 48-hour notice of AGENCY’s intent to complete outstanding work. All costs incurred by such action will be deducted from the CONTRACTOR’s next progress payment. Should the remaining progress payment prove to be inadequate to cover the AGENCY’s costs incurred for completing the work, the AGENCY will look to the CONTRACTOR’s surety for all costs incurred. The AGENCY’s election to complete a portion of the CONTRACTOR’s work which is covering a project delay or damage to another CONTRACTOR shall not relieve the CONTRACTOR of the balance of the CONTRACTOR’s contractual obligations, and shall not be construed as termination of the contract unless specifically stated per the requirements of 14.2.2.

12.2.5 COST OF CORRECTING THE WORK

The CONTRACTOR shall bear the cost of correcting destroyed or damaged construction of the AGENCY or separate CONTRACTORs, whether completed or partially completed, caused by the CONTRACTOR’s correction or removal of the nonconforming work.

12.2.6 NO TIME LIMITATION

Nothing contained in this Article 12 shall be construed to establish a period of limitation with respect to other obligations, which the CONTRACTOR might have under the contract documents. Establishment of the time period of one (1) year as described in paragraph 12.2.2 relates only to the specific obligation of the CONTRACTOR to correct the work and has, for example, no relationship to the time within which the obligation to comply with the contract documents may be sought to be enforced, or to the time within which proceedings may be commenced to establish the CONTRACTOR’s liability with respect to the CONTRACTOR’s obligations other than specifically to correct the work.

12.3 ACCEPTANCE OF NONCONFORMING WORK

If it is found at any time before or after completion of the work that the CONTRACTOR has varied from the contract documents in materials, quality, form, finish or in the amount or value of the materials or labor used, the AGENCY ARCHITECT/ENGINEER shall make a recommendation: that all such improper work should be removed, remade and replaced; that all work disturbed by these changes be made good at the CONTRACTOR’s expense; and that the AGENCY deduct from any amount due CONTRACTOR that sum of money equivalent to the difference in value between the work performed and that called for by the drawings and specifications. The AGENCY ARCHITECT/ENGINEER shall determine such difference in value. The AGENCY, at its option, may pursue either course unless correction is required by law.

ARTICLE 13

MISCELLANEOUS PROVISIONS

13.1 GOVERNING LAW

The contract shall be governed by the laws of the State of California without regard to choice of laws with venue for any disputes in San Bernardino County, California.

13.2 NO ASSIGNMENT
The CONTRACTOR shall not assign, transfer, convey, sublet or otherwise dispose of this contract or of its rights, title or interest in or to the same or any part thereof. If the CONTRACTOR shall assign, transfer, convey, sublet or otherwise dispose of the contract or its right, title or interest therein, or any part thereof, such attempted or purported assignment, transfer, conveyance, sublease or other disposition shall be null, void and of no legal effect whatsoever; and the contract may, at the option of the AGENCY, be terminated, revoked and annulled, and the AGENCY shall thereupon be relieved and discharged from any and all liability and obligations growing out of the same to the CONTRACTOR and to its purported assignee or transferee.

13.3 **WRITTEN NOTICE**

In the absence of specific notice requirements in the contract documents, written notice shall be deemed to have been duly served if delivered in person to the individual, member of the firm or entity, or to an officer of the corporation for which it was intended, or if delivered at or sent by registered or certified mail to the last business address known to the party giving notice.

13.4 **RIGHTS AND REMEDIES**

13.4.1 **DUTIES AND OBLIGATIONS CUMULATIVE**

Duties and obligations imposed by the contract documents and rights and remedies available hereunder shall be in addition to and not a limitation of duties, obligations, rights and remedies otherwise imposed or available by law.

13.4.2 **NO WAIVER**

The lack of action or failure to act by the inspector, the AGENCY, the AGENCY ARCHITECT/ENGINEER or the CONTRACTOR to insist upon strict performance of any option herein conferred shall not constitute a waiver of a right or duty afforded them under the contract documents, nor shall such action or failure to act constitute approval of or acquiescence in a breach hereunder, except as may be specifically agreed in writing.

13.5 **TESTS AND INSPECTIONS**

13.5.1 **COMPLIANCE**

Tests, inspections and approvals of portions of the work required by the contract documents will comply with Title 24, Section 4335, and with all other laws, ordinances, rules, regulations or orders of public authorities having jurisdiction.

13.5.2 **INDEPENDENT TESTING LABORATORY**

The AGENCY will select and pay an independent testing laboratory to conduct all tests and inspections. Selection of the materials required to be tested shall be made by the laboratory or the AGENCY’s representative and not by the CONTRACTOR. Any costs or expenses of inspection or testing occurring outside of a one hundred (100) mile radius from the Project site or not located in a contiguous county to the site, whichever distance is greater, shall be paid for by the AGENCY, and deducted from the next progress payment.
13.5.3 ADVANCE NOTICE TO INSPECTOR

The CONTRACTOR shall notify the inspector of its readiness for observation or inspection at least two (2) working days in advance so that the inspector may arrange for same. The CONTRACTOR shall notify the inspector at least two (2) working days in advance of the manufacture of material to be supplied under the contract documents, which must, by terms of the contract documents, be tested in order that the inspector may arrange for the testing of the material at the source of supply.

13.5.4 TESTING OFF-SITE

Any material shipped by the CONTRACTOR from the source of supply, prior to having satisfactorily passed such testing and inspection or prior to the receipt of notice from said inspector that such testing and inspection will not be required, shall not be incorporated in the work.

13.5.5 ADDITIONAL TESTING OR INSPECTION

If the inspector, the AGENCY ARCHITECT/ENGINEER, the AGENCY, or public authority having jurisdiction determines that portions of the work require additional testing, inspection, or approval not included under paragraph 13.5.1, the inspector will, upon written authorization from the AGENCY, make arrangements for such additional testing, inspection, or approval. The AGENCY shall bear such costs except as provided in paragraph 13.5.6.

13.5.6 COSTS OF RETESTING

If such procedures for testing, inspection or approval under paragraphs 13.5.1 and 13.5.2 reveal failure of the portions of the work to comply with requirements established by the contract documents, the CONTRACTOR shall bear all costs arising from such failure, including those of re-testing, re-inspection, or re-approval, including, but not limited to, compensation for the AGENCY ARCHITECT/ENGINEER’s services and expenses. Any such costs shall be paid by the AGENCY, invoiced to the CONTRACTOR and deducted from the next progress payment.

13.5.7 COSTS FOR PREMATURE TEST

In the event the CONTRACTOR requests any test or inspection for the project and is not completely ready for the inspection, the CONTRACTOR shall be invoiced by the AGENCY for all costs and expenses resulting from that testing or inspection, including, but not limited to, the AGENCY ARCHITECT/ENGINEER’s fees and expenses and the amount of the invoice shall be deducted from the next progress payment.

13.5.8 TESTS OR INSPECTIONS NOT TO DELAY WORK

Tests or inspections conducted pursuant to the contract documents shall be made promptly to avoid unreasonable delay in the work.

13.6 INTEREST

Payments due and unpaid under the Contract shall bear interest from the date payment is due at such rate as the parties may agree upon in writing or, in the absence thereof, at the legal rate prevailing from time to time at the place where the project is located.

13.7 TRENCH EXCAVATION

13.7.1 TRENCHES GREATER THAN FIVE (5) FEET DEEP
Pursuant to Labor Code § 6705, if this contract involves the excavation of any trench or trenches five feet or more in depth, the CONTRACTOR shall, in advance of excavation, submit to the AGENCY or to whomever AGENCY designates a detailed plan showing the design or shoring, bracing, sloping or other provisions to be made for worker protection from the hazard of caving ground during the excavation of such trench or trenches. If such plan varies from the Shoring System Standards established by the Construction Safety Orders of the Division of Industrial Safety, the plan shall be prepared by a registered civil or structural engineer employed by the CONTRACTOR, and all costs therefore shall be included in the price named in the contract for completion of the work as set forth in the Project documents. In no case shall such plan be less effective than that required by the Construction Safety Orders. No excavation of such trench or trenches shall be commenced until said plan has been accepted by CAL-OSHA and a CAL-OSHA permit for such plan delivered to the AGENCY. (Labor Code § 6500; Health and Safety Code Section 17922.5).

13.7.2 TRENCHES GREATER THAN FOUR (4) FEET DEEP

If this contract involves the digging of trenches or excavations that extend deeper than four (4) feet below the surface, the following shall apply:

(1) The CONTRACTOR shall promptly, and before the following conditions are disturbed, notify the AGENCY, in writing, of any:

   (i) Material that the CONTRACTOR believes may be material that is hazardous waste, as defined in Section 25117 of the Health and Safety Code that is required to be removed to a Class I, Class II or Class III disposal site in accordance with provisions of existing law.

   (ii) Subsurface or latent physical conditions at the site different from those indicated by information about the site made available to bidders prior to the deadline for submitting bids.

   (iii) Unknown physical conditions at the site of any unusual nature, different materially from those ordinarily encountered and generally recognized as inherent in work of the character provided for in the contract.

13.7.3 CONTRACTOR’S RESPONSIBILITY FOR SHORING, BRACING AND SLOPING

Nothing in this Article shall relieve the CONTRACTOR of the full responsibility of providing shoring, bracing, sloping or other provisions adequate for worker protection.

(1) The AGENCY shall promptly investigate the conditions, and if it finds that the conditions do materially so differ or do involve hazardous waste, and cause a decrease or increase in the CONTRACTOR’s cost of, or the time required for, performance of any part of the work shall issue a change order under the procedures described in the Project documents.

(2) In the event a dispute arises between the Agency and the CONTRACTOR, whether the conditions materially differ or involve hazardous waste, or cause a decrease or increase in the CONTRACTOR’s cost of or time required for, performance of any part of the work, the CONTRACTOR shall not be excused from any scheduled completion date provided for by the Project documents, but shall proceed with all the work to be performed under the Project documents. The CONTRACTOR shall retain any and all rights provided either by contract or by law, which pertain to the resolution of disputes and protests between the contracting parties. (Public Contract Code section 7104.)

13.7.4 NO TORT LIABILITY OF
Pursuant to Labor Code § 6705, nothing in this Article shall impose tort liability upon the AGENCY or any of its employees.

13.7.5 NO EXCAVATION WITHOUT PERMITS

The CONTRACTOR shall not commence any excavation work until it has secured all necessary permits including the required CAL OSHA excavation/shoring permit. Any permits shall be prominently displayed on the site prior to the commencement of any excavation.

13.8 WAGE RATES, TRAVEL AND SUBSISTENCE

13.8.1 WAGE RATES

Pursuant to the provisions of Article 2 (commencing at § 1720), Chapter 1, Part 7, Division 2, of the Labor Code, the governing board of the AGENCY has obtained the general prevailing rate of per diem wages and the general prevailing rate for holiday and overtime work in the locality in which this public work is to be performed for each craft, classification, or type of worker needed for this Project from the Director of the Department of Industrial Relations (“Director”). These rates are on file with the Clerk of the AGENCY’s governing board, and copies will be made available to any interested party on request. The CONTRACTOR shall post a copy of such wage rates at the site.

Any worker employed to perform work on the Project and such work is not covered by any classification listed in the published general prevailing wage rate determinations or per diem wages determined by the Director of the Department of Industrial Relations shall be paid not less than the minimum rate of wages specified therein for the classification which most nearly corresponds to the employment of such person in such classification.

13.8.2 HOLIDAY AND OVERTIME PAY

Holiday and overtime work, when permitted by law, shall be paid for at the rate set forth in the prevailing wage rate determinations issued by the Director of the Department of Industrial Relations or at least one and one-half (1-1/2) times the specified basic rate of per diem wages, plus employer payments, unless otherwise specified in the Contract Documents or authorized by law.

Holidays shall be defined in the Collective Bargaining Agreement applicable to each particular craft, classification, or type of worker employed.

13.8.3 WAGE RATES NOT AFFECTED BY SUBCONTRACTS

The CONTRACTOR shall pay and shall cause to be paid each worker engaged in work on the Project not less than the general prevailing rate of per diem wages, pursuant to Labor Code § 1773.2, determined by the Director, regardless of any contractual relationship which may be alleged to exist between the CONTRACTOR or any subcontractor and such workers.

13.8.4 TRAVEL AND SUBSISTENCE

The CONTRACTOR shall pay and shall cause to be paid to each worker needed to execute the work on the Project travel and subsistence payments, as such travel and subsistence payments are defined in the applicable Collective Bargaining Agreements filed with the Department of Industrial Relations in accordance with Labor Code § 1773.8.

13.8.5 CHANGE IN PREVAILING WAGE DURING BID OR CONSTRUCTION

If during the period this bid is required to remain open, the Director of Industrial Relations determines that there has been a change in any prevailing rate of per diem wages in the locality in which this public work is to be performed, such change shall not alter the wage rates in the Notice.
Calling for Bids or the contract subsequently awarded. However, should a scheduled change occur during the period the bid to remain open in accordance with what is known as a double asterisk determination, the new wage rates shall supersede those rates contained in the Notice Calling for Bids and shall be incorporated in the contract subsequently awarded.

13.8.6 FORFEITURE AND PAYMENTS

Pursuant to Labor Code § 1775, the CONTRACTOR shall forfeit to the Agency, not more than Two Hundred Dollars ($200.00) for each calendar day, or portion thereof, for each worker paid less than the prevailing wages rates as determined by the Director of the Department of Industrial Relations, for the work or craft in which the worker is employed for any Work done under the Agreement by the CONTRACTOR or by any Subcontractor under it. The amount of the penalty shall be determined by the Labor Commissioner and shall be based on consideration of: (1) whether the CONTRACTOR or Subcontractor's failure to pay the correct rate of per diem wages was a good faith mistake and, if so, the error was promptly and voluntarily correct upon being brought to the attention of the CONTRACTOR or Subcontractor; and (2) whether the Trade CONTRACTOR or Subcontractor has a prior record of failing to meet its prevailing wage obligations.

13.8.7 MINIMUM WAGE RATES

Any worker employed to perform work on the Project, which work is not covered by any craft or classification listed in the general prevailing rate of per diem wages determined by the Director, shall be paid not less than the minimum rate of wages specified therein for the craft or classification which most nearly corresponds to the Work to be performed by them, and such minimum wage rate shall be retroactive to time of initial employment of such person in such craft or classification.

13.8.8 PER DIEM WAGES

Pursuant to Labor Code § 1773.1, per diem wages are deemed to include employer payments for health and welfare, pension, vacation, travel time, and subsistence pay as provided for in Labor Code § 1773.8.

13.8.9 POSTING OF WAGE RATES

The CONTRACTOR shall post at appropriate conspicuous points on the site, a schedule showing all determined minimum wage rates and all authorized deductions, if any, from unpaid wages actually earned.

13.9 RECORDS OF WAGES PAID: INSPECTION

13.9.1 PAYROLL RECORDS.

(a) Pursuant to § 1776 of the Labor Code, each CONTRACTOR and Subcontractor shall keep an accurate payroll record showing the name, address, social security number, work classification and straight time and overtime hours worked each day and week and the actual per diem wages paid to each journeyman, apprentice, worker or other employee employed by him or her in connection with the Project.

(b) All payroll records shall be certified and submitted to the AGENCY upon request or if so instructed by AGENCY with each application for payment. All payroll records shall be available for inspection at all reasonable hours at the principal office of the CONTRACTOR on the following basis:

(1) A certified copy of an employee's payroll record shall be made available for inspection or furnished to the employee or his or her authorized representative on request.
(2) A certified copy of all payroll records shall be made available for inspection or furnished upon request to a representative of AGENCY, the Division of Labor Standards Enforcement and the Division of Apprenticeship Standards of the Department of Industrial Relations.

(3) A certified copy of all payroll records shall be made available upon request by the public for inspection or for copies thereof. However, a request by the public shall be made through the AGENCY, the Division of Apprenticeship Standards of the Division of Labor Standards Enforcement. If the requested payroll records have not been provided pursuant to Paragraph (2) above, the requesting party shall, prior to being provided the records, reimburse the costs of the preparation by the CONTRACTOR, Subcontractors, and the entity through which the request was made. The public shall not be given access to such records at the principal office of the CONTRACTOR.

(c) Unless required to be furnished directly to the Labor Commissioner in accordance with paragraph (3) of subdivision (a) of Section 1771.4 the certified payroll records shall be on forms provided by the Division of Labor Standards Enforcement or shall contain the same information as the forms provided by the Division.

(d) The CONTRACTOR or Subcontractor(s) shall file a certified copy of all payroll records with the entity that requested such records within ten (10) days after receipt of a written request.

(e) Except as provided in subdivision (f), any copy of records made available for inspection as copies and furnished upon request to the public or any public agency by the AGENCY or the Division of Labor Standards Enforcement shall be marked or obliterated to prevent disclosure of an individual's name, address, and social security number. The name and address of the contractor awarded the contract or the subcontractor performing the contract shall not be marked or obliterated. Any copy of records made available for inspection by, or furnished to, a multimultiemployer Taft-Hartley trust fund (29 U.S.C. Sec. 186(c)(5)) that requests the records for the purposes of allocating contributions to participants shall be marked or obliterated only to prevent disclosure of an individual's full social security number, but shall provide the last four digits of the social security number. 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 (29 U.S.C. Sec. 175a) shall be marked or obliterated only to prevent disclosure of an individual's social security number.

(f)(1) Notwithstanding any other provision of law, agencies that are included in the Joint Enforcement Strike Force on the Underground Economy established pursuant to Section 329 of the Unemployment Insurance Code and other law enforcement agencies investigating violations of law shall, upon request, be provided nonredacted copies of certified payroll records. Any copies of records or certified payroll made available for inspection and furnished upon request to the public by an agency included in the Joint Enforcement Strike Force on the Underground Economy or to a law enforcement agency investigating a violation of law shall be marked or redacted to prevent disclosure of an individual's name, address, and social security number.

(2) An employer shall not be liable for damages in a civil action for any reasonable act or omission taken in good faith in compliance with this subdivision.

(g) The CONTRACTOR shall inform the AGENCY of the location of all payroll records, including the street address, city and county, and shall, within five (5) working days, provide a notice of a change of location and address.

(h) The CONTRACTOR or Subcontractor(s) shall have ten (10) days in which to comply subsequent to receipt of a written notice requesting payroll records. In the event that the CONTRACTOR or Subcontractor(s) fails to comply within the ten (10) day period, the
CONTRACTOR or Subcontractor(s) shall, as a penalty to the AGENCY, forfeit One Hundred Dollars ($100.00) for each calendar day, or portion thereof, for each worker, until strict compliance is effectuated. Upon the request of the Division of Apprenticeship Standards or the Division of Labor Standards Enforcement, these penalties shall be withheld from progress payments then due. The CONTRACTOR is not subject to a penalty due to the failure of a Subcontractor to comply with this section.

The responsibility for compliance with this Article shall rest upon the Trade CONTRACTOR.

13.9.2 WITHHOLDING OF CONTRACT PAYMENTS & PENALTIES.

The Agency may withhold or delay contract payments to the CONTRACTOR and/or any Subcontractor if:

(a) The required prevailing rate of per diem wages determined by the Director of the Department of Industrial Relations is not paid to all workers employed on the Project; or

(b) The CONTRACTOR or Subcontractor(s) fail to submit all required certified payroll records with each application for payment; or

(c) The CONTRACTOR or Subcontractor(s) submit incomplete or inadequate payroll records; or

(d) The CONTRACTOR or Subcontractor(s) fail to comply with the Labor Code requirements concerning apprentices; or

(e) The CONTRACTOR or Subcontractor(s) fail to comply with any applicable state laws governing labor on public works projects.

13.10 APPRENTICES

13.10.1 GOVERNED BY LABOR CODE § 1777.5

The CONTRACTOR acknowledges and agrees that, if this Agreement involves a dollar amount greater than or a number of working days greater than that specified in Labor Code Section 1777.5, this Agreement is governed by the provisions of Labor Code Section 1777.5. It shall be the responsibility of the CONTRACTOR to ensure compliance with this Article 13.10 and with Labor Code Section 1777.5 for all apprenticing occupations.

13.10.2 EMPLOYMENT OF APPRENTICES

Apprentices of any crafts or trades may be employed and, when required by Labor Code Section 1777.5, shall be employed provided they are properly registered in full compliance with the provisions of the Labor Code.

13.10.3 APPRENTICE WAGES AND DEFINITIONS

All apprentices employed by the CONTRACTOR to perform services under the Contract shall be paid the standard wage paid to apprentices under the regulations of the craft or trade at which he or she is employed, and shall be employed only at the work or the craft or trade to which he or she is registered. Only apprentices, as defined in § 3077 of the Labor Code, who are in training under apprenticeship standards and written apprenticeship agreements under Chapter 4 (commencing with § 3070) of division 3, are eligible to be employed under this contract. The employment and training of each apprentice shall be in accordance with the apprenticeship standards and apprentice agreements under which he or she is training.
13.10.4  APPRENTICE LABOR POOL

When the CONTRACTOR to whom the contract is awarded by the AGENCY or any subcontractor under him or her, in performing any of the work under the contract or subcontract, employs workers in any apprentice able craft or trade, the CONTRACTOR and subcontractor shall apply to the joint apprenticeship committee administering the apprenticeship standards of the craft or trade in the area of the site of the Project, for a certificate approving the CONTRACTOR or as subcontractor under the apprenticeship standards for the employment and training of apprentices in the area or industry affected. However, approval as established by the joint apprenticeship committee or committees shall be subject to the approval of the Administrator of Apprenticeship. The joint apprenticeship committee or committees, subsequent to approving the subject CONTRACTOR or subcontractor, shall arrange for the dispatch of apprentices to the CONTRACTOR or subcontractor in order to comply with this section. Every CONTRACTOR and subcontractor shall submit the contract award information to the applicable joint apprenticeship committee, which shall include an estimate of journeyman hours to be performed under the contract, the number of apprentices to be employed, and the approximate dates the apprentices will be employed.

There shall be an affirmative duty upon the joint apprenticeship committee or committees administering the apprenticeship standards of the crafts or trade in the area of the public work, to ensure equal employment and affirmative action and apprenticeship for women and minorities. CONTRACTORS or subcontractors shall not be required to submit individual applications for approval to local joint apprenticeship committees provided they are already covered by the local apprenticeship standards. The ratio of work performed by apprentices to journeymen, who shall be employed in the craft or trade on the Project, may be the ratio stipulated in the apprenticeship standards under which the joint apprenticeship committee operates, but, except as otherwise provided in this section, in no case shall the ratio be less than one (1) hour of apprentice work for every five (5) hours of labor performed by a journeyman. However, the minimum ratio for the land surveyor classification shall not be less than one (1) apprentice for each five (5) journeymen.

13.10.5  JOURNEYMAN/APPRENTICE RATIO; COMPUTATION OF HOURS

Any ratio shall apply during any day or portion of a day when any journeyman or the higher standard stipulated by the joint apprenticeship committee, is employed at the job site and shall be computed on the basis of the hours worked during the day by journeymen so employed, except for the land surveyor classification. The CONTRACTOR shall employ apprentices for the number of hours computed as above before the end of the contract. However, the CONTRACTOR shall endeavor, to the greatest extent possible, to employ apprentices during the same time period that the journeymen in the same craft or trade are employed at the job site. Where an hourly apprenticeship ratio is not feasible for a particular craft or trade, the Division of Apprenticeship Standards, upon application of a joint apprenticeship committee, may order a minimum ratio of not less than one (1) apprentice for each five (5) journeymen in a craft or trade classification.

13.10.6  JOURNEYMAN/APPRENTICE RATIO

The CONTRACTOR or subcontractor, if he or she is covered by this section upon the issuance of the approval certificate, or if he or she has been previously approved in the craft or trade, shall employ the number of apprentices or the ratio of apprentices to journeymen stipulated in the apprenticeship standards. Upon proper showing by the CONTRACTOR that he or she employs apprentices in the craft or trade in the state on all of his or her contracts on an annual average of not less than one (1) hour of apprentice work for every five (5) hours of labor performed by a journeyman in the land surveyor classification, the division of Apprenticeship Standards may grant a certificate exempting the CONTRACTOR from the 1-to-5 hourly ratio as set forth in this section. This section shall not apply to contracts of general CONTRACTORS or to contracts of specialty CONTRACTORS not bidding for work through a general or prime CONTRACTOR, when the contracts of general CONTRACTORS or those specialty CONTRACTORS involve less than Thirty Thousand Dollars ($30,000.00) or twenty (20)
working days. Any work performed by a journeyman in excess of eight (8) hours per day or forty (40) hours per week shall not be used to calculate the hourly ratio required by this section.

13.10.6.1 **APPRENTICEABLE CRAFT OR TRADE**

“Apprenticeable craft or trade” as used in this Article means a craft or trade determined as an apprenticeable occupation in accordance with the rules and regulations prescribed by the Apprenticeship Council. The joint apprenticeship committee shall have the discretion to grant a certificate, which shall be subject to the approval of the Administrator of Apprenticeship, exempting a CONTRACTOR from the 1-to-5 ratio set forth in this Article when it finds that any one of the following conditions is met:

A. Unemployment for the previous three-month period in the area exceeds an average of fifteen percent (15%).

B. The number of apprentices in training in such area exceeds a ratio of 1-to-5.

C. There is a showing that the apprenticeable craft or trade is replacing at least one-thirtieth (1/30) of its journeymen annually through the apprenticeship training, either on a statewide basis or on a local basis.

D. Assignment of an apprentice to any work performed under this contract would create a condition which would jeopardize his or her life or the life, safety or property of fellow employees or the public at large or if the specific task to which the apprentice is to be assigned is of such a nature that training cannot be provided by a journeyman.

13.10.7 **RATIO EXEMPTION**

When exemptions are granted to an organization which represents CONTRACTORs in a specific trade from the 1-to-5 ratio on a local or statewide basis, the member CONTRACTORS will not be required to submit individual applications for approval to local joint apprenticeship committees, if they are already covered by the local apprenticeship standards.

13.10.8 **APPRENTICE FUND**

A CONTRACTOR to whom the contract is awarded or any subcontractor who, in performing any of the work under the contract, employs journeymen or apprentices in any apprenticeable craft or trade and who is not contributing to a fund or funds to administer and conduct the apprenticeship program in any such craft or trade in the area of the site of the Project, to which fund or funds other CONTRACTORS in the area of the site of the Project are contributing, shall contribute to the fund or funds in each craft or trade in which he or she employs journeymen or apprentices on the Project in the same amount or upon the same basis and in the same manner as the other CONTRACTORS do, but where the trust fund administrators are unable to accept the funds, CONTRACTORS not signatory to the trust agreement shall pay a like amount to the California Apprenticeship Council. The CONTRACTOR or subcontractor may add the amount of the contributions in computing his or her bid for the contract. The Division of Labor Standards Enforcement is authorized to enforce the payment of the contributions to the fund or funds as set forth in the Labor Code § 227.

13.10.9 **PRIME CONTRACTOR COMPLIANCE**

The responsibility of compliance with Article 13.10 and § 1777.5 of the Labor Code for all apprenticeable occupations is with the Prime CONTRACTOR.

13.10.10 **DECISIONS OF JOINT APPRENTICESHIP COMMITTEE**

All decisions of the joint apprenticeship committee under this paragraph 13.10 and Labor Code § 1777.5 are subject to Labor Code § 3081.
13.10.11 **NO BIAS**

It shall be unlawful for an employer or a labor union to refuse to accept otherwise qualified employees as registered apprentices on any public works on the grounds of race, religious creed, color, national origin, ancestry, sex or age, except as provided in the Labor Code § 3077.

13.10.12 **VIOLATION OF LABOR CODE**

Pursuant to portions of Labor Code § 1777.7, in the event a CONTRACTOR or subcontractor willfully fails to comply with the provisions of this Article 13.10 and Labor Code § 1777.5:

“(a) . . . the Chief of the Division of Apprenticeship Standards shall deny to the CONTRACTOR or subcontractor and its responsible officers the right to bid on, or to receive, any public works contract for a period of up to one year for the first violation and for a period of up to three years for the second and subsequent violations. Each period of debarment shall run from the date the determination of non-compliance by the Chief of the Division of Apprenticeship Standards becomes an order of the Administrator of Apprenticeship.

(b) A CONTRACTOR or subcontractor who violates Section 1777.5 shall forfeit as a civil penalty the sum of One Hundred Dollars ($100.00) for each calendar day of noncompliance. A CONTRACTOR or subcontractor that knowingly commits a second or subsequent violation of Section 1777.5 within a three-year period, where the noncompliance results in apprenticeship training not being provided as required by this chapter, shall forfeit as a civil penalty the sum of not more than three hundred dollars ($300) for each full calendar day of noncompliance. Notwithstanding Section 1727, upon receipt of a determination that a civil penalty has been imposed, the awarding body shall withhold the amount of the civil penalty from the contract progress payments then due or to become due.

(c) In lieu of the penalty provided for in subdivision (a) or (b), the director may for a first time violation and with the concurrence of the joint apprenticeship committee, order the CONTRACTOR or subcontractor to provide apprentice employment equivalent to the work hours that would have been provided for apprentices during the period of noncompliance.

(d) Any funds withheld by the awarding body pursuant to this section shall be deposited in the General Fund if the awarding body is a state entity, or in the equivalent fund of an awarding body if the awarding body is an entity other than the state.

(e) The interpretation and enforcement of Section 1777.5 and this section shall be in accordance with the regulations and procedures of the California Apprenticeship Council.

13.11 **ASSIGNMENT OF ANTITRUST CLAIMS**

13.11.1 **APPLICATION**

Public Contract Code Section 7103.5 provides that pursuant to Government Code § 4551, in entering into a public works contract or a subcontract to supply goods, services or materials pursuant to a public works contract, the CONTRACTOR or subcontractor offers and agrees to assign to the AGENCY 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. § 15) or under the Cartwright Act (Chapter 2 [commencing with § 16700] of Part 2 of Division 7 of the Business and Professions Code), arising from the purchase 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 the CONTRACTOR, without further acknowledgment by the parties. If the AGENCY receives, either through judgment or settlement, a monetary recovery for a cause of action assigned under Chapter 11 (commencing with § 4550) of Division 5 of Title 1 of the Government Code, the
assignor shall be entitled to receive reimbursement for actual legal costs incurred and may, upon
demand, recover from the AGENCY any portion of the recovery, including treble damages,
attributable to overcharges that were paid by the assignor but were not paid by the AGENCY as
part of the bid price, less the expenses incurred in obtaining that portion of the recovery.

13.11.2 ASSIGNMENT OF CLAIM

Upon demand in writing by the assignor, the AGENCY shall, within one (1) year from such demand,
reassign the cause of action assigned pursuant to this Article if the assignor has been or may have
been injured by the violation of law for which the cause of action arose and the AGENCY has not
been injured thereby or the AGENCY declines to file a court action for the cause of action.

13.12 STATE AUDIT

Pursuant to and in accordance with the provisions of Government Code § 8546.7 or any
amendments thereto, all books, records, and files of the AGENCY, the CONTRACTOR, or any
subcontractor connected with the performance of this Contract involving the expenditure of public
funds in excess of Ten Thousand Dollars ($10,000.00), including, but not limited to, the
administration thereof, shall be subject to the examination and audit of the State Auditor, at the
request of AGENCY, for a period of three (3) years after final payment is made under this Contract.
CONTRACTOR shall preserve and cause to be preserved such books, records, and files for the
audit period.

ARTICLE 14

TERMINATION OR SUSPENSION OF THE CONTRACT

14.1 TERMINATION BY THE CONTRACTOR FOR CAUSE

14.1.1 GROUNDS FOR TERMINATION

The CONTRACTOR may terminate the contract if the work is stopped for a period of thirty (30)
calendar days through no act or fault of the CONTRACTOR, a subcontractor, a sub-subcontractor,
their agents or employees, or any other persons performing portions of the work for whom the
CONTRACTOR is contractually responsible, for only the following reasons:

A. Issuance of an order of a court or other public authority having jurisdiction;
B. An act of government, such as a declaration of national emergency, making
material unavailable;
C. If repeated suspensions, delays, or interruptions by the AGENCY as described in
paragraph 14.3 constitute in the aggregate more than one hundred percent (100%)
of the total number of days scheduled for completion, or one hundred twenty (120)
days in any three hundred sixty-five (365) day period, whichever is less; or
D. The AGENCY has failed to furnish to the CONTRACTOR promptly, upon the
CONTRACTOR’s request, reasonable evidence of financing or funding as required
by paragraph 2.2.1.

14.1.2 NOTICE OF TERMINATION

If one of the above reasons exists, the CONTRACTOR may, upon written notice of seven (7)
additional calendar days to the AGENCY, terminate the contract and recover from the AGENCY
payment for Work executed and for reasonable costs verified by the AGENCY
ARCHITECT/ENGINEER with respect to materials, equipment, tools, construction equipment, and
machinery, including reasonable overhead, profit and damages.
14.1.3 NOTICE OF TERMINATION - AGENCY FAULT

If the work is stopped for a period of sixty (60) calendar days through no act or fault of the CONTRACTOR, subcontractor, sub-subcontractor, their agents or employees, or any other persons performing portions of the work for whom the CONTRACTOR is contractually responsible because the AGENCY has persistently failed to fulfill the AGENCY’s obligations under the contract documents with respect to matters important to the progress of the Work, the CONTRACTOR may, upon written notice of seven (7) additional calendar days to the AGENCY, terminate the contract and recover from the AGENCY as provided in paragraph 14.1.2.

14.2 NOTIFICATION OF TERMINATION – CONTRACTOR FAULT

14.2.1 TERMINATION FOR DEFAULT.

CONTRACTOR shall be deemed in default hereunder if CONTRACTOR fails to perform any obligation under this contract after written notice from AGENCY to CONTRACTOR and the CONTRACTOR’S surety specifying the nature of the default. The length of such notice shall be as specified under this Contract for the nature of such default or if no particular length of notice is specified then seven (7) days’ notice. Upon the occurrence of any default by CONTRACTOR the AGENCY may, without prejudice to any other rights or remedies available under this Contract or under applicable law, terminate the contract and may, subject to any prior rights of the Surety:

A. Take possession of the site and of all material, equipment, tools, and construction equipment and machinery thereon owned by the CONTRACTOR;

B. Accept assignment of subcontracts pursuant to paragraph 5.4; and

C. Complete with work by whatever reasonable method the AGENCY may deem expedient.

14.2.1 PAYMENTS WITHHELD

If the AGENCY terminates the contract by reason of a CONTRACTOR default the CONTRACTOR shall not be entitled to receive further payment until the work is complete.

14.2.2 PAYMENTS UPON COMPLETION

If the unpaid balance of the contract sum exceeds costs of completing the work, including compensation for professional services and expenses made necessary thereby, such excess shall be paid to the CONTRACTOR. If such costs exceed the unpaid balance, the CONTRACTOR shall pay the difference to the AGENCY. The amount to be paid to the CONTRACTOR or AGENCY, as the case may be, shall be certified by the AGENCY ARCHITECT/ENGINEER upon application. This payment obligation shall survive completion of the contract.

14.3 TERMINATION OR SUSPENSION BY THE AGENCY FOR CONVENIENCE

14.3.1 SUSPENSION BY AGENCY

The AGENCY may, without cause, order the CONTRACTOR in writing to suspend, delay or interrupt the work in whole or in part for such period of time as the AGENCY may determine.

14.3.1.1 Adjustments. An adjustment shall be made for increases in the cost of performance of the Contract, including profit on the increased cost of performance caused by suspension, delay, or interruption. No adjustment shall be made to the extent:
A. That performance is, was or would have been so suspended, delayed, or interrupted by another cause for which the CONTRACTOR is responsible; or

B. That an equitable adjustment is made or denied under another provision of this Contract.

14.3.1.2 Adjustments for Fixed Cost. Adjustments made in the cost of performance may have a mutually agreed fixed or percentage fee.

14.3.2 TERMINATION DUE TO DISCOVERY OF UNKNOWN OR CHANGED CONDITIONS

The AGENCY reserves the right to terminate this contract should the AGENCY determine not to proceed because of the discovery of any condition described in Article 4.5.5 or Article 10.4. The CONTRACTOR shall receive payment for all work performed to the date of termination in accordance with the provisions of Article 9, but not receive any anticipated lost profits that would have been obtained if the project had been completed.

14.3.3 MUTUAL TERMINATION FOR CONVENIENCE

The CONTRACTOR and the AGENCY may mutually agree to terminate this contract for convenience. The CONTRACTOR shall receive payment for all work performed to the date of termination in accordance with the provisions of Article 9, but not receive any anticipated lost profits that would have been obtained if the project had been completed.

ARTICLE 15

NON-UTILIZATION OF ASBESTOS MATERIAL

A. The CONTRACTOR will be required to execute and submit the Certificate Regarding Non-Asbestos Containing Materials.

B. Should asbestos containing materials be installed by the CONTRACTOR in violation of this certification, or if removal of asbestos containing materials is part of the Project, decontaminations and removals will meet the following criteria:
   1. Decontamination and removal of work found to contain asbestos or work installed with asbestos containing equipment shall be done only under the supervision of a qualified consultant, knowledgeable in the field of asbestos abatement and accredited by the Environmental Protection Agency (EPA).
   2. The asbestos removal CONTRACTOR shall be an EPA accredited CONTRACTOR qualified in the removal of asbestos and shall be chosen and approved by the asbestos consultant who shall have sole discretion and final determination in this matter.
   3. The asbestos consultant shall be chosen and approved by the AGENCY who shall have sole discretion and final determination in this matter.
   4. The work will not be accepted until asbestos contamination is reduced to levels deemed acceptable by the asbestos consultant.

C. Cost of all asbestos removal, including, but no/necessarily limited to the cost of the asbestos removal CONTRACTOR, the cost of the asbestos consultant, analytical and laboratory fees, time delays and additional costs as may be incurred by the AGENCY shall be borne entirely by the CONTRACTOR.

D. Hold Harmless: Interface of work for the Project with work containing asbestos shall be executed by the CONTRACTOR at his/her risk and at his/her discretion with full knowledge of the currently
accepted standards, hazards, risks and liabilities associated with asbestos work and asbestos containing products. By execution of the Agreement, the CONTRACTOR acknowledges the above and agrees to hold harmless the AGENCY, its Governing Board, employees, agents, AGENCY ARCHITECT/ENGINEER, and assigns for all asbestos liability which may be associated with this work. The CONTRACTOR further agrees to instruct his/her employees with respect to the above-mentioned standards, hazards, risks and liabilities.

END OF GENERAL CONDITIONS
### SAN BERNARDINO INTERNATIONAL AIRPORT AUTHORITY

### DIVISION 01

### GENERAL PROJECT REQUIREMENTS

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SECTION 01010
SUMMARY OF WORK

PART 1 – GENERAL

1.01 SUMMARY

The work under this Contract includes all labor and materials necessary for and incidental to the execution and completion of all work indicated in the Contract Documents for the construction of:

MAINTENANCE BUILDING #730 RENOVATION

This includes all work shown and inferred in the plans, specifications, regulatory permits (including environmental, soils report, and all supplementary information provided before project bid. This project is considered a “Public Work” as defined by the California Labor Code and all applicable laws and regulations associated must be followed. The work associated with project must be in compliance with the codes and regulations indicated in the contract documents.

SECTION 01015
CONTRACTOR’S USE OF PREMISES

PART 1 – GENERAL

1.01 SUMMARY

A. This Section applies to all situations in which the CONTRACTOR or its representatives including, but not limited to, employees, subcontractors of any tier, suppliers, and field engineers, who enter the project (job-site) CONTRACTOR shall coordinate its use of the premises under the direction of the AGENCY’s representative.

1.02 ACCESS TO THE JOB SITE

A. CONTRACTOR shall restrict its representative’s access to the site until they have been properly trained as to the biological and environmental restrictions placed on the project and access to an environmentally sensitive area.

B. CONTRACTOR is responsible for providing compliant and safe access to the work area for all project representatives. Temporary construction area and security for stored materials and facilities onsite are also the responsibility of the CONTRACTOR.

1.03 STORAGE

A. Project materials shall only be stored in areas designated by the Construction Manager and/or agency representatives.

B. CONTRACTOR shall assume full responsibility for the protection and safekeeping of products, tools and equipment stored on Site.

C. CONTRACTOR shall move any stored products under CONTRACTOR’s control which interfere with the operation of the AGENCY representatives.
D. If additional storage area is needed outside of the defined project area, the CONTRACTOR is responsible for obtaining and paying for the use of any additional storage or work areas needed in the performance of the Work.

1.04 SANITARY FACILITIES AND UTILITIES

A. CONTRACTOR shall provide sanitary facilities and utilities for CONTRACTOR’s employees, sub contractors, and other project representatives during the duration of the project. Any utilities required for temporary facility are the responsibility of the CONTRACTOR.

1.05 NOISE CONTROL

A. CONTRACTOR shall comply with the requirements of the city and county having jurisdiction with regard to noise ordinances governing construction sites and activities.

SECTION 01105
PHASING OF THE WORK

THIS SECTION NOT USED

SECTION 01210
ALLOWANCES

PART 1 – GENERAL

1.01 SUMMARY- the Allowance is used only as directed by the AGENCY. The CONTRACTOR will prepare detailed breakdown of all costs associated with the work defined for the allowance. These amounts will be charged against the Allowance by Change Order, based on final detailed payment receipts and back-up as required by Architect/Engineer, and will include all direct costs of work performed under the defined work scope. CONTRACTOR shall obtain quotes for equipment from three separate vendors and present to AGENCY for consideration and selection. CONTRACTOR shall include in the base bid contract amount all cost of coordination, supervision, bond costs, overhead and profit, supervision, installation and all indirect project costs associated with the work defined. Where allowance amount is not exceeded, no general CONTRACTOR costs will be permitted to be charged against the allowance amounts specified. At project closeout, unused Cash Allowance amounts shall be credited to the Agency by Change Order. Changes that exceed the scope of work or amount of each allowance covered by each allowance will be processed as a Change Order per Contract Documents.

1.02 SCHEDULE OF ALLOWANCES
Included in the Total Base Bid are the Allowances identified below.

None-

END OF SECTION
SECTION 01230

ALTERNATES

THIS SECTION NOT USED

END OF SECTION
SECTION 01250

SUBSTITUTION PROCEDURES

PART 1 – GENERAL

1.01 SUMMARY- Formal requests must be made for substitutions of products or work processes in place of those specified in the contract document. It is the intent of the AGENCY and ARCHITECT/ENGINEER to have this Project constructed with materials, products and systems originally designed and specified in the Contract Documents. The opportunity to request substitutions is not for the convenience of bidders or CONTRACTORS to submit bids for materials, products and systems which may be more familiar to them or have a lesser cost. AGENCY shall receive full benefit of any cost reductions as a result of any request for substitution.

1.02 SUBSTITUTION REQUEST PROCESS- Requests for substitutions must be expeditiously forwarded for consideration in accordance with the General Conditions. Any requests prior to bid, must be received 10 Calendar days prior to the bid due date. Notification of decisions concerning acceptance or rejection will be in writing, and are final without need for clarification. Submit a separate request for each substitution, using the Substitution Request Form included in this Section (five (5) copies). It shall be the responsibility of the entity requesting the substitution to obtain all regulatory approvals required for proposed substitutions, including any additional agency review fees. Support each request with explanation for the request, and include:

1. Complete data substantiating compliance of proposed substitutions with requirements stated in Contract Documents:
   a. Manufacturer’s literature, including product description, reference standards, performance and test data.
   b. Name and address of similar projects on which product has been used and date of each installation, as well as servicing agency and installer.

2. Itemized comparison of the proposed substitution vs. specified, listing significant variations.

3. Data relating to changes in the construction schedule, if any.

4. Any effect of substitution on in-place construction or other materials and systems to be installed.

5. Accurate cost data comparing proposed substitution with product specified.


F. Substitutions will not be considered for acceptance when:
   1. Lesser material cost is the sole reason for request.
   2. They are indicated or implied on shop drawings or product data submittals without formal request.
   3. Acceptance may require revision of Contract Documents.

G. Substitute products shall not be ordered or installed without written acceptance and authorization of AGENCY, ARCHITECT/ENGINEER and approval of regulatory agencies.

END OF SECTION (Form Attached)
SUBSTITUTION REQUEST FORM

To: Date:

The undersigned requests consideration of the following substitution:

Specified Item: ____________________________

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
<th>Paragraph</th>
<th>Description</th>
</tr>
</thead>
</table>

Proposed Substitution:

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

Statement of Cause:

________________________________________________________________________

________________________________________________________________________

We have attached the following for your use (check box):

- Product description, specifications, drawings, photographs, performance and test data adequate for evaluation of the requests; applicable portions of the data are clearly identified.

- Complete documentation of all regulatory approvals required by the Contract Documents for the proposed substitution.

- Itemized comparison of proposed substitution with that of the specified product.

- Detailed cost summary of the change to the Contract Sum (if no change, state so).

- Evaluation of the effect of the proposed substitution on the construction schedule.

- Description of changes to the Contract Documents which proposed substitution will require for its proper installation.

- Manufacturer’s Warranty comparison between the specified manufacturer and the proposed manufacturer.

The undersigned states that the following paragraphs, unless modified on the attachments, are correct:

Project: San Bernardino International Airport Authority
Maintenance Building #730 Renovation
1. The proposed substitution does not affect dimensions shown on the Drawings.

2. The undersigned will pay all costs for changes to the building design, including architectural or engineering design, detailing, and construction costs caused by the requested substitution.

3. The proposed substitution will have no adverse effect on other trades or specified warranty requirements.

4. Maintenance and service parts will be locally available for the proposed substitution.

The undersigned further states that the function, appearance and quality of the proposed substitution is equivalent or superior to the specified item.

Submitted By:

Signature: ___________________________  Firm: ________________________________

Address: __________________________________________________________________

Telephone: __________________________  Date: ________________________________
SECTION 01314
LABOR COMPLIANCE COORDINATION

PART 1 – GENERAL

1.01 SUMMARY- The CONTRACTOR awarded this project is required to comply with all laws and regulations of the state of California regarding a "Public Work" project as defined by the state Labor Code. In addition to providing the required certified payroll, the CONTRACTOR may be asked by the AGENCY to provide proof compliance with the applicable laws.

1.02 LABOR COMPLIANCE PROGRAM MEETING- After the AGENCY awards the Contract, and prior to the commencement of the work, a mandatory pre-job Labor Compliance Meeting will be conducted by the AGENCY representative with the CONTRACTOR(s) and those subcontractors listed in the Bid Documents this may be done as part of the Pre-Construction Meeting or as a separate meeting. At that meeting, the AGENCY representative will discuss the federal and state labor law requirements applicable to the contract including prevailing wage, respective record keeping responsibilities, the requirement for the submittal of certified payroll records to the AGENCY, and the prohibition against discrimination in employment. The AGENCY representative will provide the CONTRACTOR and each subcontractor with general information on labor law requirements. It is the sole responsibility of each CONTRACTOR or sub-CONTRACTOR to understand the applicable laws surrounding this project prior to bid. The following is a list of requirements that are applicable to this project:

1. Payment of Prevailing Wage Rates
   i. The CONTRACTOR to whom the contract is awarded and its subcontractors hired for the public works project are required to pay no less than the specified general prevailing wage rates to all workers employed in the execution of the contract, including each subcontract.

   ii. The CONTRACTOR is responsible for ascertaining and complying with all current general prevailing wage rates for crafts and any rate changes that occur during the life of the contract. Information on all prevailing wage rates and all rate changes are to be posted at the job site for all workers to view.

2. Apprentice
   i. It is the duty of the CONTRACTOR and subcontractor’s to employ registered apprentices on the public works project under Labor Code Section 1777.5;

3. Penalties
   i. There are penalties required for CONTRACTOR’S/ subcontractor’s failure to pay prevailing wages and for failure to employ apprentices, including forfeitures and debarment under Labor Code Sections 1775; 1776; 1771.1; 1777.7 and 1813;

4. Certified Payroll Reports
   i. Under Labor Code Section 1776, CONTRACTORS and subcontractors are required to keep accurate payroll records showing the name, address, social security number and work classification for each employee and Agency performing work; also the straight time and overtime hours worked each day and each week, the fringe benefits and the actual per diem wage paid to each Agency, journey person, apprentice worker or other employee hired in connection with the public works project.

   ii. Employee payroll records shall be certified and shall be made available for inspection at all reasonable hours at the principal office of the CONTRACTOR/subcontractor, or shall be furnished to any employee, or his/her authorized representative on request, pursuant to Labor Code Section 1776;

   iii. Each CONTRACTOR and every lower-tier subcontractor and supplier is required to
submit certified payrolls and labor compliance documentation electronically as specified by the AGENCY. Under Labor Code Section 1776(g) there are penalties required for CONTRACTOR's/ subcontractor's failure to maintain and submit copies of certified payroll records on request.

iv. CONTRACTOR may be required to provide the monthly payroll records required under Labor Code Section 1776 directly to the Labor Commissioner in accordance with the provisions of Labor Code Section 1771.4(a)(3).

5. Nondiscrimination in Employment
   i. There exist prohibition against employment discrimination under Labor Code Sections 1735 and 1776.6, the Government Code, the Public Contracts Code and Title VII of the Civil Rights Act of 1964;

6. Kickbacks Prohibited
   i. CONTRACTORS and subcontractors are prohibited from recapturing wages illegally or extracting "kickbacks" from employee wages under Labor Code Section 1778;

7. Itemized Wage Deduction Statement
   i. Under Labor Code Section 226, every employer shall at the time of each payment of wages, furnish each of his or her employees, an accurate itemized statement in writing showing the gross wages, total hours worked, all deductions, net wages earned, the inclusive dates of the period for which the employee is paid, name of the employee and his/her social security number, the name and address of the employer and all applicable hourly rates in effect during the pay period.

8. Acceptance of fees prohibited
   i. There exists a prohibition against CONTRACTOR/subcontractor acceptance of fees for registering any person for public work under Labor Code Section 1779; or for filling work orders on public works contracts pursuant to Labor Code Section 1780;
   
   b. Listing of Subcontractors
      i. All prime CONTRACTORS are required to list properly all subcontractors hired to perform work on the public works projects covering more than one half of one percent, pursuant to Government Code Section 4100 et seq;

9. Proper Licensing
   i. CONTRACTORS are required to be licensed properly and to require that all subcontractors be properly licensed. Penalties are required for employing workers while unlicensed under Labor Code Section 1021 and under the California CONTRACTORs License Law found at Business and Professions Code Section 7000 et seq.

10. Unfair Competition Prohibited
    i. CONTRACTORS/ subcontractors are prohibited from engaging in unfair competition as specified under Business and Professions Code Sections 17200 to 17208;

11. Workers Compensation Insurance
    i. Labor Code Section 1861 requires that CONTRACTORS and subcontractors be insured properly for Workers Compensation.

This list does not represent all of all laws and regulations applicable to this project and it remains the SOLE responsibility of each CONTRACTOR and sub-CONTRACTOR to understand all laws and regulations prior to submission of a bid.

END OF SECTION
SECTION 01322
CONSTRUCTION PROJECT SCHEDULE

PART 1 – GENERAL

1.01 SUMMARY- The CONTRACTOR shall provide within ten (10) calendar day of award, a computerized, time scaled, cost loaded (if requested) Critical Path Method (CPM) Construction Schedule, showing in detail how the CONTRACTOR plans to execute and coordinate the Work within the allotted project duration. The schedule shall be in Microsoft Project format and provided electronically to the AGENCY upon request.

1.02 CONSTRUCTION SCHEDULE UPDATING- The Construction Schedule shall be updated on a monthly basis throughout the entire Contract duration. The CONTRACTOR shall review actual progress made through the data date of the Schedule, including the dates that activities started or finished, the percentage of Work completed, and remaining duration for each activity in progress prior to the update. In addition to the monthly update, the CONTRACTOR is required to prove a three week look ahead at each weekly construction progress meeting. Updating the Construction Schedule to reflect actual progress made up to the date of a schedule update shall not be considered revisions to the Construction Schedule. If, as a result of the monthly schedule update, it appears the Construction Schedule no longer represents the actual prosecution and progress of the Work, the AGENCY will request, and the CONTRACTOR shall submit, a revision to the Construction Schedule. The AGENCY may also request revisions to the Construction Schedule in the event the CONTRACTOR's planning for the Work is revised. If the CONTRACTOR desires to make changes in the Construction Schedule to reflect revisions in its method of operating and scheduling of the Work, the CONTRACTOR shall describe the revision(s) in its narrative report, stating the reason for the proposed revision.

1.03 RESPONSIBILITY FOR COMPLETION- CONTRACTOR shall furnish sufficient forces, offices, facilities, and equipment, and shall work such hours including night shift and overtime operations, as necessary to ensure the prosecution of the Work in accordance with the project schedule and current monthly schedule updates. If, in the opinion of the AGENCY, the CONTRACTOR falls behind in meeting the schedule as presented in the current monthly schedule update, the CONTRACTOR shall take such steps as may be necessary to improve its progress without additional cost to the AGENCY. The provisions of this paragraph shall not be construed as prohibiting work on Saturdays, Sundays, and holidays, if the CONTRACTOR so elects and gives advanced notice as required by the Contract documents and obtains all necessary approvals to do so.

END OF SECTION
SECTION 01357

CONTRACTOR SAFETY REQUIREMENTS

PART 1 – GENERAL

1.01 SUMMARY- This information is offered as assistance to the CONTRACTOR in complying with all project safety requirements, and to provide assurance to the AGENCY that appropriate and required safety measures are being taken. However, the information contained within this Section is not intended to reflect all requirements for safe practices and conduct for which a CONTRACTOR may be responsible, including safety of persons and property, and compliance with all statutes, rules, regulations and orders applicable to the conduct of the work. The AGENCY assumes no liability for the CONTRACTOR’s safety program, or the CONTRACTOR’s compliance with any safety practices or policies. It is the sole responsibility of each CONTRACTOR to monitor and maintain a safe working environment for their employees, and in so doing, assure a safe working environment for all other CONTRACTORs who may come in contact with their work. The policy of the AGENCY is to promote safety at a level to assure personal safety and minimize potential property damage. Employees of CONTRACTORs working on this project are required to meet or exceed all established and recognized codes and standards for safety and protection of personnel and property. The AGENCY reserves the right to take corrective action, as deemed in the best interest of the project and the AGENCY, for violation of any health or safety standard. This corrective action may include, but is not limited to removal (from the job site) of any unsafe tools or equipment; temporary work stoppage for any unhealthy or unsafe condition; and immediate removal (from the job site) of any person that is unwilling or incapable of conducting themselves in a manner that promotes a healthy and safe working atmosphere. Any person found to be repeatedly in violation of health and/or safety standards will be permanently restricted from the site.

1.02 RESPONSIBILITIES-The AGENCY demands that all project CONTRACTORs perform in a reasonable and safe manner at all times. The CONTRACTOR shall implement a safety program that includes a site specific safety plan prior to commencement of the project and enforce this plan for all employees, sub-CONTRACTORs, and vendors throughout the entire duration of the project. The CONTRACTOR must have a well devised safety program, which includes training employees in safety matters relating to their individual job assignments. The CONTRACTOR should effectively enforces the safety program and provide sanctions against employees who violate the safety program.

1.03 SAFETY ACTIVITIES-CONTRACTOR will conduct or initiate:

a. Safety program as required by current State of California requirements.

b. Weekly "tool box" safety meetings between CONTRACTOR and CONTRACTOR's supervisors, foremen, employees and subcontractors working on the project.

c. Weekly safety inspections of your work area and those areas of work under your responsibility or shared responsibility as well as taking any other necessary safety precautions.

1.04 REPORTS-The following reports must be submitted to the AGENCY for inclusion to the project files. The CONTRACTOR is in no way relieved of the requirements for submission of reports to any agency or authority.

a. All reports listing deficiencies, accidents or injuries shall show corrective action taken.

b. A weekly status and summary report of each "tool box" meeting held and items discussed.

c. A weekly status report of inspection results. The attached status forms are for your convenience only.
d. A continuing list of deficiencies found, date identified, responsible party, corrective action and date corrected.

e. Accident reports and injury forms. Submit a copy of one of the following to the Construction Manager for each case:

1) California Division of Labor Statistics and Research Form 5020 (latest rev.), or;

2) Federal OSHA Form 101, or;

3) Insurance Company form similar to 1 or 2 above.

f. A copy of CAL/OSHA Form 200 "Log and Summary of Occupational Injuries and Illness."

2. Special Reports

a. Notify the CONSTRUCTION MANAGER immediately of any accident involving injury to personnel or property; and complete written reports within 24 hours of a death or injury of five (5) or more employees as a result of one accident.

b. Copies of all toxic or harmful agent reports (See paragraph B.4.)

3. Governmental Reports

a. Notification of governmental authorities is the responsibility of each affected CONTRACTOR.

END OF SECTION
SECTION 01500
TEMPORARY FACILITIES AND CONTROLS

PART 1 – GENERAL

1.01 SUMMARY- Furnishing and installing required temporary facilities as indicated or specified as required for proper performance and safety while the work of this contract is performed is the responsibility of the CONTRACTOR as it relates to their bid package scope of work.

A. REGULATORY REQUIREMENTS

1. Comply with governing regulations and utility company regulations and recommendations.

2. Comply with pollution and environmental protection regulations for use of water and energy, for discharge of wastes and storm drainage from Project Site, and for control of dust, air pollution and noise.

3. Temporary construction shall conform to requirements of State, County, and Local authorities and underwriters which pertain to operation, health, safety, and fire hazard. CONTRACTOR shall furnish and install items necessary for conformance with such requirements, whether or not called for under the separate divisions of these specifications.

4. Any Construction Facilities purchased for the AGENCY or the Construction Manager’s use during the Project become the property of the AGENCY upon completion of the Contract and will be turned over to the AGENCY. CONTRACTOR will pay for any costs associated with moving and delivering items to a location identified by AGENCY.

B. TEMPORARY WATER & DUST CONTROL

1. CONTRACTOR shall provide and pay for construction water throughout the duration of the project in sufficient quantities to continually maintain dust control and construction operations. The CONTRACTOR shall also provide & maintain a water truck (minimum 2,000 gallons) on site with an operator every work day for purposes of dust control.

C. TEMPORARY SANITARY FACILITIES

1. The CONTRACTOR will provide and maintain temporary chemical type toilet and wash facilities throughout the duration of the project in sufficient quantities as required for the total workforce on the project site. CONTRACTOR will add additional facilities as required based on fluctuations in workforce. CONTRACTOR shall provide temporary facilities at the lay down area and at work site as needed. All temporary toilets shall be properly serviced twice weekly and shall meet all applicable governmental codes at all times.

D. FENCES AND BARRICADES

1. In additional to fencing required by the environmental permits, the CONTRACTOR shall furnish, install, and continually maintain throughout the duration of the project a 8 foot high temporary chain link fence with locked entrance and access gates to enclose each end of the bridge to limit public access.

2. Fence and gates shall be covered in new green privacy fabric. Fence & gates must be continually maintained to prohibit public from gaining access to the site and also deter persons of all ages from entering the site after hours. If fence, gates, mesh screen are damaged or vandalized in anyway, the CONTRACTOR must repair or replace applicable sections within 24 hours or less to provide a secure, graffiti and vandalism free perimeter.

E. CONSTRUCTION EQUIPMENT

1. CONTRACTOR shall erect, equip, and maintain construction equipment in strict accordance with applicable statues, laws, ordinances, and regulations of authority having jurisdiction.
2. CONTRACTOR shall provide, maintain, and move upon completion of the Work all
temporary rigging, scaffolding, hoisting equipment, rubbish chutes, ramps, stairs,
runways, platforms, ladders, railings, and other temporary construction as required for all
work hereunder.

F. TEMPORARY SITE CONVEYANCE

1. CONTRACTOR to provide a compact utility vehicle (E-Z Go, Club Car, Gator, etc.) for the
AGENCY use capable of transporting four people through the jobsite for the duration of
the project. Vehicle to have covered canopy to protect occupants from weather and sun.
CONTRACTOR to provide any required maintenance. CONTRACTOR to provide a
secure storage facility/container for cart.

G. TEMPORARY ELECTRICAL

1. The CONTRACTOR shall furnish, install, maintain, relocate as required, and eventually
remove a temporary electrical as required for temporary facilities and as required for the
CONTRACTORs use to complete the work.

END OF SECTION
SECTION 01786
WARRANTIES (GUARANTEES) AND BONDS

PART 1  GENERAL

1.01  SECTION INCLUDES

A. Preparation and submittal of warranties and bonds
B. Time and schedule of submittals

1.03  WARRANTY REQUIREMENTS

A. Warranties or bonds shall provide for replacement or reconstruction of failed or defective Work to an acceptable condition complying with the requirements of the Contract Documents. Work shall be restored at no cost to the AGENCY regardless of whether the AGENCY has benefited from use of the Work for a portion of its anticipated useful service life.

B. Provide warranties and bonds, executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within ten days after completion of the applicable item or work.

C. When a designated portion of the Work is partially used and/or occupied by the AGENCY, submit properly executed warranties within ten (10) days of the Partial Use or Occupancy of the designated portion of the Work.

D. Verify that documents are in proper form, contain full information and are notarized.

E. AGENCY Recourse: Expressed warranties made to AGENCY are in addition to implied warranties and shall not limit the duties, obligations, rights, and remedies otherwise available under the law. Expressed warranty periods shall not be interpreted as limitations on the time in which AGENCY can enforce such other duties, obligations, rights, or remedies.

1.04  FORM OF SUBMITTALS

A. Prepare duplicate binders, commercial quality, 8-1/2 x 11 inch, three-ring side binders with hardback, cleanable, plastic covers.

B. Label cover and spine of each binder with typed or printed title WARRANTIES AND BONDS, with title of Project. Number separate volumes in order.

C. Table of Contents: Typed, in the sequence of the Table of Contents of the Project Manual, with each item identified with the number and title of the specification Section in which specified and the name of the product or work item.

D. Separate each warranty or bond with index tab sheets keyed to the Table of Contents listing. Provide full information, using separate typed sheets as necessary. Use paper of durable, long-lasting quality. List Subcontractor, supplier, and manufacturer, with name, address and telephone number of responsible principal.

1.05  TIME AND SCHEDULE OF SUBMITTALS

A. Except for specifically authorized exceptions, the date for beginning the period of warranty shall be the Date of Substantial Completion.

B. For equipment or component parts of equipment put into service during construction with AGENCY's permission, submit documents within ten (10) days after acceptance.
C. Make other submittals within ten (10) days after Date of Substantial Completion prior to final Application for Payment.

D. For items of Work when acceptance is delayed beyond Date of Substantial Completion, submit within ten (10) days after acceptance, listing the date of acceptance as the beginning of the warranty period.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)
GUARANTEE

We hereby guarantee that the __________________________, which we have installed for SAN BERNARDINO INTERNATIONAL AIRPORT AUTHORITY has been performed in accordance with the requirements of the Contract Documents and that the work as installed will fulfill the requirements of the Contract Documents as they pertain to Bid Package __________.

The undersigned agrees to repair or replace any or all of such work that may prove to be defective in workmanship or material together with any other adjacent work which may be displaced in connection with such replacement within a minimum period of ONE (1) YEAR (see individual trade specifications for more stringent requirements) from the date of acceptance of the above-mentioned project by SAN BERNARDINO INTERNATIONAL AIRPORT AUTHORITY, ordinary wear and tear and unusual abuse or neglect excepted.

In the event of the undersigned's failure to comply with the above mentioned conditions within a reasonable period of time, as determined by the AGENCY, but not later than ten (10) working days after being notified in writing by the AGENCY, the undersigned authorizes the AGENCY to proceed to have said defects repaired and made good at the expense of the undersigned, who will pay the costs and charges therefore upon demand.

____________________________________________
CONTRACTOR

____________________________________________
SIGNED

____________________________________________
NAME

Representatives to be contacted for service subject to terms of contract:

NAME: ______________________________________

ADDRESS: ___________________________________

PHONE #: ___________________________________
SECTION 01789
PROJECT RECORD DOCUMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. This Section includes administrative and procedural requirements for preparing, maintaining, and submitting Project Record Documents.

1.02 PROJECT RECORD DOCUMENTS

A. General: Record documents shall be kept on site at the field office. CONTRACTOR shall prepare and maintain record documents throughout the course of construction, as specified herein.

B. Access to record documents will be provided during normal working hours.

C. Do not use project record documents for construction purposes. Protect record documents from deterioration and loss.

D. Record in concise and neat manner, concurrent with construction progress, and at least on a weekly basis, all actual revisions to the work:

1. Changes made on the Drawings, including Clarification Drawings.
2. Changes made to the Specifications.
3. Changes made by Addenda.
4. Changes made by Instruction Bulletins.
5. Change Orders or other authorized Modifications to the Contract.
6. Revisions made to shop drawings, product data and samples.

E. Record Drawings shall be a clean, undamaged set of black-line white prints of Drawings and Shop Drawings. Mark the set with red erasable pencil to show the actual installation where the installation varies substantially from the Work as originally shown. Indicate which Drawing is most capable of showing conditions fully and accurately. Where Shop Drawings are used, record a cross-reference at the corresponding location on the Drawings. Provide detailed and accurate field dimensions for concealed elements that would be difficult to measure and record at a later date.

1. Mark new information, including details, that is important to AGENCY but was not shown on Drawings or Shop Drawings.
2. Show measured depths of foundations in relation to finish first floor datum.
3. Show measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements. Identify drains and sewers by invert elevation.
4. Verify Surveyor’s Record Drawings with CONTRACTOR’S utilities locations and depths markups.
5. Show measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work. Identify ducts, dampers, valves, access doors and control equipment wiring.

6. Field changes of dimension and detail.

7. Refer to Scope Summaries for electronic as-built requirements.

8. Note related Change Order or Construction Directive numbers on each affected sheet.

9. Organize Record Drawing sheets into manageable sets. Bind sets with durable-paper cover sheets; print suitable titles, dates, and other identification on the cover of each set.

F. Record Specifications: Maintain a complete copy of the Specifications, including Addenda, Change Orders and Construction Directives issued during construction. Legibly mark at each Section description of actual products installed if different from that specified, including:

1. Manufacturer's name, trade name, product model and number and supplier.

2. Authorized product substitutions or alternates utilized.

3. Changes made by Addenda and Modifications.

G. Record Product Data: Maintain a copy of each Product Data submittal. Note related Change Orders and Construction Directives and mark-up of record drawings and Specifications.

1. Mark these documents to illustrate significant variations in actual Work performed in comparison with information submitted. Include variations in products delivered to the Project site and from the manufacturer's installation instructions and recommendations.

2. Provide detailed and accurate information regarding concealed products and portions of Work that cannot otherwise be readily discerned later by direct observation.

END OF SECTION
DIVISION 02: EXISTING CONDITIONS

02 4000 DEMOLITION AND STRUCTURE MOVING

02 4113 SELECTIVE SITE DEMOLITION
02 4119 SELECTIVE STRUCTURE DEMOLITION

END OF TABLE OF CONTENTS
SECTION 02 4113
SELECTIVE SITE DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Demolish and remove portions of existing site facilities as described in Contract Documents.

B. Related Requirements:
   1. New and replacement work specified in appropriate specification Sections.

1.2 ADMINISTRATIVE REQUIREMENTS

A. Scheduling:
   1. Include on Construction Schedule specified in Section 01 3200 detailed sequence of individual site demolition operations.

1.3 SUBMITTALS

A. Closeout Submittals:
   1. Include following in Operations And Maintenance Manual specified in Section 01 7800:
      a. Record Documentation:
         1) Identify abandoned utility and service lines and capping locations on record drawings.

PART 2 - PRODUCTS: Not Used

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine as-builts and meet with Owner’s representative to review location of existing utilities and irrigation lines and systems prior to demolition activities.

3.2 PREPARATION

A. Notify corporations, companies, individuals, and local authorities owning conduits running to property.
   1. Protect and maintain conduits, drains, sewers, pipes, and wires that are to remain on the property.
   2. Arrange for removal of wires running to and on property. Remove pipes and sewers in accordance with instructions of above owners.

B. Locate and cap all irrigation lines so system remains usable during construction.
3.3 PERFORMANCE

A. Execute work in orderly and careful manner, with due consideration for neighbors and the public.

B. Carefully remove, disassemble, or dismantle as required, and store in approved location on site, existing items to be reused in completed work. Coordinate with Owner for equipment and materials to be removed by Owner.

C. Concrete And Paving Removal:
   1. Saw cut joints between material to be removed and material to remain to full depth.
   2. Hand-excavate trench 12 inches (300 mm) wide and 16 inches (400 mm) deep along concrete or paving to be removed. Cut roots encountered with saw, axe, or pruner. Do not cut roots with excavating equipment. Remove roots under concrete and paving to be replaced down to 12 inches (300 mm) below finish grade.
   3. Demolition and removal of existing structures including slab and footings.

3.4 CLEANING

A. Keep streets and roads reasonably clean, and sweep daily.

B. Sprinkle demolition rubbish and debris as necessary to lay dust.

C. Promptly remove demolition materials, rubbish, and debris from property.

END OF SECTION
SECTION 02 4119
SELECTIVE STRUCTURE DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Demolition and removal of selected portions of building or structure.
   2. Salvage of existing items to be reused.

B. Reference Standards:
   1. National Fire Protection Association / American National Standards Institute:
   2. American National Standards Institute / American Society of Safety Engineers:
      a. ANSI / ASSE A10.6-2006, ‘Safety Requirements for Demolition Operations.’

1.2 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Storage of removed items or materials will not be permitted on-site.

B. Pre-Installation Conference:
   1. Before beginning Selective Demolition work, in addition to requirements of Section 01 3100, meet
      on site to confirm work to be demolished, items to be reused, and coordination with Owner.

C. Scheduling:
   1. Indicate detailed sequence of selective demolition and removal work, with starting and ending
      dates for each activity, on Schedule specified in Section 01 3200.

1.3 QUALITY ASSURANCE

A. Regulatory Agency Sustainability Approvals:
   1. Comply with governing EPA notification regulations before beginning selective demolition.
   2. Comply with hauling and disposal regulations of authorities having jurisdiction.

1.4 FIELD CONDITIONS

A. Existing Conditions:
   1. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far
      as practical.
   2. Prior to demolition, the Contractor shall obtain written verification from the utility owner(s) that the
      existing utilities, including storm water, wastewater, and/or water facilities, are not operational and
      are ready for demolition.
   3. The Contractor shall examine the various Drawings, visit the site, determine the extent of the
      Work, the extent of work affected therein, and all conditions under which he is required to perform
      the various operations.
PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification Of Conditions:
   1. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
      a. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.

B. Evaluation And Assessment:
   1. Hazardous Materials:
      a. It is not expected that hazardous materials will be encountered in the Work. Identified hazardous materials will be removed by Owner before start of the Work.
      b. If materials suspected of containing hazardous materials are encountered, do not disturb and immediately notify Architect.
   2. Inventory and record condition of items to be removed and reinstalled.
   3. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure nature and extent of conflict. Promptly submit written report to Architect.
   4. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.

3.2 PREPARATION

A. Temporary Facilities:
   1. Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
   2. Maintain fire-protection facilities in service during selective demolition operations.

B. Temporary Shoring if needed:
   1. Provide and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.
   2. Strengthen or add new supports when required during progress of selective demolition.

C. Utility Services:
   1. Existing Services/Systems: Maintain services/systems indicated to remain and protect them against damage during selective demolition operations.
   2. Service/System Requirements: Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be selectively demolished.
      a. Arrange to shut off indicated utilities with utility companies.
      b. If services/systems are required to be removed, relocated, or abandoned, before proceeding with selective demolition, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.

3.3 SELECTIVE DEMOLITION

A. General:
   1. Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
2. Demolish and remove existing construction only to extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
   a. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
   b. Conduct operations to minimize damage by falling debris or other causes to adjacent buildings, structures, roadways, other facilities, and persons.
   c. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
   d. The Contractor shall fill and compact all voids left by the removal of trees, pipe or structures, etc. with materials described herein to a grade that will provide for positive drainage of the disturbed area to drain run-off in direction consistent with the surrounding area. The Contractor shall provide all fill materials to the site as needed. Compaction of fill shall match the compaction of adjacent undisturbed material.
   e. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain fire watch and portable fire-suppression devices during flame-cutting operations.
   f. Maintain adequate ventilation when using cutting torches.
   g. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
   h. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
   i. Dispose of demolished items and materials promptly.

B. Removed and Reinstalled Items:
   1. Clean and repair items to functional condition adequate for intended reuse. Paint equipment to match new equipment.
   2. Protect items from damage during transport and storage.
   3. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

C. Existing Items to Remain:
   1. Protect construction indicated to remain against damage and soiling during selective demolition.
   2. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.
   3. Where indicated on the Drawings, the utility service, fence, tree, or device so designated shall be temporarily protected during the prosecution of the demolition work as specified.
   4. Where indicated on the Drawings, the designated facilities shall remain intact and in service during the prosecution of the demolition work.

D. Damage:
   1. Promptly repair damage caused to adjacent facilities by demolition operations as directed by the City at no cost to the City.

3.4 TRAFFIC AND ACCESS

A. Conduct work to ensure minimum interference with on-site and off-site roads, streets, sidewalks, and occupied or used facilities.

B. Do not close or obstruct streets, sidewalks, or other occupied or used facilities without permission from the City. Provide alternate routes around closed or obstructed traffic in access ways.
C. Coordinate truck routing and timing with City.

3.5 CLEANING

A. General:
   1. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations.
   2. Return adjacent areas to condition existing before selective demolition operations began.

B. Waste Management:
   1. All material, equipment, rubble, debris, and other products of the demolition shall become the property of the Contractor for his disposal off-site in accordance with all applicable laws and ordinances at the Contractor's expense. The sale of salvageable materials by the Contractor shall only be conducted off-site. The sale of removed items on the site is prohibited by the City.
   2. Disposal of Demolished Materials:
      a. Remove demolished materials from Project site and legally dispose of them in an EPA-approved landfill. Do not burn demolished materials.
         1) Do not allow demolished materials to accumulate on-site.
         2) Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
         3) Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.

END OF SECTION
DIVISION 03: CONCRETE

03 1000 CONCRETE FORMING AND ACCESSORIES
   03 1113 STRUCTURAL CAST-IN-PLACE CONCRETE FORMING
   03 1511 CONCRETE ANCHORS AND INSERTS

03 2000 CONCRETE REINFORCING
   03 2100 REINFORCEMENT BARS

03 3000 CAST-IN-PLACE CONCRETE
   03 3053 MISCELLANEOUS EXTERIOR CAST-IN-PLACE CONCRETE
   03 3111 NORMAL WEIGHT STRUCTURAL CONCRETE

END OF TABLE OF CONTENTS
SECTION 03 1113

STRUCTURAL CAST-IN-PLACE CONCRETE FORMING

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Design, construction, and safety of formwork.
   2. Furnish and install required formwork ready for placing of concrete.
   3. Strip and dispose of formwork.

B. Related Requirements:
   1. Section 01 1200: ‘Multiple Contract Summary’ for Owner Furnished Testing and Inspecting Services.
   2. Section 01 3100: ‘Project Management and Coordination’ for pre-installation conference.
   3. Section 01 4000: ‘Quality Requirements’ for administrative and procedural requirements for quality assurance and quality control.
   4. Section 01 4301: ‘Quality Assurance – Qualifications’ establishes minimum qualification levels required.
   5. Section 01 4523: ‘Testing and Inspecting Services’ for testing and inspection and testing laboratory services for materials, products, and construction methods.
   6. Section 01 7800: ‘Closeout Submittals’.
   7. Section 03 3111: ‘Normal Weight Structural Concrete’.
      a. Tolerances for placing normal weight structural concrete.
      b. Pre-installation conference held jointly with other concrete related sections.

1.2 REFERENCES

A. Association Publications:

B. Definitions (Following are specifically referenced for testing):
   1. Accreditation: Process in which certification of competency, authority, or credibility is presented. Verify that laboratories have an appropriate quality management system and can properly perform certain test methods (e.g., ANSI, ASTM, and ISO test methods) and calibration parameters according to their scopes of accreditation.
   2. Approved: To authorize, endorse, validate, confirm, or agree to.
   3. Field Quality Control: Testing, Inspections, Special Testing and Special Inspections to assure compliance to Contract Documents.
   4. Inspection/Special Inspection: Inspection of materials, installation, fabrication, erection or placement of components and connections requiring special expertise to ensure compliance with approved construction documents and referenced standards:
      a. Inspection: Not required by code provisions but may be required by Contract Documents.
      b. Special Inspection: Required by code provisions and by Contract Documents.
      c. Inspection-Continuous: Full-time observation of the Work requiring inspection by approved inspector who is present in area where the Work is being performed.
      d. Inspection-Periodic: Part-time or intermittent observation of the Work requiring inspection by approved inspector who is present in area where the Work has been or is being performed and at completion of the Work.
5. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform particular construction operation, including installation, erection, application, and similar operations.
   a. Using term such as "carpentry" does not imply that certain construction activities must be performed by accredited or unionized individuals of corresponding generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to trades people of corresponding generic name.

6. Observation: Visual observation of building / site elements or structural system by registered design professional for general conformance to approved construction documents at significant construction stages and at completion. Observation does not include or waive responsibility for performing inspections or special inspections.

7. Owner’s Representative: Owner’s Designated Representative (Project Manager or Facilities Manager) who will have express authority to bind Owner with respect to all matters requiring Owner’s approval or authorization.

8. Preconstruction Testing: Tests and inspections that are performed specifically for Project before products and materials are incorporated into the Work to verify performance or compliance with specified criteria.

9. Product Testing: Tests and inspections that are performed by testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with industry standards.

10. Quality Assurance: Testing, Inspections, Special Testing and Special Inspections provided for by Owner.

11. Quality Control: Testing, Inspections, Special Testing and Special Inspections provided for by Contractor.

12. Service Provider: Agency or firm qualified to perform required tests and inspections.

13. Source Quality Control Testing: Tests and inspections that are performed at source, i.e., plant, mill, factory, or shop.


15. Special Inspector: Certified individual or firm that implements special inspection program for project.


17. Test/Special Test: Field or laboratory tests to determine characteristics and quality of building materials and workmanship.
   a. Test: Not required by code provisions but may be required by Contract Documents.
   b. Special Test: Required by code provisions and by Contract Documents.

18. Testing Agency: Entity engaged to perform specific tests, inspections, or both.

19. Testing Agency Laboratory: Agency or firm qualified to perform field and laboratory tests to determine characteristics and quality of materials and workmanship.

20. Verification: Act of reviewing, inspecting, testing, etc. to establish and document that product, service, or system meets regulatory, standard, or specification requirements.

C. Reference Standards:
   1. American Concrete Institute:
      a. ACI 318-11, 'Building Code Requirements for Structural Concrete and Commentary'.

1.3 SUBMITTALS

A. Informational Submittals:
   1. Manufacturer Instructions:
      a. Printed application instructions for form release agents.

1.4 QUALITY ASSURANCE

A. Testing and Inspection:
   1. Owner will provide Testing and Inspection for inspection of concrete formwork:
      a. See Section 01 1200: 'Multiple Contract Summary'.
PART 2 - PRODUCTS

2.1 COMPONENTS

A. Forms:  Wood, metal, or plastic as arranged by Contractor:
   1. Forming material shall be compatible with specified form release agents and with finish requirements for concrete to be left exposed or to receive a smooth rubbed finish.

2.2 ACCESSORIES

A. Form Release Agents:
   1. Unexposed Surfaces Only:  Contractor's option.

B. Form Release / Finish Agent:
   1. Vertical, Exposed Surfaces or Unexposed Surfaces:
      a. Chemically acting type.
      b. Acceptable Products:
         3) E-Z Strip or DEBOND Form Coating by L & M Construction Chemicals, Omaha, NE www.lmcc.com.
         7) Equal as approved by Architect before use.  See Section 01 6200.

C. Expansion / Contraction Joints:
   1. 1/2 inch (13 mm) thick.
   2. Manufactured commercial fiber type:
      a. Meet requirements of ASTM D1751.
      b. Acceptable Products:
         3) Equal as approved by Architect before installation.  See Section 01 6200.

3. Recycled Vinyl:
   a. Light gray color.
   b. Acceptable Products:
      2) Equal as approved by Architect before Installation.  See Section 01 6200.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Forms:
   1. Assemble forms so forms are sufficiently tight to prevent leakage.
   2. Properly brace and tie forms.
   3. Make proper form adjustments before, during, and after concreting.
   4. Use new forms, or used forms that have been cleaned of loose concrete and other debris from previous concreting and repaired to proper condition.  Use APA Plyform B-B Class I, or APA HDO Plyform B-B Class I, on exposed to view concrete that do not receive a smooth rubbed finish.
   5. Use metal cold joint forms when unable to place concrete for footings, foundations, and slabs in continuous pours.
B. Accessories:
   1. General:
      a. Provide for installation of inserts, templates, fastening devices, sleeves, and other accessories to be set in concrete before placing.
      b. Position anchor bolts for hold-down anchors and columns and securely tie in place before placing concrete.
   2. Form Release / Finish Agents:
      a. Film thickness shall be no thicker than as recommended by Manufacturer.
      b. Allow no release / finish agent on reinforcing steel or footings.

C. Form Removal:
   1. Removal of forms can usually be accomplished in twelve (12) to twenty four (24) hours.
   2. If temperature is below 50 deg F (10 deg C) or if concrete (stairs, beams, etc) depends on forms for structural support, leave forms intact for sufficient period for concrete to reach adequate strength.
   3. For exposed to view surfaces that receive a smooth rubbed finish, remove forms while concrete is still "green".
   4. Metal bars or prys should not be used. Use wood wedges, tapping gradually when necessary.

3.2 FIELD QUALITY CONTROL

A. Field Tests And Inspections:
   1. Concrete Formwork:
      a. Inspections are not required and will be performed at discretion of Architect.
      b. Inspections, if performed, will include following:
         1) Concrete Formwork:
            a) Certified Inspector shall inspect forms for general location, configuration, camber, shoring, sealing of form joints, correct forming material, concrete accessories, and form tie locations.

END OF SECTION
SECTION 03 1511

CONCRETE ANCHORS AND INSERTS

PART 1 - GENERAL

1.1 SUMMARY

A. Products Furnished But Not Installed Under This Section:
   2. Screw anchors for concrete.
   3. Concrete anchors and inserts not specified elsewhere.

B. Related Requirements:
   1. Section 01 1200: ‘Multiple Contract Summary’ for Owner Furnished Testing and Inspecting Services.
   2. Section 01 3100: ‘Project Management and Coordination’ for pre-installation conference.
   3. Section 01 4000: ‘Quality Requirements’ for administrative and procedural requirements for quality assurance and quality control.
   4. Section 01 4301: ‘Quality Assurance – Qualifications’ establishes minimum qualification levels required.
   5. Section 01 4523: ‘Testing and Inspecting Services’ for testing and inspection, and testing laboratory services for materials, products, and construction methods.
   6. Section 01 7800: ‘Closeout Submittals’.
   7. Section 03 3111: ‘Normal-Weight Structural Concrete’ for installation of cast-in-place anchors and inserts.

1.2 REFERENCES

A. Association Publications:

B. Definitions (Following are specifically referenced for testing):
   1. Accreditation: Process in which certification of competency, authority, or credibility is presented. Verify that laboratories have an appropriate quality management system and can properly perform certain test methods (e.g., ANSI, ASTM, and ISO test methods) and calibration parameters according to their scopes of accreditation.
   2. Approved: To authorize, endorse, validate, confirm, or agree to.
   3. Field Quality Control: Testing, Inspections, Special Testing and Special Inspections to assure compliance to Contract Documents.
   4. Inspection/Special Inspection: Inspection of materials, installation, fabrication, erection or placement of components and connections requiring special expertise to ensure compliance with approved construction documents and referenced standards:
      a. Inspection: Not required by code provisions but may be required by Contract Documents.
      b. Special Inspection: Required by code provisions and by Contract Documents.
      c. Inspection-Continuous: Full-time observation of the Work requiring inspection by approved inspector who is present in area where the Work is being performed.
      d. Inspection-Periodic: Part-time or intermittent observation of the Work requiring inspection by approved inspector who is present in area where the Work has been or is being performed and at completion of the Work.
5. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform particular construction operation, including installation, erection, application, and similar operations.

6. Observation: Visual observation of building / site elements or structural system by registered design professional for general conformance to approved construction documents at significant construction stages and at completion. Observation does not include or waive responsibility for performing inspections or special inspections.

7. Owner’s Representative: Owner’s Designated Representative (Project Manager or Facilities Manager) who will have express authority to bind Owner with respect to all matters requiring Owner’s approval or authorization.

8. Preconstruction Testing: Tests and inspections that are performed specifically for Project before products and materials are incorporated into the Work to verify performance or compliance with specified criteria.

9. Product Testing: Tests and inspections that are performed by testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with industry standards.

10. Quality Assurance: Testing, Inspections, Special Testing and Special Inspections provided for by Owner.

11. Quality Control: Testing, Inspections, Special Testing and Special Inspections provided for by Contractor.

12. Service Provider: Agency or firm qualified to perform required tests and inspections.

13. Source Quality Control Testing: Tests and inspections that are performed at source, i.e., plant, mill, factory, or shop.


15. Special Inspector: Certified individual or firm that implements special inspection program for project.


17. Test/Special Test: Field or laboratory tests to determine characteristics and quality of building materials and workmanship.

18. Testing Agency: Entity engaged to perform specific tests, inspections, or both.

19. Testing Agency Laboratory: Agency or firm qualified to perform field and laboratory tests to determine characteristics and quality of materials and workmanship.

20. Verification: Act of reviewing, inspecting, testing, etc. to establish and document that product, service, or system meets regulatory, standard, or specification requirements.

C. Reference Standards:

1. American Concrete Institute:
   a. ACI 355.4-11, ‘Qualification of Post-Installed Adhesive Anchors in Concrete and Commentary’.
   b. ACI 548.12-12, ‘Specification for Bonding Hardened Concrete and Steel to Hardened Concrete with an Epoxy Adhesive’.

2. ASTM International:
   b. ASTM A307-12, ‘Standard Specification for Carbon Steel Bolts and Studs, 60 000 psi Tensile Strength’.
   e. ASTM A490M-12, ‘Standard Specification for High-Strength Steel Bolts, Classes 10.9 and 10.9.3, for Structural Steel Joints [Metric]’.
   f. ASTM A496/A496M-07, ‘Standard Specification for Steel Wire, Deformed, for Concrete Reinforcement’.
   g. ASTM A563-07a, ‘Standard Specification for Carbon and Alloy Steel Nuts’.
   h. ASTM A615/A615M-13, ‘Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement’.
i. ASTM A706/A706M-13, ‘Standard Specification for Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement’.


3. International Code Council (IBC):
   a. IBC Chapter 17, ‘Structural Tests and Special Inspections’.
   b. ICC-ES Reports: ‘ES Acceptance Criteria - Concrete Anchor Compendium’:
      1) AC193, ‘Acceptance Criteria For Mechanical Anchors in Concrete Elements’ (approved June 2012).
      2) AC308 ‘Acceptance Criteria For Post-Installed Adhesive Anchors in Concrete Elements’ (approved June 2013).

1.3 ADMINISTRATIVE REQUIREMENTS

A. Scheduling:
   1. Inspection shall be performed according to Manufacturer’s submitted ICC ES Evaluation Report.
   2. Notify Testing Agency and Architect one week before installing anchors so testing may be scheduled.

1.4 SUBMITTALS

A. Action Submittals:
   1. Product Data:
      a. Manufacturer’s product literature for each item.

B. Informational Submittals:
   1. Test And Evaluation Reports:
   2. Manufacturer’s Instructions:
      a. Manufacturer’s published installation recommendations for each item.

1.5 QUALITY ASSURANCE

A. Qualifications:
   1. Manufacturer:
      a. Having sufficient capacity to produce and deliver required materials without causing delay in work.
   2. Installer:
      a. Acceptable to Manufacturer, experienced in performing work of this section and has specialized in installation of work similar to that required for this project.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Delivery And Acceptance Requirements:
   1. Materials shall be delivered in original, unopened packages with labels intact.

B. Storage And Handling Requirements:
   1. Store materials protected from exposure to harmful weather conditions and as directed by Manufacturer.
PART 2 - PRODUCTS

2.1 MATERIALS

A. Manufactured Units:
   1. General:
      a. Use hot-dipped galvanized or stainless steel with matching nuts and washers in exterior and moist interior applications unless indicated otherwise on Drawings.
      b. Nut: Conform to requirements of ASTM A563, Grade A, Hex.
   2. Threaded rod for adhesive anchors and cast-in anchors:
      a. Conform to requirements of ASTM A307, Grade A or ASTM F1554.
   3. Anchor Bolts:
      a. J-Bolts:
         1) Non-headed type threaded 2 inches (50 mm) minimum conforming to requirements of ASTM F1554, Grade A.
         2) Anchor hook to project 2 inches (50 mm) minimum including bolt diameter.
      b. Headed Bolts:
         1) Headed type threaded 2 inches (50 mm) minimum conforming to requirements of ASTM F1554, Grade A.
   4. Rebar:
      a. Composed of deformed carbon steel meeting requirements of ASTM A706/A706M, Grade 60.
   5. Screw Anchors:
      a. Provide anchors with length identification markings conforming to ICC ES AC 193 for concrete.
      b. Acceptable Products:
         3) Equals as approved by Architect through shop drawing submittal before installation. See Section 01 6200.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification Of Conditions:
   1. Embedded Items:
      a. Identify position of reinforcing steel and other embedded items before drilling holes for anchors:
         1) Exercise care in coring or drilling to avoid damaging existing reinforcing or embedded items.
         2) Take precautions as necessary to avoid damaging pre-stressing tendons, electrical and telecommunications conduit, and gas lines.
      b. Notify Engineer if reinforcing steel or other embedded items are encountered during drilling.
   2. Base Material Strength:
      a. Unless otherwise specified, do not drill holes in concrete until concrete has achieved full design strength.

3.2 PREPARATION

A. Surface Preparation:
   1. Clean surfaces prior to installation.
   2. Prepare surface in accordance with Manufacturer's written recommendations.
3.3 INSTALLATION

A. Drilled-In Anchors:
   1. Screw Anchors:
      a. Protect threads from damage during anchor installation.
      b. Set anchors to Manufacturer’s recommended torque, using a torque wrench.

3.4 FIELD QUALITY CONTROL

A. Field Tests and Inspections:
   1. Screw Anchors:
      a. Certified Inspector from Testing Agency shall verify procedures used for installation of all concrete anchors and monitor their installation for compliance with Manufacturer’s requirements.
      b. Inspections:
         1) Inspections shall include required verification and inspection of anchors as referenced in IBC Table 1704.4 and in accordance with ACI 318 and applicable ASTM material standards. Periodic and continuous inspections include:
            a) Inspection of bolts to be installed in concrete prior to and during placement of concrete (continuous).
            b) Inspection of anchors installed in hardened concrete (periodic).
      c. Testing:
         1) Ten percent (10%) of each type and size of drilled-in anchor shall be proof loaded by Testing Agency’s testing laboratory or as directed by Architect. Adhesive anchors will not be torque tested unless otherwise directed by Architect. If more than 10 percent of tested anchors fail to achieve specified torque or proof load within limits defined on Drawings, all anchors of same diameter and type as failed anchors shall be tested at Contractors expense, unless otherwise instructed by Architect.
            a) Torque will be applied with calibrated torque wrench.
            b) Proof loads will be applied with calibrated hydraulic ram. Displacement of adhesive anchors at proof load shall not exceed D/10, where D is nominal anchor diameter.

B. Non-Conforming Work:
   1. Remove and replace misplaced or malfunctioning anchors.
   2. Fill empty anchor holes and patch failed anchor locations with high-strength, non-shrink, non-metallic grout acceptable to Architect.
   3. Anchors that fail to meet proof load or installation torque requirements will be regarded as malfunctioning.
   4. Repair damage to adjacent materials caused by product installation.

3.5 CLEANING

A. Waste Management:
   1. Disposal of rubbish, debris, and packaging materials.

3.6 PROTECTION

A. General:
   1. Protect installed products from damage during construction.

END OF SECTION
SECTION 03 2100

REINFORCEMENT BARS

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Furnish and install concrete reinforcement bars as described in Contract Documents.

B. Related Requirements
   1. Section 01 1200: ‘Multiple Contract Summary’ for Owner Furnished Testing and Inspecting Services.
   2. Section 01 3100: ‘Project Management and Coordination’ for pre-installation conference.
   3. Section 01 4000: ‘Quality Requirements’ for administrative and procedural requirements for quality assurance and quality control.
   4. Section 01 4301: ‘Quality Assurance – Qualifications’ establishes minimum qualification levels required.
   5. Section 01 4523: ‘Testing and Inspecting Services’ for testing and inspection, and testing laboratory services for materials, products, and construction methods.
   6. Section 01 7800: ‘Closeout Submittals’.
   7. Section 03 1113: ‘Structural Cast-In-Place Concrete Forming’.
   8. Section 03 3111: ‘Normal Weight Structural Concrete’.
      a. Reinforcement installed in concrete.
      b. Pre-installation conference held jointly with other concrete related sections.

1.2 REFERENCES

A. Association Publications:
   2. Concrete Reinforcing Steel Institute (CRSI):

B. Definitions (Following are specifically referenced for testing):
   1. Accreditation: Process in which certification of competency, authority, or credibility is presented. Verify that laboratories have an appropriate quality management system and can properly perform certain test methods (e.g., ANSI, ASTM, and ISO test methods) and calibration parameters according to their scopes of accreditation.
   2. Field Quality Control: Testing, Inspections, Special Testing and Special Inspections to assure compliance to Contract Documents.
   3. Inspection/Special Inspection: Inspection of materials, installation, fabrication, erection or placement of components and connections requiring special expertise to ensure compliance with approved construction documents and referenced standards:
      a. Inspection: Not required by code provisions but may be required by Contract Documents.
      b. Special Inspection: Required by code provisions and by Contract Documents.
      c. Inspection-Continuous: Full-time observation of the Work requiring inspection by approved inspector who is present in area where the Work is being performed.
      d. Inspection-Periodic: Part-time or intermittent observation of the Work requiring inspection by approved inspector who is present in area where the Work has been or is being performed and at completion of the Work.
4. Observation: Visual observation of building/site elements or structural system by registered design professional for general conformance to approved construction documents at significant construction stages and at completion. Observation does not include or waive responsibility for performing inspections or special inspections.

5. Preconstruction Testing: Tests and inspections that are performed specifically for Project before products and materials are incorporated into the Work to verify performance or compliance with specified criteria.

6. Product Testing: Tests and inspections that are performed by testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with industry standards.

7. Quality Assurance: Testing, Inspections, Special Testing and Special Inspections provided for by Owner.

8. Quality Control: Testing, Inspections, Special Testing and Special Inspections provided for by Contractor.

9. Service Provider: Agency or firm qualified to perform required tests and inspections.

10. Source Quality Control Testing: Tests and inspections that are performed at source, i.e., plant, mill, factory, or shop.

11. Special Inspection: See Inspection.

12. Special Inspector: Certified individual or firm that implements special inspection program for project.


14. Test/Special Test: Field or laboratory tests to determine characteristics and quality of building materials and workmanship.
   a. Test: Not required by code provisions but may be required by Contract Documents.
   b. Special Test: Required by code provisions and by Contract Documents.

15. Testing Agency: Entity engaged to perform specific tests, inspections, or both.

16. Testing Agency Laboratory: Agency or firm qualified to perform field and laboratory tests to determine characteristics and quality of materials and workmanship.

17. Verification: Act of reviewing, inspecting, testing, etc. to establish and document that product, service, or system meets regulatory, standard, or specification requirements.

C. Reference Standards:
   1. American Concrete Institute:
      a. ACI 117-10: ‘Specifications for Tolerances for Concrete Construction and Materials and Commentary’.
      b. ACI 117M-10: ‘Specifications for Tolerances for Concrete Construction and Materials and Commentary (Metric)’.
      c. ACI 318-11, ‘Building Code Requirements for Structural Concrete and Commentary’.
   2. ASTM International (Following are specifically referenced for reinforcement bars testing):
      a. ASTM A615/A615M-13, ‘Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement’.
   3. ASTM International (Following are specifically referenced for Testing Agencies):

1.3 ADMINISTRATIVE REQUIREMENTS

A. Pre-Installation Conferences:
   1. Participate in pre-installation conference as specified in Section 03 3111.
   2. In addition to agenda items specified in Section 01 3100, and Section 03 3111, review following:
      a. Installation scheduling and reinforcing placement.
      b. Review Section 01 4523 for Testing and Inspection administrative requirements and responsibilities and Field Quality Control tests and inspections required of this section.  
         1) Review frequency of testing and inspections.

B. Scheduling:
1. Notify Testing Agency and Architect as directed in Section 03 3111.

1.4 SUBMITTALS

A. Action Submittals:
   1. Shop Drawings:
      a. Reinforcing placement drawings.

B. Informational Submittals:
   1. Certificates:
      a. Mill certificates for mill tests for reinforcing in accordance with ASTM A615/A615M.

C. Closeout Submittals:
   1. Include following in Operations And Maintenance Manual specified in Section 01 7800:
      a. Record Documentation:
         1) Testing and Inspection Reports:
            a) Testing Agency Inspection Reports of reinforcement bars.

1.5 QUALITY ASSURANCE

A. Regulatory Agency Sustainability Approvals:
   1. Comply with provisions of following codes and standards except where more stringent requirements are shown or specified:
      a. ACI 318, 'Building Code Requirements for Structural Concrete and Commentary'.
      b. Concrete Reinforcing Steel Institute (CRSI) 'Manual of Standard Practice'.

B. Qualifications:
   1. Throughout progress of the work of this section, provide at least one (1) person who shall be thoroughly familiar with Construction Documents and other applicable specified requirements, completely trained and experienced in necessary skills, and who shall be present at site and shall direct all work performed under this Section:
      a. In actual installation of the work of this Section, use adequate numbers of skilled workmen to ensure installation in strict accordance with approved design.
      b. In acceptance or rejection of work performed under this Section, no allowance will be made for lack of skill on part of workmen.

C. Testing and Inspection:
   1. Owner will provide Testing and Inspection for inspection of reinforcement bars:
      a. Owner will employ testing agencies to perform testing and inspection on concrete as specified in Field Quality Control in Part 3 of this specification.
         1) Owner's employment of an independent Testing Agency does not relieve Contractor of Contractor's obligation to perform the Work in strict accordance with requirements of Contract Documents and perform contractor testing and inspection.
         2) See Section 01 1200: 'Multiple Contract Summary'.
      b. Owner's employment of an independent Testing Agency does not relieve Contractor of Contractor's obligation to perform testing and inspection as part of his Quality Control.
         1) Testing and inspections, if performed by Contractor, will be responsibility of Contractor to be performed by an independent entity.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Delivery And Acceptance Requirements:
   1. Deliver bars separated by size and tagged with manufacturer's heat or test identification number.
   2. Reinforcement bars shall be free of heavy rust scales and flakes, or other coating at time of delivery and placing.
B. Storage And Handling Requirements:
   1. Properly protect rebar on site after delivery.

PART 2 - PRODUCTS

2.1 MATERIAL

A. Reinforcement Bars:
   1. Bars shall have grade identification marks and conform to ASTM A615/A615M:
      a. Grade 60 minimum, except dowels that are to be field bent, Grade 40 minimum.
   2. Bars shall be deformed type.
   3. Bars shall be free of heavy rust scales and flakes, or other bond-reducing coatings.

2.2 ACCESSORIES

A. Bar Supports:
   1. Concrete masonry units or bricks are not acceptable.
   2. For exposed-to-view concrete surfaces, where legs of supports are in contact with forms, provide supports with legs which are plastic protected (CRSI, Class 1) or stainless steel protected (CSRI, Class 2).
   3. Type Two Acceptable Products:
      a. Concrete 'dobies' or blocks wired to reinforcing.
      b. Manufactured chairs with 4 sq inch (25.8 sq cm) bearing surface on sub-grade, or other feature to prevent chair from being pushed into sub-grade or damaging vapor retarder under slabs on grade.
      c. Equals as approved by Architect before installation. See Section 01 6200.

2.3 FABRICATION

A. Fabricate reinforcement bars according to the Concrete Reinforcing Steel Institute (CRSI) 'Manual of Standard Practice' and details on Contract Documents.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General:
   1. Avoid cutting or puncturing vapor retarder during reinforcement placement and concrete operations.
   2. Clean reinforcement of loose rust and mill scale, earth, ice, and other materials which reduce or destroy bond with concrete.
   3. Blowtorch shall not be used to facilitate field cutting or bending or any other reinforcing work.
   4. Reinforcement shall not be bent after partially embedded in hardened concrete.

B. Placing Reinforcement:
   1. Comply with Concrete Reinforcing Steel Institute (CRSI) 'Manual of Standard Practice' recommended practice for 'Placing Reinforcing Bars' for details and methods of reinforcement placement and supports. and as herein specified.
   2. Accurately position, support, and secure reinforcement against displacement by formwork, construction, or concrete placement operations:
      a. Locate and support reinforcing by chairs, runners, bolsters, bar supports, spacers, or hangers, as required as recommended by 'ACI Detailing Manual, latest edition, except slab on grade work.'
b. Support bars in slabs on grade and footings with specified bar supports around perimeter and at 4-1/2 feet (1350 mm) on center each way maximum to maintain specified concrete cover.

c. Install bar supports at bar intersections.

C. Splices:
   1. Non-Concrete Structural System:
      a. Avoid splices of reinforcement bars at points of maximum stress. Lap bars 60 bar diameters minimum unless dimensioned otherwise on Drawings. Run reinforcement bars continuous through cold joints.
   2. Concrete Structural System:
      a. In beams, slabs, and walls, avoid splices of reinforcement bars at points of maximum stress.
      b. Lap bars as follows:
         1) Compression Splices: 45 bar diameters minimum.
         2) Tension Splices: In accordance with ACI Class B requirements.
         3) No splice shall be less than 20 inches (508 mm).

D. Tolerances:
   1. Provide following minimum concrete cover for reinforcement as per ACI 318. Arrange, space and securely tie bars and bar supports to hold reinforcement in position during concrete placement operations:
      a. Concrete cast against and permanently exposed to earth:
         1) Interior Slabs on Grade: 1 inches (25 mm). clear from top of slab at 4 inches (100 mm) slabs, 2 inches (50 mm) clear at 6 inches (150 mm) slabs.
         2) Sections other than Slabs: 3 inches (75 mm).
      b. Concrete Exposed to Earth or Weather:
         1) No. 6 and Larger Bars: 2 inches (50 mm).
         2) No. 5 and Smaller Bars, W31 and D31 Wire: 1-1/2 inches (38 mm).

3.2 FIELD QUALITY CONTROL

A. Field Tests And Inspections:
   1. General:
      a. Owner is responsible for Quality Assurance. Quality assurance performed by Owner will be used to validate Quality Control performed by Contractor.
      b. Quality Control is sole responsibility of Contractor as specified in Section 01 4523 ‘Testing And Inspection Services’.
   2. Reinforcement Bars:
      a. Testing Agency shall provide inspection for Reinforcement Bars. See Section 03 3111 for Testing and Inspection requirements.
SECTION 03 3053
MISCELLANEOUS EXTERIOR CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   2. Furnish and install miscellaneous cast-in-place concrete and equipment pads as described in Contract Documents.
   3. Furnish and install sealants and curing compounds as described in Contract Documents.

B. Products Installed But Not Furnished Under This Section:
   1. Detectable warning panels.

C. Related Requirements:
   1. Section 03 1113: ‘Structural Cast-In-Place Concrete Forming’.
   2. Section 03 3111: ‘Normal Weight Structural Concrete’ for:
      a. Concrete mix information and use admixtures.
      b. Field Quality Control Testing and Inspection requirements for concrete.
   3. Section 03 4800: ‘Precast Concrete Specialties’ for detectable warning panels.

1.2 REFERENCES

A. Association Publications:
      a. ACI 224R-01, ‘Control of Cracking in Concrete Structures’.
      b. ACI 224.1R-07, ‘Causes, Evaluation, and Repair of Cracks in Concrete Structures’.
      c. ACI 224.2R-92(R2004): ‘Cracking of Concrete Members in Direct Tension’.
      d. ACI 224.3R-95(R2013), ‘Joints in Concrete Construction’.
      e. ACI 224.4R-13, ‘Guide to Design Detailing to Mitigate Cracking’.
      f. ACI 302.1R-04: ‘Guide for Concrete Floor and Slab Construction’.
      g. ACI 305R-10, ‘Guide to Hot Weather Concrete’.
      h. ACI 306R-10, ‘Guide to Cold Weather Concrete’.


B. Definitions:
   1. Field Quality Control: Testing, Inspections, Special Testing and Special Inspections to assure compliance to Contract Documents.

C. Reference Standards:
   1. American Concrete Institute:
      a. ACI 117-10: ‘Specifications for Tolerances for Concrete Construction and Materials and Commentary’.
      b. ACI 117M-10: ‘Specifications for Tolerances for Concrete Construction and Materials and Commentary (Metric)’.
1.3 SUBMITTALS

A. Action Submittals:
   1. Joint layout plan for control and expansion joints for sidewalks, curbs, and gutters for written approval before starting work on this Section.
   2. Detectable warning panels:
      a. Layout plan and joints location for written approval before starting work on this Section.

B. Closeout Submittals:
   1. Include following in Operations And Maintenance Manual specified in Section 01 7800:
      a. Record Documentation:
         1) Testing and Inspection Reports:
            a) Testing Agency Testing and Inspecting Reports of concrete for exterior site work.

1.4 QUALITY ASSURANCE

A. Testing and Inspection.
   1. Owner will provide Testing and Inspection for concrete for exterior site work:

1.5 FIELD CONDITIONS

A. Ambient Conditions:
   1. Cold Weather Limitations:
      a. Follow requirements of ACI 306 for cold weather concreting.
   2. Hot Weather Limitations:
      a. Follow requirements of ACI 305 for hot weather concreting.

PART 2 - PRODUCTS

2.1 SYSTEM

A. Materials:
   1. Concrete:
      a. Meet requirements specified in Section 03 3111 for exterior concrete.
2.2 ACCESSORIES

A. Formwork:
   1. Meet requirements specified in Section 03 1113.

B. Expansion Joint Material:
   1. 1/2 inch (12.7 mm) thick.
   2. Manufactured commercial fiber type:
      a. Meet requirements of ASTM D1751.
      b. Acceptable Products:
         3) Equal as approved by Architect before installation. See Section 01 6200.

C. Finishing Material:
   1. Finishing Material available in multiple concrete shades to closely match concrete surface.
   2. Acceptable Products:
      a. Mixture of 1 part cement (using same cement as used in concrete foundations), 1 part sand
         with 95% passing #50 sieve.
      c. Equal as approved by Architect before installation. See Section 01 6200.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification Of Conditions:
   1. Concrete Forms:
      a. Verify dimensions and spot elevations for locations of forms for concrete footings, stem
         walls, building slabs, curbs, gutters, walkways, and drainage systems are correct before
         concrete is placed.
      1) Notify Architect of incorrect dimensions or spot elevations in writing.
      2) Do not place concrete until corrections are made and verified.
   2. Detectable Warning Panels:
      a. Examine substrate and verify substrate is suitable for installation of detectable warning
         panels:
      1) Notify Architect of unsuitable conditions in writing.
      2) Do not install detectable warning panels over unsuitable conditions.
      3) Commencement of Work by installer is considered acceptance of substrate.

3.2 PREPARATION

A. Concrete Slab Thickness:
   1. Increase thickness of concrete beneath detectable warning panels one inch (25 mm).

3.3 INSTALLATION

A. General:
   1. Form vertical surfaces full depth. Do not allow concrete to flow out from under forms in any
      degree into landscaped areas.
B. Sidewalks And Landings:
   1. Slope with cross slope of 1/8 to 1/4 inch per ft (3 to 6 mm per 300 mm) (one to two percent) in direction of intended drainage.
   2. Slope away from building 1/8 to 1/4 inch per ft (3 to 6 mm per 300 mm) (one to two percent) minimum.
   3. Do not dust with cement.
   4. Concrete walks shall be screeded to bring surface to grades and lines as indicated. Surface shall be floated with wood float with no coarse aggregate showing and then given broom finish before concrete sets.

C. Detectable Warning Panels:
   1. Follow Manufacturer’s recommendations on following:
      a. Temperature requirements.
      b. Expansion and control joint requirements.
      c. Installation of panels.
      d. Curing of panels.

D. Joints:
   1. Control Joints:
      a. Depth of control joints shall be approximately one quarter of concrete slab thickness, but not less than one inch (25 mm).
      b. Control joints to be hand tooled in sidewalks, curbs and gutters, mow strips, and aprons.
      c. Spacing On Center (+/-):

         | Sidewalks         | 4 feet to 6 feet | 12 meters to 18 meters |
         | Curbs and Gutters | 10 feet          | 3.0 meters            |

   2. Expansion Joints:
      a. Install so top of expansion joint material is 1/4 inch (6 mm) below finished surface of concrete.
      b. No expansion joint required between curbs and sidewalks parallel to curb.
      c. Provide expansion joints at ends of exterior site concrete elements that are perpendicular to and terminate at curbs, building foundations or other concrete elements (i.e. sidewalks, mow strips, aprons).
      d. Provide expansion joints between sidewalks that are parallel, and adjacent, to the storage building or main building.
      e. Spacing On Center (+/-):

         | Sidewalks, Curbs and Gutters | 40 feet to 100 feet | 12 meters to 30 meters |
         | Mow Strips and Aprons         | 20 feet to 40 feet  | 6 meters to 12 meters  |

   f. Seal expansion joints as specified in Section 07 9213 for following areas:
      1) Between entryway slabs and building foundations.
      2) Between sidewalks and building foundations.
      3) Within curbs and gutters.
   g. Expansion joints are not required to be sealed for following areas:
      1) Within aprons and where apron abuts sidewalks.
      2) Within sidewalks.

E. Finish:
   1. Flatwork:
      a. Curb, Gutter Sidewalks And Miscellaneous:
         1) After completion of floating and troweling when excess moisture or surface sheen has disappeared, complete surface finishing, as follows:
            a) Provide fine hair finish where grades are less than 6 percent 1-1/4 inch (32 mm).
            b) Provide rough hair finish where grades exceed 6 percent 1-1/4 inch (32 mm).
c) Broom finish, by drawing broom across concrete surface, perpendicular to line of traffic. Repeat operation if required to provide fine line texture acceptable to Architect. At curb and gutter, apply broom finish longitudinal to curb and gutter flowline.

d) On inclined slab surfaces, provide coarse, non-slip finish by scoring surface with stiff-bristled broom, perpendicular to line of traffic. At curb and gutter, apply broom finish longitudinal to curb and gutter flowline.

e) Do not remove forms for twenty four (24) hours after concrete has been placed. After form removal, clean ends of joints and point-up any minor honeycombed areas. Remove and replace areas or sections with major defects, as directed by Architect.

f) Round edges exposed to public view to 1/2 inch (13 mm) radius, including edges formed by expansion joints.

g) Remove edger marks.

b. Concrete Paving Finish – Broom finish.

2. Vertical Surfaces (Exposed To View Vertical Surfaces.):
   a. General:
      1) Finishing Material to fill and smooth interior and exterior concrete surface defects such as spalls, gouges, cracks, dents, chips, bug holes, stone pockets, honeycombs, voids and other defective areas.
      2) Chamfer lines shall be finished.

   b. Surface Preparation:
      1) Formwork shall be stripped from concrete while concrete is still “green”.
      2) Concrete surface to be finished immediately after formwork has been removed.
         a) Immediately after removing forms, remove joints, marks, bellies, projections, loose materials and other irregularities, and cut back metal ties from surfaces to be exposed.
         b) Repair defective areas and voids or stone pockets with Finishing Material and smooth to even surface matching surrounding undamaged area.

   c. Smooth Rubbed Finish:
      1) Thoroughly wet with water, apply Finishing Material in thin layer, rub in circular motion to smooth uniform finish.
      2) Entire surface shall be protected from rapid drying for not less than three (3) days.
      3) Surfaces shall be cleaned of drip marks and discolorations.
      4) Concrete surface shall be left with clean, neat, uniform finish, free from form markings and shall be uniform in color and texture.

3.4 FIELD QUALITY CONTROL

A. Field Tests and Inspections:
   1. Concrete:
      a. Testing Agency shall provide testing and inspection for ‘Miscellaneous Cast-In-Place Exterior Concrete’ as specified in Section 03 3111 ‘Normal Weight Structural Concrete’ in Part 3 Field Quality Control for exterior site work.

B. Non-Conforming Work: Non-conforming work as covered in the General Conditions applies, but is not limited to the following:
   1. Correct any work found defective or not complying with contract document requirements at no additional cost to the Owner.

3.5 CLEANING

A. General:
   1. Detectable Warning Panels:
      a. Clean the panel in accordance with Manufacturer’s cleaning instructions.
3.6 PROTECTION

A. General:
   1. Protect concrete that has not received its initial set from precipitation to avoid excess water in mix and unsatisfactory surface finish.

B. Detectable Warning Panels:
   1. Protect installed panels from damage and until completion of project.
   2. Protect installed panels from traffic until desired concrete strength is achieved.

END OF SECTION
SECTION 03 3111
NORMAL WEIGHT STRUCTURAL CONCRETE

PART 1 - GENERAL

1.1 SUMMARY
A. Includes But Not Limited To:
   1. Furnish and install Project concrete work as described in Contract Documents.
   2. Quality of concrete used on Project but furnished under other Sections.
B. Products Installed But Not Furnished Under This Section:
   1. Inserts, bolts, boxes, templates, and fastening devices for other work, including those for bases only for Mechanical and Electrical.
   2. Concrete accessories.
C. Related Requirements:
   1. Pre-installation conference held jointly with Section 31 3111 as described in Administrative Requirements on Part 1 of this specification section.
   2. Section 01 1200: ‘Multiple Contract Summary’ for Owner Furnished Testing and Inspecting Services.
   4. Section 01 4000: ‘Quality Requirements’ for administrative and procedural requirements for quality assurance and quality control.
   5. Section 01 4301: ‘Quality Assurance – Qualifications’ establishes minimum qualification levels required.
   6. Section 01 4523: ‘Testing and Inspecting Services’ for testing and inspection, and testing laboratory services for materials, products, and construction methods.
   7. Section 01 7800: ‘Closeout Submittals’.
   8. Section 03 1113: ‘Structural Cast-In-Place Concrete Forming’.
   9. Section 03 1511: ‘Concrete Anchors and Inserts’.
   10. Section 03 2100: ‘Reinforcement Bars’.
   11. Divisions 22, 23, And 26: Mechanical and electrical devices including boxes, conduits, pipes, hangers, inserts, and other work to be embedded in concrete work before placing.
   14. Furnishing of items to be embedded in concrete specified in Section involved.

1.2 REFERENCES
A. Association Publications:
      a. ACI 214.3R-88(97), ‘Recommended Practice for Evaluation of Strength Test Results of Concrete.
      b. ACI 224R-01, ‘Control of Cracking in Concrete Structures’.
      c. ACI 224.1R-07, ‘Causes, Evaluation, and Repair of Cracks in Concrete Structures’.
      d. ACI 224.2R-92(R2004): ‘Cracking of Concrete Members in Direct Tension’.
      e. ACI 224.3R-95(R2013), ‘Joints in Concrete Construction’.
      f. ACI 224.4R-13, ‘Guide to Design Detailing to Mitigate Cracking’.
      g. ACI 302.1R-04: ‘Guide for Concrete Floor and Slab Construction’.

h. ACI 302.2R-06, ‘Guide for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials’.

i. ACI 304R-00, ‘Guide for Measuring, Mixing, Transporting and Placing Concrete’.


m. ACI 309.1R-08, ‘Report on Behavior of Fresh Concrete During Vibration’.

n. ACI 311.4R-05, ‘Guide for Concrete Inspection’.

o. ACI 347-04, ‘Guide to Formwork for Concrete’.

p. Certifications:
   1) ACI CP-1(13), ‘Technical Workbook for ACI Certification of Concrete Field Testing Technician-Grade 1’.
   2) ACI CP-10(10), ‘Craftsman Workbook for ACI Certification of Concrete Flatwork Technician/Finisher’.
   3) ACI CP-19(13), ‘Technical Workbook for ACI Certification of Concrete Strength Testing Technician’.


B. Definitions (Following are specifically referenced for testing):

1. Accreditation: Process in which certification of competency, authority, or credibility is presented. Verify that laboratories have an appropriate quality management system and can properly perform certain test methods (e.g., ANSI, ASTM, and ISO test methods) and calibration parameters according to their scopes of accreditation.

2. Approved: To authorize, endorse, validate, confirm, or agree to.

3. Cementitious Materials: Portland cement alone or in combination with one or more of following: blended hydraulic cement, fly ash and other pozzolans, ground granulated blast-furnace slag, and silica fume; subject to compliance with requirements.


5. Floor Flatness (FF): Rate of change in elevation of floor over a 12 inches (305 mm) section.

6. Floor Levelness (FL): Measures difference in elevation between two points which are 10 feet (3.05 m) apart.

7. Inspection/Special Inspection: Inspection of materials, installation, fabrication, erection or placement of components and connections requiring special expertise to ensure compliance with approved construction documents and referenced standards:
   a. Inspection: Not required by code provisions but may be required by Contract Documents.
   b. Special Inspection: Required by code provisions and by Contract Documents.
   c. Inspection-Continuous: Full-time observation of the Work requiring inspection by approved inspector who is present in area where the Work is being performed.
   d. Inspection-Periodic: Part-time or intermittent observation of the Work requiring inspection by approved inspector who is present in area where the Work has been or is being performed and at completion of the Work.

8. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform particular construction operation, including installation, erection, application, and similar operations.

9. Mockups: Full-size, physical assemblies that are constructed on-site. Mockups are used to verify selections made under sample submittals, to demonstrate aesthetic effects and, where indicated, qualities of materials and execution, and to review construction, coordination, testing, or operation. They are not samples. Approved mockups establish standard by which the Work will be judged.

10. Observation: Visual observation of building / site elements or structural system by registered design professional for general conformance to approved construction documents at significant construction stages and at completion. Observation does not include or waive responsibility for performing inspections or special inspections.
11. Owner’s Representative: Owner’s Designated Representative (Project Manager or Facilities Manager) who will have express authority to bind Owner with respect to all matters requiring Owner’s approval or authorization.

12. Preconstruction Testing: Tests and inspections that are performed specifically for Project before products and materials are incorporated into the Work to verify performance or compliance with specified criteria.

13. Product Testing: Tests and inspections that are performed by testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with industry standards.


15. Quality Control: Testing, Inspections, Special Testing and Special Inspections provided for by Contractor.

16. Service Provider: Agency or firm qualified to perform required tests and inspections.

17. Source Quality Control Testing: Tests and inspections that are performed at source, i.e., plant, mill, factory, or shop.

18. Special Inspection: See Inspection.

19. Special Inspector: Certified individual or firm that implements special inspection program for project.


21. Test/Special Test: Field or laboratory tests to determine characteristics and quality of building materials and workmanship.
   a. Test: Not required by code provisions but may be required by Contract Documents.
   b. Special Test: Required by code provisions and by Contract Documents.

22. Testing Agency: Entity engaged to perform specific tests, inspections, or both.

23. Testing Agency Laboratory: Agency or firm qualified to perform field and laboratory tests to determine characteristics and quality of materials and workmanship.

24. Verification: Act of reviewing, inspecting, testing, etc. to establish and document that product, service, or system meets regulatory, standard, or specification requirements.

C. Reference Standards:

1. American Association of State and Highway Transportation Officials:
   b. AASHTO M 213-01 (2010), 'Standard Specification for Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)'.
   c. AASHTO T 318-02(2011), 'Standard Method of Test for Water Content of Freshly Mixed Concrete Using Microwave Oven Drying'.

2. American Concrete Institute:
   a. ACI 117-10: ‘Specifications for Tolerances for Concrete Construction and Materials and Commentary’.
   b. ACI 117M-10: ‘Specifications for Tolerances for Concrete Construction and Materials and Commentary (Metric)’.
   c. ACI 117-10: ‘Specifications for Tolerances for Concrete Construction and Materials and Commentary’.
   d. ACI 211.1-91(R2009), ‘Standard Practice for Selecting Proportions for Normal, Heavyweight and Mass Concrete’.
   e. ACI 301-10, ‘Specification for Structural Concrete for Buildings’.
   f. ACI 301M-10, ‘Specification for Structural Concrete (Metric)’.
   g. ACI 305.1-06, ‘Specification for Hot Weather Concreting’.
   i. ACI 308.1-11, ‘Standard Specification for Curing Concrete’.
   j. ACI 308.1M-11, ‘Standard Specification for Curing Concrete’.
   k. ACI 318-11, ‘Building Code Requirements for Structural Concrete and Commentary’.

3. ASTM International:
   a. ASTM A615/A615M-14, ‘Standard Specification for Deformed and Plain Carbon Steel Bars for Concrete Reinforcement’.
b. ASTM A706/A706M-14, ‘Standard Specification for Low-Alloy Steel Deformed and Plain Bars for Concrete Reinforcement’.

c. ASTM C31/C31M-12, ‘Standard Practice for Making and Curing Concrete Test Specimens in the Field’.


f. ASTM C42/C42M-13, ‘Standard Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete’.


h. ASTM C138/C138M-13a, ‘Standard Test Method for Density (Unit Weight), Yield, and Air Content (Gravimetric) of Concrete’.

i. ASTM C140/C140M-14, ‘Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units’.

j. ASTM C143/C143M-12, ‘Standard Test Method for Slump of Hydraulic-Cement Concrete’.


m. ASTM C172/C172M-14, ‘Standard Practice for Sampling Freshly Mixed Concrete’.

n. ASTM C173/C173M-14, ‘Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method’.

o. ASTM C192/C192M-13a, ‘Standard Practice for Making and Curing Concrete Test Specimens in the Laboratory’.

p. ASTM C231/C231M-10, ‘Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method’.


w. ASTM C597-09, ‘Standard Test Method for Pulse Velocity Through Concrete’.

x. ASTM C618-12a, ‘Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete’.


z. ASTM C805/C805M-13a, ‘Standard Test Method for Rebound Number of Hardened Concrete’.


bb. ASTM C1077-14, ‘Practice for Laboratories Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Laboratory Evaluation’.


ll. ASTM F710-11, ‘Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring’.

4. International Code Council (IBC):
   a. CBC Chapter 17, ‘Structural Tests and Special Inspections’.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Pre-Installation Conference:
   1. Participate in pre-installation conference as specified in Section 01 3100 and held jointly with following sections:
      a. Section 03 1113: ‘Structural Cast-In-Place Concrete Forming’.
      b. Section 03 2100: ‘Reinforcement Bars’.
      c. Section 22 1116: ‘Domestic Water Piping’.
      d. Section 26 0526: ‘Grounding And Bonding For Electrical Systems’.
   2. Schedule pre-installation conference prior to placing of footings, installation of foundation forms and reinforcing steel, and installation of anchors, dowels, inserts, and block outs in foundation walls and slabs:
   3. In addition to agenda items specified in Section 01 3100, review following:
      a. Installation scheduling, coordination, placement of concrete, and placement of items installed in and under floor slab.
      b. Review requirements for preparation of subgrade.
      c. Review aggregate base requirements.
      d. Review formwork requirements.
      e. Review approved mix design requirements and use of admixtures.
      f. Review reinforcing steel submittals.
      g. Review placement, finishing, and curing of concrete including cold and hot weather requirements.
      h. Review jointing requirements and joint layout.
      i. Review concrete slab tolerances and corrective measures if tolerances not met.
      j. Review safety issues.
      k. Review Section 01 4523 for Testing and Inspection administrative requirements and responsibilities and Field Quality Control tests and inspections required of this section.
         1) Review frequency of testing and inspections.

B. Scheduling:
   1. Notify Testing Agency and Architect twenty four (24) hours minimum before placing concrete.

1.4 SUBMITTALS

A. Action Submittals:
   1. Shop Drawings:
      a. Show dimensioned locations of anchor bolts for hold-down anchors and columns.
      b. Show reinforcement and all necessary bending diagrams and reinforcing steel list, and construction joint locations.
      c. Provide bar schedules and bending details.
      d. Reinforced concrete walls shall be shown in scale elevation (scale at least one quarter inch to one foot). Details shall be in accordance with ACI rules.
      e. Show all formwork for concrete surfaces which are to remain exposed in the finished work.
B. Informational Submittals:
   1. Certificates:
      a. Installers:
         1) Certification for National Ready Mixed Concrete Association (NRMCA).
         2) Certification for ACI-certified Flatwork Finishers and Technicians.
   2. Design Data:
      a. Mix Design:
         1) Furnish proposed mix design to Architect for review prior to commencement of Work.
            a) Include density (unit weight) and void content determined per ASTM C1688/C1688M for fresh mixed properties and per ASTM C140/C140M for hardened concrete properties.
            b) Mix design shall show proposed admixture, amount, usage instructions, and justification for proposed use.
      b. Ready-Mix Supplier:
         1) Require mix plant to furnish delivery ticket for each batch of concrete. Keep delivery tickets at job-site for use of Owner or his representatives. Tickets shall show following:
            a) Name of ready-mix batch plant.
            b) Serial number of ticket.
            c) Date and truck number.
            d) Name of Contractor.
            e) Name and location of Project.
            f) Specific class or designation of concrete conforming to that used in Contract Documents.
            g) Amount of concrete.
            h) Amount and type of cement.
            i) Total water content allowed by mix design.
            j) Amount of water added at plant.
            k) Sizes and weights of sand and aggregate.
            l) Time loaded.
            m) Type, name, manufacturer, and amount of admixtures used.
            n) Design Data.
         2) Provide certificates with supporting testing reports verifying compliance with Contract Document requirements and that materials provided are from single source for following:
            a) Cement.
            b) Aggregate.
            c) Fly Ash.
   3. Source Quality Control Submittals:
      a. Concrete mix design: Submit mix designs to meet following requirements:
         1) Proportions:
            a) Mix Type A:
               (1) 3000 psi (20.68 MPa) minimum at twenty eight (28) days.
               (2) Water / Cementitious Material: 0.45 to 0.50 by weight.
            b)...
         2) Slump:
            a) 4 inch (100 mm) slump maximum before addition of high range water reducer.
            b) 8 inch (200 mm) slump maximum with use of high range water reducer.
            c) Slump not required for Mix Type F.
         3) Admixtures:
            a) Mix design shall show proposed admixture, amount, usage instructions, and justification for proposed use. Do not use any admixture without Architect's written approval.
            b) Mineral: An amount of specified Class F (or Class C where Class F is not available) fly ash not to exceed ten (10) percent of weight of cement may be substituted for cement. If substituted, consider fly ash with cement in determining amount of water necessary to provide specified water / cement ratio.
            c) Chemical: Specified accelerator or retarder may be used if necessary to meet environmental conditions.
d) Chemical: Special additives to promote rapid drying concrete may be used in interior concrete slabs on grade if necessary to meet construction schedules.

C. Closeout Submittals:
   1. Include following in Operations And Maintenance Manual specified in Section 01 7800:
      a. Record Documentation:
         1) Pour Reports:
            a) Provide report that records following information:
            b) Date and time of start of pour, Date and time of end of pour, and Date and time of end of finishing procedures.
            c) Temperature at start of pour, Temperature at end of Pour, and Maximum temperature during performance of finishing procedures.
            d) Wind speed at start of pour, Wind speed at end of pour, and Maximum wind speed during performance of finishing procedures.
            e) Humidity at start of pour, Humidity at end of pour, and High and low humidity during performance of finishing procedures.
            f) Cloud cover at start of pour, Cloud cover at end of pour, and High and low cloud cover during performance of finishing procedures.
            g) Screeding method and equipment used.
            h) Saw cut method and equipment used.
         2) Testing and Inspection Reports:

1.5 QUALITY ASSURANCE

A. Qualifications: Requirements of Section 01 4301 applies, but is not limited to following:
   1. Ready-Mix Supplier:
      a. Comply with ASTM C94/C94M requirements and be certified according to NRMCA's 'Certification of Ready Mixed Concrete Production Facilities'.

B. Testing and Inspection:
   1. Owner will provide Testing and Inspection on concrete:
      a. Owner will employ testing agencies to perform testing and inspection on concrete as specified in Field Quality Control in Part 3 of this specification.
         1) Owner’s employment of an independent Testing Agency does not relieve Contractor of Contractor’s obligation to perform the Work in strict accordance with requirements of Contract Documents and perform contractor testing and inspection.
         2) See Section 01 1200: ‘Multiple Contract Summary’.
      b. Owner’s employment of an independent Testing Agency does not relieve Contractor of Contractor’s obligation to perform testing and inspection as part of his Quality Control.
         1) Testing and inspections, if performed by Contractor, will be responsibility of Contractor to be performed by an independent entity.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Delivery And Acceptance Requirements:
   1. Expansion Filler Material:
      a. Deliver materials to site in manufacturer’s original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.

B. Storage And Handling Requirements:
   1. Expansion Filler Material:
      a. Store materials in a clean, dry area in accordance with manufacturer’s instructions.
      b. Protect materials during handling and application to prevent damage.
PART 2 - PRODUCTS

2.1 SYSTEM

A. Manufacturers:
   1. Manufacturer Contact List:
      f. Fritz-Pak Concrete Admixtures, Dallas, TX  www.fritzpak.com.
      h. L & M Construction Chemicals, Omaha, NE  www.lmcc.com.

B. Performance:
   1. Design Criteria: Conform to requirements of ASTM C94/C94M unless specified otherwise:
      a. Floor Slab for interior concrete slabs:
         1) Class 1 Floor:
            a) Anticipated type of traffic: exposed surface – foot traffic.
            b) Special considerations: Uniform finish, nonslip aggregated in specific areas, curing.
            c) Final finish: Normal steel-troweled finish, nonslip finish where required.
      2. Capacities:
         a. For testing purposes, following concrete strengths are required:
            1) At 7 days: 60 percent minimum of 28 day strengths.
            2) At 28 days: 100 percent minimum of 28 day strengths.
            3) At 28 days:
               a) Mix Type A: 3000 psi (20.7 MPa).

C. Materials:
   1. Table One:

      | Portland Cement / Blended Hydraulic Cement Equivalencies |
      |----------------------------------------------------------|
      | ASTM C150/C150M (Low Alkali)  | ASTM C595/C595M  | ASTM C1157/C1157M |
      | Type I                       | IP              | GU               |
      | Type II                      | IP (MS)         | MS               |

   2. Hydraulic Cement: Meet requirements of ASTM C150/C150M, Type I or II
      a. Meet requirements of ASTM C595/C595M, Type I or II
      b. Meet requirements of ASTM C1157/C1157M, Type I or II

   3. Aggregates:
      a. General:
         1) Submit a letter on quarry’s letterhead that certifies all aggregate for concrete complies
            with the requirements of this section. Material certificates which are submitted shall be
            signed by both the materials producer and the contractor, certifying that materials
            comply with or exceed requirements specified herein to the Architect, Civil and
            Structural Engineering Consultant and the Independent Testing Laboratory for review
            and approval.
2) Aggregates for all concrete shall come from a quarry that is DOT approved and meets or exceeds durability Class I aggregate. The quarry shall submit a letter to Engineer that certifies that all aggregate complies with DOT requirements for durability. Aggregate not meeting DOT durability requirements shall not be used.

b. Coarse:
   1) Meet requirements of ASTM C33/C33M or nonconforming aggregate that by test or actual service produces concrete of required strength and conforms to local governing codes.
   2) Aggregate shall be uniformly graded by weight as follows:

   a) Table Two: Flat Work, Size No. 67.

<table>
<thead>
<tr>
<th>Sieve</th>
<th>Percent Passing</th>
<th>Sieve</th>
<th>Percent Passing</th>
</tr>
</thead>
<tbody>
<tr>
<td>One Inch</td>
<td>100</td>
<td>25 mm</td>
<td>100</td>
</tr>
<tr>
<td>3/4 Inch</td>
<td>90 - 100</td>
<td>19 mm</td>
<td>90 - 100</td>
</tr>
<tr>
<td>3/8 Inch</td>
<td>20 - 55</td>
<td>9 mm</td>
<td>20 - 55</td>
</tr>
<tr>
<td>No. 4</td>
<td>0 - 10</td>
<td>4.75 mm</td>
<td>0 - 10</td>
</tr>
<tr>
<td>No. 8</td>
<td>0 - 5</td>
<td>2.36 mm</td>
<td>0 - 5</td>
</tr>
</tbody>
</table>

   b) Table Three: All Other, Size No. 57.

<table>
<thead>
<tr>
<th>Sieve</th>
<th>Percent Passing</th>
<th>Sieve</th>
<th>Percent Passing</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-1/2 Inch</td>
<td>100</td>
<td>38 mm</td>
<td>100</td>
</tr>
<tr>
<td>One Inch</td>
<td>95 - 100</td>
<td>25 mm</td>
<td>95 - 100</td>
</tr>
<tr>
<td>1/2 Inch</td>
<td>25 - 60</td>
<td>12 mm</td>
<td>25 - 60</td>
</tr>
<tr>
<td>No. 4</td>
<td>0 - 10</td>
<td>4.75 mm</td>
<td>0 - 10</td>
</tr>
<tr>
<td>No. 8</td>
<td>0 - 5</td>
<td>2.36 mm</td>
<td>0 - 5</td>
</tr>
</tbody>
</table>

c. Fine:
   1) Meet requirements of ASTM C33/C33M.
   2) Aggregate shall be uniformly graded by weight as follows:

   a) Table Four:

<table>
<thead>
<tr>
<th>Sieve</th>
<th>Percent Passing</th>
<th>Sieve</th>
<th>Percent Passing</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/8 Inch</td>
<td>100</td>
<td>9 mm</td>
<td>100</td>
</tr>
<tr>
<td>No. 4</td>
<td>95 - 100</td>
<td>4.75 mm</td>
<td>95 - 100</td>
</tr>
<tr>
<td>No. 8</td>
<td>80 - 100</td>
<td>2.36 mm</td>
<td>80 - 100</td>
</tr>
<tr>
<td>No. 16</td>
<td>50 - 85</td>
<td>1.18 mm</td>
<td>50 - 85</td>
</tr>
<tr>
<td>No. 30</td>
<td>25 - 60</td>
<td>0.60 mm</td>
<td>25 - 60</td>
</tr>
<tr>
<td>No. 50</td>
<td>10 - 30</td>
<td>0.30 mm</td>
<td>10 - 30</td>
</tr>
<tr>
<td>No. 100</td>
<td>2 - 10</td>
<td>0.15 mm</td>
<td>2 - 10</td>
</tr>
</tbody>
</table>

5. Admixtures And Miscellaneous:
   a. Chemical:
      1) No admixture shall contain calcium chloride nor shall calcium chloride be used as an admixture. All chemical admixtures used shall be from same manufacturer and compatible with each other.
   2) Water Reducing Admixture:
      a) Meet requirements of ASTM C494/C494M, Type A and containing not more than 0.05 percent chloride ions.
      b) Acceptable Products:
         (1) Pozzolith Series by BASF.
         (2) Eucon WR 75 or Eucon 91 by Euclid.
         (3) FR-2 or FR-3 by Fritz-Pak.
         (4) Plastocrete 160 by Sika.
         (5) Daracem, WRDA, or MIRA Series by W R Grace.
         (6) Equal as approved by Architect before use. See Section 01 6200.
   3) Water Reducing, Retarding Admixture:
      a) Meet requirements of ASTM C494/C494M, Type D and contain not more than 0.05 percent chloride ions.
2.2 ACCESSORIES

A. Bonding Agents:
   1. Acceptable Products:
      a. Acrylic Additive by Bonsal American.
      b. Day Chem Ad Bond (J-40) by Dayton Superior.
      c. Flex-Con by Euclid Chemical Co.
      d. Larsen Weldcrete by Larsen Products Corp.
      e. Everbond by L & M Construction Chemicals.
      f. Acryl Set by BASF.
      g. Sonocrete by Sonneborn.
      h. U S Spec Multicoat by U S Mix Products.
      i. Intralok by W R Meadows.
      j. Equal as approved by Architect before use. See Section 01 6200.

B. Evaporation Retardant:
   1. Acceptable Products:
      a. Confilm by BASF.
      b. Sure Film J-74 by Dayton Superior.
      c. Eucobar By Euclid Chemical Co.
      d. E-Con by L & M Construction Chemicals.
      e. Pro Film by Unitex.
      f. U S Spec Monofilm ER by U S Mix Products.
      g. Equal as approved by Architect before use. See Section 01 6200.

C. Expansion Filler Material:
   1. Expansion Filler Material:
      a. Design Criteria:
         1) Resilient, flexible, non-extruding, expansion-contraction joint filler meeting requirements of ASTM D1751 and AASHTO M-213.
         2) 1/2 inch (12.7 mm) thick.
         3) Resilience:
            a) When compressed to half of original thickness, recover to minimum of 70 percent of original thickness.
      b. Acceptable Products:
         2) Equal as approved by Architect before installation. See Section 01 6200.
   2. Recycled PVC Joint Filler:
      a. Design Criteria:
         1) Expansion joint filler manufactured from 100 percent recycled vinyl material meeting requirements of ASTM D1752 and AASHTO M-153.
         2) 1/2 inch (12.7 mm) thick.
         3) Compressive/Recovery:
            a) Meet requirements for ASTM D1752 recover minimum of 90 percent of original thickness.
         4) Light gray color.
      b. Approved Products:
         2) Equal as approved by Architect before bidding. See Section 01 6200.

D. Lightweight Coarse Aggregate:
   1. Lightweight coarse aggregate shall be presoaked and then introduced to mixing water for one (1) minute before cement is added and mixing started.
   2. Air entrainment should be introduced into mixing water or fine aggregate.
   3. Mixing of cement shall be as recommended by ACI No. 2 or as recommended by supplier of lightweight aggregate.
PART 3 - EXECUTION

3.1 PREPARATION

A. Concrete Mixing:
   1. General:
      a. All concrete shall be machine mixed.
      b. Water gauge shall be provided to deliver exact predetermined amount of water for each batch.
      c. Reliable system must be employed to insure that no less than predetermined amount of cement goes into each batch.
      d. Re-tempering partly set concrete will not be permitted.
   2. Transit Mix:
      a. Transit mix concrete may be used provided it conforms to Specifications and tests herein described and ASTM C94/C94M.
      b. Central plant producing concrete and equipment transporting it are suitable for production and transportation of controlled concrete and plant is currently approved by local state DOT.
      c. Maximum elapsed time between time of introduction of water and placing shall be one (1) hour.
      d. Minimum time of mixing shall be one (1) minute per cubic yard after all material, including water, has been placed in drum, and drum shall be reversed for an additional two (2) minutes.
      e. Mixing water shall be added only in presence of Inspecting Engineer or inspector employed by Testing Agency.
      f. Trucks shall not be overloaded in excess of rated capacity as recommended by manufacturer.

B. Surface Preparation:
   1. Inserts, bolts, boxes, templates, pipes, conduits, and other accessories required by Divisions 22, 23, and 26 shall be installed and inspected before placing concrete.
   2. Install inserts, bolts, boxes, templates, pipes, conduits, and other accessories furnished under other Sections to be installed as part of work of this Section.
      a. Tie anchor bolts for hold-down anchors and columns securely to reinforcing steel.

C. Removal:
   1. Remove water and debris from space to be placed.

3.2 INSTALLATION

A. Special Techniques:
   1. Cold Weather Concreting Procedures:
      a. General Requirements:
         1) Materials and equipment required for heating and protection of concrete shall be approved and available at Project site before beginning cold weather concreting.
            a) Heating devices used to maintain specified temperatures shall have baffle plate above, of sufficient size, and sand bed below, in order to distribute heat.
            b) Heating devices shall be so operated that temperature of air immediately below slab forms shall not exceed 100 deg F (37.8 deg C). Provide sufficient and suitable thermometers to verify compliance.
         2) Forms, reinforcement, metallic embedments, and fillers shall be free from snow, ice, and frost. Surfaces that will be in contact with newly placed concrete, including sub-grade materials, shall be 35 deg F (2 deg C) minimum at time of concrete placement.
         3) Thaw sub-grade 6 inches (150 mm) deep minimum before beginning concrete placement. If necessary, re-compact thawed material.
         4) Use no frozen materials or materials containing ice.
         5) No salt or other chemical may be used for such protection.
6) Only specified non-corrosive non-chloride accelerator shall be used. Calcium chloride, thiocyanates or admixtures containing more than 0.05 percent chloride ions are not permitted.

b. Requirements When Average twenty four (24) Hour Temperature, midnight to midnight, Is Below 40 deg F (4 deg C):
   1) Temperature of concrete as placed and maintained shall be 55 deg F (13 deg C) minimum and 75 deg F (27 deg C) maximum.
   2) Heat concrete for seventy two (72) hours minimum after placing if regular cement is used; for 48 hours if high early strength cement is used; or longer if determined necessary by Architect.
      a) During this period, maintain concrete surface temperature between 55 and 75 deg F (13 and 27 deg C).
   3) Prevent concrete from drying during heating period. Maintain housing, insulation, covering, and other protection twenty four (24) hours after heat is discontinued.
   4) After heating period, if temperature falls below 32 deg F (0 deg C), protect concrete from freezing until strength of 2000 psi (13.79 MPa) minimum is achieved.
      a) Protect flatwork exposed to melting snow or rain during day and freezing during night from freezing until strength of 3500 psi (24.13 MPa) minimum is achieved.
   c. Requirements When Average twenty four (24) Hour Temperature, midnight to midnight, Is Above 40 deg F (4 deg C), but when temperature falls below 32 deg F (0 deg C):
   1) Protect concrete from freezing for seventy two (72) hours after placing, or until strength of 2000 psi (13.79 MPa) is achieved, whichever is longer.
   2) Protect flatwork exposed to melting snow or rain during day and freezing during night from freezing until strength of 3500 psi (24.13 MPa) minimum is achieved.
   d. Protect soil supporting concrete footings from freezing under any circumstances.

2. Hot Weather Concreting Procedures:
   a. Maximum concrete temperature allowed is 90 deg F (32 deg C) in hot weather.
   b. Cool aggregate and subgrades by sprinkling.
   c. Avoid cement over 140 deg F (60 deg C).
   d. Use cold mixing water or ice.
   e. Use fog spray or evaporation retardant to lessen rapid evaporation from concrete surface.

B. Tolerances:
   1. Tolerances shall conform to requirements of ACI 117 or CSA A23.1, except where specified differently:
      a. Floor test surfaces shall be measured and reported within seventy two (72) hours after completion of slab concrete finishing operations and before removal of any supporting shores to eliminate any curling effect F-numbers.
   2. Local Flatness / Levelness of Interior Slabs (Carpet and Tile Areas):
      a. Specified Overall Value of \( F_45 \) / \( F_35 \) and Minimum Local Value of \( F_30 \) / \( F_20 \) when tested in accordance with ASTM E1155.
      b. Table Five: Maximum Variation Tolerances.

<table>
<thead>
<tr>
<th>Thickness, standard</th>
<th>plus 3/8 inch, minus 1/4 inch</th>
<th>plus 9.5 mm, minus 3 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thickness, footings</td>
<td>minus 0 inch</td>
<td>minus 0 mm</td>
</tr>
<tr>
<td>Plan, 0 - 20 feet</td>
<td>1/2 inch</td>
<td>12.7 mm</td>
</tr>
<tr>
<td>Plan, 40 feet or greater</td>
<td>3/4 inch</td>
<td>19 mm</td>
</tr>
<tr>
<td>Plan, footings</td>
<td>plus 1/2 inch</td>
<td>plus 12.7 mm</td>
</tr>
<tr>
<td>Eccentricity, footings</td>
<td>2 inch max standard,</td>
<td>50 mm max standard,</td>
</tr>
<tr>
<td></td>
<td>1/2 inch at masonry</td>
<td>12.7 mm at masonry</td>
</tr>
<tr>
<td>Openings, size</td>
<td>minus 1/4 inch, plus One inch</td>
<td>minus 6 mm, plus 25.4 mm</td>
</tr>
<tr>
<td>Openings, location</td>
<td>plus / minus 1/2 inch at center</td>
<td>plus / minus 12.7 mm at center</td>
</tr>
<tr>
<td>Plumb</td>
<td>1/2 inch max</td>
<td>12.7 mm max</td>
</tr>
</tbody>
</table>

c. Remedy For Out-of-Tolerance Building Slabs (Carpet Areas):
   1) Sections of slabs to be covered by carpet, which do not meet specified tolerances but are within ten (10) percent of specified tolerances, may be corrected by grinding or filling, at Owner's option.
2) Remove and replace sections of slabs measuring outside specified correctable tolerances.
3) If floor leveling compounds or concrete patching compounds are required to bring floor into specified tolerances in carpeted areas, they will be provided by Owner in conjunction with carpet installation and back-charged to Contractor.

3. Local Flatness / Levelness of Interior Slabs (Wood Floor Areas):
   a. Specified Overall Value of $F_{r50}$ / $F_{r33}$ and Minimum Local Value of $F_{r25} / F_{r17}$ when tested in accordance with ASTM E1155.

C. Placing:
   1. General:
      a. Structural
   2. General:
      a. Place as soon after mixing as possible.
      b. Deposit as nearly as possible in final position.
      c. No concrete shall be deposited in water.
      d. Placing of concrete shall be continuous until panel or section is complete.
      e. In order to avoid overloading of forms and ties, observe following rate of filling for various air temperatures:
         1) Table Six: Placing Rate.

<table>
<thead>
<tr>
<th>Temperature</th>
<th>Rate of Fill per Hour</th>
<th>Temperature</th>
<th>Rate of Fill per Hour</th>
</tr>
</thead>
<tbody>
<tr>
<td>40 deg F</td>
<td>2 feet</td>
<td>4 deg C</td>
<td>600 mm</td>
</tr>
<tr>
<td>50 deg F</td>
<td>3 feet</td>
<td>10 deg C</td>
<td>900 mm</td>
</tr>
<tr>
<td>60 deg F</td>
<td>4 feet</td>
<td>16 deg C</td>
<td>1 200 mm</td>
</tr>
<tr>
<td>70 deg F</td>
<td>5 feet</td>
<td>21 deg C</td>
<td>1 500 mm</td>
</tr>
</tbody>
</table>

   f. Compact concrete in forms by vibrating and other means where required.
      1) Thoroughly consolidate concrete around reinforcing bars (Consolidation not required in concrete around reinforcing bars with Mix Type F).
      2) Use and type of vibrators shall conform to ACI 309.
   g. Consolidate concrete thoroughly.
   h. Do not embed aluminum in concrete.
   i. Do not use contaminated, deteriorated, or re-tempered concrete.
   j. Avoid accumulation of hardened concrete.

3. Footings:
   a. Bear 12 inches (300 mm) minimum into undisturbed earth or on mechanically compacted engineered fill. Step footings at ratio of 1-1/2 horizontal to One vertical unless detailed otherwise. Exterior wall footing shall bear minimum below finish grades as per structural plans.
   b. Level top of finish footing and leave rough.


5. Exterior Slabs:
   a. Dusting with cement not permitted.
   b. For continuous placing and where shown on Drawings, saw cut one inch deep control joints before shrinkage occurs (2 inches at 6 inch slabs) (50 mm at 150 mm slabs).

6. Joints:
   a. Construction Joints: Locate where shown on Drawings to least impair strength of completed structure. Construction joints in foundation walls shall not occur within 6 feet (1.80 meters) of corner and be keyed.

7. Bonding Fresh And Hardened Concrete:
   a. Re-tighten forms.
   b. Roughen surfaces.
   c. Clean off foreign matter and laitance.
   d. Wet but do not saturate.
   e. Slush with neat cement grout or apply bonding agent.
   f. Proceed with placing new concrete.

8. Anchor Bolts:
a. Place anchor bolts not tied to reinforcing steel immediately following leveling of concrete. Reconsolidate concrete around bolt immediately after placing bolt.
b. Do not disturb bolts during finishing process.

D. Finishing:
1. Rubbed Finish, Exposed Vertical Surfaces:
   a. Smooth Rubbed Finish shall be as specified in Section 03 3053.
2. Steel Trowel Finishes, Interior Flatwork:
   a. Float and steel trowel interior slabs after concrete has set enough to avoid bringing water and fines to surface.
   b. If power troweling is used, get approval of finish from Architect.
3. Broom Finishes, Exterior Flatwork Not Specified in Section 03 3053:
   a. Broom finish exterior slabs.
   b. Round edges including edges formed by expansion joints.
   c. Remove edger marks.

3.1 FIELD QUALITY CONTROL

A. Field Tests And Inspections:
   1. General:
      a. Owner is responsible for Quality Assurance. Quality assurance performed by Owner will be used to validate Quality Control performed by Contractor.
      b. Quality Control is sole responsibility of Contractor as specified in Section 01 4523 ‘Testing And Inspection Services’.
   2. Reinforcement Bars and Bolts:
      a. Testing Agency shall provide inspections will include following:
         1) Bolts:
            a) Inspection of bolts to be installed in concrete prior to and during placement of concrete.
            b) Periodic inspection of anchors installed in hardened concrete.
         2) Reinforcement Bars:
            a) Periodic inspection of reinforcement bars and placement prior to concrete placement to verify grade, size, cover, spacing, and position of reinforcing.
            b) Inspect that all reinforcement bars are be positively identified as to heat number and mill analysis.
            c) Confirm surface of reinforcing bars is free of form release oil or other deleterious substances.
   3. Concrete:
      a. Testing Agency shall provide testing and inspection for concrete as per ASTM C1077.
      b. Testing Agency will sample and test for quality control during placement of concrete as directed by Architect.
      c. Testing and inspections, if performed, will include following:
         1) Periodic inspection verifying use of required design mix.
         2) Inspection at time fresh concrete is sampled to fabricate specimens for strength tests, perform slump and air content tests, and determine temperature of concrete.
         3) Inspection of concrete and shotcrete placement for proper application techniques.
         4) Periodic inspection for maintenance of specified curing temperature and techniques.
         5) Periodic inspect of formwork for shape, location and dimensions of concrete member being formed:
            a) Certified Inspector shall inspect forms for general location, configuration, camber, shoring, sealing of form joints, correct forming material, concrete accessories, and form tie locations.
         6) Concrete moisture and alkalinity testing. See Section 09 0503 Flooring Substrate Preparation.
      d. Testing Agency will sample and test during placement of concrete as directed by Architect and may include following:
         1) Sampling Fresh Concrete: ASTM C172/C172M, except modified for slump to comply with ASTM C94/C94M:
a) Slump: ASTM C143/C143M, Test each time set of compressive specimens are made.
b) Air Content: ASTM C173/C173M, volumetric method for lightweight or normal weight concrete: ASTM C231/C231M, pressure method for normal weight concrete each time set of compression test specimens are made.
c) Concrete Temperature: Test each time set of compressive specimens are made.
d) Unit Weight: ASTM C567/C567M, Test each time set of compressive specimens are made.
e) Compression Test Specimen: ASTM C31/C31M, one (1) set of four (4) standard cylinders for each compressive strength test, unless otherwise directed. Mold and store cylinders for laboratory cured test specimens except when field-cure test specimens are required.
f) Compressive Strength Tests: ASTM C39/C39M:
   1) Obtain one (1) composite sample for each day’s pour of each concrete mixture exceeding 5 cu. yd (4 cu m), but less than 50 cu. yd (38 cu m), plus one (1) set for each additional 50 cu. yd (38 cu m) or fraction thereof.
   2) One (1) specimen tested at at seven (7) days, two (2) specimens tested at twenty eight (28) days, and one (1) specimen retained in reserve for later testing if required.
   3) If strength of field-cured cylinders is less than eighty five (85) percent of companion laboratory-cured cylinders, evaluate current operations and provide corrective procedures for protecting and curing in-place concrete.
   4) Strength level of concrete will be considered satisfactory if averages of sets of three (3) consecutive strength test results equal or exceed specified compressive strength, and no individual strength test result falls below specified compressive strength by more than 500 psi (3.45 MPa).

4. Reinforcement Bars and Bolts:
a) Inspection of Reinforcement Bars and Bolts is required for Project:
   1) Reinforcement Bars - Inspections will include following:
      a) Periodic inspection of reinforcement bars and placement prior to concrete placement to verify grade, size, cover, spacing, and position of reinforcing.
      b) Inspect that all reinforcement bars are be positively identified as to heat number and mill analysis.
      c) Confirm surface of reinforcing bars is free of form release oil or other deleterious substances.
   2) Bolts - Inspections will include following:
      a) Inspection of bolts to be installed in concrete prior to and during placement of concrete.
      b) Periodic inspection of anchors installed in hardened concrete.

3.2 PROTECTION

A. Protect concrete that has not received its initial set from precipitation to avoid excess water in mix and unsatisfactory surface finish.

B. Do not allow materials resulting from construction activities, which will affect concrete or application of finish floor systems adversely, to come in contact with interior concrete slabs.

C. Protect interior concrete floors from stains, paint, mortar and other construction activities.

END OF SECTION
DIVISION 05: METALS

05 0500 COMMON WORK RESULTS OF METALS
  05 0503 SHOP-APPLIED METAL COATINGS
  05 0523 METAL FASTENINGS

05 4000 COLD-FORMED METAL FRAMING
  05 4010 STRUCTURAL LOAD-BEARING METAL STUD FRAMING

END OF TABLE OF CONTENTS
SECTION 05 0503
SHOP-APPLIED METAL COATINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Quality of factory or shop-applied priming applied to steel supplied to Project without finish coat.
   2. Quality of and procedures for field touch-up and repair of factory-applied priming and galvanizing.

B. Related Requirements:
   1. Sections under 09 9000 heading: Finish painting.

1.2 REFERENCES

A. Reference Standards:
   1. ASTM International:

PART 2 - PRODUCTS

2.1 FINISHES

A. Factory And Shop-Applied Primer:
   1. Compatible with and of equal or better quality than finish paint system to be applied by Sections under 09 9000 heading.
   2. Primer on unexposed, unfinished surfaces may be fabricator’s standard shop coat.

B. Repairs To Primed Surface:

C. Unless otherwise specified, use primer which matches characteristics of original primer and is compatible with and of equal or better quality than finish paint system to be applied by Sections under 09 9000 heading.

D. Material For Repairs Of Galvanized Surfaces:
   1. Non-Structural, Non-Load-Bearing Items Not Exposed To Weather:
      a. Zinc-Rich Paints:
         1) Zinc-Dust Content: Dried film shall contain 94 percent minimum of zinc-dust by weight.
         2) Type One Acceptable Manufacturers:
            c) Equal as approved by Architect before bidding. See Section 01 6200.
   2. Structural, Load-Bearing Items And Items Exposed To Weather:
      a. Zinc-Based Solders, Powder, Or Rod:
         1) Zinc-Cadmium solder with liquidus temperature range from 518 to 527 deg F (270 to 275 deg C), or
2) Zinc-Tin-Lead alloy with liquidus temperature range from 446 to 500 deg F (230 to 260 deg C).
   b. Sprayed Zinc: Wire, ribbon, or powdered zinc suitable for process.

PART 3 - EXECUTION

3.1 PREPARATION

A. Surface Preparation:
   1. General:
      a. Clean, grind, or otherwise prepare welds in steel that is to be coated within limits acceptable to welder responsible for structural integrity.
      b. Surfaces to be coated shall be clean, dry and free of oil, grease, and corrosion products.
   2. Preparation Of Primed, Ungalvanized Surfaces:
      a. Clean welds and grind serious abrasions.
   3. Preparation Of Galvanized Surfaces:
      a. Follow requirements of ASTM A780/A780M and following:
         b. For Repair Using Zinc-Rich Paints:
            1) Blast clean surfaces to near-white metal, in accordance with SSPC-SP10 (1 to 2 mil anchor pattern), as minimum.
            2) Where circumstances do not allow blast cleaning, power disk sand to bright metal finish.
            3) Extend surface preparation into undamaged galvanized area.
            4) Remove flux residue and weld spatter from welded areas.
         c. For Repair Using Zinc-Based Alloys:
            1) Clean surface to be reconditioned using wire brush, light grinding action, or mild blasting.
            2) Extend surface preparation into surrounding, undamaged galvanized areas.
            3) Remove flux residue and weld spatter from welded areas.
            4) Preheat cleaned area to at least 600 deg F (316 deg C).
               a) Do not overheat surface beyond 750 deg F (400 deg C) or allow surrounding galvanized coatings to be burned.
               b) Wire brush surface during preheating.
         d. For Repair Using Sprayed Zinc (Metallizing):
            1) Blast clean surfaces to near-white metal, in accordance with SSPC-SP5 as minimum.
            2) Extend surface preparation into undamaged galvanized area.
            3) Remove flux residue and weld spatter from welded areas.
   b. Preparation Of Galvanized Surfaces:
      a. Follow requirements of ASTM A780/A780M and following:
      b. For Repair Using Zinc-Rich Paints:
         1) Spray- or brush-apply zinc-rich paint to prepared area.
         2) Apply paint in single application employing multiple spray passes to achieve dry film thickness of 2 mils.
      c. For Repair Using Zinc-Based Alloys:
         1) Repair Using Zinc-Based Alloys:
            a. Repair Using Zinc-Based Alloys:

3.2 REPAIR / RESTORATION

A. Repairs To Primed, Ungalvanized Surfaces:
   1. Thoroughly clean metal and give one (1) prime coat of specified material, well-worked into metal joints and open spaces. Match existing primed finish as required.
      a. Do not apply primer at temperatures below 45 deg F (7 deg C).
      b. Protect un-primed machine-finished surfaces against corrosion by priming.

B. Repairs To Galvanized Surfaces:
   1. Non-Structural, Non-Load-Bearing Items Not Exposed To Weather:
         Apply paint in single application employing multiple spray passes to achieve dry film thickness of 2 mils.
   2. Structural, Load-Bearing Items And Items Exposed To Weather:
      a. Repair Using Zinc-Based Alloys:
1) Rub cleaned, pre-heated areas with repair stick to deposit evenly distributed layer of zinc alloy. If powdered zinc alloys are used, sprinkle powder on surface and spread out with spatula or similar tool.
2) Remove flux residue by rinsing with water or wiping with damp cloth.
   b. Repair Using Sprayed Zinc (Metallizing): Apply 2 mil minimum coating by means of metal-spraying pistols fed with either zinc wire or zinc powder in accordance with requirements of ASTM B695, Type I.
3. All Items:
   a. Apply repair materials immediately after surface preparation is complete.
   b. Take thickness measurements, with either magnetic or electromagnetic gauge, to ensure applied coating is as specified or agreed to.

END OF SECTION
SECTION 05 0523
METAL FASTENING

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Quality of structural metal-to-metal, wood-to-metal, and wood-to-wood bolts used on Project.
   2. Requirements and standards for site welded metal-to-metal connections.

B. Related Requirements:
   1. Section 03 1511: Cast-in-place and drilled-in anchor bolts.
   2. Furnishing and installing of structural bolts specified under Section concerned.
   3. Performance of welding specified under Section concerned.

1.2 REFERENCES

A. Reference Standards:
   1. American National Standards Institute / American Welding Society:
   2. ASTM International:
      a. ASTM A36/A36M-08, 'Standard Specification for Carbon Structural Steel'.
      b. ASTM A307-10, 'Standard Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength'.
      c. ASTM A325-10, 'Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength'.

1.3 QUALITY ASSURANCE

A. Qualifications: Requirements of Section 01 4301 applies, but not limited to the following:
   1. Welders shall be certified 30 days minimum before beginning work on Project. If there is doubt as to proficiency of welder, Architect may require welder to take another test, at no expense to Owner. Certification shall be by Pittsburgh Laboratories or other authority approved by Architect.

B. Certifications:
   1. Maintain welder's certifications on job-site.

PART 2 - PRODUCTS

2.1 MANUFACTURED UNITS

A. Materials:
   1. Bolts And Threaded Fasteners:
      a. Bolts: Conform to requirements of ASTM A307, Grade A.
2.2 ACCESSORIES

A. Arc-Welding Electrodes: Type E70XX AWS Iron and Steel Arc-welding electrodes and meeting current AISC Specifications.

PART 3 - EXECUTION

3.1 PERFORMANCE

A. Welding shall meet requirements of ANSI / AWS D1.1 and D1.3.

B. Minimum weld sizes, unless detailed otherwise.
   1. Weld pipe columns to base plates and top plates with 1/4 inch (6 mm) fillet weld all around.
   2. Weld glu-lam connection side plates to base plates with 1/4 inch (6 mm) fillet weld all along outside edges.
   3. Weld stiffeners to pipe columns with 1/4 inch (6 mm) fillet weld all around.

END OF SECTION
SECTION 05 4010

STRUCTURAL LOAD-BEARING METAL STUD FRAMING

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Furnish and install load-bearing metal framing and blocking as described in Contract Documents.

B. Related Requirements:
   1. Section 05 0503: Galvanizing repair.
   2. Section 09 2216: ‘Non-Structural Metal Framing’.

1.2 REFERENCES

A. Association Publications:
   1. International Code Council (ICC):

B. Reference Standards:
   1. ASTM International:
      a. ASTM A653/A653M-11, ‘Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.’
      b. ASTM A924/A924M-10a, ‘Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.’
      c. ASTM C955-11c, ‘Standard Specification for Load-Bearing (Transverse and Axial) Steel Studs, Runners (Tracks), and Bracing or Bridging for Screw Application of Gypsum Panel Products and Metal Plaster Bases.’
      d. ASTM C1007-11a, ‘Standard Specification for Installation of Load Bearing (Transverse and Axial) Steel Studs and Related Accessories.’

1.3 QUALITY ASSURANCE

A. Regulatory Agency Sustainability Approvals:
   1. IBC approved.

PART 2 - PRODUCTS

2.1 ASSEMBLIES

A. Manufacturers:
   1. Acceptable Manufacturers:
      a. Any member of Steel Stud Manufacturer's Association.
      b. Equal as approved by Architect before bidding. See Section 01 6200.

B. Design Criteria:
1. Fabricate framing members and accessories in accordance with ASTM C955 from metal meeting requirements of ASTM A653/A653M, SQ (Structural Quality) - Grade 50 Class 2 minimum or ASTM A924/A924M with G-60 coating.

C. Materials:
1. Wall Framing:
   a. Studs: C-shaped steel studs, punched, and with stiffened 1-5/8 inch (41.3 mm) flanges. Metal thickness and section properties as shown on Drawings.
   b. Tracks: U-shaped steel track, unpunched and with straight, 1-1/4 inch (32 mm) wide flanges. Metal thickness to match studs.
2. Floor Framing:
   a. Joists: C-shaped steel joists, unpunched, and with stiffened 1-5/8 inch (41.3 mm) flanges. Metal thickness and section properties as shown on Drawings.
   b. Tracks: U-shaped steel track, unpunched and with straight, 1-5/8 inch (41.3 mm) wide flanges. Metal thickness to match joists.
3. Framing Accessories:
   a. Provide accessories of Manufacturer's standard thickness and configuration, unless indicated otherwise.
   b. Accessories include, but are not limited to, supplementary framing, bracing, bridging and solid blocking, web stiffeners, end clips, gusset plates, girts, joist hangers and end closures, hole reinforcing plates, and backer plates, all as needed to provide complete metal framing system.

2.2 ACCESSORIES

A. Fasteners:

B. Sill Sealer:
   1. Closed cell polyethylene foam, 1/4 inch (6.4 mm) by width of sill plate.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Interface With Other Work:
   1. Coordinate with other Sections to provide blocking necessary for their work.
   2. Coordinate with other Sections for location of blocking required for installation of equipment and building specialties.

B. General:
   1. Install metal framing in accordance with ASTM C1007, Manufacturer's printed recommendations, and Contract Document requirements, whichever is most stringent on an item-by-item basis.
   2. Notify Architect of conflicts in these requirements.

C. Erection Tolerances:
   1. 1/4 inch (6 mm) in 20 feet (500 mm), non-cumulative in length of wall.
   2. 1/8 inch (3 mm) in 10 feet (250 mm) with 1/4 inch (6 mm) maximum in height of wall.
   3. Distances between parallel walls shall be 1/4 inch (6 mm) maximum along length and height of wall.
   4. Space individual framing members plus or minus 1/8 inch (3 mm) maximum from required location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.

D. Wall Framing:
   1. Securely anchor tracks to supporting structures.
2. Provide complete uniform and level bearing support for bottom track.
3. Securely anchor abutting pieces of track to common structural element or butt weld or splice.
4. Securely attach studs to flanges or webs of both upper and lower tracks, and plumb and align.
5. Install jack studs at door heads and elsewhere as required to furnish structural support and securely attach to supporting members.
6. Provide temporary bracing until erection is completed.
7. Install wall stud bridging in manner to provide resistance to both minor axis bending and rotation. Space bridging rows equally not to exceed 48 inch (1 200 mm).
8. Furnish and install insulation equal to that specified in Division 07 in doubled jamb studs and doubled header members that will not be accessible to insulation installer.
9. Wrap multiple, adjacent framing members with duct tape or otherwise secure to eliminate 'chattering.'
10. Use grommets at framing penetrations where unsecured items pass through.

3.2 PROTECTION

A. Repair galvanizing as specified in Section 05 0503.

END OF SECTION
## DIVISION 06: WOOD, PLASTICS, AND COMPOSITES

### 06 1000  ROUGH CARPENTRY
- 06 1100  WOOD FRAMING
- 06 1636  WOOD PANEL PRODUCT SHEATHING

### 06 2000  FINISH CARPENTRY
- 06 2001  COMMON FINISH CARPENTRY REQUIREMENTS
- 06 2024  DOOR, FRAME, AND FINISH HARDWARE INSTALLATION

### 06 4000  ARCHITECTURAL WOODWORK
- 06 4005  PLASTIC LAMINATE
- 06 4116  PLASTIC LAMINATE FACED ARCHITECTURAL CABINETS

END OF TABLE OF CONTENTS
SECTION 06 1100

WOOD FRAMING

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Furnish and install wood framing and blocking as described in Contract Documents.

B. Products Installed But Not Furnished Under This Section:
   1. Wood 'I' joists.
   2. Wood panel product sheathing.

C. Related Requirements:
   1. Section 05 1223: 'Structural Steel For Buildings' for furnishing of miscellaneous structural steel.
   2. Section 06 1636: 'Wood Panel Product Sheathing'.
   3. Section 06 1733: 'Wood I Joists'.

1.2 REFERENCES

A. Reference Standards:
   1. National Institute of Standards and Technology (NIST), Technology Administration, U. S. Department of Commerce:

1.3 DELIVERY, STORAGE, AND HANDLING

A. Delivery And Acceptance Requirements:
   1. Protect lumber and sheathing and keep under cover in transit and at job site.
   2. Do not deliver material unduly long before it is required.

B. Storage And Handling Requirements:
   1. Store lumber and sheathing on level racks and keep free of ground to avoid warping.
   2. Stack to insure proper ventilation and drainage.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Wood Framing List:
   1. Provide VMR Suppliers with wood framing list.

B. Dimension Lumber:
   1. Design Criteria:
      a. Meet requirements of PS 20 and National Grading Rules for softwood dimension lumber.
      b. Bear grade stamp of WWPA, SPIB, or other association recognized by American Lumber Standards Committee identifying species of lumber by grade mark or by Certificate of Inspection.
c. Lumber 2 inches (50 mm) or less in nominal thickness shall not exceed 19 percent in moisture content at time of fabrication and installation and be stamped 'S-DRY', 'K-D', or 'MC15'.
d. Lumber shall be S4S.

2.2 ACCESSORIES

A. Sill Sealer:
   1. Closed-cell polyethylene foam, 1/4 inch (6 mm) thick by width of plate.

PART 3 - EXECUTION

3.1 INSTALLERS

A. Approved Installers. See Section 01 4301.

3.2 INSTALLATION

A. Interface With Other Work:
   1. Coordinate with other Sections for location of blocking required for installation of equipment and building specialties. Do not allow installation of gypsum board until required blocking is in place.
   2. Where manufactured items are to be installed in framing, provide rough openings of dimensions within tolerances required by manufacturers of such items. Confirm dimensions where not shown on Contract Drawings.

B. Tolerances:
   1. Walls:
      a. 1/4 inch (6 mm) in 20 feet (6 meters), non-cumulative in length of wall.
      b. 1/8 inch (3 mm) in 10 feet (3 meters) with 1/4 inch (6 mm) maximum in height of wall.
      c. Distances between parallel walls shall be 1/4 inch (6 mm) maximum along length and height of wall.
   2. Installation of wood Web Joists:
      a. Handle, erect, and brace plywood web joists in accordance with Manufacturer's instructions.
      b. Do not install damaged or broken wood web joists.
      c. Install temporary horizontal and cross bracing to hold members plumb and in safe condition until permanent bracing is installed.
      d. Cut holes through webs at locations or of sizes shown on Drawings and as recommended by Manufacturer.

END OF SECTION
SECTION 06 1636

WOOD PANEL PRODUCT SHEATHING

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Furnish and install wood panel product sheathing required for walls and roofs.

B. Related Requirements:
   1. Section 01 4000: ‘Quality Requirements’ for administrative and procedural requirements for
      quality assurance and quality control.
   2. Section 01 4301: ‘Quality Assurance – Qualifications’ establishes minimum qualification levels
      required.
   3. Section 01 6200: Administrative and procedural requirements for product options.
   4. Section 06 1100: Wood Framing:
      a. Pre-installation conference held jointly with Section 06 1636.

1.2 REFERENCES

A. Association Publications:
   1. Council of American Structural Engineers. CASE Form 101: Statement of Special Inspections.
      Washington, DC: CASE, 2001. (c/o American Council of Engineering Companies, 1015 15th St.,

B. Definitions:
   1. Field Quality Control: Testing, Inspections, Special Testing and Special Inspections to assure
      compliance to Contract Documents.
   2. Inspection/Special Inspection: Inspection of materials, installation, fabrication, erection or
      placement of components and connections requiring special expertise to ensure compliance with
      approved construction documents and referenced standards:
      a. Inspection: Not required by code provisions but may be required by Contract Documents.
      b. Special Inspection: Required by code provisions and by Contract Documents.
      c. Inspection-Continuous: Full-time observation of the Work requiring inspection by approved
         inspector who is present in area where the Work is being performed.
      d. Inspection-Periodic: Part-time or intermittent observation of the Work requiring inspection by
         approved inspector who is present in area where the Work has been or is being performed
         and at completion of the Work.
   3. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee,
      Subcontractor, or Sub-subcontractor, to perform particular construction operation, including
      installation, erection, application, and similar operations.
   4. Observation: Visual observation of building / site elements or structural system by registered
      design professional for general conformance to approved construction documents at significant
      construction stages and at completion. Observation does not include or waive responsibility for
      performing inspections or special inspections.
   5. Owner’s Representative: Owner’s Designated Representative (Project Manager or Facilities
      Manager) who will have express authority to bind Owner with respect to all matters requiring
      Owner’s approval or authorization.
   6. Product Testing: Tests and inspections that are performed by testing agency qualified to conduct
      product testing and acceptable to authorities having jurisdiction, to establish product performance
      and compliance with industry standards.
7. **Quality Assurance:** Testing, Inspections, Special Testing and Special Inspections provided for by Owner.

8. **Quality Control:** Testing, Inspections, Special Testing and Special Inspections provided for by Contractor.

9. **Special Inspection:** See Inspection.

10. **Testing Agency:** Entity engaged to perform specific tests, inspections, or both.

11. **Verification:** Act of reviewing, inspecting, testing, etc. to establish and document that product, service, or system meets regulatory, standard, or specification requirements.

**C. Reference Standards:**

1. **National Institute of Standards and Technology (NIST), Technology Administration, U. S. Department of Commerce:**

2. **California Building Code (CBC) (2013):**
   a. CBC Chapter 17, ‘Special Inspections And Tests’.
      1) Section 1704, ‘Special Inspections, Contractor Responsibility And Structural Observations’.
      2) Section 1705, ‘Required Verification And Inspection’.
         a) Section 1705.5, ‘Wood Construction’.

**1.3 SUBMITTALS**

A. **Informational Submittals:**
   1. Qualification Statement:
      a. Alternate Supplier: See Section 01 4301 for supplier qualifications.
         1) Provide documentation of the following:
            a) Firm experience in supplying products indicated for this Project.
            b) Financial stability.
            c) Sufficient production capacity to produce required units.
            d) Comply with specifications and contract documents.
            e) Agree to complete reporting documents, including:
               1) Agree to provide total costs to the Church including breakdown costs of dimensional lumber, structural composite lumber, wood panel product-sheathing, wood ‘I’ joists and glued-laminated members.

**1.4 DELIVERY, STORAGE, AND HANDLING**

A. **Delivery And Acceptance Requirements:**
   1. Do not deliver material unduly long before it is required.
   2. Protect sheathing and keep under cover in transit and at job site.

B. **Storage And Handling Requirements:**
   1. Store sheathing on level racks and keep free of ground.
   2. Stack to insure proper ventilation and drainage.

**PART 2 - PRODUCTS**

**2.1 MANUFACTURED UNITS**

A. **Performance:**
   1. **Design Criteria:**
      a. Meet requirements of PS 1, PS 2, PRP-108 (APA), or PRP-133 (TECO). Except where plywood is specifically indicated on Drawings, oriented strand board (OSB) is acceptable.
B. Materials:  
   1. Sheathing:  
      a. Sheathing shall bear grade stamp from American Plywood Association (APA) or equal grading organization.  
      b. Sheathing shall not exceed 18 percent moisture content when fabricated or more than 19 percent when installed in Project.  
      c. Sheathing 23/32 inch (18.3 mm) thick and thicker used for single-layer subflooring shall be tongue and groove.  
      d. Sheathing used for same purpose shall be of same thickness. In all cases, thickness specified is minimum required regardless of span rating.  
      e. Minimum span ratings for given thicknesses shall be as follows:  

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<thead>
<tr>
<th>Thickness</th>
<th>Span Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/8 inch</td>
<td>9.5 mm</td>
</tr>
<tr>
<td>7/16 inch nominal</td>
<td>11 mm nominal</td>
</tr>
<tr>
<td>15/32 inch actual</td>
<td>11.9 mm actual</td>
</tr>
<tr>
<td>1/2 inch nominal</td>
<td>12.5 mm nominal</td>
</tr>
<tr>
<td>19/32 inch actual</td>
<td>15.1 mm actual</td>
</tr>
<tr>
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<td>15.9 mm nominal</td>
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<tr>
<td>23/32 inch actual</td>
<td>18.3 mm actual</td>
</tr>
<tr>
<td>3/4 inch nominal</td>
<td>19 mm nominal</td>
</tr>
</tbody>
</table>


2.2 ACCESSORIES

A. Nails:  
   1. As indicated on Drawings.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General:  
   1. Top of nail heads shall be flush with sheathing surface.  
   2. Use of edge clips to provide spacing between sheathing panels is acceptable.  

B. Wall Sheathing:  
   1. Spacing:  
      a. Provide 1/8 inch (3 mm) space between sheets at end and edge joints.  
   2. Edge Bearing And Blocking:  
      a. Panel edges shall bear on framing members and butt along their center lines.  
      b. Back block panel edges, which do not bear on framing members, with 2 inch nominal (45 mm) framing.  
   3. Nail Spacing:  
      a. As indicated on Drawings.  
      b. Place nails not less than 3/8 inch (9.5 mm) in from edge.  
   4. Thickness:  
      a. As indicated on Drawings.  
   5. Do not install any piece of wall sheathing with shortest dimension of less than 12 inches (300 mm).  

C. Roof Sheathing:  
   1. Placing:  
      a. Lay face grain at right angles to supports. Provide blocking for support if framing turns at roof overhang.  
      b. Provide 1/8 inch (3 mm) space between sheets at end and side joints.  
      c. Stagger panel end joints.
d. Sheathing shall be continuous of two spans minimum.

2. Nail Spacing:
   a. As indicated on Drawings.
   b. Place nails at least 3/8 inch (9.5 mm) in from edge.

3. Thickness:
   a. As indicated on Drawings.

4. Do not install any piece of roof sheathing with shortest dimension of less than 24 inches (600 mm) unless support is provided under all edges.

3.2 PROTECTION

   A. Protect roof sheathing from moisture until roofing is installed.

   END OF SECTION
SECTION 06 2001
COMMON FINISH CARPENTRY REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Furnish and install sealants required for items installed under this Section, as described in Contract Documents.

B. Products Installed But Not Furnished Under This Section:
   1. Plastic Laminate Countertops.
   2. Selected Building Specialties.
   3. Selected Equipment.
   5. Miscellaneous as specified elsewhere.

C. Related Requirements:
   1. Sections under 06 4000 Heading: Furnishing of Architectural Woodwork.
      a. Section 06 4001: 'Common Architectural Woodwork Requirements':
         1) Quality of wood materials to be used in Finish Carpentry.
      b. Section 06 4005: 'Plastic Laminate' for countertops.
   2. Section 07 9213: 'Elastomeric Joint Sealants' for quality of sealants, submittal and installation requirements.
   4. Sections in Division 10: Furnishing of Specialties.
   5. Sections in Division 11: Furnishing of Equipment.

1.2 REFERENCES

A. Association Publications:

B. Definitions:
   1. Grade: Unless otherwise noted, this term means Grade rules for Economy, Custom, and/or Premium Grade:
      a. Economy Grade: The lowest acceptable grade in both material and workmanship requirements, and is for work where price outweighs quality considerations.
      b. Custom Grade: Typically specified for and adequately covers most high-quality architectural woodwork, providing a well-defined degree of control over a project’s quality of materials, workmanship, or installation.
      c. Premium Grade: The highest Grade available in both material and workmanship where the highest level of quality, materials, workmanship, and installation is required.
PART 2 - PRODUCTS

2.1 MATERIALS

A. Glue: Waterproof and of best quality.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification Of Conditions:
   1. Verify walls, ceilings, floors, and openings are plumb, straight, in-line, and square before installing Architectural Woodwork.
   2. Report conditions that are not in compliance to Architect before starting installation.

3.2 PREPARATION

A. Surface Preparation:
   1. Install Architectural Woodwork after wall and ceiling painting is completed in areas where Architectural Woodwork is to be installed.

B. Items Installed But Not Furnished Under This Section: Install in accordance with requirements specified in Section furnishing item.

3.3 INSTALLATION

A. Special Techniques:
   1. AWS Custom Grade is minimum acceptable standard, except where explicitly specified otherwise, for installation of architectural woodwork.

B. General Architectural Woodwork Installation:
   1. Fabricate work in accordance with measurements taken on Project site.
   2. Scribe, miter, and join accurately and neatly to conform to details.
   3. Exposed surfaces shall be machine sanded, ready for finishing.
   4. Allow for free movement of panels.
   6. Attach custom casework as specified in Sections under 06 4000 Heading: ‘Furnishing of Architectural Woodwork’ to wall blocking with #10 x 3 inch (76 mm) minimum Cabinet Screws. Attach wall cabinets with screws equally spaced horizontally not to exceed 12 inches (305 mm) O.C. with 3 inch (76 mm) maximum spacing at cabinet edges.

END OF SECTION
SECTION 06 2024
DOOR, FRAME, AND FINISH HARDWARE INSTALLATION

PART 1 - GENERAL

1.1 SUMMARY
A. Includes But Not Limited To:
   1. Furnish and install sealants for caulking door frames as described in Contract Documents.
   2. Furnish and install insulation in doorframes as described in Contract Documents.

B. Products Installed But Not Furnished Under This Section:
   1. Flush wood doors.
   2. Hollow metal door frames.
   3. Finish hardware.

C. Related Requirements:
   1. Section 08 1416: ‘Flush Wood Doors’.
   2. Section 07 2116: Quality of fiberglass insulation.
   3. Section 07 9213: Quality of sealants.
   4. Sections under 08 1000 heading: Furnishing of doors and metal frames.
   5. Sections under 08 7000 heading: Furnishing of finish hardware.

1.2 REFERENCES
A. Association Publications:

1.3 SUBMITTALS
A. Informational Submittals:
   1. Installer Report:
      a. Report verifying correct operation and adjustment of installed hardware.
   2. Special Procedure Submittals:
      a. Copy of ‘Installation Guide for Doors & Hardware’ by Door & Hardware Institute. Guide may be obtained from Door and Hardware Institute (DHI).

1.4 DELIVERY, STORAGE, AND HANDLING
A. Delivery And Acceptance Requirements:
   1. Wood Doors:
      a. Do not have doors delivered to building site until after plaster, cement, and taping compound are dry.
      b. If doors are to be stored at job-site for more than one week, seal top and bottom edges if not factory sealed.
   2. Metal Frames:
      a. Examine door frames and note damage upon acceptance.

B. Storage And Handling Requirements:
   1. Wood Doors:
a. Store flat on a level surface in a dry, well ventilated building.
   1) Cover to keep clean but allow air circulation
b. Handle with clean gloves and do not drag doors across one another or across other surfaces.
c. Do not subject doors to abnormal heat, dryness, or humidity or sudden changes therein
   1) Condition doors to average prevailing humidity of locality before hanging.

2. Metal Frames:
   a. Protect metal frames from damage before and during installation.

PART 2 - PRODUCTS: Not Used

PART 3 - EXECUTION

3.1 INSTALLATION

A. Hollow Metal Frames:
   1. Site Tolerances:
      a. Squareness: 1/16 inch (1.6 mm) from top edge to opposite top edge.
      b. Plumbness: 1/16 inch (1.6 mm) from top of jamb to bottom of jamb.
      c. Alignment: 1/16 inch (1.6 mm) from plane of left side face of jamb to right side face of jamb.
      d. Twist: 1/16 inch (1.6 mm) across throat of jamb plane measured across each face to plane of opposite jamb throat.
      e. Finished Clearance Between Door And Frame:
         1) 1/16 inch (1.6 mm) at head and hinge jamb plus 1/16 inch (1.6 mm) maximum
         2) 1/8 inch (3 mm) at strike jamb plus or minus 1/16 inch (1.6 mm) maximum.
         3) 1/2 inch (12.7 mm) to top of finished floor surface or 1/4 inch (6 mm) to top of threshold, plus or minus 1/16 inch (1.6 mm) maximum.
   2. Set frame in location and level head.
      a. Use of crowbar or other prying device to set door frame into wall opening will damage door frames and are not permitted to be used.
   3. Equalize with adjustable floor anchor.
   4. Set spreaders and fasten jambs to floor and wall.
      a. Wood spreaders shall be square, fabricated from lumber one inch minimum thick, be same length as door opening at header, and same depth as frame.
      b. Cut notches for frame stops.
      c. Do not remove spreaders until frames are permanently anchored in wall.
      d. Use one spreader at base of frame and another at strike level.
      e. Do not use temporary spreaders welded to base of jambs during installation of frame.
   5. Fill gap between frame and framing with urethane foam or tightly-packed fiberglass insulation. If urethane foam is used, foam interior of frames before installing frame. Trim excess before installation of frame.
   6. Caulking:
      a. Caulk around both sides of frames of doors receiving acoustical seals with specified sealant.
      b. Caulk around both sides of frames installed in exposed masonry walls with specified sealant.

B. Doors:
   1. When Project is completed, doors shall not bind, stick, or be mounted so as to cause future hardware difficulties.
   2. Do not impair utility or structural strength of door in fitting of door, applying hardware, or cutting and altering door louvers, panels, or other special details.

C. Hardware:
   1. General:
      a. Install using set of Manufacturer's installation, adjustment, and maintenance instructions submitted with hardware under Section 08 7101. Follow as closely as possible.
b. Mount closers on jamb stop side of door in parallel arm configuration where it is physically possible to do so and not damage or hinder operation of door or closer.

2. Hardware for Wood Doors:
   a. If doors are not factory-machined, use hardware templates furnished by Hardware Manufacturer when mounting hardware.
   b. Set hinges flush with edge surface. Be sure that hinges are set in a straight line to prevent distortion.
   c. Mount door latches high in strike plate opening so when door later settles, latch will not bind.

3.2 FIELD QUALITY CONTROL

A. Field Tests:
   1. Arrange to have keys brought to Project site and, in meeting attended by local representatives and Architect, test every new key and locking mechanism.

B. Non-Conforming Work: Non-conforming work as covered in the General Conditions applies, but is not limited to the following:
   1. Correct any work found defective or not complying with contract document requirements at no additional cost to the Owner.
   2. Door frames:
      a. Door frames damaged by use of crowbar or other prying devices to set door frames shall be repaired or replaced at no additional cost to Owner.

3.3 CLOSEOUT ACTIVITIES

A. Instruction of Owner:
   1. Using Owner's Operations And Maintenance Manual, explain keying systems at same time keys and locking mechanisms are tested.

B. Key Delivery:
   1. Immediately before Final Acceptance Meeting, turn change keys over to Owner properly organized, tagged, and placed in new or existing key cabinet.

END OF SECTION
SECTION 06 4005

PLASTIC LAMINATE

PART 1 - GENERAL

1.1 SUMMARY

A. Products Furnished But Not Installed Under This Section:
   1. Countertops for custom casework.

B. Related Requirements:
   1. Section 06 2001: 'Common Finish Carpentry Requirements':
      a. Installation of countertops for custom casework.
   2. Sections Under 22 4200 Heading: Plumbing Fixtures.

1.2 REFERENCES

A. Association Publications:

B. Definitions:
   1. Flame Spread: The propagation of flame over a surface.
   2. Flame Spread Index: The numerical value assigned to a material tested in accordance with ASTM E84 or UL 723 or CAN/ULC-S102.2.
   3. Grade: Unless otherwise noted, this term means Grade rules for Economy, Custom, and/or Premium Grade.
      a. Premium Grade: Highest Grade available in both material and workmanship where highest level of quality, materials, workmanship, and installation is required.
   4. High-Pressure Decorative Laminate (HPDL): Laminated thermosetting decorative sheets intended for decorative purposes. Sheets consist essentially of layers of fibrous sheet material, such as paper, impregnated with thermosetting condensation resin and consolidation under heat and pressure. Top layers have decorative color or printed design. Exposed surface has attractive exposed surface that is durable and resistant to damage from abrasion and mild alkalies, acids, and solvents.
   5. Smoke-Developed Index: The numerical value assigned to a material tested in accordance with ASTM E84 or UL 723 or CAN/ULC-S102.2.

C. Reference Standards:
   1. ASTM International:
   2. Kitchen Cabinet Manufacturers Association:
      a. ASTM/KCMA A161.1-2000 (R2006), 'Performance And Construction Standards For Kitchen And Vanity Cabinets'.
      b. ANSI/KCMA A161.2-1998, 'Performance Standards for Fabricated High Pressure Decorative Laminate Countertops'.
   3. National Electrical Manufacturer's Association / American National Standards Institute:
      a. ANSI/NEMA LD-3-2005, 'High Pressure Decorative Laminates'.
   4. Underwriters Laboratories, Inc.:

1.3 SUBMITTALS

A. Action Submittals:
   1. Product Data:
      a. Color selections.
      b. Manufacturer's technical data sheet.

B. Informational Submittals:
   1. Certificates:
      a. Provide Manufacturer's certification of compliance to ANSI/NEMA LD 3.
   2. Test And Evaluation Reports:
      a. Test reports: Certified test reports showing compliance with specified performance characteristics and physical properties for Quality Assurance if requested by Owner or Architect.

C. Closeout Submittals:
   1. Include following in Operations And Maintenance Manual specified in Section 01 7800:
      a. Record Documentation:
         1) Manufacturers documentation:
            a) Manufacturer's literature for plastic laminate.
            b) Color selections.

1.4 QUALITY ASSURANCE

A. Regulatory Agency Sustainability Approvals:
   1. Fire-Test-Response Characteristics: Provide plastic laminate with surface burning characteristics as determined by testing identical products by qualified testing agency.
      a. Surface-Burning Characteristics:
         1) Plastic Laminate shall have Class A flame spread rating in accordance with ASTM E84 or UL 723 Type 1.
            a) Class A (Flame spread index 0-25; Smoke-developed index 0-450).
            b) Flash point: None.

1.5 WARRANTY

A. Manufacturer Extended Warranty:
   1. Approved Fabricator's written guarantee that all Goods and Services will be free from defects in materials and workmanship for a period of five (5) years from date of substantial completion.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Fabricators:
   1. Approved Fabricators. See Section 06 4001 for Approved Fabricators.

B. Manufacturers:
   1. Acceptable Manufacturers:
      a. Formica, Cincinnati, OH www.formica.com
C. Plastic Laminates:

1. Design Criteria:
   a. Countertops:
      1) Post-formed front edge and backsplash, except where detailed otherwise, with plastic laminate meeting requirements of ANSI/NEMA LD 3: PF 42.
         a) Vertical Applications: GP 28.
         b) Horizontal (other than countertops): GP 38.
      2) No raised lip on front edge.
   c. AWS Quality Grade: Premium.

2. Assemblies:
   a. Countertops shall meet requirements of KCMA A161.1 and A161.2.
   b. Adhesives for other than post-formed types shall be spray grade, high heat resistant, neoprene contact adhesive.

3. Approved Colors. See Section 01 6200
   a. Nevamar – Vanilla Bean VS2002T

PART 3 - EXECUTION: Not Used

END OF SECTION
SECTION 06 4116

PLASTIC LAMINATE FACED ARCHITECTURAL CABINETS

PART 1 GENERAL

1.1 SUMMARY

A. Products Supplied But Not Installed Under This Section
   1. Custom casework

B. Related Sections
   1. Section 062001 - Installation
   2. Section 06 4005 - Plastic Laminate
   3. Section 22 4000 - Plumbing Fixtures.

1.2 SUBMITTALS

A. Shop Drawings
   1. Fabricator to submit complete details of construction and elevations of all cabinets and countertops.

1.3 QUALITY ASSURANCE

A. Construction Details, Fastening, Tolerances and Workmanship
   1. Architectural Woodwork Institute (AWI) Premium Grade Standards, with exceptions indicated.

1.4 DESCRIPTION

A. General
   1. Furnish all labor, materials, tools, equipment, and services for all architectural cabinetwork as indicated, in accordance with provisions of the contract documents.
   2. Although such work is not specifically indicted, furnish and install all supplementary or miscellaneous appurtenances and devices incidental to or necessary for a sound, secure and complete installation.

B. Work Included
   1. All plastic laminate cabinets and hardware.

C. Definitions
   1. Exposed surfaces: All surfaces visible when drawers and doors are closed.
      a. Door and drawer fronts, and their exposed edges, and inside of doors.
      b. Exposed ends.
      c. Countertops, vertical surfaces and their exposed edges.
      d. Face frames.
      e. Toe strip.
   2. Concealed surfaces: Surfaces not visible after installation.
      a. Web frames.
      b. Dust panels.
   3. Semi-exposed surfaces: All other surfaces not exposed or concealed.
PART 2 PRODUCTS

2.1 GENERAL

A. Cabinetwork
   1. Custom, shop or factory-build casework, complete with all hardware, accessories, countertops and bases, in sizes and configurations indicated.
   2. Style: Flush overlay, with square corner doors and drawer fronts overlapping case front with minimum reveal.

2.2 MATERIALS

A. Acceptable Manufacturers
   1. Plastic Laminate
      a. Base: Formica Corp.; Ralph Wilson Plastics Co. (WilsonArt); Pionite
   2. Plastic Overlay Panel Products
   3. Cabinet Hardware
      a. Base: National Lock Co.; Knape & Vogt; Grant; Epco; Webber Knapp; Stylemark; Ives; and Stanley

B. Plastic Laminate
   1. NEMA LD3-1975 High Pressure Laminate, Smooth Finish
   2. Countertops and their edges: Grade GP50, 0.050 inch (1.3 mm) thick.
   3. All other exposed surfaces: Grade GP28, 0.028 inch (9.7 mm) thick.
   4. Provide backer sheet on each plastic laminated item.
      a. Semi-exposed backer sheet: Grade C120, 0.020 inch (1.5 mm) thick; color to match plastic overlay.
      b. Concealed backer sheet: Grade BK20, 0.020 inch (0.5 mm) thick.
   5. Color shall be as indicated on Sheet F-101 on Finishes Plan.

C. Particle Board
   1. ANSI A208.1, Mat Formed, 45 PCF density
   2. Type 1-M-3 for general use.

D. Fiber Board
   1. ANSI A208.2, Medium Density Wood Fiber Board, 48 PCF Density, Minimum

E. Hardboard
   1. CS251, Tempered, Smooth on Both Sides

F. Plywood
   1. PSI-74, Softwood Plywood, AA Grade

G. Countertop Core
   1. Veneer Core, Spruce Faced Plywood or Particle Board

2.3 HARDWARE

A. Hardware for Doors
   1. Stanley cabinet pivot hinges for overlay doors or as approved by Architect.
   2. Pull: Wire, 4 inch centers; brushed aluminum finish; Stanley 4480.
   3. Lock: Provide where indicated.
B. Hardware for Drawers
   1. Slides: KV 1300 series; 75 lb. capacity, nylon wheels/rollers, stainless steel ball bearings, positive closing and pull-out stops, drawer removable without use of tools.
   2. Pull: Wire, 4 inch centers; brushed aluminum finish; Stanley 4480.
   3. Lock: Provide where indicated.

C. Locks
   1. Heavy duty institutional pin tumbler type; latch or cam suitable for application; National Lock M2-0106 series.
   2. Provide two keys for each lock at all drawers and doors.
   3. Master key and grand master key as directed by INS.

2.4 FABRICATION

A. Case Body - All Joints Glued
   1. Top and bottom (and fixed horizontals): Lock-jointed, dadoed or rabbeted into ends/dividers and screwed or doweled at approximately 2.5 inches (60 mm) on center.
   2. Back: Dadoed or rabbeted into top, sides and bottom.
   3. Fixed small compartment dividers: Dadoed.

B. Drawers with (sub-front) - All Joints Glued
   1. All corners dovetailed or doweled; or front corners dovetailed and back corners lock-jointed; or sides dadoed front and back and all joints nailed, stapled or screwed.
   2. Bottom dadoed into all four sides.
   3. Front screwed into sub-front.
   4. Top edges of drawers to be box-rounded.

C. Plastic Laminate Countertops
   1. Apply laminate front edge before top laminate.

D. Fasteners
   1. Use no blocking or fasteners in exposed or semi-exposed locations.

2.5 CASE CONFIGURATION

A. Flush all sides, top and bottom of doors and drawer fronts, and between door and drawer fronts in the same unit.

B. Double door units: No vertical rail of divider between doors. A vertical dividing panel will be located behind the doors in order to secure the locks.

C. Toe space: Four inch high by approximately three inches deep. Provide on front of each base unit (INS side).

D. Hardware Mounting
   1. Drawers: Center-pull in front, horizontally.
   2. Swinging Doors: Set-pull in swing-side corner; vertically at top of base units.

PART 3 EXECUTION - Not Used

END OF SECTION
## DIVISION 07: THERMAL AND MOISTURE PROTECTION

### 07 1000 DAMPPROOFING AND WATERPROOFING
- 07 1900 WATER REPELLENTS

### 07 2000 THERMAL PROTECTION
- 07 2116 BLANKET INSULATION

### 07 6000 FLASHING AND SHEET METAL
- 07 6210 GALVANIZED STEEL FLASHING AND TRIM

### 07 7000 ROOF AND WALL SPECIALTIES AND ACCESSORIES
- 07 7126 REGLETS

### 07 9000 JOINT PROTECTION
- 07 9213 ELASTOMERIC JOINT SEALANTS
- 07 9219 ACOUSTICAL JOINT SEALANTS

END OF TABLE OF CONTENTS
SECTION 07 1900
WATER REPELLENTS

PART 1 - GENERAL

1.1 SUMMARY
A. Includes But Not Limited To:
   1. Furnish and apply water repellent system to exposed exterior brick masonry
B. Related Requirements:
   1. Sections under 04 0100 heading: 'Maintenance Of Masonry'.
   2. Sections Under 04 2000 heading: 'Unit Masonry'.
   3. Section: 04 2113: 'Brick Veneer Masonry'.

1.2 SUBMITTALS
A. Action Submittals:
   1. Product Data: Manufacturer's product data including data substantiating that specified materials are recommended by Manufacturer for applications shown.
B. Informational Submittals:
   1. Manufacturer Instructions: Printed application instructions.

1.3 QUALITY ASSURANCE
A. Regulatory Agency Sustainability Approvals:
   1. Comply with applicable VOC standards and other local requirements.
B. Qualifications:
   1. Installer:
      a. Installer shall be acceptable to Manufacturer as applicator of its product.
      b. Minimum five (5) satisfactorily completed installations of comparable quality, scope, similar size, and complexity in past two (2) years before bidding.

1.4 FIELD CONDITIONS
A. Ambient Conditions:
   1. Temperatures at time of application:
      a. Silane: Between 40 and 75 deg F (4 and 24 deg C).
      b. Siloxane: Between 40 and 100 deg F (4 and 38 deg C).
   2. No precipitation shall have occurred within 24 hours of application or be expected for 48 hours minimum after completion of application.

PART 2 - PRODUCTS

2.1 MANUFACTURERS
A. Acceptable Products:
1. Silane:
   b. Rainstopper 120 by TexCote - Textured Coatings of America, Panama City, FL [www.texcote.com](http://www.texcote.com).

2. Siloxane:
   b. Rainstopper 600 by TexCote - Textured Coatings of America, Panama City, FL [www.texcote.com](http://www.texcote.com).

3. Equals as approved by Architect before bidding. See Section 01 6200.

PART 3 - EXECUTION

3.1 PREPARATION

A. Do not apply water repellent until after installation of sealants in areas to receive water repellants and adjoining areas.

B. Clean substrate of substances that will interfere with penetration and adhesion of water repellent.

C. Protect adjoining work from spillage or blow-over as recommended by Manufacturer.

3.2 APPLICATION

A. Apply two heavy saturation spray coats beginning at bottom of walls and following Manufacturer's written application instructions.

3.3 CLEANING

A. Immediately clean adjoining surfaces of spillage and overspray as recommended by Manufacturer.

END OF SECTION
SECTION 07 2116
BLANKET INSULATION

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Furnish and install faced thermal and acoustic batt insulation as described in Contract Documents.
   2. Furnish and install unfaced thermal and acoustic batt insulation in metal framing as described in Contract Documents.
   3. Furnish and install unfaced thermal insulation in ceilings as described in Contract Documents.

1.2 REFERENCES

A. Reference Standards:
   1. ASTM International:

1.3 QUALITY ASSURANCE

A. Regulatory Agency Sustainability Approvals:
   1. Insulation shall be manufactured to be in compliance with California Code Council (CBC) or other applicable building codes.

PART 2 - PRODUCTS

2.1 SYSTEMS

A. Manufacturers:
   1. Insulation:
      a. Acceptable Manufacturers:
      b. Equal as approved by Architect before bidding. See Section 01 6200.

B. Materials:
   1. Thermal And Acoustic Insulation:
      a. Faced Insulation:
         1) Kraft faced meeting requirements of ASTM C665, Type II, Class C.
         2) Foil faced meeting requirements of ASTM C665, Type III.
            a) Class B: Enclosed insulation.
b) Class A: Exposed insulation.
b. Unfaced Insulation: Meet requirements of ASTM C665, Type I.
c. Order insulation by 'R' factor rather than 'U' factor, rating, or thickness, either 16 or 24 inches (400 or 600 mm) wide according to framing spacing.
d. 'R' Factor Required:
   1) Acoustically Insulated Ceilings:
      a) Enclosed Spaces: Fill framed cavity with batt of appropriate thickness.
      b) Unenclosed Spaces: R38.
   2) Metal Wall Stud Framing:
      | Value | Thickness |
      |-------|-----------|
      | R11   | 3-1/2 inches deep | 89 mm deep |
      | R19   | 5-1/2 inches deep | 140 mm deep |
      | R26   | 7-1/2 inches deep | 191 mm deep |

PART 3 - EXECUTION

3.1 INSTALLATION

A. General:
   1. Leave no gaps in insulation envelope.
   2. If two layers of insulation are used to attain required 'R' factor, only layer towards interior of building shall have facing.
   3. Provide minimum clearance around recessed lighting fixtures as approved by local code.

B. In Framing:
   1. Install insulation behind plumbing and wiring, around duct and vent line penetrations, and in similar places.
   2. Fit ends of batts snug against top and bottom plates.
   3. Fit batts snug against stud framing at each side.
   4. Where insulation is not enclosed by structure or drywall, support in place with wire or other suitable material.
   5. Install baffles between trusses and rafters at ventilation spaces if necessary to prevent insulation from blocking airflow from soffit.

END OF SECTION
SECTION 07 6210

GALVANIZED STEEL FLASHING AND TRIM

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Furnish and install miscellaneous flashing, counterflashing, as described in Contract Documents and not specified to be of other material.

B. Related Requirements:
   1. Section 06 1100: 'Wood Framing' for wood base.
   2. Section 07 9213: 'Elastomeric Joint Sealant'.

1.2 REFERENCES

A. Reference Standards:
   1. ASTM International:
      a. ASTM A653/A653M-13, ‘Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process’.

   2. Federal Specifications:
      a. TT-S-00230C(2) Sealing Compound, Elastomeric Type, Single Component, (For Caulking, Sealing, and Glazing in Buildings and Other Structures).

PART 2 - PRODUCTS

2.1 SYSTEM

A. Manufacturers:
   1. Acceptable Manufacturers Of Metal:
      e. MBCI, Houston, TX www.mbcicom.
      g. O’Neal Flat Rolled Metals (member of O’Neal Industries), Brighton, CO www.ofrmetals.com.
      j. Equal as approved by Architect before installation. See Section 01 6200.

B. Materials:
   1. Sheet Metal:
      a. Galvanized iron or steel meeting requirements of ASTM A653/A653M, G 90 or Galvalume steel meeting requirements of ASTM A792/A792M A250, 50 ksi.
         1) 22 ga (0.792 mm) for hold-down clips.
         2) 24 ga (0.635 mm) for all other.
C. Fabrication:
   1. Form accurately to details.
   2. Profiles, bends, and intersections shall be even and true to line.
   3. Fold exposed edges 1/2 inch (12.7 mm) to provide stiffness.

D. Finish:
   1. Exposed to view:
      a. Provide face coating of polyvinyledene Fluoride (PVF₂) Resin-base finish (Kynar 500 or Hylar 5000) containing seventy (70) percent minimum PVF₂ in resin portion of formula. Thermo-cured two coat system consisting of corrosion inhibiting epoxy primer and top coat factory applied over properly pre-treated metal.
      b. Reverse side coating shall be thermo-cured system consisting of corrosion inhibiting epoxy primer applied over properly pre-treated metal.
   2. Color as selected by Architect from Manufacturer's standard colors.

2.2 ACCESSORIES

A. Sealants: Rubber base type conforming to Fed Spec TT-S-00230C.

B. Fasteners:
   1. Of strength and type consistent with function.
   3. Screws, Bolts, And Accessory Fasteners: Galvanized or other acceptable corrosion resistant treatment.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install with small, watertight seams.

B. Slope to provide positive drainage.

C. Provide 4 inch (100 mm) minimum overlap.

D. Allow sufficient tolerance for expansion and contraction.

E. Insulate work to prevent electrolytic action.

3.2 CLEANING

A. Leave metals clean and free of defects, stains, and damaged finish.

END OF SECTION
SECTION 07 7126

REGLETS

PART 1 - GENERAL

1.1 SUMMARY

A. Products Furnished But Not Installed Under this Section:
   1. Reglets.

B. Related Requirements:
   2. Section under 07 5000 heading: Surface-mounted Installation.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Galvanized Reglets:
   1. Acceptable Products:
      b. Equal as acceptable to Roofing System Manufacturer and approved by Architect before installation. See Section 01 6200.

PART 3 - EXECUTION: Not Used

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
1. Furnish and install sealants not specified to be furnished and installed under other Sections.
2. Quality of sealants to be used on Project not specified elsewhere, including submittal, material, and installation requirements.

B. Products Furnished But not Installed Under This Section:
1. Interior Ceramic Tile Joint Sealants:

C. Related Requirements:
1. Section 09 3013: 'Ceramic Tiling'.

1.2 REFERENCES

A. Association Publications:
1. American Architectural Manufacturers Association (AAMA):
   a. 'Voluntary Specifications and Test Methods for Sealants'.
2. ASM International:
   b. Committee C24 on Building Seals and Sealants for various Specifications, Guides, Test Methods, and Practices related to sealant specifying and application.
   c. Committee E6 on Building Performance for various Specifications, Guides, Test Methods, and Practices related to sealant use with air barriers, vapor retarders, and exterior enclosure systems and materials.
   a. 'Sealants: The Professional's Guide'.
   b. 'Joint Sealants, Whole Building Design Guide'.

B. Definitions:
1. Adhere: To cause two surfaces to be held together by adhesion.
2. Adhesive: An adhesive, as defined by The American Society for Testing and Materials (ASTM), is 'a substance capable of holding materials together by surface attachment'.
3. Caulk: Caulks have variety of definitions but are generally recognized as materials used in applications where only minor elastomeric properties are needed.
4. Elastomer: Rubbery material which returns to approximately its original dimensions in short time after relatively large amount of deformation.
5. Flow: Movement of adhesive during bonding process before adhesive is set.
6. Joint: Location at which two substrates are held together with layer of adhesive.
7. Primer: Coating applied to surface, prior to application of an adhesive, to improve performance of the bond.
8. Sealant: Sealants are generally used in applications where elastic properties are needed while adhesives are generally used in applications where bonding strength and rigidity are needed. With technology advancements both sealants and adhesives can be used interchangeably depending on applications performance requirements.
9. Sealant Types and Classifications:
   a. ASTM Specifications:
1) Type:
   a) Type S: Single-component sealant.
   b) Type M: Multi-component sealant.
2) Grade:
   a) Grade P: Pourable or self-leveling sealant used for horizontal traffic joints.
   b) Grade NS: Non-sag or gunnable sealant used for vertical and non-traffic joints.
3) Classes: Represent movement capability in percent of joint width.
   a) Class 100/50: Sealant that, when tested for adhesion or cohesion under cyclic movement shall withstand of at least 100 percent increase and decrease of at least 50 percent of joint width as measured at time of application.
   b) Class 50: Sealant that, when tested for adhesion or cohesion under cyclic movement shall withstand increase and decrease of at least 50 percent of joint width as measured at time of application.
   c) Class 25: Sealant that, when tested for adhesion or cohesion under cyclic movement shall withstand increase and decrease of at least 25 percent of joint width as measured at time of application.
   d) Class 12: Sealant that, when tested for adhesion and cohesion under cyclic movement shall withstand increase and decrease of at least 12 percent of joint width as measured at time of application.
4) Use:
   a) T (Traffic): Sealant designed for use in joints in pedestrian and vehicular traffic areas such as walkways, plazas, decks and parking garages.
   b) NT (Non-Traffic): Sealant designed for use in joints in non-traffic areas.
   c) I (Immersion): Sealant that meets bond requirements when tested by immersion (Immersion rated sealant applications require primer).
   d) M (Mortar): Sealant that meets bond requirements when tested on mortar specimens.
   e) G (Glass): Sealant that meets bond requirements when tested on glass specimens.
   f) A (Aluminum): Sealant that meets bond requirements when tested on aluminum specimens.
   g) O (Other): Sealant that meets bond requirements when tested on substrates other than standard substrates, being glass, aluminum, mortar.

b. Federal Specifications:
1) Type:
   a) Type I: Self-leveling, pour grade.
      (1) Compound which has sufficient flow to give smooth level surface when applied in horizontal joint at 40 deg F (4.4 deg C).
   b) Type II: Non-sag, gun grade
      (1) Compound which permits application in joints on vertical surfaces without sagging (slumping) at temperatures 40 deg F (4.4 deg C) and 122 deg. F (50 deg. C).
   c) Type NS: Non-sag, gun grade.
      (1) Non-sag shall be a compound which permits application in joints on vertical surfaces without sagging (slumping) at temperatures between -20 deg F and 122 deg. F (-29 and 50 deg. C).
2) Class:
   a) Class A: Compounds resistant to 50 percent total joint movement (includes Type I and Type II).
      (1) Capable of resisting compression-extension cycling of plus and minus 25 percent of nominal half inch width.
   b) Class B: Compounds resistant to 25 percent total joint movement (includes Type I and Type II).
      (1) Capable of resisting compression-extension cycling of plus and minus 12 1/2 percent of nominal half inch width.

10. Shelf Life: Period of time, usually beginning with date of manufacture, during which stored adhesive will remain effective or useful.
11. Silicone: Any member of family of polymeric products whose molecular backbone is made up of alternating silicon and oxygen atoms and which has pendant hydrocarbon groups attached to silicon atoms. Used primarily as a sealant. Offers excellent resistance to water and large variations in temperature (minus 100 deg F to + 600 deg F) (minus 73.3 deg C to + 316 deg C).
12. Stability: Ability of material to remain unchanged.
13. Storage Life: Period of time during which packaged adhesive can be stored under specified temperature conditions and remain suitable for use.
14. Substrate: Material upon surface of which an adhesive-containing substance is spread for any purpose, such as bonding or coating.
15. Surface Preparation: Physical and/or chemical preparation of substrate to render it suitable for adhesive joining. Same as substrate preparation or pre-bond preparation.
16. Toxicity: Material shall have no adverse effect on health of personnel when used for its intended purpose.

C. Reference Standards:
   1. American Association of State and Highway Transportation Officials:
      a. AASHTO T 132-87(2013), 'Standard Method of Test for Tensile Strength of Hydraulic Cement Mortars'.
   2. ASTM International:
      b. ASTM C661-06(2011), 'Standard Test Method for Indentation Hardness of Elastomeric-Type Sealants by Means of a Durometer'.
      e. ASTM C793-05(2010), 'Standard Test Method for Effects of Laboratory Accelerated Weathering on Elastomeric Joint Sealants'.
      g. ASTM C920-14, 'Standard Specification for Elastomeric Joint Sealants'.
      i. ASTM C1184-13, 'Standard Specification for Structural Silicone Sealants'.
      o. ASTM D2202-00(2010), 'Standard Test Method for Slump of Sealants'.
   3. Federal Specifications:
      b. TT-S-00230C (CON-NBS), 'Sealing compound: Elastomeric Type, Single Component (For Calking, Sealing, and Glazing In Buildings And Other Structures). (2 Feb 1970).
   4. Government Services Administration (GSA), Commercial Item Descriptions (CID):
      b. GSA CID A-A-1556, 'Sealing Compound Elastomeric Type, Single Component (For Caulking, Sealing, and Glazing in Buildings and Other Structures)'.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Scheduling:
1. Schedule work so waterproofing, water repellents and preservative finishes are installed after sealants, unless sealant manufacturer approves otherwise in writing.
2. Ensure sealants are cured before covering with other materials.

1.4 SUBMITTALS

A. Action Submittals:
   1. Product Data:
      a. Manufacturer's specifications and other data needed to prove compliance with the specified requirements.
      b. Manufacturer's literature for each Product.
      c. Schedule showing joints requiring sealants. Show also backing and primer to be used.

B. Informational Submittals:
   1. Certificates:
      a. Manufacturer's Certificate:
         1) Certify products are suitable for intended use and products meet or exceed specified requirements.
         2) Certificate from Manufacturer indicating date of manufacture.
      2. Manufacturers' Instructions:
         a. Manufacturer's installation recommendations for each Product.
         b. Manufacturer's installation for completing sealant intersections when different materials are joined.

1.5 QUALITY ASSURANCE

A. Qualifications:
   1. Manufacturer: Company specializing in manufacturing products specified in this section with minimum ten (10) years documented experience.
   2. Applicator Qualifications:
      a. Company specializing in performing work of this section.
      b. Provide if requested, reference of projects with minimum three (3) years documented experience, minimum three (3) successfully completed projects of similar scope and complexity, and approved by manufacturer.
      c. Designate one (1) individual as project foreman who shall be on site at all times during installation.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Delivery and Acceptance Requirements:
   1. Deliver and keep in original containers until ready for use.
   2. Inspect for damage or deteriorated materials.

B. Storage and Handling Requirements:
   1. Handle, store, and apply materials in compliance with applicable regulations and material safety data sheets (MSDS).
   2. Handle to prevent inclusion of foreign matter, damage by water, or breakage.
   3. Store in a cool dry location, but never under 40 deg F (4 deg C) or subjected to sustained temperatures exceeding 90 deg F (32 deg C) or as per Manufacturer's written recommendations.
   4. Do use sealants that have exceeded shelf life of product.

1.7 FIELD CONDITIONS

A. Ambient Conditions:
1. Do not install sealant during inclement weather or when such conditions are expected. Allow wet surfaces to dry.
2. Follow Manufacturer’s temperature recommendations for installing sealants.

1.8 WARRANTY

A. Manufacturer Warranty:
1. Signed warranties against adhesive and cohesive failure of sealant and against infiltration of water and air through sealed joint for period of three (3) years from date of Substantial Completion.
   a. Manufacturer’s standard warranty covering sealant materials.
   b. Applicator’s standard warranty covering workmanship.

PART 2 - PRODUCTS

2.1 SYSTEMS

A. Manufacturers:
1. Manufacturer Contact List:
   a. Dow Corning Corp., Midland, MI www.dowcorning.com
   b. Franklin International, Inc. Columbus, OH www.titebond.com
   c. GE Sealants & Adhesives (see Momentive Performance Materials Inc.).
   d. Laticrete International Inc., Bethany, CT www.laticrete.com
   e. Momentive Performance Materials Inc. (formally GE Sealants & Adhesives), Huntersville, NC www.ge.com/silicones
   f. Sherwin-Williams, Cleveland, OH www.sherwin-williams.com
   g. Sika Corporation, Lyndhurst, NJ www.sikaconstruction.com
   h. Tremco, Beachwood, OH www.tremcosealants.com

B. Materials:
1. Design Criteria:
   a. Compliance: Meet or exceed requirements of these standards:
      1) ASTM C920: Elastomeric joint sealant performance standard.
      2) ASTM C639 or ASTM D2202: Flow (sag or slump).
      3) ASTM C661 or ASTM D2240: Durometer hardness (shore A).
      4) ASTM C679 or ASTM C794: Tack free time (peel strength).
      5) ASTM C719: Joint movement capability.
      6) ASTM 793: Effects of accelerated weathering.
      7) ASTM C1135 or ASTM D412: Tensile adhesion strength.
      8) ASTM C1184: Structural silicone sealants.
      9) ASTM C1248: Staining.
      10) ASTM D412: Modulus.
      11) ASTM D5893: Silicone Joint Sealant for Concrete Pavements.
      12) Federal Specification TT-S-001543A.
      13) Federal Specification TT-S-00230C.
      14) GSA CID A-A-272A.
   b. Comply with Manufacturer’s ambient condition requirements.
   c. Sealants must meet Manufacturer’s shelf-life requirements.
   d. Sealants must adhere to and be compatible with specified substrates.
   e. Sealants shall be stable when exposed to UV, joint movements, and particular environment prevailing at project location.
   f. Primers (Concrete, stone, masonry, and other nonporous surfaces typically do not require a primer. Aluminum and other nonporous surfaces except glass require use of a primer. Installer Option to use Adhesion Test to determine if primer is required or use primer called out in related sections)
1) Adhesion Test:
   a) Apply silicone sealant to small area and perform adhesion test to determine if primer is required to achieve adequate adhesion. If necessary, apply primer at rate and in accordance with Manufacturer’s instructions. See ‘Field Quality Control’ in Part 3 of this specification for Adhesive Test.

2) If Primer required, shall not stain and shall be compatible with substrates.
3) Allow primer to dry before applying sealant.

2. Sealants At Exterior Building Elements:
   a. Description:
      1) Weathersealing expansion, contraction, perimeter, and other movement joints which may include all or part of the following for project:
         a) Aluminum entrance perimeters and thresholds.
         b) Columns.
         c) Connections.
         d) Door frames.
         e) Joints and cracks around windows.
         f) Louvers.
         g) Masonry.
         h) Parapet caps.
         i) Wall penetrations.
         j) Other joints necessary to seal off building from outside air and moisture.

   b. Design Criteria:
      1) Meet following standards for Sealant:
         a) ASTM C920: Type S, Grade NS, Class 50 Use A, G, M.
      2) Color:
         a) Architect to select from Manufacturer's standard colors.
         b) Match building elements instead of window (do not use white that shows dirt easily).
   c. Approved Products. See Section 01 6200
      1) Dow Corning:
         a) Primer: 1200 Prime Coat.
         b) Sealant: 791 Silicone Weatherproofing Sealant.
      2) Momentive Performance Materials (formerly, GE Sealants & Adhesives):
         a) Primer: SS4044 Primer.
      3) Tremco:
         a) Primer:
            (1) Metal surface: No. 20 primer.
            (2) Porous surfaces: No. 23 primer.
         b) Sealant: Spectrum 1 Silicone Sealant.

3. Sealants At Exterior Sheet Metal And Miscellaneous:
   a. Description:
      1) Weathersealing expansion, contraction, perimeter, and other movement joints which may include all or part of the following for project:
         a) Flashings.
         b) Gutters.
         c) Penetrations in soffits and fascias.
         d) Roof vents and flues.

   b. Design Criteria:
      1) Meet following standards for Sealant:
         a) ASTM C920: Type S Grade NS, Class 25 (min) Use A.
   c. Approved Products. See Section 01 6200
      1) Dow Corning: 790 Silicone Building Sealant.
      3) Tremco: Tremsil 600 Silicone Sealant.

4. Sealants At Expansion Joints in Exterior Concrete:
   a. Expansion Joints:
      1) Design Criteria:
         a) Meet following standards for Sealant:
1) ASTM C920: Type S, Grade NS, Class 50 Use A, G, M, O.

2) Sealant required at expansion for following areas:
   a) Between entryway slabs and building foundations.
   b) Between sidewalks and building foundations.
   c) Miscellaneous vertical applications.

3) Sealant NOT required at expansion joints for following areas:
   a) Within aprons and where aprons abut building foundations and sidewalks.
   b) Within sidewalks.

4) Approved Products. See Section 01 6200
   a) Dow Corning:
      (1) Primer: 1200 Prime Coat.
      (2) Sealant: 790 Silicone Building Sealant.
   b) Sika:
      (1) Primer: Sikasil Primer-2100.
      (2) Sealant: Sikasil-728 NS Non-Sag Silicone Sealant.

b. Penetrations thru Concrete Walls:
1) Design Criteria:
   a) Meet following standards for Sealant:
      (1) ASTM C920: Type S, Grade NS, Class 50 Use A, G, M, O.
   2) Approved Products. See Section 01 6200
      a) Dow Corning:
         (1) Primer: 1200 Prime Coat.
         (2) Sealant: 790 Silicone Building Sealant.
      b) Sika:
         (1) Primer: Sikasil Primer-2100.
         (2) Sealant: Sikasil-728 NS Non-Sag Silicone Sealant.

5. Sealants At Flat Drainage Exterior Concrete Structures:
   a. Expansion Joints and Control Joints:
      1) Description:
         a) One component (part) self-leveling silicon material that cures to ultra-low modulus
            silicone rubber upon exposure to atmospheric moisture.
         b) Cured silicone rubber remains flexible over entire temperature range expected in
            pavement applications.
      2) Design Criteria:
         a) Sealant is required at following areas:
            (1) Within flat drainage structures and at joints between flat drainage structures
                and other concrete elements.
         b) Meet following standards for Sealant: Self-leveling: ASTM D-5893; ASTM C-920,
            Type S, Grade P, Class 100/50; Use T, M, G, A, O.
   3) Four Approved Products. See Section 01 6200
      a) Dow Corning:
         (1) Primer: 1200 Prime Coat.
         (2) Sealant: 890-SL Silicone Building Sealant.
      b) Sika:
         (1) Primer: Primer: Sikasil Primer-2100.
         (2) Sealant: Sikasil-728 SL Self-leveling Silicone Sealant.

6. General Interior Sealants:
   a. General:
      1) Inside jambs and heads of exterior door frames.
      2) Both sides of interior door frames.
      3) Inside perimeters of windows.
      4) Miscellaneous gaps between substrates.
   b. Design Criteria:
      1) Meet ASTM C920, Type S, Grade NS, NT, and Class 25 test requirements.
      2) 100 percent silicone sealant.
   c. Non-Paintable Sealant (Installer Option A):
      1) Approved Product. See Section 01 6200
         a) Dow Corning: Tub, Tile, And Ceramic Silicone Sealant.
         b) Laticrete: Latasil Silicone Sealant.
d) Sherwin Williams: White Lightning Silicone Ultra Low Odor Window and Door Sealant.
e) Tremco: TremSil 200 Silicone Sealant.
f) Franklin International: TileBond 2601 (White) 2611 (Clear) 100% Silicone Sealant.
d. Paintable Sealant (Installer Option B):
   1) Approved Product. See Section 01 6200

7. Sealants For Interior Joints:
   a. General:
      1) Countertops and backsplash to wall.
      2) Sinks and lavatories to countertops.
      3) Joints between plumbing fixtures and other substrates
   b. Interior Ceramic Tile Joints are furnished in Section 07 9213 and installed in Section 09 3013 'Ceramic Tiling' including the following:
      1) Ceramic tile inside corners.
      2) Ceramic tile and paver tile joints.
      3) Termination joints in showers and fountains.
   c. Description:
      1) One-part acetoxy cure silicone sealant with fungicides to resist mold and mildew.
   d. Design Criteria:
      1) Meet ASTM C920, Type S, Grade NS, NT, and Class 25 test requirements.
      2) 100 percent silicone sealant.
   e. Color: As selected by Architect from Manufacturer's standard colors.
   f. Approved Products. See Section 01 6200
      1) Dow Corning: Tub, Tile, And Ceramic Silicone Sealant.
      2) Laticrete: Latasil Tile and Stone Silicone Sealant.
      4) Tremco: TremSil 200 Silicone Sealant.

2.2 ACCESSORIES

A. Bond Breaker Tape:
   1. Pressure sensitive tape as by Sealant Manufacturer to suit application.
   2. Provide tape to prevent adhesion to joint fillers or joint surfaces at back of joint and allow sealant movement.

B. Joint Backing:
   2. Flexible closed cell, non-gassing polyurethane or polyolefin rod or bond breaker tape as recommended by Sealant Manufacturer for joints being sealed.
   3. Oversized 25 to 50 percent larger than joint width.

C. Joint Cleaner:
   1. Non-corrosive and non-staining type as recommended by Sealant Manufacturer, compatible with joint forming materials.

D. Masking Tape:
   1. Non-staining, non-absorbent tape product compatible with joint sealants and adjacent joint surfaces.
PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification Of Conditions:
   1. Examine substrate surfaces and joint openings are ready to receive Work.
      a. Verify each sealant is compatible for use with joint substrates.
      b. Verify joint surfaces are clean and dry.
      c. Ensure concrete surfaces are fully cured.
   2. Sealants provided shall meet Manufacturer’s shelf-life requirements.
      a. Do not proceed until unsatisfactory conditions are corrected.
   4. Commencement of Work by installer is considered acceptance of substrate.

3.2 PREPARATION

A. Surface Preparation:
   1. Surfaces shall be clean, dry, free of dust, oil, grease, dew, or frost. Prepare substrates in accordance with Manufacturer’s instructions:
      a. Porous surfaces: Abrasive-clean followed by blasting with oil-free compressed air.
      b. Nonporous surfaces: Use two-cloth solvent wipe in accordance with ASTM C1193.
      c. High-pressure water cleaning: Exercise care that water does not enter through failed joints.
   2. Field test joints in inconspicuous location.
      a. Verify joint preparation and primer required to obtain optimum adhesion of sealants to joint substrate.
      b. When test indicates sealant adhesion failure, modify joint preparation primer, or both and retest until joint passes sealant adhesion test.
   3. Masking: Apply masking tape as required to protect adjacent surfaces and to ensure straight bead line and facilitate cleaning.

B. Joints:
   1. Prepare joints in accordance with ASTM C1193.
      a. Clean joint surfaces of contaminates capable of affecting sealant bond to joint surface using Manufacturer’s recommended instructions for joint preparation methods.
      b. Remove dirt, dust, oils, wax, paints, and contamination capable of affecting primer and sealant bond.
      c. Clean concrete joint surfaces to remove curing agents and form release agents.

C. Protection:
   1. Protect elements surrounding the Work of this section from damage or disfiguration.

3.3 APPLICATION

A. General:
   1. Apply silicone sealant in accordance with Manufacturer’s instructions.
   2. Do not use damaged or deteriorated materials.
   3. Install primer and sealants in accordance with ASTM C1193 and Manufacturer’s instructions.
   4. Apply primer where required for sealant adhesion.
   5. Install sealants immediately after joint preparation.
   6. Do not use silicone sealant as per the following:
      a. Apply caulking/sealant at temperatures below 40 deg F (4 deg C).
      b. Below-grade applications.
      c. Brass and copper surfaces.
      d. Materials bleeding oils, plasticizers, and solvents.
      e. Structural glazing and adhesive.
      f. Surfaces to be immersed in water for prolonged time.
B. Joint Backing:
   1. Install joint backing to maintain sealant joint ratios recommended by Manufacturer.
   2. Install without gaps, twisting, stretching, or puncturing backing material. Use gage to ensure uniform depth to achieve correct profile, coverage, and performance.
   3. Rod for open joints shall be at least 1-1/2 times width of open joint and of thickness to give solid backing. Backing shall fill up joint so depth of sealant bite is no more than 3/8 inch (9.5 mm) deep.

C. Bond Breaker:
   1. Install bond breaker where joint backing is not used or where backing is not feasible.
      a. Apply bond-breaker tape in shallow joints as recommended by Sealant Manufacturer.

D. Sealant:
   1. Apply sealant with hand-caulking gun with nozzle of proper size to fit joints. Use sufficient pressure to insure full contact to both sides of joint to full depth of joint. Apply sealants in vertical joints from bottom to top.
   2. Fill joint opening to full and proper configuration.
   3. Apply in continuous operation.
   4. Tool joints immediately after application of sealant if required to achieve full bedding to substrate or to achieve smooth sealant surface. Tool joints in opposite direction from application direction, i.e., in vertical joints, from the top down. Do not 'wet tool' sealants.
   5. Depth of sealant bite shall be 1/4 inch (6 mm) minimum and 1/2 inch (12.7 mm) maximum, but never more than one half or less than one fourth joint width.

E. Caulk gaps between painted or coated substrates and unfinished or pre-finished substrates. Caulk gaps larger than 3/16 inch (5 mm) between painted or coated substrates.

3.4 TOLERANCES
   A. Provide joint tolerances in accordance with Manufacturer’s printed instructions.

3.5 CLEANING
   A. Remove masking tape and excess sealant.
   B. Clean adjacent materials, which have been soiled, immediately (before setting) as recommended by Manufacturer.
   C. Waste Management: Dispose of products in accordance with manufacturer’s recommendation.

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Quality of sealants to be used at perimeters of and penetrations through office and conference room insulated walls and associated ceilings.

B. Related Requirements:
   1. Section 09 2900: Furnishing and installing of acoustical sealants.

1.2 REFERENCES

A. Association Publications:
   1. American Architectural Manufacturers Association (AAMA):
      a. “Voluntary Specifications and Test Methods for Sealants”.
   2. ASM International:
      b. Committee C24 on Building Seals and Sealants for various Specifications, Guides, Test Methods, and Practices related to sealant specifying and application.
      c. Committee E6 on Building Performance for various Specifications, Guides, Test Methods, and Practices related to sealant use with air barriers, vapor retarders, and exterior enclosure systems and materials.

B. Definitions:
   1. Adhesion: Bonding forces between two different materials (e.g. between an adhesive and substrate).
   2. Adhesive: An adhesive, as defined by The American Society for Testing and Materials (ASTM), is “a substance capable of holding materials together by surface attachment”.
   4. Caulk: Caulks have a variety of definitions but are generally recognized as materials used in applications where only minor elastomeric properties are needed.
   5. Primer: Coating applied to surface, prior to application of an adhesive, to improve performance of bond.
   6. Sealant. Sealants are generally used in applications where elastic properties are needed while adhesives are generally used in applications where bonding strength and rigidity are needed. With technology advancements both sealants and adhesives can be used interchangeably depending on the applications performance requirements.
   7. Sealant Types and Classes:
      a. Federal Specifications:
         1) Type I: Self-leveling, pour grade.
         2) Type II: Non-sag, gun grade.
         3) Type NS: Non-sag, gun grade.
         4) Class A: +25 percent, -25 percent expansion – contraction.
      b. ASTM Specifications:
1) Type S: Single-component sealant.
2) Type M: Multi-component sealant.
3) Grade P: Pourable or self-leveling sealant for joints on horizontal surfaces.
4) Grade NS: Non-sag or gunnable sealant for joints in vertical surfaces.
5) Class 25: Sealant that, when tested for adhesion or cohesion under cyclic movement shall withstand increase and decrease of at least 25 percent of joint width as measured at time of application.
6) Class 12: Sealant that, when tested for adhesion and cohesion under cyclic movement shall withstand increase and decrease of at least 12 percent of joint width as measured at time of application.
7) T: Sealant designed for use in joints in pedestrian and vehicular traffic areas such as walkways, plazas, decks and parking garages.
8) NT: Sealant designed for use in joints in non-traffic areas.
9) M: Sealant will remain adhered to mortar.
10) G: Sealant will remain adhered to glass.
11) A: Sealant will remain adhered to aluminum.
12) O: Sealant will remain adhered to substrates other than glass, aluminum, mortar.

8. Shelf Life: Usable storage time of material. Most adhesives have shelf-life of 6 to 12 months. Shelf-life of an adhesive may be increased by refrigeration and is usually shortened by exposure to heat.

9. Stability: Compound in original unopened container shall be stable for at least six months when stored at temperature not exceeding 80 degrees F. (26.7 degrees C.).

10. Toxicity: Material shall have no adverse effect on health of personnel when used for its intended purpose.

C. Reference Standards:
   1. ASTM International:
      a. ASTM C834-10, 'Standard Specification for Latex Sealants'.
      b. ASTM C919-12, 'Standard Practice for Use of Sealants in Acoustical Applications'.
      c. ASTM C1193-12, 'Standard Guide for Use of Joint Sealants'.
      d. ASTM E84-12c, 'Standard Test Method for Surface Burning Characteristics of Building Materials'.
      e. ASTM E90-09, 'Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements'.
   2. Underwriters Laboratories, Inc.:

1.3 SUBMITTALS

A. Action Submittals:
   1. Product Data:
      a. Manufacturer's literature for each Product.

B. Informational Submittals:
   1. Certificates:
      a. Manufacturer's Certificate:
         1) Certify products are suitable for intended use and products meet or exceed specified requirements.
         2) Certificate from Manufacturer indicating date of manufacture.
   2. Manufacturers’ Instructions:
      a. Manufacturer’s installation recommendations for each Product.

1.4 QUALITY ASSURANCE

A. Regulatory Agency Sustainability Approvals:
1. Surface-Burning Characteristics:
   a. Class A flame spread rating in accordance with ASTM E84 or UL 723 Type 1.
      1) Class A (Flame spread index 0-25; Smoke-developed index 0-450).

1.5 DELIVERY, STORAGE, AND HANDLING

A. Delivery And Acceptance Requirements:
   1. Deliver and keep in original containers until ready for use.
   2. Inspect for damage or deteriorated materials.

B. Storage And Handling Requirements:
   1. Handle to prevent inclusion of foreign matter, damage by water, or breakage.
   2. Store in cool, dry location, and at temperatures never under 40 deg F (4 deg C) nor exceeding 80 deg F (26.7 C).

1.6 FIELD CONDITIONS

A. Ambient Conditions:
   1. Do not apply caulking at temperatures below 40 deg F (4 deg C).

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Sealants:
   1. Design Criteria:
      a. Meet requirements of ASTM C834.
      b. Meet Class A flame spread rating.
   2. Approved Products. See Section 01 6200
      c. Acoustical Sealant by Tremco, Beachwood, OH
      d. Acoustical Sound Sealant by Titebond

2.2 ACCESSORIES

A. Bond Breaker: Pressure sensitive tape recommended by Sealant Manufacturer to suit application.

B. Joint Backing:
   1. Flexible closed cell polyurethane or polyolefin rod or bond breaker tape as recommended by Sealant Manufacturer for joints being sealed.
   2. Oversized 25 to 50 percent larger than joint width.

C. Joint Cleaner: Non-corrosive and non-staining type, recommended by Sealant Manufacturer, compatible with joint forming materials.

D. Masking Tape: Pressure sensitive tape recommended by Sealant Manufacturer to suit application.

E. Primer: Non-staining type, type, recommended by Sealant Manufacturer to suit application.
PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification Of Conditions:
   1. Examine substrate surfaces and joint openings are ready to receive Work.
   2. Sealants provided shall meet Manufacturer's shelf-life requirements.
      a. Do not proceed until unsatisfactory conditions are corrected.
   4. Commencement of Work by installer is considered acceptance of substrate.

3.2 PREPARATION

A. Surface Preparation:
   1. Prepare joints in accordance with ASTM C1193 and Manufacturer's instructions.
   2. Clean joint surfaces to remove dirt, dust, oils, wax, paints, and other contamination capable of affecting primer and sealant bond.
   3. Protect elements surrounding the Work of this section from damage or disfiguration. Apply masking tape to adjacent surfaces when required to prevent damage to finishes from sealant installation.

B. Surface Preparation:
   1. Clean joint surfaces of residual sealant and other contaminates capable of affecting sealant bond to joint surface.
   2. Surfaces shall be clean, dry, and free of dust, oil, grease, dew, or frost.

3.3 INSTALLATION

A. General:
   1. Do not use damaged or deteriorated materials.
   2. Install primer and sealants in accordance with ASTM C1193 and Manufacturer’s instructions where required for sealant adhesion.
   3. Install sealants immediately after joint preparation.
   4. Do not apply caulking/sealant at temperatures below 40 deg F (4 deg C).

B. Joint Backing:
   1. Rod for open joints shall be at least 1-1/2 times width of open joint and of thickness to give solid backing. Backing shall fill up joint so depth of sealant bite is no more than 3/8 inch (9.5 mm) deep.
   2. Apply bond-breaker tape in shallow joints as recommended by Sealant Manufacturer.

C. Install at perimeter joints and mechanical and electrical penetrations in sound insulated rooms. Apply sealant with hand-caulking gun with nozzle of proper size to fit joints. Use sufficient pressure to insure full contact to both sides of joint to full depth of joint.

D. Tool joints immediately after application of sealant if required to achieve full bedding to substrate or to achieve smooth sealant surface.

E. Depth of sealant bite shall be 1/4 inch (6 mm) minimum and 1/2 inch (12.7 mm) maximum, but never more than one half or less than one fourth joint width.

3.4 FIELD QUALITY CONTROL

A. Inspection:
1. Examine sealant joints to verify compliance with Contract Document requirements.

B. Non-Conforming Work. Non-conforming work as covered in the General Conditions applies, but is not limited to the following:
   1. Sealant material found to be contaminated or damaged or inadequate preparation of substrate results in deficiencies in joint sealant adhesion is considered defective or not complying with Contract Document requirements.
   2. Correct any work found defective or not-complying with Contract Document requirements at no additional cost to Owner.

3.5 CLEANING

A. General:
   1. Remove masking tape and any other foreign material.
   2. Clean adjacent materials that have been soiled immediately (before setting) as recommended by Manufacturer.

B. Waste Management: Dispose of products in accordance with Sealant Manufacturer’s recommendation.

END OF SECTION
SECTION 09 9113

EXTERIOR PAINTED GALVANIZED METAL

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Preparing and painting new and existing exterior exposed galvanized metal surfaces as
      described in Contract Documents.

B. Related Requirements:
   1. Section 09 9001: ‘Common Painting And Coating Requirements’:
      a. Pre-installation conference for Sections under 09 9000 heading ‘Paints and Coatings’.

PART 2 - PRODUCTS

2.1 SYSTEM

A. Manufacturers:
   1. Category Four Approved Products and Manufacturers. See Section 01 6200 for definitions of
      Categories.
      a. Products listed in edition of MPI Approved Product List current at time of bidding and later
         are approved, providing they meet VOC requirements in force where Project is located.

B. Description:
   1. Exposed Miscellaneous Structural Steel:
      a. New Surfaces: Use MPI(a) EXT 5.3D Pigmented Polyurethane Finish system.
      b. Previously Finished Work: Use MPI(r) REX 5.3D Pigmented Polyurethane Finish system.
   2. All Other:
      a. New Surfaces: Use MPI(a) EXT 5.3H Latex Finish system.
      b. Previously Finished Surfaces: Use MPI(r) REX 5.3H Latex Finish system.

C. Performance:
   1. Design Criteria:
      a. New Surfaces: MPI Premium Grade finish requirements.
      b. Deteriorated Existing Surfaces: MPI Premium Grade finish requirements.
      c. Sound Existing Surfaces: MPI Custom Grade finish requirements.
      d. Gloss / Sheen Level Required: Gloss Level 5.

D. Materials:
   1. Polyurethane:
      b. Finish Coats:
         1) Epoxy MPI Product 101: ‘Primer, Epoxy, Anti-Corrosive, for Metal’.
         2) Polyurethane MPI Product 72: ‘Polyurethane, Two-Component, Pigmented, Gloss (MPI
            Gloss Level 6-7)’.
   2. Latex:
PART 3 - EXECUTION

3.1 APPLICATION

A. General: See appropriate paragraphs of Section 09 9001.

B. New Surfaces:
   1. Clean 'passivated' or 'stabilized' galvanized steel as specified in SSPC-SP1.
   2. After removal of 'passivated' or 'stabilized' coating or for surfaces without coating, clean surfaces to be painted with mineral spirits or product recommended by Paint Manufacturer. Change to clean rags or wiping cloths regularly to reduce possibility of re-contamination of surface.
   3. Apply prime coat.
   4. Apply finish coats.

C. Existing Painted Surfaces:
   1. Remove deteriorated and chalked existing paint and rust deposits down to sound substrate by sanding, scraping, or wire brushing.
   2. Clean existing sound painted surfaces as well as scraped and sanded existing painted surfaces as recommended by Paint Manufacturer.
   3. Apply prime coat.
   4. Apply finish coats.

D. Existing Unpainted Surfaces:
   1. Wirebrush or power wash as necessary to remove 'white rust'.
   2. Apply prime coat.
   3. Apply finish coats.

END OF SECTION
SECTION 09 9114

EXTERIOR PAINTED CMU AND CONCRETE

PART 1 - GENERAL

SUMMARY

A. Includes But Not Limited To:
   1. Preparing and painting new and existing exterior masonry, concrete, and stucco surfaces as described in Contract Documents.

B. Related Requirements:
   1. Section 09 9001: 'Common Painting And Coating Requirements':
      a. Pre-installation conference for Sections under 09 9000 heading 'Paints and Coatings'.

PART 2 - PRODUCTS

2.1 SYSTEM

A. Manufacturers:
   1. Approved Products and Manufacturers. See Section 01 6200.
      a. Products listed in edition of MPI Approved Product List current at time of bidding and later are approved, providing they meet VOC requirements in force where Project is located.

B. Description:
   1. Concrete:
      a. New Surfaces: Use MPI(a) EXT 3.1A Latex Finish system.
      b. Previously Finished Surfaces: Use MPI(r) REX 3.1A Latex Finish system.
   2. CMU:
      a. New Surfaces: Use MPI(a) EXT 4.2A Latex Finish system.
      b. Previously Finished Surfaces: Use MPI(r) REX 4.2A Latex Finish system.

C. Performance:
   1. Finish Requirements:
      a. New Surfaces: MPI Premium Grade finish requirements.
      b. Deteriorated Existing Surfaces: MPI Premium Grade finish requirements.
      c. Sound Existing Surfaces: MPI Custom Grade finish requirements.
      d. Gloss / Sheen Level Required: Gloss Level 1.

D. Materials:
   2. Finish Coats: MPI Product 10: 'Latex, Exterior Flat (MPI Gloss Level 1-2)'.

PART 3 - EXECUTION

3.1 PREPARATION

A. Except for steam cured products, cure cement type surfaces from 60 to 90 days in accordance with Paint Manufacturer's recommendations before painting.
3.2 APPLICATION

A. General: See appropriate paragraphs of Section 09 9001.

B. New Surfaces:
   1. On highly porous surfaces when weather is exceptionally hot and dry, it may be desirable to dampen surface before applying first coat of an emulsion paint.
   2. Completely cover voids in masonry block.
   3. Roll after spraying if necessary to eliminate pinholing.

**EDIT REQUIRED:** After examination of the existing surfaces to be repainted, edit following TWO paragraphs to specify procedure to be followed in preparing those surfaces for repainting, if necessary.

Delete following two paragraphs if no existing exterior CMU, concrete, or stucco work is to be painted.

C. Existing Painted Surfaces:
   1. Remove deteriorated and chalked existing paint down to sound substrate by scraping and or high-pressure spray. Feather edges of existing paint by sanding to be smooth with adjacent surfaces.
   2. Clean existing sound painted surfaces as well as scraped and sanded existing painted surfaces as recommended by Paint Manufacturer.
   3. Fill cracks with masonry crack filler.
   4. Prime scraped and sanded areas.
   5. Apply finish coat as required for new work.

D. Existing Unpainted Surfaces:
   1. Power wash surfaces to be painted.
   2. Fill cracks with masonry crack filler.
   3. Apply block filler and finish coat as required for new work.

END OF SECTION
SECTION 09 9122
INTERIOR PAINTED CMU

PART 1 - GENERAL

1.1 SUMMARY
A. Includes But Not Limited To:
   1. Preparing and painting new and existing interior CMU walls as described in Contract Documents.

B. Related Requirements:
   1. Section 09 9001: ‘Common Painting And Coating Requirements’:
      a. Pre-installation conference for Sections under 09 9000 heading ‘Paints and Coatings’.

PART 2 - PRODUCTS

2.1 SYSTEM
A. Manufacturer:
   1. Approved Products and Manufacturers. See Section 01 6200.
      a. Products listed in edition of MPI Approved Product List current at time of bidding and later are approved, providing they meet VOC requirements in force where Project is located.

B. Description:
   1. Rest Rooms And Custodial Rooms:
      a. New Surfaces: Use MPI(a) INT 4.2F Waterborne Epoxy Finish system.
      b. Previously Finished Surfaces: Use MPI(r) RIN 4.2E Waterborne Epoxy Finish system.
   2. All Other:
      a. New Surfaces: Use MPI(a) INT 4.2D Latex Finish system.
      b. Previously Finished Surfaces: Use MPI(r) REX 4.2H Latex Finish system.
   3. New Surfaces:
      a. Use MPI(a) INT 4.2D Latex Finish system.

C. Performance:
   1. Design Criteria:
      a. New Surfaces: MPI Premium Grade finish requirements.
      b. Deteriorated Existing Surfaces: MPI Premium Grade finish requirements.
      c. Sound Existing Surfaces: MPI Custom Grade finish requirements.
      d. Gloss / Sheen Level Required: Gloss Level 5.

D. Materials:
   1. Block Filler, Over New Masonry Only: MPI Product 4: 'Block Filler, Latex, Interior/Exterior'.

PART 3 - EXECUTION

3.1 APPLICATION
A. General: See appropriate paragraphs of Section 09 9001.
B. Existing Painted Surfaces:
1. Remove deteriorated existing paint by scraping or sanding. Wash surfaces that have been defaced with marking pens, crayons, lipstick, etc, with solvent recommended by Paint Manufacturer. Spot prime such surfaces.
2. Sand areas of existing sound paint if necessary for bonding of new paint system. Clean existing painted surfaces, sanded or not, with mild soap and water, or with tri-sodium phosphate (TSP).
3. Fill large holes with patching and small holes and cracks with spackle.
4. Apply one coat primer to scraped and sanded areas.
5. Apply one finish coat. Completely cover voids in masonry block but do not fill.

END OF SECTION
SECTION 09 9123

INTERIOR PAINTED GYPSUM BOARD, PLASTER

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Preparing, priming, and finish painting new and existing interior gypsum board and plaster surfaces as described in Contract Documents.

B. Related Requirements:

PART 2 - PRODUCTS

2.1 SYSTEM

A. Manufacturers:
   1. Approved Manufacturers and Products. See Section 01 6200.
      a. Products listed in edition of MPI Approved Product List current at time of bidding and later are approved, providing they meet VOC requirements in force where Project is located.

B. Description:
   1. Custodial Rooms:
      a. New Surfaces: Use MPI(a) INT 9.2F Waterborne Epoxy Finish system.
      b. Previously Finished Surfaces: Use MPI(r) RIN 9.2E Waterborne Epoxy Finish system.
   2. All Other:
      a. New Surfaces: Use MPI(a) INT 9.2B Latex Finish system.
      b. Previously Finished Work: Use MPI(r) RIN 9.2B Latex Finish system.

C. Performance:
   1. Design Criteria:
      a. New Surfaces: MPI Premium Grade finish requirements.
      b. Deteriorated Existing Surfaces: MPI Premium Grade finish requirements.
      c. Sound Existing Surfaces: MPI Custom Grade requirements.
      d. Gloss / Sheen Required:
         1) Custodial Rooms: Gloss Level 6.
         2) Ceiling: Gloss Level 1 or 2.
         3) Remaining Painted Surfaces: Gloss Level 5.

D. Materials:
   1. Primers:
      a. MPI Product 50, ‘Primer Sealer, Latex, Interior’.
   2. Finish Coats:
      a. Custodial Rooms:
         1) Buildings with only Gypsum Board surfaces in rooms:
            a) MPI Product 115, ‘Epoxy-Modified Latex, Interior, Gloss (MPI Gloss Level 6)’.
         b. Ceiling:
            1) MPI Product 53, ‘Latex, Interior, Flat (MPI Gloss Level 1)’.
         c. Remaining Painted Surfaces:
            1) MPI Product 141, ‘Latex, Interior, High Performance Architectural, Semi-Gloss (MPI Gloss Level 5)’.
PART 3 - EXECUTION

3.1 APPLICATION

A. General: See appropriate paragraphs of Section 09 9001.

B. New Surfaces:
   1. Primer: Apply primer to be covered with other paint coats with roller only, or with spray gun and back-rolled.

C. Existing Painted Surfaces:
   1. Remove deteriorated existing paint down to sound substrate by scraping or sanding. Feather edges of existing paint by sanding to be smooth with adjacent surfaces.
   2. Clean surface with mild soap and water, or with tri-sodium phosphate (TSP). Wash surfaces that have been defaced with marking pens, crayons, lipstick, etc, with solvent recommended by Paint Manufacturer. Spot prime such surfaces.
   4. Sand or chemically etch existing painted surface as required to prepare surface to accept new paint.
   5. Re-clean surface.
   6. Apply primer coat.
   7. Apply finish coats.

END OF SECTION
SECTION 09 9124
INTERIOR PAINTED METAL

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Preparing and painting new and existing interior metal surfaces as described in Contract Documents.

B. Related Requirements:
   1. Section 09 9001: 'Common Painting And Coating Requirements':

PART 2 - PRODUCTS

2.1 SYSTEM

A. Manufacturers:
   1. Approved Products and Manufacturers. See Section 01 6200.
      a. Products listed in edition of MPI Approved Product List current at time of bidding and later are approved, providing they meet VOC requirements in force where Project is located.

B. Description:
   1. Ferrous Metal:
      a. New Surfaces: Use MPI(a) INT 5.1B Waterborne Light Industrial Finish system.
      b. Previously Finished Surfaces: Use MPI(r) RIN 5.1B Waterborne Light Industrial Finish system.
   2. Galvanized Metal:
      a. New Surfaces: Use MPI(a) INT 5.3J Latex Finish system
      b. Previously Finished Surfaces: Use MPI(r) RIN 5.3AH Latex Finish system.
   3. Aluminum:
      a. New Surfaces: Use MPI(a) INT 5.4E Waterborne Light Industrial Finish system.
      b. Previously Finished Surfaces: Use MPI(r) REX 5.4E Light Industrial Finish system.

C. Performance:
   1. Design Requirements:
      a. New Surfaces: MPI Premium Grade finish requirements.
      b. Deteriorated Existing Surfaces: MPI Premium Grade finish requirements.
      c. Sound Existing Surfaces: MPI Custom Grade finish requirements.
      d. Gloss / Sheen Level Required: Gloss Level 5.

D. Materials:
   1. Primers:
      c. Aluminum: MPI Product 95: ‘Primer, Quick Dry, for Aluminum’.
PART 3 - EXECUTION

3.1 APPLICATION

A. General:
   1. See appropriate paragraphs of Section 09 9001.
   2. Systems specified are in addition to prime coats furnished under other Sections.

B. New Surfaces: Remove rust spots by sanding and immediately spot prime. If all traces of rust cannot be removed, apply rust blocker recommended by Paint Manufacturer before applying full primer coat.

END OF SECTION
SECTION 09 9125
INTERIOR PAINTED WOOD

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Preparing and painting new and existing door and woodwork not requiring transparent finish, as described in Contract Documents.

B. Related Requirements:
   1. Section 09 9001: 'Common Painting And Coating Requirements':
      a. Pre-installation conference for Sections under 09 9000 heading ‘Paints and Coatings’.

PART 2 - PRODUCTS

2.1 SYSTEM

A. Manufacturers:
   1. Products and Manufacturers. See Section 01 6200.
      a. Products listed in edition of MPI Approved Product List current at time of bidding and later are approved, providing they meet VOC requirements in force where Project is located.

B. Description:
   1. Systems:
      a. Doors & woodwork:
         1) New Surfaces: Use MPI(a) INT 6.3T or U Latex Finish system.
         2) Previously Finished Surfaces: MPI(r) Rin 6.3U Latex Finish system.

C. Performance:
   1. Design Criteria:
      a. New Surfaces: MPI Premium Grade finish requirements.
      b. Deteriorated Existing Surfaces: MPI Premium Grade finish requirements.
      c. Sound Existing Surfaces: MPI Custom Grade finish requirements.
      d. Gloss / Sheen Level Required: Gloss Level 5.

D. Materials:
   1. Doors & Woodwork:
PART 3 - EXECUTION

3.1 APPLICATION

A. General: See appropriate paragraphs of Section 09 9001.

B. Interface With Other Work:
   1. Properly clean and paint light cove interiors before installation of light fixtures.
   2. Where back-priming is required, apply one (1) coat of primer.

C. New Surfaces:
   1. Spot prime nail holes, cracks, and blemishes before and after puttying.
   2. Apply stain blocker or other product recommended by Paint Manufacturer to knots before applying primer coat.

D. Existing Painted Surfaces:
   1. Remove deteriorated existing paint down to sound substrate by scraping and sanding. Feather edges of existing paint by sanding to be smooth with adjacent surfaces. Spot prime bare wood areas on woodwork.
   2. Wash surfaces that have been defaced with marking pens, crayons, lipstick, etc, with solvent recommended by Paint Manufacturer. Spot prime such surfaces.
   3. Apply finish coats.

END OF SECTION
SECTION 09 9413
INTERIOR TEXTURED FINISHING

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Furnish and apply texturing on walls and ceilings as described in Contract Documents.

B. Related Requirements:
   1. Section 09 2900: Priming.
   2. Section 09 9001: ‘Common Painting And Coating Requirements’.

1.2 REFERENCES

A. Definitions:
   1. Drywall Texture: Compound rolled, sprayed, or troweled onto sheetrock after taping and floating
      of joints is complete. Uses same material as joint compound, but thinned down with water and
      applied to wall surface:
      a. Light Orange Peel: Sprayed texture leaves light splatter on walls. Resembles peel of
         orange. If done with fine spray, can be one of the lightest, least noticeable of the texture
         styles.
      b. Smooth - Smooth application of texture over sheetrock wall that feathers out sheetrock
         joints, and creates even, non-textured wall.

1.3 SUBMITTALS

A. Action Submittals:
   1. Samples:
      a. Light Orange Peel Texture:
         1) Provide minimum of three (3) 24 inch (600 mm) square control samples on primed
            gypsum wallboard of ‘light orange peel’ texture to show possible variations.

1.4 QUALITY ASSURANCE

A. Field Samples:
   1. Before performing work of this Section, prepare control samples.
   2. Architect will inspect control sample at pre-installation conference following preparation of control
      sample. When sample is approved, work of this Section may proceed. Approved samples will be
      kept at site at all times work of this section is being performed.

PART 2 - PRODUCTS

2.1 SYSTEM

A. Manufacturers:
   1. Manufacturer Contact List:
B. Materials:
1. Quality Standards: See Section 01 6200.
   a. ProForm Perfect Spray EM/HF by National Gypsum.
   b. Sheetrock Wall & Ceiling Texture by U S Gypsum.

PART 3 - EXECUTION

3.1 APPLICATION

A. Location:
1. Walls and ceilings:
   a. Light Orange Peel Texture:
      1) All areas except those listed in following paragraph.
   b. Smooth:
      1) Custodial rooms.

B. Finishing:
1. Light Orange Peel Texture:
   a. After gypsum board is taped, sanded, and primed, apply texture. Closely match samples accepted by Architect.
2. Smooth:
   a. After gypsum board is taped, sanded, and primed, apply texture.

END OF SECTION
DIVISION 09: FINISHES

09 0500 COMMON WORK RESULTS FOR FINISHES

09 0503 FLOORING SUBSTRATE PREPARATION

09 2000 PLASTER AND GYPSUM BOARD

09 2216 NON-STRUCTURAL METAL FRAMING
09 2900 GYPSUM BOARD

09 5000 CEILINGS

09 5113 ACOUSTICAL PANEL CEILINGS
09 5323 METAL ACOUSTICAL SUSPENSION ASSEMBLIES

09 6000 FLOORING

09 6513 RESILIENT BASE AND ACCESSORIES
09 6519 RESILIENT TILE FLOORING
09 6700 EPOXY RESIN COMPOSITION FLOORING
09 6813 TILE CARPETING

09 9000 PAINTS AND COATINGS

09 9001 COMMON PAINTING AND COATING REQUIREMENTS
09 9113 EXTERIOR PAINTED GALVANIZED METAL
09 9114 EXTERIOR PAINTED CMU, CONCRETE
09 9122 INTERIOR PAINTED CMU
09 9123 INTERIOR PAINTED GYPSUM BOARD, PLASTER
09 9124 INTERIOR PAINTED METAL
09 9125 INTERIOR PAINTED WOOD
09 9413 INTERIOR TEXTURED FINISHING

END OF TABLE OF CONTENTS
SECTION 09 0503

FLOORING SUBSTRATE PREPARATION

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
2. Preparing floor substrate to receive flooring as described in Contract Documents.
3. Remove existing carpet and prepare floor as described in Contract Documents.
4. Perform building modifications and repairs to accommodate carpet, vinyl flooring, epoxy resin flooring and rubber base as described in Contract Documents.

B. Related Requirements:
1. Pre-Installation conferences held jointly with Section 09 0503 as described in Administrative Requirements on Part 1 of this specification section.
2. Section 01 1200: ‘Multiple Contract Summary’.
4. Section 01 4000: ‘Quality Requirements’ for administrative and procedural requirements for quality assurance and quality control.
5. Section 01 4301: ‘Quality Assurance – Qualifications’ establishes minimum qualification levels required.
6. Section 01 4523: ‘Testing and Inspecting Services’ for testing and inspection, and testing laboratory services for materials, products, and construction methods.
7. Section 01 7800: ‘Closeout Submittals’.
8. Section 09 6519: ‘Resilient Tile Flooring’.
10. Section 09 6700: ‘Epoxy Resin Composition Flooring’.

1.2 REFERENCES

A. Association Publications:
   a. ACI 302.2R-06, Guide for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials (August 15, 2006).
   a. ICRI Certification: ‘Concrete Slab Moisture Testing Technician, Tier 2, Grade 1’.

B. Definitions (Following are specifically referenced for testing):
1. Accreditation: Process in which certification of competency, authority, or credibility is presented. Verify that laboratories have an appropriate quality management system and can properly perform certain test methods (e.g., ANSI, ASTM, and ISO test methods) and calibration parameters according to their scopes of accreditation.
2. Approved: To authorize, endorse, validate, confirm, or agree to.
3. Field Quality Control: Testing, Inspections, Special Testing and Special Inspections to assure compliance to Contract Documents.
4. Inspection/Special Inspection: Inspection of materials, installation, fabrication, erection or placement of components and connections requiring special expertise to ensure compliance with approved construction documents and referenced standards:
   a. Inspection: Not required by code provisions but may be required by Contract Documents.
b. Special Inspection: Required by code provisions and by Contract Documents.
c. Inspection-Continuous: Full-time observation of the Work requiring inspection by approved inspector who is present in area where the Work is being performed.
d. Inspection-Periodic: Part-time or intermittent observation of the Work requiring inspection by approved inspector who is present in area where the Work has been or is being performed and at completion of the Work.

5. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform particular construction operation, including installation, erection, application, and similar operations.

6. Observation: Visual observation of building / site elements or structural system by registered design professional for general conformance to approved construction documents at significant construction stages and at completion. Observation does not include or waive responsibility for performing inspections or special inspections.

7. Owner’s Representative: Owner’s Designated Representative (Project Manager or Facilities Manager) who will have express authority to bind Owner with respect to all matters requiring Owner’s approval or authorization.

8. Preconstruction Testing: Tests and inspections that are performed specifically for Project before products and materials are incorporated into the Work to verify performance or compliance with specified criteria.

9. Product Testing: Tests and inspections that are performed by testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with industry standards.

10. Moisture Vapor Emission Rate (MVER): Anhydrous Calcium Chloride (CaCl2) Moisture Vapor Emission Test was developed to quantify amount of moisture vapor emission from concrete slab.
   a. Test method to obtain quantitative value indicating rate of moisture vapor emission from concrete slab and if slab can receive floor covering by determination of rate of moisture vapor emitted from below-grade, on-grade, and above-grade (suspended) concrete floors.
   b. Moisture vapor emitted from concrete slab in measured in pounds which is equivalent weight of water evaporating from 1000 ft$^2$ of concrete surface in 24 hour period.
   c. Moisture vapor emission rate only reflects condition of concrete floor at time of test.

11. Outlier: Statistical observation or test data value which is far removed in value from others in the data set. An outlier may be an error in measurement which will distort interpretation of the data.

12. Relative Humidity (RH) Testing: Testing of concrete slabs is defined as ratio of actual amount of water vapor present in volume of air at given temperature to maximum amount that air could hold at that temperature, expressed as percentage.
   a. Relative Humidity test method covers quantitative determination of percent relative humidity in concrete slabs for field or laboratory tests.
   b. Moisture test results indicate moisture condition of slab only at time of test.

13. Quality Assurance: Testing, Inspections, Special Testing and Special Inspections provided for by Owner.

14. Quality Control: Testing, Inspections, Special Testing and Special Inspections provided for by Contractor.

15. Service Provider: Agency or firm qualified to perform required tests and inspections.

16. Source Quality Control Testing: Tests and inspections that are performed at source, i.e., plant, mill, factory, or shop.

17. Special Inspection: See Inspection.

18. Special Inspector: Certified individual or firm that implements special inspection program for project.


20. Test/Special Test: Field or laboratory tests to determine characteristics and quality of building materials and workmanship.
   a. Test: Not required by code provisions but may be required by Contract Documents.
   b. Special Test: Required by code provisions and by Contract Documents.

21. Testing Agency: Entity engaged to perform specific tests, inspections, or both.

22. Testing Agency Laboratory: Agency or firm qualified to perform field and laboratory tests to determine characteristics and quality of materials and workmanship.

23. Verification: Act of reviewing, inspecting, testing, etc. to establish and document that product, service, or system meets regulatory, standard, or specification requirements.
C. Reference Standards:
   1. ASTM International:
      a. ASTM F710-11, ‘Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring’.
      b. ASTM F1869-11, ‘Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride’.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Scheduling:
   1. Concrete Moisture Testing:
      a. General Contractor Responsibility to provide:
         1) Maintain ambient temperatures and relative humidity conditions as specified in Field Conditions in Part 1 of this specification before Moisture Testing Agency will test for concrete moisture.
         2) Notify Owner to contact Moisture Testing Agency when building is enclosed and temperature and relative humidity meet requirements for testing.
         3) Provide access for and cooperate with Moisture Testing Agency.
      b. Owner's Representative Responsibility to provide:
         1) Provide following information to Moisture Testing Agency at time of notification:
            a) Digital copy of floor plan(s).
            b) Indicate different flooring material areas and which rooms on floor plan(s) and finish schedule requiring additional tests if required.
            c) Digital copy of Specification Section 09 0503 (this specification) from Contract Documents for this Project.
      c. Testing Agency will provide Moisture Testing for following flooring areas:
         1) Resilient Tile Flooring:
            a) Moisture Testing for Resilient Tile Flooring required.
            c) See individual flooring section for additional scheduling requirements if required.
         2) Epoxy Resin Composition Flooring:
            a) Moisture Testing for Resinous Flooring required.
            c) See individual flooring section for additional scheduling requirements if required.
         3) Tile Carpeting:
            a) Moisture Testing for Tile Carpeting required.
            c) See individual flooring section for additional scheduling requirements if required.

1.4 SUBMITTALS

A. Informational Submittals:
   1. Certificates:
      a. Concrete Slab Moisture Technician:
         1) Provide current IFTI trained documentation and certified Field Technician certification. and/or
         2) Provide current ICRI 'Concrete Slab Moisture Testing Technician, Tier 2, Grade 1' Certification.
      b. Certified Standard Moisture Testing Report:
1) Report to include following:
   a) Available to Testing Agency from Owner’s Representative:
      (1) Project Name.
      (2) Property Number.
   b) Test date.
   c) Executive summary.
   d) Certified Moisture and Alkalinity (pH) Test Report.
   e) Project floor plan.
   f) Project photographs including following information on each photograph:
      (1) Site location.
      (2) Test hole number.
      (3) Serial number probe.
      (4) Relative Humidity (RH), Alkalinity (pH) and temperature reading.
      (5) Property number.
   g) Outlier Test (As specified in Field Quality Control Testing in Part 3 of this specification:
      (1) Note test as Outlier Test for which hole number was conducted.
      (2) Site location.
      (3) Test hole number.
      (4) Serial number probe.
      (5) Relative Humidity (RH), Alkalinity (pH) and temperature reading.
      (6) Property number.

2) At completion of testing, Testing Agency shall submit Concrete Moisture Test Report for each flooring system included for project to following:
   a) One (1) copy to Owner’s Representative.

B. Closeout Submittals:
   1. Include following in Operations And Maintenance Manual specified in Section 01 7800:
      a. Record Documentation:
         1) Testing and Inspection Reports:
            a) Testing Agency Testing Reports of Alkalinity and Concrete Moisture testing.

1.5 QUALITY ASSURANCE

A. Testing and Inspection.
   1. Owner will provide Testing for Alkalinity and Concrete Moisture of concrete slab before installation as specified in Field Quality Control in Part 3 of this specifications for flooring:
      a. See Section 01 1200: ‘Multiple Contract Summary’.
      b. See Section 01 4523: ‘Testing and Inspecting Services’ for testing and inspection, and testing laboratory services for materials, products, and construction methods.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Storage And Handling Requirements:
   1. Provide storage space and protection for flooring and installation accessories if materials are delivered before start of flooring installation.

1.7 FIELD CONDITIONS

A. Ambient Conditions:
   1. Testing conditions inside building shall be brought to same ambient temperature and relative humidity levels to be normal at occupancy of building (service conditions). Service conditions include normal levels of humidity, lighting, heating, and air conditioning:
      a. If service conditions are not possible, test conditions shall be 75 deg F (23.9 deg C) ± 10 deg F (minus 12.2 deg C) maintain relative humidity between forty (40) and sixty (60) percent in spaces to receive testing.
2. Maintain these conditions forty eight (48) hours prior to, and during testing. Otherwise, results may not accurately reflect amount of moisture which is present in concrete slab or would normally be emitted from or through concrete slab during normal operating conditions.

B. Existing Conditions:
1. If asbestos containing materials are suspected or discovered upon removing carpet, stop work and report to Architect and Owner’s Representative before proceeding:
   a. Do not use solvents to wash substrate during abatement process.

PART 2 - PRODUCTS Not Used

PART 3 - EXECUTION

3.1 PREPARATION

A. Furniture Removal:
   1. Remove existing pews, rostrum seating, and pianos and store in location as directed by Owner.
   2. Protect stored furniture items from dust, dirt, and damage related to other installation activities.

B. Flooring Preparation:
   1. General:
      a. Prepare floor substrate in accordance with ASTM F710, ‘Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring’ (This standard is used for preparing concrete floors for all flooring).
         1) Required RH test and alkalinity test of concrete slab has been performed.
      b. Concrete floor slab patching:
         1) Cracks, chips and joints must be properly patched or repaired.
      c. Concrete surface cured, clean, dry, and free of foreign substances that will compromise carpet and/or other flooring installations.
         1) Removal of curing compounds.
         2) Remove paint, sealer, grease, oil, silicone sealants, and other materials incompatible with flooring adhesives.
         3) Removal of overspray from painted walls (essential so glue will stick).
      d. Vacuum and damp mop floor areas to receive flooring before flooring installation.
   2. Carpeted floor areas:
      a. Prepare floor substrate in accordance with Carpet And Rug Institute (CRI) best practices to receive carpet installation and to provide installation that meets Carpet Manufacturer's warranty requirements.

C. Carpet Accessories:
   1. Sundry items, such as adhesives, shall be conditioned to building ambient conditions before use.

3.2 FIELD QUALITY CONTROL

A. Field Tests:
   1. Concrete Moisture and Alkalinity:
      a. Testing Agency will test interior concrete slabs before installation of floor coverings as directed by Architect and will include following:
         1) Interior concrete slab areas to be tested:
            a) Section 09 6519 ‘Resilient Tile Flooring’.
            b) Section 09 6700 ‘Epoxy Resin Composition Flooring’.
            c) Section 09 6813 ‘Tile Carpeting’.
         2) Standard Moisture Testing required of interior concrete slabs on grade:
            a) General:
(1) Testing for concrete moisture shall be taken at concrete slab substrates scheduled to receive flooring as specified in Contract Drawings for complete flooring installation.

(2) Outlier Test: If one (1) test is abnormally different from other moisture tests, then additional test should be done. Outlier will be defined in this specification as moisture test that is at least fifteen (15) percent higher or lower than other tests at project building completed same day:
   (a) Retesting should be done within 5 feet (1.50 m) feet of original test hole.
   (b) Contact Owner’s Representative for the need to outlier test and additional testing fees will apply.

(3) Include required tests for carpeting and additional tests at each different type of flooring system included for project.

(4) Carpet area moisture testing may be performed sooner than other flooring areas such as athletic flooring if included for Project, but should be tested at same time.

END OF SECTION
SECTION 09 2216
NON-STRUCTURAL METAL FRAMING

PART 1 - GENERAL

1.1 SUMMARY
A. Includes But Not Limited To:
   1. Furnish and install metal framing and blocking as described in Contract Documents.

B. Related Requirements:
   1. Section 05 4010: ‘Structural Load Bearing Metal Stud Framing’.

1.2 REFERENCES
A. Reference Standards:
   1. ASTM International:
      a. ASTM A653/A653M-11, ‘Standard Specification for Steel Sheet, Zinc-Coated (Galvanized)
         or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process’.
      b. ASTM A1003/A1003M-13, ‘Standard Specification for Steel Sheet, Carbon, Metallic- and
         Nonmetallic-Coated for Cold-Formed Framing Members’.
      d. ASTM C754-11, ‘Standard Specification for Installation of Steel Framing Members to
         Receive Screw-Attached Gypsum Panel Products’.
      e. ASTM E119-12a, ‘Standard Test Methods for Fire Tests of Building Construction and
         Materials’.

1.3 ADMINISTRATIVE REQUIREMENTS
A. Pre-Installation Conferences:
   1. Schedule pre-installation conference to be held after submittals have been reviewed and returned
      by Architect, but before beginning metal framing work.
   2. In addition to agenda items specified in Section 01 3100, review following:
      a. Identify location of required blocking.

1.4 QUALITY ASSURANCE
A. Regulatory Agency Sustainability Approvals:
   1. ICC approved.

PART 2 - PRODUCTS

2.1 SYSTEMS
A. Manufacturers:
   1. Manufacturer Contact List:
d. Steeler Inc, Seattle, WA [www.steeler.com]
e. Any member of Steel Stud Manufacturer's Association (SSMA).
f. Equal as approved by Architect before bidding. See Section 01 6200.

B. Materials:
1. Framing:
   a. General:
      1) 20 ga (0.95 mm) minimum, unless noted greater on Drawings, meeting requirements of ASTM C645.
      2) Steel Sheet Components: Comply with ASTM C645 requirements for metal unless otherwise indicated.
      3) Steel Coating Requirement: Comply with ASTM C645 roll-formed from hot dipped galvanized steel complying with ASTM A1003/A1003M and ASTM A653/A653M G40 (Z120) or equivalent corrosion resistant coating. A40 galvannealed products are not acceptable.
   b. Steel Studs and Runners: Cold-formed galvanized steel C-studs, as per ASTM C645 for conditions indicated.
   c. Bridging, blocking, strapping, and other accessories shall be as described in Contract Documents or as required by Manufacturer's system.
   d. Acceptable Products:
      1) Any member of Steel Stud Manufacturer's Association (SSMA).
      2) Equal as approved by Architect before bidding. See Section 01 6200.

C. Fasteners:

PART 3 - EXECUTION

3.1 INSTALLATION

A. Interface With Other Work:
   1. Coordinate with other Sections to provide blocking necessary for their work.
   2. Coordinate with other Sections for location of blocking required for installation of equipment and building specialties.

B. Tolerances:
   1. 1/8 inch (3 mm) in 10 feet (3 meters) with 1/4 inch (6 mm) maximum in height of wall.
   2. Distances between parallel walls shall be 1/4 inch (6 mm) maximum along length and height of wall.

C. Framing:
   1. Installation Standard: ASTM C754.
   2. Specifications of Stud Wall Manufacturer shall govern this work unless more stringent requirements are required by Contract Documents.

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Furnish and install gypsum board as described in Contract Documents.
   2. Furnish and install acoustical sealants as described in Contract Documents.

B. Related Requirements:

1.2 REFERENCES

A. Definitions:
   1. Accessories: Metal or plastic beads, trim, or moulding used to protect or conceal corners, edges, or abutments of the gypsum board construction.
   2. Drywall Primer: Paint material specifically formulated to fill the pores and equalize the suction difference between gypsum board surface paper and the compound used on finished joints, angles, fastener heads, and accessories and over skim coatings.
   3. Skim Coat: Either a thin coat of joint compound trowel applied, or a material manufactured especially for this purpose and applied in accordance with manufacturer’s recommendations, over the entire surface.
   4. Texturing: Regular or irregular patterns typically produced by applying a mixture of joint compound and water, or proprietary texture materials including latex base texture paint, to a gypsum board surface previously coated with drywall primer.

B. Reference Standards:
   1. ASTM International:
      b. ASTM C475/C475M-12, 'Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board'.
      d. ASTM C1002-07(2013), 'Standard Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs'.
      e. ASTM C1047-14a, 'Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base'.
      g. ASTM C1396/C1396M-14, 'Standard Specification for Gypsum Board'.
      h. ASTM E84-14, 'Standard Test Method for Surface Burning Characteristics of Building Materials'.
1.3 DELIVERY, STORAGE, AND HANDLING

A. General:
1. Following recommendations of GA-801 Guide for Handling and Storage of Gypsum Panel Products unless local, state or federal laws or agency rules differing from the recommendations shall take precedence.

B. Delivery And Acceptance Requirements:
1. Deliver materials in original packages, containers, or bundles bearing brand name, applicable standard designation, and Manufacturer's name.

C. Storage And Handling Requirements:
1. Store material under roof and keep dry and protected against damage from weather, condensation, direct sunlight, construction traffic, and other causes. Stack gypsum board flat to prevent sagging.

1.4 FIELD CONDITIONS

A. Ambient Conditions:
1. Comply with ASTM C840 or GA-216 requirements, whichever are more stringent:
   a. Do not install interior products until installation areas are enclosed and conditioned.
      1) Temperature shall be 50 deg F (10 deg C) and 95 deg F (35 deg C) maximum day and night during entire joint operation and until execution of Certificate of Substantial Completion.
      2) Provide ventilation to eliminate excessive moisture.
      3) Avoid hot air drafts that will cause too rapid drying.
   b. Do not install panels that are wet, those that are moisture damaged, and those that are mold damaged.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Manufacturers:
1. Manufacturer Contact List:

B. Materials:
1. Interior Gypsum Board:
   a. General:
      1) Size:
         a) Provide maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.
      2) Quality Standard:
         a) Core: Fire-resistant rated gypsum core.
         b) Complies with Type X requirements of ASTM C1396/C1396M (Section 5).
         c) Surface paper: Face paper suitable for painting.
         d) Long edges: Tapered edge.
         e) Overall thickness: 5/8 inch (15.9 mm).
2.2 ACCESSORIES

A. Manufacturers:
   1. Manufacturer Contact List:

2. Gypsum Board Mounting Accessories:
   a. Corner And Edge Trim:
      1) Metal, paper-faced metal, paper-faced plastic, or solid vinyl meeting requirements of
         ASTM C1047. Surfaces to receive bedding cement treated for maximum bonding.

3. Joint Compound:
   a. Best grade or type recommended by Board Manufacturer and meeting requirements of
      ASTM C475/C475M.
      1) Use Taping Compound for first coat to embed tape and accessories.
      2) Use Taping Compound or All-Purpose Compound for subsequent coats except final
         coat.
      3) Use Finishing Compound for final coat and for skim coat.

4. Joint Reinforcing:
   a. Paper reinforcing tape acceptable to Gypsum Board Manufacturer.

5. Fasteners:
   a. Bugle head screws meeting requirements of ASTM C1002:
      1) Gypsum Board:
         a) Type W: For fastening gypsum board to wood members, of length to penetrate
            wood framing 5/8 inch (15.9 mm) minimum.
         b) Type S: For fastening gypsum board to steel framing and ceiling suspension
            members, of length to penetrate steel framing 3/8 inch (9.5 mm) minimum.

B. Primer / Surfacer On Surfaces To Receive Texturing:
   1. Acceptable Products:
      a. Sheetrock First Coat by USG.
      b. Prep Coat by Westpac Materials.
      c. Level Coat by Magnum Products.
      d. Equal as approved by Architect before bidding. See Section 01 6200.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification Of Conditions:
   1. Examine substrate and verify framing is suitable for installation of gypsum board.
   2. Examine gypsum board before installation. Reject panels that are wet, moisture damaged, and
      mold damaged.
      a. Do not install board over unsuitable conditions.
   4. Commencement of Work by installer is considered acceptance of substrate.

3.2 INSTALLATION

A. Interface With Other Work:
1. Coordinate with Division 06 for location of backblocking for edges and ends of gypsum board and for blocking required for installation of equipment and building specialties.
2. Do not install gypsum board until required blocking is in place.

B. General: Install and finish as recommended in ASTM C840 or GA-216 unless specified otherwise in this Section.

C. Interior Gypsum Board:
1. General:
   a. Install so trim and reinforcing tape are fully backed by gypsum board. No hollow spaces between pieces of gypsum board over 1/8 inch (3 mm) wide before taping are acceptable.
   b. Rout out backside of gypsum board to accommodate items that extend beyond face of framing, but do not penetrate face of gypsum board, such as metal door frame mounting brackets, etc.
   c. On walls over 108 inches (2 700 mm) high, apply board perpendicular to support
   d. Butt edges in moderate contact. Do not force in place. Shim to level.
   e. Leave facings true with joint, finishing flush. Vertical work shall be plumb and ceiling surfaces level.
   f. Scribe work closely:
      1) Keep joints as far from openings as possible.
      2) If joints occur near an opening, apply board so vertical joints are centered over openings.
      3) No vertical joints shall occur within 8 inches (200 mm) of external corners or openings.
   g. Install board tight against support with joints even and true. Tighten loose screws.
   h. Caulk perimeter joints in sound insulated rooms with specified acoustical sealant.

2. Ceilings:
   a. Apply ceilings first using minimum of two (2) men.
   b. Use board of length to give minimum number of joints.
   c. Apply board perpendicular to support.
      1) Single Layer Application:
         a) Stagger end joints:
            1) End and edge joints of board applied on ceilings shall occur over framing members or be back blocked with 2x4 (38 mm by 89 mm) blocking.
            2) Edge joints of board vertically applied on walls shall occur over framing members.
            3) 2x4 (38 mm by 89 mm) blocking is required at wall to ceiling transitions and at top of ceiling vault transitions.
   d. Fastening:
      a. Apply from center of board towards ends and edges.
      b. Apply screws 3/8 inch (9.5 mm) minimum from ends and edges, one inch (25 mm) maximum from edges, and 1/2 inch (13 mm) maximum from ends.
      c. Spacing:
         1) Ends: Screws not over 7 inches (175 mm) on center at edges where blocking or framing occurs.
         2) Wood Framed Walls And Ceilings: Screws 7 inches (175 mm) on center in panel field.
         3) Metal Framed Walls: Screws 12 inches (300 mm) on center in panel field.
      d. Set screw heads 1/32 inch (0.8 mm) below plane of board, but do not break face paper. If face is accidentally broken, apply additional screw 2 inches (50 mm) away.
      e. Screws on adjacent ends or edges shall be opposite each other.
      f. Drive screws with shank perpendicular to face of board.

4. Trim:
   a. Corner Beads:
      1) Attach corner beads to outside corners.
         a) Attach metal corner bead with staples spaced 4 inches (100 mm) on center maximum and flat taped over edges of corner bead. Also, apply screw through edge of corner bead where wood trim will overlay corner bead.
         b) Set paper-faced trim in solid bed of taping compound.
b. Edge Trim: Apply where gypsum board abuts dissimilar material. Hold channel and 'L' trim back from exterior window and door frames 1/8 inch (3 mm) to allow for caulking.

5. Finishing:
   a. General:
      1) Tape and finish joints and corners throughout building as specified below to correspond with final finish material to be applied to gypsum board. When sanding, do not raise nap of gypsum board face paper or paper-faced trim.
      2) First Coat:
         a) Apply tape over center of joint in complete, uniform bed of specified taping compound and wipe with a joint knife leaving a thin coating of joint compound. If metal corner bead is used, apply reinforcing tape over flange of metal corner bead and trim so half of tape width is on flange and half is on gypsum board.
         b) Completely fill gouges, dents, and fastener dimples.
         c) Allow to dry and sand lightly if necessary to eliminate high spots or excessive compound.
      3) Second Coat:
         a) Apply coat of specified joint compound over embedded tape extending 3-1/2 inches (88 mm) on both sides of joint center. Use finishing compound only if applied coat is intended as final coat.
         b) Re-coat gouges, dents, and fastener dimples.
         c) Allow to dry and sand lightly to eliminate high spots or excessive compound.
      4) Third Coat: Apply same as second coat except extend application 6 inches (150 mm) on both sides of joint center. Allow to dry and sand with fine sandpaper or wipe with damp sponge.
      5) Fourth Coat: Apply same as second coat except extend application 9 inches (425 mm) on both sides of joint center. Allow to dry and sand with fine sandpaper or wipe with damp sponge.
   a. Finishing Levels: Finish panels to levels indicated below and according to ASTM C840, GA-214 and GA-216:
      1) Gypsum Board Surfaces not painted or finished:
         a) GA-214 Level 1: 'All joints and interior angles shall have tape set in joint compound. Surface shall be free of excess joint compound. Tool marks and ridges are acceptable'.
      2) Gypsum Board Surfaces to Receive: Painted Texturing - Section 09 9413: 'Interior Textured Finishing':
         a) GA-214 Level 4: 'All and interior angles shall have tape embedded in joint compound and two separate coats of joint compound applied over all flat joints and one separate coat of joint compound applied over interior angles. Fastener heads and accessories shall be covered with three separate coats of joint compound. All joint compound shall be smooth and free of tool marks and ridges. Coat prepared surface with specified primer'.

3.3 FIELD QUALITY CONTROL

A. Non-Conforming Work:
   1. Remove and replace panels that are wet, moisture damaged, and mold damaged.
      a. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
      b. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

3.4 CLEANING

A. Remove from site debris resulting from work of this Section including taping compound spills.
END OF SECTION
SECTION 09 5113

ACOUSTICAL PANEL CEILINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Furnish and install acoustical ceiling panels for suspended acoustical ceilings as described in
      Contract Documents.

B. Related Requirements:
   1. Section 09 5323: ‘Metal Acoustical Suspension Assemblies’
   2. Division 26: Interior light fixtures.
   3. Division 23: Related sections for HVAC installed in ceiling.

1.2 REFERENCES

A. Association Publications:
      405 Illinois Avenue, 2B, St Charles IL. www.cisca.org.
      a. Recommendations for direct hung acoustical tile and lay-in panel ceilings.

B. Definitions:
   1. Acoustical Panel: Form of a prefabricated sound absorbing ceiling element used with exposed
      suspension systems.
   2. Absorption: Materials that have capacity to absorb sound. Absorption is the opposite of
      reflection.
   3. Ceiling Attenuation Class (CAC): Rates ceiling's efficiency as barrier to airborne sound
      transmission between adjacent closed offices. Shown as minimum value, previously expressed
      as CSTC (Ceiling Sound Transmission Class). Single-figure rating derived from normalized
      ceiling attenuation values in accordance with classification ASTM E413, except that resultant
      rating shall be designated ceiling attenuation class. (Defined in ASTM E1414.) Acoustical unit
      with high CAC may have low NRC.
   4. Center Line: Line indicating midpoint of surface in either direction. Used as guide in starting
      ceiling.
   5. Class A: Fire classification for product with flame spread rating of no more than 25 and smoke
      developed rating not exceeding 50, when tested in accordance with ASTM E84 or UL 723.
   7. Flame Spread Index: Comparative measure, expressed as a dimensionless number, derived
      from visual measurements of the spread of flame versus time for a material tested in accordance
      with ASTM E84 or UL 723.
   8. Interior Finish: Interior finish includes interior wall and ceiling finish and interior floor finish.
   9. Mineral Base: Ceilings composed principally of mineral materials such as fibers manufactured
      from rock or slab, with or without binders.
   10. Noise Reduction Coefficient (NRC): Average sound absorption coefficient measured at four
       frequencies: 250, 500, 1,000 and 2,000 Hertz expressed to the nearest integral multiple of 0.05.
       Rates ability of ceiling or wall panel or other construction to absorb sound. NRC is fraction of
       sound energy, averaged over all angles of direction and from low to high sound frequencies that
       is absorbed and not reflected.
   12. Reveal Edge: Acoustical lay-in panels with step-down edge are intended for use in direct hung
       exposed suspension systems.
13. Sound Absorption: Property possessed by materials and objects, including air, of converting sound energy into heat energy. Sound wave reflected by surface always loses part of its energy. Fraction of energy that is not reflected is called sound absorption coefficient of reflecting surface. For instance, if material reflects 80 percent of sound energy, then sound absorption coefficient would be 20 percent (0.20).

14. Surface Burning Characteristic: Rating of interior and surface finish material providing indexes for flame spread and smoke developed, based on testing conducted according to ASTM Standard E84 or UL 723.

15. Textured Pattern: Granular or raised (fine, coarse, or a blend), felted or matted surface as an integral part of the basic product or superimposed on the product surface.

16. Smoke-Developed Index: Comparative measure, expressed as a dimensionless number, derived from visual measurements of smoke obscuration versus time for a material tested in accordance with ASTM E84 or UL 723.

C. Reference Standards:
   2. ASTM International:
      f. ASTM E1264-08, ‘Standard Classification for Acoustical Ceiling Products’.
   3. California Building Code CBC 2013:
      a. Chapter 8, ‘Interior Finishes’:
         1) Section 803, ‘Wall And Ceiling Finishes’:
            b) 803.1.2, ‘Room Corner Test for Interior Wall or Ceiling Finish Materials’.
   4. National Fire Protection Association:
   5. Underwriters Laboratories Inc.:

1.3 SUBMITTALS

A. Action Submittals:
   1. Produce Data: Technical data for each type of acoustical ceiling unit required.
   2. Sample: Minimum 6 inch (150 mm) x 6 inch (150 mm) samples of specified acoustical panel.

B. Informational Submittals:
   1. Certificates:
      a. Manufacturer’s certifications that products comply with specified requirements including laboratory reports showing compliance with specified tests and standards. For acoustical performance, each carton of material must carry approved independent laboratory classification of NRC, CAC, and AC.
2. Test And Evaluation Reports:
   a. If requested by Owner, provide copies of Quality Assurance requirements for ‘Class A’ flame spread rating and ‘Room-Corner Test’.

C. Closeout Submittals:
   1. Include following in Operations And Maintenance Manual specified in Section 01 7800:
      a. Warranty Documentation:
         1) Final, executed copy of Warranty.
      b. Record Documentation:
         1) Manufacturers Documentation:
            a) Manufacturer’s literature.
            b) Color and pattern selection.

D. Maintenance Material Submittals:
   1. Extra Stock Materials:
      a. Provide Owner with one (1) carton of each type of tile for future use.
      1) Packaged with protective covering for storage and identified with appropriate labels.

1.4 QUALITY ASSURANCE

A. Regulatory Agency Sustainability Approvals:
   1. Fire-Test-Response Characteristics: As determined by testing identical ceiling tile applied with identical adhesives to substrates according to test method indicated below by qualified testing agency. Identify products with appropriate markings of applicable testing agency.
      a. Surface-Burning Characteristics:
         1) Ceiling tile shall have Class A flame spread rating in accordance with ASTM E84 or UL 723 Type 1.
            a) Class A (Flame spread index 0-25; Smoke-developed index 0-450).
            b) Flash point: None.
      2. Passage of ‘Room-Corner Test’ as recognized by AHJ, is required for system. Adhesive cited in test literature is required for installation of ceiling tile on Project.
         a. Room Corner Tests:
            2) CBC 803.2.1, ‘Room Corner Test for Interior Wall or Ceiling Finish Materials’.
            3) NFPA 265: ‘Room Corner Test for Interior Wall or Ceiling Finish Materials’.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Delivery and Acceptance Requirements:
   1. Materials shall be delivered in original, unopened packages with labels intact.

B. Storage And Handling Requirements:
   1. Store materials where protected from moisture, direct sunlight, surface contamination, and damage.
   2. Store in cool, dry location, out of direct sunlight and weather, and at temperatures between 32 deg F (0 deg C) and 86 deg F (30 deg C).
   3. Handle acoustical ceiling panels carefully to avoid chipping edges or damage. Use no soiled, scratched, or broken material in the Work.

1.6 FIELD CONDITIONS

A. Ambient Conditions:
1. Building shall be enclosed, mechanical system operating with proper filters in place, and
temperature and humidity conditions stabilized within limits under which Project will operate
before, during, and after installation until Substantial Completion.
2. Installation shall be at temperatures between 32 deg F (0 deg C) and 86 deg F (30 deg C) or as
per Manufacturer recommendations.

1.7 WARRANTY

A. Manufacturers Warranty:
   1. Acoustical ceiling panels:
      a. Manufacturer’s warranty to be free from defects in materials and factory workmanship.
      b. Manufacturer’s warranty against sagging and warping.
      c. Manufacturer’s warranty against mold/mildew, and bacterial growth.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers Contact List:

2.2 MATERIALS

A. Acoustic Ceiling Panels:
   1. Description:
      b. Composition: Wet-formed mineral fiber, water-felted mineral or cast mineral.
   2. Design Criteria:
      a. Acoustics:
         1) Noise Reduction Coefficient (NRC): ASTM C423; 0.85 minimum.
      b. Antimicrobial Protection: Resistance against growth of mold/mildew.
      c. Classification:
         1) Meet requirements of ASTM E1264, Type III (mineral base with painted finish), Form 1
            (nodular) or Form 4 (cast or molded), Pattern E1 (lightly textured) or Pattern F (heavily
            textured).
         d. Fire Performance: As specified in Quality Assurance in Part 1 of this specification.
         e. Light Reflectance (LR): ASTM E1477; 0.83 minimum.
         f. Sag Resistance: Resistance to sagging in high humidity conditions.
         g. VOC: Low.
   3. Wide Face Design:
      a. Design Criteria:
         1) Grid Face: 15/16 inch (24 mm).
         2) Size: 24 inch x 48 inch x 1”.
         3) Edge profile: Square Tegular:
      b. Acceptable Product:
         1) Quality Standard:
            a) Calla, Item number 2823 by Armstrong.
         2) Equal as approved by Architect before bidding. See Section 01 6200.
PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification Of Conditions:
   1. Inspect for defects in support that are not acceptable.
      a. All wet work (concrete, painting, and etc.) must be completed and dry.
      b. Temperature conditions within Manufacturer’s written recommendation.
   2. Notify Architect of unsuitable conditions in writing.
      a. Do not install acoustical ceiling panels until defects in support or environmental conditions are corrected.

3.2 PREPARATION

A. Materials shall be dry and clean at time of application.

B. Measure each ceiling area and establish layout of acoustical units to balance border widths at opposite edges of each ceiling. Avoid use of less than half width units at borders, and comply with reflected ceiling plans. Coordinate panel layout with mechanical and electrical fixtures.

3.3 INSTALLATION

A. Install acoustical panels in coordination with suspended system, with edges resting on flanges of main runner and cross tees. Cut and fit panels neatly against abutting surfaces. Support edges by wall moldings.

B. Special Techniques:
   1. If recommended by Manufacturer, use tile one at a time from at least four (4) open boxes to avoid creating any pattern due to slight variations from box to box. Use tile from same color run in individual rooms to assure color match.
   2. Leave tile in true plane with straight, even joints.

3.4 FIELD QUALITY CONTROL

A. Non-Conforming Work:
   1. Remove and replace defective materials at no additional cost to Owner including, but not limited to following:
      a. Remove and replace damaged or broken acoustical ceiling panels.
      b. Remove and replace discolored acoustical ceiling panels to match adjacent.
      c. Remove and replace work that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

3.5 CLEANING

A. Clean exposed surfaces of acoustical ceiling panels, including trim, edge moldings, and suspension members.
   1. Comply with Manufacturer's written instructions for cleaning and touch up of minor finish damage.

B. Waste Management:
   1. Remove from site all debris connected with work of this Section.

END OF SECTION
SECTION 09 5323
METAL ACOUSTICAL SUSPENSION ASSEMBLIES

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
1. Furnish and install metal acoustical suspension system as described in Contract Documents including:
   a. Suspension system framing.
   b. Wire hangers, fasteners, main runners, cross tees, and wall angle moldings.

B. Related Requirements:
5. Division 26: ‘Electrical’ for related electrical work.

1.2 REFERENCES

A. Association Publications:
   a. ‘Ceiling Systems Handbook’: Recommendations for direct hung acoustical tile and lay-in panel ceiling installation.
   b. CISCA 0-2, ‘Guidelines for Seismic Restraint for Direct-hung Suspended Ceiling Assemblies (zones 0-2)’ Covers Seismic Design Category C.
   c. CISCA 3-4, ‘Guidelines for Seismic Restraint for Direct-hung Suspended Ceiling Assemblies (zones 3-4)’ Covers Seismic Design Category D, E, and F.
   d. ‘Production Guide’: Practical reference for ceiling systems and estimating costs.

B. Definitions:
1. Ceiling Suspension System: System of metal members, designed to support a suspended ceiling, typically acoustical ceiling. Also may be designed to accommodate lighting fixtures or air diffusers.
2. Clips: Several clip designs are available to suit applications such as fire resistance, wind uplift and impact. Fire-resistance rated designs have exact requirements, including mandatory use of hold down clips for acoustical panels or tiles weighing less than 1 lb per sq ft (4.9 kg per sq m). For rooms with significant air pressure differential from adjacent spaces, retention clips may be necessary to retain panels in place. Maintaining air pressure values may also require perimeter panel seals, typically closed cell foam gasket with adhesive on one side.
3. Compression Post (Vertical Strut, Seismic Struts): Rigid member used to provide lateral force bracing of suspension system.
4. Cross Runner, Cross Tee: Cross runner is secondary or cross beams of mechanical ceiling suspension system, usually supporting only acoustical tile. Cross tee is inserted into main runner to form different module sizes. In some suspension systems, however, cross runners also provide support for lighting fixtures, air diffusers and other cross runners.
5. Exposed Grid System: Structural suspension system for lay-in ceiling panels. Factory-painted supporting members are exposed to view. Exposed tee surfaces may be continuous or have integral reveal. Reveals are typically formed as channel or rail profiles extending down from tee leg.
6. Flange: Horizontal surface on face of tee, visible from below ceiling. Part of grid to which color cap is applied. Most grid system flanges are either 15/16 inch (24 mm) or 9/16 inch (14 mm).

7. Hanger Wires: Wire employed to suspend acoustical ceiling from existing structure. Standard material is 12 gauge (0.105 inch - 2.70 mm) galvanized, soft annealed steel wire, conforming to ASTM A641/A641M. Heavier gauge wire is available for higher load carrying installations, or situations where hanger wire spacing exceeds 4 feet (1.20 m) on center. Seismic designs or exterior installations subject to wind uplift may require supplemental bracing or substantial hanger devices such as metal straps, rods or structural angles.

8. Heavy-Duty Systems: Primarily used for installations in which the quantities and weights of ceiling fixtures (lights, air diffusers, etc.) are greater than those for ordinary commercial structure.

9. Hold Down Clip: Mechanical fastener that snaps over bulb of grid system to hold ceiling panels in place.

10. Main Beam, Main Runner, Main Tee: Primary or main beams of type of ceiling suspension system in which structural members are mechanically locked together. Provide direct support for cross runners and may support lighting fixtures and air diffusers, as well as acoustical tile. Supported by hanger wires attached directly to existing structure; or installed perpendicular to carrying channels and supported by specially designed sheet metal or wire clips attached to carrying channels.


12. Stiffening Brace: Used to prevent uplift of grid caused by wind pressure in exterior applications.

13. Suspension System: Metal grid suspended from hanger rods or wires, consisting of main beams and cross tees, clips, splines and other hardware which supports lay-in acoustical panels or tiles. Completed ceiling forms barrier to sound, heat and fire. It also absorbs in-room sound and hides ductwork and wiring in plenum.

14. T-Bar: Any metal member of “T” cross section used in ceiling suspension systems.

C. Reference Standards:

1. American Society of Civil Engineers/Structural Engineering Institute:
   a. ASCE/SEI 7-10, ‘Minimum Design Loads for Buildings and Other Structures’ (Section 9, ‘Earthquake Loads’).

2. ASTM International:
   c. ASTM A653/A653M-13, ‘Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process’.
   g. ASTM C636/C636M-13, ‘Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels’.
   h. ASTM D610-08(2012), ‘Standard Practice for Evaluating Degree of Rusting on Painted Steel Surfaces’.

3. California Building Code CBC 2013:
   a. CBC 808.1.1.1, ‘Suspended Acoustical Ceiling’.

4. International Code Council (ICC):
   a. ICC/ESR-1222 (Revised December 2013), ‘USG Interiors, Inc’.

5. Underwriters Laboratories / American National Standards Institute:
1.3 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Coordinate layout of suspension system with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, and fire-suppression systems.
   2. All work above ceiling should be completed prior to installing suspended system. There should be no materials resting against or wrapped around suspension system, hanger wires or ties.

1.4 SUBMITTALS

A. Action Submittals:
   1. Product Data:
      a. Provide Manufacturer's technical literature on suspension system including listing dimensions, load carrying capacity and standard compliance.
   2. Samples:
      a. Minimum 8 inch (200 mm) long samples of exposed wall molding and suspension system, including main runner/tee and cross runner/tee with couplings.

B. Informational Submittals:
   1. Certificates:
      a. Manufacturer's certifications that products comply with specified requirements, including laboratory reports showing compliance with specified tests and standards.
      b. Installer’s certificates of training.
   2. Manufacturer’s Instructions:
      a. Manufacturer’s details and installation instructions for seismic bracing. If requested, provide copy of code requirements applicable to Project.

1.5 QUALITY ASSURANCE

A. Regulatory Agency Sustainability Approvals:
   1. All system components conform to ASTM standards.
   2. Fire-Resistance Rating: UL approved metal suspension system.
   3. Meet seismic bracing requirements of ASCE 7, ASTM C635/C635M and ASTM C636/C636M or equivalent governing standard for project site.
   4. Seismic Standard: Acoustical ceilings shall be designed and installed to withstand the effects of earthquake motions according to the following:

B. Qualifications. Requirements of Section 01 4301 applies, but not limited to following:
   1. Installer:
      a. Installer training (Ceiling Masters training course or equivalent).
   2. Manufacturer:
      a. Manufacturer in good standing of CISCA (Ceiling and Interior Systems Construction Association).

1.6 DELIVERY, STORAGE, AND HANDLING

A. Delivery And Acceptance Requirements:
   1. Materials shall be delivered in original, unopened packages with labels intact.

B. Storage And Handling Requirements:
1. Materials shall be delivered in original, unopened packages with labels intact.
2. Store material in fully enclosed space protected against damage from moisture, direct sunlight, surface contamination, and general damage.

1.7 WARRANTY

A. Manufacturer Warranty:
   1. Suspension system: Manufacturer warranty including repair or replacement of rusting as defined by ASTM D610 and defects in material or factory workmanship.

PART 2 - PRODUCTS

2.1 SYSTEM

A. Manufacturers:
   1. Acceptable Manufacturers. See Section 01 6200.
      a. Grid Face: 15/16 inch:

B. Materials:
   1. Grid:
      a. Systems shall meet requirements of ASTM C635/C635M, Heavy Duty suspension system.
      b. Exposed surfaces shall be finished with factory-applied white baked enamel.
      c. Meet requirements of ASTM D610 for red rust.
      d. Main runners and cross tees:
         1) All main beams and cross tees shall be commercial quality hot-dipped galvanized (galvanized steel, aluminum, or stainless steel) as per ASTM A653/A653M. Main beams and cross tees are double-web steel construction with type exposed flange design.
   3. Wire Hangers, Braces, and Ties:
      a. Zinc-Coated, carbon-steel wire meeting requirements of ASTM A641/A641M, Class 1 zinc coating, soft temper.
      b. Size:
         1) Standard size: 12 gauge (0.105 inch) (2.70 mm) galvanized, soft annealed steel wire.
         2) Select wire diameter so its stress is less than yield when loaded at three (3) times hanger design load (ASTM C635/C635M), Table 1, 'Direct Hung') will be less than yield stress of wire, but provide not less than 12 gauge (0.105 inch) (2.70 mm).
      c. Protect with rust inhibitive paint.
   4. Wall Molding: Channel section of cold-rolled electro-galvanized steel.
   5. Edge Moldings and Trim: Metal or extruded aluminum of types and profiles indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations, including light fixtures, that fit type of edge detail and suspension system indicated. Provide moldings with exposed flange of same width as exposed runner.
   6. Hold-down Clips: As required by UL to prevent lifting of panels under unusual draft conditions.
   7. Seismic Joint Clip:
      a. Quality Standard Product:
         2) Equal as approved by Architect before bidding. See Section 01 6200.
   8. Seismic Suspension System:
      a. Installation of ceiling system must be as prescribed by ICC-ES Evaluation Reports ESR-1222 or ESR-1308 and applicable code.
      b. Meet requirements of ASTM A568/A568M for hot-dipped galvanized, cold-rolled steel.
      c. Wall Molding Size: 7/8 inch (22 mm).
d. Category Four Acceptable Products. See Section 01 6200 for definition of Categories.

9. Compression Posts/Struts:
   a. Meet seismic requirements for Project.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification Of Conditions:
   1. Inspect area receiving suspension system to identify conditions which will adversely affect installation.
      a. Work trades work to be thoroughly dry and complete prior to installation.
      b. Verify weather tightness of area to receive suspension system prior to installation.
   2. Notify Architect of unsuitable conditions in writing.
      a. Do not install ceiling panels until adverse conditions have been remedied.

3.2 INSTALLATION

A. Interface With Other Work:
   1. All work above ceiling should be completed prior to installing suspended ceiling system including related work including: drywall furring work, acoustical tile, light fixtures, mechanical systems, electrical systems, and sprinklers.

B. General:
   1. Install suspension system and panels in accordance with Manufacturer's written instructions, and in compliance with ASTM C636/C636M, and with authorities having jurisdiction (AHJ).

C. Lay out suspension system symmetrically about center lines of room unless shown otherwise by Contract Drawings. Lay out system so use of tiles less than 1/2 size is minimized.

D. Suspend main runner/tee from overhead construction with hanger wires spaced 4 feet (1.20 m) on center along length of main runner/tee. Install hanger wires plumb and straight. Hanger wires shall not be installed in convenience holes.

E. Maintain suspension system in true plane with straight, even joints.

F. Suspension system joints shall be straight and in alignment, and exposed surface flush and level. Wherever system abuts walls, columns, and other vertical surfaces, furnish and install appropriate molding.

G. Install wall moldings at intersection of suspended ceiling and vertical surfaces. Miter corners where wall moldings intersect or install corner caps.

H. Support edges with wall moldings.

I. Locate light fixtures, speakers, and mechanical diffusers and grilles symmetrically in room insofar as possible (unless shown otherwise). Locate fixtures, speakers, diffusers, and grilles within suspension grid spaces and centered at least one (1) direction within grid. Installed fixtures shall not compromise ceiling performance.

J. Pay particular attention to required hanger wire placement and fixture protection. Individual component deflection not to exceed 1/360 of span.
3.3 FIELD QUALITY CONTROL

A. Field Inspections:
   1. Inspect:
      a. Suspended ceiling system.
      b. Hangers, anchors and fasteners.

B. Non-Conforming Work:
   1. Correct any work found defective or not complying with contract document requirements at no additional cost to Owner.

END OF SECTION
SECTION 09 6513
RESILIENT BASE AND ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes But Not Limited To:
   1. Resilient base as described in Contract Documents.

1.2 REFERENCES

A. Definitions:
   1. Flame Spread: Propagation of flame over a surface.
   2. Flame Spread Index: The numerical value assigned to a material tested in accordance with ASTM E84 or UL 723.
   3. Resilient Wall Base Classification:
      a. Type:
         1) TS: Rubber, vulcanized thermoset.
         2) TP: Rubber, thermoplastic.
         3) TV: Vinyl, thermoplastic.
      b. Group:
         1) Group 1: Solid (homogeneous).
         2) Group 2: Layered (multiple layers).
      c. Styles:
         1) Style A: Straight.
         2) Style B: Cove.
         3) Style C: Butt-to.
   4. Smoke-Developed Index: The numerical value assigned to a material tested in accordance with ASTM E84 or UL 723.

B. Reference Standards:
   1. ASTM International:
   2. Underwriters Laboratories, Inc.:

1.3 SUBMITTALS

A. Action Submittals:
   1. Product Data:
      a. Manufacturer’s literature or cut sheet on base and adhesive.
      b. Color selection.

1.4 QUALITY ASSURANCE

A. Regulatory Agency Sustainability Approvals:
   1. Fire-Test-Response Characteristics:
      a. Surface-Burning Characteristics:
         1) Base shall have Class B flame spread rating in accordance with ASTM E84 or UL 723.
1.5 DELIVERY, STORAGE, AND HANDLING

A. Delivery And Acceptance Requirements:
   1. Materials shall be delivered in original, unopened packages with labels intact.

B. Storage And Handling Requirements:
   1. Store materials in dry space protected from weather at not less than 55 deg F (12.8 deg C) or more than 85 deg F (29.4 deg C) or as per Manufacturer's recommendation.
   2. Materials from containers which have been distorted, damaged or opened prior to installation will be rejected.

1.6 FIELD CONDITIONS

A. Ambient Conditions:
   1. Store materials at not less than 70 deg F (21 deg C) for at least twenty four (24) hours before installation.
   2. Do not apply in temperatures below 70 deg F (21 deg C).

PART 2 - PRODUCTS

2.1 PRODUCTS

A. Manufacturers:
   1. Manufacturers:
      c. Johnsonite, Chagrin Falls, OH.
      e. VPI, Corporation, Sheboygan, WI  www.vpicorp.com.

B. Materials:
   1. Wall Base:
      a. General:
         1) Size:
            a) Minimum body thickness: 1/8 inch by 4 inch (3 mm by 100 mm).
            b) Length: not less than normal.
         2) Corners:
            a) Use preformed, molded external corners for both inside and outside corners.
            b) Butt joint interior corners.
            c) Corners must meet same height and thickness requirements as wall base.
      b. Design Criteria:
         1) Meet requirements of ASTM F1861, Type TP or TS, Group 1 (solid), Style B (cove).
         2) Free from objectionable odors, blisters, cracks, and other defects affecting appearance or serviceability of rubber, and not containing fabric.
         3) Style: Coved.
      c. Colors:
         1) Color pigments used shall be highly fade-resistant, insoluble in water, and resistant to light, alkali, and cleaning agents.
         2) Colors as selected by Architect from Manufacturer's standard colors.
      d. Approved Products. See Section 01 6200:
         1) RubberMyte Wall Base by Burke.
         2) Base 2000 Wall Base by Flexco.
         3) Rubber Wall Base by Johnsonite.
         4) Rubber Wall Base by Roppe.
         5) Rubber Wall Base by VPI.
2. Adhesive:
   a. Use products recommended by Manufacturer for conditions of use.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification Of Conditions:
   1. Inspect surfaces for conditions not suitable for installation. Surface to receive specified items shall be sound, clean, free from foreign matter, tightly nailed, and dry.
   2. Notify Architect of unsuitable conditions in writing:
      a. Do not start work until defects are corrected.
   3. Commencement of Work by installer is considered acceptance of substrate.

3.2 PREPARATION

A. Surface Preparation:
   1. Remedy cracks and minor irregularities in substrate in accordance with Manufacturer's recommendations.

3.3 INSTALLATION

A. Base:
   1. Install in manner to produce smooth, even finished surfaces tightly jointed and accurately aligned.
   2. Fit specified items tightly. Use fillers where necessary. Fit neatly against projections, piping, electrical service outlets, etc.
   3. Secure specified items with specified adhesive. Cement substantially to vertical surfaces including rubber base to cabinet work base.
   4. Line up top and bottom lines of base throughout.
   5. Do not stretch base during installation.
   6. Roll until firm bond has been established. Leave level, free from buckles, cracks, and projecting edges.
   7. In wall runs longer than 12 inches (300 mm), install no lengths of base shorter than 12 inches (300 mm) long.

3.4 FIELD QUALITY CONTROL

A. Non-Conforming Work:
   1. Replace damaged materials at no additional cost to Owner.
   2. Damaged materials are defined as having cuts, gouges, scrapes or tears, and not fully adhered.

3.5 ADJUSTING

A. Inspect and make necessary adjustments within one (1) month after mechanical heat or other heat has been supplied continuously in finished areas.

3.6 CLEANING

A. General:
   1. Base:
a. Clean all exposed surfaces of base of adhesive spatter before it sets in accordance with Manufacturer’s cleaning instructions.
b. Damp-mop surfaces to remove marks and soil.

2. Adjacent Work:
   a. Clean all exposed surfaces of adjoining areas of adhesive spatter before it sets.

3.7 PROTECTION

A. Base:
   1. Cover material until Substantial Completion.
   2. Keep traffic away until adhesive has set.

END OF SECTION
SECTION 09 6519
RESILIENT TILE FLOORING

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Furnish and install resilient tile flooring as described in Contract Documents.

B. Related Requirements:
   1. Section 01 3100: 'Project Management and Coordination' for pre-installation conference.
   2. Section 01 4000: ‘Quality Requirements’ for administrative and procedural requirements for quality assurance and quality control.
   3. Section 01 4301: ‘Quality Assurance – Qualifications’ establishes minimum qualification levels required.
   4. Section 01 7800: ‘Closeout Submittals’.
   5. Section 09 0503: Floor substrate preparation.

1.2 REFERENCES

A. Association Publications:
      a. ACI 302.2R-06, Guide for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials (August 15, 2006).

B. Reference Standards:
   1. ASTM International:
      a. ASTM F710-11, ‘Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring.’

1.3 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Coordinate completion of flooring installation with other trades.

B. Pre-Installation Conference: In addition to agenda items specified in Section 01 3100, review following:
   1. Participate in Pre-Installation Conference specified in Section 09 0503.
   2. In addition to agenda items specified in Section 01 3100, review following:
      a. Schedule conference after substrate preparation and TWO weeks before installation of flooring system.
   3. Review Flooring Manufacturer's installation conditions verification procedure and requirements.
   4. Review Building Ambient Conditions including normal levels of humidity, lighting, heating, and air conditioning for acceptability for beginning floor preparation and flooring installation.

C. Scheduling:
   1. Notify Testing Agency and Architect two weeks minimum before Pre-Installation Conference to allow testing for Alkalinity and Concrete Moisture of concrete slab.
1.4 SUBMITTALS

A. Action Submittals:
   1. Product Data:
      a. Manufacturer's literature or cut sheet on each component of system.
      b. Maintenance instructions.
      c. Color and style selection.

B. Closeout Submittals:
   1. Include following in Operations And Maintenance Manual specified in Section 01 7800:
      a. Record Documentation:
         1) Manufacturers documentation:
            a) Manufacturer's literature.
            b) Color and style selection.
         2) Testing and Inspection Reports:
            a) Testing Agency Testing Reports of Alkalinity and Concrete Moisture testing.

C. Maintenance Material Submittals:
   1. Extra Stock Materials:
      a. Leave box of 20 extra tile of each pattern and color used on Project with Owner.

1.5 FIELD CONDITIONS

A. Ambient Conditions:
   1. Building Conditions:
      a. Conditions inside building shall be brought to levels to be normal at occupancy of building.
      b. Conditions include normal levels of humidity, lighting, heating, and air conditioning.
   2. Concrete Slab:
      a. General:
         1) Final determination as to whether or not a concrete slab is dry enough for flooring installation should be based on evaluating both Alkalinity and Concrete Moisture Vapor Emission Rate (MVER) testing.
      b. Alkalinity:
         1) Do not install sheet carpeting if alkalinity of concrete surface exceeds pH level 9. Corrective procedures are required.
      c. Concrete Moisture Vapor Emission Rate (MVER):
         1) Testing conditions inside building shall be brought to same ambient temperature and relative humidity levels to be normal at occupancy of building. Conditions include normal levels of humidity, lighting, heating, and air conditioning.
         2) Do not install sheet carpeting if moisture vapor emission rate (MVER) of concrete slab relative humidity (RH) exceeds 75% as per ASTM F2170. Corrective procedures are required.
   3. Application:
      a. Maintain 70 deg F (21 deg C) minimum during application.

PART 2 - PRODUCTS

2.1 SYSTEM

A. Manufacturers:
   1. Manufacturer Contact List:
      a. Patcraft: PO Box 2128, Dalton, GA 30722 – 2128 800-241-4014 info@patcraft.com
      b. Equals as approved by architect prior to bidding.
B. Materials:
   1. Reinforced Vinyl Tile:
      a. Product: 18 inch by 18 inches square - Verify size with Architect.
      1. Typography –
         a. Charted 1313V – 45% of Punctuate 00630
         b. Typeface 1312V – 45% of Punctuate 00630
         c. Letterpress 1311V - 10% of Punctuate 00630
      b. Meet or exceed Fed Spec SS-T-312b, Type IV.
         1) Equals as approved by Architect before bidding. See Section 01 6200.
   2. Adhesive: Water-resistant type. Best grade in accordance with Tile Manufacturer's recommendations.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification of Conditions:
   1. Verify concrete surfaces are sufficiently cured and moisture content is within acceptable levels before beginning installation.

B. Evaluation And Assessment:
   1. Variation In Grade: Plus or minus 1/8 inch (3 mm) in any 10 feet (3 meters) of floor slab and distance between high point and low point of slab of 1/2 inch (12 mm).
   2. Testing Procedure: Place ends of straightedge on 3/8 inch (9 mm) high shims. Floor is satisfactory if 1/4 inch (6 mm) diameter steel rod rolled under straightedge will not touch anywhere along 10 foot (3 meter) length and 1/2 inch (12 mm) diameter steel rod will not fit under straightedge anywhere along 10 foot (3 meter) length.
   3. Notify Architect in writing if floor surface is not acceptable to install tile. Do not lay tile over unsuitable surface. Commencing installation constitutes acceptance of floor and approval of existing conditions.
   4. Confirm acceptance and approval of substrate with Architect before beginning installation of flooring system.

3.2 INSTALLATION

A. Special Techniques:
   1. Lay tile symmetrically about center line of spaces to insure even borders, unless shown differently on Drawings.
   2. Install beveled edge stripping at terminal edges of tile except at ceramic tile, carpet, and where Drawings indicate different detail. Conceal edging strips beneath doors.

3.3 FIELD QUALITY CONTROL

A. Field Tests:
   1. See Section 09 0503 'Flooring Substrate Preparation' for Field Testing for Alkalinity and Concrete Moisture of concrete slab.

END OF SECTION
PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 WORK INCLUDED

A. Work of this Section includes, but is not limited to, providing all labor, materials, equipment transportation and services necessary to complete the epoxy resin composition flooring and integral coved base as indicated on the drawings and as specified herein. To include surface preparation, primer, base and finish coat and cove base.

1.3 REFERENCES

A. References made herein to published specifications; standards, methods of testing and recommended methods of trade, industry and governmental organizations shall apply to the year of original adoption or the year of the latest revision or approvals.

1.4 SUBMITTALS

A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.

B. Product Data: Submit manufacturer=s technical data, application instructions and general recommendations for the epoxy resin composition flooring specified herein.

C. Samples for initial selection purposes in form of manufacturer=s color charts showing full range of colors and finishes available.

1. Submit 4" x 4" samples of color chips from manufacturer=s standard colors.

D. Material certificates signed by manufacturer certifying that the epoxy resin composition flooring complies with requirements specified herein.

E. Maintenance Instructions: Submit manufacturer=s written instructions for recommended maintenance practices.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Engage an experienced Installer or applicator with five years experience and who has specialized in installing resinous flooring types similar to that required for this Project and who is acceptable to manufacturer of primary materials.

B. Single-Source Responsibility: Obtain epoxy resin composition flooring materials, including primers, resins, hardening agents and finish or sealing coats from a single manufacturer.

C. Qualified Materials: Request for material approvals for any products other than the specified products must be submitted to the Architect prior to the bid, including
complete application specification, physical characteristics, and chemical resistance data. Any request after this date will not be accepted. Failure of performance requires immediate removal and replacement of unapproved substituted material with those originally specified at no cost to the Owner, Architect, Construction Manager or General Contractor.

1.6 DELIVERY, STORAGE AND HANDLING

A. Deliver materials in original packages and containers with seals unbroken and bearing manufacturer’s labels containing brand name and directions for storage and mixing with other components.

B. Store materials to comply with manufacturer’s directions to prevent deterioration from moisture, heat, cold, direct sunlight or other detrimental effects.

C. Materials shall be stored in a dry, enclosed area protected from exposure to moisture. Temperature of storage area shall be maintained between 60 and 85 degrees F/16 and 32 degrees C.

1.7 PROJECT CONDITIONS

A. Environmental Conditions: Comply with epoxy resin composition flooring manufacturer’s directions for maintenance of ambient and substrate temperature, moisture, humidity, ventilation and other conditions required to execute and protect Work.

1.8 WARRANTY

A. Provide one (1) year guarantee for material and installation.

PART 2 PRODUCTS

2.1 MATERIALS

A. Troweled epoxy resin composition flooring.

2.2 PROPERTIES


B. Physical Properties: Provide flooring system that meets or exceeds the listed minimum physical property requirements when tested according to the referenced standard test method in parentheses.

1. Compressive Strength (ASTM C-579) 11,000 psi
2. Tensile Strength (ASTM C-307) 2,000 psi
3. Flexural Modulus of Elasticity (ASTM C-580) 4,300 psi
4. Water Absorption (ASTM C-413) .01%
5. Surface Hardness (ASTM D-2240) 86 Durometer AD®
6. Abrasion Resistance (ATM C-501) 597.4
7. Impact Resistance (MIL D-3134, Para 4.7.3) 0.024” max. No chipping, cracking, loss of adhesion
8. Impact Resistance (Gardner Impact Tester) No chipping, cracking, or delamination and not more than 0.014” indentation
9. Adhesion (A.C.I. Comm. No. 503.1) 400 psi (100% failure in concrete)
10. Electrical Conductivity (NFPA 56A) Di-electric
11. Flammability-Critical Radiant Flux (ASTM E-648) Greater than 1.07 watts/cm²
12. Bond Strength (ASTM D-454) 600 psi
13. Coefficient of Friction (ASTM D-2047 ) >0.9
14. Heat Resistance limit  
   Dry- 250 deg. Continuous/ 275 deg. Intermittent
   Wet- 140 deg. Continuous/ 200 deg. Intermittent
15. Electrical Conductivity  Electrically non-conductive

C. Joint Sealer
   1. Type produced by manufacturer of resinous flooring system for type of service and joint
   condition indicated.

2.3 SUPPLEMENTAL MATERIALS

A. Anti-Microbial Additive: Incorporate antimicrobial chemical additive to prevent growth of most bacteria, fungi, algae and actinomycetes.

2.4 APPROVED MANUFACTURERS

A. Sunbelt Flooring, Inc., Chino, CA (909)628-1090
B. Dur-A-Flex, Inc., East Hartford, CN (800) 253-3539
C. Equal as approved by Architect before bidding.

PART 3 EXECUTION

3.1 PREPARATION

A. Concrete substrate preparation shall be by mechanical means and include use of a scabbler, scarifier or shot blast machine for removal of bond inhibiting materials such as curing compounds of laitance. Cleaning of interior concrete slabs: Vacuum shot blast ("Blastrac") all designated existing interior concrete floor slabs that are to receive new flooring materials or leveling underlayment coating. Vacuum shot blasting shall be with steel pellets 330-5 to 390-5 for optimum surface profile in order for all sealers or adhesives to penetrate and bond. Coordinate all vacuum shotblasting with respective floor covering contractor. Dustless diamond cup grinding may be used in some instances in lieu of shot blasting.

3.2 INSTALLATION

A. General - Apply each component of resinous flooring system in compliance with manufacturer=s directions to produce a uniform monolithic wearing surface of thickness indicated, uninterrupted except at divider strips, sawn joints or other types of joints (if any), indicated or required.

B. Primer - Mix and apply primer over properly prepared substrate with strict adherence to manufacturer=s installation procedures and coverage rates. Coordinate timing of primer application with application of troweled mortar to ensure optimum adhesion between resinous flooring materials and substrate.

C. Troweled Mortar - Mix mortar material according to manufacturer=s recommended procedures. Uniformly spread mortar over substrate using manufacturer=s specially designed screed box adjusted to manufacturer=s recommended height. Hand trowel apply mixed material over freshly primed substrate using steel finishing trowels or power trowel material.

D. Undercoat - Remove any surface irregularities by lightly abrading and vacuuming the floor
surface. Mix and apply undercoat with strict adherence to manufacturer’s installation procedures and coverage rates.

E. Broadcast - Immediately broadcast quartz silica aggregate into the undercoat using manufacturer’s specially design spray caster. Strict adherence to manufacturer’s installation procedures and coverage rates is imperative.

F. Sealer - Remove excess unbonded granules by lightly brushing and vacuuming the floor surface. Mix and apply sealer with strict adherence to manufacturer’s installation procedures.

3.4 CURING, PROTECTION & CLEANING

A. Curing resinous flooring materials in compliance with manufacturer’s directions, taking care to prevent contamination during stages of application and prior to completion of curing process. Close area of application for a minimum of 24 hours.

B. Protect resinous flooring materials from damage and wear during construction operation. Where temporary covering is required for this purpose, comply with manufacturer’s recommendations for protective and method of application. General Contractor is responsible for protection and cleaning of surfaces after final coats.

C. Cleaning: Remove temporary covering and clean resinous flooring just prior to final inspection. Use cleaning materials and procedures recommended by resinous flooring manufacture.

END OF SECTION
SECTION 09 6813
TILE CARPETING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes But Is Not Limited To:
   1. Furnish and install carpet tiles as described in contract documents and including following:
      a. Maintain Building Ambient Conditions including normal levels of humidity, lighting, heating, and air conditioning for acceptability for beginning floor preparation and carpet installation.
      b. Installation of floor leveling compound prior to finish floor installation.

B. Products Installed But Not Furnished Under This Section:
   1. Section 09 6513 – Resilient Base And Accessories

C. Related Requirements:
   1. Section 09 6513 – Resilient Base And Accessories

1.2 REFERENCES

A. Association Publications:
      a. ACI 302.2R-06, Guide for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials (August 15, 2006).
   2. NSF International (NSF) / American National Standards Institute (ANSI):
      a. NSF International, Ann Arbor, MI www.nsf.org
      b. CRI Indoor Air Quality (IAQ):
         1) CRI Green Label Plus Certification.
      c. CRI Texture Appearance Retention Rating (TARR):
         1) Retention Rating Scales.

B. Definitions:
   1. Adhesive: Substance that dries to film capable of holding materials together by surface attachment.
   2. Antimicrobial: Chemical treatment added to carpet or reduce growth of common bacteria, fungi, yeast, mold and mildew.
   3. Appearance Retention: Ability of a fabric to retain its original aesthetics, color, and construction integrity.
   4. Backing: Materials comprising back of carpet as opposed to carpet pile or face.
      a. Tufted carpets: (1) Primary backing, woven or nonwoven fabric in which pile yarn is inserted by tufting needles. (2) Secondary backing, Fabric laminated to back of carpet to reinforce and increase dimensional stability.
      b. Woven carpets: Backings are ‘construction yarns’ comprising chain warp, stuffer warp, and shot or fill, which are interwoven with face yarn during carpet fabric formation.
   5. Backing Fabric: Fabric into which pile yarn is inserted, or reinforcing layer that is adhered to reverse side of fabric.
6. Bonding Agent (Backcoating): Application of latex or adhesive to back of carpet to anchor tufts usually followed immediately by addition of secondary backing material such as nonwoven polypropylene or poly-urethane attached cushion.
7. Carpet: Heavy fabric used to cover floor and made from variety of fibers.
8. Change In Surface Appearance: Cumulative change in surface appearance between unexposed and exposed specimens due to crushing, loss of tuft definition, and matting.
9. Colorfastness: Ability of fiber or carpet to retain color when exposed to (1) ultraviolet light, (2) crocking (wet or dry) and (3) atmospheric conditions.
10. Commercial Match: Matching of colors with acceptable tolerance, or with color variation that is barely detectable to naked eye.
11. Crockfastness: Resistance of transfer of colorant from surface of colored yarn or fabric to another surface, or to an adjacent area of same fabric, principally by rubbing.
12. Crushing: Collapsing of pile yarns, resulting in carpet matting and loss of resilience due to traffic.
13. Delamination: Form of deterioration of tufted carpet in which primary back and face yarns separate from secondary back.
15. Dimensional Stability: Ability of carpet to retain its size and shape once installed.
16. Face Weight: Total weight of face (above backing) yarns in carpet.
17. Fiber: Fundamental unit of carpet made from nylon, polyester, cotton, acrylics, wool, and recycled material.
18. Flammability: Procedures that have been developed for assessing flame resistance of carpets.
19. Fuzzing: Fluffy particles appear on carpet surfaces caused by fibers that loosen because of weak twist or snags.
20. Lightfastness: Degree of resistance of dyed textile materials to color destroying influence of sunlight.
21. Loss of Tuft Definition: Bursting, opening, and untwisting of pile yarn and/or decrimping of fibers in surface pile of pile yarn floor covering.
22. Matting: Loss of pile definition of a textile floor covering due to entanglement and compression of pile fibers.
23. Modification Ratio: Ratio between circumference of inner core of multi lobal fiber’s cross section, and circumference of circle drawn around outer edges of fibers cross sections’ outer lobes or tips.
24. Pile: Visible surface of carpet, consisting of yarn tufts in loop and/or cut configuration. Sometimes called face or nap.
25. Resilience: Ability of carpet to spring back to its original texture and thickness after being walked on or compressed weight of furniture.
26. Soil Resistance: Ability of carpet fiber to resist dry soil and maintain its original appearance after intermittent or restorative cleanings.
27. Soiling: Occurs when dirt particles build up in carpet fibers.
28. Stain Resistance: Ability of carpet fiber to resist absorption of stain and maintain its original appearance.
29. Texture: Visual and tactile surface characteristics of carpet pile, including such aesthetic and structural elements.
30. Texture Appearance Retention Rating (TARR): Model specification process that classifies areas of intended use and minimum carpeting texture appearance retention ratings for particular areas of use. Moderate, heavy, severe, or special end-use classification is established for each application based on level of expected foot traffic in specific areas.
31. Tile: Carpet module usually 24 inch x 24 inch in size. Extremely dense construction with heavy reinforced backing.
32. Tuft: Cluster of yarns drawn through fabric and projecting from surface in form of cut yarns or loops.
33. Tuft Bind: Force (usually measured in pounds) required to pull tuft from carpet backing.
34. Tufted Carpet: Carpet produced by tufting machine instead of loam.
36. Woven Carpet: Carpet produced on a loom.
37. Woven: Interlacing strands of fiber into yarn forms woven carpet.
38. Yarn: Fibers that are twisted together to form a continuous strand.
C. Reference Standards:
   1. ASTM International:

1.3 SUBMITTALS

A. Informational Submittals:
   1. Manufacturer Instructions:
      a. Published installation instructions.

B. Closeout Submittals:
   1. Include following in Operations And Maintenance Manual specified in Section 01 7800:
      a. Warranty Documentation:
         1) Final, executed copy of Warranty.
      b. Record Documentation:
         1) Manufacturers documentation:
            a) Manufacturer’s literature.
            b) Color and style selection.

C. Maintenance Material Submittals:
   1. Extra Stock Materials:
      a. Leave carpet tiles equivalent to 15 percent of number installed as attic stock.
      b. Tie securely and wrap in protective cover.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Delivery And Acceptance Requirements:
   1. Deliver materials and accessories necessary for completion of carpet installation to site before beginning installation of carpet.
   2. Do not deliver materials before date scheduled for installation.

B. Storage And Handling Requirements:
   1. Store carpet and related materials in a climate-controlled, dry space.
   2. Protect carpet from soil, dust, moisture and other contaminants.

1.5 FIELD CONDITIONS

A. Ambient Conditions:
   1. Building Conditions:
      a. Conditions inside building shall be brought to levels to be normal at occupancy of building. Conditions include normal levels of humidity, lighting, heating, and air conditioning.
      1) Carpet installation is not to begin until HVAC system is operational and following conditions are maintained for at least forty eight (48) hours before, during and seventy two (72) hours after completion:
         a) Carpet is to be installed when indoor temperature is between 65º - 95º F (18º - 35º C) with maximum relative humidity of 65%.
         b) Substrate surface temperature should not be less than 65º F (18º C) at time of installation.
         c) Do not allow temperature of indoor carpeted areas to fall below 50º F (10º C), regardless of age of installation.
      2) Maintain fresh air ventilation after installation for seventy two (72) hours minimum or until lingering odors are gone.
1.6 WARRANTY

A. Manufacturer Warranty:
   1. Provide Carpet Manufacturer's standard Warranty.

PART 2 - PRODUCTS

2.1 PRODUCTS

A. Approved Manufacturer:
   1. Patcraft Commercial Flooring, Dalton, GA Contact Shaun Tait (714) 322-5483
   2. Equal as approved by Architect before bidding. See Section 01 6200.

B. Materials: Design Standard
   1. Carpet Tiles:
      1) Collection - Visual Energy by Patcraft
      2) Pattern - Vivid
      3) Color - Lightning 00725

2.2 ACCESSORIES

A. Carpet Accessories: Snap-in vinyl reducer strips and vinyl track

B. Floor Leveling Compound and Floor Patching Compound: As recommended and approved by carpet Manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification of Conditions:
   1. Resilient Base:
      a. Inspect surfaces for conditions not suitable for installation. Surface to receive specified items shall be sound, clean, free from foreign matter, tightly nailed, and dry:
         1) Notify Owner's Representative in writing of unsuitable conditions:
            a) Do not start work until defects are corrected. Commencing installation constitutes acceptance of substrate.

3.2 PREPARATION

A. Carpet Areas:
   1. Flooring Preparation:
      a. Carpet Installer's Responsibility:
         1) Prepare floor substrate in accordance with ‘CRI Carpet Installation Standard’ best practices to receive carpet installation and to provide installation that meets warranty requirements.
         2) Verify concrete surface cured, clean, dry, and free of foreign substances that will compromise carpet and/or installation.
      b. Concrete floor slab patching:
         1) Cracks, chips and joints must be properly patched or repaired.
      c. Concrete surface cured, clean, dry, and free of foreign substances that will compromise carpet and/or other flooring installations:
1) Removal of curing compounds.
2) Remove paint, sealer, grease, oil, silicone sealants, and other materials incompatible with flooring adhesives.
3) Removal of overspray from painted walls (essential so glue will stick).
   d. Vacuum and damp mop floor areas to receive floor leveling compound before flooring installation.
   e. Install floor leveling compound per manufacturers instructions.
   f. Vacuum and damp mop floor areas to receive flooring before flooring installation.

B. Resilient Base:
   1. Surface Preparation:
      a. Remedy cracks and minor irregularities in substrate in accordance with Manufacturer's recommendations.

3.3 INSTALLATION

A. Carpet:
   1. General:
      a. Install carpet in accordance with 'CRI Carpet Installation Standard' and Manufacturer's written instructions supplied with product.
      b. Adhesion of carpet tile to floor substrate shall be continuous on floor surface so there are no bubble, ridges, or any separation of carpet from backings or backing from floor substrate caused by failure of carpet system.
      c. Install carpet under edge of metal thresholds where possible. Use specified carpet accessories at exposed edges.
      d. Install transition strips between new and existing flooring systems.

B. Resilient Base:
   1. Install in manner to produce smooth, even finished surfaces tightly jointed and accurately aligned.
   2. Fit specified items tightly. Use fillers where necessary. Fit neatly against projections, piping, electrical service outlets, etc.
   3. Secure specified items with specified adhesive. Cement substantially to vertical surfaces including rubber base to cabinet work base.
   4. Line up top and bottom lines of base throughout.
   5. Do not stretch base during installation.
   6. Roll until firm bond has been established. Leave level, free from buckles, cracks, and projecting edges.
   7. In wall runs longer than 12 inches (300 mm), install no lengths of base shorter than 12 inches (300 mm) long.

3.4 FIELD QUALITY CONTROL

A. Non-Conforming Work:
   1. Carpeting:
      a. Basis of Acceptable Carpeting: Source Quality Control Testing:
         1) Carpet products not meeting Design Criteria and Source Quality Control Testing of this specification will be considered unacceptable carpeting.
      b. Unacceptable Carpeting:
         1) Unacceptable carpeting will be rejected and shall be repaired or replaced at no additional cost to Owner.
   2. Resilient Base:
      a. Replace damaged materials at no additional cost to Owner:
      b. Damaged materials are defined as having cuts, gouges, scrapes or tears, and not fully adhered.
3.5 CLEANING

A. General:
   1. Carpeting:
      a. Carpet Installer’s Responsibility:
         1) Remove any soiling and/or staining from carpet.
         2) Remove excessive adhesive with manufacturer recommended adhesive removers.
   2. Resilient Base:
      a. Carpet Installer’s Responsibility:
         1) Clean all exposed surfaces of resilient base of adhesive spatter before it sets in accordance with Manufacturer’s cleaning instructions.

B. Damage to building:
   1. Carpeting:
      a. Carpet Installer’s Responsibility:
         1) Carpet Installer responsible for cleaning and repair of all damaged surfaces to their original condition from carpet installation.
   2. Resilient Base:
      a. Carpet Installer’s Responsibility:
         1) Clean all exposed surfaces of adjoining areas of adhesive spatter before it sets.

C. Waste Management:
   1. Contractor’s Responsibility:
      a. Provide adequate waste receptacles (dumpsters) and dispose of materials from building and property.
   2. Carpet Installer’s Responsibility:
      a. All work areas are to be kept clean, clear and free of debris at all times.
      b. Disposal of rubbish, wrapping paper, scraps, and trimmings in provided dumpster(s).

3.6 PROTECTION

A. Protection of Carpeting:
   1. Contractor’s Responsibility:
      a. No traffic of any kind on newly installed carpet for minimum of twenty four (24) hours after installation is completed.
      b. No wheeled traffic of any kind placement of furniture or equipment on carpet for minimum of forty eight (48) hours after completion of carpet installation.
      c. Protect carpet adequately from soil, dust, moisture and other contaminants after carpet installation.
      d. Protect carpet from abuse, vandalism, or damage occurring after installation is complete.

B. Protection of Base:
   1. Resilient Base:
      a. Contractor’s Responsibility:
         1) Cover material until Final Inspection.
         2) Keep traffic away until adhesive has set.

END OF SECTION
SECTION 09 9001
COMMON PAINTING AND COATING REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Common procedures and requirements for field-applied painting and coating.

B. Related Requirements:

1.2 REFERENCES

A. Definitions:
   1. Damage Caused By Others: Damage caused by individuals other than those under direct control of Painting Applicator (MPI(a), PDCA P1.92).
   2. Gloss Levels:
      a. Specified paint gloss level shall be defined as sheen rating of applied paint, in accordance with following terms and values, unless specified otherwise for a specific paint system.

<table>
<thead>
<tr>
<th>Gloss Level</th>
<th>Traditional Matte Finish - Flat</th>
<th>Gloss Level 1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gloss Level 2</td>
<td>High side sheen flat - 'velvet-like' finish</td>
<td>10 units maximum at 60 degrees and 10 to 35 units at 85 degrees.</td>
</tr>
<tr>
<td>Gloss Level 3</td>
<td>Traditional 'eggshell-like finish'</td>
<td>10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees.</td>
</tr>
<tr>
<td>Gloss Level 4</td>
<td>'Satin-like' finish</td>
<td>20 to 35 units at 60 degrees and 35 units minimum at 85 degrees.</td>
</tr>
<tr>
<td>Gloss Level 5</td>
<td>Traditional semi-gloss</td>
<td>35 to 70 units at 60 degrees.</td>
</tr>
<tr>
<td>Gloss Level 6</td>
<td>Traditional gloss</td>
<td>70 to 85 units at 60 degrees.</td>
</tr>
<tr>
<td>Gloss Level 7</td>
<td>High gloss</td>
<td>More than 85 units at 60 degrees.</td>
</tr>
</tbody>
</table>

3. Properly Painted Surface:
   a. Surface that is uniform in appearance, color, and sheen and free of foreign material, lumps, skins, runs, sags, holidays, misses, strike-through, and insufficient coverage. Surface free of drips, spatters, spills, and overspray caused by Paint Applicator. Compliance will be determined when viewed without magnification at a distance of 5 feet (1.50 m) minimum under normal lighting conditions and from normal viewing position (MPI(a), PDCA P1.92).

4. Latent Damage: Damage or conditions beyond control of Painting Applicator caused by conditions not apparent at time of initial painting or coating work.

B. Reference Standards:
   1. The latest edition of the following reference standard shall govern all painting work:
      a. MPI(a), 'Architectural Painting Specification Manual' by Master Painters Institute (MPI), as issued by local MPI Accredited Quality Assurance Association having jurisdiction.
      b. MPI(r), 'Maintenance Repainting Manual' by Master Painters Institute (MPI), as issued by local MPI Accredited Quality Assurance Association having jurisdiction.
1.3 SUBMITTALS

A. Action Submittals:
   1. Product Data:
      a. Include following information for each painting product, arranged in same order as in Project Manual.
         1) Manufacturer's cut sheet for each product indicating ingredients and percentages by weight and by volume, environmental restrictions for application, and film thicknesses and spread rates.
         2) Provide one (1) copy of 'MPI Approved Products List' showing compliance for each MPI product specified.
            a) MPI Information is available from MPI Approved Products List using the following link: http://www.paintinfo.com/mpi/approved/index.shtml.
         3) Confirmation of colors selected and that each area to be painted or coated has color selected for it.
   2. Samples: Provide two 4 inch by 6 inch (100 mm by 150 mm) minimum draw-down cards for each paint or coating color selected for this Project.

B. Informational Submittals:
   1. Manufacturer Instructions:
      a. Manufacturer's substrate preparation instructions and application instruction for each painting system used on Project.
   2. Qualification Statement:
      a. Applicator:
         1) Provide Qualification documentation if requested by Architect or Owner.

C. Closeout Submittals:
   1. Include following in Operations And Maintenance Manual specified in Section 01 7800:
      a. Record Documentation:
         1) Manufacturer’s documentation:
            a) Manufacturer's cut sheet for each component of each system.
            b) Schedule showing rooms and surfaces where each system was used.

D. Maintenance Materials Submittals:
   1. Extra Stock Materials:
      a. Provide painting materials in Manufacturer's original containers and with original labels in each color used. Label each can with color name, mixture instructions, date, and anticipated shelf life.
      b. Provide one (1) quart of each finish coat and one (1) pint of each primer and of each undercoat in each color used.

1.4 QUALITY ASSURANCE

A. Regulatory Agency Sustainability Approval:
   1. Conform to work place safety regulations and requirements of those authorities having jurisdiction for storage, mixing, application and disposal of all paint and related hazardous materials.
   2. Paint and painting materials shall be free of lead and mercury, and have VOC levels acceptable to local jurisdiction.
   3. Master Painters Institute (MPI) Standards:
      a. Products: Comply with MPI standards indicated and listed in 'MPI Approved Products List'.

B. Field Samples:
   1. Before application of any paint system, meet on Project site with Architect, Owner's representative, and Manufacturer's representative. Architect may select one (1) surface for
application of each paint system specified. This process will include establishing acceptable substrate conditions required for Project before application of paints and coatings.

2. Apply paint systems to surfaces indicated by Architect following procedures outlined in Contract Documents and Product Data submission specified above.

3. After approval of samples, proceed with application of paint system throughout Project. Approved samples will serve as standard of acceptability.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Delivery And Acceptance Requirements:
   1. Deliver specified products in sealed, original containers with Manufacturer's original labels intact on each container.
   2. Deliver amount of materials necessary to meet Project requirements in single shipment.

B. Storage And Handling Requirements:
   1. Store materials in single place.
   2. Keep storage area clean and rectify any damage to area at completion of work of this Section.
   3. Maintain storage area at 55 deg F (13 deg C) minimum.

1.6 FIELD CONDITIONS

A. Ambient Conditions:
   1. Perform painting operations at temperature and humidity conditions recommended by Manufacturer for each operation and for each product for both interior and exterior work.
   2. Apply painting systems at lighting level of 540 Lux (50 foot candles) minimum on surfaces to be painted.
      a. Inspection of painting work shall take place under same lighting conditions as application.
      b. If painting and coating work is applied under temporary lighting, deficiencies discovered upon installation of permanent lighting will be considered latent damage as defined in MPI Manual, PDCA P1-92.

PART 2 - PRODUCTS

2.1 SYSTEMS

A. Performance:
   1. Design Criteria:
      a. Provide materials for use within each coating system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
      b. All materials, preparation and workmanship shall conform to requirements of ‘Architectural Painting Specification Manual’ by Master Painters Institute (MPI).
      c. All paint manufacturers and products used shall be as listed under Approved Product List section of MPI Painting Manual.
      d. Provide Premium Grade systems (2 top coats) as defined in MPI Architectural Painting Specification Manual, except as otherwise indicated.
      e. Where specified paint system does not have Premium Grade, provide Budget Grade.
      f. Provide products of same manufacturer for each coat in coating system.
      g. Where required to meet LEED (Leadership in Energy and Environmental Design) program requirements, use only MPI listed materials having an “L” rating designation.
B. Materials:
1. Materials used for any painting system shall be from single manufacturer unless approved otherwise in writing by painting system manufacturers and by Architect. Include manufacturer approvals in Product Data submittal.
2. Linseed oil, shellac, turpentine, and other painting materials shall be pure, be compatible with other coating materials, bear identifying labels on containers, and be of highest quality of an approved manufacturer listed in MPI manuals. Tinting color shall be best grade of type recommended by Manufacturer of paint or stain used on Project.

PART 3 - EXECUTION

3.1 EXAMINATION
A. Verification Of Conditions:
1. Directing applicator to begin painting and coating work will indicate that substrates to receive painting and coating materials have been previously inspected as part of work of other Sections and are complete and ready for application of painting and coating systems as specified in those Sections.

B. Pre-Installation Testing:
1. Before beginning work of this Section, examine, and test surfaces to be painted or coated for adhesion of painting and coating systems.
2. Report in writing to Architect of conditions that will adversely affect adhesion of painting and coating work.
3. Do not apply painting and coating systems until party responsible for adverse condition has corrected adverse condition.

C. Evaluation And Assessment:
1. Report defects in substrates that become apparent after application of primer or first finish coat to Architect in writing and do not proceed with further work on defective substrate until such defects are corrected by party responsible for defect.

3.2 PREPARATION
A. Protection Of In-Place Conditions:
1. Protect other finish work and adjacent materials during painting. Do not splatter, drip, or paint surfaces not intended to be painted. These items will not be spelled out in detail but pay special attention to the following:
   a. Do not paint finish copper, bronze, chromium plate, nickel, stainless steel, anodized aluminum, or monel metal except as explicitly specified.
   b. Keep cones of ceiling speakers completely free of paint.
   c. On existing work where ceiling is to be painted, speakers and grilles are already installed, and ceiling color is not being changed, mask off metal grilles installed on ceiling speakers. If ceiling color is being changed, remove metal grilles and paint, and mask off ceiling speakers.

B. Surface Preparation:
1. Prepare surfaces in accordance with MPI requirements and requirements of Manufacturer for each painting system specified, unless instructed differently in Contract Documents. Bring conflicts to attention of Architect in writing.
2. Fill minor holes and cracks in wood surfaces to receive paint or stain.
3. Surfaces to be painted shall be clean and free of loose dirt. Clean and dust surfaces before painting or finishing.
3.3 APPLICATION

A. Interface With Other Work:
   1. Coordinate with other trades for materials and systems that require painting before installation.
   2. Schedule painting and coating work to begin when work upon which painting and coating work is dependent has been completed. Schedule installation of pre-finished and non-painted items, which are to be installed on painted surfaces, after application of final finishes.

B. Paint or finish complete all surfaces to be painted or coated as described in Contract Documents.

C. Apply sealant in gaps 3/16 inch (5 mm) and smaller between two substrates that are both to be painted or coated. Sealants in other gaps furnished and installed under Section 07 9213.

D. Spread materials smoothly and evenly. Apply coats to not less than wet and dry film thicknesses and at spreading rates for specified products as recommended by Manufacturer.

E. Touch up suction spots after application of first finish coat.

F. Paint shall be thoroughly dry and surfaces clean before applying succeeding coats.

G. Make edges of paint adjoining other materials or colors clean, sharp, and without overlapping.

H. Finished work shall be a 'Properly Painted Surface' as defined in this Section.

3.4 FIELD QUALITY CONTROL

A. Non-Conforming Work:
   1. Correct deficiencies in workmanship as required to leave surfaces in conformance with 'Properly Painted Surface,' as defined in this Section.
   2. Correction of 'Latent Damage' and 'Damage Caused By Others,' as defined in this Section, is not included in work of this Section.

3.5 CLEANING

A. General:
   1. As work proceeds and upon completion of work of any painting Section, remove paint spots from floors, walls, glass, or other surfaces and leave work clean, orderly, and in acceptable condition.

B. Waste Management:
   1. Remove rags and waste used in painting operations from building each night. Take every precaution to avoid danger of fire.
   2. Paint, stain and wood preservative finishes and related materials (thinners, solvents, caulking, empty paint cans, cleaning rags, etc.) shall be disposed of subject to regulations of applicable authorities having jurisdiction.
   3. Remove debris caused by work of paint Sections from premises and properly dispose.
   4. Retain cleaning water and filter out and properly dispose of sediments.

END OF SECTION
DIVISION 08: OPENINGS

08 0100 OPERATION AND MAINTENANCE OF OPENINGS
   08 0601 HARDWARE GROUP AND KEYING SCHEDULES

08 1000 DOORS AND FRAMES
   08 1213 HOLLOW METAL FRAMES
   08 1313 HOLLOW METAL DOORS
   08 1416 FLUSH WOOD DOORS

08 4000 ENTRANCES, STOREFRONTS, AND CURTAIN WALLS
   08 4113 ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS

08 7000 HARDWARE
   08 7101 COMMON FINISH HARDWARE REQUIREMENTS
   08 7102 HANGING DEVICES
   08 7103 SECURING DEVICES
   08 7105 ACCESSORIES FOR PAIRS OF DOORS
   08 7106 CLOSING DEVICES
   08 7107 PROTECTIVE PLATES AND TRIM
   08 7108 STOPS AND HOLDERS
   08 7109 ACCESSORIES

08 8000 GLAZING
   08 8100 GLASS GLAZING

END OF TABLE OF CONTENTS
SECTION 08 1213
HOLLOW METAL FRAMES

PART 1 - GENERAL

1.1 SUMMARY
A. Products Furnished But Not Installed Under This Section:
   1. Hollow metal frames.

B. Related Requirements:
   1. Section 06 2024: ‘Door, Frame, And Finish Hardware Installation’ for installation.
   2. Section 08 4113: ‘Aluminum-Framed Entrances And Storefronts’ for aluminum entry frames.

1.2 REFERENCES
A. Reference Standards:
   1. American Architectural Manufacturers Association / Window & Door Manufacturers Association /
   2. ASTM International:
   b. ASTM A653/A653M-13, ‘Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process’.
   3. Steel Door Institute:
   b. SDI A250.11-2012, 'Recommended Erection Instructions for Steel Frames'.

1.3 SUBMITTALS
A. Informational Submittals:
   1. Copy of SDI A250.11.

PART 2 - PRODUCTS

2.1 MANUFACTURED UNITS
A. Manufacturers:
   1. Category One Approved Manufacturers. See Section 01 6200 for definitions of Categories.
      a. Any current member of Steel Door Institute.
      b. See Section 01 6200.

B. Frames:
   1. Cold rolled furniture steel.
      a. Interior Frames: 16 ga. (1.6 mm).
      b. Exterior Frames: 14 ga. (1.9 mm).
   2. Provide labeled frame to match fire rating of door.
   3. Finish:
      a. Use one of following systems:
1) Prime surfaces with rust inhibiting primer.
2) Galvanize.
4. Anchors: 16 US ga (1.6 mm) minimum meeting UL or other code acceptable requirements for door rating involved.

C. Fabrication:
1. General Requirements:
   a. Frames shall be welded units. Provide temporary spreader on each welded frame.
   b. Provide Manufacturer's gauge label for each item.
   c. Make breaks, arrises, and angles uniform, straight, and true. Accurately fit corners.
2. Frame width dimension:
   a. Fabricate frame 1/8 inch (3 mm) wider than finished wall thickness as described in Contract Documents.
3. Provide mortar guards at strikes and hinges.
4. Anchors:
   a. Provide three jamb anchors minimum for each jamb. On hinge side, install one anchor at each hinge location. On strike side, install one anchor at strike level and anchors at same level as top and bottom hinges. Tack weld anchors on frames intended for installation in framed walls.
   b. Frames installed before walls are constructed shall be provided with extended base anchors in addition to other specified anchors.
   c. Anchor types and configurations shall meet wall conditions.

PART 3 - EXECUTION: Not Used

END OF SECTION
SECTION 08 1313
HOLLOW METAL DOORS

PART 1 - GENERAL

1.1 SUMMARY

A. Products Furnished But Not Installed Under This Section:
   1. Hollow metal doors.

B. Related Requirements:
   1. Section 06 2024: 'Door, Frame, And Finish Hardware Installation' for door installation.
   2. Section 08 7105: 'Accessories For Pairs Of Doors' for astragals.

1.2 REFERENCES

A. Association Publications:
   1. National Association of Architectural Metal Manufacturers (NAAMM):
      a. HMMA 810-09, 'Hollow Metal Manual'.
      b. HMMA 860-09, 'Hollow Metal Door and Frames'.
   2. Steel Door Institute:

B. Reference Standards:
   1. American Architectural Manufacturers Association / Window & Door Manufacturers Association / Canadian Standards Association:
   2. ASTM International:
      b. ASTM A653/A653M-13, 'Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process'.
      c. ASTM C1036-11e, 'Standard Specification for Flat Glass'.
      d. ASTM C1048-12e, 'Standard Specification for Heat-Treated Flat Glass—Kind HS, Kind FT Coated and Uncoated Glass'.
   3. California Building Code (CBC):
      a. 715.4, 'Fire Door and Shutter Assemblies'. (2013).
   4. Steel Door Institute:
      a. SDI A250.8-2003(R2008), 'Standard Steel Doors and Frames'.
   5. Underwriters Laboratories, Inc.:

PART 2 - PRODUCTS

2.1 MANUFACTURED UNITS

A. Manufacturers:
   1. Approved Manufacturers. See Section 01 6200:
a. Any current member of Steel Door Institute.

B. Doors:
   1. Meet one of following requirements:
      a. Meet requirements of Steel Door Institute ANSI / SDI A250.8.
      b. Commercial grade steel meeting requirements of ASTM A568/A568M, Class 1:
         1) Grade I for interior doors, Grade II for exterior doors.
         2) Model 1 Full Flush or Model 2 Seamless designs at Manufacturer's option.
         3) Type F, G, or L as required.
         4) Finish:
            a) Interior doors primed or galvanized as per ASTM A653/A653M.
            b) Exterior doors galvanized and primed as per ASTM A653/A653M.
   2. Insulation: Insulate doors at exterior of main building sufficient to provide U-value of 0.10 maximum.

C. Fabrication:
   1. General:
      a. Mortise and reinforce doors for hinges and locks.
      b. Reinforce doors for closers and other surface applied hardware.
      c. Drill and tap on job.
      d. Seams along vertical edges of door need not be filled.
      e. Do not extend hinge cut out full width of door unless fill strip is inserted, weld filled, and ground smooth so no seam appears on back face plate.
      f. Double doors shall have overlapping rolled steel astragal.

2.2 SOURCE QUALITY CONTROL

A. Tests:
   1. Verification of Performance:
      a. Label each door as conforming to above required standards.

PART 3 - EXECUTION: Not Used

END OF SECTION
SECTION 08 1416

FLUSH WOOD DOORS

PART 1 - GENERAL

1.1 SUMMARY

A. Products Furnished But Not Installed Under This Section:
   1. Flush wood doors.

B. Related Requirements:
   1. Section 06 2024: 'Door, Frame, And Finish Hardware Installation' for installation.
   2. Div. 9: Painting

1.2 REFERENCES

A. Abbreviations And Acronyms:
   1. AWS: Architectural Woodwork Standards (formerly AWI).
   2. FD: Fire-resistant core, fire-resistant materials assembled to stiles and rails according to methods prescribed by the testing agency to meet rigorous smoke, flame, and pressure tests.
   3. FD-5: Core with 2 layers on each side.
   4. ME: Matching edges, i.e., vertical edges same as decorative faces.
   5. PC: Particleboard core, solid core door with stiles and rails bonded to the core and abrasive planed flat prior to the application of the faces.
   6. PC-5: Core with 2 layers on each side.

B. Association Publications:

C. Definitions:
   1. Adhesive, Type I (fully waterproof): Forms a bond that will retain practically all of its strength when occasionally subjected to a thorough wetting and drying; bond shall be of such quality that specimens will withstand shear and the two-cycle boil test specified in ANSI/HPVA HP (latest edition).
   2. Book-Match: Matching between adjacent veneer leaves on one panel face. Every other piece of veneer is turned over so that the adjacent leaves are “opened” as two pages in a book. The fibers of the wood, slanting in opposite directions in the adjacent leaves, create a characteristic light and dark effect when the surface is seen from an angle.
   3. Core: The material (typically, veneer, lumber, particleboard, medium-density fiberboard, or a combination of these) on which an exposed surface material (typically, veneer or HPDL) is applied.
   4. Core, Solid: The innermost layer or section in flush door construction. Typical constructions are as follows:
      a. Core, Mineral: A fire-resistant core material generally used in wood doors requiring fire ratings of 3/4 hours or more.
      b. Particleboard - A solid core of wood or other lignocellulose particles bonded together with a suitable binder, cured under heat, and pressed into a rigid panel in a flat-platen press.
   5. Face Veneer: The outermost exposed wood veneer surface of a veneered wood door, panel, or other component exposed to view when the project is completed.
6. Fire-rated: Fire-retardant particleboard with an Underwriters’ Laboratory (UL) stamp for Class 1 fire rating (Flame Spread 20, Smoke Developed 25). Fire-rated doors are available with particleboard and mineral cores for ratings up to 1-1/2 hours.

7. Fire-rated Door: A door made of fire-resistant material that can be closed to prevent the spread of fire and can be rated as resisting fire for 20 minutes (1/3 hour), 30 minutes (1/2 hour), 45 minutes (3/4 hour) (C), 1 hour (B), or 1-1/2 hours (B). The door must be tested and carry an identifying label from a qualified testing and inspection agency.

8. Flitch: A hewn or sawn log made ready for veneer production or the actual veneer slices of one half log, kept in order, and used for the production of fine plywood panels.

9. Grade: Unless otherwise noted, this term means Grade rules for Economy, Custom, and/or Premium Grade.
   a. Custom Grade: Typically specified for and adequately covers most high-quality architectural woodwork, providing a well-defined degree of control over a project’s quality of materials, workmanship, or installation.
   b. Premium Grade: The highest Grade available in both material and workmanship where the highest level of quality, materials, workmanship, and installation is required.

10. Plain Slicing: Most commonly used for hardwood plywood. The log is cut in half, and one half is placed onto a carriage and moved up and down past a fixed knife to produce the veneers. Veneer is sliced parallel to the pith of the log and approximately tangent to the growth rings to achieve flat-cut veneer. Each piece is generally placed in a stack and kept in order. One half log, sliced this way, is called a “flitch.”

11. Running Match: Each panel face is assembled from as many veneer leaves as necessary. Any portion left over from one panel may be used to start the next.

12. Stile-and-Rail Construction: A technique often used in the making of doors, wainscoting, and other decorative features for cabinets and furniture. The basic concept is to capture a panel within a frame, and in its most basic form it consists of five members: the panel and the four members that make up the frame. The vertical members of the frame are called stiles, while the horizontal members are known as rails.

D. Reference Standards:
   1. American Architectural Manufacturers Association / Window & Door Manufacturers Association / Canadian Standards Association:

   2. ASTM International:
      b. ASTM C1048-12e, ‘Standard Specification for Heat-Treated Flat Glass—Kind HS, Kind FT Coated and Uncoated Glass’.

   3. Underwriters Laboratories, Inc.

1.3 SUBMITTALS

A. Action Submittals:
   1. Shop Drawings:
      a. Schedule showing type of door at each location. Included shall be size, veneer, core type, fire rating, hardware prep, openings, blocking, etc.
      b. Indicate factory finish color and type.

B. Closeout Submittals:
   1. Include following information in Operations And Maintenance Manuals specified in Section 01 7800:
      a. Record Documentation:
1) Manufacturers Documentation:
   a) Manufacturer’s product literature on doors and factory finish.
   b) Maintenance and repair instructions.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Delivery And Acceptance Requirements:
   1. Deliver in clean truck and, in wet weather, under cover.
   2. Deliver to building site only after plaster, cement, and taping compound are completed and dry and after interior painting operations have been completed.

B. Storage And Handling Requirements:
   1. Store doors in a space having controlled temperature and humidity range between 25 and 55 percent.
   2. Store flat on level surface in dry, well ventilated space.
   3. Cover to keep clean but allow air circulation.
   4. Do not subject doors to direct sunlight, abnormal heat, dryness, or humidity.
   5. Handle with clean gloves and do not drag doors across one another or across other surfaces.
   6. Doors have been acclimated to the field conditions for a minimum of 72 hours before installation is commenced.

1.5 WARRANTY

A. Manufacturer Warranty:
   1. Manufacturer’s standard full door warranty for lifetime of original installation.
      a. Warranty shall include finishing, hanging, and installing hardware if manufacturing defect was discovered after door was finished and installed.
      b. Warranty to include defects in materials including following:
         1) Delaminating in any degree.
         2) Warp or twist of 1/4 inch (6 mm) or more in door panel at time of one-year warranty inspection.
         3) Telegraphing of core assembly: Variation of 1/100 inch (0.25 mm) or more in 3 inch (75 mm) span.

PART 2 - PRODUCTS

2.1 MANUFACTURED UNITS

A. Manufacturers:
   1. Approved Manufacturers. See Section 01 6200 for definitions of Categories.
      a. Graham Wood Doors, Mason City, IA.
      b. Marshfield Door Systems Inc, Marshfield, WI.
      c. VT Industries, Holstein, IA.
      d. Equal as approved by Architect prior to bidding.

B. Wood Doors:
   1. For Opaque Finish:
      a. Type: AWS PC-5.
      b. Grade: AWS Economy.
      c. Face Veneer: Paint grade Birch.
      d. Adhere all glue lines with Type II adhesive minimum, including veneer lay-up.
   2. Core:
      a. Fully bonded to stiles and rails and sanded as a unit before applying veneers.
b. Non-Rated And Fire-rated, AWS FD 1/3:
   1) 32 lb density meeting requirements of ANSI A208.1 Mat Formed Wood Particle Board, Grade 1-L-1 minimum.
   2) Stiles:
      a) 1-3/8 inches (35 mm) deep minimum before fitting.
      b) Stile face to be hardwood matching face veneer material, thickness manufacturer's standard.
   3) Rails:
      a) 1-1/8 inches (28 mm).
      b) Manufacturer's option.

3. Factory Glazing:
   a. Glazing:
      1) Wired glazing meeting requirements of ASTM C 1036, Type II, Class I - Clear, Quality - q8 Glazing Select, Form I polished both sides, Mesh - m1 welded square.
      3) Thickness 1/4 inch (6 mm).
   b. Lite Kit:
      1) Design Criteria:
         a) Fire-rated, pre-finished, fire-rated wood veneer frames.
      2) Approved Products:
         a) Profile W6 by Marshfield.
         b) Profile VT1 by VT Industries.

C. Fabrication:
   1. Doors shall be factory-machined. Coordinate with Section 08 1213 and Sections under 08 7000.
   2. Provide doors requiring lites with factory- or shop-installed lites and stops to match fire rating of door.

2.2 SOURCE QUALITY CONTROL

A. Inspections:
   1. Verification of Performance:
      a. Doors shall have following information permanently affixed on top of door:
         1) Manufacturer:
         2) Door designation or model.
         3) Veneer species.

PART 3 - EXECUTION: Not Used

END OF SECTION
SECTION 08 4113

ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Furnish and install aluminum storefront entry and window systems, including hardware, glazing, and caulking, as described in Contract Documents and including the following:

B. Related Requirements:
   1. Section 07 9213: Quality of sealants.
   2. Section 08 7103: Locking cylinders.
   3. Section 08 8100: Quality of glass glazing.
   4. Section 28 'Access Control System':
      a. Coordination and location of pull string inside storefront door mullion for electric strike and proximity reader.
   5. Division 26: Raceway, boxes, wiring for controls and operator.

1.2 REFERENCES

A. Association Publications:
   1. American Architectural Manufacturers Association (AAMA):
      a. AAMA 506-11, 'Voluntary Specifications for Impact and Cycle Testing of Fenestration Products'.
      d. AAMA 611-12, 'Voluntary Standards for Anodized Architectural Aluminum'.
      e. AAMA 701/702-11, 'Voluntary Specification for Pile Weatherstripping and Replaceable Fenestration Weatherseals'.
   2. Glass Association of North America (GANA):
      a. 'Glazing Manual'.
   3. National Association of Architectural Metal Manufacturers (NAAMM):
      a. Metal Finishes Manual for Architectural and Metal Products.

B. Definitions:
   1. Activation Device: Device that, when actuated, sends electrical signal to door operator to open door.
   2. Exit Device: Door locking mechanism designed to be always operable from interior by pressure on crash bar or lever.
   3. Deadbolt: Lock in which a bolt is moved by means of key or thumb turn, and is positively stopped in its projected position.
   4. Door Closer: Device or mechanism to control door during its opening and closing cycle; may be overhead or floor mounted, and either exposed or concealed.
   5. Glass Surface:
      a. Insulated glass unit:
         1) Surface 1: Exterior surface of outer lite.
         2) Surface 2: Interspace-facing surface of outer lite.
         3) Surface 3: Interspace-facing surface of inner lite.
         4) Surface 4: Interior surface of inner lite.
6. Hinge: Hardware device by means of which a door is suspended in its frame, allowing it to swing.
7. Pull Hardware: Fixed handle or grip used to pull door open.
8. Push Hardware: Fixed bar or plate used to push door open.
9. Safety Device:
   a. Device that prevents door from opening or closing, as appropriate.
10. Sweep Strip:
    a. Weatherstrip mounted at top or bottom edge of swing door.
11. Threshold:
    a. Lower horizontal member of door frame set on floor and extends from jamb to jamb.

C. Reference Standards:
1. American National Standards Institute / Builders Hardware Manufacturers Association:
   b. ANSI/BHMA A156.3-2008, ‘Exit Devices’.
   c. ANSI/BHMA A156.4-2013, ‘Door Controls-Closers’.
   d. ANSI/BHMA A156.5-2010, ‘Cylinders and Input Devices for Locks’.
   e. ANSI/BHMA A156.6-2010, ‘Architectural Door Trim’.
   f. ANSI/BHMA A156.18-2012, ‘Materials and Finishes’.
2. ASTM International:
   e. ASTM E2112-07, ‘Standard Practice for Installation of Exterior Windows, Doors and Skylights’.
3. California Building Code (CBC):
4. California Code Council / American National Standards Institute:
5. National Fenestration Rating Council (NFRC):
6. National Fire Protection Association / American National Standards Institute:

1.3 SUBMITTALS

A. Action Submittals:
1. Product Data:
   a. Manufacturer’s literature.
      1) Storefront entry system.
      2) Low-energy door operator.
   b. Color and finish.
2. Shop Drawings:
   a. Show locations, sizes, etc, of hardware reinforcing.

B. Informational Submittals:
1. Qualification Statement:
   a. Installer:
      1) Provide Qualification documentation if requested by Architect or Owner.

C. Closeout Submittals:
1. Include following in Operations And Maintenance Manual specified in Section 01 7800:
   a. Operations and Maintenance Data:
      1) Maintenance, adjustment, and repair instructions.
   b. Warranty Documentation:
      1) Final, executed copy of Warranty.
         a) Storefront warranty.
         b) Storefront closers.
         c) Low-energy door operator.
   c. Record Documentation:
      1) Manufacturers documentation:
         a) Manufacturer's literature or cut sheets for storefront system and for each item of
            hardware.
         b) Manufacturer's literature of cut sheets for low-energy door operators.
         c) Color and finish selections.
         d) Parts lists.

1.4 QUALITY ASSURANCE

A. Regulatory Agency Sustainability Approvals:
   1. Provide wind load and impact testing by testing laboratory when required by local codes and
      jurisdictions.
      a. See Section 01 4523 for Testing and Inspection administrative requirements and
         responsibilities for Testing Agencies and Section 01 4301 for Testing Agency Qualifications.

B. Qualifications: Requirements of Section 01 4301 applies, but not limited to following:
   1. Manufacturer Qualifications:
      a. Provide aluminum entrances and storefront systems produced by a firm experienced in
         manufacturing systems that are similar to those indicated for this project and that have a
         record of successful in service performance.
   2. Fabricator Qualifications:
      a. Provide aluminum entrances and storefront systems fabricated by a firm experienced in
         producing systems that are similar to those indicated for this Project, and that have a record
         of successful in service performance.
      b. Fabricator shall have sufficient production capacity to produce components required without
         causing delay in progress of the Work.
   3. Installer Qualifications:
      a. Minimum three (3) years experience in storefront installations.
      b. Minimum five (5) satisfactorily completed projects of comparable quality, similar size, and
         complexity in past three (3) years before bidding.
      c. Upon request, submit documentation.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Delivery And Acceptance Requirements:
   1. Deliver all parts of door, together with hardware, in original, unopened packages with labels intact
      to Project at same time.

B. Storage And Handling Requirements:
   1. Store in clean, dry location, indoors in Manufacturer's unopened packaging until ready for
      installation and in accordance with Manufacturer's instructions.
   2. Stack framing components in a manner that will prevent bending and avoid significant or
      permanent damage.
   3. Protect materials and finish from damage during handling and installation.
1.6 WARRANTY

A. Manufacturer Warranty:
   1. Storefront Entrances:
      a. Manufacturer’s Warranty to be free of defects in material and workmanship.
      b. Manufacturer’s Warranty against deterioration or fading.
      c. Manufacturer’s Lifetime Warranty for Door Construction for normal use.
   2. Closers:
      a. Closer Manufacturer's standard warranty, 10 years minimum.
   3. Low-Energy Door Operator:
      a. Manufacturer’s standard warranty.

PART 2 - PRODUCTS

2.1 ASSEMBLIES

A. Manufacturers:
   1. Category One VMR Approved Manufacturers. See Section 01 6200 for definitions of Categories:
         1) Contact Information: Paul Cannon, West Valley City, UT (801) 201-1080, FAX 801-768-4588 paul.cannon@alcoa.com.

B. Materials:
   1. Frames:
      a. Aluminum:
         1) 6063-T5 aluminum alloy or meet requirements of ASTM B221, alloy GS 10A-T6 or T6.
      b. Sills:
         1) Match height of door bottoms.
      c. Sealer Tape:
         1) 3M.
      d. Fasteners:
         1) Aluminum or non-magnetic stainless steel.
         2) Concealed fastenings shall be cadmium or zinc-plated steel.
      e. Finish:
         1) Match doors.
      f. Approved Products. See Section 01 6200:
         1) Double Glazed:
            a) Trifab 451 by Kawneer.
   2. Manually Operated Doors:
      a. Aluminum:
         1) 6063 T5 aluminum alloy, or meet requirements of ASTM B221, alloy GS 10A-T6 or T6.
      b. Stiles:
         1) 3-1/2 inches by 1-3/4 inches by 0.125 inches (89 mm by 45 mm by 3.175 mm) thick nominal.
      c. Top Rails:
         1) 5-3/4 inches minimum by 1-3/4 inches by 0.125 inches (146 mm minimum by 45 mm by 3.175 mm) thick nominal.
      d. Bottom Rails:
         1) 10 inches minimum by 1-3/4 inches by 0.125 inches (254 mm minimum by 45 mm by 3.175 mm) thick nominal.
      e. Construction:
         1) Manufacturer's standard.
      f. Glazing Stops:
         1) Snap-in type with neoprene bulb-type glazing. Units shall be glazed from exterior side.
      g. Weatherstripping:
         1) Neoprene bulb-type.
2) Approved Products. See Section 01 6200
   a) Sealair by Kawneer.
   b) Equal as approved by Architect prior to bidding.

h. Finish:
   1) AA-M12C22A42 Class I Dark Bronze anodized to match existing.

i. Approved Products. See Section 01 6200
   1) 350 Medium Stile by Kawneer.

j. Approved Products. See Section 01 6200
   1) 350 Medium Stile by Kawneer.

3. Hardware:
   a. Hinging:
      1) Top and bottom offset, ball bearing pivots per door leaf.
   b. Overhead Door Closers:
      1) Provide parallel arms on closers unless door position requires otherwise.
      2) Where possible, closers shall allow for 180 degree opening and not be used as stop.
         Provide Cush-N-Stop or equivalent arm where wall stop cannot be used.
      3) Adjust closers to provide maximum opening force as required by governing code authority.
      4) Closers shall have following features:
         a) Adjustable sweep speed.
         b) Adjustable backcheck.
         c) Non-handed, non-sized.
         d) Cush arm by LCN or equal by Norton.
   5) Approved Products. See Section 01 6200.
      a) Surface mounted:
      b) 4041 Series parallel arm by LCN.
      c) 7500 Series Parallel arm by Norton.

c. Exit Devices:
   1) Entry Doors:
      a) Operation:
         (1) Entry shall be by key. Device shall be locked by cylinder from outside. Key shall be removable when cylinder is in locked or unlocked position.
         (2) Dogging operation shall be by manufacturer's accessible thumbturn cylinder function.
         (3) Exterior Trim: Lever Handle or Pull equal to Kawneer CO-9.
         (4) Types: Rim Type. Provide type of strike that will allow installation of specified panic devices on storefront system specified.
   2) Access Doors:
      a) Operation:
         (1) Access accomplished by dogging device. Dogging operation shall be by accessible, permanent knob, not by removable allen wrench devices.
         (2) Exterior Trim: Match Entry Doors.
         (3) Types: Rim Type. Provide type of strike that will allow installation of specified panic devices on storefront system specified.
   3) Emergency Egress Exit Doors:
      a) Operation:
         (1) Exit only with no dogging.
         (2) Exterior Trim: None.
         (3) Type: Rim Type with type of strike that will allow installation of specified panic devices on storefront system specified.
   4) Color:
      a) To match existing.
   5) Approved Products. See Section 01 6200:
      a) Apex Series by Precision.
      b) 80 Series by Sargent.
      c) 98 or 99 Rim Series by Von Duprin.

d. Thresholds:
   1) Exterior:
      a) Design Criteria: Meet handicap accessibility requirements.
b) Exterior to Carpet Tile: Similar to Pemko 273 Profile.
e. Sweep Strips:
   1) Quality Standard:
      a) Entrance Manufacturer’s standard.
      b) Pemko 18041PWP.
f. Push / Pulls:
   1) Approved Products. See Section 01 6200
      a) Kawneer CP and CO-9, color to match door
g. Kick Plates:
   1) Push side of Door only.
   2) 10 inches (254 mm) high by width of door less 3/4 inch (19 mm) on each side.
   3) Material: 0.050 inch (1.27 mm) thick Stainless Steel.
   4) Acceptable Manufacturers:
      b) Hager, St Louis, MO  (800) 255-3590 or (314) 772-4400  www.hagerhinge.com.
      e) Equal as approved by Architect before bidding. See Section 01 6200.

C. Fabrication:
   1. Construction shall meet Manufacturer’s recommendations.
   2. Fabricate in factory to dimensions required to fit framed openings detailed on Contract Documents. Joints shall be tightly closed.
   3. Mortise in manner to give maximum hardware-door connection strength and neatness of appearance. Adequately reinforce with backplates or rivnuts to hold pivots and closers.

D. Hardware Finishes:
   1. Finishes for steel, brass, or bronze hardware items shall match door color.
   2. Materials other than steel, brass, or bronze shall be finished to match door color.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification Of Conditions:
   1. Verify that framed openings comply with Contract Document requirements.
   2. Verify floor is level across entire width of automatic door opening.
   3. Verify sill conditions are level and/or sloped away from openings as specified.
   4. Notify Architect and Owner in writing if framed openings are not as agreed upon.
      a. Do not install storefront entry and window frames until deficiencies in framed openings have been corrected to allow installation of standard entries and windows.
      b. Commencement of Work by installer is considered acceptance of substrate.

3.2 INSTALLATION

A. General:
   1. Installation shall meet or exceed all applicable federal, state and local requirements, referenced standards and conform to codes and ordinances of authorities having jurisdiction.
   2. All installation shall be in accordance with manufacturer’s published recommendations.
   3. Do not install damaged components. Fit frame joints tight, free of burrs and distortion. Rigidly secure non-movement joints.
   4. Isolate metal surfaces in contact with incompatible metal or corrosive substrates, including wood, by applying sealer tape to prevent electrolytic action.

B. Set plumb, square, level, and in correct alignment and securely anchor to following tolerances:
1. Variation from plane: Limit to 1/8 inch (3 mm) in 12 feet (3.6 meters); 1/4 inch (6 mm) over total length.
2. Offset from Alignment: For surfaces abutting in line, limit offset to 1/16 inch (1.6 mm).
3. Offset at Corners: For surfaces meeting at corner, limit offset to 1/32 inch (0.8 mm).
4. Diagonal measurements: Limit difference between diagonal measurements to 1/8 inch (3 mm).

C. Install doors without warp of rack. Adjust doors and hardware to provide 90 degree operation, tight fit at contact points and smooth operation.

D. Install exterior window units with through wall sill flashing.

E. Thresholds:
   1. Accurately cut thresholds to fit profile of storefront frame. Bed exterior thresholds in specified sealant at contact points with floor and make watertight.

F. Sealants:
   1. Apply in accordance with Section 07 9213 'Elastomeric Joint Sealant'.
   2. Caulk joints between frames and walls, both interior and exterior to provide weather tight installation.

G. Glazing Characteristics:
   1. Exterior Storefront Doors Opening Into Foyers And Corridors:

3.3 FIELD QUALITY CONTROL

A. Field Tests And Inspections:
   1. Pull test doors to ensure security of opening.

B. Non-Conforming Work:: Non-conforming work as covered in the General Conditions applies, but is not limited to the following:
   1. Correct any work found defective or not complying with contract document requirements including removal and replacement of glass that has been broken, chipped, cracked, abraded, or damaged during construction period at no additional cost to the Owner.

3.4 ADJUSTING

A. Adjust doors for proper operation after glazing entry. After repeated operation of completed installation, re-adjust door for optimum operating condition and safety if required.

3.5 PROTECTION

A. During Installation:
   1. Installer’s Responsibility:
      a. During installation, all adjacent work shall be protected from damage.

B. After Installation:
   1. General Contractor’s Responsibility:
      a. Institute protective measures required throughout remainder of construction period to ensure that aluminum entrances and storefronts will be without damage or deterioration, other than normal weathering, at time of acceptance.
3.6 CLEANING

A. General:
   1. Installer’s Responsibility:
      a. Follow Manufacturer’s written recommendations for cleaning and maintenance or guidelines of AAMA Publications 609 & 610-02 ‘Cleaning and Maintenance Guide for Architecturally Finished Aluminum’ (combined documents).
      b. Clean glass and aluminum surfaces, inside and out, promptly after installation. Remove excess glazing and sealant compounds, dirt, and other substances. Exercise care to avoid damage to coatings.
      c. Remove nonpermanent labels, protective films, and clean surfaces following recommended procedures.
         1) Do NOT remove permanent ANSI/AAMA/CSA or NFRC labels.

B. Waste Management:
   1. Upon completion and verification of performance of installation, remove surplus materials, excess materials, rubbish, tools and equipment.

END OF SECTION
SECTION 08 7101
COMMON FINISH HARDWARE REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. General requirements for finish hardware related to architectural wood and hollow metal doors.

B. Related Requirements:
   1. Section 06 2024: Installation.
   2. Section 08 0601: Hardware Group Schedules.

1.2 REFERENCES

A. Association Publications:
   1. Builders Hardware Manufacturers Association (BHMA), 355 Lexington Avenue, 15th Floor, New

1.3 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Hardware Templates:
      a. Provide hardware templates to Sections 08 1429 as soon as possible after Architect
         approves hardware schedule.
      b. Supply necessary hardware installation templates to Section 06 2024 before installation.

1.4 SUBMITTALS

A. Action Submittals:
   1. Product Data:
      a. Manufacturer’s cut sheets.
      b. Two copies of Manufacturer’s installation, adjustment, and maintenance instructions for each
         piece of hardware. Include one set in Operations And Maintenance Manual and send one
         set with hardware when delivered.
      c. Copy of hardware schedule.
      d. Written copy of keying system explanation.
   2. Shop Drawings:
      a. Submit hardware schedule indicating hardware to be supplied.
      b. Schedule shall indicate details such as proper type of strikeplates, spindle lengths, hand,
         backset, and bevel of locks, hand and degree opening of closer, length of kickplates, length
         of rods and flushbolts, type of door stop, and other necessary information necessary to
         determine exact hardware requirements.

B. Closeout Submittals:
   1. Include following in Operations And Maintenance Manual specified in Section 01 7800:
      a. Operations and Maintenance Data:
         1) Manufacturer’s installation, adjustment, and maintenance instructions for each piece of
            hardware.
b. Record Documentation:
   1) Manufacturers documentation:
      a) Manufacturer's literature and/or cut sheets.
      b) Include keying plan and bitting schedule.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Storage And Handling Requirements:
   1. Neatly and securely package hardware items by hardware group and identify for individual door
      with specified group number and set number used on Supplier's hardware schedule.
   2. Include fasteners and accessories necessary for installation and operation of finish hardware in
      same package.

PART 2 - PRODUCTS

2.1 FINISHES

A. Hardware Finishes:
   1. Finishes for brass or bronze hardware items shall be:
      a. ANSI / BHMA Finish Code 613 or 690.
         1) Description: Bronze to match existing
         2) Base Metal: Brass. Bronze.
   2. Finishes for flat goods items may be:
      a. ANSI / BHMA Finish Code 613 or 690.
         1) Description: Bronze to match existing
         2) Base Metal: Stainless Steel (300 Series).
   3. Materials other than steel, brass, or bronze shall be finished to match appearance bronze plated.

2.2 FASTENERS

A. Fasteners shall be of suitable types, sizes and quantities to properly secure hardware. Fasteners shall
   be of same material and finish as hardware unless otherwise specified. Fasteners exposed to weather
   shall be non-ferrous or corrosion resisting steel.

PART 3 - EXECUTION

3.1 PREPARATION

A. Before ordering materials, examine documents to be assured that material to be ordered is
   appropriate for substrate to which it is to be secured and will function as intended.

END OF SECTION
SECTION 08 7102
HANGING DEVICES

PART 1 - GENERAL

1.1 SUMMARY

A. Products Furnished But Not Installed Under This Section:
   1. Hinges for flush wood doors.

B. Related Requirements:
   1. Section 08 7101: Common Hardware Requirements.

PART 2 - PRODUCTS

2.1 MANUFACTURED UNITS

A. Manufacturers:
   1. Manufacturer Contact List:

B. Hinges:
   1. Sizes:
      a. 1-3/4 inch (45 mm) doors and fire-rated doors in metal frames:
         1) Standard: 4-1/2 inches by 4-1/2 inches (115 mm by 115 mm).
      2. Use non-removable pins on exterior opening doors.
      3. Hinges on exterior doors shall be solid brass, plated to achieve specified finish.
      4. Approved Products. See Section 01 6200:
         a. Interior:
            1) Hager: BB 1279.
            2) Ives: 5BBI.
            4) MacPro / McKinney: MPB79.
            5) PBB: BB81.
            6) Stanley: FBB 179.
         b. Exterior:
            1) Hager: BB 1191.
            2) Ives: 5BBI.
            3) McKinney: TA 2314.
            4) PBB: BB21.
            5) Stanley: FBB 191.

PART 3 - EXECUTION: Not Used

END OF SECTION
SECTION 08 7103
SECURING DEVICES

PART 1 - GENERAL

1.1 SUMMARY

A. Products Furnished But Not Installed Under This Section:
   1. Items for architectural wood or hollow metal doors:
      a. Cylinders.
      b. Interior exit devices.
   2. Miscellaneous Items:

1.2 DELIVERY, STORAGE, AND HANDLING

A. Delivery And Acceptance Requirements:
   1. Standard Key Delivery:
      a. Include change keys with hardware.

PART 2 - PRODUCTS

2.1 MANUFACTURED UNITS

A. Manufacturers:
   1. Manufacturer List:

B. General:
   1. Backsets shall be 2-3/4 inches (70 mm).

C. Locksets And Latchsets:
   1. Lever Operated:
      a. Approved Products. See Section 01 6200.
         1) 7K Series Best Lock by Stanley standard cylinders - (I/C cores may be used when authorized by PFD HQ).
         2) 7 Series by Sargent.
         3) AL Series by Schlage.
         4) 5300LN by Yale.
      
D. Standard Cylinders:
   1. Provide cylinders for interior exit devices requiring cylinders.
   2. Approved Products. See Section 01 6200.
      a. Match Manufacturer of locksets.
E. Exit Devices:
   1. Use operable lever trim.
   2. Provide labeled hardware where required by local code authority.
   3. Products. See Section 01 6200.
      a. Apex Series by Precision.
      b. 80 Series by Sargent.
      c. 99 or 98 Series by Von Duprin.
      d. 7100 Series by Yale.

PART 3 - EXECUTION: Not Used

END OF SECTION
SECTION 08 7105
ACCESSORIES FOR PAIRS OF DOORS

PART 1 - GENERAL

1.1 SUMMARY

A. Products Furnished But Not Installed Under This Section:
   1. Coordinators.
   2. Astragals.

B. Related Requirements:
   1. Section 08 1313: Astragals for steel doors.
   2. Section 08 7101: Common Hardware Requirements

PART 2 - PRODUCTS

2.1 MANUFACTURED UNITS

A. Manufacturers:
   1. Manufacturer Contact List:

B. Coordinators:
   1. Approved Products. See Section 01 6200:
      a. CO2 x FB1 by Glynn Johnson.
      b. 297D by Hager.
      c. Series 900 by Ives.
      d. 1600 Series by Rockwood.

C. Astragals:
   1. Acceptable Products:
      a. 835S by Hager.
      b. 139 DKB by NGP.
      c. 357D by Pemko.
      d. Equal as approved by Architect before installation. See Section 01 6200.

PART 3 - EXECUTION: Not Used

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. Products Furnished But Not Installed Under This Section:
   1. Closers for flush wood doors.
   2. Closers for metal doors

B. Related Requirements:
   1. Section 08 7101: ‘Common Finish Hardware Requirements’.
   2. Section 08 7108: ‘Stops And Holders’.

1.2 SUBMITTALS

A. Closeout Submittals:
   1. Include following in Operations And Maintenance Manual specified in Section 01 7800:
      a. Warranty Documentation:
         1) Manufacturer’s final, executed copy of warranty.

1.3 WARRANTY

A. Manufacturer Warranty:
   1. Manufacturer’s Standard Warranty, five (5) years minimum.

PART 2 - PRODUCTS

2.1 MANUFACTURED UNITS

A. Manufacturers:
   1. Approved Manufacturers. See Section 01 6200

B. Surface-Mounted Overhead Door Closers:
   1. Closers provided under this Section shall be from same Manufacturer.
   2. Provide parallel arms on closers unless door position in relation to adjacent wall requires otherwise. Provide covers.
   3. Door Closers on doors that swing 90 degree as shown on Contract Documents:
      a. Closers shall allow for 100 degree opening and not be used as a stop.
      b. Closers shall have following features:
         1) Adjustable sweep speed.
         2) Adjustable backcheck.
         3) Non-handed, non-sized.
         4) Hold open arm function with thumb turn or handle control (Cush And Hold).
5) Delayed action closing

PART 3 - EXECUTION

3.1 INSTALLATION
   A. Mount closers on stop side of door wherever conditions permit.
   B. Through-bolt hardware-to-door connections.

3.2 ADJUSTING
   A. Adjust closers to provide maximum opening force as required by governing code authority and proper backcheck and sweep speed.

END OF SECTION
SECTION 08 7107

PROTECTIVE PLATES AND TRIM

PART 1 - GENERAL

1.1 SUMMARY

A. Products Furnished But Not Installed Under This Section:

B. Related Requirements:
   1. Section 08 7101: Common Hardware Requirements and VMR Suppliers.

PART 2 - PRODUCTS

2.1 MANUFACTURED UNITS

A. Manufacturers:
   1. Acceptable Manufacturers:
      b. Hager, St Louis, MO  (800) 255-3590 or (314) 772-4400  www.hagerhinge.com.
      e. Equal as approved by Architect before installation. See Section 01 6200.

B. Protective Plates:
   1. Material: 0.050 inch (1.27) mm thick Stainless Steel.
   2. Sizes:
      a. Kick Plates: 10 inches (255) mm high by width of door less 3/4 inch (19 mm) on each side.

PART 3 - EXECUTION: Not Used

END OF SECTION
SECTION 08 7108

STOPS AND HOLDERS

PART 1 - GENERAL

1.1 SUMMARY

A. Products Supplied But Not Installed Under This Section:
   1. Door stops.
   2. Door stops and holders.

B. Related Sections:
   1. Section 08 7101: Common Hardware Requirements.

PART 2 - PRODUCTS

2.1 MANUFACTURED UNITS

A. Manufacturers:
   1. Manufacturer Contact List:
      e. Sargent, New Haven, CT  (800) 906-6606 or (203) 562-2151  www.sargentlock.com.

B. Stops:
   1. Use wall type stops unless indicated otherwise on Door Schedule.
   2. Provide model appropriate for substrate. Wall stops may be either cast or wrought.
   3. Acceptable Products:
      a. Hager 236W 255W 243F
      b. Ives WS407CCV WS447 FS438
      c. Rockwood 409 474 / 475 440 / 441
      d. Glynn Johnson - - - - - - - GJ 90S
      e. Sargent - - - - - - - 590S Series
      f. Equal as approved by Architect before Installation. See Section 01 6200.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Interface With Other Work: When using overhead stops, coordinate installation with door closer and other door hardware.

END OF SECTION
SECTION 08 7109
ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY
A. Products Furnished But Not Installed Under This Section:
   1. Smoke Gaskets.
B. Related Requirements:
   1. Section 08 7101: ‘Common Finish Hardware Requirements' for general finish hardware requirements and Approved Suppliers.

1.2 REFERENCES
A. Association Publications:
   1. American Architectural Manufacturers Association (AAMA):
      b. AAMA 611-12, ‘Voluntary Standards for Anodized Architectural Aluminum’.
   2. National Association of Architectural Metal Manufacturers (NAAMM):
      a. AMP 500-06, ‘Metal Finishes Manual' for Architectural and Metal Products.
B. Reference Standards:
   1. American National Standards Institute / Builders Hardware Manufacturers Association:
      a. ANSI / BHMA A156.18-2006, ‘Materials and Finishes’.
   2. International Code Council / American National Standards Institute:

PART 2 - PRODUCTS

2.1 MANUFACTURED UNITS
A. Manufacturers:
   1. Manufacturer Contact List:
      d. Equal as approved by Architect before bidding. See Section 01 6200.
B. Smoke Gaskets:
   1. Color as selected by Architect.
   2. Acceptable Products:
      a. 726 by Hager.
      b. 5050 by NGP.
      c. PK55 by Pemko.
      d. Equal as approved by Architect before bidding. See Section 01 6200.
PART 3 - EXECUTION

3.1 INSTALLATION

A. Install smoke gaskets in manner to give continuous air-tight fit.
   1. Install smoke gaskets as per Manufacturer’s installation requirements:
      a. Hinge Jamb: Install smoke gaskets on jamb face of door frame so door will compress smoke gasket.
      b. Header and Strike Jamb: Install smoke gaskets on face of stop of door frame so door will compress smoke gasket.

END OF SECTION
SECTION 08 8100

GLASS GLAZING

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Quality of glazing used in entries, doors, and windows.

B. Related Requirements:
   1. Sections Under 08 1000 Heading: Furnishing and installing of glazing for hollow metal doors and hollow metal sidelite windows.
   2. Sections Under 08 1000 Heading: Furnishing and installing of flush wood door lites in new doors.
   3. Section 08 4113: Furnishing and installing of glazing in aluminum-framed storefront.
   4. Section 08 5 000: Furnishing and installing of glazing in windows.

1.2 REFERENCES

A. Association Publications:
   1. Glass Association of North America (GANA):
      b. ‘Laminated Glass Design Guide’.
      c. ‘Engineering Standards Manual’.
   2. The Insulating Glass Manufacturers Alliance (IGMA):
      a. IGMA TB-3001 ‘Sloped Glazing Guidelines’.

B. Definitions:
   1. Airspace: Space between lites of insulating glass unit that contains dehydrated air or other inert specified gas.
   2. Emissivity: Ability of surface to absorb heat and to reflect it. Lower emissivity, the less room heat is absorbed and more heat is reflected back into the room.
   3. Glass Surface:
      a. Insulated glass unit:
         1) Surface 1: Exterior surface of outer lite.
         2) Surface 2: Interspace-facing surface of outer lite.
         3) Surface 3: Interspace-facing surface of inner lite.
         4) Surface 4: Interior surface of inner lite.
      b. Monolithic glass:
         1) Surface 1: Exterior surface.
         2) Surface 2: Interior surface.
   4. Insulation Glass: Two pieces of glass spaced apart and hermetically sealed to form single-glazed unit with air space between. Heat transmission through this type of glass may be as low as half that without air space. Also called double glazing, double pane, insulated unit, and thermal pane.
   5. Laminated Glass: Two or more sheets with inner layer of transparent plastic to which glass adheres if broken. Used for overhead, safety glazing, and sound reduction.
   6. Low-Emissivity Glass (Low-E): Reduces wintertime heat loss from interior with thin, almost colorless metallic coating that reflects heat back inside structure. Allows moderate solar heat gain while reducing harmful ultraviolet light in any season. Minimizes summertime air
conditioning loss by reflecting radiated heat to outside. May be tempered for where safety glass is required. Available in single strength clear, gray and bronze (brown) color.

7. Shading Coefficient: Ratio of solar heat gain passing through a glazing system to solar heat gain that occurs under the same conditions if the window was made of clear, unshaded double strength glass. Lower SC number, the better solar control efficiency of glazing system.

8. Solar Absorptance: Percent of incident solar radiation that is absorbed by window film/glass system. Lower the number, the less solar radiation absorbed.

9. Solar Heat Gain Coefficient (SHGC): Ratio of total solar heat passing through a given window relative to the solar heat incident on the projected window surface at normal solar incidence. (Percentage of solar energy directly transmitted or absorbed and re-radiated into a building). Lower SHGC, the better it is able to reduce heat.

10. Solar Reflectance (R): Percent of incident solar radiation that is reflected by window film/glass system. Lower the number, the less solar radiation reflected.

11. Solar Transmittance (T): Percent of incident solar radiation that is transmitted through window film/glass system. Lower the number, the less solar radiation transmitted.

12. Tempered Glass: Glass strengthened through process of heating, creating tensile strength that causes glass to resist breakage, yet disintegrate into small pieces if break occurs. Tempered glass is type of safety glass.

13. Tinted Glass: Special type glass with additives, usually metallic particles that reduce passage of sunlight. Tinted glass can be bronze, gray, green or blue as well as other more exotic colors.

14. U-Factor: Overall heat transfer coefficient of glazing system. Measure of heat transfer that occurs through glazing system, and its outer and inner surfaces. This value is a function of temperature, and is expressed in BTU per square foot per hour per degree Fahrenheit (BTU/sq ft/hr deg F). Lower the U-Factor, the better insulation qualities of glazing system.

15. U-Value: Measurement of heat transfer through film due to outdoor/indoor temperature differences. Lower U-value, less heat transfers. When using performance data, the lower U-value, better insulating qualities of window film/glass system.

16. Ultraviolet Transmittance: Percent of ultraviolet light (UV) that is transmitted by window film/glass system. Lower the number, the less ultraviolet transmitted.

17. Visible Light Transmitted (VLT): Percent of total visible light (380-780 nanometers) that passes through glass. Lower the number, the less visible light transmitted.

C. Reference Standards:

1. American National Standards Institute:
   a. ANSI Z97.1 Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test'.

2. ASTM International:
   a. ASTM C1036-11, 'Standard Specification for Flat Glass'.
   b. ASTM C1048-12, 'Standard Specification for Heat-Treated Flat Glass - Kind H, Kind FT Coated and Uncoated Glass'.
   c. ASTM C1172-09e1, 'Standard Specification for Laminated Architectural Flat Glass'.
   d. ASTM C1281-03(2009), 'Standard Specification for Preformed Tape Sealants for Glazing Applications'.
   e. ASTM E2190-10, 'Standard Specification for Insulating Glass Unit Performance and Evaluation'.


4. National Fenestration Rating Council (NFRC):
   a. NFRC 100-2010, "Procedure for Determining Fenestration Product U Properties'.
   b. NFRC 200-2010, 'Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence'.

5. National Fire Protection Association (NFPA):


1.3 SUBMITTALS

A. Action Submittals:
   1. Product Data:
      a. Manufacturer’s data sheets for each glass product and glazing material.
   2. Samples:
      a. Provide 12 inch (300 mm) by 12 inch (300 mm) sample with color required for spandrel glass.

B. Informational Submittals:
   1. Qualification Statement:
      a. Installer:
         1) Provide Qualification documentation if requested by Architect or Owner.

C. Closeout Submittals:
   1. Include following in Operations And Maintenance Manual specified in Section 01 7800:
      a. Warranty Documentation:
         1) Final, executed copy of Warranty.

1.4 QUALITY ASSURANCE

A. Regulatory Agency Sustainability Approvals:
   2. Comply with published recommendations of glass product Manufacturers and organizations, except where more stringent requirements are indicated.
   3. Glazing for Fire-Rated Door and Window Assemblies:
      a. Glazing tested per NFPA 252 and NFPA 257, as applicable, for assemblies complying with NFPA 80 and listed and labeled per requirements of authorities having jurisdiction.

B. Qualifications:
   1. Installer: Requirements of Section 01 4301 applies, but not limited to following:
      a. Satisfactorily completed at least three (3) installations of similar size, scope, and complexity in each of past two (2) years and be approved by glass product Manufacturer before bidding.
      b. Upon request, submit documentation.

C. Certifications:
   1. Labels showing strength, grade, thickness, type, and quality are required on each piece of glass.
   2. Manufacturers/Fabricators certifying products furnished comply with project requirements.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Delivery And Acceptance Requirements:
   1. Follow Manufacturer’s instruction for receiving, handling, and protecting glass & glazing materials to prevent breakage scratching, damage to seals, or other visible damage.
   2. Deliver materials in manufacturer’s original, unopened, undamaged containers with identification labels intact.

B. Storage And Handling Requirements:
   1. Follow Manufacturer’s instruction for storing and protecting glass & glazing materials.
2. Store materials protected from exposure to harmful environmental conditions and at temperatures and humidity conditions recommended by Manufacturer.
3. Protect edge damage to glass, and damage/deterioration to coating on glass.

1.6 FIELD CONDITIONS

A. Ambient Conditions:
   1. Do not proceed with glazing when ambient and substrate temperature conditions are outside the limits permitted by glazing material manufacturer or when joint substrates are wet due to rain, frost, condensation or other causes.

1.7 WARRANTY

A. Manufacturer Warranty:
   1. Insulating Glass Warranty:
      a. Manufacturer’s standard form, signed by insulating-glass product Manufacturer/Fabricator, agreeing to replace insulating-glass units that exhibit failure of hermetic seal under normal use evidenced by obstruction of vision by dust, moisture, or film on interior surfaces of glass, for ten [10] years of date of installation.
   2. Installer’s Warranty:
      a. Form acceptable to Owner, signed by glass product Installer, agreeing to replace glass products that deteriorate, or that exhibit damage or deterioration of glass or glazing products due to faulty installation, for two (2) years from date of installation.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Manufacturers:
   1. Manufacturer Contact List for Low E Glazing:
      a. AGC Flat glass North America, Kingsport, TN  www.us.agc.com
      d. Oldcastle BuildingEnvelope, Santa Monica, CA  www.oldcastlebe.com
      e. Pilkington North America Inc., Toledo, OH  www.pilkington.com
      f. PPG Industries, Pittsburgh, PA  www.ppgglass.com

B. Storefront Glazing:
   1. Thickness: 1/4 inch (6 mm).
   2. Glazing shall have following characteristics:
      a. Low-Emissivity (or Low E):
         1) Design Criteria:
            a) Clear.
            b) Insulated Glass: 1 inch (25 mm) units with 1/2 inch (13 mm) airspace and two (2) 1/4 inch (6 mm) lites.
            c) Meet requirements of ASTM C1036, Type I, Class I, Quality Q3.
            d) Location: Surface 2.
         2) Low-Emissivity (or Low E) Acceptable Product:
            a) Performance Standard:
               (1) 64 percent Visible Light Transmission (VLT).
               (2) 0.28 U-value winter.
               (3) 0.26 U-value summer.
               (4) 0.27 Solar Heat Gain Coefficient (SHGC).
               (5) 0.32 Shading Coefficient.
b) Quality Standard:
   (1) Cardinal LoE³-366.
   (2) Solarban 70 XL.
   (3) Equal product by Acceptable Manufacturer as approved by Architect before bidding. See Section 01 6200.

3) Acceptable Manufacturers:
   a) AGC.
   b) Guardian.
   c) PPG.
   d) Equal as approved by Architect before bidding. See Section 01 6200.
   e) #62.

b. Glazing Below Door Height:
   1) Design Criteria:
      a) Tempered.
      b) Meet requirements of ASTM C1048, Kind FT, Condition A, Type I, Class I, Quality Q3.

C. Fabrication:
   1. Except where glass exceeds 66 inches (1 675 mm) in width, cut clear glass so any wave will run horizontally when glazed.
   2. Sealed, Insulating Glazing Units:
      a. Double pane, sealed insulating glass units. Install at exterior windows and exterior aluminum-framed storefront.
      b. Unit Thickness: 5/8 inch (16 mm) minimum, one inch (25 mm) maximum.
      c. Type Seal:
         1) Metal-to-glass bond and separated by 1/2 inch (12.7 mm) dehydrated air space.
         2) Use non-hardening sealants.
      d. Approved Fabricators. See Section 01 6200.
         1) Members of Sealed Insulating Glass Manufacturer's Association.

2.2 ACCESSORIES

A. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.

B. Glazing Tape: Butyl-based elastomeric tape with integral resilient tube spacer, 10 to 15 Shore A durometer hardness, black color, coiled on release paper; widths required for specified installation, complying with ASTM C1281 and AAMA 800 for application.

PART 3 - EXECUTION: Not Used

END OF SECTION
DIVISION 09: FINISHES

09 0500 COMMON WORK RESULTS FOR FINISHES

09 0503 Flooring Substrate Preparation

09 2000 PLASTER AND GYPSUM BOARD

09 2216 Non-Structural Metal Framing
09 2900 Gypsum Board

09 5000 CEILINGS

09 5113 Acoustical Panel Ceilings
09 5323 Metal Acoustical Suspension Assemblies

09 6000 FLOORING

09 6513 Resilient Base and Accessories
09 6519 Resilient Tile Flooring
09 6700 Epoxy Resin Composition Flooring
09 6813 Tile Carpeting

09 9000 PAINTS AND COATINGS

09 9001 Common Painting and Coating Requirements
09 9113 Exterior Painted Galvanized Metal
09 9114 Exterior Painted CMU, Concrete
09 9122 Interior Painted CMU
09 9123 Interior Painted Gypsum Board, Plaster
09 9124 Interior Painted Metal
09 9125 Interior Painted Wood
09 9413 Interior Textured Finishing

END OF TABLE OF CONTENTS
SECTION 09 0503

FLOORING SUBSTRATE PREPARATION

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
2. Preparing floor substrate to receive flooring as described in Contract Documents.
3. Remove existing carpet and prepare floor as described in Contract Documents.
4. Perform building modifications and repairs to accommodate carpet, vinyl flooring, epoxy resin flooring and rubber base as described in Contract Documents.

B. Related Requirements:
1. Pre-Installation conferences held jointly with Section 09 0503 as described in Administrative Requirements on Part 1 of this specification section.
2. Section 01 1200: ‘Multiple Contract Summary’.
4. Section 01 4000: ‘Quality Requirements’ for administrative and procedural requirements for quality assurance and quality control.
5. Section 01 4301: ‘Quality Assurance – Qualifications’ establishes minimum qualification levels required.
6. Section 01 4523: ‘Testing and Inspecting Services’ for testing and inspection, and testing laboratory services for materials, products, and construction methods.
7. Section 01 7800: ‘Closeout Submittals’.
8. Section 09 6519: ‘Resilient Tile Flooring’.
10. Section 09 6700: ‘Epoxy Resin Composition Flooring’.

1.2 REFERENCES

A. Association Publications:
   a. ACI 302.2R-06, Guide for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials (August 15, 2006).
   a. ICRI Certification: ‘Concrete Slab Moisture Testing Technician, Tier 2, Grade 1’.

B. Definitions (Following are specifically referenced for testing):
1. Accreditation: Process in which certification of competency, authority, or credibility is presented. Verify that laboratories have an appropriate quality management system and can properly perform certain test methods (e.g., ANSI, ASTM, and ISO test methods) and calibration parameters according to their scopes of accreditation.
2. Approved: To authorize, endorse, validate, confirm, or agree to.
3. Field Quality Control: Testing, Inspections, Special Testing and Special Inspections to assure compliance to Contract Documents.
4. Inspection/Special Inspection: Inspection of materials, installation, fabrication, erection or placement of components and connections requiring special expertise to ensure compliance with approved construction documents and referenced standards:
   a. Inspection: Not required by code provisions but may be required by Contract Documents.
b. Special Inspection: Required by code provisions and by Contract Documents.

c. Inspection-Continuous: Full-time observation of the Work requiring inspection by approved inspector who is present in area where the Work is being performed.

d. Inspection-Periodic: Part-time or intermittent observation of the Work requiring inspection by approved inspector who is present in area where the Work has been or is being performed and at completion of the Work.

5. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, Subcontractor, or Sub-subcontractor, to perform particular construction operation, including installation, erection, application, and similar operations.

6. Observation: Visual observation of building / site elements or structural system by registered design professional for general conformance to approved construction documents at significant construction stages and at completion. Observation does not include or waive responsibility for performing inspections or special inspections.

7. Owner’s Representative: Owner’s Designated Representative (Project Manager or Facilities Manager) who will have express authority to bind Owner with respect to all matters requiring Owner’s approval or authorization.

8. Preconstruction Testing: Tests and inspections that are performed specifically for Project before products and materials are incorporated into the Work to verify performance or compliance with specified criteria.

9. Product Testing: Tests and inspections that are performed by testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with industry standards.

10. Moisture Vapor Emission Rate (MVER): Anhydrous Calcium Chloride (CaCl2) Moisture Vapor Emission Test was developed to quantify amount of moisture vapor emission from concrete slab.

   a. Test method to obtain quantitative value indicating rate of moisture vapor emission from concrete slab and if slab can receive floor covering by determination of rate of moisture vapor emitted from below-grade, on-grade, and above-grade (suspended) concrete floors.

   b. Moisture vapor emitted from concrete slab in measured in pounds which is equivalent weight of water evaporating from 1000 ft² of concrete surface in 24 hour period.

   c. Moisture vapor emission rate only reflects condition of concrete floor at time of test.

11. Outlier: Statistical observation or test data value which is far removed in value from others in the data set. An outlier may be an error in measurement which will distort interpretation of the data.

12. Relative Humidity (RH) Testing: Testing of concrete slabs is defined as ratio of actual amount of water vapor present in volume of air at given temperature to maximum amount that air could hold at that temperature, expressed as percentage.

   a. Relative Humidity test method covers quantitative determination of percent relative humidity in concrete slabs for field or laboratory tests.

   b. Moisture test results indicate moisture condition of slab only at time of test.

13. Quality Assurance: Testing, Inspections, Special Testing and Special Inspections provided for by Owner.

14. Quality Control: Testing, Inspections, Special Testing and Special Inspections provided for by Contractor.

15. Service Provider: Agency or firm qualified to perform required tests and inspections.

16. Source Quality Control Testing: Tests and inspections that are performed at source, i.e., plant, mill, factory, or shop.

17. Special Inspection: See Inspection.

18. Special Inspector: Certified individual or firm that implements special inspection program for project.


20. Test/Special Test: Field or laboratory tests to determine characteristics and quality of building materials and workmanship.

   a. Test: Not required by code provisions but may be required by Contract Documents.

   b. Special Test: Required by code provisions and by Contract Documents.

21. Testing Agency: Entity engaged to perform specific tests, inspections, or both.

22. Testing Agency Laboratory: Agency or firm qualified to perform field and laboratory tests to determine characteristics and quality of materials and workmanship.

23. Verification: Act of reviewing, inspecting, testing, etc. to establish and document that product, service, or system meets regulatory, standard, or specification requirements.
C. Reference Standards:
   1. ASTM International:
      a. ASTM F710-11, ‘Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring’.
      b. ASTM F1869-11, ‘Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride’.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Scheduling:
   1. Concrete Moisture Testing:
      a. General Contractor Responsibility to provide:
         1) Maintain ambient temperatures and relative humidity conditions as specified in Field Conditions in Part 1 of this specification before Moisture Testing Agency will test for concrete moisture.
         2) Notify Owner to contact Moisture Testing Agency when building is enclosed and temperature and relative humidity meet requirements for testing.
         3) Provide access for and cooperate with Moisture Testing Agency.
      b. Owner's Representative Responsibility to provide:
         1) Provide following information to Moisture Testing Agency at time of notification:
            a) Digital copy of floor plan(s).
            b) Indicate different flooring material areas and which rooms on floor plan(s) and finish schedule requiring additional tests if required.
            c) Digital copy of Specification Section 09 0503 (this specification) from Contract Documents for this Project.
      c. Testing Agency will provide Moisture Testing for following flooring areas:
         1) Resilient Tile Flooring:
            a) Moisture Testing for Resilient Tile Flooring required.
            c) See individual flooring section for additional scheduling requirements if required.
         2) Epoxy Resin Composition Flooring:
            a) Moisture Testing for Resinous Flooring required.
            c) See individual flooring section for additional scheduling requirements if required.
         3) Tile Carpeting:
            a) Moisture Testing for Tile Carpeting required.
            c) See individual flooring section for additional scheduling requirements if required.

1.4 SUBMITTALS

A. Informational Submittals:
   1. Certificates:
      a. Concrete Slab Moisture Technician:
         1) Provide current IFTI trained documentation and certified Field Technician certification.
         2) Provide current ICRI 'Concrete Slab Moisture Testing Technician, Tier 2, Grade 1' Certification.
      b. Certified Standard Moisture Testing Report:
1) Report to include following:
   a) Available to Testing Agency from Owner’s Representative:
      (1) Project Name.
      (2) Property Number.
   b) Test date.
   c) Executive summary.
   d) Certified Moisture and Alkalinity (pH) Test Report.
   e) Project floor plan.
   f) Project photographs including following information on each photograph:
      (1) Site location.
      (2) Test hole number.
      (3) Serial number probe.
      (4) Relative Humidity (RH), Alkalinity (pH) and temperature reading.
      (5) Property number.
   g) Outlier Test (As specified in Field Quality Control Testing in Part 3 of this specification:
      (1) Note test as Outlier Test for which hole number was conducted.
      (2) Site location.
      (3) Test hole number.
      (4) Serial number probe.
      (5) Relative Humidity (RH), Alkalinity (pH) and temperature reading.
      (6) Property number.
2) At completion of testing, Testing Agency shall submit Concrete Moisture Test Report for each flooring system included for project to following:
   a) One (1) copy to Owner’s Representative.

B. Closeout Submittals:
   1. Include following in Operations And Maintenance Manual specified in Section 01 7800:
      a. Record Documentation:
         1) Testing and Inspection Reports:
            a) Testing Agency Testing Reports of Alkalinity and Concrete Moisture testing.

1.5 QUALITY ASSURANCE

A. Testing and Inspection.
   1. Owner will provide Testing for Alkalinity and Concrete Moisture of concrete slab before installation as specified in Field Quality Control in Part 3 of this specification for flooring:
      a. See Section 01 1200: ‘Multiple Contract Summary’.
      b. See Section 01 4523: ‘Testing and Inspecting Services’ for testing and inspection, and testing laboratory services for materials, products, and construction methods.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Storage And Handling Requirements:
   1. Provide storage space and protection for flooring and installation accessories if materials are delivered before start of flooring installation.

1.7 FIELD CONDITIONS

A. Ambient Conditions:
   1. Testing conditions inside building shall be brought to same ambient temperature and relative humidity levels to be normal at occupancy of building (service conditions). Service conditions include normal levels of humidity, lighting, heating, and air conditioning:
      a. If service conditions are not possible, test conditions shall be 75 deg F (23.9 deg C) ± 10 deg F (minus 12.2 deg C) maintain relative humidity between forty (40) and sixty (60) percent in spaces to receive testing.
2. Maintain these conditions forty eight (48) hours prior to, and during testing. Otherwise, results may not accurately reflect amount of moisture which is present in concrete slab or would normally be emitted from or through concrete slab during normal operating conditions.

B. Existing Conditions:
1. If asbestos containing materials are suspected or discovered upon removing carpet, stop work and report to Architect and Owner’s Representative before proceeding:
   a. Do not use solvents to wash substrate during abatement process.

PART 2 - PRODUCTS Not Used

PART 3 - EXECUTION

3.1 PREPARATION

A. Furniture Removal:
1. Remove existing pews, rostrum seating, and pianos and store in location as directed by Owner.
2. Protect stored furniture items from dust, dirt, and damage related to other installation activities.

B. Flooring Preparation:
1. General:
   a. Prepare floor substrate in accordance with ASTM F710, ‘Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring’ (This standard is used for preparing concrete floors for all flooring).
      1) Required RH test and alkalinity test of concrete slab has been performed.
   b. Concrete floor slab patching:
      1) Cracks, chips and joints must be properly patched or repaired.
   c. Concrete surface cured, clean, dry, and free of foreign substances that will compromise carpet and/or other flooring installations.
      1) Removal of curing compounds.
      2) Remove paint, sealer, grease, oil, silicone sealants, and other materials incompatible with flooring adhesives.
      3) Removal of overspray from painted walls (essential so glue will stick).
   d. Vacuum and damp mop floor areas to receive flooring before flooring installation.
2. Carpeted floor areas:
   a. Prepare floor substrate in accordance with Carpet And Rug Institute (CRI) best practices to receive carpet installation and to provide installation that meets Carpet Manufacturer's warranty requirements.

C. Carpet Accessories:
1. Sundry items, such as adhesives, shall be conditioned to building ambient conditions before use.

3.2 FIELD QUALITY CONTROL

A. Field Tests:
1. Concrete Moisture and Alkalinity:
   a. Testing Agency will test interior concrete slabs before installation of floor coverings as directed by Architect and will include following:
      1) Interior concrete slab areas to be tested:
         a) Section 09 6519 'Resilient Tile Flooring'.
         b) Section 09 6700 'Epoxy Resin Composition Flooring'.
         c) Section 09 6813 'Tile Carpeting'.
      2) Standard Moisture Testing required of interior concrete slabs on grade:
         a) General:
(1) Testing for concrete moisture shall be taken at concrete slab substrates scheduled to receive flooring as specified in Contract Drawings for complete flooring installation.

(2) Outlier Test: If one (1) test is abnormally different from other moisture tests, then additional test should be done. Outlier will be defined in this specification as moisture test that is at least fifteen (15) percent higher or lower than other tests at project building completed same day:
   (a) Retesting should be done within 5 feet (1.50 m) feet of original test hole.
   (b) Contact Owner’s Representative for the need to outlier test and additional testing fees will apply.

(3) Include required tests for carpeting and additional tests at each different type of flooring system included for project.

(4) Carpet area moisture testing may be performed sooner than other flooring areas such as athletic flooring if included for Project, but should be tested at same time.

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Furnish and install metal framing and blocking as described in Contract Documents.

B. Related Requirements:
   1. Section 05 4010: ‘Structural Load Bearing Metal Stud Framing’.

1.2 REFERENCES

A. Reference Standards:
   1. ASTM International:
      a. ASTM A653/A653M-11, ‘Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process’.
      b. ASTM A1003/A1003M-13, ‘Standard Specification for Steel Sheet, Carbon, Metallic- and Nonmetallic-Coated for Cold-Formed Framing Members’.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Pre-Installation Conferences:
   1. Schedule pre-installation conference to be held after submittals have been reviewed and returned by Architect, but before beginning metal framing work.
   2. In addition to agenda items specified in Section 01 3100, review following:
      a. Identify location of required blocking.

1.4 QUALITY ASSURANCE

A. Regulatory Agency Sustainability Approvals:
   1. ICC approved.

PART 2 - PRODUCTS

2.1 SYSTEMS

A. Manufacturers:
   1. Manufacturer Contact List:
e. Any member of Steel Stud Manufacturer's Association (SSMA).
f. Equal as approved by Architect before bidding. See Section 01 6200.

B. Materials:
1. Framing:
   a. General:
      1) 20 ga (0.95 mm) minimum, unless noted greater on Drawings, meeting requirements of ASTM C645.
      2) Steel Sheet Components: Comply with ASTM C645 requirements for metal unless otherwise indicated.
      3) Steel Coating Requirement: Comply with ASTM C645 roll-formed from hot dipped galvanized steel complying with ASTM A1003/A1003M and ASTM A653/A653M G40 (Z120) or equivalent corrosion resistant coating. A40 galvannealed products are not acceptable.
   b. Steel Studs and Runners: Cold-formed galvanized steel C-studs, as per ASTM C645 for conditions indicated.
   c. Bridging, blocking, strapping, and other accessories shall be as described in Contract Documents or as required by Manufacturer's system.
   d. Acceptable Products:
      1) Any member of Steel Stud Manufacturer's Association (SSMA).
      2) Equal as approved by Architect before bidding. See Section 01 6200.

C. Fasteners:

PART 3 - EXECUTION

3.1 INSTALLATION

A. Interface With Other Work:
   1. Coordinate with other Sections to provide blocking necessary for their work.
   2. Coordinate with other Sections for location of blocking required for installation of equipment and building specialties.

B. Tolerances:
   1. 1/8 inch (3 mm) in 10 feet (3 meters) with 1/4 inch (6 mm) maximum in height of wall.
   2. Distances between parallel walls shall be 1/4 inch (6 mm) maximum along length and height of wall.

C. Framing:
   1. Installation Standard: ASTM C754.
   2. Specifications of Stud Wall Manufacturer shall govern this work unless more stringent requirements are required by Contract Documents.

END OF SECTION
SECTION 09 2900

GYPSUM BOARD

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Furnish and install gypsum board as described in Contract Documents.
   2. Furnish and install acoustical sealants as described in Contract Documents.

B. Related Requirements:
   2. Section 09 9413: 'Interior Textured Finishing'.

1.2 REFERENCES

A. Definitions:
   1. Accessories: Metal or plastic beads, trim, or moulding used to protect or conceal corners, edges, or abutments of the gypsum board construction.
   2. Drywall Primer: Paint material specifically formulated to fill the pores and equalize the suction difference between gypsum board surface paper and the compound used on finished joints, angles, fastener heads, and accessories and over skim coatings.
   3. Skim Coat: Either a thin coat of joint compound trowel applied, or a material manufactured especially for this purpose and applied in accordance with manufacturer’s recommendations, over the entire surface.
   4. Texturing: Regular or irregular patterns typically produced by applying a mixture of joint compound and water, or proprietary texture materials including latex base texture paint, to a gypsum board surface previously coated with drywall primer.

B. Reference Standards:
   1. ASTM International:
      b. ASTM C475/C475M-12, 'Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board'.
      d. ASTM C1002-07(2013), 'Standard Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs'.
      e. ASTM C1047-14a, 'Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base'.
      g. ASTM C1396/C1396M-14, 'Standard Specification for Gypsum Board'.
      h. ASTM E84-14, 'Standard Test Method for Surface Burning Characteristics of Building Materials'.

Gypsum Board - 1 -
1.3 DELIVERY, STORAGE, AND HANDLING

A. General:
   1. Following recommendations of GA-801 Guide for Handling and Storage of Gypsum Panel Products unless local, state or federal laws or agency rules differing from the recommendations shall take precedence.

B. Delivery And Acceptance Requirements:
   1. Deliver materials in original packages, containers, or bundles bearing brand name, applicable standard designation, and Manufacturer's name.

C. Storage And Handling Requirements:
   1. Store material under roof and keep dry and protected against damage from weather, condensation, direct sunlight, construction traffic, and other causes. Stack gypsum board flat to prevent sagging.

1.4 FIELD CONDITIONS

A. Ambient Conditions:
   1. Comply with ASTM C840 or GA-216 requirements, whichever are more stringent:
      a. Do not install interior products until installation areas are enclosed and conditioned.
         1) Temperature shall be 50 deg F (10 deg C) and 95 deg F (35 deg C) maximum day and night during entire joint operation and until execution of Certificate of Substantial Completion.
         2) Provide ventilation to eliminate excessive moisture.
         3) Avoid hot air drafts that will cause too rapid drying.
      b. Do not install panels that are wet, those that are moisture damaged, and those that are mold damaged.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Manufacturers:
   1. Manufacturer Contact List:

B. Materials:
   1. Interior Gypsum Board:
      a. General:
         1) Size:
            a) Provide maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.
         2) Quality Standard:
            a) Core: Fire-resistant rated gypsum core.
            b) Complies with Type X requirements of ASTM C1396/C1396M (Section 5).
            c) Surface paper: Face paper suitable for painting.
            d) Long edges: Tapered edge.
            e) Overall thickness: 5/8 inch (15.9 mm).
2.2 ACCESSORIES

A. Manufacturers:
   1. Manufacturer Contact List:

   2. Gypsum Board Mounting Accessories:
      a. Corner And Edge Trim:
         1) Metal, paper-faced metal, paper-faced plastic, or solid vinyl meeting requirements of
            ASTM C1047. Surfaces to receive bedding cement treated for maximum bonding.

   3. Joint Compound:
      a. Best grade or type recommended by Board Manufacturer and meeting requirements of
         ASTM C475/C475M.
         1) Use Taping Compound for first coat to embed tape and accessories.
         2) Use Taping Compound or All-Purpose Compound for subsequent coats except final
            coat.
         3) Use Finishing Compound for final coat and for skim coat.

   4. Joint Reinforcing:
      a. Paper reinforcing tape acceptable to Gypsum Board Manufacturer.

   5. Fasteners:
      a. Bugle head screws meeting requirements of ASTM C1002:
         1) Gypsum Board:
            a) Type W: For fastening gypsum board to wood members, of length to penetrate
               wood framing 5/8 inch (15.9 mm) minimum.
            b) Type S: For fastening gypsum board to steel framing and ceiling suspension
               members, of length to penetrate steel framing 3/8 inch (9.5 mm) minimum.

B. Primer / Surfacer On Surfaces To Receive Texturing:
   1. Acceptable Products:
      a. Sheetrock First Coat by USG.
      b. Prep Coat by Westpac Materials.
      c. Level Coat by Magnum Products.
      d. Equal as approved by Architect before bidding. See Section 01 6200.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification Of Conditions:
   1. Examine substrate and verify framing is suitable for installation of gypsum board.
   2. Examine gypsum board before installation. Reject panels that are wet, moisture damaged, and
      mold damaged.
      a. Do not install board over unsuitable conditions.
   4. Commencement of Work by installer is considered acceptance of substrate.

3.2 INSTALLATION

A. Interface With Other Work:
1. Coordinate with Division 06 for location of backblocking for edges and ends of gypsum board and for blocking required for installation of equipment and building specialties.

2. Do not install gypsum board until required blocking is in place.

B. General: Install and finish as recommended in ASTM C840 or GA-216 unless specified otherwise in this Section.

C. Interior Gypsum Board:
1. General:
   a. Install so trim and reinforcing tape are fully backed by gypsum board. No hollow spaces between pieces of gypsum board over 1/8 inch (3 mm) wide before taping are acceptable.
   b. Rout out backside of gypsum board to accommodate items that extend beyond face of framing, but do not penetrate face of gypsum board, such as metal door frame mounting brackets, etc.
   c. On walls over 108 inches (2 700 mm) high, apply board perpendicular to support
   d. Butt edges in moderate contact. Do not force in place. Shim to level.
   e. Leave facings true with joint, finishing flush. Vertical work shall be plumb and ceiling surfaces level.
   f. Scribe work closely:
      1) Keep joints as far from openings as possible.
      2) If joints occur near an opening, apply board so vertical joints are centered over openings.
      3) No vertical joints shall occur within 8 inches (200 mm) of external corners or openings.
   g. Install board tight against support with joints even and true. Tighten loose screws.
   h. Caulk perimeter joints in sound insulated rooms with specified acoustical sealant.

2. Ceilings:
   a. Apply ceilings first using minimum of two (2) men.
   b. Use board of length to give minimum number of joints.
   c. Apply board perpendicular to support.
      1) Single Layer Application:
         a) Stagger end joints:
            (1) End and edge joints of board applied on ceilings shall occur over framing members or be back blocked with 2x4 (38 mm by 89 mm) blocking.
            (2) Edge joints of board vertically applied on walls shall occur over framing members.
            (3) 2x4 (38 mm by 89 mm) blocking is required at wall to ceiling transitions and at top of ceiling vault transitions.

3. Fastening:
   a. Apply from center of board towards ends and edges.
   b. Apply screws 3/8 inch (9.5 mm) minimum from ends and edges, one inch (25 mm) maximum from edges, and 1/2 inch (13 mm) maximum from ends.
   c. Spacing:
      1) Ends: Screws not over 7 inches (175 mm) on center at edges where blocking or framing occurs.
      2) Wood Framed Walls And Ceilings: Screws 7 inches (175 mm) on center in panel field.
      3) Metal Framed Walls: Screws 12 inches (300 mm) on center in panel field.
   d. Set screw heads 1/32 inch (0.8 mm) below plane of board, but do not break face paper. If face is accidentally broken, apply additional screw 2 inches (50 mm) away.
   e. Screws on adjacent ends or edges shall be opposite each other.
   f. Drive screws with shank perpendicular to face of board.

4. Trim:
   a. Corner Beads:
      1) Attach corner beads to outside corners.
         a) Attach metal corner bead with staples spaced 4 inches (100 mm) on center maximum and flat taped over edges of corner bead. Also, apply screw through edge of corner bead where wood trim will overlay corner bead.
         b) Set paper-faced trim in solid bed of taping compound.
b. **Edge Trim:** Apply where gypsum board abuts dissimilar material. Hold channel and 'L' trim back from exterior window and door frames 1/8 inch (3 mm) to allow for caulking.

5. **Finishing:**
   a. **General:**
      1) Tape and finish joints and corners throughout building as specified below to correspond with final finish material to be applied to gypsum board. When sanding, do not raise nap of gypsum board face paper or paper-faced trim.
      2) **First Coat:**
         a) Apply tape over center of joint in complete, uniform bed of specified taping compound and wipe with a joint knife leaving a thin coating of joint compound. If metal corner bead is used, apply reinforcing tape over flange of metal corner bead and trim so half of tape width is on flange and half is on gypsum board.
         b) Completely fill gouges, dents, and fastener dimples.
         c) Allow to dry and sand lightly if necessary to eliminate high spots or excessive compound.
      3) **Second Coat:**
         a) Apply coat of specified joint compound over embedded tape extending 3-1/2 inches (88 mm) on both sides of joint center. Use finishing compound only if applied coat is intended as final coat.
         b) Re-coat gouges, dents, and fastener dimples.
         c) Allow to dry and sand lightly to eliminate high spots or excessive compound.
      4) **Third Coat:** Apply same as second coat except extend application 6 inches (150 mm) on both sides of joint center. Allow to dry and sand with fine sandpaper or wipe with damp sponge.
      5) **Fourth Coat:** Apply same as second coat except extend application 9 inches (425 mm) on both sides of joint center. Allow to dry and sand with fine sandpaper or wipe with damp sponge.
   a. **Finishing Levels:** Finish panels to levels indicated below and according to ASTM C840, GA-214 and GA-216:
      1) Gypsum Board Surfaces not painted or finished:
         a) GA-214 Level 1: 'All joints and interior angles shall have tape set in joint compound. Surface shall be free of excess joint compound. Tool marks and ridges are acceptable'.
      2) Gypsum Board Surfaces to Receive: Painted Texturing - Section 09 9413: 'Interior Textured Finishing':
         a) GA-214 Level 4: 'All and interior angles shall have tape embedded in joint compound and two separate coats of joint compound applied over all flat joints and one separate coat of joint compound applied over interior angles. Fastener heads and accessories shall be covered with three separate coats of joint compound. All joint compound shall be smooth and free of tool marks and ridges. Coat prepared surface with specified primer'.

3.3 **FIELD QUALITY CONTROL**

A. **Non-Conforming Work:**
   1. Remove and replace panels that are wet, moisture damaged, and mold damaged.
      a. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
      b. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

3.4 **CLEANING**

A. Remove from site debris resulting from work of this Section including taping compound spills.
END OF SECTION
SECTION 09 5113
ACOUSTICAL PANEL CEILINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Furnish and install acoustical ceiling panels for suspended acoustical ceilings as described in
      Contract Documents.

B. Related Requirements:
   1. Section 09 5323: 'Metal Acoustical Suspension Assemblies'
   2. Division 26: Interior light fixtures.
   3. Division 23: Related sections for HVAC installed in ceiling.

1.2 REFERENCES

A. Association Publications:
      405 Illinois Avenue, 2B, St Charles IL. www.cisca.org.
      a. Recommendations for direct hung acoustical tile and lay-in panel ceilings.

B. Definitions:
   1. Acoustical Panel: Form of a prefabricated sound absorbing ceiling element used with exposed
      suspension systems.
   2. Absorption: Materials that have capacity to absorb sound. Absorption is the opposite of
      reflection.
   3. Ceiling Attenuation Class (CAC): Rates ceiling's efficiency as barrier to airborne sound
      transmission between adjacent closed offices. Shown as minimum value, previously expressed
      as CSTC (Ceiling Sound Transmission Class). Single-figure rating derived from normalized
      ceiling attenuation values in accordance with classification ASTM E413, except that resultant
      rating shall be designated ceiling attenuation class. (Defined in ASTM E1414.) Acoustical unit
      with high CAC may have low NRC.
   4. Center Line: Line indicating midpoint of surface in either direction. Used as guide in starting
      ceiling.
   5. Class A: Fire classification for product with flame spread rating of no more than 25 and smoke
      developed rating not exceeding 50, when tested in accordance with ASTM E84 or UL 723.
   7. Flame Spread Index: Comparative measure, expressed as a dimensionless number, derived
      from visual measurements of the spread of flame versus time for a material tested in accordance
      with ASTM E84 or UL 723.
   8. Interior Finish: Interior finish includes interior wall and ceiling finish and interior floor finish.
   9. Mineral Base: Ceilings composed principally of mineral materials such as fibers manufactured
      from rock or slab, with or without binders.
   10. Noise Reduction Coefficient (NRC): Average sound absorption coefficient measured at four
       frequencies: 250, 500, 1,000 and 2,000 Hertz expressed to the nearest integral multiple of 0.05.
       Rates ability of ceiling or wall panel or other construction to absorb sound. NRC is fraction of
       sound energy, averaged over all angles of direction and from low to high sound frequencies that
       is absorbed and not reflected.
   12. Reveal Edge: Acoustical lay-in panels with step-down edge are intended for use in direct hung
       exposed suspension systems.
13. **Sound Absorption**: Property possessed by materials and objects, including air, of converting sound energy into heat energy. Sound wave reflected by surface always loses part of its energy. Fraction of energy that is not reflected is called sound absorption coefficient of reflecting surface. For instance, if material reflects 80 percent of sound energy, then sound absorption coefficient would be 20 percent (0.20).

14. **Surface Burning Characteristic**: Rating of interior and surface finish material providing indexes for flame spread and smoke developed, based on testing conducted according to ASTM Standard E84 or UL 723.

15. **Textured Pattern**: Granular or raised (fine, coarse, or a blend), felted or matted surface as an integral part of the basic product or superimposed on the product surface.

16. **Smoke-Developed Index**: Comparative measure, expressed as a dimensionless number, derived from visual measurements of smoke obscuration versus time for a material tested in accordance with ASTM E84 or UL 723.

C. **Reference Standards**:
   a. ASHRAE Standard 62.1-2010, 'Ventilation for Acceptable Indoor Air Quality'.

2. ASTM International:
   a. ASTM C423-09a, 'Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method'.
   f. ASTM E1264-08, 'Standard Classification for Acoustical Ceiling Products'.
   g. ASTM E1414/E1414M-11a, 'Standard Test Method for Airborne Sound Attenuation Between Rooms Sharing a Common Ceiling Plenum'.
   h. ASTM E1477 - 98a(2013), 'Standard Test Method for Luminous Reflectance Factor of Acoustical Materials by Use of Integrating-Sphere Reflectometers'.

3. California Building Code CBC 2013:
   a. Chapter 8, 'Interior Finishes':
      1) Section 803, 'Wall And Ceiling Finishes':
         a) 803.1.1, 'Interior Wall and Ceiling Finish Materials'.
         b) 803.1.2, 'Room Corner Test for Interior Wall or Ceiling Finish Materials'.

4. National Fire Protection Association:

5. Underwriters Laboratories Inc.:

1.3 **SUBMITTALS**

A. **Action Submittals**:
   1. Produce Data: Technical data for each type of acoustical ceiling unit required.
   2. Sample: Minimum 6 inch (150 mm) x 6 inch (150 mm) samples of specified acoustical panel.

B. **Informational Submittals**:
   1. Certificates:
      a. Manufacturer's certifications that products comply with specified requirements including laboratory reports showing compliance with specified tests and standards. For acoustical performance, each carton of material must carry approved independent laboratory classification of NRC, CAC, and AC.
2. **Test And Evaluation Reports:**
   a. If requested by Owner, provide copies of Quality Assurance requirements for ‘Class A’ flame
      spread rating and ‘Room-Corner Test’.

C. **Closeout Submittals:**
   1. Include following in Operations And Maintenance Manual specified in Section 01 7800:
      a. Warranty Documentation:
         1) Final, executed copy of Warranty.
      b. Record Documentation:
         1) Manufacturers Documentation:
            a) Manufacturer's literature.
            b) Color and pattern selection.

D. **Maintenance Material Submittals:**
   1. Extra Stock Materials:
      a. Provide Owner with one (1) carton of each type of tile for future use.
         1) Packaged with protective covering for storage and identified with appropriate labels.

### 1.4 QUALITY ASSURANCE

A. **Regulatory Agency Sustainability Approvals:**
   1. **Fire-Test-Response Characteristics:** As determined by testing identical ceiling tile applied with
      identical adhesives to substrates according to test method indicated below by qualified testing
      agency. Identify products with appropriate markings of applicable testing agency.
      a. **Surface-Burning Characteristics:**
         1) Ceiling tile shall have Class A flame spread rating in accordance with ASTM E84 or UL
            723 Type 1.
            a) Class A (Flame spread index 0-25; Smoke-developed index 0-450).
            b) Flash point: None.
     2. Passage of ‘Room-Corner Test’ as recognized by AHJ, is required for system. Adhesive cited in
        test literature is required for installation of ceiling tile on Project.
        a. **Room Corner Tests:**
              Materials’.
           2) CBC 803.2.1, ‘Room Corner Test for Interior Wall or Ceiling Finish Materials’.
           3) NFPA 265: ‘Room Corner Test for Interior Wall or Ceiling Finish Materials’.
           4) UL 723, ‘Standard for Safety Test for Surface Burning Characteristics of Building
              Materials’.

### 1.5 DELIVERY, STORAGE, AND HANDLING

A. **Delivery and Acceptance Requirements:**
   1. Materials shall be delivered in original, unopened packages with labels intact.

B. **Storage And Handling Requirements:**
   1. Store materials where protected from moisture, direct sunlight, surface contamination, and
      damage.
   2. Store in cool, dry location, out of direct sunlight and weather, and at temperatures between 32
      deg F (0 deg C) and 86 deg F (30 deg C).
   3. Handle acoustical ceiling panels carefully to avoid chipping edges or damage. Use no soiled,
      scratched, or broken material in the Work.

### 1.6 FIELD CONDITIONS

A. **Ambient Conditions:**
1. Building shall be enclosed, mechanical system operating with proper filters in place, and temperature and humidity conditions stabilized within limits under which Project will operate before, during, and after installation until Substantial Completion.
2. Installation shall be at temperatures between 32 deg F (0 deg C) and 86 deg F (30 deg C) or as per Manufacturer recommendations.

1.7 WARRANTY

A. Manufacturers Warranty:
   1. Acoustical ceiling panels:
      a. Manufacturer’s warranty to be free from defects in materials and factory workmanship.
      b. Manufacturer’s warranty against sagging and warping.
      c. Manufacturer’s warranty against mold/mildew, and bacterial growth.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers Contact List:

2.2 MATERIALS

A. Acoustic Ceiling Panels:
   1. Description:
      b. Composition: Wet-formed mineral fiber, water-felted mineral or cast mineral.
   2. Design Criteria:
      a. Acoustics:
         1) Noise Reduction Coefficient (NRC): ASTM C423; 0.85 minimum.
      b. Antimicrobial Protection: Resistance against growth of mold/mildew.
      c. Classification:
         1) Meet requirements of ASTM E1264, Type III (mineral base with painted finish), Form 1 (nodular) or Form 4 (cast or molded), Pattern E1 (lightly textured) or Pattern F (heavily textured).
         2) Fire Performance: As specified in Quality Assurance in Part 1 of this specification.
         3) Light Reflectance (LR): ASTM E1477; 0.83 minimum.
         4) Sag Resistance: Resistance to sagging in high humidity conditions.
         5) VOC: Low.
   3. Wide Face Design:
      a. Design Criteria:
         1) Grid Face: 15/16 inch (24 mm).
         2) Size: 24 inch x 48 inch x 1”.
         3) Edge profile: Square Tegular:
      b. Acceptable Product:
         1) Quality Standard:
            a) Calla, Item number 2823 by Armstrong.
         2) Equal as approved by Architect before bidding. See Section 01 6200.
PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification Of Conditions:
   1. Inspect for defects in support that are not acceptable.
      a. All wet work (concrete, painting, and etc.) must be completed and dry.
      b. Temperature conditions within Manufacturer's written recommendation.
   2. Notify Architect of unsuitable conditions in writing.
      a. Do not install acoustical ceiling panels until defects in support or environmental conditions are corrected.

3.2 PREPARATION

A. Materials shall be dry and clean at time of application.

B. Measure each ceiling area and establish layout of acoustical units to balance border widths at opposite edges of each ceiling. Avoid use of less than half width units at borders, and comply with reflected ceiling plans. Coordinate panel layout with mechanical and electrical fixtures.

3.3 INSTALLATION

A. Install acoustical panels in coordination with suspended system, with edges resting on flanges of main runner and cross tees. Cut and fit panels neatly against abutting surfaces. Support edges by wall moldings.

B. Special Techniques:
   1. If recommended by Manufacturer, use tile one at a time from at least four (4) open boxes to avoid creating any pattern due to slight variations from box to box. Use tile from same color run in individual rooms to assure color match.
   2. Leave tile in true plane with straight, even joints.

3.4 FIELD QUALITY CONTROL

A. Non-Conforming Work:
   1. Remove and replace defective materials at no additional cost to Owner including, but not limited to following:
      a. Remove and replace damaged or broken acoustical ceiling panels.
      b. Remove and replace discolored acoustical ceiling panels to match adjacent.
      c. Remove and replace work that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

3.5 CLEANING

A. Clean exposed surfaces of acoustical ceiling panels, including trim, edge moldings, and suspension members.
   1. Comply with Manufacturer's written instructions for cleaning and touch up of minor finish damage.

B. Waste Management:
   1. Remove from site all debris connected with work of this Section.

END OF SECTION
SECTION 09 5323
METAL ACOUSTICAL SUSPENSION ASSEMBLIES

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
1. Furnish and install metal acoustical suspension system as described in Contract Documents
   including:
   a. Suspension system framing.
   b. Wire hangers, fasteners, main runners, cross tees, and wall angle moldings.

B. Related Requirements:
5. Division 26: ‘Electrical’ for related electrical work.

1.2 REFERENCES

A. Association Publications:
1. The Ceilings & Interior Systems Construction Association (CISCA), 405 Illinois Avenue, 2B, St
   a. ‘Ceiling Systems Handbook’: Recommendations for direct hung acoustical tile and lay-in
      panel ceiling installation.
   b. CISCA 0-2, ‘Guidelines for Seismic Restraint for Direct-hung Suspended Ceiling Assemblies
      (zones 0-2)’ Covers Seismic Design Category C.
   c. CISCA 3-4, ‘Guidelines for Seismic Restraint for Direct-hung Suspended Ceiling Assemblies
      (zones 3-4)’ Covers Seismic Design Category D, E, and F.
   d. ‘Production Guide’: Practical reference for ceiling systems and estimating costs.

B. Definitions:
1. Ceiling Suspension System: System of metal members, designed to support a suspended
   ceiling, typically acoustical ceiling. Also may be designed to accommodate lighting fixtures or air
   diffusers.
2. Clips: Several clip designs are available to suit applications such as fire resistance, wind uplift
   and impact. Fire-resistance rated designs have exact requirements, including mandatory use of
   hold down clips for acoustical panels or tiles weighing less than 1 lb per sq ft (4.9 kg per sq m). For
   rooms with significant air pressure differential from adjacent spaces, retention clips may be
   necessary to retain panels in place. Maintaining air pressure values may also require perimeter
   panel seals, typically closed cell foam gasket with adhesive on one side.
3. Compression Post (Vertical Strut, Seismic Struts): Rigid member used to provide lateral force
   bracing of suspension system.
4. Cross Runner, Cross Tee: Cross runner is secondary or cross beams of mechanical ceiling
   suspension system, usually supporting only acoustical tile. Cross tee is inserted into main runner
   to form different module sizes. In some suspension systems, however, cross runners also
   provide support for lighting fixtures, air diffusers and other cross runners.
   supporting members are exposed to view. Exposed tee surfaces may be continuous or have
   integral reveal. Reveals are typically formed as channel or rail profiles extending down from tee
   leg.
6. **Flange:** Horizontal surface on face of tee, visible from below ceiling. Part of grid to which color cap is applied. Most grid system flanges are either 15/16 inch (24 mm) or 9/16 inch (14 mm).

7. **Hanger Wires:** Wire employed to suspend acoustical ceiling from existing structure. Standard material is 12 gauge (0.105 inch - 2.70 mm) galvanized, soft annealed steel wire, conforming to ASTM A641/A641M. Heavier gauge wire is available for higher load carrying installations, or situations where hanger wire spacing exceeds 4 feet (1.20 m) on center. Seismic designs or exterior installations subject to wind uplift may require supplemental bracing or substantial hanger devices such as metal straps, rods or structural angles.

8. **Heavy-Duty Systems:** Primarily used for installations in which the quantities and weights of ceiling fixtures (lights, air diffusers, etc.) are greater than those for ordinary commercial structure.

9. **Hold Down Clip:** Mechanical fastener that snaps over bulb of grid system to hold ceiling panels in place.

10. **Main Beam, Main Runner, Main Tee:** Primary or main beams of type of ceiling suspension system in which structural members are mechanically locked together. Provide direct support for cross runners and may support lighting fixtures and air diffusers, as well as acoustical tile. Supported by hanger wires attached directly to existing structure; or installed perpendicular to carrying channels and supported by specially designed sheet metal or wire clips attached to carrying channels.

11. **Splay Wires:** Wires installed at angle rather than perpendicular to grid.

12. **Stiffening Brace:** Used to prevent uplift of grid caused by wind pressure in exterior applications.

13. **Suspension System:** Metal grid suspended from hanger rods or wires, consisting of main beams and cross tees, clips, splines and other hardware which supports lay-in acoustical panels or tiles. Completed ceiling forms barrier to sound, heat and fire. It also absorbs in-room sound and hides ductwork and wiring in plenum.

14. **T-Bar:** Any metal member of "T" cross section used in ceiling suspension systems.

C. **Reference Standards:**

1. **American Society of Civil Engineers/Structural Engineering Institute:**
   a. ASCE/SEI 7-10, 'Minimum Design Loads for Buildings and Other Structures' (Section 9, 'Earthquake Loads').

2. **ASTM International:**
   c. ASTM A653/A653M-13, ‘Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process’.
   g. ASTM C636/C636M-13, ‘Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels’.
   h. ASTM D610-08(2012), ‘Standard Practice for Evaluating Degree of Rusting on Painted Steel Surfaces’.

3. **California Building Code CBC 2013:**
   a. CBC 808.1.1.1, ‘Suspended Acoustical Ceiling’.

4. **International Code Council (ICC):**
   a. ICC/ESR-1222 (Revised December 2013), ‘USG Interiors, Inc’.

5. **Underwriters Laboratories / American National Standards Institute:**
1.3 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Coordinate layout of suspension system with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, and fire-suppression systems.
   2. All work above ceiling should be completed prior to installing suspended system. There should be no materials resting against or wrapped around suspension system, hanger wires or ties.

1.4 SUBMITTALS

A. Action Submittals:
   1. Product Data:
      a. Provide Manufacturer's technical literature on suspension system including listing dimensions, load carrying capacity and standard compliance.
   2. Samples:
      a. Minimum 8 inch (200 mm) long samples of exposed wall molding and suspension system, including main runner/tee and cross runner/tee with couplings.

B. Informational Submittals:
   1. Certificates:
      a. Manufacturer’s certifications that products comply with specified requirements, including laboratory reports showing compliance with specified tests and standards.
      b. Installer’s certificates of training.
   2. Manufacturer’s Instructions:
      a. Manufacturer’s details and installation instructions for seismic bracing. If requested, provide copy of code requirements applicable to Project.

1.5 QUALITY ASSURANCE

A. Regulatory Agency Sustainability Approvals:
   1. All system components conform to ASTM standards.
   2. Fire-Resistance Rating: UL approved metal suspension system.
   3. Meet seismic bracing requirements of ASCE 7, ASTM C635/C635M and ASTM C636/C636M or equivalent governing standard for project site.
   4. Seismic Standard: Acoustical ceilings shall be designed and installed to withstand the effects of earthquake motions according to the following:

B. Qualifications. Requirements of Section 01 4301 applies, but not limited to following:
   1. Installer:
      a. Installer training (Ceiling Masters training course or equivalent).
   2. Manufacturer:
      a. Manufacturer in good standing of CISCA (Ceiling and Interior Systems Construction Association).

1.6 DELIVERY, STORAGE, AND HANDLING

A. Delivery And Acceptance Requirements:
   1. Materials shall be delivered in original, unopened packages with labels intact.

B. Storage And Handling Requirements:
1. Materials shall be delivered in original, unopened packages with labels intact.
2. Store material in fully enclosed space protected against damage from moisture, direct sunlight, surface contamination, and general damage.

1.7 WARRANTY

A. Manufacturer Warranty:
1. Suspension system: Manufacturer warranty including repair or replacement of rusting as defined by ASTM D610 and defects in material or factory workmanship.

PART 2 - PRODUCTS

2.1 SYSTEM

A. Manufacturers:
1. Acceptable Manufacturers. See Section 01 6200.
   a. Grid Face: 15/16 inch:

B. Materials:
1. Grid:
   a. Systems shall meet requirements of ASTM C635/C635M, Heavy Duty suspension system.
   b. Exposed surfaces shall be finished with factory-applied white baked enamel.
   c. Meet requirements of ASTM D610 for red rust.
   d. Main runners and cross tees:
      1) All main beams and cross tees shall be commercial quality hot-dipped galvanized (galvanized steel, aluminum, or stainless steel) as per ASTM A653/A653M. Main beams and cross tees are double-web steel construction with type exposed flange design.
   3. Wire Hangers, Braces, and Ties:
      a. Zinc-Coated, carbon-steel wire meeting requirements of ASTM A641/A641M, Class 1 zinc coating, soft temper.
      b. Size:
         1) Standard size: 12 gauge (0.105 inch) (2.70 mm) galvanized, soft annealed steel wire.
         2) Select wire diameter so its stress is less than yield when loaded at three (3) times hanger design load (ASTM C635/C635M), Table 1, 'Direct Hung') will be less than yield stress of wire, but provide not less than 12 gauge (0.105 inch) (2.70 mm).
      c. Protect with rust inhibitive paint.

4. Wall Molding: Channel section of cold-rolled electro-galvanized steel.
5. Edge Moldings and Trim: Metal or extruded aluminum of types and profiles indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations, including light fixtures, that fit type of edge detail and suspension system indicated. Provide moldings with exposed flange of same width as exposed runner.
6. Hold-down Clips: As required by UL to prevent lifting of panels under unusual draft conditions.
7. Seismic Joint Clip.
   a. Quality Standard Product:
      2) Equal as approved by Architect before bidding. See Section 01 6200.
8. Seismic Suspension System:
   a. Installation of ceiling system must be as prescribed by ICC-ES Evaluation Reports ESR-1222 or ESR-1308 and applicable code.
   b. Meet requirements of ASTM A568/A568M for hot-dipped galvanized, cold-rolled steel.
   c. Wall Molding Size: 7/8 inch (22 mm).
d. Category Four Acceptable Products. See Section 01 6200 for definition of Categories.

9. Compression Posts/Struts:
   a. Meet seismic requirements for Project.

PART 3 - EXECUTION

3.1 EXAMINATION

   A. Verification Of Conditions:
      1. Inspect area receiving suspension system to identify conditions which will adversely affect
         installation.
         a. Work trades work to be thoroughly dry and complete prior to installation.
         b. Verify weather tightness of area to receive suspension system prior to installation.
      2. Notify Architect of unsuitable conditions in writing.
         a. Do not install ceiling panels until adverse conditions have been remedied.

3.2 INSTALLATION

   A. Interface With Other Work:
      1. All work above ceiling should be completed prior to installing suspended ceiling system including
         related work including: drywall furring work, acoustical tile, light fixtures, mechanical systems,
         electrical systems, and sprinklers.

   B. General:
      1. Install suspension system and panels in accordance with Manufacturer's written instructions, and
         in compliance with ASTM C636/C636M, and with authorities having jurisdiction (AHJ).

   C. Lay out suspension system symmetrically about center lines of room unless shown otherwise by
      Contract Drawings. Lay out system so use of tiles less than 1/2 size is minimized.

   D. Suspend main runner/tee from overhead construction with hanger wires spaced 4 feet (1.20 m) on
      center along length of main runner/tee. Install hanger wires plumb and straight. Hanger wires shall
      not be installed in convenience holes.

   E. Maintain suspension system in true plane with straight, even joints.

   F. Suspension system joints shall be straight and in alignment, and exposed surface flush and level.
      Wherever system abuts walls, columns, and other vertical surfaces, furnish and install appropriate
      molding.

   G. Install wall moldings at intersection of suspended ceiling and vertical surfaces. Miter corners where
      wall moldings intersect or install corner caps.

   H. Support edges with wall moldings.

   I. Locate light fixtures, speakers, and mechanical diffusers and grilles symmetrically in room insofar as
      possible (unless shown otherwise). Locate fixtures, speakers, diffusers, and grilles within suspension
      grid spaces and centered at least one (1) direction within grid. Installed fixtures shall not compromise
      ceiling performance.

   J. Pay particular attention to required hanger wire placement and fixture protection. Individual
      component deflection not to exceed 1/360 of span.
3.3 FIELD QUALITY CONTROL

A. Field Inspections:
   1. Inspect:
      a. Suspended ceiling system.
      b. Hangers, anchors and fasteners.

B. Non-Conforming Work:
   1. Correct any work found defective or not complying with contract document requirements at no additional cost to Owner.

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes But Not Limited To:
   1. Resilient base as described in Contract Documents.

1.2 REFERENCES

A. Definitions:
   1. Flame Spread: Propagation of flame over a surface.
   2. Flame Spread Index: The numerical value assigned to a material tested in accordance with ASTM E84 or UL 723.
   3. Resilient Wall Base Classification:
      a. Type:
         1) TS: Rubber, vulcanized thermoset.
         2) TP: Rubber, thermoplastic.
         3) TV: Vinyl, thermoplastic.
      b. Group:
         1) Group 1: Solid (homogeneous).
         2) Group 2: Layered (multiple layers).
      c. Styles:
         1) Style A: Straight.
         2) Style B: Cove.
         3) Style C: Butt-to.
   4. Smoke-Developed Index: The numerical value assigned to a material tested in accordance with ASTM E84 or UL 723.

B. Reference Standards:
   1. ASTM International:
   2. Underwriters Laboratories, Inc.:

1.3 SUBMITTALS

A. Action Submittals:
   1. Product Data:
      a. Manufacturer's literature or cut sheet on base and adhesive.
      b. Color selection.

1.4 QUALITY ASSURANCE

A. Regulatory Agency Sustainability Approvals:
   1. Fire-Test-Response Characteristics:
      a. Surface-Burning Characteristics:
         1) Base shall have Class B flame spread rating in accordance with ASTM E84 or UL 723.
1.5 DELIVERY, STORAGE, AND HANDLING

A. Delivery And Acceptance Requirements:
   1. Materials shall be delivered in original, unopened packages with labels intact.

B. Storage And Handling Requirements:
   1. Store materials in dry space protected from weather at not less than 55 deg F (12.8 deg C) or more than 85 deg F (29.4 deg C) or as per Manufacturer's recommendation.
   2. Materials from containers which have been distorted, damaged or opened prior to installation will be rejected.

1.6 FIELD CONDITIONS

A. Ambient Conditions:
   1. Store materials at not less than 70 deg F (21 deg C) for at least twenty four (24) hours before installation.
   2. Do not apply in temperatures below 70 deg F (21 deg C).

PART 2 - PRODUCTS

2.1 PRODUCTS

A. Manufacturers:
   1. Manufacturers:
      a. Burke Flooring, San Jose, CA www.burkemercer.com
      b. Flexco Corporation, Tuscumbia, AL www.marleyflexco.com
      c. Johnsonite, Chagrin Falls, OH
      d. Roppe Corporation, Fostoria, OH www.roppe.com
      e. VPI, Corporation, Sheboygan, WI www.vpicorp.com

B. Materials:
   1. Wall Base:
      a. General:
         1) Size:
            a) Minimum body thickness: 1/8 inch by 4 inch (3 mm by 100 mm).
            b) Length: not less than normal.
         2) Corners:
            a) Use preformed, molded external corners for both inside and outside corners.
            b) Butt joint interior corners.
            c) Corners must meet same height and thickness requirements as wall base.
      b. Design Criteria:
         1) Meet requirements of ASTM F1861, Type TP or TS, Group 1 (solid), Style B (cove).
         2) Free from objectionable odors, blisters, cracks, and other defects affecting appearance or serviceability of rubber, and not containing fabric.
         3) Style: Coved.
      c. Colors:
         1) Color pigments used shall be highly fade-resistant, insoluble in water, and resistant to light, alkali, and cleaning agents.
         2) Colors as selected by Architect from Manufacturer's standard colors.
      d. Approved Products. See Section 01 6200:
         1) RubberMyte Wall Base by Burke.
         2) Base 2000 Wall Base by Flexco.
         3) Rubber Wall Base by Johnsonite.
         4) Rubber Wall Base by Roppe.
         5) Rubber Wall Base by VPI.
2. Adhesive:
   a. Use products recommended by Manufacturer for conditions of use.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification Of Conditions:
   1. Inspect surfaces for conditions not suitable for installation. Surface to receive specified items shall be sound, clean, free from foreign matter, tightly nailed, and dry.
   2. Notify Architect of unsuitable conditions in writing:
      a. Do not start work until defects are corrected.
   3. Commencement of Work by installer is considered acceptance of substrate.

3.2 PREPARATION

A. Surface Preparation:
   1. Remedy cracks and minor irregularities in substrate in accordance with Manufacturer's recommendations.

3.3 INSTALLATION

A. Base:
   1. Install in manner to produce smooth, even finished surfaces tightly jointed and accurately aligned.
   2. Fit specified items tightly. Use fillers where necessary. Fit neatly against projections, piping, electrical service outlets, etc.
   3. Secure specified items with specified adhesive. Cement substantially to vertical surfaces including rubber base to cabinet work base.
   4. Line up top and bottom lines of base throughout.
   5. Do not stretch base during installation.
   6. Roll until firm bond has been established. Leave level, free from buckles, cracks, and projecting edges.
   7. In wall runs longer than 12 inches (300 mm), install no lengths of base shorter than 12 inches (300 mm) long.

3.4 FIELD QUALITY CONTROL

A. Non-Conforming Work:
   1. Replace damaged materials at no additional cost to Owner.
   2. Damaged materials are defined as having cuts, gouges, scrapes or tears, and not fully adhered.

3.5 ADJUSTING

A. Inspect and make necessary adjustments within one (1) month after mechanical heat or other heat has been supplied continuously in finished areas.

3.6 CLEANING

A. General:
   1. Base:
a. Clean all exposed surfaces of base of adhesive spatter before it sets in accordance with Manufacturer’s cleaning instructions.
b. Damp-mop surfaces to remove marks and soil.
2. Adjacent Work:
   a. Clean all exposed surfaces of adjoining areas of adhesive spatter before it sets.

3.7 PROTECTION

A. Base:
   1. Cover material until Substantial Completion.
   2. Keep traffic away until adhesive has set.

END OF SECTION
SECTION 09 6519
RESILIENT TILE FLOORING

PART 1 - GENERAL

1.1 SUMMARY
A. Includes But Not Limited To:
   1. Furnish and install resilient tile flooring as described in Contract Documents.

B. Related Requirements:
   1. Section 01 3100: ‘Project Management and Coordination’ for pre-installation conference.
   2. Section 01 4000: ‘Quality Requirements’ for administrative and procedural requirements for
      quality assurance and quality control.
   3. Section 01 4301: ‘Quality Assurance – Qualifications’ establishes minimum qualification levels
      required.
   4. Section 01 7800: ‘Closeout Submittals’.
   5. Section 09 0503: Floor substrate preparation.

1.2 REFERENCES
A. Association Publications:
   1. American Concrete Institute, Farmington Hills, MI www.concrete.org. Abstracts of ACI
      Periodicals and Publications.
      a. ACI 302.2R-06, Guide for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials
         (August 15, 2006).

B. Reference Standards:
   1. ASTM International:
      a. ASTM F710-11, ‘Standard Practice for Preparing Concrete Floors to Receive Resilient
         Flooring.’
      b. ASTM F2170-09, ‘Standard Test Method for Determining Relative Humidity in Concrete
         Floor Slabs Using in situ Probes.’

1.3 ADMINISTRATIVE REQUIREMENTS
A. Coordination:
   1. Coordinate completion of flooring installation with other trades.

B. Pre-Installation Conference: In addition to agenda items specified in Section 01 3100, review
   following:
   1. Participate in Pre-Installation Conference specified in Section 09 0503.
   2. In addition to agenda items specified in Section 01 3100, review following:
      a. Schedule conference after substrate preparation and TWO weeks before installation of
         flooring system.
   3. Review Flooring Manufacturer's installation conditions verification procedure and requirements.
   4. Review Building Ambient Conditions including normal levels of humidity, lighting, heating, and air
      conditioning for acceptability for beginning floor preparation and flooring installation.

C. Scheduling:
   1. Notify Testing Agency and Architect two weeks minimum before Pre-Installation Conference to
      allow testing for Alkalinity and Concrete Moisture of concrete slab.
1.4 SUBMITTALS

A. Action Submittals:
   1. Product Data:
      a. Manufacturer's literature or cut sheet on each component of system.
      b. Maintenance instructions.
      c. Color and style selection.

B. Closeout Submittals:
   1. Include following in Operations And Maintenance Manual specified in Section 01 7800:
      a. Record Documentation:
         1) Manufacturers documentation:
            a) Manufacturer's literature.
            b) Color and style selection.
         2) Testing and Inspection Reports:
            a) Testing Agency Testing Reports of Alkalinity and Concrete Moisture testing.

C. Maintenance Material Submittals:
   1. Extra Stock Materials:
      a. Leave box of 20 extra tile of each pattern and color used on Project with Owner.

1.5 FIELD CONDITIONS

A. Ambient Conditions:
   1. Building Conditions:
      a. Conditions inside building shall be brought to levels to be normal at occupancy of building.
      b. Conditions include normal levels of humidity, lighting, heating, and air conditioning.
   2. Concrete Slab:
      a. General:
         1) Final determination as to whether or not a concrete slab is dry enough for flooring installation should be based on evaluating both Alkalinity and Concrete Moisture Vapor Emission Rate (MVER) testing.
      b. Alkalinity:
         1) Do not install sheet carpeting if alkalinity of concrete surface exceeds pH level 9. Corrective procedures are required.
      c. Concrete Moisture Vapor Emission Rate (MVER):
         1) Testing conditions inside building shall be brought to same ambient temperature and relative humidity levels to be normal at occupancy of building. Conditions include normal levels of humidity, lighting, heating, and air conditioning.
         2) Do not install sheet carpeting if moisture vapor emission rate (MVER) of concrete slab relative humidity (RH) exceeds 75% as per ASTM F2170. Corrective procedures are required.
   3. Application:
      a. Maintain 70 deg F (21 deg C) minimum during application.

PART 2 - PRODUCTS

2.1 SYSTEM

A. Manufacturers:
   1. Manufacturer Contact List:
      a. Patcraft: PO Box 2128, Dalton, GA 30722 – 2128 800-241-4014 info@patcraft.com
      b. Equals as approved by architect prior to bidding.
B. Materials:
   1. Reinforced Vinyl Tile:
      a. Product: 18 inch by 18 inches square - Verify size with Architect.
      1. Typography –
         a. Charted 1313V – 45% of Punctuate 00630
         b. Typeface 1312V – 45% of Punctuate 00630
         c. Letterpress 1311V - 10% of Punctuate 00630
      b. Meet or exceed Fed Spec SS-T-312b, Type IV.
         1) Equals as approved by Architect before bidding. See Section 01 6200.
   2. Adhesive: Water-resistant type. Best grade in accordance with Tile Manufacturer's recommendations.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification of Conditions:
   1. Verify concrete surfaces are sufficiently cured and moisture content is within acceptable levels before beginning installation.

B. Evaluation And Assessment:
   1. Variation In Grade: Plus or minus 1/8 inch (3 mm) in any 10 feet (3 meters) of floor slab and distance between high point and low point of slab of 1/2 inch (12 mm).
   2. Testing Procedure: Place ends of straightedge on 3/8 inch (9 mm) high shims. Floor is satisfactory if 1/4 inch (6 mm) diameter steel rod rolled under straightedge will not touch anywhere along 10 foot (3 meter) length and 1/2 inch (12 mm) diameter steel rod will not fit under straightedge anywhere along 10 foot (3 meter) length.
   3. Notify Architect in writing if floor surface is not acceptable to install tile. Do not lay tile over unsuitable surface. Commencing installation constitutes acceptance of floor and approval of existing conditions.
   4. Confirm acceptance and approval of substrate with Architect before beginning installation of flooring system.

3.2 INSTALLATION

A. Special Techniques:
   1. Lay tile symmetrically about center line of spaces to insure even borders, unless shown differently on Drawings.
   2. Install beveled edge stripping at terminal edges of tile except at ceramic tile, carpet, and where Drawings indicate different detail. Conceal edging strips beneath doors.

3.3 FIELD QUALITY CONTROL

A. Field Tests:
   1. See Section 09 0503 'Flooring Substrate Preparation' for Field Testing for Alkalinity and Concrete Moisture of concrete slab.

END OF SECTION
SECTION 096700
EPOXY RESIN COMPOSITION FLOORING

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS
A. Work of this Section, as shown or specified, shall be in accordance with the requirements of the Contract Documents.

1.2 WORK INCLUDED
A. Work of this Section includes, but is not limited to, providing all labor, materials, equipment transportation and services necessary to complete the epoxy resin composition flooring and integral coved base as indicated on the drawings and as specified herein. To include surface preparation, primer, base and finish coat and cove base.

1.3 REFERENCES
A. References made herein to published specifications; standards, methods of testing and recommended methods of trade, industry and governmental organizations shall apply to the year of original adoption or the year of the latest revision or approvals.

1.4 SUBMITTALS
A. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.
B. Product Data: Submit manufacturer’s technical data, application instructions and general recommendations for the epoxy resin composition flooring specified herein.
C. Samples for initial selection purposes in form of manufacturer’s color charts showing full range of colors and finishes available.
   1. Submit 4” x 4” samples of color chips from manufacturer’s standard colors.
D. Material certificates signed by manufacturer certifying that the epoxy resin composition flooring complies with requirements specified herein.
E. Maintenance Instructions: Submit manufacturer’s written instructions for recommended maintenance practices.

1.5 QUALITY ASSURANCE
A. Installer Qualifications: Engage an experienced Installer or applicator with five years experience and who has specialized in installing resinous flooring types similar to that required for this Project and who is acceptable to manufacturer of primary materials.
B. Single-Source Responsibility: Obtain epoxy resin composition flooring materials, including primers, resins, hardening agents and finish or sealing coats from a single manufacturer.
C. Qualified Materials: Request for material approvals for any products other than the specified products must be submitted to the Architect prior to the bid, including
complete application specification, physical characteristics, and chemical resistance data. Any request after this date will not be accepted. Failure of performance requires immediate removal and replacement of unapproved substituted material with those originally specified at no cost to the Owner, Architect, Construction Manager or General Contractor.

1.6 DELIVERY, STORAGE AND HANDLING

A. Deliver materials in original packages and containers with seals unbroken and bearing manufacturer’s labels containing brand name and directions for storage and mixing with other components.

B. Store materials to comply with manufacturer’s directions to prevent deterioration from moisture, heat, cold, direct sunlight or other detrimental effects.

C. Materials shall be stored in a dry, enclosed area protected from exposure to moisture. Temperature of storage area shall be maintained between 60 and 85 degrees F/16 and 32 degrees C.

1.7 PROJECT CONDITIONS

A. Environmental Conditions: Comply with epoxy resin composition flooring manufacturer’s directions for maintenance of ambient and substrate temperature, moisture, humidity, ventilation and other conditions required to execute and protect Work.

1.8 WARRANTY

A. Provide one (1) year guarantee for material and installation.

PART 2 PRODUCTS

2.1 MATERIALS

A. Troweled epoxy resin composition flooring.

2.2 PROPERTIES


B. Physical Properties: Provide flooring system that meets or exceeds the listed minimum physical property requirements when tested according to the referenced standard test method in parentheses.

1. Compressive Strength (ASTM C-579) 11,000 psi
2. Tensile Strength (ASTM C-307) 2,000 psi
3. Flexural Modulus of Elasticity (ASTM C-580) 4,300 psi
4. Water Absorption (ASTM C-413) .01%
5. Surface Hardness (ASTM D-2240) 86 Durometer A/D
6. Abrasion Resistance (ATM C-501) 597.4
7. Impact Resistance (MIL D-3134, Para 4.7.3) 0.024” max. No chipping, cracking, loss of adhesion
8. Impact Resistance (Gardner Impact Tester) No chipping, cracking, or delamination and not more than 0.014” indentation
9. Adhesion (A.C.I. Comm. No. 503.1) 400 psi (100% failure in concrete)
10. Electrical Conductivity (NFPA 56A) Di-electric
11. Flammability-Critical Radiant Flux (ASTM E-648) Greater than 1.07 watts/cm²
12. Bond Strength (ASTM D-454) 600 psi
13. Coefficient of Friction (ASTM D-2047 ) >0.9
14. Heat Resistance limit 
   Dry- 250 deg. Continuous/ 275 deg. Intermittent
   Wet- 140 deg. Continuous/ 200 deg. Intermittent
15. Electrical Conductivity Electrically non-conductive

C. Joint Sealer
   1. Type produced by manufacturer of resinous flooring system for type of service and joint
      condition indicated.

2.3 SUPPLEMENTAL MATERIALS

A. Anti-Microbial Additive: Incorporate antimicrobial chemical additive to prevent growth of most
   bacteria, fungi, algae and actinomycetes.

2.4 APPROVED MANUFACTURERS

A. Sunbelt Flooring, Inc., Chino, CA (909)628-1090
B. Dur-A-Flex, Inc., East Hartford, CN (800) 253-3539
C. Equal as approved by Architect before bidding.

PART 3 EXECUTION

3.1 PREPARATION

A. Concrete substrate preparation shall be by mechanical means and include use of a scabbler,
   scarifier or shot blast machine for removal of bond inhibiting materials such as curing
   compounds of laitance. Cleaning of interior concrete slabs: Vacuum shot blast ("Blastrac") all
   designated existing interior concrete floor slabs that are to receive new flooring materials or
   leveling underlayment coating. Vacuum shot blasting shall be with steel pellets 330-5 to 390-5
   for optimum surface profile in order for all sealers or adhesives to penetrate and bond.
   Coordinate all vacuum shot blasting with respective floor covering contractor. Dustless
   diamond cup grinding may be used in some instances in lieu of shot blasting.

3.2 INSTALLATION

A. General - Apply each component of resinous flooring system in compliance with manufacturer’s
   directions to produce a uniform monolithic wearing surface of thickness indicated, uninterrupted
   except at divider strips, sawn joints or other types of joints (if any), indicated or required.

B. Primer - Mix and apply primer over properly prepared substrate with strict adherence to
   manufacturer’s installation procedures and coverage rates. Coordinate timing of primer
   application with application of troweled mortar to ensure optimum adhesion between resinous
   flooring materials and substrate.

C. Troweled Mortar - Mix mortar material according to manufacturer’s recommended procedures.
   Uniformly spread mortar over substrate using manufacturer’s specially designed screed box
   adjusted to manufacturer’s recommended height. Hand trowel apply mixed material over
   freshly primed substrate using steel finishing trowels or power trowel material.

D. Undercoat - Remove any surface irregularities by lightly abrading and vacuuming the floor
surface. Mix and apply undercoat with strict adherence to manufacturer’s installation procedures and coverage rates.

E. Broadcast - Immediately broadcast quartz silica aggregate into the undercoat using manufacturer’s specially design spray caster. Strict adherence to manufacturer’s installation procedures and coverage rates is imperative.

F. Sealer - Remove excess unbonded granules by lightly brushing and vacuuming the floor surface. Mix and apply sealer with strict adherence to manufacturer’s installation procedures.

3.4 CURING, PROTECTION & CLEANING

A. Curing resinous flooring materials in compliance with manufacturer’s directions, taking care to prevent contamination during stages of application and prior to completion of curing process. Close area of application for a minimum of 24 hours.

B. Protect resinous flooring materials from damage and wear during construction operation. Where temporary covering is required for this purpose, comply with manufacturer’s recommendations for protective and method of application. General Contractor is responsible for protection and cleaning of surfaces after final coats.

C. Cleaning: Remove temporary covering and clean resinous flooring just prior to final inspection. Use cleaning materials and procedures recommended by resinous flooring manufacture.

END OF SECTION
SECTION 09 6813
TILE CARPETING

PART 1 - GENERAL

1.1 SUMMARY
A. Section Includes But Is Not Limited To:
   1. Furnish and install carpet tiles as described in contract documents and including following:
      a. Maintain Building Ambient Conditions including normal levels of humidity, lighting, heating,
         and air conditioning for acceptability for beginning floor preparation and carpet installation.
      b. Installation of floor leveling compound prior to finish floor installation.

B. Products Installed But Not Furnished Under This Section:
   1. Section 09 6513 – Resilient Base And Accessories

C. Related Requirements:
   1. Section 09 6513 – Resilient Base And Accessories

1.2 REFERENCES
A. Association Publications:
   1. American Concrete Institute, Farmington Hills, MI  www.concrete.org. Abstracts of ACI
      Periodicals and Publications.
      a. ACI 302.2R-06, Guide for Concrete Slabs that Receive Moisture-Sensitive Flooring Materials
         (August 15, 2006).
   2. NSF International (NSF) / American National Standards Institute (ANSI):
      a. NSF International, Ann Arbor, MI  www.nsf.org
      Specification of Commercial Carpet:
      b. CRI Indoor Air Quality (IAQ):
         1) CRI Green Label Plus Certification.
      c. CRI Texture Appearance Retention Rating (TARR):
         1) Retention Rating Scales.

B. Definitions:
   1. Adhesive: Substance that dries to film capable of holding materials together by surface
      attachment.
   2. Antimicrobial: Chemical treatment added to carpet or reduce growth of common bacteria, fungi,
      yeast, mold and mildew.
   3. Appearance Retention: Ability of a fabric to retain its original aesthetics, color, and construction
      integrity.
   4. Backing: Materials comprising back of carpet as opposed to carpet pile or face.
      a. Tufted carpets: (1) Primary backing, woven or nonwoven fabric in which pile yarn is inserted
         by tufting needles. (2) Secondary backing, Fabric laminated to back of carpet to reinforce
         and increase dimensional stability.
      b. Woven carpets: Backings are ‘construction yarns’ comprising chain warp, stuffer warp, and
         shot or fill, which are interwoven with face yarn during carpet fabric formation.
   5. Backing Fabric: Fabric into which pile yarn is inserted, or reinforcing layer that is adhered to
      reverse side of fabric.
6. Bonding Agent (Backcoating): Application of latex or adhesive to back of carpet to anchor tufts usually followed immediately by addition of secondary backing material such as nonwoven polypropylene or poly-urethane attached cushion.

7. Carpet: Heavy fabric used to cover floor and made from variety of fibers.

8. Change In Surface Appearance: Cumulative change in surface appearance between unexposed and exposed specimens due to crushing, loss of tuft definition, and matting.

9. Colorfastness: Ability of fiber or carpet to retain color when exposed to (1) ultraviolet light, (2) crocking (wet or dry) and (3) atmospheric conditions.

10. Commercial Match: Matching of colors with acceptable tolerance, or with color variation that is barely detectable to naked eye.

11. Crockfastness: Resistance of transfer of colorant from surface of colored yarn or fabric to another surface, or to an adjacent area of same fabric, principally by rubbing.

12. Crushing: Collapsing of pile yarns, resulting in carpet matting and loss of resilience due to traffic.

13. Delamination: Form of deterioration of tufted carpet in which primary back and face yarns separate from secondary back.


15. Dimensional Stability: Ability of carpet to retain its size and shape once installed.

16. Face Weight: Total weight of face (above backing) yarns in carpet.

17. Fiber: Fundamental unit of carpet made from nylon, polyester, cotton, acrylics, wool, and recycled material.

18. Flammability: Procedures that have been developed for assessing flame resistance of carpets.

19. Fuzzing: Fluffy particles appear on carpet surfaces caused by fibers that loosen because of weak twist or snags.

20. Lightfastness: Degree of resistance of dyed textile materials to color destroying influence of sunlight.

21. Loss of Tuft Definition: Bursting, opening, and untwisting of pile yarn and/or decrimping of fibers in surface pile of pile yarn floor covering.

22. Matting: Loss of pile definition of a textile floor covering due to entanglement and compression of pile fibers.

23. Modification Ratio: Ratio between circumference of inner core of multi lobal fiber's cross section, and circumference of circle drawn around outer edges of fibers cross sections' outer lobes or tips.

24. Pile: Visible surface of carpet, consisting of yarn tufts in loop and/or cut configuration. Sometimes called face or nap.

25. Resilience: Ability of carpet to spring back to its original texture and thickness after being walked on or compressed weight of furniture.

26. Soil Resistance: Ability of carpet fiber to resist dry soil and maintain its original appearance after intermittent or restorative cleanings.

27. Soiling: Occurs when dirt particles build up in carpet fibers.

28. Stain Resistance: Ability of carpet fiber to resist absorption of stain and maintain its original appearance.

29. Texture: Visual and tactile surface characteristics of carpet pile, including such aesthetic and structural elements.

30. Texture Appearance Retention Rating (TARR): Model specification process that classifies areas of intended use and minimum carpeting texture appearance retention ratings for particular areas of use. Moderate, heavy, severe, or special end-use classification is established for each application based on level of expected foot traffic in specific areas.

31. Tile: Carpet module usually 24 inch x 24 inch in size. Extremely dense construction with heavy reinforced backing.

32. Tuft: Cluster of yarns drawn through fabric and projecting from surface in form of cut yarns or loops.

33. Tuft Bind: Force (usually measured in pounds) required to pull tuft from carpet backing.

34. Tufted Carpet: Carpet produced by tufting machine instead of loom.


36. Woven Carpet: Carpet produced on a loom.

37. Woven: Interlacing strands of fiber into yarn forms woven carpet.

38. Yarn: Fibers that are twisted together to form a continuous strand.
C. Reference Standards:
   1. ASTM International:
      a. ASTM F2170-09, 'Standard Test Method for Determining Relative Humidity in Concrete
         Floor Slabs Using in situ Probes.'

1.3 SUBMITTALS

A. Informational Submittals:
   1. Manufacturer Instructions:
      a. Published installation instructions.

B. Closeout Submittals:
   1. Include following in Operations And Maintenance Manual specified in Section 01 7800:
      a. Warranty Documentation:
         1) Final, executed copy of Warranty.
      b. Record Documentation:
         1) Manufacturers documentation:
            a) Manufacturer’s literature.
            b) Color and style selection.

C. Maintenance Material Submittals:
   1. Extra Stock Materials:
      a. Leave carpet tiles equivalent to 15 percent of number installed as attic stock.
      b. Tie securely and wrap in protective cover.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Delivery And Acceptance Requirements:
   1. Deliver materials and accessories necessary for completion of carpet installation to the site before
      beginning installation of carpet.
   2. Do not deliver materials before date scheduled for installation.

B. Storage And Handling Requirements:
   1. Store carpet and related materials in a climate-controlled, dry space.
   2. Protect carpet from soil, dust, moisture and other contaminants.

1.5 FIELD CONDITIONS

A. Ambient Conditions:
   1. Building Conditions:
      a. Conditions inside building shall be brought to levels to be normal at occupancy of building.
         Conditions include normal levels of humidity, lighting, heating, and air conditioning.
         1) Carpet installation is not to begin until HVAC system is operational and following
            conditions are maintained for at least forty eight (48) hours before, during and seventy
            two (72) hours after completion:
            a) Carpet is to be installed when indoor temperature is between 65º - 95º F (18º - 35º
               C) with maximum relative humidity of 65%.
            b) Substrate surface temperature should not be less than 65º F (18º C) at time of
               installation.
            c) Do not allow temperature of indoor carpeted areas to fall below 50º F (10º C),
               regardless of age of installation.
         2) Maintain fresh air ventilation after installation for seventy two (72) hours minimum or
            until lingering odors are gone.
1.6 WARRANTY

A. Manufacturer Warranty:
   1. Provide Carpet Manufacturer's standard Warranty.

PART 2 - PRODUCTS

2.1 PRODUCTS

A. Approved Manufacturer:
   1. Patcraft Commercial Flooring, Dalton, GA Contact Shaun Tait (714) 322-5483
   2. Equal as approved by Architect before bidding. See Section 01 6200.

B. Materials: Design Standard
   1. Carpet Tiles:
      1) Collection - Visual Energy by Patcraft
      2) Pattern - Vivid
      3) Color - Lightning 00725

2.2 ACCESSORIES

A. Carpet Accessories: Snap-in vinyl reducer strips and vinyl track

B. Floor Leveling Compound and Floor Patching Compound: As recommended and approved by carpet Manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification of Conditions:
   1. Resilient Base:
      a. Inspect surfaces for conditions not suitable for installation. Surface to receive specified items shall be sound, clean, free from foreign matter, tightly nailed, and dry:
         1) Notify Owner's Representative in writing of unsuitable conditions:
            a) Do not start work until defects are corrected. Commencing installation constitutes acceptance of substrate.

3.2 PREPARATION

A. Carpet Areas:
   1. Flooring Preparation:
      a. Carpet Installer's Responsibility:
         1) Prepare floor substrate in accordance with 'CRI Carpet Installation Standard' best practices to receive carpet installation and to provide installation that meets warranty requirements.
         2) Verify concrete surface cured, clean, dry, and free of foreign substances that will compromise carpet and/or installation.
      b. Concrete floor slab patching:
         1) Cracks, chips and joints must be properly patched or repaired.
      c. Concrete surface cured, clean, dry, and free of foreign substances that will compromise carpet and/or other flooring installations:
1) Removal of curing compounds.
2) Remove paint, sealer, grease, oil, silicone sealants, and other materials incompatible with flooring adhesives.
3) Removal of overspray from painted walls (essential so glue will stick).
   d. Vacuum and damp mop floor areas to receive floor leveling compound before flooring installation.
   e. Install floor leveling compound per manufacturers instructions.
   f. Vacuum and damp mop floor areas to receive flooring before flooring installation.

B. Resilient Base:
   1. Surface Preparation:
      a. Remedy cracks and minor irregularities in substrate in accordance with Manufacturer's recommendations.

3.3 INSTALLATION

A. Carpet:
   1. General:
      a. Install carpet in accordance with 'CRI Carpet Installation Standard' and Manufacturer's written instructions supplied with product.
      b. Adhesion of carpet tile to floor substrate shall be continuous on floor surface so there are no bubble, ridges, or any separation of carpet from backings or backing from floor substrate caused by failure of carpet system.
      c. Install carpet under edge of metal thresholds where possible. Use specified carpet accessories at exposed edges.
      d. Install transition strips between new and existing flooring systems.

B. Resilient Base:
   1. Install in manner to produce smooth, even finished surfaces tightly jointed and accurately aligned.
   2. Fit specified items tightly. Use fillers where necessary. Fit neatly against projections, piping, electrical service outlets, etc.
   3. Secure specified items with specified adhesive. Cement substantially to vertical surfaces including rubber base to cabinet work base.
   4. Line up top and bottom lines of base throughout.
   5. Do not stretch base during installation.
   6. Roll until firm bond has been established. Leave level, free from buckles, cracks, and projecting edges.
   7. In wall runs longer than 12 inches (300 mm), install no lengths of base shorter than 12 inches (300 mm) long.

3.4 FIELD QUALITY CONTROL

A. Non-Conforming Work:
   1. Carpeting:
      a. Basis of Acceptable Carpeting: Source Quality Control Testing:
         1) Carpet products not meeting Design Criteria and Source Quality Control Testing of this specification will be considered unacceptable carpeting.
      b. Unacceptable Carpeting:
         1) Unacceptable carpeting will be rejected and shall be repaired or replaced at no additional cost to Owner.
   2. Resilient Base:
      a. Replace damaged materials at no additional cost to Owner:
      b. Damaged materials are defined as having cuts, gouges, scrapes or tears, and not fully adhered.
3.5 CLEANING

A. General:
   1. Carpeting:
      a. Carpet Installer’s Responsibility:
         1) Remove any soiling and/or staining from carpet.
         2) Remove excessive adhesive with manufacturer recommended adhesive removers.
   2. Resilient Base:
      a. Carpet Installer’s Responsibility:
         1) Clean all exposed surfaces of resilient base of adhesive spatter before it sets in accordance with Manufacturer’s cleaning instructions.

B. Damage to building:
   1. Carpeting:
      a. Carpet Installer’s Responsibility:
         1) Carpet Installer responsible for cleaning and repair of all damaged surfaces to their original condition from carpet installation.
   2. Resilient Base:
      a. Carpet Installer’s Responsibility:
         1) Clean all exposed surfaces of adjoining areas of adhesive spatter before it sets.

C. Waste Management:
   1. Contractor’s Responsibility:
      a. Provide adequate waste receptacles (dumpsters) and dispose of materials from building and property.
   2. Carpet Installer’s Responsibility:
      a. All work areas are to be kept clean, clear and free of debris at all times.
      b. Disposal of rubbish, wrapping paper, scraps, and trimmings in provided dumpster(s).

3.6 PROTECTION

A. Protection of Carpeting:
   1. Contractor’s Responsibility:
      a. No traffic of any kind on newly installed carpet for minimum of twenty four (24) hours after installation is completed.
      b. No wheeled traffic of any kind placement of furniture or equipment on carpet for minimum of forty eight (48) hours after completion of carpet installation.
      c. Protect carpet adequately from soil, dust, moisture and other contaminants after carpet installation.
      d. Protect carpet from abuse, vandalism, or damage occurring after installation is complete.

B. Protection of Base:
   1. Resilient Base:
      a. Contractor’s Responsibility:
         1) Cover material until Final Inspection.
         2) Keep traffic away until adhesive has set.

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Common procedures and requirements for field-applied painting and coating.

B. Related Requirements:

1.2 REFERENCES

A. Definitions:
   1. Damage Caused By Others: Damage caused by individuals other than those under direct control of Painting Applicator (MPI(a), PDCA P1.92).
   2. Gloss Levels:
      a. Specified paint gloss level shall be defined as sheen rating of applied paint, in accordance with following terms and values, unless specified otherwise for a specific paint system.

<table>
<thead>
<tr>
<th>Gloss Level</th>
<th>Description</th>
<th>Gloss Level Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>'1'</td>
<td>Traditional matte finish - flat</td>
<td>0 to 5 units at 60 degrees to 10 units maximum at 85 degrees.</td>
</tr>
<tr>
<td>'2'</td>
<td>High side sheen flat - 'velvet-like' finish</td>
<td>10 units maximum at 60 degrees and 10 to 35 units at 85 degrees.</td>
</tr>
<tr>
<td>'3'</td>
<td>Traditional ‘eggshell-like finish'</td>
<td>10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees.</td>
</tr>
<tr>
<td>'4'</td>
<td>'Satin-like' finish</td>
<td>20 to 35 units at 60 degrees and 35 units minimum at 85 degrees.</td>
</tr>
<tr>
<td>'5'</td>
<td>Traditional semi-gloss</td>
<td>35 to 70 units at 60 degrees.</td>
</tr>
<tr>
<td>'6'</td>
<td>Traditional gloss</td>
<td>70 to 85 units at 60 degrees.</td>
</tr>
<tr>
<td>'7'</td>
<td>High gloss</td>
<td>More than 85 units at 60 degrees.</td>
</tr>
</tbody>
</table>

3. Properly Painted Surface:
   a. Surface that is uniform in appearance, color, and sheen and free of foreign material, lumps, skins, runs, sags, holidays, misses, strike-through, and insufficient coverage. Surface free of drips, spatters, spills, and overspray caused by Paint Applicator. Compliance will be determined when viewed without magnification at a distance of 5 feet (1.50 m) minimum under normal lighting conditions and from normal viewing position (MPI(a), PDCA P1.92).

4. Latent Damage: Damage or conditions beyond control of Painting Applicator caused by conditions not apparent at time of initial painting or coating work.

B. Reference Standards:
   1. The latest edition of the following reference standard shall govern all painting work:
      a. MPI(a), 'Architectural Painting Specification Manual' by Master Painters Institute (MPI), as issued by local MPI Accredited Quality Assurance Association having jurisdiction.
      b. MPI(r), 'Maintenance Repainting Manual' by Master Painters Institute (MPI), as issued by local MPI Accredited Quality Assurance Association having jurisdiction.
1.3 SUBMITTALS

A. Action Submittals:
   1. Product Data:
      a. Include following information for each painting product, arranged in same order as in Project Manual.
         1) Manufacturer’s cut sheet for each product indicating ingredients and percentages by weight and by volume, environmental restrictions for application, and film thicknesses and spread rates.
         2) Provide one (1) copy of ‘MPI Approved Products List’ showing compliance for each MPI product specified.
            a) MPI Information is available from MPI Approved Products List using the following link: http://www.paintinfo.com/mpi/approved/index.shtml.
         3) Confirmation of colors selected and that each area to be painted or coated has color selected for it.

   2. Samples: Provide two 4 inch by 6 inch (100 mm by 150 mm) minimum draw-down cards for each paint or coating color selected for this Project.

B. Informational Submittals:
   1. Manufacturer Instructions:
      a. Manufacturer’s substrate preparation instructions and application instruction for each painting system used on Project.

   2. Qualification Statement:
      a. Applicator:
         1) Provide Qualification documentation if requested by Architect or Owner.

C. Closeout Submittals:
   1. Include following in Operations And Maintenance Manual specified in Section 01 7800:
      a. Record Documentation:
         1) Manufacturer’s documentation:
            a) Manufacturer’s cut sheet for each component of each system.
            b) Schedule showing rooms and surfaces where each system was used.

D. Maintenance Materials Submittals:
   1. Extra Stock Materials:
      a. Provide painting materials in Manufacturer’s original containers and with original labels in each color used. Label each can with color name, mixture instructions, date, and anticipated shelf life.
      b. Provide one (1) quart of each finish coat and one (1) pint of each primer and of each undercoat in each color used.

1.4 QUALITY ASSURANCE

A. Regulatory Agency Sustainability Approval:
   1. Conform to work place safety regulations and requirements of those authorities having jurisdiction for storage, mixing, application and disposal of all paint and related hazardous materials.
   2. Paint and painting materials shall be free of lead and mercury, and have VOC levels acceptable to local jurisdiction.
   3. Master Painters Institute (MPI) Standards:
      a. Products: Comply with MPI standards indicated and listed in ‘MPI Approved Products List’.

B. Field Samples:
   1. Before application of any paint system, meet on Project site with Architect, Owner’s representative, and Manufacturer’s representative. Architect may select one (1) surface for
application of each paint system specified. This process will include establishing acceptable substrate conditions required for Project before application of paints and coatings.

2. Apply paint systems to surfaces indicated by Architect following procedures outlined in Contract Documents and Product Data submission specified above.

3. After approval of samples, proceed with application of paint system throughout Project. Approved samples will serve as standard of acceptability.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Delivery And Acceptance Requirements:
   1. Deliver specified products in sealed, original containers with Manufacturer's original labels intact on each container.
   2. Deliver amount of materials necessary to meet Project requirements in single shipment.

B. Storage And Handling Requirements:
   1. Store materials in single place.
   2. Keep storage area clean and rectify any damage to area at completion of work of this Section.
   3. Maintain storage area at 55 deg F (13 deg C) minimum.

1.6 FIELD CONDITIONS

A. Ambient Conditions:
   1. Perform painting operations at temperature and humidity conditions recommended by Manufacturer for each operation and for each product for both interior and exterior work.
   2. Apply painting systems at lighting level of 540 Lux (50 foot candles) minimum on surfaces to be painted.
      a. Inspection of painting work shall take place under same lighting conditions as application.
      b. If painting and coating work is applied under temporary lighting, deficiencies discovered upon installation of permanent lighting will be considered latent damage as defined in MPI Manual, PDCA P1-92.

PART 2 - PRODUCTS

2.1 SYSTEMS

A. Performance:
   1. Design Criteria:
      a. Provide materials for use within each coating system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
      b. All materials, preparation and workmanship shall conform to requirements of ‘Architectural Painting Specification Manual’ by Master Painters Institute (MPI).
      c. All paint manufacturers and products used shall be as listed under Approved Product List section of MPI Painting Manual.
      d. Provide Premium Grade systems (2 top coats) as defined in MPI Architectural Painting Specification Manual, except as otherwise indicated.
      e. Where specified paint system does not have Premium Grade, provide Budget Grade.
      f. Provide products of same manufacturer for each coat in coating system.
      g. Where required to meet LEED (Leadership in Energy and Environmental Design) program requirements, use only MPI listed materials having an “L” rating designation.
B. Materials:
1. Materials used for any painting system shall be from single manufacturer unless approved otherwise in writing by painting system manufacturers and by Architect. Include manufacturer approvals in Product Data submittal.
2. Linseed oil, shellac, turpentine, and other painting materials shall be pure, be compatible with other coating materials, bear identifying labels on containers, and be of highest quality of an approved manufacturer listed in MPI manuals. Tinting color shall be best grade of type recommended by Manufacturer of paint or stain used on Project.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification Of Conditions:
1. Directing applicator to begin painting and coating work will indicate that substrates to receive painting and coating materials have been previously inspected as part of work of other Sections and are complete and ready for application of painting and coating systems as specified in those Sections.

B. Pre-Installation Testing:
1. Before beginning work of this Section, examine, and test surfaces to be painted or coated for adhesion of painting and coating systems.
2. Report in writing to Architect of conditions that will adversely affect adhesion of painting and coating work.
3. Do not apply painting and coating systems until party responsible for adverse condition has corrected adverse condition.

C. Evaluation And Assessment:
1. Report defects in substrates that become apparent after application of primer or first finish coat to Architect in writing and do not proceed with further work on defective substrate until such defects are corrected by party responsible for defect.

3.2 PREPARATION

A. Protection Of In-Place Conditions:
1. Protect other finish work and adjacent materials during painting. Do not splatter, drip, or paint surfaces not intended to be painted. These items will not be spelled out in detail but pay special attention to the following:
   a. Do not paint finish copper, bronze, chromium plate, nickel, stainless steel, anodized aluminum, or monel metal except as explicitly specified.
   b. Keep cones of ceiling speakers completely free of paint.
   c. On existing work where ceiling is to be painted, speakers and grilles are already installed, and ceiling color is not being changed, mask off metal grilles installed on ceiling speakers. If ceiling color is being changed, remove metal grilles and paint, and mask off ceiling speakers.

B. Surface Preparation:
1. Prepare surfaces in accordance with MPI requirements and requirements of Manufacturer for each painting system specified, unless instructed differently in Contract Documents. Bring conflicts to attention of Architect in writing.
2. Fill minor holes and cracks in wood surfaces to receive paint or stain.
3. Surfaces to be painted shall be clean and free of loose dirt. Clean and dust surfaces before painting or finishing.
3.3 APPLICATION

A. Interface With Other Work:
   1. Coordinate with other trades for materials and systems that require painting before installation.
   2. Schedule painting and coating work to begin when work upon which painting and coating work is dependent has been completed. Schedule installation of pre-finished and non-painted items, which are to be installed on painted surfaces, after application of final finishes.

B. Paint or finish complete all surfaces to be painted or coated as described in Contract Documents,

C. Apply sealant in gaps 3/16 inch (5 mm) and smaller between two substrates that are both to be painted or coated. Sealants in other gaps furnished and installed under Section 07 9213.

D. Spread materials smoothly and evenly. Apply coats to not less than wet and dry film thicknesses and at spreading rates for specified products as recommended by Manufacturer.

E. Touch up suction spots after application of first finish coat.

F. Paint shall be thoroughly dry and surfaces clean before applying succeeding coats.

G. Make edges of paint adjoining other materials or colors clean, sharp, and without overlapping.

H. Finished work shall be a 'Properly Painted Surface' as defined in this Section.

3.4 FIELD QUALITY CONTROL

A. Non-Conforming Work:
   1. Correct deficiencies in workmanship as required to leave surfaces in conformance with 'Properly Painted Surface,' as defined in this Section.
   2. Correction of 'Latent Damage' and 'Damage Caused By Others,' as defined in this Section, is not included in work of this Section.

3.5 CLEANING

A. General:
   1. As work proceeds and upon completion of work of any painting Section, remove paint spots from floors, walls, glass, or other surfaces and leave work clean, orderly, and in acceptable condition.

B. Waste Management:
   1. Remove rags and waste used in painting operations from building each night. Take every precaution to avoid danger of fire.
   2. Paint, stain and wood preservative finishes and related materials (thinners, solvents, caulking, empty paint cans, cleaning rags, etc.) shall be disposed of subject to regulations of applicable authorities having jurisdiction.
   3. Remove debris caused by work of paint Sections from premises and properly dispose.
   4. Retain cleaning water and filter out and properly dispose of sediments.

END OF SECTION
SECTION 09 9113
EXTERIOR PAINTED GALVANIZED METAL

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Preparing and painting new and existing exterior exposed galvanized metal surfaces as
      Described in Contract Documents.

B. Related Requirements:
   1. Section 09 9001: 'Common Painting And Coating Requirements':
      a. Pre-installation conference for Sections under 09 9000 heading ‘Paints and Coatings’.

PART 2 - PRODUCTS

2.1 SYSTEM

A. Manufacturers:
   1. Category Four Approved Products and Manufacturers. See Section 01 6200 for definitions of
      Categories.
      a. Products listed in edition of MPI Approved Product List current at time of bidding and later
         are approved, providing they meet VOC requirements in force where Project is located.

B. Description:
   1. Exposed Miscellaneous Structural Steel:
      a. New Surfaces: Use MPI(a) EXT 5.3D Pigmented Polyurethane Finish system.
      b. Previously Finished Work: Use MPI(r) REX 5.3D Pigmented Polyurethane Finish system.
   2. All Other:
      a. New Surfaces: Use MPI(a) EXT 5.3H Latex Finish system.
      b. Previously Finished Surfaces: Use MPI(r) REX 5.3H Latex Finish system.

C. Performance:
   1. Design Criteria:
      a. New Surfaces: MPI Premium Grade finish requirements.
      b. Deteriorated Existing Surfaces: MPI Premium Grade finish requirements.
      c. Sound Existing Surfaces: MPI Custom Grade finish requirements.
      d. Gloss / Sheen Level Required: Gloss Level 5.

D. Materials:
   1. Polyurethane:
      b. Finish Coats:
         1) Epoxy MPI Product 101: ‘Primer, Epoxy, Anti-Corrosive, for Metal’.
         2) Polyurethane MPI Product 72: ‘Polyurethane, Two-Component, Pigmented, Gloss (MPI
            Gloss Level 6-7)’.
   2. Latex:
PART 3 - EXECUTION

3.1 APPLICATION

A. General: See appropriate paragraphs of Section 09 9001.

B. New Surfaces:
   1. Clean 'passivated' or 'stabilized' galvanized steel as specified in SSPC-SP1.
   2. After removal of 'passivated' or 'stabilized' coating or for surfaces without coating, clean surfaces to be painted with mineral spirits or product recommended by Paint Manufacturer. Change to clean rags or wiping cloths regularly to reduce possibility of re-contamination of surface.
   3. Apply prime coat.
   4. Apply finish coats.

C. Existing Painted Surfaces:
   1. Remove deteriorated and chalked existing paint and rust deposits down to sound substrate by sanding, scraping, or wire brushing.
   2. Clean existing sound painted surfaces as well as scraped and sanded existing painted surfaces as recommended by Paint Manufacturer.
   3. Apply prime coat.
   4. Apply finish coats.

D. Existing Unpainted Surfaces:
   1. Wirebrush or power wash as necessary to remove 'white rust'.
   2. Apply prime coat.
   3. Apply finish coats.

END OF SECTION
SECTION 09 9114

EXTERIOR PAINTED CMU AND CONCRETE

PART 1 - GENERAL

SUMMARY

A. Includes But Not Limited To:
   1. Preparing and painting new and existing exterior masonry, concrete, and stucco surfaces as described in Contract Documents.

B. Related Requirements:
   1. Section 09 9001: 'Common Painting And Coating Requirements':
      a. Pre-installation conference for Sections under 09 9000 heading 'Paints and Coatings'.

PART 2 - PRODUCTS

2.1 SYSTEM

A. Manufacturers:
   1. Approved Products and Manufacturers. See Section 01 6200.
      a. Products listed in edition of MPI Approved Product List current at time of bidding and later are approved, providing they meet VOC requirements in force where Project is located.

B. Description:
   1. Concrete:
      a. New Surfaces: Use MPI(a) EXT 3.1A Latex Finish system.
      b. Previously Finished Surfaces: Use MPI(r) REX 3.1A Latex Finish system.
   2. CMU:
      a. New Surfaces: Use MPI(a) EXT 4.2A Latex Finish system.
      b. Previously Finished Surfaces: Use MPI(r) REX 4.2A Latex Finish system.

C. Performance:
   1. Finish Requirements:
      a. New Surfaces: MPI Premium Grade finish requirements.
      b. Deteriorated Existing Surfaces: MPI Premium Grade finish requirements.
      c. Sound Existing Surfaces: MPI Custom Grade finish requirements.
      d. Gloss / Sheen Level Required: Gloss Level 1.

D. Materials:
   2. Finish Coats: MPI Product 10: 'Latex, Exterior Flat (MPI Gloss Level 1-2)'.

PART 3 - EXECUTION

3.1 PREPARATION

A. Except for steam cured products, cure cement type surfaces from 60 to 90 days in accordance with Paint Manufacturer's recommendations before painting.
3.2 APPLICATION

A. General: See appropriate paragraphs of Section 09 9001.

B. New Surfaces:
   1. On highly porous surfaces when weather is exceptionally hot and dry, it may be desirable to dampen surface before applying first coat of an emulsion paint.
   2. Completely cover voids in masonry block.
   3. Roll after spraying if necessary to eliminate pinholing.

EDIT REQUIRED: After examination of the existing surfaces to be repainted, edit following TWO paragraphs to specify procedure to be followed in preparing those surfaces for repainting, if necessary.

Delete following two paragraphs if no existing exterior CMU, concrete, or stucco work is to be painted.

C. Existing Painted Surfaces:
   1. Remove deteriorated and chalked existing paint down to sound substrate by scraping and or high-pressure spray. Feather edges of existing paint by sanding to be smooth with adjacent surfaces.
   2. Clean existing sound painted surfaces as well as scraped and sanded existing painted surfaces as recommended by Paint Manufacturer.
   3. Fill cracks with masonry crack filler.
   4. Prime scraped and sanded areas.
   5. Apply finish coat as required for new work.

D. Existing Unpainted Surfaces:
   1. Power wash surfaces to be painted.
   2. Fill cracks with masonry crack filler.
   3. Apply block filler and finish coat as required for new work.

END OF SECTION
SECTION 09 9122
INTERIOR PAINTED CMU

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Preparing and painting new and existing interior CMU walls as described in Contract Documents.

B. Related Requirements:
   1. Section 09 9001: ‘Common Painting And Coating Requirements’:
      a. Pre-installation conference for Sections under 09 9000 heading ‘Paints and Coatings’.

PART 2 - PRODUCTS

2.1 SYSTEM

A. Manufacturer:
   1. Approved Products and Manufacturers. See Section 01 6200.
      a. Products listed in edition of MPI Approved Product List current at time of bidding and later are approved, providing they meet VOC requirements in force where Project is located.

B. Description:
   1. Rest Rooms And Custodial Rooms:
      a. New Surfaces: Use MPI(a) INT 4.2F Waterborne Epoxy Finish system.
      b. Previously Finished Surfaces: Use MPI(r) RIN 4.2E Waterborne Epoxy Finish system.
   2. All Other:
      a. New Surfaces: Use MPI(a) INT 4.2D Latex Finish system.
      b. Previously Finished Surfaces: Use MPI(r) REX 4.2H Latex Finish system.
   3. New Surfaces:
      a. Use MPI(a) INT 4.2D Latex Finish system.

C. Performance:
   1. Design Criteria:
      a. New Surfaces: MPI Premium Grade finish requirements.
      b. Deteriorated Existing Surfaces: MPI Premium Grade finish requirements.
      c. Sound Existing Surfaces: MPI Custom Grade finish requirements.
      d. Gloss / Sheen Level Required: Gloss Level 5.

D. Materials:

PART 3 - EXECUTION

3.1 APPLICATION

A. General: See appropriate paragraphs of Section 09 9001.
B. Existing Painted Surfaces:
   1. Remove deteriorated existing paint by scraping or sanding. Wash surfaces that have been
defaced with marking pens, crayons, lipstick, etc, with solvent recommended by Paint
Manufacturer. Spot prime such surfaces.
   2. Sand areas of existing sound paint if necessary for bonding of new paint system. Clean existing
painted surfaces, sanded or not, with mild soap and water, or with tri-sodium phosphate (TSP).
   3. Fill large holes with patching and small holes and cracks with spackle.
   4. Apply one coat primer to scraped and sanded areas.
   5. Apply one finish coat. Completely cover voids in masonry block but do not fill.

END OF SECTION
SECTION 09 9123
INTERIOR PAINTED GYPSUM BOARD, PLASTER

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Preparing, priming, and finish painting new and existing interior gypsum board and plaster surfaces as described in Contract Documents.

B. Related Requirements:

PART 2 - PRODUCTS

2.1 SYSTEM

A. Manufacturers:
   1. Approved Manufacturers and Products. See Section 01 6200.
      a. Products listed in edition of MPI Approved Product List current at time of bidding and later are approved, providing they meet VOC requirements in force where Project is located.

B. Description:
   1. Custodial Rooms:
      a. New Surfaces: Use MPI(a) INT 9.2F Waterborne Epoxy Finish system.
      b. Previously Finished Surfaces: Use MPI(r) RIN 9.2E Waterborne Epoxy Finish system.
   2. All Other:
      a. New Surfaces: Use MPI(a) INT 9.2B Latex Finish system.
      b. Previously Finished Work: Use MPI(r) RIN 9.2B Latex Finish system.

C. Performance:
   1. Design Criteria:
      a. New Surfaces: MPI Premium Grade finish requirements.
      b. Deteriorated Existing Surfaces: MPI Premium Grade finish requirements.
      c. Sound Existing Surfaces: MPI Custom Grade requirements.
      d. Gloss / Sheen Required:
         1) Custodial Rooms: Gloss Level 6.
         2) Ceiling: Gloss Level 1 or 2.
         3) Remaining Painted Surfaces: Gloss Level 5.

D. Materials:
   1. Primers:
      a. MPI Product 50, 'Primer Sealer, Latex, Interior'.
   2. Finish Coats:
      a. Custodial Rooms:
         1) Buildings with only Gypsum Board surfaces in rooms:
            a) MPI Product 115, 'Epoxy-Modified Latex, Interior, Gloss (MPI Gloss Level 6)'.
         b. Ceiling:
            1) MPI Product 53, 'Latex, Interior, Flat (MPI Gloss Level 1)'.
         c. Remaining Painted Surfaces:
            1) MPI Product 141, 'Latex, Interior, High Performance Architectural, Semi-Gloss (MPI Gloss Level 5)'.

PART 3 - EXECUTION

3.1 APPLICATION

A. General: See appropriate paragraphs of Section 09 9001.

B. New Surfaces:
   1. Primer: Apply primer to be covered with other paint coats with roller only, or with spray gun and back-rolled.

C. Existing Painted Surfaces:
   1. Remove deteriorated existing paint down to sound substrate by scraping or sanding. Feather edges of existing paint by sanding to be smooth with adjacent surfaces.
   2. Clean surface with mild soap and water, or with tri-sodium phosphate (TSP). Wash surfaces that have been defaced with marking pens, crayons, lipstick, etc, with solvent recommended by Paint Manufacturer. Spot prime such surfaces.
   4. Sand or chemically etch existing painted surface as required to prepare surface to accept new paint.
   5. Re-clean surface.
   6. Apply primer coat.
   7. Apply finish coats.

END OF SECTION
SECTION 09 9124
INTERIOR PAINTED METAL

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Preparing and painting new and existing interior metal surfaces as described in Contract Documents.

B. Related Requirements:
   1. Section 09 9001: 'Common Painting And Coating Requirements':

PART 2 - PRODUCTS

2.1 SYSTEM

A. Manufacturers:
   1. Approved Products and Manufacturers. See Section 01 6200.
      a. Products listed in edition of MPI Approved Product List current at time of bidding and later are approved, providing they meet VOC requirements in force where Project is located.

B. Description:
   1. Ferrous Metal:
      a. New Surfaces: Use MPI(a) INT 5.1B Waterborne Light Industrial Finish system.
      b. Previously Finished Surfaces: Use MPI(r) RIN 5.1B Waterborne Light Industrial Finish system.
   2. Galvanized Metal:
      a. New Surfaces: Use MPI(a) INT 5.3J Latex Finish system
      b. Previously Finished Surfaces: Use MPI(r) RIN 5.3AH Latex Finish system.
   3. Aluminum:
      a. New Surfaces: Use MPI(a) INT 5.4E Waterborne Light Industrial Finish system.
      b. Previously Finished Surfaces: Use MPI(r) REX 5.4E Light Industrial Finish system.

C. Performance:
   1. Design Requirements:
      a. New Surfaces: MPI Premium Grade finish requirements.
      b. Deteriorated Existing Surfaces: MPI Premium Grade finish requirements.
      c. Sound Existing Surfaces: MPI Custom Grade finish requirements.
      d. Gloss / Sheen Level Required: Gloss Level 5.

D. Materials:
   1. Primers:
      c. Aluminum: MPI Product 95: ‘Primer, Quick Dry, for Aluminum’.
PART 3 - EXECUTION

3.1 APPLICATION

A. General:
   1. See appropriate paragraphs of Section 09 9001.
   2. Systems specified are in addition to prime coats furnished under other Sections.

B. New Surfaces: Remove rust spots by sanding and immediately spot prime. If all traces of rust cannot be removed, apply rust blocker recommended by Paint Manufacturer before applying full primer coat.

END OF SECTION
SECTION 09 9125
INTERIOR PAINTED WOOD

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Preparing and painting new and existing door and woodwork not requiring transparent finish, as described in Contract Documents.

B. Related Requirements:
   1. Section 09 9001: ‘Common Painting And Coating Requirements’:
      a. Pre-installation conference for Sections under 09 9000 heading ‘Paints and Coatings’.

PART 2 - PRODUCTS

2.1 SYSTEM

A. Manufacturers:
   1. Products and Manufacturers. See Section 01 6200.
      a. Products listed in edition of MPI Approved Product List current at time of bidding and later are approved, providing they meet VOC requirements in force where Project is located.

B. Description:
   1. Systems:
      a. Doors & woodwork:
         1) New Surfaces: Use MPI(a) INT 6.3T or U Latex Finish system.
         2) Previously Finished Surfaces: MPI(r) Rin 6.3U Latex Finish system.

C. Performance:
   1. Design Criteria:
      a. New Surfaces: MPI Premium Grade finish requirements.
      b. Deteriorated Existing Surfaces: MPI Premium Grade finish requirements.
      c. Sound Existing Surfaces: MPI Custom Grade finish requirements.
      d. Gloss / Sheen Level Required: Gloss Level 5.

D. Materials:
   1. Doors & Woodwork:
PART 3 - EXECUTION

3.1 APPLICATION

A. General: See appropriate paragraphs of Section 09 9001.

B. Interface With Other Work:
   1. Properly clean and paint light cove interiors before installation of light fixtures.
   2. Where back-priming is required, apply one (1) coat of primer.

C. New Surfaces:
   1. Spot prime nail holes, cracks, and blemishes before and after puttying.
   2. Apply stain blocker or other product recommended by Paint Manufacturer to knots before applying primer coat.

D. Existing Painted Surfaces:
   1. Remove deteriorated existing paint down to sound substrate by scraping and sanding. Feather edges of existing paint by sanding to be smooth with adjacent surfaces. Spot prime bare wood areas on woodwork.
   2. Wash surfaces that have been defaced with marking pens, crayons, lipstick, etc, with solvent recommended by Paint Manufacturer. Spot prime such surfaces.
   3. Apply finish coats.

END OF SECTION
SECTION 09 9413
INTERIOR TEXTURED FINISHING

PART 1 - GENERAL

1.1 SUMMARY

A. Includes But Not Limited To:
   1. Furnish and apply texturing on walls and ceilings as described in Contract Documents.

B. Related Requirements:
   1. Section 09 2900: Priming.
   2. Section 09 9001: ‘Common Painting And Coating Requirements’.

1.2 REFERENCES

A. Definitions:
   1. Drywall Texture: Compound rolled, sprayed, or troweled onto sheetrock after taping and floating of joints is complete. Uses same material as joint compound, but thinned down with water and applied to wall surface:
      a. Light Orange Peel: Sprayed texture leaves light splatter on walls. Resembles peel of orange. If done with fine spray, can be one of the lightest, least noticeable of the texture styles.
      b. Smooth - Smooth application of texture over sheetrock wall that feathers out sheetrock joints, and creates even, non-textured wall.

1.3 SUBMITTALS

A. Action Submittals:
   1. Samples:
      a. Light Orange Peel Texture:
         1) Provide minimum of three (3) 24 inch (600 mm) square control samples on primed gypsum wallboard of ‘light orange peel’ texture to show possible variations.

1.4 QUALITY ASSURANCE

A. Field Samples:
   1. Before performing work of this Section, prepare control samples.
   2. Architect will inspect control sample at pre-installation conference following preparation of control sample. When sample is approved, work of this Section may proceed. Approved samples will be kept at site at all times work of this section is being performed.

PART 2 - PRODUCTS

2.1 SYSTEM

A. Manufacturers:
   1. Manufacturer Contact List:
B. Materials:
   1. Quality Standards: See Section 01 6200.
      a. ProForm Perfect Spray EM/HF by National Gypsum.
      b. Sheetrock Wall & Ceiling Texture by U S Gypsum.

PART 3 - EXECUTION

3.1 APPLICATION

A. Location:
   1. Walls and ceilings:
      a. Light Orange Peel Texture:
         1) All areas except those listed in following paragraph.
      b. Smooth:
         1) Custodial rooms.

B. Finishing:
   1. Light Orange Peel Texture:
      a. After gypsum board is taped, sanded, and primed, apply texture. Closely match samples accepted by Architect.
   2. Smooth:
      a. After gypsum board is taped, sanded, and primed, apply texture.

END OF SECTION
DIVISION 10: SPECIALTIES

10 1000 INFORMATION SPECIALTIES
   10 1453 TRAFFIC SIGNAGE
   10 1490 MISCELLANEOUS CODE SIGNS

10 2000 INTERIOR SPECIALTIES
   10 2113 METAL TOILET COMPARTMENTS

10 4000 SAFETY SPECIALTIES
   10 4400 FIRE PROTECTION SPECIALTIES

END OF TABLE OF CONTENTS
SECTION 10 1453
TRAFFIC SIGNAGE

PART 1 - GENERAL

1.1 SUMMARY
A. Includes But Not Limited To:
   1. Furnishing and installing of exterior post-mounted site signage as described in Contract Documents.

B. Related Requirements:
   1. Section 03 3053: ‘Miscellaneous Exterior Cast-In-Place Concrete’ for quality requirements of concrete used for parking sign posts.

1.2 REFERENCES
A. Reference Standards:
   1. International Code Council / American National Standards Institute:
   2. U.S. Department of Justice:
      a. 2010 ‘ADA Standards for Accessible Design’.

1.3 QUALITY ASSURANCE
A. Regulatory Agency Sustainability Approvals:
   1. Sign shall meet ANSI A117.1 accessibility code and ADA standards for accessible design and local and state authorities having jurisdiction (AHJ) requirements.

PART 2 - PRODUCTS

2.1 ASSEMBLIES
A. Permanently Mounted:
   1. Post Foundation Concrete: One cu ft cement, 2 cu ft (0.0566 cu m) sand, 4 cu ft (0.1132 cu m) gravel, and 5 gallons (18.93 liters) minimum to 6 gallons (22.71 liters) maximum of water.
   2. Post Setting Grout at Sleeves:
      a. Acceptable Products:
         3) NS Grout by Euclid Chemical Co, Cleveland, OH www.euclidchemical.com.
3. Accessible Parking Signs:
   a. Design Criteria:
      1) Meet regulatory agency requirements for accessibility.
      2) Sign graphics and lettering shall be minimum required by agency having jurisdiction:
         a) International symbol of accessibility should be posted on all accessible parking spaces.
         b) Letters must contain visual characters and high dark to light contrast between characters and background as per ADA requirements:
         c) Provide reflective background.
         d) Van-accessible parking spaces to have additional ‘text’ or ‘sign’ below the accessibility symbol to mark the van-accessible area specifically:
      3) Size: 12 inches (305 mm) x 18 inches (457 mm) aluminum sign.
      4) Sign shall have rounded corners.
   b. Acceptable Products:
      2) Equal as approved by Architect before use. See Section 01 6200.

4. Posts:
   a. Handicap Accessible Parking Signage:
      1) Provide galvanized post as shown on Contract Drawings.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Permanently Mounted:
   1. Locate as shown on Site Plan.
      a. Follow ADA guidelines and local and state authorities having jurisdiction (AHJ) for placement of sign requirements:
         1) Van accessible sign should be placed so that it is not obscured by anything including a standing van, vehicle or other obtrusive objects.
         2) Signs should be placed at such a height (at least 60 inches (1500 mm) above surface) that they do not get obscured by any parked vehicles or other obstructions. Signs must be viewable from drivers’ seat of vehicle and located right in view of parking spaces.
   2. Install signs square and plumb.
   3. Post Foundations:
      a. Follow requirements of Section 03 3053: 'Miscellaneous Exterior Cast-In-Place Concrete' for post foundation:
         1) Mix concrete components thoroughly, place in post foundation holes sized as shown on Contract Drawings.
      b. Mow Strips:
         1) At mow strips where shown on Site Plan, set top of post foundation below grade sufficient to allow for placing of mow strip.
      c. Placement Before Installation of Slabs:
         1) Measure post foundation depth from top of slab. Extend bottom of slab footing sufficient to allow specified amount of concrete around post.
      d. Placement After Installation of Slabs:
         1) Where posts are installed after installation of slabs, core slab width of foundation diameter as shown on Contract Documents to accommodate post foundation.
   4. Handicap Accessible Parking Signage:
      1) Attach sign to galvanized steel posts as shown on Contract Drawings with stainless steel self tapping screws.
      2) Isolate dissimilar materials (steel tube and aluminum sign).
   5. Post Foundations:
a. Mix concrete components thoroughly, place in post foundation holes 8 inches (200 mm) in diameter by 36 inches (900 mm) deep, and set mounting sleeves. Sleeves shall extend 2 inches (50 mm) maximum above top of finish concrete elevation.

1) Where posts are installed before installation of slabs, measure post foundation depth from top of slab. Extend bottom of slab footing sufficient to allow specified amount of concrete around post.

2) Where posts are installed after installation of slabs, core slab 8 inches (200 mm) in diameter minimum to accommodate post foundation.

b. Install post in mounting sleeve so bottom of post is 6 inches (150 mm) from top of sleeve. Rivet post to mounting sleeve or bolt using tamper-proof bolts.

END OF SECTION
SECTION 10 1490
MISCELLANEOUS CODE SIGNS

PART 1 - GENERAL

1.1 SUMMARY
A. Products Supplied But Not Installed Under This Section
   1. Code Signs
B. Related Sections
   1. Division 06: Installation

1.2 SUBMITTALS
A. Action Submittals:
   1. Shop Drawings: Schedule showing signs required, location, and text.

PART 2 - PRODUCTS

2.1 MANUFACTURED UNITS
A. Restroom Accessibility Signs
   1. Men’s – equilateral triangle 1/4" thick, 12" long edges with base parallel to floor and vertex pointing upward. ANSI A117.1 symbol for men.
   2. Women’s – circle 1/4" thick, 12” in diameter. ANSI A117.1 symbol for women.
   3. Unisex – circle 1/4" thick, 12” in diameter. ANSI A117.1 symbol for unisex facilities.
   4. Mount in center of door at 60” above floor to symbol center.
   5. Brown background with contrasting symbol, engraved.
B. Handicap Symbol of Accessibility
   1. Mount on building exterior adjacent to accessible entrance; mount 40” above floor.
   2. Mount adjacent to accessible restrooms.
   3. White symbol on blue background.
C. Tactile Exit Signs
   1. Provide tactile exit signs as shown on drawings in compliance with CBC Section 1117B.5
D. Identification Signs Required By Fire Department
   1. Provide signs identifying fire roof access and electrical room in accordance with Fire Department requirements.
   2. Provide signs identifying fire extinguishers in accordance with Fire Department Requirements.
E. Approved Manufacturers
   1. Inland Pacific – Spokane, WA (800) 541-4000
   2. CCSW Graphics – Corpus Christi, TX (800) 322-4515
   3. Mark Master – Tampa, FL (800) 441-6275
   4. South Texas Graphics Specialties, Inc. – Houston, TX (713) 467-4499
   5. AA White Company – Providence RI (401) 453-4300

PART 3 - EXECUTION

3.1 INSTALLATION
A. Install signs square and plumb.
B. Mount with permanent two-sided tape.
SECTION 10 2113
METAL TOILET COMPARTMENTS

PART 1 - GENERAL

1.1 SUMMARY
A. Includes But Not Limited To:
   1. Furnish and install metal toilet compartments as described in Contract Documents.

1.2 REFERENCES
A. Definitions:
   1. Stainless Steel: Stainless steels are alloys of iron to which at least 10 percent chromium has been added to increase corrosion resistance and will not rust when exposed to weather. To obtain greater corrosion resistance, more nickel and chromium are added to the alloy. Along with iron and chromium, all stainless steels contain some carbon to make it stronger.
      a. Stainless Steel Alloys:
         1) Type 304 (UNS S30400): Austenitic stainless steel with non-magnetic properties in annealed condition that provide good corrosion resistance to both chemical and atmospheric exposures, with high resistance to oxidations. Most common and widely used stainless steel.

B. Reference Standards:
   1. ASTM International:
      b. ASTM A484/A484M-12, ‘Standard Specification for General Requirements for Stainless Steel Bars, Billets, and Forgings’.

1.3 SUBMITTALS
A. Action Submittals:
   1. Product Data:

B. Closeout Submittals:
   1. Include following in Operations And Maintenance Manual specified in Section 01 7800:
      a. Warranty Documentation:
         1) Final, executed copy of Warranty.
      b. Record Documentation:
         1) Manufacturers documentation:
            a) Manufacturer’s literature or cut sheet.
            b) Color selection.

1.4 DELIVERY, STORAGE, AND HANDLING
A. Delivery And Acceptance Requirements:
   1. Materials shall be delivered in original, unopened packages with labels intact.

B. Storage And Handling Requirements:
1. Store and handle in compliance with Manufacturer’s instructions and recommendations.

1.5 WARRANTY

A. Manufacturer Warranty:
   1. Manufacturer’s standard warranty.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturers:
   9. Equal as Approved by Architect before bidding.  See Section 01 6200.

2.2 MANUFACTURED UNITS

A. Toilet And Miscellaneous Partitions:
   1. Floor-mounted, overhead-braced.
   2. Panels:
      a. Galvanized bonderized steel sheets (minimum 0.00015 inch (0.004 mm) zinc coating).
      b. Edges bound interlocked with drawn molding welded on corners.
      c. Corners welded and ground smooth.
      d. Sound deadening honeycomb core.
      e. Provide wood blocking on all panels that have grab bars.
      f. Gauge:
         1) Doors: 22 ga (0.08 mm) minimum.
         2) Panels: 22 ga (0.08 mm) minimum.
         3) Pilasters: 22 ga (0.08 mm) minimum.
         4) Screens: 22 ga (0.08 mm) minimum.
   3. Posts:
      a. 20 ga (one mm) minimum of same construction and finish as panels.
   4. Headrails:
      a. Aluminum.
      b. 20 ga (one mm) minimum of same construction and finish as panels.
      c. Anti-grip design.
   5. Plinths:
      a. 20 ga (one mm) Type 304 stainless steel, Number 4 finish.
      b. 3 inch (76 mm) minimum high, secured with concealed clips.
      c. All fasteners used to attach Plinths, Posts and Pilasters to the floor shall be Type 304 stainless steel.
   6. Anchorages and fasteners:
      b. Tamper resistant Torx Head with pin screws.
   7. Hardware:
      a. Each door:
1) Gravity type hinges with double handed, nylon bottom cam, adjustable for partial door closing position, bottom hinge finished flush with door bottom.
2) Sliding or concealed door bolt with emergency access.
3) Door strike and keeper with rubber bumper.
4) Coat hook / door bumper.

b. Finish: Chrome plated.
c. Meet requirements of ASTM B86, Alloy AG 40A.

2.3 FINISHES

A. Finish And Color:
   1. Powder-coated paint finish.
      Color as selected by Architect from manufacturer’s standard colors to match existing.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification Of Conditions:
   1. Field verify dimensions.
   2. Verify that necessary blocking has been installed in framed walls for partition installation and for place where coat hook / door bumper will strike wall.

3.2 INSTALLATION

A. Install pilasters rigid, plumb, and level. Maintain proper door openings. Anchor pilaster to floor with Type 304 stainless steel fasteners embedded 2 inches (50 mm) into concrete slab below setting bed.

B. Secure panels to walls with two stirrup brackets minimum attached near top and bottom of each panel. Use fasteners of length to provide one inch (25 mm) embedment into blocking or masonry.

C. Secure overhead brace to face sheets with two fasteners minimum per face. Set door tops parallel with brace. Set door bottom 12 inches (300 mm) above floor.

D. Plinth to be level with and snug to floor.

3.3 FIELD QUALITY CONTROL

A. Non-Conforming Work: Non-conforming work as covered in the General Conditions applies, but is not limited to the following:
   1. Correct any work found defective or not complying with contract document requirements at no additional cost to the Owner.
   2. Replace damaged or severely scratched materials with new materials at no additional cost to the Owner.

3.4 ADJUSTING

A. Lubricate hardware as recommended by Manufacturer.

B. Set hinges on out-swinging doors to return to nearly closed position.
C. Perform final adjustments to pilaster leveling devices, door hardware, and other operating parts of partition assembly just before Substantial Completion.

3.5 CLEANING

A. Remove protective masking. Clean exposed surfaces of partitions, hardware, fittings, and accessories.

B. Touch-up minor scratches and other finish imperfections using materials and methods recommended by Manufacturer.

END OF SECTION
PART 1 - GENERAL

1.1 SUMMARY

A. Products Furnished But Not Installed Under This Section:
   1. Wall hung extinguishers and brackets.
   2. Extinguishers with cabinets.

B. Related Requirements:
   1. Section 09 2216: ‘Non-Structural Metal Framing’ for blocking in metal-framed walls.

1.2 SUBMITTALS

A. Action Submittals:
   1. Product Data:
      a. Manufacturer's literature or cut sheets for cabinets and extinguishers.

B. Closeout Submittals:
   1. Include following in Operations And Maintenance Manual specified in Section 01 7800:
      a. Warranty Documentation:
         1) Include copy of final, executed warranty.
      b. Record Documentation:
         1) Testing and Inspection Reports:
            a) Testing Agency Inspecting Reports of Drilled-In Mechanical Anchors / Adhesive Anchors / Screw Anchors.

1.3 QUALITY ASSURANCE

A. Regulatory Agency Sustainability Approvals:
   1. Fire extinguishers shall be inspected and have annual inspection tag attached before Substantial Completion.

1.4 WARRANTY

A. Manufacturer Warranty:
   1. Manufacturer's standard, written warranty on fire extinguisher.

PART 2 - PRODUCTS

2.1 EQUIPMENT

A. Manufacturers:
   1. Fire Extinguishers:
      a. Approved Manufacturers. See Section 01 6200.
4) Extinguishers private-labeled by manufacturers approved above are approved, with appropriate documentation.

2. Cabinets And Brackets:
   a. Acceptable Manufacturers:
      7) Seton Inc, Richmond Hill, ON (905) 764-1122.
      8) Equal as approved by Architect before bidding.  See Section 01 6200.

B. Acceptable Distributors:
   2. Equal as approved by Architect before bidding.  See Section 01 6200.

C. Fire Extinguishers:
   1. Design Criteria:
      a. Ten pound dry chemical ABC stored pressurized type equipped with pressure gauge and which does not need recharging except after use.
      b. Instructions for repairs, maintenance, and recharging shall be attached.
      c. Unit shall be tested and approved by UL and have minimum 4A:60-B:C UL rating.  UL rating shall appear on extinguisher labels and be attached to and a part of fire extinguisher units.

D. Fire Extinguisher Cabinets:
   1. Design Criteria:
      a. Two-piece, semi-recessed or flush type depending on wall thickness, and have white baked enameled steel tubs with white baked enamel return trim and doors, clear acrylic glazing, 'Safe-T-Lock,' and cylinder locks.
      b. Supply each cabinet with one specified fire extinguisher.
   2. Acceptable Manufacturers:
      b. Equal as approved by Architect before bidding from Acceptable Manufacturer's equivalent product.  See Section 01 6200.

E. Wall-Mounted Brackets:
   1. Design Criteria:
      a. Heavy duty with minimum of double strap/bracket.
   2. Approved Bracket.  See Section 01 6200 for definitions of Categories:
      b. Equal as approved by Architect before bidding from Approved Manufacturer's equivalent product.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Special Techniques:
   1. Securely mount cabinets and hangers plumb with wall surfaces.
   2. Trim for cabinets shall be neat in appearance.

END OF SECTION
DIVISION 12: FURNISHINGS

12 3000 STONE FABRICATIONS

12 3661 QUARTZ COUNTERTOPS

END OF TABLE OF CONTENTS
SECTION 12 3661
QUARTZ COUNTERTOPS

- GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Quartz countertops.
   2. Setting materials and accessories.

B. Related Sections:
   1. Division 01: Administrative, procedural, and temporary work requirements.
   2. Section 06 – Rough Carpentry for blocking

1.2 REFERENCES

A. American National Standards Institute (ANSI):
   1. A108.5 - Installation of Ceramic Tile with Dry-Set Portland Cement Mortar or Latex Portland Cement Mortar.
   2. A118.4 - Latex-Portland Cement Mortar.

B. ASTM International (ASTM):

1.3 SUBMITTALS

A. Shop Drawings: Include countertop layout, dimensions, materials, finishes, cutouts, and attachments.

B. Samples:
   1. 3 x 3 inch quartz samples in specified colors.
   2. Joint sealer samples – full range of colors for selection.
1.4 QUALITY ASSURANCE

A. Fabricator and Installer Qualifications: Minimum [2] years documented experience in work of this Section.

B. Mockup:
   2. Larger sample as Approved mockup may remain as part of the Work.

1.5 WARRANTY

A. Provide manufacturer's 10 year warranty against defects in materials and workmanship.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Design Standard – Viatera by LG Haysys
   1. Color - Sand Palace
   B. Equal as approved by architect prior to bidding.

2.2 MATERIALS

A. Quartz Sheet:
   1. Product: LG VIATERA
   2. Composition: Quartz aggregate, resin, and color pigments formed into flat slabs.
   4. Color: VIATERA “Castle” at Serving Area and “Cocoa Beach” at Restrooms.
   5. Thickness: ½” minimum with turned down edges.
   6. Physical characteristics:
      a. Static coefficient of friction: 1.02 dry, 0.51 wet, tested to ASTM C1028.
      b. Water absorption: Maximum 0.03 percent, tested to ASTM C97.
      c. Compressive strength: Minimum 29,000 psi, tested to ASTM C170.
      d. Bond strength: Minimum 210 psi, tested to ASTM C482.
      e. Modulus of rupture: Minimum 6300 psi, tested to ASTM C99.
      f. Flexural strength: Minimum 5800 psi, tested to ASTM C880.
      g. Breaking strength: Minimum 480 lbf, tested to ASTM C648.
      h. Stain resistance: Not affected by 10 percent hydrochloric acid or 10 percent KOH, tested to ASTM C650.
      i. Thermal shock resistance: Pass 5 cycles, tested to ASTM C484.
      k. Thermal expansion: 1.670 x 10^-5 in/in/deg F, tested to ASTM C531.
      l. Deicing resistance: Rating of 0, tested to ASTM C672/C672M.
      m. Freeze/thaw resistance: 0 tiles at 15 cycles, tested to ASTM C1026.
      n. Flame spread rating: Class 1, tested to ASTM E84.

2.3 ACCESSORIES

A. Adhesive: Type recommended by quartz manufacturer.

B. Joint Sealer:
   1. Latisil Tile and Stone Sealant by Laticrete International, Inc.
   2. Color: To be selected from manufacturer's full color range.

2.4 FABRICATION

A. Cut quartz panels accurately to required shapes and dimensions.

   B. Radius exposed edges.
C. Fabricate with hairline joints.
D. Cut holes for sinks, faucets and toilet accessories as needed.

PART 3 - EXECUTION

3.1 PREPARATION
A. Clean surfaces to receive countertops; remove loose and foreign matter that could interfere with adhesion.

3.2 INSTALLATION
A. Install countertops in accordance with manufacturer's instructions and approved Shop Drawings.
B. Adhere countertops to supports with continuous beads of adhesive.
C. Set plumb and level. Align adjacent pieces in same plane.
D. Install with hairline joints.
E. Fill joints between countertops and adjacent construction with joint sealer; finish smooth and flush.

3.3 INSTALLATION TOLERANCES
A. Maximum variation from level and plumb: 1/8 inch in 10 feet, noncumulative.
B. Maximum variation in plane between adjacent pieces at joint: Plus or minus 1/16 inch.

3.4 CLEANING
A. Clean countertops in accordance with manufacturer's instructions.

3.5 PROTECTION
A. Protect installed countertops with non-staining sheet coverings.

END OF SECTION
DIVISION 22: PLUMBING

22 0500 COMMON WORK RESULTS FOR PLUMBING

22 0010 BASIC PLUMBING REQUIREMENTS
22 0517 SLEEVES & SLEEVE SEALS FOR PLUMBING & PIPING
22 0518 ESCUTCHEONS FOR PLUMBING & PIPING
22 0529 HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT
22 0553 IDENTIFICATION FOR PLUMBING PIPES AND EQUIPMENT

END OF TABLE OF CONTENTS
SECTION 22 0010
BASIC PLUMBING REQUIREMENTS

PART 1. GENERAL

1.01 SECTION INCLUDES
   A. Basic Plumbing Requirements specifically applicable to Division 22 Sections, in addition to Division 01 - General Requirements.

1.02 DESCRIPTION
   A. Furnish materials and perform labor required to execute this work as indicated on the drawings, as specified and as required to complete the work of this section, except as otherwise herein specifically excluded.

1.03 REFERENCES
   A. Section 23 0801 - Commissioning of Building Systems

1.04 WORK INCLUDED
   A. The complete Plumbing systems (including Fire Protection systems), including but not limited to these major items.
      1. Coordinate work of this Section with related trades.
      2. Verify applicable dimensions at the jobsite.
      3. Furnishing and installation of miscellaneous hangers, supports, sleeves, inserts, anchors and other auxiliary equipment for systems under this Division.
      4. Soil waste and vent system inside and outside the building including connections to fixtures, equipment, sewer connections, clean-outs.
      5. Water piping systems inside and outside the building, including connections to fixtures, equipment, water meters and vaults; pressure regulating stations, backflow preventers.
      6. Interruptible and non-interruptible fuel gas systems inside and outside the building, including connections, gas meters, earthquake valves, and pressure regulating stations.
      7. Plumbing fixtures, carriers, fittings, trim, hose bibs, wall hydrants, and accessories.
      8. Installation and connection of Owner furnished equipment.
      9. Water heating systems, including water heating equipment, circulating pumps, connections.
     10. Shop drawings.
     12. Equipment and systems adjustments and balancing.
     13. Air and water systems testing, adjusting and balancing.
     14. Written operating and maintenance instructions.
     15. Record drawings.
     16. Guarantee

1.05 WORK SPECIFIED ELSEWHERE
   A. Concrete, Architectural Sheet Metal, Door and Exterior Wall Louvers, Painting and Electrical.

1.06 SITE INSPECTION
   A. Contractor shall familiarize himself with the conditions at the site. No allowance will be made subsequently for any error through negligence in observing the site conditions. Contractor shall
observe and make cost allowance for any mechanical and/or electrical items that must be relocated to accommodate the installation or servicing of any item covered under this contract.

1.07 ORDINANCES, REGULATIONS AND CODES

A. References to Technical Societies, Trade Organizations, Governmental Agencies is made in Division 15 in accordance with the following abbreviations.
1. AFI - Air Filter Institute
2. AMCA - Air Moving & Conditioning Association
3. ARI - Air Conditioning & Refrigeration Institute
4. ASHRAE - American Society of Heating, Refrigerating and Air Conditioning Engineers
5. ASME - American Society of Mechanical Engineers
6. ASTM - American Society of Testing Materials
7. AWSC - American Welding Society Code
8. ANSI - American National Standards Institute
9. CBC - California Building Code
10. CCR - California Code of Regulations
11. CEC - California Electrical Code
12. CFC - California Fire Codes
13. CMC - California Mechanical Code
14. CPC - California Plumbing Code
15. FIA - Factory Insurance Association
16. NAFM - National Association of Fan Manufacturers
17. NEMA - National Electrical Manufacturer's Association
18. NFPA - National Fire Protection Association
19. ORS - Office of Regulatory Services
20. SCAQMD - South Coast Air Quality Management District
21. SMACNA - Sheet Metal and Air Conditioning Contractors National Association
22. UFC - Uniform Fire Code
23. UL - Underwriter's Laboratories
24. UPC - Uniform Plumbing Code

B. Requirements of Regulatory Agencies: Materials and installation shall comply with applicable local, state, and national codes and ordinances. Rulings and interpretations of the enforcing agencies shall be considered as part of the local codes. No extras will be permitted for furnishing items required by the local codes but not specified or shown on the drawings.

C. Codes and Standards:
1. UBC and California Amendments (California Building Code - Part 2, Title 24, CCR).
2. UMC and California Amendments (California Mechanical Code - Part 4, Title 24 CCR).
3. UPC and California Amendments (California Plumbing Code - Part 5, Title 24 CCR).
4. Uniform Fire Code with State Amendments (California Fire Code - Part 9, Title 24 CCR).

D. Nothing in these drawings and specifications is to be construed to permit work in violation thereof. Ordinances, regulations and codes are to be construed as minimum requirements.

E. The responsibility of the Architect to conduct construction reviews of the Contractor's performance is not intended to include the adequacy of the Contractor's safety measures in, on, or near the construction site.

F. Ventilating, refrigeration and electrical equipment and appliances are required to be approved by the Underwriters' Laboratories, Inc., or other nationally recognized testing agency and installed per the testing agency's specifications.

1.08 PERMITS, FEES AND INSPECTIONS

A. Obtain and pay for all necessary permits, fees, assessments, complimentary drawings, required by any legally constituted public authorities having jurisdiction.
1.09 DRAWINGS AND SPECIFICATIONS

A. The Architect's decision will be final on interpretation of the Drawings and Specifications.

B. The Drawings and Specifications are complimentary. Any work called for on the Drawings and not mentioned in the Specifications, or vice versa, shall be performed as though fully set forth in both.

C. Piping, ductwork and other equipment shown as existing has been taken from the Owner's drawings. Contractor shall verify exact location in field before proceeding with the work.

D. Where codes, standards, drawings or specifications conflict, the most stringent shall prevail, unless prior approval for variance is obtained. Specific details on the drawings shall supercede the specification in the event of a conflict.

E. Alternate support or seismic detail shall have prior approval by the Architect; and the Contractor shall obtain agency approval without any additional cost or time to the contract and without any time penalty on the work schedule.

1.10 SUBMITTALS

A. Before starting work, the Contractor shall furnish for the approval of the Architect, Shop Drawings and Submittals with Itemized Equipment Lists, complete in all details that they proposes to install. All items shall be submitted at the same time.

B. Submittals must be specific to this project with respect to model number, capacities, performance, etc., generic submittals will not be accepted.

C. Variations or deviations on submitted items from that specified must be clearly tagged and / or identified.

D. Submittals shall include, but not necessarily be limited to the following which are mandatory:
   1. Draw Equipment Layouts to ¼” scale, including equipment, piping accessories, and showing clearances for operating and servicing.
   2. Schedule of pipe, fittings, valves, with manufacturer and catalog number.
   3. Specialties, valves, gauges and thermometers of all types.
   5. Earthquake supports and calculations.
   7. Insulation.
   8. Ventilation and air conditioning equipment, specialties and the air control systems.
   9. Shop fabrication drawings and installation drawings of ductwork and piping layouts. Submit for approval prior to fabrication. Drawings shall indicate dimensions from bottom of piping and ductwork to finish floor level.
  10. Wiring diagrams, control panel board, motor starters and controls for electrically operated equipment furnished by mechanical trades.
  11. Automatic control system diagrams.
  13. Clean-outs
  14. Fixture carriers.
  15. Hangers, inserts, supports, anchors.
  16. Hose bibs.
  17. Pipe, fittings and specialties.
  18. Plumbing fixtures, fittings, trim, drains and receptors.
  19. Roof flashing.
  20. Sleeves, escutcheons, caulking, waterproofing, fireproofing.
  21. Strainers
  22. Water heating equipment.
  23. Expansion joints, guides and anchors.
  24. Shop fabrications drawings and calculations.
  25. Special and miscellaneous products furnished under this section and not listed herein.
1.11 RECORD DRAWINGS AND MANUALS

A. Record Set During the Work: At site, maintain at least one set of Drawings as a Field Record Set. Also maintain at least one copy of all Addenda, Modifications, approved submittals, correspondence, and transmittals at site. Keep Drawings and data in good order and readily available to Architect and Owner.

B. Changes: Clearly and correctly mark Record Drawings to show changes made during the construction process at the time the changed work is installed. No such changes shall be made in the work unless authorized by the Architect.

C. Final Record Drawings: Conform to Division 1 requirements.

D. Preparation of Final Record Drawings: Contractor shall transfer recorded changes in the work indicated on the Field Record Set to the record set. Changes shall be neatly and clearly drawn and noted by skilled draftsmen, and shown technically correct.

E. Approval: Prior to Architect's inspection for Substantial Completion, submit the Final Record Drawings to the Architect for review, and make such revisions as may be necessary for Final Record Drawings to be a true, complete, and accurate record of the work.

F. Manuals: Obtain data from the various manufacturers and submit instruction, operation, and maintenance manuals as required and to the extent required under other Sections.

G. Contents: Each manual shall have an index listing the contents. Information in the manuals shall include not less than:
   1. General introductions and overall equipment description, purpose, functions and simplified theory of operation.
   2. Specifications
   3. Installation instructions, procedures, sequences, and precautions, including tolerances for level, horizontal and vertical alignment.
   4. Grouting requirements.
   5. List showing lubricants for each item of mechanical equipment and recommended lubrication intervals.
   6. Start-up and beginning operation procedures.
   7. Operational procedures.
   8. Shutdown procedures.
   9. Maintenance and calibration procedures
   10. Parts lists
   11. Name, address and telephone number of each manufacturer's local representative.

H. Manual Submittals: Unless otherwise specified, each submittal shall include two copies of each manual, one of which will be returned to the Contractor, marked to show the required review. When approved, deliver four copies to Architect unless otherwise specified.

I. “As-Built” drawings of ductwork and piping, including all elbows, transitions, damper and valve locations shall be provided prior to commencement of air and water balance.

1.12 QUALITY OF EQUIPMENT, MATERIALS AND WORKMANSHIP

A. Unless otherwise specified, equipment and materials used in the installation shall be new and in perfect condition when installed. Articles provided for the same general purpose or use shall be of the same make. Workmanship shall be of the best quality and none but competent mechanics skilled in their trades shall be employed. Furnish the services of an experienced superintendent, who shall be constantly in charge of the work, together with all necessary journeymen, helpers and laborers required.

1.13 SEISMIC DESIGN

A. Contractor shall be responsible for anchors and connections of mechanical work to the building structure including calculations for approval by structural engineer or for approval by inspector of record, as applies, for items or work, where approval is deferred or where alternate support or
anchorage detail is proposed to prevent damage as a result of an earthquake, including manufactured equipment, the connection and integrity of shop fabricated and field fabricated materials and equipment. The anchorage of all pipes, ducts, conduits, fixtures, equipment, etc. shall withstand the lateral forces and shall accommodate calculated building displacement as required by the California Building Code, and local city/county codes. (Building equipment and connections therefore shall be designed to resist lateral seismic forces equal to 1.0 of equipment weight to working allowable stress. Cantilever posts supporting equipment shall be designed to resist lateral seismic forces equal to 0.5 of equipment weight to allowable working stress. Conform to the following:

1. In accordance with Title 24, 2010 CBC Chapter 16, details shall be provided for the seismic anchorage of all mechanical and electrical equipment, anchorage details shall be based upon appropriate design calculations.

2. For equipment weighing 400 pounds or more anchorage details and appropriate design calculations shall be submitted as part of the mechanical and electrical drawings. “Deferred Approval” items will not be permitted unless specifically approved by the plan check supervisor.
   a. Exception: Attachments of equipment weighting less than 400 pounds and supported directly on the floor or roof structure, furniture, or temporary or movable equipment and equipment weighing less than 20 pounds that is supported by vibration isolation devices suspended from the roof, wall or floor, need not be detailed on the plans provided the following notes are included on the mechanical and electrical plans.

3. The seismic anchorage of mechanical and electrical equipment shall conform to C.C.R. Title 24, 2010 CBC Chapter 16. Anchorage details for roof/floor-mounted equipment shall be shown on plans.

1.14 SUBSTITUTIONS AND CHANGES

A. The design has been based on data from certain manufacturers, suitable for each application. Recommendations for alternative manufacturers are made for each product, except when "no substitutions permitted" is indicated.

B. It is the intent of the Owner to have this project constructed with materials, products and system originally designed and specified into the project.

C. Alternatives that may require the modification, realignment and/or adjustment of other associated components, including impact on other trades, shall be accomplished at no additional cost or time to the contract and shall have the approval of the Architect.

D. Substitutions shall be submitted addressing all features listed in the specifications. Features that deviate from the plans and specifications shall be clearly identified including justification for deviations. Design West Engineers will review initial submittal on substitutes only. Subsequent submittals made to correct deficiencies in original submittals will be reviewed at Contractor's expense based on Design West Engineer's hourly rate for engineering services.

E. Should the Contractor elect to propose substitutions for the Owner's interest, the substitutions shall be in compliance with Division 01.

1.15 APPROVALS

A. The Architect will have the right to accept or reject equipment, materials, workmanship, tests and determine when the Contractor has complied with the requirements herein specified.

1.16 SELECTION AND ORDERING OF EQUIPMENT AND MATERIALS

A. Immediately after award of the Contract and after the approval of submittals by the Architect, the Contractor shall arrange for the purchase and delivery of equipment and materials required, in ample quantities and at the proper time. He shall deliver to the Architect a complete list of equipment and materials ordered, giving descriptions, plate numbers, brochures, name of the wholesalers, date of the orders and approximate delivery dates.
1.17 LOCATIONS AND ACCESSIBILITY

A. Drawings show pipe and ductwork diagrammatically. Conform to Drawings as closely as possible in layout work. Vary run of piping, run and shape of ductwork and make offsets during progress of work as required to meet structural and other interferences as approved by Architect. Install piping and ductwork to best suit field conditions after coordinating with other trades. Run exposed piping and ductwork parallel to, or at right angle to, building walls. Keep horizontal lines as close to bottom of structures as possible. Conform to ceiling heights established on Drawings.

B. Install equipment in such a manner as to be readily accessible for maintenance and repairs. Install piping, ducts and conduit in such a manner as to preserve headroom, avoid obstructions and keep openings and passageways clear.

C. Installation at valves, thermometers, gauges, cleanouts, dampers, controls, steam and water specialties, duct access doors or any other indicating equipment or specialties requiring reading, adjustment, inspection, maintenance shall be conveniently and accessible located with reference to the finished building.

D. Where wall and ceiling access doors are required but not shown, such doors shall be furnished under other sections and as directed by the Architect. Coordinate this requirement with appropriate trade.

E. If changes in the indicated locations or arrangements are required, they shall be made without additional charges.

F. In an existing area, where required, remove, reinstall, reconnect or replace, etc., any existing work to accommodate new work without any additional cost to the Owner. Material shall match existing, unless otherwise specified or approved in writing by the Architect.

G. Provide sheaves and belts if required, to Test, Adjust and Balance Agency, to allow air moving equipment to meet flow requirements specified at no additional cost to the Owner.

1.18 COORDINATION OF TRADES

A. Contractor shall coordinate all trades in the interest of obtaining the most practical overall arrangement of equipment, piping, conduit, and ducts and to maintain maximum headroom and accessibility.

B. No extras will be allowed for changes made necessary by interference between trades.

C. Submit Composite Drawings in accordance with Special Conditions. Include dimensioned plans, elevations, sections and details and give complete information particularly as to the kinds and types of materials and equipment, size and location of sleeves, inserts, attachments, chases, openings, conduits, ducts, boxes, lighting, structural interferences. Coordinate these Composite Drawings and field layouts in the field for proper relationship to work of applicable trades based on field conditions. Contractor shall have competent personnel readily available for coordinating, checking, and supervision of field layouts. The procedures for submittals and resubmittals, and final distribution shall be as specified in Divison 01. Do not start installation of work involved under Composite Drawings until the Architect reviews applicable submittal. Discrepancies between the Drawings and Composite Drawings shall be specifically noted and identified on the Composite Drawings. Drawings for the various trades involved shall be submitted as required and reviewed prior to preparation of Composite Drawings.

1. Equipment Foundations and Bases: Furnish certified details and drawings for approval before fabrication. Furnish parts necessary for each foundation sub base and support.

2. Pipe Sleeves and Inserts: Furnish and install pipe sleeves and pipe support inserts before concrete is poured.

3. Roof, Wall and Floor Openings: Furnish Shop Drawings showing exact locations and sizes of openings through roofs, walls and floors.

4. Concrete: Conform to Concrete Section of the Specifications.

1.19 GUARANTEES

A. Contractor shall guarantee workmanship, equipment and materials installed under his contract for a period of not less than one (1) year from the date of Substantial Completion. Should any defects occur
during this period, the Contractor shall promptly repair or replace the defective item and any other damage caused to the building free of charge to the Owner, including cost of labor and materials.

B. Guarantee included in this section to cover:
   1. Faulty or inadequate design of equipment or material installed
   2. Improper assembly or erection
   3. Defective workmanship or material
   4. Incorrect or inadequate operation or other failure

C. He shall guarantee the complete and perfect operation of the entire system and that equipment will be supported in such a way as to be free of objectionable vibration and noise

D. Furnish the parts and labor to replace any items found to be defective in the refrigeration equipment with the guarantee period

E. In addition to other guarantees, furnish free maintenance for the refrigeration equipment, including replacement of refrigerant and oil, for a period of one (1) year. This shall include regular monthly maintenance and "On Call" service if required.

F. For equipment bearing a manufacturer's warranty in excess of one year, furnish a copy of the warranty to the Owner, who shall be named as beneficiary.

1.20 PROTECTION OF EQUIPMENT AND MATERIALS
   A. Provide adequate storage facilities for equipment and materials on the site and shall make provisions to protect such materials and equipment from damage.

1.21 CLOSING-IN OF UNINSPECTED WORK
   A. Contractor shall not allow or cause any of the work, specifically ductwork and piping, to be covered up or enclosed until it has been inspected, tested, and approved by the Architect. Should any of work be covered up or enclosed before such inspection and test, shall at their own expense, uncover the work and after it has been inspected, tested, and approved, make repairs with such materials as may be necessary to restore work to its original and proper condition.

1.22 BUILDING FOOTING CLEARANCES
   A. Under no circumstances shall pipes, ducts, or conduits penetrate footings. They shall cross below footings or through sleeves above footings. Those running parallel to footings shall have the minimum clearance from the cone of influence indicated on the Drawings or as required by Code.

1.23 DAMAGE BY LEAKS
   A. Contractor shall be responsible for all damage to any part of the premises caused by rain leaks through or around ducts or pipes, leaks or breaks in piping, equipment or fixtures furnished or installed by him for a period of one (1) year from the date of Substantial Completion.

1.24 EQUIPMENT LABELS
   A. Equipment provided under this Section shall be provided with the manufacturer's metal identification labels attached to each individual piece of equipment showing complete performance characteristics, size, model and serial number.

1.25 PRELIMINARY OPERATION
   A. Should the Owner request that any portion of the plant, apparatus, or equipment be operated for the Owner's beneficial use prior to the final completion and acceptance of the work, the Contractor shall conform to Beneficial Occupancy Provisions of the General Conditions. Such operation shall be under
the supervision and direction of the Contractor. Such preliminary operation shall not be construed as an acceptance of any of the work.

1.26 MAINTAINING EXISTING SERVICES
   A. The premises and existing building at the site will be in use at the time the work of this Section is in progress. Contractor shall conduct his work so as to cause no inconvenience or danger to the personnel on the premises.
   B. He shall maintain continuity of service to the existing mechanical systems, except for designated intervals during which connections can be made. The scheduling of the shut down period shall be at a time directed by the Architect.
   C. In some instances, it may be necessary to defer work in certain areas and locations until such time as existing facilities can be relocated or rearranged by the Owner. Therefore, whenever it becomes necessary for the Contractor to perform work under this contract in areas in which the Owner's work is being performed. This contractor shall advise the Architect relative to this requirement and shall follow closely the directive issued by the Architect insofar as time and procedure are concerned. Allow Owner 72 hours prior notice.
   D. This contractor shall include in his bid all premium time to which he may be subjected for performing work in such procedure and at such time as may be necessary to cause the least interference with the function of the Owner.

1.27 ELECTRICAL WORK
   A. Coordinate with Division 26 in making the line and low voltage electrical connections and be responsible for the operation of the equipment furnished under this section.
   B. Voltage for electrical work will be included in Division 26. However, any control wiring which is required that is not shown on the control diagram shall be as described under this Section. In the event that the Contractor chooses to provide equipment that requires extra expense in the power or control wiring, he shall pay additional electrical costs.
   C. Safety switches, starters, circuit breakers, unless provided as a portion of package equipment, and the electrical connections of mechanical equipment to the electrical power service shall be provided under Division 26.
   D. Interconnecting wiring, safety switches, relays, controllers and motor starters which are integral components of packaged equipment shall be provided as an integral part of that equipment.
   E. All interconnecting power wiring and conduits shall be provided by Division 26.
   F. Control wiring shall be provided by Division 22, unless otherwise indicated on the drawings.
   G. Conduit for control wiring shall be provided by Division 26.

END OF SECTION
SECTION 22 0517
SLEEVES AND SLEEVE SEALS FOR PLUMBING PIPING

PART 1  GENERAL

1.01  SUMMARY
   A. Section Includes:
      1. Sleeves.
      2. Sleeve-seal systems.

1.02  ACTION SUBMITTALS
   A. Product Data: For each type of product indicated.

PART 2  PRODUCTS

2.01  SLEEVES
   A. Cast-Iron Wall Pipes: Cast or fabricated of cast or ductile iron and equivalent to ductile-iron
      pressure pipe, with plain ends and integral waterstop unless otherwise indicated.
   B. Galvanized-Steel Wall Pipes: ASTM A 53/A 53M, Schedule 40, with plain ends and welded
      steel collar; zinc coated.
   C. Galvanized-Steel-Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, zinc
      coated, with plain ends.
   E. Galvanized-Steel-Sheet Sleeves: 0.0239-inch (0.6-mm) minimum thickness; round tube closed
      with welded longitudinal joint.

2.02  SLEEVE-SEAL SYSTEMS
   A. Manufacturers: Subject to compliance with requirements, provide products by one of the
      following:
   B. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated
      on Drawings or comparable product by one of the following:
      1. Advance Products & Systems, Inc
      2. CALPICO, Inc
      3. Metraflex Company
      4. Pipeline Seal and Insulator, Inc
      5. Proco Products, Inc
   C. Description: Modular sealing-element unit, designed for field assembly, for filling annular space
      between piping and sleeve.
      1. Sealing Elements: EPDM-rubber interlocking links shaped to fit surface of pipe. Include
         type and number required for pipe material and size of pipe.
      2. Pressure Plates: Carbon steel.
      3. Connecting Bolts and Nuts: Carbon steel, with corrosion-resistant coating, of length
         required to secure pressure plates to sealing elements.

2.03  GROUT
   A. Standard: ASTM C 1107/C 1107M, Grade B, post-hardening and volume-adjusting, dry,
      hydraulic-cement grout.
   B. Characteristics: Nonshrink; recommended for interior and exterior applications.
C. Design Mix: 5000-psi (34.5-MPa), 28-day compressive strength.
D. Packaging: Premixed and factory packaged.

PART 3 EXECUTION

3.01 SLEEVE INSTALLATION
A. Install sleeves for piping passing through penetrations in floors, partitions, roofs, and walls.
B. For sleeves that will have sleeve-seal system installed, select sleeves of size large enough to provide 1-inch (25-mm) annular clear space between piping and concrete slabs and walls.
   1. Sleeves are not required for core-drilled holes.
C. Install sleeves in concrete floors, concrete roof slabs, and concrete walls as new slabs and walls are constructed.
   1. Cut sleeves to length for mounting flush with both surfaces.
   a. Exception: Extend sleeves installed in floors of mechanical equipment areas or other wet areas 2 inches (50 mm) above finished floor level.
   2. Using grout, seal the space outside of sleeves in slabs and walls without sleeve-seal system.
D. Install sleeves for pipes passing through interior partitions.
   1. Cut sleeves to length for mounting flush with both surfaces.
   2. Install sleeves that are large enough to provide 1/4-inch (6.4-mm) annular clear space between sleeve and pipe or pipe insulation.
   3. Seal annular space between sleeve and piping or piping insulation; use joint sealants appropriate for size, depth, and location of joint. Comply with requirements for sealants specified in Section 079200 “Joint Sealants.”
E. Fire-Barrier Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at pipe penetrations. Seal pipe penetrations with firestop materials. Comply with requirements for firestopping specified in Section 078413 “Penetration Firestopping.”

3.02 SLEEVE-SEAL-SYSTEM INSTALLATION
A. Install sleeve-seal systems in sleeves in exterior concrete walls and slabs-on-grade at service piping entries into building.
B. Select type, size, and number of sealing elements required for piping material and size and for sleeve ID or hole size. Position piping in center of sleeve. Center piping in penetration, assemble sleeve-seal system components, and install in annular space between piping and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make a watertight seal.

3.03 SLEEVE AND SLEEVE-SEAL SCHEDULE
A. Use sleeves and sleeve seals for the following piping-penetration applications:
   1. Exterior Concrete Walls above Grade:
      a. Piping Smaller than NPS 6 (DN 150): Cast-iron wall sleeves.
      b. Piping NPS 6 (DN 150) and Larger: Cast-iron wall sleeves.
   2. Exterior Concrete Walls below Grade:
      a. Piping Smaller than NPS 6 (DN 150): Cast-iron wall sleeves with sleeve-seal system.
         1) Select sleeve size to allow for 1-inch (25-mm) annular clear space between piping and sleeve for installing sleeve-seal system.
      b. Piping NPS 6 (DN 150) and Larger: Cast-iron wall sleeves with sleeve-seal system.
         1) Select sleeve size to allow for 1-inch (25-mm) annular clear space between piping and sleeve for installing sleeve-seal system.
   3. Concrete Slabs-on-Grade:
      a. Piping Smaller than NPS 6 (DN 150): Cast-iron wall sleeves with sleeve-seal system.
         1) Select sleeve size to allow for 1-inch (25-mm) annular clear space between piping and sleeve for installing sleeve-seal system.
b. Piping NPS 6 (DN 150) and Larger: Cast-iron wall sleeves with sleeve-seal system.
   1) Select sleeve size to allow for 1-inch (25-mm) annular clear space between piping and sleeve for installing sleeve-seal system.

4. Concrete Slabs above Grade:
   b. Piping NPS 6 (DN 150) and Larger: Galvanized-steel-pipe sleeves.

5. Interior Partitions:
   b. Piping NPS 6 (DN 150) and Larger: Galvanized-steel-sheet sleeves.

END OF SECTION
SECTION 22 0518
ESCUTCHEONS FOR PLUMBING PIPING

PART 1 GENERAL
1.01 SUMMARY
   A. Section Includes:
      1. Escutcheons.
      2. Floor plates.

1.02 ACTION SUBMITTALS
   A. Product Data: For each type of product indicated.

PART 2 PRODUCTS
2.01 ESCUTCHEONS
   A. One-Piece, Cast-Brass Type: With polished, chrome-plated finish and setscrew fastener.
   B. One-Piece, Deep-Pattern Type: Deep-drawn, box-shaped brass with chrome-plated finish and spring-clip fasteners.
   C. One-Piece, Stamped-Steel Type: With chrome-plated finish and spring-clip fasteners.

2.02 FLOOR PLATES
   A. One-Piece Floor Plates: Cast-iron flange with holes for fasteners.

PART 3 EXECUTION
3.01 INSTALLATION
   A. Install escutcheons for piping penetrations of walls, ceilings, and finished floors.
   B. Install escutcheons with ID to closely fit around pipe, tube, and insulation of piping and with OD that completely covers opening.
      1. Escutcheons for New Piping:
         a. Piping with Fitting or Sleeve Protruding from Wall: One-piece, deep-pattern type.
         b. Chrome-Plated Piping: One-piece, cast-brass type with polished, chrome-plated finish.
         c. Insulated Piping: One-piece, stamped-steel type.
         d. Bare Piping at Wall and Floor Penetrations in Finished Spaces: One-piece, cast-brass type with polished, chrome-plated finish.
         e. Bare Piping at Wall and Floor Penetrations in Finished Spaces: One-piece, stamped-steel type.
         f. Bare Piping at Ceiling Penetrations in Finished Spaces: One-piece, cast-brass type with polished, chrome-plated finish.
         g. Bare Piping at Ceiling Penetrations in Finished Spaces: One-piece, stamped-steel type.
         h. Bare Piping in Unfinished Service Spaces: One-piece, cast-brass type with rough-brass finish.
         i. Bare Piping in Unfinished Service Spaces: One-piece, stamped-steel type.
         j. Bare Piping in Equipment Rooms: One-piece, cast-brass type with rough-brass finish.
         k. Bare Piping in Equipment Rooms: One-piece, stamped-steel type.
   C. Install floor plates for piping penetrations of equipment-room floors.
   D. Install floor plates with ID to closely fit around pipe, tube, and insulation of piping and with OD that completely covers opening.
      1. New Piping: One-piece, floor-plate type.

3.02 FIELD QUALITY CONTROL
   A. Replace broken and damaged escutcheons and floor plates using new materials.

END OF SECTION
SECTION 22 0529
HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT

PART 1 GENERAL
1.01 SUMMARY
   A. Section Includes:
      1. Metal pipe hangers and supports.
      2. Trapeze pipe hangers.
      3. Thermal-hanger shield inserts.
      4. Fastener systems.
      5. Pipe positioning systems.
      6. Equipment supports.

1.02 PERFORMANCE REQUIREMENTS
   A. Delegated Design: Design trapeze pipe hangers and equipment supports, including comprehensive
      engineering analysis by a qualified professional engineer, using performance requirements and design
      criteria indicated.
   B. Structural Performance: Hangers and supports for plumbing piping and equipment shall withstand the
      effects of gravity loads and stresses within limits and under conditions indicated according to ASCE/SEI 7
      1. Design supports for multiple pipes capable of supporting combined weight of supported systems,
         system contents, and test water.
      2. Design equipment supports capable of supporting combined operating weight of supported
         equipment and connected systems and components.
      3. Design seismic-restraint hangers and supports for piping and equipment and obtain approval from
         authorities having jurisdiction.

1.03 SUBMITTALS
   A. Product Data: For each type of product indicated.
   B. Shop Drawings: Signed and sealed by a qualified professional engineer. Show fabrication and
      installation details and include calculations for the following; include Product Data for components:
      1. Trapeze pipe hangers.
      2. Equipment supports.
   C. Delegated-Design Submittal: For trapeze hangers indicated to comply with performance requirements
      and design criteria, including analysis data signed and sealed by the qualified professional engineer
      responsible for their preparation.

1.04 INFORMATIONAL SUBMITTALS
   A. Welding certificates.

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

PART 2 PRODUCTS
2.01 METAL PIPE HANGERS AND SUPPORTS
   A. Carbon-Steel Pipe Hangers and Supports:
      1. Description: MSS SP-58, Types 1 through 58, factory-fabricated components.
      2. Galvanized Metallic Coatings: Pregalvanized or hot dipped.
      3. Nonmetallic Coatings: Plastic coating, jacket, or liner.
4. Padded Hangers: Hanger with fiberglass or other pipe insulation pad or cushion to support bearing surface of piping.

B. Copper Pipe Hangers:
1. Description: MSS SP-58, Types 1 through 58, copper-coated-steel, factory-fabricated components.

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

2.03 THERMAL-HANGER SHIELD INSERTS
A. Insulation-Insert Material for Cold Piping: ASTM C 552, Type II cellular glass with 100-psig (688-kPa) or ASTM C 591, Type VI, Grade 1 polyisocyanurate with 125-psig (862-kPa) minimum compressive strength and vapor barrier.
B. Insulation-Insert Material for Hot Piping: Water-repellent treated, ASTM C 533, Type I calcium silicate with 100-psig (688-kPa), ASTM C 552, Type II cellular glass with 100-psig (688-kPa) or ASTM C 591, Type VI, Grade 1 polyisocyanurate with 125-psig (862-kPa) minimum compressive strength.
C. For Trapeze or Clamped Systems: Insert and shield shall cover entire circumference of pipe.
D. For Clevis or Band Hangers: Insert and shield shall cover lower 180 degrees of pipe.
E. Insert Length: Extend 2 inches (50 mm) beyond sheet metal shield for piping operating below ambient air temperature.

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

2.05 PIPE POSITIONING SYSTEMS
A. Description: IAPMO PS 42, positioning system of metal brackets, clips, and straps for positioning piping in pipe spaces; for plumbing fixtures in commercial applications.

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

2.07 MISCELLANEOUS MATERIALS
A. Structural Steel: ASTM A 36/A 36M, carbon-steel plates, shapes, and bars; black and galvanized.
B. Grout: ASTM C 1107, factory-mixed and -packaged, dry, hydraulic-cement, nonshrink and nonmetallic grout; suitable for interior and exterior applications.
2. Design Mix: 5000-psi (34.5-MPa), 28-day compressive strength.

PART 3 EXECUTION
3.01 HANGER AND SUPPORT INSTALLATION
A. Metal Pipe-Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Install hangers, supports, clamps, and attachments as required to properly support piping from the building structure.
B. Metal Trapeze Pipe-Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Arrange for grouping of parallel runs of horizontal piping, and support together on field-fabricated trapeze pipe hangers.
1. Pipes of Various Sizes: Support together and space trapezes for smallest pipe size or install intermediate supports for smaller diameter pipes as specified for individual pipe hangers.

2. Field fabricate from ASTM A 36/A 36M, carbon-steel shapes selected for loads being supported. Weld steel according to AWS D1.1/D1.1M.

C. Thermal-Hanger Shield Installation: Install in pipe hanger or shield for insulated piping.

D. Fastener System Installation:
   1. Install mechanical-expansion anchors in concrete after concrete is placed and completely cured. Install fasteners according to manufacturer's written instructions.

E. Pipe Positioning-System Installation: Install support devices to make rigid supply and waste piping connections to each plumbing fixture.

F. Install hangers and supports complete with necessary attachments, inserts, bolts, rods, nuts, washers, and other accessories.


H. Install hangers and supports to allow controlled thermal and seismic movement of piping systems, to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends, and similar units.

I. Install lateral bracing with pipe hangers and supports to prevent swaying.

J. Install building attachments within concrete slabs or attach to structural steel. Install additional attachments at concentrated loads, including valves, flanges, and strainers, NPS 2-1/2 (DN 65) and larger and at changes in direction of piping. Install concrete inserts before concrete is placed; fasten inserts to forms and install reinforcing bars through openings at top of inserts.

K. Load Distribution: Install hangers and supports so that piping live and dead loads and stresses from movement will not be transmitted to connected equipment.

L. Pipe Slopes: Install hangers and supports to provide indicated pipe slopes and to not exceed maximum pipe deflections allowed by ASME B31.9 for building services piping.

M. Insulated Piping:
   1. Attach clamps and spacers to piping.
      a. Piping Operating above Ambient Air Temperature: Clamp may project through insulation.
      b. Piping Operating below Ambient Air Temperature: Use thermal-hanger shield insert with clamp sized to match OD of insert.
      c. Do not exceed pipe stress limits allowed by ASME B31.9 for building services piping.
   2. Install MSS SP-58, Type 39, protection saddles if insulation without vapor barrier is indicated. Fill interior voids with insulation that matches adjoining insulation.
      a. Option: Thermal-hanger shield inserts may be used. Include steel weight-distribution plate for pipe NPS 4 (DN 100) and larger if pipe is installed on rollers.
   3. Install MSS SP-58, Type 40, protective shields on cold piping with vapor barrier. Shields shall span an arc of 180 degrees.
      a. Option: Thermal-hanger shield inserts may be used. Include steel weight-distribution plate for pipe NPS 4 (DN 100) and larger if pipe is installed on rollers.
   4. Shield Dimensions for Pipe: Not less than the following:
      a. NPS 1/4 to NPS 3-1/2 (DN 8 to DN 90): 12 inches (305 mm) long and 0.048 inch (1.22 mm) thick.
      b. NPS 4 (DN 100): 12 inches (305 mm) long and 0.06 inch (1.52 mm) thick.
      c. NPS 5 and NPS 6 (DN 125 and DN 150): 18 inches (457 mm) long and 0.06 inch (1.52 mm) thick.
      d. NPS 8 to NPS 14 (DN 200 to DN 350): 24 inches (610 mm) long and 0.075 inch (1.91 mm) thick.
      e. NPS 16 to NPS 24 (DN 400 to DN 600): 24 inches (610 mm) long and 0.105 inch (2.67 mm) thick.
   5. Pipes NPS 8 (DN 200) and Larger: Include wood or reinforced calcium-silicate-insulation inserts of length at least as long as protective shield.
6. **Thermal-Hanger Shields:** Install with insulation same thickness as piping insulation.

### 3.02 EQUIPMENT SUPPORTS

A. Fabricate structural-steel stands to suspend equipment from structure overhead or to support equipment above floor.

B. Grouting: Place grout under supports for equipment and make bearing surface smooth.

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

### 3.03 METAL FABRICATIONS

A. Cut, drill, and fit miscellaneous metal fabrications for trapeze pipe hangers and equipment supports.

B. Fit exposed connections together to form hairline joints. Field weld connections that cannot be shop welded because of shipping size limitations.

C. Field Welding: Comply with AWS D1.1/D1.1M procedures for shielded, metal arc welding; appearance and quality of welds; and methods used in correcting welding work; and with the following:
   1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
   2. Obtain fusion without undercut or overlap.
   3. Remove welding flux immediately.
   4. Finish welds at exposed connections so no roughness shows after finishing and so contours of welded surfaces match adjacent contours.

### 3.04 ADJUSTING

A. Hanger Adjustments: Adjust hangers to distribute loads equally on attachments and to achieve indicated slope of pipe.

B. Trim excess length of continuous-thread hanger and support rods to 1-1/2 inches (40 mm).

### 3.05 PAINTING

A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.
   1. Apply paint by brush or spray to provide a minimum dry film thickness of 2.0 mils (0.05 mm).

B. Touchup: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint on miscellaneous metal are specified in Section 099113 "Exterior Painting." And Section 099123 "Interior Painting."

C. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

### 3.06 HANGER AND SUPPORT SCHEDULE

A. Specific hanger and support requirements are in Sections specifying piping systems and equipment.

B. Comply with MSS SP-69 for pipe-hanger selections and applications that are not specified in piping system Sections.

C. Use hangers and supports with galvanized metallic coatings for piping and equipment that will not have field-applied finish.

D. Use nonmetallic coatings on attachments for electrolytic protection where attachments are in direct contact with copper tubing.

E. Use carbon-steel pipe hangers and supports and metal trapeze pipe hangers and attachments for general service applications.

F. Use copper-plated pipe hangers and copper attachments for copper piping and tubing.

G. Use padded hangers for piping that is subject to scratching.

H. Use thermal-hanger shield inserts for insulated piping and tubing.

I. **Horizontal-Piping Hangers and Supports:** Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Adjustable, Steel Clevis Hangers (MSS Type 1): For suspension of noninsulated or insulated, stationary pipes NPS 1/2 to NPS 30 (DN 15 to DN 750).
2. Yoke-Type Pipe Clamps (MSS Type 2): For suspension of up to 1050 deg F (566 deg C), pipes NPS 4 to NPS 24 (DN 100 to DN 600), requiring up to 4 inches (100 mm) of insulation.
3. Carbon- or Alloy-Steel, Double-Bolt Pipe Clamps (MSS Type 3): For suspension of pipes NPS 3/4 to NPS 36 (DN 20 to DN 900), requiring clamp flexibility and up to 4 inches (100 mm) of insulation.
4. Adjustable, Steel Band Hangers (MSS Type 7): For suspension of noninsulated, stationary pipes NPS 1/2 to NPS 8 (DN 15 to DN 200).
5. U-Bolts (MSS Type 24): For support of heavy pipes NPS 1/2 to NPS 30 (DN 15 to DN 750).
6. Pipe Saddle Supports (MSS Type 36): For support of pipes NPS 4 to NPS 36 (DN 100 to DN 900), with steel-pipe base stanchion support and cast-iron floor flange or carbon-steel plate.
7. Pipe Stanchion Saddles (MSS Type 37): For support of pipes NPS 4 to NPS 36 (DN 100 to DN 900), with steel-pipe base stanchion support and cast-iron floor flange or carbon-steel plate, and with U-bolt to retain pipe.
8. Single-Pipe Rolls (MSS Type 41): For suspension of pipes NPS 1 to NPS 30 (DN 25 to DN 750), from two rods if longitudinal movement caused by expansion and contraction might occur.
9. Complete Pipe Rolls (MSS Type 44): For support of pipes NPS 2 to NPS 42 (DN 50 to DN 1050) if longitudinal movement caused by expansion and contraction might occur but vertical adjustment is not necessary.

J. Vertical-Piping Clamps: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
   1. Extension Pipe or Riser Clamps (MSS Type 8): For support of pipe risers NPS 3/4 to NPS 24 (DN 24 to DN 600).
   2. Carbon- or Alloy-Steel Riser Clamps (MSS Type 42): For support of pipe risers NPS 3/4 to NPS 24 (DN 20 to DN 600) if longer ends are required for riser clamps.

K. Hanger-Rod Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
   1. Steel Turnbuckles (MSS Type 13): For adjustment up to 6 inches (150 mm) for heavy loads.
   2. Steel Clevises (MSS Type 14): For 120 to 450 deg F (49 to 232 deg C) piping installations.

L. Building Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
   1. Steel or Malleable Concrete Inserts (MSS Type 18): For upper attachment to suspend pipe hangers from concrete ceiling.
   2. Top-Beam C-Clamps (MSS Type 19): For use under roof installations with bar-joist construction, to attach to top flange of structural shape.
   3. Side-Beam or Channel Clamps (MSS Type 20): For attaching to bottom flange of beams, channels, or angles.
   4. Center-Beam Clamps (MSS Type 21): For attaching to center of bottom flange of beams.
   5. Welded Beam Attachments (MSS Type 22): For attaching to bottom of beams if loads are considerable and rod sizes are large.
   6. C-Clamps (MSS Type 23): For structural shapes.
   7. Welded-Steel Brackets: For support of pipes from below, or for suspending from above by using clip and rod. Use one of the following for indicated loads:
      a. Light (MSS Type 31): 750 lb (340 kg).
      b. Medium (MSS Type 32): 1500 lb (680 kg).
      c. Heavy (MSS Type 33): 3000 lb (1360 kg).
   8. Side-Beam Brackets (MSS Type 34): For sides of steel or wooden beams.
   9. Plate Lugs (MSS Type 57): For attaching to steel beams if flexibility at beam is required.

M. Saddles and Shields: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
   1. Steel-Pipe-Covering Protection Saddles (MSS Type 39): To fill interior voids with insulation that matches adjoining insulation.
2. Protection Shields (MSS Type 40): Of length recommended in writing by manufacturer to prevent crushing insulation.
3. Thermal-Hanger Shield Inserts: For supporting insulated pipe.

N. Spring Hangers and Supports: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
   1. Spring Cushions (MSS Type 48): For light loads if vertical movement does not exceed 1-1/4 inches (32 mm).
   2. Spring-Cushion Roll Hangers (MSS Type 49): For equipping Type 41, roll hanger with springs.
   3. Variable-Spring Base Supports (MSS Type 52): Preset to indicated load and limit variability factor to 25 percent to allow expansion and contraction of piping system from base support.

O. Comply with MSS SP-69 for trapeze pipe-hanger selections and applications that are not specified in piping system Sections.

P. Use mechanical-expansion anchors instead of building attachments where required in concrete construction.

Q. Use pipe positioning systems in pipe spaces behind plumbing fixtures to support supply and waste piping for plumbing fixtures.

END OF SECTION
PART 1 GENERAL

1.01 SECTION INCLUDES
   A. Nameplates.
   B. Tags.
   C. Stencils.
   D. Pipe markers.

1.02 RELATED REQUIREMENTS
   A. Section 09 9123 - Interior Painting: Identification painting.

1.03 REFERENCE STANDARDS

1.04 SUBMITTALS
   A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
   B. List: Submit list of wording, symbols, letter size, and color coding for mechanical identification.

PART 2 PRODUCTS

2.01 MANUFACTURERS

2.02 NAMEPLATES
   A. Description: Laminated three-layer plastic with engraved letters.
      2. Letter Height: 1/4 inch.

2.03 TAGS
   A. Metal Tags: Brass with stamped letters; tag size minimum 1-1/2 inch diameter with smooth edges.

2.04 STENCILS
   A. Stencils: With clean cut symbols and letters of following size:
      1. 3/4 to 1-1/4 inch Outside Diameter of Insulation or Pipe: 8 inch long color field, 1/2 inch high letters.
      2. 1-1/2 to 2 inch Outside Diameter of Insulation or Pipe: 8 inch long color field, 3/4 inch high letters.
      3. 2-1/2 to 6 inch Outside Diameter of Insulation or Pipe: 12 inch long color field, 1-1/4 inch high letters.
      4. 8 to 10 inch Outside Diameter of Insulation or Pipe: 24 inch long color field, 2-1/2 inch high letters.
      5. Over 10 inch Outside Diameter of Insulation or Pipe: 32 inch long color field, 3-1/2 inch high letters.
   B. Stencils shall be identified as indicated below including direction of flow
      1. Refrigerant Suction Line - R.S.L.
      2. Refrigerant Liquid Line - R.L.L.
      3. Gravity Condensate - G.C.
      4. Domestic Cold Water - D.C.W.
      5. Domestic Hot Water - D.H.W.
      6. Domestic Hot Water Return - D.H.W.R.

**2.05 PIPE MARKERS**

A. Comply with ASME A13.1.

B. Underground Plastic Pipe Markers: Bright colored continuously printed plastic ribbon tape, minimum 6 inches wide by 4 mil thick, manufactured for direct burial service.

**PART 3 EXECUTION**

**3.01 PREPARATION**

A. Degrease and clean surfaces to receive adhesive for identification materials.

**3.02 INSTALLATION**

A. Install plastic nameplates with corrosive-resistant mechanical fasteners, or adhesive. Apply with sufficient adhesive to ensure permanent adhesion and seal with clear lacquer.

B. Install plastic pipe markers in accordance with manufacturer’s instructions.

C. Install plastic tape pipe markers complete around pipe in accordance with manufacturer's instructions.

D. Install underground plastic pipe markers 6 to 8 inches below finished grade, directly above buried pipe.

E. Identify air handling units, pumps, heat transfer equipment, tanks, and water treatment devices with plastic nameplates. Small devices, such as in-line pumps, may be identified with tags.

F. Identify control panels and major control components outside panels with plastic nameplates.

G. Identify thermostats relating to terminal boxes or valves with nameplates.

H. Identify valves in main and branch piping with tags.

I. Identify air terminal units and radiator valves with numbered tags.

J. Tag automatic controls, instruments, and relays. Key to control schematic.

K. Identify piping, concealed or exposed, with plastic pipe markers. Use tags on piping 3/4 inch diameter and smaller. Identify service, flow direction, and pressure. Install in clear view and align with axis of piping. Locate identification not to exceed 20 feet on straight runs including risers and drops, adjacent to each valve and Tee, at each side of penetration of structure or enclosure, and at each obstruction.

**END OF SECTION**
DIVISION 23: HEATING, VENTILATING, AND AIR-CONDITIONING

23 0500 COMMON WORK RESULTS FOR HVAC

23 0010 USER-BASIC MECHANICAL REQUIREMENTS
23 0529 HANGERS AND SUPPORTS
23 0593 TESTING, ADJUSTING AND BALANCING FOR HVAC

23 3000 HVAC AIR DISTRIBUTION

23 3100 HVAC DUCTS & CASINGS
23 3300 AIR DUCT ACCESSORIES
23 3423 POWER VENTILATORS
23 3700 AIR OUTLETS & INLETS

END OF TABLE OF CONTENTS
SECTION 23 0010
BASIC MECHANICAL REQUIREMENTS

PART 1. GENERAL

1.01 SECTION INCLUDES
A. Basic Mechanical Requirements specifically applicable to Division 23 Sections, in addition to Division 01 - General Requirements.

1.02 DESCRIPTION
A. Furnish materials and perform labor required to execute this work as indicated on the drawings, as specified and as required to complete the work of this section, except as otherwise herein specifically excluded.

1.03 REFERENCES
A. Section 23 0801 - Commissioning of Building Systems

1.04 WORK INCLUDED
A. The complete Heating, Ventilating and Air Conditioning (HVAC) systems, including but not limited to these major items.
1. Coordinate work of this Section with related trades.
2. Verify applicable dimensions at the jobsite.
3. Duct systems; supply, return and exhaust complete with fire dampers, combination fire-smoke dampers, and manual dampers.
4. Diffusers and registers.
5. Exhaust supply, return fans and air curtains.
6. Furnishing and installation of miscellaneous hangers, supports, sleeves, inserts, anchors and other auxiliary equipment for systems under this Division.
7. Duct lining and insulation.
8. Installation and connection of Owner furnished equipment.
11. Equipment and systems adjustments and balancing.
12. Written operating and maintenance instructions.
13. Record drawings.
14. Guarantee

1.05 WORK SPECIFIED ELSEWHERE
A. Concrete, Architectural Sheet Metal, Door and Exterior Wall Louvers, Painting and Electrical.

1.06 SITE INSPECTION
A. Contractor shall familiarize himself with the conditions at the site. No allowance will be made subsequently for any error through negligence in observing the site conditions. Contractor shall observe and make cost allowance for any mechanical and/or electrical items that must be relocated to accommodate the installation or servicing of any item covered under this contract.

1.07 ORDINANCES, REGULATIONS AND CODES
A. References to Technical Societies, Trade Organizations, Governmental Agencies is made in Division 15 in accordance with the following abbreviations.
1. AFI - Air Filter Institute
2. AMCA - Air Moving & Conditioning Association
3. ARI - Air Conditioning & Refrigeration Institute
4. ASHRAE - American Society of Heating, Refrigerating and Air Conditioning Engineers
5. ASME - American Society of Mechanical Engineers
6. ASTM - American Society of Testing Materials
7. AWSC - American Welding Society Code
8. ANSI - American National Standards Institute
9. CBC - California Building Code
10. CCR - California Code of Regulations
11. CEC - California Electrical Code
12. CFC - California Fire Codes
13. CMC - California Mechanical Code
14. CPC - California Plumbing Code
15. FIA - Factory Insurance Association
16. NAFM - National Association of Fan Manufacturers
17. NEMA - National Electrical Manufacturer's Association
18. NFPA - National Fire Protection Association
19. ORS - Office of Regulatory Services
20. SCAQMD - South Coast Air Quality Management District
21. SMACNA - Sheet Metal and Air Conditioning Contractors National Association
22. UFC - Uniform Fire Code
23. UL - Underwriter's Laboratories
24. UPC - Uniform Plumbing Code

B. Requirements of Regulatory Agencies: Materials and installation shall comply with applicable local, state, and national codes and ordinances. Rulings and interpretations of the enforcing agencies shall be considered as part of the local codes. No extras will be permitted for furnishing items required by the local codes but not specified or shown on the drawings.

C. Codes and Standards:
1. UBC and California Amendments (California Building Code - Part 2, Title 24, CCR).
2. UMC and California Amendments (California Mechanical Code - Part 4, Title 24 CCR).
3. UPC and California Amendments (California Plumbing Code - Part 5, Title 24 CCR).
4. Uniform Fire Code with State Amendments (California Fire Code - Part 9, Title 24 CCR).

D. Nothing in these drawings and specifications is to be construed to permit work in violation thereof. Ordinances, regulations and codes are to be construed as minimum requirements.

E. The responsibility of the Architect to conduct construction reviews of the Contractor's performance is not intended to include the adequacy of the Contractor's safety measures in, on, or near the construction site.

F. Ventilating, refrigeration and electrical equipment and appliances are required to be approved by the Underwriters' Laboratories, Inc., or other nationally recognized testing agency and installed per the testing agency's specifications.

1.08 PERMITS, FEES AND INSPECTIONS
A. Obtain and pay for all necessary permits, fees, assessments, complimentary drawings, required by any legally constituted public authorities having jurisdiction.

1.09 DRAWINGS AND SPECIFICATIONS
A. The Architect's decision will be final on interpretation of the Drawings and Specification.
B. The Drawings and Specifications are complimentary. Any work called for on the Drawings and not mentioned in the Specifications, or vice versa, shall be performed as though fully set forth in both.
C. Piping, ductwork and other equipment shown as existing has been taken from the Owner's drawings. Contractor shall verify exact location in field before proceeding with the work.
D. Where codes, standards, drawings or specifications conflict, the most stringent shall prevail, unless prior approval for variance is obtained. Specific details on the drawings shall supercede the specification in the event of a conflict.
E. Alternate support or seismic detail shall have prior approval by the Architect; and the Contractor shall obtain agency approval without any additional cost or time to the contract and without any time penalty on the work schedule.

1.10 SUBMITTALS
A. Before starting work, the Contractor shall furnish for the approval of the Architect, Shop Drawings and Submittals with Itemized Equipment Lists, complete in all details that they propose to install. All items shall be submitted at the same time.
B. Submittals must be specific to this project with respect to model number, capacities, performance, etc., generic submittals will not be accepted.
C. Variations or deviations on submitted items from that specified must be clearly tagged and/or identified.
D. Submittals shall include, but not necessarily be limited to the following which are mandatory:
   1. Draw Equipment Layouts to ¼” scale, including equipment, piping accessories, and showing clearances for operating and servicing.
   2. Schedule of pipe, fittings, valves, with manufacturer and catalog number.
   3. Specialties, valves, gauges and thermometers of all types.
   5. Earthquake supports and calculations.
   6. Insulation.
   7. Ventilation and air conditioning equipment, specialties and the air control systems.
   8. Fans, fan characteristic curves, fan tests.
   10. Shop fabrication drawings and installation drawings of ductwork and piping layouts. Submit for approval prior to fabrication. Drawings shall indicate dimensions from bottom of piping and ductwork to finish floor level.
   11. Wiring diagrams, control panel board, motor starters and controls for electrically operated equipment furnished by mechanical trades.
   12. Automatic control system diagrams.
   13. Exhaust, supply and return fans.
   15. Hangers, inserts, supports, anchors.
   16. Sleeves, escutcheons, caulking, waterproofing, fireproofing.
   17. Expansion joints, guides and anchors.
   18. Shop fabrications drawings and calculations.
   19. Special and miscellaneous products furnished under this section and not listed herein.

1.11 RECORD DRAWINGS AND MANUALS
A. Record Set During the Work: At site, maintain at least one set of Drawings as a Field Record Set. Also maintain at least one copy of all Addenda, Modifications, approved submittals, correspondence, and transmittals at site. Keep Drawings and data in good order and readily available to Architect and Owner.
B. Changes: Clearly and correctly mark Record Drawings to show changes made during the construction process at the time the changed work is installed. No such changes shall be made in the work unless authorized by the Architect.
C. Final Record Drawings: Conform to Division 01 requirements.
D. Preparation of Final Record Drawings: Contractor shall transfer recorded changes in the work indicated on the Field Record Set to the record set. Changes shall be neatly and clearly drawn and noted by skilled draftsmen, and shown technically correct.
E. Approval: Prior to Architect's inspection for Substantial Completion, submit the Final Record Drawings to the Architect for review, and make such revisions as may be necessary for Final Record Drawings to be a true, complete, and accurate record of the work.
F. Manuals: Obtain data from the various manufacturers and submit instruction, operation, and maintenance manuals as required and to the extent required under other Sections.

G. Contents: Each manual shall have an index listing the contents. Information in the manuals shall include not less than:
   1. General introductions and overall equipment description, purpose, functions and simplified theory of operation.
   2. Specifications
   3. Installation instructions, procedures, sequences, and precautions, including tolerances for level, horizontal and vertical alignment.
   4. Grouting requirements.
   5. List showing lubricants for each item of mechanical equipment and recommended lubrication intervals.
   6. Start-up and beginning operation procedures.
   7. Operational procedures.
   8. Shutdown procedures.
   9. Maintenance and calibration procedures
  10. Parts lists
  11. Name, address and telephone number of each manufacturer's local representative.

H. Manual Submittals: Unless otherwise specified, each submittal shall include two copies of each manual, one of which will be returned to the Contractor, marked to show the required review. When approved, deliver four copies to Architect unless otherwise specified.

I. “As-Built” drawings of ductwork and piping, including all elbows, transitions, damper and valve locations shall be provided prior to commencement of air and water balance.

1.12 QUALITY OF EQUIPMENT, MATERIALS AND WORKMANSHIP

A. Unless otherwise specified, equipment and materials used in the installation shall be new and in perfect condition when installed. Articles provided for the same general purpose or use shall be of the same make. Workmanship shall be of the best quality and none but competent mechanics skilled in their trades shall be employed. Furnish the services of an experienced superintendent, who shall be constantly in charge of the work, together with all necessary journeymen, helpers and laborers required.

1.13 SEISMIC DESIGN

A. Contractor shall be responsible for anchors and connections of mechanical work to the building structure including calculations for approval by structural engineer or for approval by inspector of record, as applies, for items or work, where approval is deferred or where alternate support or anchorage detail is proposed to prevent damage as a result of an earthquake, including manufactured equipment, the connection and integrity of shop fabricated and field fabricated materials and equipment. The anchorage of all pipes, ducts, conduits, fixtures, equipment, etc. shall withstand the lateral forces and shall accommodate calculated building displacement as required by the California Building Code, and local city/county codes. (Building equipment and connections therefore shall be designed to resist lateral seismic forces equal to 1.0 of equipment weight to working allowable stress. Cantilever posts supporting equipment shall be designed to resist lateral seismic forces equal to 0.5 of equipment weight to allowable working stress. Conform to the following:

1. In accordance with Title 24, 2010 CBC Chapter 16, details shall be provided for the seismic anchorage of all mechanical and electrical equipment, anchorage details shall be based upon appropriate design calculations.

2. For equipment weighing 400 pounds or more anchorage details and appropriate design calculations shall be submitted as part of the mechanical and electrical drawings. “Deferred Approval” items will not be permitted unless specifically approved by the plan check supervisor.
   a. Exception: Attachments of equipment weighing less than 400 pounds and supported directly on the floor or roof structure, furniture, or temporary or movable equipment and equipment weighing less than 20 pounds that is supported by vibration isolation
devices suspended from the roof, wall or floor, need not be detailed on the plans provided the following notes are included on the mechanical and electrical plans.

3. The seismic anchorage of mechanical and electrical equipment shall conform to C.C.R. Title 24, 2010 CBC Chapter 16. Anchorage details for roof/floor-mounted equipment shall be shown on plans.

1.14 SUBSTITUTIONS AND CHANGES
A. The design has been based on data from certain manufacturers, suitable for each application. Recommendations for alternative manufacturers are made for each product, except when "no substitutions permitted" is indicated.
B. It is the intent of the Owner to have this project constructed with materials, products and system originally designed and specified into the project.
C. Alternatives that may require the modification, realignment and/or adjustment of other associated components, including impact on other trades, shall be accomplished at no additional cost or time to the contract and shall have the approval of the Architect.
D. Substitutions shall be submitted addressing all features listed in the specifications. Features that deviate from the plans and specifications shall be clearly identified including justification for deviations. Design West Engineers will review initial submittal on substitutes only. Subsequent submittals made to correct deficiencies in original submittals will be reviewed at Contractor's expense based on Design West Engineer's hourly rate for engineering services.
E. Should the Contractor elect to propose substitutions for the Owner's interest, the substitutions shall be in compliance with Division 01.

1.15 APPROVALS
A. The Architect will have the right to accept or reject equipment, materials, workmanship, tests and determine when the Contractor has complied with the requirements herein specified.

1.16 SELECTION AND ORDERING OF EQUIPMENT AND MATERIALS
A. Immediately after award of the Contract and after the approval of submittals by the Architect, the Contractor shall arrange for the purchase and delivery of equipment and materials required, in ample quantities and at the proper time. He shall deliver to the Architect a complete list of equipment and materials ordered, giving descriptions, plate numbers, brochures, name of the wholesalers, date of the orders and approximate delivery dates.

1.17 LOCATIONS AND ACCESSIBILITY
A. Drawings show pipe and ductwork diagrammatically. Conform to Drawings as closely as possible in layout work. Vary run of piping, run and shape of ductwork and make offsets during progress of work as required to meet structural and other interferences as approved by Architect. Install piping and ductwork to best suit field conditions after coordinating with other trades. Run exposed piping and ductwork parallel to, or at right angle to, building walls. Keep horizontal lines as close to bottom of structures as possible. Conform to ceiling heights established on Drawings.
B. Install equipment in such a manner as to be readily accessible for maintenance and repairs. Install piping, ducts and conduit in such a manner as to preserve headroom, avoid obstructions and keep openings and passageways clear.
C. Installation at valves, thermometers, gauges, cleanouts, dampers, controls, steam and water specialties, duct access doors or any other indicating equipment or specialties requiring reading, adjustment, inspection, maintenance shall be conveniently and accessible located with reference to the finished building.
D. Where wall and ceiling access doors are required but not shown, such doors shall be furnished under other sections and as directed by the Architect. Coordinate this requirement with appropriate trade.
E. If changes in the indicated locations or arrangements are required, they shall be made without additional charges.
F. In an existing area, where required, remove, reinstall, reconnect or replace, etc., any existing work to accommodate new work without any additional cost to the Owner. Material shall match existing, unless otherwise specified or approved in writing by the Architect.

G. Provide sheaves and belts if required, to Test, Adjust and Balance Agency, to allow air moving equipment to meet flow requirements specified at no additional cost to the Owner.

1.18 COORDINATION OF TRADES

A. Contractor shall coordinate all trades in the interest of obtaining the most practical overall arrangement of equipment, piping, conduit, and ducts and to maintain maximum headroom and accessibility.

B. No extras will be allowed for changes made necessary by interference between trades.

C. Submit Composite Drawings in accordance with Special Conditions. Include dimensioned plans, elevations, sections and details and give complete information particularly as to the kinds and types of materials and equipment, size and location of sleeves, inserts, attachments, chases, openings, conduits, ducts, boxes, lighting, structural interferences. Coordinate these Composite Drawings and field layouts in the field for proper relationship to work of applicable trades based on field conditions. Contractor shall have competent personnel readily available for coordinating, checking, and supervision of field layouts. The procedures for submittals and resubmittals, and final distribution shall be as specified in Division 01. Do not start installation of work involved under Composite Drawings until the Architect reviews applicable submittal. Discrepancies between the Drawings and Composite Drawings shall be specifically noted and identified on the Composite Drawings. Drawings for the various trades involved shall be submitted as required and reviewed prior to preparation of Composite Drawings.

1. Equipment Foundations and Bases: Furnish certified details and drawings for approval before fabrication. Furnish parts necessary for each foundation sub base and support.

2. Pipe Sleeves and Inserts: Furnish and install pipe sleeves and pipe support inserts before concrete is poured.

3. Roof, Wall and Floor Openings: Furnish Shop Drawings showing exact locations and sizes of openings through roofs, walls and floors.

4. Concrete: Conform to Concrete Section of the Specifications.

1.19 GUARANTEES

A. Contractor shall guarantee workmanship, equipment and materials installed under his contract for a period of not less than one (1) year from the date of Substantial Completion. Should any defects occur during this period, the Contractor shall promptly repair or replace the defective item and any other damage caused to the building free of charge to the Owner, including cost of labor and materials.

B. Guarantee included in this section to cover:

1. Faulty or inadequate design of equipment or material installed
2. Improper assembly or erection
3. Defective workmanship or material
4. Incorrect or inadequate operation or other failure

C. He shall guarantee the complete and perfect operation of the entire system and that equipment will be supported in such a way as to be free of objectionable vibration and noise

D. Furnish the parts and labor to replace any items found to be defective in the refrigeration equipment with the guarantee period

E. In addition to other guarantees, furnish free maintenance for the refrigeration equipment, including replacement of refrigerant and oil, for a period of one (1) year. This shall include regular monthly maintenance and “On Call” service if required.

F. For equipment bearing a manufacturer's warranty in excess of one year, furnish a copy of the warranty to the Owner, who shall be named as beneficiary.
1.20 PROTECTION OF EQUIPMENT AND MATERIALS
   A. Provide adequate storage facilities for equipment and materials on the site and shall make
      provisions to protect such materials and equipment from damage.

1.21 CLOSING-IN OF UNINSPECTED WORK
   A. Contractor shall not allow or cause any of the work, specifically ductwork and piping, to be
      covered up or enclosed until it has been inspected, tested, and approved by the Architect.
      Should any of work be covered up or enclosed before such inspection and test, he shall at his
      own expense, uncover the work and after it has been inspected, tested, and approved, make
      repairs with such materials as may be necessary to restore work to its original and proper
      condition.

1.22 DAMAGE BY LEAKS
   A. Contractor shall be responsible for all damage to any part of the premises caused by rain leaks
      through or around ducts or pipes, leaks or breaks in piping, equipment or fixtures furnished or
      installed by him for a period of one (1) year from the date of Substantial Completion.

1.23 EQUIPMENT LABELS
   A. Equipment provided under this Section shall be provided with the manufacturer's metal
      identification labels attached to each individual piece of equipment showing complete
      performance characteristics, size, model and serial number.

1.24 PRELIMINARY OPERATION
   A. Should the Owner request that any portion of the plant, apparatus, or equipment be operated
      for the Owner's beneficial use prior to the final completion and acceptance of the work, the
      Contractor shall conform to Beneficial Occupancy Provisions of the General Conditions. Such
      operation shall be under the supervision and direction of the Contractor. Such preliminary
      operation shall not be construed as an acceptance of any of the work.

1.25 MAINTAINING EXISTING SERVICES
   A. The premises and existing building at the site will be in use at the time the work of this Section
      is in progress. Contractor shall conduct his work so as to cause no inconvenience or danger to
      the personnel on the premises.
   B. He shall maintain continuity of service to the existing mechanical systems, except for
      designated intervals during which connections can be made. The scheduling of the shut down
      period shall be at a time directed by the Architect.
   C. In some instances, it may be necessary to defer work in certain areas and locations until such
      time as existing facilities can be relocated or rearranged by the Owner. Therefore, whenever it
      becomes necessary for the Contractor to perform work under this contract in areas in which the
      Owner's work is being performed. This contractor shall advise the Architect relative to this
      requirement and shall follow closely the directive issued by the Architect insofar as time and
      procedure are concerned. Allow Owner 72 hours prior notice.
   D. This contractor shall include in his bid all premium time to which he may be subjected for
      performing work in such procedure and at such time as may be necessary to cause the least
      interference with the function of the Owner.

1.26 ELECTRICAL WORK
   A. Coordinate with Division 16 in making the line and low voltage electrical connections and be
      responsible for the operation of the equipment furnished under this section.
   B. Voltage for electrical work will be included in Division 26. However, any control wiring which is
      required that is not shown on the control diagram shall be as described under this Section. In
      the event that the Contractor chooses to provide equipment that requires extra expense in the
      power or control wiring, he shall pay additional electrical costs.
   C. Safety switches, starters, circuit breakers, unless provided as a portion of package equipment,
      and the electrical connections of mechanical equipment to the electrical power service shall be
      provided under Division 26.
D. Interconnecting wiring, safety switches, relays, controllers and motor starters which are integral components of packaged equipment shall be provided as an integral part of that equipment.

E. All interconnecting power wiring and conduits shall be provided by Division 26.

F. Control wiring shall be provided by Division 23, unless otherwise indicated on the drawings.

G. Conduit for control wiring shall be provided by Division 26.

END OF SECTION
SECTION 23 0529
HANGERS AND SUPPORTS

PART 1 - GENERAL

1.01 SUMMARY
A. This Section includes the following hangers and supports for mechanical system piping and equipment:
   1. Steel pipe hangers and supports.
   2. Trapeze pipe hangers.
   3. Metal framing systems.
   4. Thermal-hanger shield inserts.
   5. Fastener systems.
   6. Pipe stands.
   7. Pipe positioning systems.
   8. Equipment supports.
B. Related Sections include the following:
   1. Division 05 for structural-steel shapes and plates for trapeze hangers for pipe and equipment supports.
   2. Division 21 Section "Fire-Suppression Piping" for pipe hangers for fire-protection piping.
   3. Division 23 Section "Mechanical Vibration and Seismic Controls" for vibration isolation devices.
   4. Division 23 Section "Pipe Expansion Fittings and Loops" for flexible pipe.
   5. Division 23 Section "Metal Ducts" for duct hangers and supports.

1.02 DEFINITIONS
A. MSS: Manufacturers Standardization Society for The Valve and Fittings Industry Inc.
B. Terminology: As defined in MSS SP-90, "Guidelines on Terminology for Pipe Hangers and Supports."

1.03 PERFORMANCE REQUIREMENTS
A. Design supports for multiple pipes, including pipe stands, capable of supporting combined weight of supported systems, system contents, and test water.
B. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.
C. Design seismic-restraint hangers and supports for piping and equipment and obtain approval from authorities having jurisdiction.

1.04 SUBMITTALS
A. Product Data: For the following:
   1. Steel pipe hangers and supports.
   2. Thermal-hanger shield inserts.
   3. Powder-actuated fastener systems. Not allowed for this project.
   4. Pipe positioning systems.
B. Shop Drawings: Signed and sealed by a qualified professional engineer. Show fabrication and installation details and include calculations for the following:
   1. Trapeze pipe hangers. Include Product Data for components.
   2. Metal framing systems. Include Product Data for components.
   3. Pipe stands. Include Product Data for components.
   4. Equipment supports.
C. Welding and brazing certificates.
1.05 QUALITY ASSURANCE
   A. Welding: Qualify procedures and personnel according to AWS D1.1, "Structural Welding Code-Steel." ASME Boiler and Pressure Vessel Code: Section IX.
   B. Welding: Qualify procedures and personnel according to the following:
      1. AWS D1.1, "Structural Welding Code--Steel."
      2. ASME Boiler and Pressure Vessel Code: Section IX.

PART 2 - PRODUCTS

2.01 MANUFACTURERS
   A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:
      1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.

2.02 STEEL PIPE HANGERS AND SUPPORTS
   A. Description: MSS SP-58, Types 1 through 58, factory-fabricated components. Refer to Part 3 "Hanger and Support Applications" Article for where to use specific hanger and support types.
   B. Galvanized, Metallic Coatings: Pre-galvanized or hot dipped.
   C. Nonmetallic Coatings: Plastic coating, jacket, or liner.
   D. Padded Hangers: Hanger with fiberglass or other pipe insulation pad or cushion for support of bearing surface of piping.

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

2.04 METAL FRAMING SYSTEMS
   A. Description: MFMA-3, shop- or field-fabricated pipe-support assembly made of steel channels and other components.
   B. Coatings: Manufacturer's standard finish, unless bare metal surfaces are indicated.
   C. Nonmetallic Coatings: Plastic coating, jacket, or liner.

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

2.06 FASTENER SYSTEMS
   A. Mechanical-Expansion Anchors: Insert-wedge-type stainless steel, for use in hardened portland cement concrete with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.
      1. Before Installation: Verify suitability for use in lightweight concrete or concrete slabs less than 4 inches thick with project structural engineer.
2.07 PIPE STAND FABRICATION

A. Pipe Stands, General: Shop or field-fabricated assemblies made of manufactured corrosion-resistant components to support roof-mounted piping.
   1. Submit: Calculations and details of each pipe stand unit.

B. Compact Pipe Stand: One-piece plastic unit with integral-rod-roller, pipe clamps, or V-shaped cradle to support pipe, for roof installation without membrane penetration.

C. Low-Type, Single-Pipe Stand: One-piece stainless-steel base unit with plastic roller, for roof installation without membrane penetration.

D. High-Type, Single-Pipe Stand: Assembly of base, vertical and horizontal members, and pipe support, for roof installation without membrane penetration.
   2. Vertical Members: Two or more cadmium-plated-steel or stainless-steel, continuous-thread rods.
   3. Horizontal Member: Cadmium-plated-steel or stainless-steel rod with plastic or stainless-steel, roller-type pipe support.

E. High-Type, Multiple-Pipe Stand: Assembly of bases, vertical and horizontal members, and pipe supports, for roof installation without membrane penetration.
   1. Available Manufacturer: Portable Pipe Hangers.
   2. Bases: One or more plastic.
   3. Vertical Members: Two or more protective-coated-steel channels.
   4. Horizontal Member: Protective-coated-steel channel.
   5. Pipe Supports: Galvanized-steel, clevis-type pipe hangers.

F. Curb-Mounting-Type Pipe Stands: Shop- or field-fabricated pipe support made from structural-steel shape, continuous-thread rods, and rollers for mounting on permanent stationary roof curb.

2.08 PIPE POSITIONING SYSTEMS

A. Description: IAPMO PS 42, system of metal brackets, clips, and straps for positioning piping in pipe spaces for plumbing fixtures for commercial applications.

B. Available Manufacturer: HOLDRITE Corp.; Hubbard Enterprises.

2.09 EQUIPMENT SUPPORTS

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

2.10 MISCELLANEOUS MATERIALS

A. Structural Steel: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.

B. Grout: ASTM C 1107, factory-mixed and -packaged, dry, hydraulic-cement, nonshrink and nonmetallic grout; suitable for interior and exterior applications.
   1. Properties: Non-staining, non-corrosive, and nongaseous.
   2. Design Mix: 5000-psi, 28-day compressive strength.

PART 3 - EXECUTION

3.01 HANGER AND SUPPORT APPLICATIONS

A. Specific hanger and support requirements are specified in Sections specifying piping systems and equipment.

B. Comply with MSS SP-69 for pipe hanger selections and applications that are not specified in piping system Sections.

C. Use hangers and supports with galvanized, metallic coatings for piping and equipment that will not have field-applied finish.
D. Use nonmetallic coatings on attachments for electrolytic protection where attachments are in direct contact with copper tubing.

E. Use padded hangers for bare piping for noise abatement.

F. Piping shall be concealed in chases, partitions, walls, and between floors, unless otherwise directed or specifically noted on Drawings. When penetrating wood studs, joists, and other wood members, provide such members with reinforcement steel straps of Kees Protecta-Plate.

G. For fastening to wood ceilings, beams, or joists, furnish Grinnell figure 128 or 202 pipe hanger flange fastened with drive screws. Under wood floors, 3/8 inch hanger rods shall be hung from 2 inch x 2 inch x 1/4 inch angle clips 3 inches long, with 2 staggered 10d nails, clinched over joist.

H. Horizontal-Piping Hangers and Supports: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
   1. Adjustable, Steel Clevis Hangers (MSS Type 1): For suspension of non-insulated or insulated stationary pipes.
   2. Yoke-Type Pipe Clamps (MSS Type 2): For suspension of 120 to 450 deg F pipes, NPS 4 and larger, requiring up to 4 inches of insulation.
   3. Carbon- or Alloy-Steel, Double-Bolt Pipe Clamps (MSS Type 3): For suspension of pipes, requiring clamp flexibility and up to 4 inches of insulation.
   4. Steel Pipe Clamps (MSS Type 4): For suspension of cold and hot pipes, if little or no insulation is required.
   5. Pipe Hangers (MSS Type 5): For suspension of pipes, NPS 1/2 to NPS 4, to allow off-center closure for hanger installation before pipe erection.
   6. Adjustable Swivel Split- or Solid-Ring Hangers (MSS Type 6): For suspension of non-insulated stationary pipes, NPS 3/4 to NPS 8.
   7. Adjustable, Steel Band Hangers (MSS Type 7): For suspension of non-insulated stationary pipes, NPS 1/2 to NPS 8.
   8. Adjustable Band Hangers (MSS Type 9): For suspension of non-insulated stationary pipes, NPS 1/2 to NPS 8.
  10. Split Pipe-Ring with or without Turnbuckle-Adjustment Hangers (MSS Type 11): For suspension of non-insulated stationary pipes, NPS 3/8 to NPS 8.
  11. Extension Hinged or 2-Bolt Split Pipe Clamps (MSS Type 12): For suspension of non-insulated stationary pipes, NPS 3/8 to NPS 3.
  12. U-Bolts (MSS Type 24): For support of heavy pipes, NPS 1/2 and larger.
  13. Clips (MSS Type 26): For support of insulated pipes not subject to expansion or contraction.
  14. Pipe Saddle Supports (MSS Type 36): For support of pipes, NPS 4 and larger, with steel pipe base stanchion support and cast-iron floor flange.
  15. Pipe Stanchion Saddles (MSS Type 37): For support of pipes, NPS 4 and larger, with steel pipe base stanchion support and cast-iron floor flange and with U-bolt to retain pipe.
  16. Adjustable Pipe Saddle Supports (MSS Type 38): For stanchion-type support for pipes, if vertical adjustment is required, with steel pipe base stanchion support and cast-iron floor flange.

I. Vertical-Piping Clamps: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
   1. Extension Pipe or Riser Clamps (MSS Type 8): For support of pipe risers.
   2. Carbon- or Alloy-Steel Riser Clamps (MSS Type 42): For support of pipe risers, if longer ends are required for riser clamps.

J. Hanger-Rod Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
   1. Steel Turnbuckles (MSS Type 13): For adjustment up to 6 inches for heavy loads.
   2. Steel Clevises (MSS Type 14): For 120 to 450 deg F piping installations.
3. Swivel Turnbuckles (MSS Type 15): For use with MSS Type 11, split pipe rings.
4. Malleable-Iron Sockets (MSS Type 16): For attaching hanger rods to various types of building attachments.
5. Steel Weldless Eye Nuts (MSS Type 17): For 120 to 450 deg F piping installations.

K. Building Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
   1. Welded-Steel Brackets: For support of pipes from below, or for suspending from above by using clip and rod. Use one of the following for indicated loads:
      a. Light (MSS Type 31): 750 lb.
      b. Medium (MSS Type 32): 1500 lb.
      c. Heavy (MSS Type 33): 3000 lb.
   2. Side-Beam Brackets (MSS Type 34): For sides of wooden beams.

L. Saddles and Shields: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
   1. Steel Pipe-Covering Protection Saddles (MSS Type 39): To fill interior voids with insulation that matches adjoining insulation.
   2. Protection Shields (MSS Type 40): Of length recommended in writing by manufacturer to prevent crushing insulation.
   3. Thermal-Hanger Shield Inserts: For supporting insulated pipe.

M. Comply with MSS SP-69 for trapeze pipe hanger selections and applications that are not specified in piping system Sections.
N. Comply with MFMA-102 for metal framing system selections and applications that are not specified in piping system Sections.
O. Use mechanical-expansion anchors instead of building attachments where required in concrete construction.
P. Use pipe-positioning systems in pipe spaces behind plumbing fixtures to support supply and waste piping for plumbing fixtures.

3.02 HANGER AND SUPPORT INSTALLATION

A. Steel Pipe Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Install hangers, supports, clamps, and attachments as required to properly support piping from building structure.
B. Trapeze Pipe Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Arrange for grouping of parallel runs of horizontal piping and support together on field-fabricated trapeze pipe hangers.
   1. Each trapeze pipe hanger requires submittal of calculations and details.
   2. Pipes of Various Sizes: Support together and space trapezes for smallest pipe size or install intermediate supports for smaller diameter pipes as specified above for individual pipe hangers.
   3. Field fabricate from ASTM A 36/A 36M, steel shapes selected for loads being supported. Weld steel according to AWS D1.1.
C. Metal Framing System Installation: Arrange for grouping of parallel runs of piping and support together on field-assembled metal framing systems.
   1. Each metal framing system requires submittal of calculations and details.
D. Thermal-Hanger Shield Installation: Install in pipe hanger or shield for insulated piping.
E. Fastener System Installation:
   1. Install mechanical-expansion anchors in concrete after concrete is placed and completely cured. Install fasteners according to manufacturer's written instructions.
F. Pipe Stand Installation:
   1. Each pipe stand in requires submittal of calculations and details.
   2. Pipe Stand Types except Curb-Mounting Type: Assemble components and mount on smooth roof surface. Do not penetrate roof membrane.
3. Curb-Mounting-Type Pipe Stands: Assemble components or fabricate pipe stand and mount on permanent, stationary roof curb. Refer to Division 07 for curbs specifications.

G. Pipe Positioning System Installation: Install support devices to make rigid supply and waste piping connections to each plumbing fixture. Refer to Division 22 Section "Plumbing Fixtures" for plumbing fixtures.

H. Install hangers and supports complete with necessary inserts, bolts, rods, nuts, washers, and other accessories.

   1. Each equipment support requires submittal of calculations and details.

J. Install hangers and supports to allow controlled thermal and seismic movement of piping systems, to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends, and similar units.

K. Install lateral bracing with pipe hangers and supports to prevent swaying.

L. Install building attachments. Install additional attachments at concentrated loads, including valves, flanges, and strainers, NPS 2-1/2 and larger and at changes in direction of piping.

M. Load Distribution: Install hangers and supports so piping live and dead loads and stresses from movement will not be transmitted to connected equipment.

N. Pipe Slopes: Install hangers and supports to provide indicated pipe slopes and so maximum pipe deflections allowed by ASME B31.1 (for power piping) and ASME B31.9 (for building services piping) are not exceeded.

O. Insulated Piping: Comply with the following:
   1. Attach clamps and spacers to piping.
      a. Piping Operating above Ambient Air Temperature: Clamp may project through insulation.
      b. Piping Operating below Ambient Air Temperature: Use thermal-hanger shield insert with clamp sized to match OD of insert.
      c. Do not exceed pipe stress limits according to ASME B31.1 for power piping and ASME B31.9 for building services piping.
   2. Install MSS SP-58, Type 39, protection saddles if insulation without vapor barrier is indicated. Fill interior voids with insulation that matches adjoining insulation.
      a. Option: Thermal-hanger shield inserts may be used. Include steel weight-distribution plate for pipe NPS 4 and larger if pipe is installed on rollers.
   3. Install MSS SP-58, Type 40, protective shields on cold piping with vapor barrier. Shields shall span an arc of 180 degrees.
      a. Option: Thermal-hanger shield inserts may be used. Include steel weight-distribution plate for pipe NPS 4 and larger if pipe is installed on rollers.
   4. Shield Dimensions for Pipe: Not less than the following:
      a. NPS 1/4 to NPS 3-1/2: 12 inches long and 0.048 inch thick.
      b. NPS 4: 12 inches long and 0.06 inch thick.
      c. NPS 5 and NPS 6: 18 inches long and 0.06 inch thick.
      d. NPS 8 to NPS 14: 24 inches long and 0.075 inch thick.
   5. Pipes NPS 8 and Larger: Include wood inserts.
   6. Insert Material: Length at least as long as protective shield.
   7. Thermal-Hanger Shields: Install with insulation same thickness as piping insulation.

3.03 EQUIPMENT SUPPORTS

A. Fabricate structural-steel stands to suspend equipment from structure overhead or to support equipment above floor.

B. Grouting: Place grout under supports for equipment and make smooth bearing surface.

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

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

3.06 PAINTING
   A. Touch Up: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint on miscellaneous metal are specified in Division 09.
   B. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

END OF SECTION
SECTION 23 0593
TESTING, ADJUSTING, AND BALANCING FOR HVAC

PART 1 GENERAL
1.01 SECTION INCLUDES
   A. Testing, adjustment, and balancing of air systems.
   B. Measurement of final operating condition of HVAC systems.

1.02 REFERENCE STANDARDS

1.03 SUBMITTALS
   A. The contractor shall procure the services of an independent Air Balance and Testing Agency, approved by the Engineer, which specializes in the balancing and testing of heating, ventilating, and air conditioning systems. The independent agency shall be certified and in good standing with the AABC.
   B. Installer Qualifications: Submit name of adjusting and balancing agency and TAB supervisor for approval within 30 days after award of Contract.
   C. TAB Plan: Submit a written plan indicating the testing, adjusting, and balancing standard to be followed and the specific approach for each system and component.
      1. Submit to Architect.
      2. Include certification that the plan developer has reviewed the contract documents, the equipment and systems, and the control system with Architect and other installers to sufficiently understand the design intent for each system.
      3. Include at least the following in the plan:
         a. List of all air flow, water flow, sound level, system capacity and efficiency measurements to be performed and a description of specific test procedures, parameters, formulas to be used.
         b. Copy of field checkout sheets and logs to be used, listing each piece of equipment to be tested, adjusted and balanced with the data cells to be gathered for each.
         c. Identification and types of measurement instruments to be used and their most recent calibration date.
         d. Discussion of what notations and markings will be made on the duct and piping drawings during the process.
         e. Final test report forms to be used.
         f. Expected problems and solutions, etc.
         g. Criteria for using air flow straighteners or relocating flow stations and sensors; analogous explanations for the water side.
         h. Details of how TOTAL flow will be determined; for example:
            1) Air: Sum of terminal flows via control system calibrated readings or via hood readings of all terminals, supply (SA) and return air (RA) pitot traverse, SA or RA flow stations.
            i. Specific procedures that will ensure that both air and water side are operating at the lowest possible pressures and methods to verify this.
            j. Confirmation of understanding of the outside air ventilation criteria under all conditions.
            k. Method of verifying and setting minimum outside air flow rate will be verified and set and for what level (total building, zone, etc.).
            l. Method of checking building static and exhaust fan and/or relief damper capacity.
            m. Time schedule for deferred or seasonal TAB work, if specified.
            n. False loading of systems to complete TAB work, if specified.
            o. Exhaust fan balancing and capacity verifications, including any required room pressure differentials.
p. Procedures for field technician logs of discrepancies, deficient or uncompleted work by others, contract interpretation requests and lists of completed tests (scope and frequency).
q. Procedures for formal progress reports, including scope and frequency.
r. Procedures for formal deficiency reports, including scope, frequency and distribution.

D. Field Logs: Submit at least twice a week to the Commissioning Authority.

E. Progress Reports.

F. Final Report: Indicate deficiencies in systems that would prevent proper testing, adjusting, and balancing of systems and equipment to achieve specified performance.
   1. Submit to the Commissioning Authority within two weeks after completion of testing, adjusting, and balancing.
   2. Revise TAB plan to reflect actual procedures and submit as part of final report.
   3. Submit draft copies of report for review prior to final acceptance of Project. Provide final copies for Architect and for inclusion in operating and maintenance manuals.
   4. Include actual instrument list, with manufacturer name, serial number, and date of calibration.
   5. Form of Test Reports: Where the TAB standard being followed recommends a report format use that; otherwise, follow ASHRAE Std 111.
   6. Units of Measure: Report data in both I-P (inch-pound) and SI (metric) units.
   7. Include the following on the title page of each report:
      a. Name of Testing, Adjusting, and Balancing Agency.
      b. Address of Testing, Adjusting, and Balancing Agency.
      c. Telephone number of Testing, Adjusting, and Balancing Agency.
      d. Project name.
      e. Project location.
      f. Project Architect.
      g. Project Engineer.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 GENERAL REQUIREMENTS

A. Perform total system balance in accordance with one of the following:
   1. AABC MN-1, AABC National Standards for Total System Balance.
   3. SMACNA (TAB).
   4. Maintain at least one copy of the standard to be used at project site at all times.

B. Begin work after completion of systems to be tested, adjusted, or balanced and complete work prior to Substantial Completion of the project.

C. Where HVAC systems and/or components interface with life safety systems, including fire and smoke detection, alarm, and control, coordinate scheduling and testing and inspection procedures with the authorities having jurisdiction.

D. TAB Agency Qualifications:
   1. Company specializing in the testing, adjusting, and balancing of systems specified in this section.
   2. Certified by the following:

E. TAB Supervisor and Technician Qualifications: Certified by same organization as TAB agency.

3.02 EXAMINATION

A. Verify that systems are complete and operable before commencing work. Ensure the following conditions:
   1. Systems are started and operating in a safe and normal condition.
   2. Temperature control systems are installed complete and operable.
3. Proper thermal overload protection is in place for electrical equipment.
4. Final filters are clean and in place. If required, install temporary media in addition to final filters.
5. Duct systems are clean of debris.
6. Fans are rotating correctly.
7. Fire and volume dampers are in place and open.
8. Air coil fins are cleaned and combed.
9. Access doors are closed and duct end caps are in place.
10. Air outlets are installed and connected.
11. Duct system leakage is minimized.

B. Submit field reports. Report defects and deficiencies that will or could prevent proper system balance.

C. Beginning of work means acceptance of existing conditions.

3.03 ADJUSTMENT TOLERANCES
A. Air Handling Systems: Adjust to within plus or minus 5 percent of design for supply systems and plus or minus 10 percent of design for return and exhaust systems.
B. Air Outlets and Inlets: Adjust total to within plus 10 percent and minus 5 percent of design to space. Adjust outlets and inlets in space to within plus or minus 10 percent of design.

3.04 RECORDING AND ADJUSTING
A. Field Logs: Maintain written logs including:
   1. Running log of events and issues.
   2. Discrepancies, deficient or uncompleted work by others.
   4. Lists of completed tests.
B. Ensure recorded data represents actual measured or observed conditions.
C. Permanently mark settings of valves, dampers, and other adjustment devices allowing settings to be restored. Set and lock memory stops.
D. Mark on the drawings the locations where traverse and other critical measurements were taken and cross reference the location in the final report.
E. After adjustment, take measurements to verify balance has not been disrupted or that such disruption has been rectified.
F. Leave systems in proper working order, replacing belt guards, closing access doors, closing doors to electrical switch boxes, and restoring thermostats to specified settings.

3.05 AIR SYSTEM PROCEDURE
A. Adjust air handling and distribution systems to provide required or design supply, return, and exhaust air quantities at site altitude.
B. Make air quantity measurements in ducts by Pitot tube traverse of entire cross sectional area of duct.
C. Measure air quantities at air inlets and outlets.
D. Adjust distribution system to obtain uniform space temperatures free from objectionable drafts and noise.
E. Use volume control devices to regulate air quantities only to extend that adjustments do not create objectionable air motion or sound levels. Effect volume control by duct internal devices such as dampers and splitters.
F. Measure static air pressure conditions on air supply units, including filter and coil pressure drops, and total pressure across the fan. Make allowances for 50 percent loading of filters.
G. Adjust outside air automatic dampers, outside air, return air, and exhaust dampers for design conditions.
H. Measure temperature conditions across outside air, return air, and exhaust dampers to check leakage.
I. Where modulating dampers are provided, take measurements and balance at extreme conditions. Balance variable volume systems at maximum air flow rate, full cooling, and at minimum air flow rate, full heating.

J. Measure building static pressure and adjust supply, return, and exhaust air systems to provide required relationship between each to maintain approximately 0.02 inches negative static pressure in chemical storage rooms.

K. For variable air volume system powered units set volume controller to air flow setting indicated. Confirm connections properly made and confirm proper operation for automatic variable air volume temperature control.

3.06 SCOPE

A. Test, adjust, and balance the following:
   1. Fans.

END OF SECTION
SECTION 23 3100
HVAC DUCTS AND CASINGS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Metal ductwork.
B. Nonmetal ductwork.
C. Casing and plenums.
D. Duct cleaning.

1.02 REFERENCE STANDARDS
A. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2015.
D. SMACNA (DCS) - HVAC Duct Construction Standards Metal and Flexible; 2005.
E. SMACNA (FGD) - Fibrous Glass Duct Construction Standards; 2003.
F. UL 181 - Standard for Factory-Made Air Ducts and Air Connectors; current edition, including all revisions.

1.03 PERFORMANCE REQUIREMENTS
A. No variation of duct configuration or sizes permitted except by written permission. Size round ducts installed in place of rectangular ducts in accordance with ASHRAE table of equivalent rectangular and round ducts.

1.04 SUBMITTALS
A. Product Data: Provide data for duct materials, duct liner, and duct connections.
B. Project Record Documents: Record actual locations of ducts and duct fittings. Record changes in fitting location and type. Show additional fittings used.

1.05 FIELD CONDITIONS
A. Do not install duct sealants when temperatures are less than those recommended by sealant manufacturers.
B. Maintain temperatures within acceptable range during and after installation of duct sealants.

PART 2 PRODUCTS

2.01 DUCT ASSEMBLIES
A. Regulatory Requirements: Construct ductwork to NFPA 90A standards.

2.02 MATERIALS
A. Galvanized Steel for Ducts: Hot-dipped galvanized steel sheet, ASTM A653/A653M FS Type B, with G60/Z180 coating.
B. Flexible Ducts:
   1. UL 181, Class 1, aluminum laminate and polyester film with latex adhesive supported by helically wound spring steel wire.
      a. Pressure Rating: 10 inches WG positive and 1.0 inches WG negative.
      b. Maximum Velocity: 4000 fpm.
      c. Temperature Range: -20 degrees F to 210 degrees F.
C. Insulated Flexible Ducts:
   1. UL 181, Class 1, aluminum laminate and polyester film with latex adhesive supported by helically wound spring steel wire; fiberglass insulation; polyethylene vapor barrier film.
a. Pressure Rating: 10 inches WG positive and 1.0 inches WG negative.
b. Maximum Velocity: 4000 fpm.
c. Temperature Range: -20 degrees F to 210 degrees F.

D. Joint Sealers and Sealants: Non-hardening, water resistant, mildew and mold resistant.
E. Hanger Rod: ASTM A 36/A 36M; steel, galvanized; threaded both ends, threaded one end, or continuously threaded.

2.03 DUCTWORK FABRICATION
A. Fabricate ductwork gauge in accordance with current (CMC) California Mechanical Code and support in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible, and as indicated.
B. Provide duct material, gages, reinforcing, and sealing for operating pressures indicated.
C. T's, bends, and elbows: Construct according to (CMC) California Mechanical Code and SMACNA (DCS).
D. Increase duct sizes gradually, not exceeding 15 degrees divergence wherever possible; maximum 30 degrees divergence upstream of equipment and 45 degrees convergence downstream.
E. Fabricate continuously welded round and oval duct fittings in accordance with SMACNA (DCS).
F. Provide standard 45 degree lateral wye takeoffs unless otherwise indicated where 90 degree conical tee connections may be used.
G. Where ducts are connected to exterior wall louvers and duct outlet is smaller than louver frame, provide blank-out panels sealing louver area around duct. Use same material as duct, painted black on exterior side; seal to louver frame and duct.

2.04 DUCT MANUFACTURERS
A. Metal-Fab, Inc: www.mtlfab.com.

2.05 MANUFACTURED DUCTWORK AND FITTINGS
A. Manufacture in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible, and as indicated. Provide duct material, gages, reinforcing, and sealing for operating pressures indicated.

2.06 CASINGS
A. Fabricate casings in accordance with SMACNA (DCS) and construct for operating pressures indicated.
B. Mount floor mounted casings on 4 inch high concrete curbs. At floor, rivet panels on 8 inch centers to angles. Where floors are acoustically insulated, provide liner of galvanized 18 gage, 0.0478 inch expanded metal mesh supported at 12 inch centers, turned up 12 inches at sides with sheet metal shields.
C. Mount floor mounted casings on 4 inch high concrete curbs. At floor, rivet panels on 8 inch centers to angles. Where floors are acoustically insulated, provide liner of 18 gage galvanized expanded metal mesh supported at 12 inch centers, turned up 12 inches at sides with sheet metal shields.
D. Reinforce door frames with steel angles tied to horizontal and vertical plenum supporting angles. Install hinged access doors where indicated or required for access to equipment for cleaning and inspection.
E. Fabricate acoustic casings with reinforcing turned inward. Provide 16 gage, 0.0598 inch sheet steel back facing and 22 gage, 0.0299 inch perforated sheet steel front facing with 3/32 inch diameter holes on 5/32 inch centers. Construct panels 3 inches thick packed with 4.5 lb/cu ft minimum glass fiber insulation media, on inverted channels of 16 gage, 0.0598 inch sheet steel.

PART 3 EXECUTION
3.01 INSTALLATION
A. Install, support, and seal ducts in accordance with SMACNA (DCS).
B. Install in accordance with manufacturer's instructions.
C. Duct sizes indicated are inside clear dimensions. For lined ducts, maintain sizes inside lining.
D. Install and seal metal and flexible ducts in accordance with SMACNA HVAC Duct Construction Standards - Metal and Flexible.
E. Provide openings in ductwork where required to accommodate thermometers and controllers. Provide pilot tube openings where required for testing of systems, complete with metal can with spring device or screw to ensure against air leakage. Where openings are provided in insulated ductwork, install insulation material inside a metal ring.
F. Locate ducts with sufficient space around equipment to allow normal operating and maintenance activities.
G. Use crimp joints with or without bead for joining round duct sizes 8 inch and smaller with crimp in direction of air flow.
H. Use double nuts and lock washers on threaded rod supports.
I. Connect terminal units to supply ducts directly or with one foot maximum length of flexible duct. Do not use flexible duct to change direction.
J. Connect diffusers or light troffer boots to low pressure ducts with 7 feet maximum length of flexible duct held in place with strap or clamp.
K. During construction provide temporary closures of metal or taped polyethylene on open ductwork to prevent construction dust from entering ductwork system.
L. At exterior wall louvers, seal duct to louver frame and install blank-out panels.

3.02 CLEANING
A. Clean duct system and force air at high velocity through duct to remove accumulated dust. To obtain sufficient air, clean half the system at a time. Protect equipment that could be harmed by excessive dirt with temporary filters, or bypass during cleaning.

END OF SECTION
SECTION 23 3300
AIR DUCT ACCESSORIES

PART 1  GENERAL
1.01  SECTION INCLUDES
   A. Air turning devices/extractors.
   B. Backdraft dampers - metal.
   C. Backdraft dampers - fabric.
   D. Backdraft dampers.
   E. Combination fire and smoke dampers.
   F. Duct access doors.
   G. Duct test holes.
   H. Fire dampers.
   I. Flexible duct connections.
   J. Smoke dampers.
   K. Volume control dampers.

1.02  REFERENCE STANDARDS
   C. SMACNA (DCS) - HVAC Duct Construction Standards Metal and Flexible; 2005.
   D. UL 33 - Safety Heat Responsive Links for Fire-Protection Service; Current Edition, Including All Revisions.

1.03  SUBMITTALS
   A. Product Data: Provide for shop fabricated assemblies including volume control dampers, duct access doors, and hardware used. Include electrical characteristics and connection requirements.
   B. Manufacturer's Installation Instructions: Provide instructions for fire dampers and combination fire and smoke dampers.

1.04  QUALITY ASSURANCE
   A. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

1.05  DELIVERY, STORAGE, AND HANDLING
   A. Protect dampers from damage to operating linkages and blades.

PART 2  PRODUCTS
2.01  AIR TURNING DEVICES/EXTRACTORS
   A. Manufacturers:
   B. Multi-blade device with radius blades attached to pivoting frame and bracket, steel construction, with worm drive mechanism with removable key operator.
2.02 BACKDRAFT DAMPERS - METAL

2.03 BACKDRAFT DAMPERS

A. Manufacturers:

B. Gravity Backdraft Dampers, Size 18 by 18 inches or Smaller, Furnished with Air Moving Equipment: Air moving equipment manufacturer's standard construction.

2.04 BACKDRAFT DAMPERS - FABRIC

A. Fabric Backdraft Dampers: Factory-fabricated.
2. Birdscreen: 1/2 inch nominal mesh of galvanized steel or aluminum.
3. Maximum Velocity: 1000 fpm (5 m/sec) face velocity.

2.05 COMBINATION FIRE AND SMOKE DAMPERS

A. Manufacturers:

B. Fabricate in accordance with NFPA 90A, UL 555, UL 555S, and as indicated.

C. Provide factory sleeve and collar for each damper.

D. Operators: UL listed and labelled spring return electric type suitable for 120 volts, single phase, 60 Hz. Provide end switches to indicate damper position. Locate damper operator on interior of duct and link to damper operating shaft.

2.06 DUCT ACCESS DOORS

A. Manufacturers:
4. Substitutions: See Section 01 6000 - Product Requirements.

B. Fabricate in accordance with SMACNA (DCS) and as indicated.

2.07 DUCT TEST HOLES

A. Temporary Test Holes: Cut or drill in ducts as required. Cap with neat patches, neoprene plugs, threaded plugs, or threaded or twist-on metal caps.

2.08 FIRE DAMPERS

A. Manufacturers:

B. Fabricate in accordance with NFPA 90A and UL 555, and as indicated.

C. Ceiling Dampers: Galvanized steel, 22 gage frame and 16 gage flap, two layers 0.125 inch ceramic fiber on top side and one layer on bottom side for round flaps, with locking clip.

D. Horizontal Dampers: Galvanized steel, 22 gage frame, stainless steel closure spring, and lightweight, heat retardant non-asbestos fabric blanket.

E. Fusible Links: UL 33, separate at 160 degrees F with adjustable link straps for combination fire/balancing dampers.

2.09 FLEXIBLE DUCT CONNECTIONS

A. Fabricate in accordance with SMACNA (DCS) and as indicated.

B. Flexible Duct Connections: Fabric crimped into metal edging strip.
2.10 SMOKE DAMPERS

A. Manufacturers:

B. Fabricate in accordance with NFPA 90A and UL 555S, and as indicated.

2.11 VOLUME CONTROL DAMPERS

A. Manufacturers:

B. Fabricate in accordance with SMACNA (DCS) and as indicated.

C. Single Blade Dampers: Fabricate for duct sizes up to 6 x 30 inch.

D. Quadrants:
   1. Provide locking, indicating quadrant regulators on single and multi-blade dampers.
   2. On insulated ducts mount quadrant regulators on stand-off mounting brackets, bases, or adapters.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install accessories in accordance with manufacturer's instructions, NFPA 90A, and follow SMACNA (DCS). Refer to Section 23 3100 for duct construction and pressure class.

B. Provide backdraft dampers on exhaust fans or exhaust ducts nearest to outside and where indicated.

C. Provide duct access doors for inspection and cleaning before and after filters, coils, fans, automatic dampers, at fire dampers, combination fire and smoke dampers, and elsewhere as indicated. Provide minimum 8 x 8 inch size for hand access, 18 x 18 inch size for shoulder access, and as indicated. Provide 4 x 4 inch for balancing dampers only. Review locations prior to fabrication.

D. Provide duct test holes where indicated and required for testing and balancing purposes.

E. Provide fire dampers, combination fire and smoke dampers, and smoke dampers at locations indicated, where ducts and outlets pass through fire rated components, and where required by Authorities Having Jurisdiction. Install with required perimeter mounting angles, sleeves, breakaway duct connections, corrosion resistant springs, bearings, bushings and hinges.

F. Install smoke dampers and combination smoke and fire dampers in accordance with NFPA 92.

G. Demonstrate re-setting of fire dampers to Owner's representative.

H. At fans and motorized equipment associated with ducts, provide flexible duct connections immediately adjacent to the equipment.

I. At equipment supported by vibration isolators, provide flexible duct connections immediately adjacent to the equipment.

J. Provide balancing dampers on duct take-off to diffusers, grilles, and registers, regardless of whether dampers are specified as part of the diffuser, grille, or register assembly.

END OF SECTION
SECTION 23 3423
POWER VENTILATORS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Roof exhausters.
B. Ceiling exhaust fans.

1.02 REFERENCE STANDARDS
C. AMCA 204 - Balance Quality and Vibration Levels for Fans; 2005.
F. AMCA 301 - Methods for Calculating Fan Sound Ratings from Laboratory Test Data; 2014.
I. UL 762 - Outline of Investigation for Power Roof Ventilators for Restaurant Exhaust Appliances; Current Edition, Including All Revisions.

1.03 SUBMITTALS
A. Product Data: Provide data on fans and accessories including fan curves with specified operating point clearly plotted, power, RPM, sound power levels at rated capacity, and electrical characteristics and connection requirements.
B. Manufacturer's Instructions: Indicate installation instructions.

1.04 FIELD CONDITIONS
A. Permanent ventilators may not be used for ventilation during construction.

PART 2 PRODUCTS

2.01 MANUFACTURERS

2.02 POWER VENTILATORS - GENERAL
A. Static and Dynamically Balanced: AMCA 204 - Balance Quality and Vibration Levels for Fans.
B. Performance Ratings: Determined in accordance with AMCA 210 and bearing the AMCA Certified Rating Seal.
C. Sound Ratings: AMCA 301, tested to AMCA 300 and bearing AMCA Certified Sound Rating Seal.
D. Fabrication: Conform to AMCA 99.
E. UL Compliance: UL listed and labeled, designed, manufactured, and tested in accordance with UL 705.
F. Electrical Components: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.
G. Kitchen Hood Exhaust Fans: Comply with requirements of NFPA 96 and UL 762.
2.03 ROOF EXHAUSTERS
   A. Fan Unit: V-belt or direct driven as indicated, with spun aluminum housing; resilient mounted motor; 1/2 inch mesh, 0.62 inch thick aluminum wire birdscreen; square base to suit roof curb with continuous curb gaskets.
   B. Roof Curb: 8 inch high self-flashing of galvanized steel with continuously welded seams, built-in cant strips.
   C. Disconnect Switch: Factory wired, non-fusible, in housing for thermal overload protected motor and wall mounted multiple speed switch.
   D. Backdraft Damper: Gravity actuated, aluminum multiple blade construction, felt edged with offset hinge pin, nylon bearings, blades linked, and line voltage motor drive, power open, spring return.
   E. Sheaves: Cast iron or steel, dynamically balanced, bored to fit shafts and keyed; variable and adjustable pitch motor sheave selected so required rpm is obtained with sheaves set at mid-position; fan shaft with self-aligning pre-lubricated ball bearings.

2.04 CABINET AND CEILING EXHAUST FANS
   A. Centrifugal Fan Unit: V-belt or direct driven with galvanized steel housing lined with acoustic insulation, resilient mounted motor, gravity backdraft damper in discharge.
   B. Grille: Molded white plastic.
   C. Sheaves: Cast iron or steel, dynamically balanced, bored to fit shafts and keyed; variable and adjustable pitch motor sheaves selected so required rpm is obtained with sheaves set at mid-position; fan shaft with self-aligning pre-lubricated ball bearings.

PART 3 EXECUTION
3.01 INSTALLATION
   A. Install in accordance with manufacturer's instructions.
   B. Secure roof exhausters with cadmium plated steel lag screws to roof curb.
   C. Extend ducts to roof exhausters into roof curb. Counterflash duct to roof opening.
   D. Hung Cabinet Fans:
      1. Install flexible connections specified in Section 23 3300 between fan and ductwork. Ensure metal bands of connectors are parallel with minimum one inch flex between ductwork and fan while running.
   E. Provide sheaves required for final air balance.
   F. Install backdraft dampers on inlet to roof and wall exhausters.
   G. Provide backdraft dampers on outlet from cabinet and ceiling exhauster fans and as indicated.

3.02 SCHEDULES SHOWN ON SHEET M-0.1

END OF SECTION
SECTION 23 3700
AIR OUTLETS AND INLETS

PART 1 GENERAL

1.01 SECTION INCLUDES
A. Diffusers.
B. Registers/grilles.
C. Door grilles.
D. Louvers.
E. Goosenecks.

1.02 REFERENCE STANDARDS
D. SMACNA (DCS) - HVAC Duct Construction Standards Metal and Flexible; 2005.

1.03 SUBMITTALS
A. Product Data: Provide data for equipment required for this project. Review outlets and inlets as to size, finish, and type of mounting prior to submission. Submit schedule of outlets and inlets showing type, size, location, application, and noise level.

1.04 QUALITY ASSURANCE
A. Test and rate air outlet and inlet performance in accordance with ASHRAE Std 70.

PART 2 PRODUCTS

2.01 MANUFACTURERS

2.02 RECTANGULAR CEILING DIFFUSERS
A. Type: Square, stamped, multi-core diffuser to discharge air in 360 degree pattern with sectorizing baffles where indicated.
B. Frame: Surface mount type. In plaster ceilings, provide plaster frame and ceiling frame.
C. Fabrication: Aluminum with baked enamel off-white finish.

2.03 CEILING SUPPLY REGISTERS/GRILLES
A. Type: Streamlined and individually adjustable curved blades to discharge air along face of grille, two-way deflection.
B. Frame: 1 inch margin with countersunk screw mounting and gasket.
C. Fabrication: Aluminum extrusions with factory off-white enamel finish.
D. Damper: Integral, gang-operated, opposed blade type with removable key operator, operable from face.

2.04 CEILING EXHAUST AND RETURN REGISTERS/GRILLES
A. Type: Streamlined blades, 3/4 inch minimum depth, 3/4 inch maximum spacing, with blades set at 45 degrees, vertical face.
B. Frame: 1 inch margin with countersunk screw mounting.
C. Damper: Integral, gang-operated, opposed blade type with removable key operator, operable from face where not individually connected to exhaust fans.

2.05 DOOR GRILLES
A. Type: V-shaped louvers of 20 gage, 0.0359 inch thick steel, 1 inch deep on 1/2 inch centers.
B. Frame: 20 gage, 0.0359 inch steel with auxiliary frame to give finished appearance on both sides of door, with factory prime coat finish.

2.06 LOUVERS
A. Type: 4 inch deep with blades on 45 degree slope with center baffle and return bend, heavy channel frame, 1/2 inch square mesh screen over exhaust and 1/2 inch square mesh screen over intake.
B. Fabrication: 12 gage thick extruded aluminum, welded assembly, with factory prime coat finish color to be selected.
C. Mounting: Furnish with interior flat flange for installation.

2.07 GOOSENECKS
A. Fabricate in accordance with SMACNA (DCS) of minimum 18 gage, 0.0598 inch galvanized steel.

PART 3 EXECUTION

3.01 INSTALLATION
A. Install in accordance with manufacturer's instructions.
B. Check location of outlets and inlets and make necessary adjustments in position to conform with architectural features, symmetry, and lighting arrangement.
C. Install diffusers to ductwork with air tight connection.
D. Provide balancing dampers on duct take-off to diffusers, and grilles and registers, despite whether dampers are specified as part of the diffuser, or grille and register assembly.

3.02 SCHEDULES SHOWN ON SHEET M-0.1

END OF SECTION
DIVISION 26: ELECTRICAL

26 0500 COMMON WORK RESULTS FOR ELECTRICAL
   26 0526 GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS
   26 0529 HANGERS & SUPPORTS FOR ELECTRICAL SYSTEMS
   26 0533 RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS
   26 0553 IDENTIFICATION FOR ELECTRICAL SYSTEMS
   26 0923 LIGHTING CONTROL DEVICES

26 2000 LOW-VOLTAGE ELECTRICAL TRANSMISSION
   26 2200 DRY TYPE TRANSFORMERS
   26 2416 PANELBOARDS
   26 2726 WIRING DEVICES
   26 2816 ENCLOSED SWITCHES AND CIRCUIT BREAKERS

26 5000 LIGHTING
   26 5100 INTERIOR LIGHTING

END OF TABLE OF CONTENTS
SECTION 26 0526
GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

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

1.2 SUMMARY
A. Section includes grounding and bonding systems and equipment.

1.3 ACTION SUBMITTALS
A. Product Data: For each type of product indicated.

1.4 INFORMATIONAL SUBMITTALS
A. As-Built Data: Plans showing dimensioned as-built locations of grounding features specified in "Field Quality Control" Article, including the following:
   1. Grounding conductors.
   2. Grounding connectors.
B. Qualification Data: For testing agency and testing agency’s field supervisor.
C. Field quality-control reports.

1.5 CLOSEOUT SUBMITTALS
A. Operation and Maintenance Data: For grounding to include in emergency, operation, and maintenance manuals.

1.6 QUALITY ASSURANCE
A. Testing Agency Qualifications: Member company of NETA or an NRTL.
   1. Testing Agency’s Field Supervisor: Certified by NETA to supervise on-site testing.
B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
C. Comply with UL 467 for grounding and bonding materials and equipment.
PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis-of-Design Product: Subject to compliance with requirements, provide product by one of the following:

1. Burndy; Part of Hubbell Electrical Systems.
2. Dossert; AFL Telecommunications LLC.
3. ERICO International Corporation.
4. Fushi Copperweld Inc.
5. Galvan Industries, Inc.; Electrical Products Division, LLC.
6. Harger Lightning and Grounding.
7. ILSCO.
9. Robbins Lightning, Inc.
10. Siemens Power Transmission & Distribution, Inc.
11. Approved equal.

2.2 SYSTEM DESCRIPTION

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Comply with UL 467 for grounding and bonding materials and equipment.

C. Existing Work: Where existing grounding and bonding system components are indicated to be reused, they may be reused only where they are free from corrosion, integrity and continuity are verified, and where acceptable to the authority having jurisdiction.

2.3 CONDUCTORS

A. Insulated Conductors: Copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.

B. Bare Copper Conductors:

4. Bonding Conductor: No. 4 or No. 6 AWG, stranded conductor.
5. Bonding Jumper: Copper tape, braided conductors terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.

2.4 CONNECTORS

A. Listed and labeled by an NRTL acceptable to authorities having jurisdiction for applications in which used and for specific types, sizes, and combinations of conductors and other items connected.
PART 3 - EXECUTION

3.1 APPLICATIONS

A. Conductors: Install solid conductor for No. 10 AWG and smaller, and stranded conductors for No. 8 AWG and larger unless otherwise indicated.

B. Isolated Grounding Conductors: Green-colored insulation with continuous yellow stripe. On feeders with isolated ground, identify grounding conductor where visible to normal inspection, with alternating bands of green and yellow tape, with at least three bands of green and two bands of yellow.

C. Grounding Bus: Install in electrical equipment rooms, in rooms housing service equipment, and elsewhere as indicated.
   1. Install bus horizontally, on insulated spacers 2 inches minimum from wall, 6 inches above finished floor unless otherwise indicated.
   2. Where indicated on both sides of doorways, route bus up to top of door frame, across top of doorway, and down; connect to horizontal bus.

D. Conductor Terminations and Connections:
   1. Pipe and Equipment Grounding Conductor Terminations: Bolted connectors.
   2. Underground Connections: Welded connectors except at test wells and as otherwise indicated.
   3. Connections to Ground Rods at Test Wells: Bolted connectors.

3.2 EQUIPMENT GROUNDING

A. Install insulated equipment grounding conductors with all feeders and branch circuits.

B. Isolated Grounding Receptacle Circuits: Install an insulated equipment grounding conductor connected to the receptacle grounding terminal. Isolate conductor from raceway and from panelboard grounding terminals. Terminate at equipment grounding conductor terminal of the applicable derived system or service unless otherwise indicated.

3.3 INSTALLATION

A. Grounding Conductors: Route along shortest and straightest paths possible unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.
B. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance except where routed through short lengths of conduit.

1. Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate any adjacent parts.
2. Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install bonding so vibration is not transmitted to rigidly mounted equipment.
3. Use exothermic-welded connectors for outdoor locations; if a disconnect-type connection is required, use a bolted clamp.

C. Bonding Interior Metal Ducts: Bond metal air ducts to equipment grounding conductors of associated fans, blowers, electric heaters, and air cleaners. Install bonding jumper to bond across flexible duct connections to achieve continuity.

3.4 FIELD QUALITY CONTROL

A. Perform tests and inspections.

B. Tests and Inspections:

1. After installing grounding system but before permanent electrical circuits have been energized, test for compliance with requirements.
2. Inspect physical and mechanical condition. Verify tightness of accessible, bolted, electrical connections with a calibrated torque wrench according to manufacturer's written instructions.

C. Grounding system will be considered defective if it does not pass tests and inspections.

D. Prepare test and inspection reports.

E. Report measured ground resistances that exceed the following values:

1. Power and Lighting Equipment or System with Capacity of 500 kVA and Less: 25 ohms.

F. Excessive Ground Resistance: If resistance to ground exceeds specified values, notify Architect promptly and include recommendations to reduce ground resistance.

END OF SECTION 260526
PART 1 - GENERAL

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

1.2 SUMMARY
   A. This Section includes the following:
      1. Hangers and supports for electrical equipment and systems.

1.3 DEFINITIONS
   A. EMT: Electrical metallic tubing.
   B. IMC: Intermediate metal conduit.
   C. RMC: Rigid metal conduit.

1.4 PERFORMANCE REQUIREMENTS
   A. Design supports for multiple raceways capable of supporting combined weight of supported systems and its contents.

1.5 ACTION SUBMITTALS
   A. Product Data: For the following:
      1. Steel slotted support systems.
      2. Nonmetallic slotted support systems.
   B. Shop Drawings: Show fabrication and installation details and include calculations for the following:
      1. Trapeze hangers. Include Product Data for components.
      2. Steel slotted channel systems. Include Product Data for components.
      3. Equipment supports.

1.6 QUALITY ASSURANCE
   A. Comply with NFPA 70.
1.7 Coordination

A. Coordinate sizes and arrangement of supports and bases with the actual equipment and components to be installed.

B. Coordinate the work with other trades to provide additional framing and materials required for installation.

C. Coordinate compatibility of support and attachment components with mounting surfaces at the installed locations.

D. Coordinate the arrangement of supports with ductwork, piping, equipment and other potential conflicts installed under other sections or by others.

E. Notify Architect of any conflicts with or deviations from the contract documents. Obtain direction before proceeding with work. Coordinate size and location of concrete bases. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified together with concrete Specifications.

PART 2 - PRODUCTS

2.1 Support, Anchorage, and Attachment Components

A. Steel Slotted Support Systems: Comply with MFMA-4, factory-fabricated components for field assembly.
   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Allied Tube & Conduit.
      b. Cooper B-Line, Inc.
      c. ERICO International Corporation.
      d. GS Metals Corp.
      e. Thomas & Betts Corporation.
      f. Unistrut; Atkore International.
      g. Wesanco, Inc.
      h. Approved equal.

B. Conduit and Cable Support Devices: Steel hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.

C. Support for Conductors in Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug or plugs for non-armored electrical conductors or cables in riser conduits. Plugs shall have number, size, and shape of conductor gripping pieces as required to suit individual conductors or cables supported. Body shall be malleable iron.

D. Structural Steel for Fabricated Supports and Restraints: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.

E. Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:
1. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete, steel, or wood, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.
   a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      1) Hilti, Inc.
      2) ITW Ramset/Red Head; Illinois Tool Works, Inc.
      3) MKT Fastening, LLC.
      4) Simpson Strong-Tie Co., Inc.
      5) Approved equal.

2. Mechanical-Expansion Anchors: Insert-wedge-type, zinc-coated steel, for use in hardened portland cement concrete with tension, shear, and pullout capacities appropriate for supported loads and building materials in which used.
   a. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      1) Cooper B-Line, Inc.
      2) Empire Tool and Manufacturing Co., Inc.
      3) Hilti, Inc.
      4) ITW Ramset/Red Head; Illinois Tool Works, Inc.
      5) MKT Fastening, LLC.
      6) Approved equal.

3. Concrete Inserts: Steel or malleable-iron, slotted support system units similar to MSS Type 18; complying with MFMA-4 or MSS SP-58.

4. Clamps for Attachment to Steel Structural Elements: MSS SP-58, type suitable for attached structural element.

5. Through Bolts: Structural type, hex head, and high strength. Comply with ASTM A 325.

6. Toggle Bolts: All-steel springhead type.


PART 3 - EXECUTION

3.1 APPLICATION

A. Comply with NECA 1 and NECA 101 for application of hangers and supports for electrical equipment and systems except if requirements in this Section are stricter.

B. Maximum Support Spacing and Minimum Hanger Rod Size for Raceway: Space supports for EMT, IMC, and RMC as required by NFPA 70. Minimum rod size shall be 1/4 inch in diameter.

C. Multiple Raceways or Cables: Install trapeze-type supports fabricated with steel slotted or other support system, sized so capacity can be increased by at least 25 percent in future without exceeding specified design load limits.

1. Secure raceways and cables to these supports with two-bolt conduit clamps.

D. Spring-steel clamps designed for supporting single conduits without bolts may be used for 1-1/2-inch and smaller raceways serving branch circuits and communication systems above suspended ceilings and for fastening raceways to trapeze supports.
3.2 SUPPORT INSTALLATION

A. Comply with NECA 1 and NECA 101 for installation requirements except as specified in this Article.

B. Raceway Support Methods: In addition to methods described in NECA 1, EMT, IMC, and RMC may be supported by openings through structure members, as permitted in NFPA 70.

C. Strength of Support Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb.

D. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten electrical items and their supports to building structural elements by the following methods unless otherwise indicated by code:

1. To Wood: Fasten with lag screws or through bolts.
2. To New Concrete: Bolt to concrete inserts.
3. To Masonry: Approved toggle-type bolts on hollow masonry units and expansion anchor fasteners on solid masonry units.
4. To Existing Concrete: Expansion anchor fasteners.
5. To Steel: Welded threaded studs complying with AWS D1.1/D1.1M, with lock washers and nuts or Beam clamps (MSS Type 19, 21, 23, 25, or 27) complying with MSS SP-69.
6. To Light Steel: Sheet metal screws.
7. Items Mounted on Hollow Walls and Nonstructural Building Surfaces: Mount cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices on slotted-channel racks attached to substrate by means that meet seismic-restraint strength and anchorage requirements.

E. Drill holes for expansion anchors in concrete at locations and to depths that avoid reinforcing bars.

END OF SECTION 260529
SECTION 26 0533
RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

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

1.2 SUMMARY
A. Section Includes:
   1. Metal conduits, tubing, and fittings.
   2. Surface raceways.

1.3 DEFINITIONS
A. GRC: Galvanized rigid steel conduit.
B. IMC: Intermediate metal conduit.

1.4 ACTION SUBMITTALS
A. Product Data: For surface raceways, wireways and fittings, floor boxes, hinged-cover enclosures, and cabinets.

PART 2 - PRODUCTS

2.1 METAL CONDUITS, TUBING, AND FITTINGS
A. Manufacturers: Subject to compliance with requirements, provide products by the following:
   1. AFC Cable Systems, Inc.
   3. Anamet Electrical, Inc.
   4. Electri-Flex Company.
   5. O-Z/Gedney.
   6. Picoma Industries.
   7. Republic Conduit.
   8. Robroy Industries.
   10. Thomas & Betts Corporation.
11. Western Tube and Conduit Corporation.
13. Approved equal.

B. Listing and Labeling: Metal conduits, tubing, and fittings shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

C. GRC: Comply with ANSI C80.1 and UL 6.

D. IMC: Comply with ANSI C80.6 and UL 1242.

E. EMT: Comply with ANSI C80.3 and UL 797.

F. Fittings for Metal Conduit: Comply with NEMA FB 1 and UL 514B.
   1. Fittings for EMT:
      a. Material: Steel.
      b. Type: compression.

2. Expansion Fittings: PVC or steel to match conduit type, complying with UL 651, rated for environmental conditions where installed, and including flexible external bonding jumper.

2.2 BOXES, ENCLOSURES, AND CABINETS

A. Manufacturers: Subject to compliance with requirements, provide products by the following:

   1. Adalet.
   2. Cooper Technologies Company; Cooper Crouse-Hinds.
   3. EGS/Appleton Electric.
   5. FSR Inc.
   8. Kraloy.
   10. Mono-Systems, Inc.
   12. RACO; Hubbell.
   13. Robroy Industries.
   14. Spring City Electrical Manufacturing Company.
   15. Stahlin Non-Metallic Enclosures.
   17. Wiremold / Legrand.
   18. Approved equal.

B. General Requirements for Boxes, Enclosures, and Cabinets: Boxes, enclosures, and cabinets installed in wet locations shall be listed for use in wet locations.

C. Sheet Metal Outlet and Device Boxes: Comply with NEMA OS 1 and UL 514A.

D. Cast-Metal Outlet and Device Boxes: Comply with NEMA FB 1, Type FD, with gasketed cover.

E. Nonmetallic Outlet and Device Boxes: Comply with NEMA OS 2 and UL 514C.
F. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.

G. Cast-Metal Access, Pull, and Junction Boxes: Comply with NEMA FB 1 and UL 1773, galvanized, cast iron with gasketed cover.

H. Box extensions used to accommodate new building finishes shall be of same material as recessed box.

I. Device Box Dimensions: 4 inches square by 2-1/8 inches deep or 4 inches by 2-1/8 inches by 2-1/8 inches deep.

J. Hinged-Cover Enclosures: Comply with UL 50 and NEMA 250, type listed for location being used with continuous-hinge cover with flush latch unless otherwise indicated.

1. Metal Enclosures: Steel, finished inside and out with manufacturer's standard enamel.
2. Interior Panels: Steel; all sides finished with manufacturer's standard enamel.

K. Cabinets:

1. NEMA 250, type listed for location being used galvanized-steel box with removable interior panel and removable front, finished inside and out with manufacturer's standard enamel.
2. Hinged door in front cover with flush latch and concealed hinge.
3. Key latch to match panelboards.
4. Metal barriers to separate wiring of different systems and voltage.
5. Accessory feet where required for freestanding equipment.
6. Nonmetallic cabinets shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

PART 3 - EXECUTION

3.1 RACEWAY APPLICATION

A. Indoors: Apply raceway products as specified below unless otherwise indicated:

1. Exposed, Not Subject to Physical Damage: EMT.
2. Exposed, Not Subject to Severe Physical Damage: EMT.
3. Exposed and Subject to Severe Physical Damage: GRC.
4. Concealed in Ceilings and Interior Walls and Partitions: EMT.
5. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): FMC, except use LFMC in damp or wet locations.
6. Damp or Wet Locations: GRC.
7. Boxes and Enclosures: NEMA 250, Type 1, except use NEMA 250, Type 4 stainless steel in institutional and commercial kitchens, NEMA-3R enclosures acceptable in damp or wet locations.

B. Minimum Raceway Size: 3/4-inch trade size.

C. Raceway Fittings: Compatible with raceways and suitable for use and location.

1. Rigid and Intermediate Steel Conduit: Use threaded rigid steel conduit fittings unless otherwise indicated. Comply with NEMA FB 2.10.
2. PVC Externally Coated, Rigid Steel Conduits: Use only fittings listed for use with this type of conduit. Patch and seal all joints, nicks, and scrapes in PVC coating after installing conduits and
fittings. Use sealant recommended by fitting manufacturer and apply in thickness and number of coats recommended by manufacturer.

4. Flexible Conduit: Use only fittings listed for use with flexible conduit. Comply with NEMA FB 2.20.

D. Do not install aluminum conduits, boxes, or fittings in contact with concrete or earth.

3.2 INSTALLATION

A. Comply with NECA 1 and NECA 101 for installation requirements except where requirements on Drawings or in this article are stricter. Comply with NECA 102 for aluminum conduits. Comply with NFPA 70 limitations for types of raceways allowed in specific occupancies and number of floors.

B. Keep raceways at least 6 inches away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.

C. Complete raceway installation before starting conductor installation.

D. Comply with requirements in Section 260529 "Hangers and Supports for Electrical Systems" for hangers and supports.

E. Arrange stub-ups so curved portions of bends are not visible above finished slab.

F. Install no more than the equivalent of three 90-degree bends in any conduit run except for control wiring conduits, for which fewer bends are allowed. Support within 12 inches of changes in direction.

G. Conceal conduit and EMT within finished walls, ceilings, and floors unless otherwise indicated. Install conduits parallel or perpendicular to building lines.

H. Support conduit within 12 inches of enclosures to which attached.

I. Raceways Embedded in Slabs:
   1. Run conduit larger than 1-inch trade size, parallel or at right angles to main reinforcement. Where at right angles to reinforcement, place conduit close to slab support. Secure raceways to reinforcement at maximum 10-foot intervals.
   2. Arrange raceways to cross building expansion joints at right angles with expansion fittings.
   3. Arrange raceways to keep a minimum of 2 inches of concrete cover in all directions.
   4. Do not embed threadless fittings in concrete unless specifically approved by Architect for each specific location.

J. Stub-ups to Above Recessed Ceilings:
   1. Use EMT, IMC, or RMC for raceways.
   2. Use a conduit bushing or insulated fitting to terminate stub-ups not terminated in hubs or in an enclosure.

K. Raceway Terminations at Locations Subject to Moisture or Vibration: Use insulating bushings to protect conductors including conductors smaller than No. 4 AWG.

L. Terminate threaded conduits into threaded hubs or with locknuts on inside and outside of boxes or cabinets. Install bushings on conduits up to 1-1/4-inch trade size and insulated throat metal bushings on
1-1/2-inch trade size and larger conduits terminated with locknuts. Install insulated throat metal grounding bushings on service conduits.

M. Install raceways square to the enclosure and terminate at enclosures with locknuts. Install locknuts hand tight plus 1/4 turn more.

N. Do not rely on locknuts to penetrate nonconductive coatings on enclosures. Remove coatings in the locknut area prior to assembling conduit to enclosure to assure a continuous ground path.

O. Cut conduit perpendicular to the length. For conduits 2-inch trade size and larger, use roll cutter or a guide to make cut straight and perpendicular to the length.

P. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb tensile strength. Leave at least 12 inches of slack at each end of pull wire. Cap underground raceways designated as spare above grade alongside raceways in use.

Q. Install raceway sealing fittings at accessible locations according to NFPA 70 and fill them with listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings according to NFPA 70.

R. Flexible Conduit Connections: Comply with NEMA RV 3. Use a maximum of 72 inches of flexible conduit for recessed and semi recessed luminaires, equipment subject to vibration, noise transmission, or movement; and for transformers and motors.

1. Use LFMC in damp or wet locations subject to severe physical damage.
2. Use LFMC or LFNC in damp or wet locations not subject to severe physical damage.

S. Mount boxes at heights indicated on Drawings. If mounting heights of boxes are not individually indicated, give priority to ADA requirements. Install boxes with height measured to top of box unless otherwise indicated.

T. Recessed Boxes in Masonry Walls: Saw-cut opening for box in center of cell of masonry block, and install box flush with surface of wall. Prepare block surfaces to provide a flat surface for a rain tight connection between box and cover plate or supported equipment and box. Any alteration or cutting of masonry wall shall be performed by Masonry Contractor.

U. Horizontally separate boxes mounted on opposite sides of walls so they are not in the same vertical channel.

V. Locate boxes so that cover or plate will not span different building finishes.

W. Support boxes of three gangs or more from more than one side by spanning two framing members or mounting on brackets specifically designed for the purpose.

X. Fasten junction and pull boxes to or support from building structure. Do not support boxes by conduits.

3.3 INSTALLATION OF UNDERGROUND CONDUIT

A. Install top of duct bank minimum 24 inches (600mm) below finished grade. Adjust depth to avoid interference with gravity flow systems of any kind. Maintain minimum 12 inches (300mm) clearance between duct bank and any gravity flow system.

B. Duct lines shall have a continuous slope downward toward manholes and away from buildings with a pitch of not less than 4 inches (100mm) in 100 feet (300m). Changes in direction of runs exceeding a
total of 10 degrees, either vertical or horizontal, shall be accomplished by long sweep bends having a minimum radius of curvature of 25 feet (50m), except that manufactured bends may be used at ends of short runs of 100 feet (300mm) or less, and then only at or close to the end of run.

C. Terminate conduit in end bell at manhole and pullbox entries.

D. Use suitable separators and chairs installed not greater than 4 feet (25m) on centers. Band conduit together with suitable banding devices. Securely anchor conduit to prevent movement during concrete placement.

E. Provide minimum 3 inches (75mm) concrete cover at bottom, top, and sides of duct bank. Concrete strength shall be a minimum of 2,500 psi.

F. Provide two No. 4 steel reinforcing bars in top of bank under paved driving areas.

G. Encase non-metallic primary and secondary feeders, telephone, fire alarm communications and data conduit installed underground 2 inches (50-mm) or larger in a concrete duct bank unless noted otherwise in the Contract Documents. Space the external surfaces of conduit within a bank a minimum of 3 inches (75-mm) apart except that sound, telephone, data and intercommunication circuits contained within non-metallic conduit shall have a minimum separation of 12 inches (300-mm) from any light or power circuits that parallel them within a bank. Use appropriate manufactured plastic spacers to insure the minimum required concrete or slurry coverage. All concrete or slurry duct conduit banks shall contain a warning tape 12 inches (300-mm) above ductbank.

H. Numbers and sizes of ducts shall be as indicated. Depending on the contour of the finished grade, the high-point may be at a terminal, a manhole, a handhole, or between manholes or handholes. Manufactured steel 90-degree duct bends shall be used only for pole or equipment risers, unless specifically indicated as acceptable. The minimum manufactured bend radius shall be 18 inches (450-mm) for ducts of less than 3-inch (75-mm) diameter, and 36 inches (900-mm) for ducts 3 inches (75mm) in diameter 48 inches (1.2-m) for ducts or greater in diameter unless noted otherwise in the Contract Documents. Long sweep bends having a minimum radius of 25 feet (75-m) shall be used for a change of direction of more than 5 degrees, horizontally or vertically. Both curved and straight sections shall be used to form long sweep bends as required, but the maximum curve used shall be 30 degrees and manufactured bends shall be used. Ducts shall be provided with end bells whenever duct lines terminate in manholes, pullboxes or handholes. Duct line markers shall be provided at the ends of long duct line stubouts or for other ducts whose locations are indeterminate because of duct curvature or terminations at completely below-grade structures. In lieu of markers, a 5-mil brightly colored plastic tape not less than 3 inches (75-mm) in width and suitably inscribed at not more than 10 feet on centers with a continuous metallic backing and a corrosion resistant 1-mil metallic foil core to permit easy location of the duct line, shall be placed approximately 12 inches (300mm) below finished grade levels of such lines.

I. Ducts shall be kept clean of concrete, dirt or foreign substances during construction. Field cuts requiring tapers shall be made with proper tools and match factory tapers. After a duct line is completed, a standard flexible mandrel shall be used for cleaning followed by a brush with stiff bristles. Mandrels shall be at least 12 inches (300-mm) long and have diameters 1/4 inch (6.2-mm) less than the inside diameter of the duct being cleaned. Pneumatic rodding may be used to draw in lead wires. A coupling recommended by the duct manufacturer shall be used whenever an existing duct is connected to a duct of different material or shape. Ducts shall be stored to avoid warping and deterioration with ends sufficiently plugged to prevent entry of any water or solid substances. Ducts shall be thoroughly cleaned before being laid. Plastic ducts shall be stored on a flat surface and protected from the direct rays of the sun.

3.4 FIRESTOPPING

A. Install firestopping at penetrations of fire-rated floor and wall assemblies.
3.5 PROTECTION

A. Protect coatings, finishes, and cabinets from damage and deterioration.

1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
2. Repair damage to PVC coatings or paint finishes with matching touchup coating recommended by manufacturer.

END OF SECTION 260533
SECTION 26 0553
IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:
   1. Identification for conductors.
   2. Equipment identification labels.

1.3 ACTION SUBMITTALS

A. Product Data: For each electrical identification product indicated.

1.4 COORDINATION

A. Coordinate identification names, abbreviations, colors, and other features with requirements in other Sections requiring identification applications, Drawings, Shop Drawings, manufacturer’s wiring diagrams, and the Operation and Maintenance Manual; and with those required by codes, standards, and 29 CFR 1910.145. Use consistent designations throughout Project.

B. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be applied.

C. Coordinate installation of identifying devices with location of access panels and doors.

D. Install identifying devices before installing acoustical ceilings and similar concealment.

PART 2 - PRODUCTS

2.1 CONDUCTOR IDENTIFICATION MATERIALS

A. Color-Coding Conductor Tape: Colored, self-adhesive vinyl tape not less than 3 mils thick by 1 to 2 inches wide.
2.2 EQUIPMENT IDENTIFICATION LABELS

A. Self-Adhesive, Engraved, Laminated Acrylic or Melamine Label: Adhesive backed, with white letters on a dark-gray background. Minimum letter height shall be 3/8 inch.


PART 3 - EXECUTION

3.1 INSTALLATION

A. Verify identity of each item before installing identification products.

B. Self-Adhesive Identification Products: Clean surfaces before application, using materials and methods recommended by manufacturer of identification device.

C. System Identification Color-Coding Bands for Raceways and Cables: Each color-coding band shall completely encircle cable or conduit. Place adjacent bands of two-color markings in contact, side by side. Locate bands at changes in direction, at penetrations of walls and floors, at 50-foot maximum intervals in straight runs, and at 25-foot maximum intervals in congested areas.

3.2 IDENTIFICATION SCHEDULE

A. Accessible Raceways and Metal-Clad Cables, 600 V or Less, for Service, Feeder, and Branch Circuits More Than 30 A, and 120 V to ground: Identify with self-adhesive vinyl tape applied in bands. Install labels at 30-foot maximum intervals.

B. Accessible Raceways and Cables within Buildings: Identify the covers of each junction and pull box of the following systems with self-adhesive vinyl labels with the wiring system legend and system voltage. System legends shall be as follows:

2. Power.
3. UPS.

C. Power-Circuit Conductor Identification, 600 V or Less: For conductors in vaults, pull and junction boxes, manholes, and handholes, use color-coding conductor tape to identify the phase.

1. Color-Coding for Phase and Voltage Level Identification, 600 V or Less: Use colors listed below for ungrounded feeder conductors.

   a. Color shall be factory applied or field applied for sizes larger than No. 8 AWG, if authorities having jurisdiction permit.

   b. Colors for 208/120-V Circuits:

      1) Phase A: Black.
      2) Phase B: Red.
      3) Phase C: Blue.

   c. Colors for 480/277-V Circuits:
IDENTIFICATION FOR ELECTRICAL SYSTEMS

1) Phase A: Brown.
2) Phase B: Orange.
3) Phase C: Yellow.

d. Field-Applied, Color-Coding Conductor Tape: Apply in half-lapped turns for a minimum distance of 6 inches from terminal points and in boxes where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding. Locate bands to avoid obscuring factory cable markings.


1. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, and pull points. Identify by system and circuit designation.
2. Use system of marker tape designations that is uniform and consistent with system used by manufacturer for factory-installed connections.

E. Equipment Identification Labels: On each unit of equipment, install unique designation label that is consistent with wiring diagrams, schedules, and the Operation and Maintenance Manual. Apply labels to disconnect switches and protection equipment, central or master units, control panels, control stations, terminal cabinets, and racks of each system. Systems include power, lighting, control, communication, signal, monitoring, and alarm systems unless equipment is provided with its own identification.

1. Labeling Instructions:
   a. Indoor Equipment: Self-adhesive, engraved, laminated acrylic or melamine label. Unless otherwise indicated, provide a single line of text with 1/2-inch-high letters on 1-1/2-inch-high label; where two lines of text are required, use labels 2 inches high.
   b. Elevated Components: Increase sizes of labels and letters to those appropriate for viewing from the floor.
   c. Unless provided with self-adhesive means of attachment, fasten labels with appropriate mechanical fasteners that do not change the NEMA or NRTL rating of the enclosure.

2. Equipment to Be Labeled:
   a. Panelboards: Typewritten directory of circuits in the location provided by panelboard manufacturer. Panelboard identification shall be self-adhesive, engraved, laminated acrylic or melamine label.
   b. Enclosures and electrical cabinets.
   c. Access doors and panels for concealed electrical items.
   d. Transformers: Label that includes tag designation shown on Drawings for the transformer, feeder, and panelboards or equipment supplied by the secondary.
   e. Emergency system boxes and enclosures.
   f. Enclosed switches.
   g. Enclosed controllers.
   h. Variable-speed controllers.
   i. Power transfer equipment.
   j. Remote-controlled switches, dimmer modules, and control devices.
   k. Monitoring and control equipment.
   l. UPS equipment.

END OF SECTION 260553
SECTION 26 0923
LIGHTING CONTROL DEVICES

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. Indoor occupancy sensors.

B. Related Requirements:

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.1 INDOOR OCCUPANCY SENSORS

A. Manufacturers: Subject to compliance with requirements, provide products by the following:
   1. Wattstopper.
   2. Hubbell Building Automation, Inc.
   3. Leviton Manufacturing Co., Inc.
   4. Sensor Switch, Inc.
   5. Approved equal.

B. General Requirements for Sensors: Wall- or ceiling-mounted, solid-state indoor occupancy sensors with a separate power pack.
   1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
   2. Operation: Unless otherwise indicated, turn lights on when coverage area is occupied, and turn them off when unoccupied; with a time delay for turning lights off, adjustable over a minimum range of 1 to 15 minutes.
   3. Sensor Output: Contacts rated to operate the connected relay, complying with UL 773A. Sensor is powered from the power pack.
4. Power Pack: Dry contacts rated for 20-A ballast load at 120- and 277-V ac, for 13-A tungsten at 120-V ac, and for 1 hp at 120-V ac. Sensor has 24-V dc, 150-mA, Class 2 power source, as defined by NFPA 70.

5. Mounting:
   a. Sensor: Suitable for mounting in any position on a standard outlet box.
   b. Relay: Externally mounted through a 1/2-inch knockout in a standard electrical enclosure.
   c. Time-Delay and Sensitivity Adjustments: Recessed and concealed behind hinged door.

6. Indicator: Digital display, to show when motion is detected during testing and normal operation of sensor.

7. Bypass Switch: Override the "on" function in case of sensor failure.

8. Automatic Light-Level Sensor: Adjustable from 2 to 200 fc; turn lights off when selected lighting level is present.

C. Dual-Technology Type: Ceiling mounted; detect occupants in coverage area using PIR and ultrasonic detection methods. The particular technology or combination of technologies that control on-off functions is selectable in the field by operating controls on unit.

   1. Sensitivity Adjustment: Separate for each sensing technology.
   2. Detector Sensitivity: Detect occurrences of 6-inch- minimum movement of any portion of a human body that presents a target of not less than 36 sq. in., and detect a person of average size and weight moving not less than 12 inches in either a horizontal or a vertical manner at an approximate speed of 12 inches/s.
   3. Detection Coverage (Standard Room): Detect occupancy anywhere within a circular area of 1000 sq. ft. when mounted on a 96-inch- high ceiling.

2.2 SWITCHBOX-MOUNTED OCCUPANCY SENSORS

A. Manufacturers: Subject to compliance with requirements, provide products by the following:
   1. Cooper Industries, Inc.
   2. Hubbell Building Automation, Inc.
   3. Leviton Manufacturing Co., Inc.
   4. Sensor Switch, Inc.
   5. Approved equal.

B. General Requirements for Sensors: Automatic-wall-switch occupancy sensor, suitable for mounting in a single gang switchbox.

   1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application, and shall comply with California Title 24.
   2. Operating Ambient Conditions: Dry interior conditions, 32 to 120 deg F.
   3. Switch Rating: Not less than 800-VA fluorescent at 120 V, 1200-VA fluorescent at 277 V, and 800-W incandescent.

C. Wall-Switch Sensor:

   1. Standard Range: 180-degree field of view, field adjustable from 180 to 40 degrees; with a minimum coverage area of 900 sq. ft.
   2. Sensing Technology: Dual technology - PIR and ultrasonic.
   3. Voltage: Dual voltage, 120 and 277 V; dual-technology type.
   4. Concealed, field-adjustable, "off" time-delay selector at up to 30 minutes.
   5. Adaptive Technology: Self-adjusting circuitry detects and memorizes usage patterns of the space and helps eliminate false "off" switching.
PART 3 - EXECUTION

3.1 SENSOR INSTALLATION

A. Coordinate layout and installation of ceiling-mounted devices with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, smoke detectors, fire-suppression systems, and partition assemblies.

B. Install and aim sensors in locations to achieve not less than 90 percent coverage of areas indicated. Do not exceed coverage limits specified in manufacturer’s written instructions.

3.2 FIELD QUALITY CONTROL

A. Perform the following tests and inspections:

1. Operational Test: After installing time switches and sensors, and after electrical circuitry has been energized, start units to confirm proper unit operation.
2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

B. Lighting control devices will be considered defective if they do not pass tests and inspections.

END OF SECTION 260923
SECTION 26 2200
DRY TYPE TRANSFORMERS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. General purpose transformers.

1.02 REFERENCE STANDARDS

A. IEEE C57.94 - Recommended Practice for Installation, Application, Operation, and Maintenance of Dry-Type General Purpose Distribution and Power Transformers; Institute of Electrical and Electronic Engineers; 1982 (R2006).
B. IEEE C57.96 - Guide for Loading Dry-Type Distribution and Power Transformers; Institute of Electrical and Electronic Engineers; 1999 (R2004).
C. NECA 1 - Standard for Good Workmanship in Electrical Construction; National Electrical Contractors Association; 2010.
D. NECA 409 - Standard for Installing and Maintaining Dry-Type Transformers; National Electrical Contractors Association; 2009.
E. NEMA ST 20 - Dry-Type Transformers for General Applications; National Electrical Manufacturers Association; 2014.
F. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum); National Electrical Manufacturers Association; 2014
K. NFPA 70 - National Electrical Code; National Fire Protection Association; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
M. UL 1561 - Standard for Dry-Type General Purpose and Power Transformers; Current Edition, Including All Revisions.

1.02 ADMINISTRATIVE REQUIREMENTS

A. Coordination: Coordinate the work with placement of support framing and anchors required for mounting of transformers.
1.04 SUBMITTALS

A. Product Data: Include voltage, kVA, impedance, tap configurations, insulation system class and rated
   temperature rise, efficiency, sound level, enclosure ratings, outline and support point dimensions,
   weight, required clearances, service condition requirements, and installed features.

1.05 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Store in a clean, dry space. Maintain factory wrapping or provide an additional heavy canvas or heavy
   plastic cover to protect units from dirt, water, construction debris, and traffic.
B. Handle in accordance with manufacturer's written instructions. Lift only with lugs provided for the
   purpose. Handle carefully to avoid damage to transformer internal components, enclosure, and finish.

1.07 FIELD CONDITIONS

PART 2 PRODUCTS

2.01 MANUFACTURERS

C. Schneider Electric; Square D Products: www.schneider-electric.us.
D. Source Limitations: Furnish transformers produced by the same manufacturer as the other electrical
   distribution equipment used for this project and obtained from a single supplier.

2.02 TRANSFORMERS - GENERAL REQUIREMENTS

A. Description: Factory-assembled, dry type transformers for 60 Hz operation designed and manufactured
   in accordance with NEMA ST 20 and listed, classified, and labeled as suitable for the purpose intended.
B. Unless noted otherwise, transformer ratings indicated are for continuous loading according to IEEE
   C57.96 under the following service conditions:
   1. Altitude: Less than 6,600 feet.
   2. Ambient Temperature:
      a. Greater than 10 kVA: Not exceeding 104 degrees F.
      b. Less than 10 kVA: Not exceeding 77 degrees F.
C. Core: High grade, non-aging silicon steel with high magnetic permeability and low hysteresis and eddy
   current losses. Keep magnetic flux densities substantially below saturation point, even at 10 percent
   primary overvoltage. Tightly clamp core laminations to prevent plate movement and maintain consistent
   pressure throughout core length.
D. Impregnate core and coil assembly with non-hydroscopic thermo-setting varnish to effectively seal out
   moisture and other contaminants.
E. Basic Impulse Level: 10 kV.
F. Ground core and coil assembly to enclosure by means of a visible flexible copper grounding strap.
G. Isolate core and coil from enclosure using vibration-absorbing mounts.
H. Nameplate: Include transformer connection data, ratings, wiring diagrams, and overload capacity based on rated winding temperature rise.

2.03 GENERAL PURPOSE TRANSFORMERS

A. Description: Self-cooled, two winding transformers listed and labeled as complying with UL 506 or UL 1561; ratings as indicated on the drawings.
B. Insulation System and Allowable Average Winding Temperature Rise:
   1. Less than 15 kVA: Class 180 degrees C insulation system with 115 degrees C average winding temperature rise.
   2. 15 kVA and Larger: Class 220 degrees C insulation system with 150 degrees C average winding temperature rise.
C. Coil Conductors: Continuous copper windings with terminations brazed or welded.
D. Winding Taps:
   1. Less than 3 kVA: None.
   2. 3 kVA through 15 kVA: Two 5 percent full capacity primary taps below rated voltage.
   3. 15 kVA through 300 kVA: Two 2.5 percent full capacity primary taps above and four 2.5 percent full capacity primary taps below rated voltage.
   4. 500 kVA and Larger: Two 2.5 percent full capacity primary taps above and two 2.5 percent full capacity primary taps below rated voltage.
   1. Test efficiency according to NEMA TP 2.
   2. Label transformer according to NEMA TP 3.
G. Sound Levels: Standard sound levels complying with NEMA ST 20.
H. Mounting Provisions:
   1. Less than 15 kVA: Suitable for wall mounting.
   2. 15 kVA through 75 kVA: Suitable for wall, floor, or trapeze mounting.
   3. Larger than 75 kVA: Suitable for floor mounting.
I. Transformer Enclosure: Comply with NEMA ST 20.
   1. Environment Type per NEMA 250: Unless otherwise indicated, as specified for the following installation locations:
      a. Indoor clean, dry locations: Type 2.
      b. Outdoor locations: Type 3R.
   2. Construction: Steel.
      a. Less than 15 kVA: Totally enclosed, non-ventilated.
      b. 15 kVA and Larger: Ventilated.
   3. Finish: Manufacturer's standard grey, suitable for outdoor installations.
   4. Provide lifting eyes or brackets.
J. Accessories:
   1. Mounting Brackets: Provide manufacturer's standard brackets.
   2. Weathershield Kits: Provide for ventilated transformers installed outdoors to provide a listed stainless steel weatherproof assembly.
   3. Lug Kits: Sized as required for termination of conductors as indicated on the drawings.
2.04 SOURCE QUALITY CONTROL

A. Factory test transformers according to NEMA ST 20.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field measurements are as shown on the drawings.
B. Verify that suitable support frames and anchors are installed where required and that mounting surfaces are ready to receive transformers.
C. Perform pre-installation tests and inspections on transformers per manufacturer's instructions and as specified in NECA 409. Correct deficiencies prior to installation.
D. Verify that conditions are satisfactory for installation prior to starting work.

3.02 INSTALLATION

A. Perform work in a neat and workmanlike manner in accordance with NECA 1.
B. Install transformers in accordance with manufacturer's instructions.
C. Install transformers in accordance with NECA 409 and IEEE C57.94.
D. Use flexible conduit, under the provisions of Section 26 05 34, 2 feet minimum length, for connections to transformer case. Make conduit connections to side panel of enclosure.
E. Arrange equipment to provide minimum clearances as specified on transformer nameplate and in accordance with manufacturer's instructions and NFPA 70.
F. Mount wall-mounted transformers using integral flanges or accessory brackets furnished by the manufacturer.
G. Mount floor-mounted transformers using vibration isolators suitable for isolating the transformer noise from the building structure.
H. Mount trapeze-mounted transformers as indicated.
I. Provide seismic restraints.
J. Provide grounding and bonding in accordance with Section 26 05 26.
K. Remove shipping braces and adjust bolts that attach the core and coil mounting bracket to the enclosure according to manufacturer's recommendations in order to reduce audible noise transmission.
L. Where not factory-installed, install lugs sized as required for termination of conductors as shown on the drawings.
M. Where furnished as a separate accessory, install transformer weathershield per manufacturer's instructions.
N. Install transformer identification nameplate in accordance with Section 26 05 53.

3.03 FIELD QUALITY CONTROL

A. See Section 01 40 00 - Quality Requirements, for additional requirements.
B. Inspect and test in accordance with NETA ATS, except Section 4.
3.04 ADJUSTING

A. Measure primary and secondary voltages and make appropriate tap adjustments.
B. Adjust tightness of mechanical and electrical connections to manufacturer's recommended torque settings.

3.05 CLEANING

A. Clean dirt and debris from transformer components according to manufacturer's instructions.
B. Repair scratched or marred exterior surfaces to match original factory finish.

END OF SECTION
SECTION 26 2416

PANELBOARDS

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. Distribution panelboards.
2. Lighting and appliance branch-circuit panelboards.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of panelboard, switching and overcurrent protective device, transient voltage suppression device, accessory, and component indicated. Include dimensions and manufacturers' technical data on features, performance, electrical characteristics, ratings, and finishes.

B. Panelboard Schedules: For installation in panelboards.

1.4 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For panelboards and components to include in emergency, operation, and maintenance manuals. In addition to items specified in Section "Operation and Maintenance Data," include the following:

1. Manufacturer's written instructions for testing and adjusting overcurrent protective devices.
2. Time-current curves, including selectable ranges for each type of overcurrent protective device that allows adjustments.

1.5 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Keys: Two spares for each type of panelboard cabinet lock.

1.6 QUALITY ASSURANCE

A. Testing Agency Qualifications: Member company of NETA or an NRTL.
1. Testing Agency’s Field Supervisor: Currently certified by NETA to supervise on-site testing.

B. Source Limitations: Obtain panelboards, overcurrent protective devices, components, and accessories from single source from single manufacturer.

C. Product Selection for Restricted Space: Drawings indicate maximum dimensions for panelboards including clearances between panelboards and adjacent surfaces and other items. Comply with indicated maximum dimensions.

D. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

E. Comply with NEMA PB 1.

F. Comply with NFPA 70.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Handle and prepare panelboards for installation according to NEMA PB 1.

1.8 PROJECT CONDITIONS

A. Interruption of Existing Electric Service: Do not interrupt electric service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary electric service according to requirements indicated:

1. Notify Owner no fewer than 30 days in advance of proposed interruption of electric service.
2. Do not proceed with interruption of electric service without Owner’s written permission.
3. Comply with NFPA 70E.

1.9 COORDINATION

A. Coordinate layout and installation of panelboards and components with other construction that penetrates walls or is supported by them, including electrical and other types of equipment, raceways, piping, encumbrances to workspace clearance requirements, and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS FOR PANELBOARDS

A. Enclosures: Flush- and surface-mounted cabinets.

1. Rated for environmental conditions at installed location.
   a. Indoor Dry and Clean Locations: NEMA 250, Type 1.

2. Front: Secured to box with concealed trim clamps. For surface-mounted fronts, match box dimensions; for flush-mounted fronts, overlap box.
3. **Hinged Front Cover**: Entire front trim hinged to box and with standard door within hinged trim cover.


**B. Incoming Mains Location**: Top and bottom.

**C. Phase, Neutral, and Ground Buses**:

1. **Material**: Hard-drawn copper, 98 percent conductivity.
2. **Equipment Ground Bus**: Adequate for feeder and branch-circuit equipment grounding conductors; bonded to box.

**D. Conductor Connectors**: Suitable for use with conductor material and sizes.

1. **Material**: Hard-drawn copper, 98 percent conductivity.

**E. Future Devices**: Mounting brackets, bus connections, filler plates, and necessary appurtenances required for future installation of devices.

**F. Panelboard Short-Circuit Current Rating**: Fully rated to interrupt symmetrical short-circuit current available at terminals.

### 2.2 DISTRIBUTION PANELBOARDS

**A. Manufacturers**: Subject to compliance with requirements, provide products by one of the following:

1. Eaton Electrical Inc.; Cutler-Hammer Business Unit.
4. Square D; a brand of Schneider Electric.

**B. Panelboards**: NEMA PB 1, power and feeder distribution type.

**C. Doors**: Secured with vault-type latch with tumbler lock; keyed alike.

1. For doors more than 36 inches high, provide two latches, keyed alike.

**D. Mains**: Circuit breaker.

**E. Branch Overcurrent Protective Devices for Circuit-Breaker Frame Sizes 125 A and Smaller**: Bolt-on circuit breakers.

**F. Branch Overcurrent Protective Devices for Circuit-Breaker Frame Sizes Larger Than 125 A**: Bolt-on circuit breakers; plug-in circuit breakers where individual positive-locking device requires mechanical release for removal.

**G. Branch Overcurrent Protective Devices**: Fused switches.

### 2.3 LIGHTING AND APPLIANCE BRANCH-CIRCUIT PANELBOARDS

**A. Manufacturers**: Subject to compliance with requirements, provide products by one of the following:
1. Eaton Electrical Inc.; Cutler-Hammer Business Unit.
4. Square D; a brand of Schneider Electric.

B. Panelboards: NEMA PB 1, lighting and appliance branch-circuit type.

C. Mains: Circuit breaker or lugs only. Refer to drawings.

D. Branch Overcurrent Protective Devices: Bolt-on circuit breakers, replaceable without disturbing adjacent units.

E. Doors: Concealed hinges; secured with flush latch with tumbler lock; keyed alike.

2.4 DISCONNECTING AND OVERCURRENT PROTECTIVE DEVICES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Eaton Electrical Inc.; Cutler-Hammer Business Unit.
4. Square D; a brand of Schneider Electric.

B. Molded-Case Circuit Breaker (MCCB): Comply with UL 489, with interrupting capacity to meet available fault currents.

3. Electronic trip circuit breakers with rms sensing; field-replaceable rating plug or field-replicable electronic trip; and the following field-adjustable settings:
   a. Instantaneous trip.
   b. Long- and short-time pickup levels.
   c. Long- and short-time time adjustments.
   d. Ground-fault pickup level, time delay, and I squared x t response.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Receive, inspect, handle, and store panelboards according to NEMA PB 1.1.

B. Examine panelboards before installation. Reject panelboards that are damaged or rusted or have been subjected to water saturation.

C. Examine elements and surfaces to receive panelboards for compliance with installation tolerances and other conditions affecting performance of the Work.
D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install panelboards and accessories according to NEMA PB 1.1.

B. Temporary Lifting Provisions: Remove temporary lifting eyes, channels, and brackets and temporary blocking of moving parts from panelboards.

C. Mount top of trim 90 inches above finished floor unless otherwise indicated.

D. Mount panelboard cabinet plumb and rigid without distortion of box. Mount recessed panelboards with fronts uniformly flush with wall finish and mating with back box.

E. Install overcurrent protective devices and controllers not already factory installed.
   1. Set field-adjustable, circuit-breaker trip ranges.

F. Install filler plates in unused spaces.

G. Stub four 1-inch empty conduits from panelboard into accessible ceiling space or space designated to be ceiling space in the future. Stub four 1-inch empty conduits into raised floor space or below slab not on grade.

H. Comply with NECA 1.

3.3 IDENTIFICATION

A. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs complying with Section 260553 "Identification for Electrical Systems."

B. Create a directory to indicate installed circuit loads; incorporate Owner's final room designations. Obtain approval before installing. Use a computer or typewriter to create directory; handwritten directories are not acceptable.

C. Panelboard Nameplates: Label each panelboard with a nameplate complying with requirements for identification specified in Section 260553 "Identification for Electrical Systems."

D. Device Nameplates: Label each branch circuit device in distribution panelboards with a nameplate complying with requirements for identification specified in Section 260553 "Identification for Electrical Systems."

3.4 FIELD QUALITY CONTROL

A. Perform tests and inspections.

B. Acceptance Testing Preparation:
   1. Test insulation resistance for each panelboard bus, component, connecting supply, feeder, and control circuit.
   2. Test continuity of each circuit.
C. Tests and Inspections:

1. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.
2. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.
3. Perform the following infrared scan tests and inspections and prepare reports:
   
a. Initial Infrared Scanning: After Substantial Completion, but not more than 60 days after Final Acceptance, perform an infrared scan of each panelboard. Remove front panels so joints and connections are accessible to portable scanner.
b. Follow-up Infrared Scanning: Perform an additional follow-up infrared scan of each panelboard 11 months after date of Substantial Completion.
c. Instruments and Equipment:
   
   1) Use an infrared scanning device designed to measure temperature or to detect significant deviations from normal values. Provide calibration record for device.

D. Panelboards will be considered defective if they do not pass tests and inspections.

E. Prepare test and inspection reports, including a certified report that identifies panelboards included and that describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

3.5 ADJUSTING

A. Adjust moving parts and operable component to function smoothly, and lubricate as recommended by manufacturer.

B. Set field-adjustable circuit-breaker trip ranges.

END OF SECTION 262416
SECTION 262726

WIRING DEVICES

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. Receptacles, receptacles with integral GFCI, and associated device plates.
2. Isolated-ground receptacles.
3. Snap switches and wall-box dimmers.
4. Communications outlets.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. Receptacles for Owner-Furnished Equipment: Match plug configurations.
2. Cord and Plug Sets: Match equipment requirements.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers’ Names: Shortened versions (shown in parentheses) of the following manufacturers’ names are used in other Part 2 articles:

1. Cooper Wiring Devices; Division of Cooper Industries, Inc. (Cooper).
2. Hubbell Incorporated; Wiring Device-Kellems (Hubbell).

B. Source Limitations: Obtain each type of wiring device and associated wall plate from single source from single manufacturer.
2.2 GENERAL WIRING-DEVICE REQUIREMENTS

A. Wiring Devices, Components, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Comply with NFPA 70.

C. Devices that are manufactured for use with modular plug-in connectors may be substituted under the following conditions:

1. Connectors shall comply with UL 2459 and shall be made with stranding building wire.
2. Devices shall comply with the requirements in this Section.

2.3 STRAIGHT-BLADE RECEPTACLES

A. Convenience Receptacles, 125 V, 20 A: Comply with NEMA WD 1, NEMA WD 6 Configuration 5-20R, UL 498, and FS W-C-596.

1. Products: Subject to compliance with requirements, provide the following:
   a. Cooper; 5351 (single), CR5362 (duplex).
   b. Hubbell; HBL5351 (single), HBL5352 (duplex).
   c. Leviton; 5891 (single), 5352 (duplex).
   d. Pass & Seymour; 5361 (single), 5362 (duplex).

B. Isolated-Ground, Duplex Convenience Receptacles, 125 V, 20 A: Comply with NEMA WD 1, NEMA WD 6 Configuration 5-20R, UL 498, and FS W-C-596.

1. Products: Subject to compliance with requirements, provide the following:
   a. Cooper; IG5362RN.
   b. Hubbell; IG5362.
   c. Leviton; 5362-IG.
   d. Pass & Seymour; IG5362.

2. Description: Straight blade; equipment grounding contacts shall be connected only to the green grounding screw terminal of the device and with inherent electrical isolation from mounting strap. Isolation shall be integral to receptacle construction and not dependent on removable parts.

2.4 GFCI RECEPTACLES

A. General Description:

1. Straight blade type.
2. Comply with NEMA WD 1, NEMA WD 6, UL 498, UL 943 Class A, and FS W-C-596.
3. Include indicator light that shows when the GFCI has malfunctioned and no longer provides proper GFCI protection.

B. Duplex GFCI Convenience Receptacles, 125 V, 20 A:

1. Products: Subject to compliance with requirements, provide the following:
a. Cooper; VGF20.
b. Hubbell; GFR5352L.
c. Pass & Seymour; 2095.
d. Leviton; 7590.

2.5 TOGGLE SWITCHES

A. Comply with NEMA WD 1, UL 20, and FS W-S-896.

B. Switches, 120/277 V, 20 A:

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

   1) Single Pole:
      2) Cooper; AH1221.
      3) Hubbell; HBL1221.
      4) Leviton; 1221-2.
      5) Pass & Seymour; CSB20AC1.

   6) Two Pole:
      7) Cooper; AH1222.
      8) Hubbell; HBL1222.
      9) Leviton; 1222-2.
     10) Pass & Seymour; CSB20AC2.

   11) Three Way:
      12) Cooper; AH1223.
      13) Hubbell; HBL1223.
      14) Leviton; 1223-2.
      15) Pass & Seymour; CSB20AC3.

   16) Four Way:
      17) Cooper; AH1224.
      18) Hubbell; HBL1224.
      19) Leviton; 1224-2.
     20) Pass & Seymour; CSB20AC4.

2.6 WALL PLATES

A. Single and combination types shall match corresponding wiring devices.

   1. Plate-Securing Screws: Metal with head color to match plate finish.
2.7 SERVICE POLES

A. Description:

1. Factory-assembled and -wired units to extend power and voice and data communication from distribution wiring concealed in ceiling to devices or outlets in pole near floor.
2. Poles: Nominal 2.5-inch- square cross section, with height adequate to extend from floor to at least 6 inches above ceiling, and with separate channels for power wiring and voice and data communication cabling.
3. Mounting: Ceiling trim flange with concealed bracing arranged for positive connection to ceiling supports; with pole foot and carpet pad attachment.
4. Wiring: Sized for minimum of five No. 12 AWG power and ground conductors and a minimum of four, four-pair, Category 3 or Category 5 voice and data communication cables.
5. Power Receptacles: Two duplex, 20-A, straight-blade receptacles complying with requirements in this Section.

2.8 FINISHES

A. Device Color:

1. Wiring Devices Connected to Normal Power System: As selected by Architect unless otherwise indicated or required by NFPA 70 or device listing.
3. Isolated-Ground Receptacles: Orange.

B. Wall Plate Color: Finish shall be brushed aluminum.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Comply with NECA 1, including mounting heights listed in that standard, unless otherwise indicated.

B. Coordination with Other Trades:

1. Protect installed devices and their boxes. Do not place wall finish materials over device boxes and do not cut holes for boxes with routers that are guided by riding against outside of boxes.
2. Keep outlet boxes free of plaster, drywall joint compound, mortar, cement, concrete, dust, paint, and other material that may contaminate the raceway system, conductors, and cables.
3. Install device boxes in brick or block walls so that the cover plate does not cross a joint unless the joint is troweled flush with the face of the wall.
4. Install wiring devices after all wall preparation, including painting, is complete.

C. Conductors:

1. Do not strip insulation from conductors until right before they are spliced or terminated on devices.
2. Strip insulation evenly around the conductor using tools designed for the purpose. Avoid scoring or nicking of solid wire or cutting strands from stranded wire.
3. The length of free conductors at outlets for devices shall meet provisions of NFPA 70, Article 300, without pigtails.
4. Existing Conductors:
   a. Cut back and pigtail, or replace all damaged conductors.
   b. Straighten conductors that remain and remove corrosion and foreign matter.
   c. Pigtailing existing conductors is permitted, provided the outlet box is large enough.

D. Device Installation:
   1. Replace devices that have been in temporary use during construction and that were installed before building finishing operations were complete.
   2. Keep each wiring device in its package or otherwise protected until it is time to connect conductors.
   3. Do not remove surface protection, such as plastic film and smudge covers, until the last possible moment.
   4. Connect devices to branch circuits using pigtails that are not less than 6 inches in length.
   5. When there is a choice, use side wiring with binding-head screw terminals. Wrap solid conductor tightly clockwise, two-thirds to three-fourths of the way around terminal screw.
   6. Use a torque screwdriver when a torque is recommended or required by manufacturer.
   7. When conductors larger than No. 12 AWG are installed on 15- or 20-A circuits, splice No. 12 AWG pigtails for device connections.
   8. Tighten unused terminal screws on the device.
   9. When mounting into metal boxes, remove the fiber or plastic washers used to hold device-mounting screws in yokes, allowing metal-to-metal contact.

E. Receptacle Orientation:
   1. Install ground pin of vertically mounted receptacles up, and on horizontally mounted receptacles to the right.
   2. Install hospital-grade receptacles in patient-care areas with the ground pin or neutral blade at the top.

F. Device Plates: Do not use oversized or extra-deep plates. Repair wall finishes and remount outlet boxes when standard device plates do not fit flush or do not cover rough wall opening.

G. Arrangement of Devices: Unless otherwise indicated, mount flush, with long dimension vertical and with grounding terminal of receptacles on top. Group adjacent switches under single, multigang wall plates.

H. Adjust locations of floor service outlets and service poles to suit arrangement of partitions and furnishings.

3.2 GFCI RECEPTACLES
   A. Install non-feed-through-type GFCI receptacles where protection of downstream receptacles is not required.

3.3 IDENTIFICATION
   A. Comply with Section 260553 "Identification for Electrical Systems."
   B. Identify each receptacle with panelboard identification and circuit number. Use hot, stamped, or engraved machine printing with black-filled lettering on face of plate, and durable wire markers or tags inside outlet boxes.
3.4 FIELD QUALITY CONTROL

A. Tests for Convenience Receptacles:

1. Line Voltage: Acceptable range is 105 to 132 V.
2. Ground Impedance: Values of up to 2 ohms are acceptable.
3. GFCI Trip: Test for tripping values specified in UL 1436 and UL 943.
4. Using the test plug, verify that the device and its outlet box are securely mounted.
5. Tests shall be diagnostic, indicating damaged conductors, high resistance at the circuit breaker, poor connections, inadequate fault current path, defective devices, or similar problems. Correct circuit conditions, remove malfunctioning units and replace with new ones, and retest as specified above.

B. Wiring device will be considered defective if it does not pass tests and inspections.

C. Prepare test and inspection reports.

END OF SECTION 262726
SECTION 26 2816
ENCLOSED SWITCHES AND CIRCUIT BREAKERS

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:
   1. Fusible switches.

1.3 ACTION SUBMITTALS
A. Product Data: For each type of enclosed switch, circuit breaker, accessory, and component indicated, include dimensioned elevations, sections, weights, and manufacturers' technical data on features, performance, electrical characteristics, ratings, accessories, and finishes.

1.4 MAINTENANCE MATERIAL SUBMITTALS
A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
   1. Fuses: Equal to 10 percent of quantity installed for each size and type, but no fewer than three of each size and type.

1.5 QUALITY ASSURANCE
A. Product Selection for Restricted Space: Drawings indicate maximum dimensions for enclosed switches and circuit breakers, including clearances between enclosures, and adjacent surfaces and other items. Comply with indicated maximum dimensions.
B. Comply with NFPA 70.

1.6 COORDINATION
A. Coordinate layout and installation of switches, circuit breakers, and components with equipment served and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.
PART 2 - PRODUCTS

2.1 FUSIBLE SWITCHES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Eaton Electrical Inc.; Cutler-Hammer Business Unit.
4. Square D; a brand of Schneider Electric.

B. Type HD, Heavy Duty, Single Throw, 600-V ac, 1200 A and Smaller: UL 98 and NEMA KS 1, horsepower rated, with clips or bolt pads to accommodate specified fuses, lockable handle with capability to accept three padlocks, and interlocked with cover in closed position.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine elements and surfaces to receive enclosed switches and circuit breakers for compliance with installation tolerances and other conditions affecting performance of the Work.

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

3.2 INSTALLATION

A. Install individual wall-mounted switches and circuit breakers with tops at uniform height unless otherwise indicated.

B. Install fuses in fusible devices.

C. Comply with NECA 1.

3.3 IDENTIFICATION

A. Comply with requirements in Section 260553 "Identification for Electrical Systems."

1. Identify field-installed conductors, interconnecting wiring, and components; provide warning signs.
2. Label each enclosure with engraved metal or laminated-plastic nameplate.

3.4 FIELD QUALITY CONTROL

A. Perform tests and inspections.

B. Acceptance Testing Preparation:

1. Test insulation resistance for each enclosed switch and circuit breaker, component, connecting supply, feeder, and control circuit.
2. Test continuity of each circuit.

C. Enclosed switches and circuit breakers will be considered defective if they do not pass tests and inspections.

3.5 ADJUSTING

A. Adjust moving parts and operable components to function smoothly, and lubricate as recommended by manufacturer.

END OF SECTION 262816
SECTION 26 5100

INTERIOR LIGHTING

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. Interior lighting fixtures, lamps, and ballasts.
2. Exit signs.

1.3 REFERENCE STANDARDS


D. IEEE C62.41.2 - Recommended Practice on Characterization of Surges in Low-Voltage (1000 V and less) AC Power Circuits; 2002 (R2008).


F. NECA 1 - Standard for Good Workmanship in Electrical Construction; National Electrical Contractors Association; 2010.


H. NEMA 410 - Performance Testing for Lighting Controls and Switching Devices with Electronic Drivers and Discharge Ballasts; National Electrical Manufacturers Association; 2011.

I. NEMA LE 4 - Recessed Luminaires, Ceiling Compatibility; National Electrical Manufacturers Association; 2012.

J. NEMA WD 6 - Wiring Devices - Dimensional Requirements; National Electrical Manufacturers Association; 2002 (R2008).
K. NFPA 70 - National Electrical Code; National Fire Protection Association; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.


N. UL 935 - Fluorescent-Lamp Ballasts; Current Edition, Including All Revisions.

O. UL 1598 - Luminaires; Current Edition, Including All Revisions.


1.4 ADMINISTRATIVE REQUIREMENTS

A. Coordination:
   1. Coordinate the installation of luminaires with mounting surfaces installed under other sections or by others. Coordinate the work with placement of supports, anchors, etc. required for mounting. Coordinate compatibility of luminaires and associated trims with mounting surfaces at installed locations.
   2. Coordinate the placement of luminaires with structural members, ductwork, piping, equipment, diffusers, fire suppression system components, and other potential conflicts installed under other sections or by others.
   3. Coordinate the placement of exit signs with furniture, equipment, signage or other potential obstructions to visibility installed under other sections or by others.
   4. Notify Architect of any conflicts or deviations from the contract documents to obtain direction prior to proceeding with work.


D. Title-24 C.C.R.

1.5 DEFINITIONS

B. BF: Ballast factor.

C. CCT: Correlated color temperature.

D. CRI: Color-rendering index.

E. LER: Luminaire efficacy rating.

F. Lumen: Measured output of lamp and luminaire, or both.

G. Luminaire: Complete lighting fixture, including ballast housing if provided.
1.6 ACTION SUBMITTALS

H. Product Data: For each type of lighting fixture, arranged in order of fixture designation. Include data on features, accessories, finishes, and the following:

1. Physical description of lighting fixture including dimensions.
2. Emergency lighting units including battery and charger.
3. Ballast, including BF.
5. Life, output (lumens, CCT, and CRI), and energy-efficiency data for lamps.

1.7 MAINTENANCE MATERIAL SUBMITTALS

I. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Lamps: 10 for every 100 of each type and rating installed. Furnish at least one of each type.
2. Plastic Diffusers and Lenses: One for every 100 of each type and rating installed. Furnish at least one of each type.
3. Fluorescent-fixture-mounted, emergency battery pack: One for every 20 emergency lighting unit.
4. Ballasts: One for every 100 of each type and rating installed. Furnish at least one of each type.

1.8 QUALITY ASSURANCE

J. Luminaire Photometric Data Testing Laboratory Qualifications: Provided by manufacturers' laboratories that are accredited under the National Volunteer Laboratory Accreditation Program for Energy Efficient Lighting Products.

K. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

L. Comply with NFPA 70.

1.9 COORDINATION

M. Coordinate layout and installation of lighting fixtures and suspension system with other construction that penetrates ceilings or is supported by them, including HVAC equipment, fire-suppression system, and partition assemblies.

1.10 WARRANTY

N. Special Warranty for Emergency Lighting Batteries: Manufacturer's standard form in which manufacturer of battery-powered emergency lighting unit agrees to repair or replace components of rechargeable batteries that fail in materials or workmanship within specified warranty period.

O. Manufacturer's Warranty: All equipment shall be warranted free of defects in materials and workmanship.

1. Warranty Period: All system components shall be warranted for at least three (3) years from date of system commissioning.
2. Owner’s Rights: Manufacturer’s warranty is in addition to, not a limitation of, other rights the Owner may have under contract documents.

PART 2 - PRODUCTS

2.1 MANUFACTURERS
   A. Products: Subject to compliance with requirements, provide product indicated on Drawings.

2.2 GENERAL REQUIREMENTS FOR LIGHTING FIXTURES AND COMPONENTS
   A. Recessed Fixtures: Comply with NEMA LE 4 for ceiling compatibility for recessed fixtures.
   B. Fluorescent Fixtures: Comply with UL 1598. Where LER is specified, test according to NEMA LE 5 and NEMA LE 5A as applicable.
   C. Metal Parts: Free of burrs and sharp corners and edges.
   D. Sheet Metal Components: Steel unless otherwise indicated. Form and support to prevent warping and sagging.
   E. Doors, Frames, and Other Internal Access: Smooth operating, free of light leakage under operating conditions, and designed to permit relamping without use of tools. Designed to prevent doors, frames, lenses, diffusers, and other components from falling accidentally during relamping and when secured in operating position.
   F. Diffusers and Globes:
      1. Acrylic Lighting Diffusers: 100 percent virgin acrylic plastic. High resistance to yellowing and other changes due to aging, exposure to heat, and UV radiation.
         a. Lens Thickness: At least 0.125 inch minimum unless otherwise indicated.
         b. UV stabilized.
      2. Glass: Annealed crystal glass unless otherwise indicated.
   G. Factory-Applied Labels: Comply with UL 1598. Include recommended lamps and ballasts. Labels shall be located where they will be readily visible to service personnel, but not seen from normal viewing angles when lamps are in place.
      1. Label shall include the following lamp and ballast characteristics:
         a. “USE ONLY” and include specific lamp type.
         b. LED Diode Code
         c. CCT and CRI for all luminaires.

2.3 BALLASTS FOR LINEAR FLUORESCENT LAMPS
   A. General Requirements for Electronic Ballasts:
1. Comply with UL 935 and with ANSI C82.11.
2. Designed for type and quantity of lamps served.
3. Ballasts shall be designed for full light output unless another BF, dimmer, or bi-level control is indicated.
4. Sound Rating: Class A.
5. Total Harmonic Distortion Rating: Less than 10 percent.
6. Transient Voltage Protection: IEEE C62.41.1 and IEEE C62.41.2, Category A or better.
7. Operating Frequency: 42 kHz or higher.
8. Lamp Current Crest Factor: 1.7 or less.
9. BF: 0.88 or higher.
10. Power Factor: 0.95 or higher.

B. Luminaires controlled by occupancy sensors shall have programmed-start ballasts.

C. Electronic Programmed-Start Ballasts for T5 and T5HO Lamps: Comply with ANSI C82.11 and the following:
   1. Lamp end-of-life detection and shutdown circuit for T5 diameter lamps.
   2. Automatic lamp starting after lamp replacement.

D. Single Ballasts for Multiple Lighting Fixtures: Factory wired with ballast arrangements and bundled extension wiring to suit final installation conditions without modification or rewiring in the field.

E. Ballasts for Bi-Level Controlled Lighting Fixtures: Electronic type.
   1. Operating Modes: Ballast circuit and leads provide for remote control of the light output of the associated lamp between high- and low-level and off.
      a. High-Level Operation: 100 percent of rated lamp lumens.
      b. Low-Level Operation: 30 percent of rated lamp lumens.
   2. Ballast shall provide equal current to each lamp in each operating mode.
   3. Compatibility: Certified by manufacturer for use with specific bi-level control system and lamp type indicated.

2.4 EXIT SIGNS

A. General Requirements for Exit Signs: Comply with UL 924; for sign colors, visibility, luminance, and lettering size, comply with authorities having jurisdiction.

B. Internally Lighted Signs:
   1. Lamps for AC Operation: LEDs, 50,000 hours minimum rated lamp life.
      a. Battery: Sealed, maintenance-free, nickel-cadmium type.
      b. Charger: Fully automatic, solid-state type with sealed transfer relay.
      c. Operation: Relay automatically energizes lamp from battery when circuit voltage drops to 80 percent of nominal voltage or below. When normal voltage is restored, relay disconnects lamps from battery, and battery is automatically recharged and floated on charger.
d. Test Push Button: Push-to-test type, in unit housing, simulates loss of normal power and demonstrates unit operability.
d. LED Indicator Light: Indicates normal power on. Normal glow indicates trickle charge; bright glow indicates charging at end of discharge cycle.

f. Integral Self-Test: Factory-installed electronic device automatically initiates code-required test of unit emergency operation at required intervals. Test failure is annunciated by an integral audible alarm and a flashing red LED.

2.5 FLUORESCENT LAMPS

A. T8 rapid-start lamps, rated 32 W maximum, nominal length of 48 inches, 2800 initial lumens (minimum), CRI 75 (minimum), color temperature 4100K, and average rated life 20,000 hours unless otherwise indicated.

B. T8 rapid-start lamps, rated 17 W maximum, nominal length of 24 inches, 1300 initial lumens (minimum), CRI 75 (minimum), color temperature 4100K, and average rated life of 20,000 hours unless otherwise indicated.

C. T5 rapid-start lamps, rated 28 W maximum, nominal length of 45.2 inches, 2900 initial lumens (minimum), CRI 85 (minimum), color temperature 4100K, and average rated life of 20,000 hours unless otherwise indicated.

D. T5HO rapid-start, high-output lamps, rated 54 W maximum, nominal length of 45.2 inches, 5000 initial lumens (minimum), CRI 85 (minimum), color temperature 4100K, and average rated life of 20,000 hours unless otherwise indicated.

2.6 LIGHTING FIXTURE SUPPORT COMPONENTS

A. Comply with Section 260529 "Hangers and Supports for Electrical Systems" for channel- and angle-iron supports and nonmetallic channel and angle supports.

B. Single-Stem Hangers: 1/2-inch steel tubing with swivel ball fittings and ceiling canopy. Finish same as fixture.

C. Twin-Stem Hangers: Two, 1/2-inch steel tubes with single canopy designed to mount a single fixture. Finish same as fixture.


E. Rod Hangers: 3/16-inch minimum diameter, cadmium-plated, threaded steel rod.

2.7 LED LIGHT FIXTURES

A. General:

1. LED light fixtures shall be in accordance with IES, NFPA, UL, as shown on the drawings, and as specified.

2. LED light fixtures shall be Reduction of Hazardous Substances (RoHS)-compliant.

3. LED drivers shall include the following features unless otherwise indicated:
INTERIOR LIGHTING

a. Minimum efficiency: 85% at full load.

b. Minimum Operating Ambient Temperature: -20˚ C. (-4˚ F.)

c. Input Voltage: 120 - 277V (±10%) at 60 Hz.

d. Integral short circuit, open circuit, and overload protection.

e. Power Factor: ≥ 0.95.

f. Total Harmonic Distortion: ≤ 20%.


4. LED modules shall include the following features unless otherwise indicated:

a. Comply with IES LM-79 and LM-80 requirements.

b. Minimum CRI 80 and color temperature 3000˚ K unless otherwise specified in LIGHTING FIXTURE SCHEDULE.

c. Minimum Rated Life: 50,000 hours per IES L70.

d. Light output lumens as indicated in the LIGHTING FIXTURE SCHEDULE.

B. LED Downlights:

1. Housing, LED driver, and LED module shall be products of the same manufacturer.

C. LED Troffers:

1. LED drivers, modules, and reflector shall be accessible, serviceable, and replaceable from below the ceiling.

2. Housing, LED driver, and LED module shall be products of the same manufacturer.

2.8 DAYLIGHT HARVESTING

A. General:

3. Daylight Harvesting: Allows interior and/or exterior photocells to control lighting levels in response to the available daylight

B. General — provide ballasts that:

1. Are dimmable from 100% to 1%

2. Connect without hardware interface to the following devices

   a. Occupant sensor (motion detector)

   b. Daylight sensor

C. Five Button Digital Switch — supply switches that:

1. Control one group of fixtures with the following commands

   a. Max: 100% illumination.
b. Bright: incrementally raises illumination.
c. Dim: incrementally lowers illumination level.
d. Daylight Harvesting On.
e. All fixtures Off.

2.8 SENSORS

D. General — provide occupancy and daylight sensors that:
   1. Are compatible with Class I and Class II wiring
   2. Can be replaced without reprogramming
   3. Have consistent color:
      a. Match NEMA WD1, Section 2 White.
      b. Color variation in same product family: Maximum $\Delta E=1$, CIE $L^*a^*b^*$ color units.
      c. Visible parts: Exhibit ultraviolet color stability when tested with multiple actinic light sources as defined in ASTM D4674. Provide proof of testing upon request.
   4. Mount to the ceiling

Infrared Receivers — supply infrared receivers that:
   1. Have 360-degree reception of wireless infrared remote controls.
   2. Indicate reception of communication from a hand held transmitter communication with an LED
   3. Are constructed of plastic meeting UL94 HB

Interior Daylight Sensors — supply sensors that:
   1. Accommodate a topology-free control scheme
   2. Maintain stable output over temperatures from 0º to 40º C (32° to 104° F)
   3. Are partially shielded for accurate detection of available daylight
      a. Sensor detection shall not be skewed by fixture lighting and horizontal light component
   4. Have linear response from 0 to 100 foot-candles.
   5. Have integral IR receivers
   6. Are constructed of plastic meeting UL94 HB

EXECUTION

2.7 INSTALLATION

A. Lighting fixtures:
   1. Set level, plumb, and square with ceilings and walls unless otherwise indicated.
   2. Install lamps in each luminaire.

B. Temporary Lighting: If it is necessary, and approved by Architect, to use permanent luminaires for temporary lighting, install and energize the minimum number of luminaires necessary. When construction is sufficiently complete, remove the temporary luminaires, disassemble, clean thoroughly, install new lamps, and reinstall.
C. Remote Mounting of Ballasts: Distance between the ballast and fixture shall not exceed that recommended by ballast manufacturer. Verify, with ballast manufacturers, maximum distance between ballast and luminaire.

D. Lay-in Ceiling Lighting Fixtures Supports: Use grid as a support element.
   1. Install ceiling support system rods or wires, independent of the ceiling suspension devices, for each fixture. Locate not more than 6 inches from lighting fixture corners.
   2. Support Clips: Fasten to lighting fixtures and to ceiling grid members at or near each fixture corner with clips that are UL listed for the application.
   3. Fixtures of Sizes Less Than Ceiling Grid: Install as indicated on reflected ceiling plans or center in acoustical panel, and support fixtures independently with at least two 3/4-inch metal channels spanning and secured to ceiling tees.

E. Suspended Lighting Fixture Support:
   1. Pendants and Rods: Where longer than 48 inches, brace to limit swinging.
   3. Continuous Rows: Use tubing or stem for wiring at one point and tubing or rod for suspension for each unit length of fixture chassis, including one at each end.
   4. Do not use grid as support for pendant luminaires. Connect support wires or rods to building structure.

F. Air-Handling Lighting Fixtures: Install with dampers closed and ready for adjustment.

G. Connect wiring according to Section 260519 "Low-Voltage Electrical Power Conductors and Cables."

H. Ensure that daylight sensor placement minimizes sensors view of electric light sources; ceiling mounted and fixture-mounted daylight sensors shall not have direct view of luminaires

2.8 IDENTIFICATION

A. Install labels with panel and circuit numbers on concealed junction and outlet boxes. Comply with requirements for identification specified in Section 260553 "Identification for Electrical Systems."

2.9 FIELD QUALITY CONTROL

A. Test for Emergency Lighting: Interrupt power supply to demonstrate proper operation. Verify transfer from normal power to battery and retransfer to normal.

B. Verify that self-luminous exit signs are installed according to their listing and the requirements in NFPA 101.

C. Prepare a written report of tests, inspections, observations, and verifications indicating and interpreting results. If adjustments are made to lighting system, retest to demonstrate compliance with standards.
2.10 STARTUP SERVICE

A. Burn-in all lamps that require specific aging period to operate properly, prior to occupancy by Owner. Burn-in fluorescent and compact fluorescent lamps intended to be dimmed, for at least 100 hours at full voltage.

2.11 ADJUSTING

A. Occupancy Adjustments: When requested within 12 months of date of Substantial Completion, provide on-site assistance in adjusting aimable luminaires to suit actual occupied conditions. Provide up to two visits to Project during other-than-normal occupancy hours for this purpose. Some of this work may be required after dark.

1. Adjust aimable luminaires in the presence of Architect.

END OF SECTION 265100
Spot Abatement Specification

Maintenance Facility Building 730
264 South Leland Norton Way
San Bernardino, California

Converse Project No. 16-42-210-02
March 28, 2017

Prepared For:
San Bernardino International Airport Authority
1601 East Third Street
San Bernardino, California 92408

Prepared By:
Converse Consultants
3176 Pullman Street
Suite 109
Costa Mesa, California 92626
March 28, 2017

Ms. Myriam Beltran
San Bernardino International Airport Authority
1601 East Third Street
San Bernardino, California 92408

Subject: SPOT ABATEMENT SPECIFICATION
Maintenance Facility Building 730
264 South Leland Norton Way
San Bernardino, California
Converse Project No. 16-42-210-02

Ms. Beltran:

Converse Consultants (Converse) is pleased to submit the attached Spot Abatement Specification for the referenced property (Property).

We appreciate the opportunity to be of service. Should you have any questions or comments regarding this Specification, please contact either Laura Tanaka at (714) 444-9660 or Norman Eke at (626) 930-1260.

CONVERSE CONSULTANTS

Laura Tanaka          Norman S. Eke
Certified Asbestos Consultant, #11-4708   Certified Asbestos Consultant, #96-2093
DPH Lead Project Designer, #D-3086         Managing Officer

Dist.: 1/Addressee
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</table>
Part 1 – General

1.1 Project Site

The project site is identified as the Maintenance Facility Building 730 located at 264 South Leland Way in San Bernardino, California.

1.2 Scope of Work

A. The main goal for this project is the spot removal of hazardous materials in those areas impacted by the planned demolition and renovation project.

B. All removal and disturbance of asbestos-containing materials (ACMs) and asbestos-containing construction materials (ACCMs) shall be performed by an asbestos abatement contractor, using 32-hour asbestos certified workers (Asbestos Worker trained as outlined in 40 CFR 763). Abatement contractor’s workforce shall be supervised by experienced persons trained, knowledgeable and qualified in the techniques of asbestos abatement, handling and disposal of asbestos-containing and/or asbestos-contaminated materials, and the subsequent cleaning of contaminated areas, including, at a minimum, Competent Person/Contractor Supervisor training as outlined in 40 CFR 763.

C. All removal and disturbance of lead-based paints (LBPs) shall be performed by a state-licensed contractor, using State of California Department of Public Health (CDPH) certified workers with at least one CDPH-certified Supervisor. All removal and disturbance of lead-containing materials (not meeting the definition of “lead-based) as defined in 8 CCR 1532.1, shall be performed by a state-licensed contractor, using lead-trained workers with certification of training meeting the requirements of 8 CCR 1532.1. Abatement contractor’s workforce shall be supervised by experienced persons trained, knowledgeable and qualified in the techniques of lead abatement, handling and disposal of lead-containing and/or lead-contaminated materials, and the subsequent cleaning of contaminated areas.

D. When exposure monitoring of a particular lead-related task indicates that the permissible exposure limit is or will be exceeded, the contractor shall use CDPH-certified lead workers to complete the task. Contractors performing work that disturbs any lead-containing material (LCM) must submit proof of negative exposure assessment (NEA) if personal protective equipment is not to be used.
E. For Cal/OSHA compliance purposes, all other painted, varnished, and glazed surfaces identified in the survey report with lead concentrations less than 1.0 milligrams per square centimeter (mg/cm²) will require that contractors performing activities that will disturb these surfaces/materials comply with the requirements of 8 CCR 1532.1.

F. Contractor shall furnish all labor, materials, services, insurance (specifically covering the handling and transportation of asbestos and lead), shown or reasonably implied for the removal, transport, and disposal of the hazardous materials identified in the following tables:

### Table 1 – Summary of ACMs and ACCMs

<table>
<thead>
<tr>
<th>Sample No.</th>
<th>Building Material</th>
<th>Percent Asbestos</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>07-13</td>
<td>Drywall/joint compound (Excluding wall between Room A-140 and A-150-180; see next entry)</td>
<td>0.4% (joint compound)</td>
<td>Point count results indicated 0.4% asbestos was detected in the joint compound. At this concentration, the material is considered an ACCM. There is approximately 85,500 square feet of material present.</td>
</tr>
<tr>
<td>17-19</td>
<td>Mastic to Baseboards</td>
<td>2%</td>
<td>Approximately 6,000 linear feet of material is present. The mastic is brown in color and contains Anthrophylite asbestos.</td>
</tr>
<tr>
<td>26-28</td>
<td>9x9 VFT, green, with black mastic</td>
<td>2% (tile) 5% (mastic)</td>
<td>Chrysotile asbestos was detected in the tile and in the mastic. Approximately 24,600 square of material is present throughout the building. The majority of the VFT is located underneath the carpeting.</td>
</tr>
<tr>
<td>38-40</td>
<td>Residual mastic (yellow/black)</td>
<td>3%</td>
<td>Residual black/yellow mastic contains Chrysotile asbestos. Approximately 1,800 square feet of mastic is present in rooms without tile under carpeting (B-160, B-180, B-230 and small room between B-130 and B-100).</td>
</tr>
<tr>
<td>47-49</td>
<td>Window putty (interior)</td>
<td>2%</td>
<td>Chrysotile asbestos was detected in the window putty. Approximately 380 linear feet of material was observed in the Men's and Women's restrooms and in the west side of the West Corridor.</td>
</tr>
<tr>
<td>50-52</td>
<td>Window putty (exterior)</td>
<td>3%</td>
<td>Chrysotile asbestos was detected in the window putty of the window above the door on the south side of the building. Approximately 10 linear feet of material is present.</td>
</tr>
</tbody>
</table>
Table 1 – Summary of ACMs and ACCMs

<table>
<thead>
<tr>
<th>Sample No.</th>
<th>Building Material</th>
<th>Percent Asbestos</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>53</td>
<td>Transite panel</td>
<td>15%</td>
<td>The transite panels contain Chrysotile asbestos. Approximately 1,350 square feet of material in good condition. The transite panels are located in the Women’s and Men’s Restrooms (window areas) and the walls of the West Corridor by the restrooms and phone room.</td>
</tr>
<tr>
<td>54</td>
<td>Gray hard packed elbow, 10 inch pipe</td>
<td>10%</td>
<td>Approximately 30 elbows observed in the Mechanical Room. Material in good condition.</td>
</tr>
<tr>
<td>55</td>
<td>Corrugated TSI, 8-inch pipe</td>
<td>10%</td>
<td>Approximately 30 linear feet of material in damaged condition observed in the attic.</td>
</tr>
<tr>
<td>56</td>
<td>Hard packed elbow, 8-inch pipe run</td>
<td>15% Amosite 10% Chrysotile 15% Crocidolite</td>
<td>Four (4) elbows observed in the attic.</td>
</tr>
<tr>
<td>57</td>
<td>Hard packed TSI, white, 4-inch pipe run</td>
<td>15% Amosite 15% Crocidolite</td>
<td>Approximately 20 linear feet observed in the attic. Material in good condition.</td>
</tr>
<tr>
<td>58</td>
<td>Hard Packed elbow, white, 4-inch pipe run</td>
<td>15% Amosite 10% Chrysotile 15% Crocidolite</td>
<td>Five (5) elbows observed in the attic.</td>
</tr>
<tr>
<td>59</td>
<td>Hard packed TSI, white, 8-inch pipe run</td>
<td>15% Amosite 15% Crocidolite</td>
<td>Approximately 100 linear feet in damaged condition observed in the attic.</td>
</tr>
<tr>
<td>60</td>
<td>Hard packed TSI, white, 10-inch pipe run</td>
<td>15% Amosite 15% Crocidolite</td>
<td>Approximately 200 linear feet in damaged condition observed in the attic.</td>
</tr>
</tbody>
</table>
Table 2 – Summary of LBPs

<table>
<thead>
<tr>
<th>Component</th>
<th>Paint Color</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Exterior Components</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metal doors and door frames</td>
<td>Beige</td>
<td>Located on north side of building. Both single and double doors</td>
</tr>
<tr>
<td>Metal ladder</td>
<td>Beige</td>
<td>Located on north side of building. Ladder to roof.</td>
</tr>
<tr>
<td><strong>Interior Components</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Metal ladder</td>
<td>Brown</td>
<td>Located in west corridor. Ladder to attic area over Women’s restroom.</td>
</tr>
<tr>
<td>Metal I beams</td>
<td>Beige, Cream, White,</td>
<td>Metal I beams located in various areas throughout the structure.</td>
</tr>
<tr>
<td>Black, Grey, Green</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exterior metal doors and door frames</td>
<td>Beige</td>
<td>Located on east side of building. Both single and double doors</td>
</tr>
<tr>
<td>Exterior metal sliding fire doors</td>
<td>Beige</td>
<td>Located on the south and west sides of the building.</td>
</tr>
<tr>
<td>Interior concrete door frame</td>
<td>Cream</td>
<td>Concrete frame to sliding fire door in south corridor.</td>
</tr>
</tbody>
</table>

G. The work includes the removal, transport, and disposal of the following:

1. All impacted hazardous materials identified in the tables in Article 1.2.F, above.
2. All materials used for work area preparation.
3. All discarded personnel protective equipment.
4. All other potentially contaminated materials.

H. Other items and responsibilities of work shall include:

1. As per agreement between Contractor and Owner.
2. The abatement contractor will coordinate with the General Contractor accessibility to the existing water supply for construction purposes.
3. The abatement contractor will coordinate with the General Contractor accessibility to the existing electrical power for construction purposes.

I. Damages caused to property features not associated with the building to be demolished and/or renovated during the performance of spot abatement activities shall be repaired by Contractor (at no additional
expense to Owner, unless other arrangements and approval have been provided by the Owner).

J. **Listed quantities are for budgetary information and are not to be used for bidding purposes. Listed quantities encompass the entire building. The abatement contractor has the sole responsibility for confirming the location, quantity and degree of difficulty in removing the identified materials.**

   *At this time, the areas and quantities that will need to have spot abatement completed have not been identified.*

K. All contractors providing bids for the spot abatement shall provide a cost break down of their bids to include labor (preparation time, abatement time and number of workers), materials (equipment to be used and material costs), and disposal and transportation costs as well as a final total.

L. The bidding contractors shall provide unit costs in their bids for the removal and disposal of ACMs and ACCMs (per square foot) and LBPs (per square foot or fixture) encountered during the demolition project.

M. If during the demolition activities, additional suspect asbestos-containing materials (ACMs) are found that have not been previously sampled, the materials will need to be assumed asbestos-containing and abated by applicable procedures (see Article 3.10.B). Abatement of assumed ACMs can be avoided if the suspect materials are sampled and analyzed for asbestos content, with the analytical results indicating no asbestos detected.

1.3 **Work to be Performed by Others**

As per Project Specifications.

1.4 **Responsibilities of Owner**

A. The abatement contractor shall coordinate with the Owner and/or General Contractor for the location of equipment storage, staging and waste storage locations.
1.5 **Required Licensure**

A. Contractor shall be licensed by the State of California, Contractors State License Board and be registered to perform asbestos related work with the Division of Occupational Safety and Health, Department of Industrial Relations, and at a minimum contractor shall hold the following license classifications:

1. C-22 – Asbestos Abatement Contractor
2. EPA Lead-Safe Certified Renovator

B. Transportation of Friable and Non-Friable Asbestos Containing Materials and lead waste: Contractor shall itself be or have a subcontractor who is a registered hazardous waste transporter with the State of California, Department of Toxic Substances Control.

C. Subcontractors shall hold all licenses applicable to specified trade work.

1.6 **Permits**

A. As required by Cal/OSHA

B. As required by the South Coast Air Quality Management District.

C. As required by City of San Bernardino Fire Department.

1.7 **Notifications**

A. Contractor shall make all required written notifications to regulatory agencies including the following:

1. Cal/OSHA
2. SCAQMD
3. Cal/DHS

1.8 **Insurance Requirements**

A. Contractor and all subcontractors shall maintain, at a minimum, workers compensation insurance at the statutory limits required. This shall, at a
minimum, include the limits necessary to maintain their DOSH Asbestos Certification in good standing.

B. Contractor shall maintain general liability insurance with the minimum rating requirement as stated in the General Conditions.

C. Contractor shall maintain pollution and environmental liability insurance with the same limits and rating requirements as the general liability insurance requirements in Article 1.8.B, above.

D. Contractor and all subcontractors shall maintain, at a minimum, auto insurance with a minimum rating requirement as stated in the General Conditions.

1.9 Bonding Requirements

Please refer to Owner General Conditions and Requirements.

1.10 Project Schedule

A. Project Start Date: To Be Determined.

Project Completion Date: To Be Determined

B. All work shall be performed as per agreement between Contractor and Owner.

C. For the purposes of this Work Plan "submittal due date" shall mean the day on which submittals required by Article 1.12 shall be received by the Construction Manager, "start work" shall mean the day Contractor arrives on the project site, and "completion date" shall mean the day Contractor leaves the project site including demobilization.

D. Contractor to indicate the number and duration of shifts required to perform abatement monitoring as part of the bid document.

1.11 Applicable Regulations

A. Contractor shall perform all work in compliance with the most recent edition of all applicable federal, state, and local regulations, standards and codes governing asbestos abatement, transport, and disposal of asbestos containing/contaminated materials, lead-based/containing surface coatings and contaminated materials, and all other hazardous materials.
1. Requirements include obtaining permits, licenses, inspections, releases and similar documentation, as well as payments, statements and similar requirements associated with codes, regulations, and standards.

B. Regulations, Standards, and Codes (General):

1. General applicability of federal, state, and local regulations, standards and codes governing hazardous materials abatement, demolition, transport, and disposal, except to the extent that more explicit or more stringent requirements are written directly into the contract documents, all applicable regulations, standards, and codes have the same force and effect and are made a part of the contract documents as if copied directly into the contract documents, or as if published copies are bound herewith.

C. Contractor Responsibility: The Contractor shall assume full responsibility and liability for the compliance with all applicable federal, state, and local regulations pertaining to work practices, transport, disposal, and protection of workers, visitors to the site, and persons occupying areas adjacent to the site.

1. The contractor is responsible for providing training, medical examinations and maintaining training/medical records of personnel as required by the applicable federal, state, and local regulations, including personal air monitoring for all work practices.

2. The Contractor shall hold the Owner harmless for failure to comply with any applicable hazardous materials abatement, transport, disposal, safety, health or other regulation on the part of himself, his employees, or his subcontractors.

1.12 Submittals

A. No later than five days prior to commencement of work, Contractor shall submit a copy to the San Bernardino International Airport Authority (SBIAA) representative documentation that includes, without limitation, the following:

1. Current Copies of licenses and registrations required by Article 1.5 Required Licensure (include copies of subcontractor’s licenses).

2. Copies of written notification to the following regulatory agencies:
   a. Cal/OSHA
   b. SCAQMD
   c. City of San Bernardino Fire Department Permit (if applicable)
   d. Cal/DHS
3. Current Proof of insurance coverage required by Article 1.8 Insurance Requirements (include proof of insurance for subcontractors).

4. Current Proof that required permits, site location and arrangements for transport and disposal of asbestos containing waste materials have been made.

5. Current Proof of legal right to use patented equipment or processes.

6. Current Manufacturer's certification that HEPA vacuums, differential pressure air filtration devices and other local exhaust ventilation equipment conform to ANSI Z9.2-79 and have been permitted by the SCAQMD.

7. Current documentation showing that Contractor's employees, including foreman, supervisor, and any other company personnel or agents who may be exposed to airborne asbestos fibers or who may be responsible for any aspects of asbestos abatement activities, have received training as required by 29 CFR 1926.1101 and 8 CCR 1529.

8. Current documentation showing that Contractor's employees, including foreman, supervisor, and any other company personnel or agents who may be exposed to airborne lead dust or who may be responsible for any aspects of lead abatement activities, have received training as required by 29 CFR 1926.62 and 8 CCR 1532.1.

9. Current documentation from Physician (signed by an M.D.) showing that all employees or agents who may be exposed to airborne asbestos fibers, and/or lead dust, in excess of background levels have received medical monitoring to determine whether they are physically capable of working while wearing the respirator required without suffering adverse health effects. The Contractor must be aware of and provide information to the examining physician about unusual conditions in the workplace environment (e.g. high temperatures, humidity, chemical contaminants) that may impact on the employee's ability to perform work activities.

10. Current documentation of respirator fit-testing for all Contractor employees and agents who must enter the work area. This fit-testing shall be conducted annually and in accordance with procedures as required by 29 CFR 1910.134 and 8 CCR 5144.


12. Master schedule, showing phasing, number of shifts, time for air clearances, tear down and manpower loading to be utilized for the duration of the project.

13. A site specific work plan based on scope of work. Include a diagram showing mini containment set-ups, glove bag locations or any abatement locations, decontamination unit(s) as appropriate, locations of negative air
machines and exhaust placement if appropriate.

14. Identify the disposal facility where all waste will be taken. Provide name and address of the facility.

B. During abatement activities, Contractor shall submit to SBIAA representative documentation that includes, without limitation, the following:

1. Copies of the work area entry/exit log book. Log book must record name, affiliation, time in, and time out for each entry into the work area.

2. Copies of logs documenting filter changes on respirators, HEPA vacuums, differential pressure air filtration devices, water filtration device, and other engineering controls.

3. Copies of Safety Data Sheets (SDS) for solvents, encapsulants, wetting agents, replacement materials, and other substances brought by Contractor to the Project Site. MSDSs shall be available the first day that subject materials/substances are present on the project site.

4. Results of all required OSHA compliance air monitoring. Results shall be available prior to the start of the following shift and within 24 hours of completion of the last shift.

5. Copies of all accident/incident reports where injury or damage has occurred on or to the Owner's property.

6. Copies of daily logs indicating location(s) worked, type of materials removed, quantity of materials removed and number of personnel conducting the aforementioned activities.

7. Copies of all transport manifests, trip tickets and disposal receipts for all asbestos, lead and universal waste materials removed from the work area shall be provided. Copies shall be provided either by email or faxed to:

   Myriam Beltran  
   San Bernardino International Airport Authority  
   1601 East Third Street  
   San Bernardino, California 92408  
   mbeltran@sbdairport.com  
   Fax: (909) 382-4106

8. Abatement contractor is responsible for profiling all waste streams that contain lead prior to transport and disposal. Results must be submitted to SBIAA representative for verification of prior to disposal. See Section 3.6, paragraph B of this specification.
1.13 Notices

A. Post in the clean room area of the worker decontamination enclosure a list containing the names, and telephone numbers of Owner, Construction Manager, and Abatement Contractor.

B. Post in the clean room area of the worker decontamination enclosure a list of all persons authorized to enter the work area.

C. Additional postings shall include:
   1. Visitor Entry and Exit Log.
   2. Employee Daily Sign in Log.
   3. Entry and Exit Procedures.
   5. Copies of permits required in Article 1.6 of this document and copies of notifications required in Article 1.7 of this document.
   6. As required by the Department of Labor.

1.14 Site Use and Security

A. Confine operations at the site to the areas permitted under the Contract. Portions of the site beyond which areas on which work is indicated are not to be disturbed.

B. The work area shall be restricted only to authorized, trained and protected personnel, including Contractor, Contractor's employees, and Owner employees, Owner, Construction Manager, State and Local Inspectors.

C. Entry into the work area by unauthorized individuals shall be reported immediately to SBIAA.

D. Contractor shall be responsible for Project site security during abatement operations in order to protect work efforts and equipment.

1.15 Emergency Planning

A. Emergency planning and procedures shall be developed by Contractor prior to abatement initiation.
B. Emergency procedures shall be in written form and prominently posted. Contractor shall ensure that all persons entering the work area read these procedures and understand the Project site layout, location of emergency exits and emergency procedures.

C. Emergency planning shall include considerations of fire, explosion, electrical hazards, slips, trips and falls, confined spaces, school emergencies and heat related injury. Written procedures shall be developed and employee training in procedures shall be provided by Contractor.

D. Employees shall be trained in evacuation procedures in the event of workplace emergencies.

1. For non-life-threatening situations, employees injured or otherwise incapacitated shall decontaminate following normal procedures with assistance from fellow workers, if necessary, before exiting the work place to obtain proper medical treatment.

2. For life-threatening injury or illness, worker decontamination shall take least priority. After measures to stabilize the injured worker, remove him from the work place and secure proper medical treatment.

3. Telephone numbers of all emergency response personnel and map to closest hospital shall be prominently posted in the clean and equipment rooms.

1.16 **Fire Protection**

A. All plastic, spray-on strippable coatings, and structural materials used in the asbestos abatement process shall be UL-approved and certified as fire retardant or noncombustible.

B. Wood shall be pressure impregnable and certified as fire retardant.

C. Safety Data Sheets (SDS) for fire retardant materials shall be made available upon request.

D. All combustible rubbish and debris, including properly bagged asbestos shall be properly disposed of at the end of each working day.

E. A minimum of one (1) 4A/60BC dry-chemical extinguisher shall be maintained at each of the following locations:
1. At each corner of the work area. Where no clear corners exist, four (4) extinguishers shall be placed around the exterior wall of the work area so that they are approximately 25 percent of the total distance apart.

   a. Exception: Where the total contained work area is less than 1,000 square feet, two (2) 4A/60BC extinguishers shall be provided. All extinguishers shall be clearly identified with red tape.

2. Contractor shall ensure that on site personnel are aware of the location and proper use of all extinguishers and other fire/life safety equipment.

F. All existing fire detection, alarm systems, connections and standpipes shall remain in place, active and unobstructed. Any alteration to this equipment must be approved by SBIAA.
Part 2 - Products

2.1 Materials

A. Generally, Contractor shall carefully adhere to the following:

1. All plastic, spray-on strippable coatings and structural materials used shall be UL-certified as fire retardant or non-combustible.

2. Deliver all materials in the original packages, containers, or bundles bearing the name of the manufacturer and brand name (where applicable).

3. Fire-retardant polyethylene sheeting utilized for worker decontamination and construction/containment barriers shall be a minimum of six-mil in thickness.

4. Disposal bags shall be of six-mil polyethylene, pre-printed with labels as required by EPA regulation 40 CFR 61.152 (b) (I) (iv) or applicable Cal/OSHA requirements.

5. Stick-on labels as per EPA or Cal/OSHA requirements for disposal drums.

6. Warning signs as required by Cal/OSHA shall be utilized.

7. Disposal drums shall be 55-gallon DOT A1A (DOT 17H) with locking ring tops and will meet the requirements of 49 CFR 172-178.

B. Removal and Encapsulation:

1. Surfactant (wetting agent) shall be a 50/50 mixture of polyoxyethylene ether and polyoxyethylene ester, or equivalent, mixed in proportion of 1 fluid ounce to 5 gallons.

2. The encapsulating agent to be applied shall adhere to the substrate surfaces from which asbestos-containing material has been stripped.

3. The encapsulating agent shall not be flammable and should not be solvent-based or utilize a vehicle (the liquid in which the solid parts of the encapsulant are suspended) consisting of hydrocarbon.

4. If utilized, mastic removal solvents shall NOT be or create a RCRA waste, and shall be of the low odor variety.
2.2 Equipment

A. General

1. A sufficient quantity of HEPA vacuums and/or differential pressure air filtration devices equipped with HEPA filtration and operated in accordance with ANSI Z9.2-79 (local exhaust ventilation requirements) and EPA guidance document EPA 560/5-83-002 Guidance for Controlling Friable Asbestos Containing Materials in Buildings. To calculate total air flow requirement:

\[
\text{Total ft}^3/\text{minute} = \frac{\text{Volume of work area (in cubic feet (ft}^3\text{))}}{15 \text{ minutes}}
\]

To calculate the number of units needed for the abatement:

\[
\text{Number of units needed} = \frac{\text{Total ft}^3/\text{minute}}{\text{Capacity of unit in ft}^3/\text{minute}}
\]

2. At a minimum, full-face powered air-purifying respirators (PAPRs) with P-100 cartridges shall be utilized during all friable/Class I asbestos removal and for all removal of lead-containing paints/substances involving abrasive removal techniques.

3. At a minimum, half-face air-purifying respirators with P-100 cartridges shall be utilized during all ceramic tile or lead-containing paint removal/impact except abrasive removal, or for the removal of all non-friable/Class II asbestos removal.

4. Respirators shall be furnished to the abatement workers by Contractor. The respirators shall have been tested and approved by National Institute of Occupational Safety and Health (NIOSH) for use in asbestos atmospheres.

5. Full body disposable protective clothing, including head, body, and foot coverings shall be furnished to visitors in sizes adequate to accommodate movement without tearing.

6. Additional safety equipment as supplied in accordance with 8 CCR 1514, (e.g. hard hats meeting the requirements of 8 CCR 1515, eye protection meeting the requirements of 8 CCR 1516, safety shoes meeting the requirements of 8 CCR 1517, hand protection meeting the requirements of 8 CCR 1520, hearing protection meeting the requirements of 8 CCR 1521 and body protection meeting the requirements of 8 CCR 1522), as necessary, shall be furnished to all workers and authorized visitors.
7. Non-skid foot wear shall be furnished to all abatement workers. Disposable clothing shall be adequately sealed to the footwear to prevent body contamination.

8. Furnish a sufficient supply of disposable mops, rags, and sponges for work area decontamination.

B. Removal:

1. A sufficient supply of scaffolds, ladders, lifts and hand tools (e.g., scrapers, wire cutters, brushes, utility knives, wire saws, etc.) shall be furnished as needed.

2. Rubber dustpans and rubber squeegees shall be furnished for cleanup. Under no circumstances shall brooms be used for the cleanup of asbestos debris.

3. Brushes utilized for removing loose asbestos-containing material shall have nylon or fiber bristles, not metal.

4. A sufficient supply of HEPA filtered vacuum systems shall be furnished and utilized during all removal activities and cleanup activities.

C. Encapsulation: Encapsulants shall be sprayed using airless spray equipment or hand pressurized sprayer.

D. Enclosure: Hand tools equipped with HEPA filtered local exhaust ventilation shall be utilized during the installation of mini enclosures and supports if there is any need to disturb asbestos-containing materials during this process.
3.1 Class I Asbestos Removal Work – Ceiling Tiles and Thermal System Insulation (TSI)

The following procedure shall be utilized for all spot removal of friable/Class I ACM Ceiling Tiles and TSI.

A. Contractor shall coordinate all items of work with the SBIAA representative.

B. Contractor shall shut down and lock out all heating, cooling, and air conditioning system (HVAC) components that are in supply or pass through the work area. The HVAC system (such as an air intake) shall remain off during the project.

C. In the event that active power is still in the area, the Contractor shall shut down and lock out electric power to all Work Areas. Contractor shall then provide temporary power and lighting sources, ensure safe installation of temporary power sources and equipment by compliance with all applicable electrical code requirements and Cal/OSHA requirements for temporary electrical systems. Protect each circuit with a Ground Fault Circuit Interrupter (GFCI) of proper size located in the temporary panel.

D. Install worker decontamination unit described in Article 3.5 as necessary or as agreed upon with SBIAA representatives.

E. Post warning signs meeting the specifications of 8 CCR 1529, 8 CCR 5208, and 29 CFR 1926.1101, at any location and approaches to a location where airborne concentration of asbestos fibers may exceed ambient background levels. Signs shall be posted at a distance sufficiently far enough away from a work area to permit a person to read the sign and take necessary protective measures to avoid exposure.

F. Asbestos Handlers shall don personnel protective equipment as required in Article 2.2, Equipment.

G. Pre-clean all vertical and horizontal surfaces within the work area using HEPA-filtered vacuum and/or wet cleaning techniques, as appropriate. Contractor shall not use any methods that would raise dust, such as dry sweeping or vacuuming with equipment not equipped with HEPA filters, and shall not disturb asbestos-containing materials during the pre-cleaning phase.

H. Seal off all windows, doorways, entrances, drains, ducts, grills, grates, diffusers and any other openings between the Work Area and
uncontaminated areas outside of the Work Area with two layers six-mil fire retardant polyethylene sheeting and tape.

I. Cover all immovable items (plumbing, etc.) and/or construct walls in the Work Area with fire retardant polyethylene sheeting and seal with duct tape, as appropriate. Walls shall be decontaminated using HEPA vacuums and wet cleaning techniques. Walls with mortar joints (e.g., tile) are considered porous. Openings through these walls, including louvers in Mechanical Rooms, must be sealed by critical barriers. Mini containments shall be constructed as follows:

1. Walls and floors in the immediate area of the spot abatement shall be covered with a layer of six-mil fire-retardant polyethylene sheeting (sealed airtight with duct tape).

2. Plastic shall be sized to minimize seams.

3. Wall sheeting shall overlap floor sheeting by at least 12 inches beyond the wall/floor joint to provide a better seal against water damage.

4. Wall sheeting shall be secured adequately to prevent it from falling away from the walls.

5. The mini containment shall be equipped with a HEPA filter equipped vacuum or a HEPA ventilation system to maintain negative pressure within the mini containment. Negative pressure must be maintained during the removal process.

6. All exposed ACMs within the mini containment must be encapsulated.

7. Tools and equipment used in the mini containment must be wet wiped until no visible residue remains. Wet wiped tools and equipment must be passed through the mini containment door in a sealed, leakproof container. The leakproof container must be opened only inside another mini containment or decontamination unit.

8. After the removal of the ACMs, encapsulation or enclosure is complete, the interior of the mini containment must be cleaned using HEPA filter equipped vacuuming, wet wiped, or both; or apply an encapsulant to the interior of the mini containment.

9. Before the mini containment is removed, a visual inspection of the interior and abated surfaces must be performed. If debris or material is still present, the interior of the mini containment must be recleaned.

10. Once the visual inspection is completed, the mini containment can be removed by sealing the door and collapsing the containment using a HEPA filter equipped vacuum, or tearing down the mini containment after clearance air sampling indicated the fiber level is within the acceptable levels.
J. The Contractor shall carry out all spot asbestos removal activities in a manner that will minimize pulverizing, breaking or creation of dust. Generally, manual removal methods will be preferred. Power equipment may be utilized as long as they are equipped with proper HEPA-filtration equipment and do not create an undue hazard.

K. Keep the ACMs being removed wet throughout removal operations by the use of an airless sprayer. In the event that visible dust is generated during the abatement process, mist the air within the containment periodically with water or an amended water solution with an airless sprayer to reduce airborne asbestos fiber concentrations.

L. Once all removal activities have been completed, clean-up of the work areas shall be conducted in accordance with Article 3.4, Clean-Up Procedures.

M. Encapsulate entire work area with a penetrating and/or lock-down type encapsulant following acceptance of clean-up activities.

N. Dispose of all asbestos containing/contaminated waste in accordance with Article 3.6, Disposal Procedures.

3.2 Class II Asbestos Removal Work – Window Putty, Drywall/Joint Compound, Vinyl Floor Tile/Baseboards and Associated Mastic & Transite Panels

The following procedure shall be utilized for all spot removal of non-friable/Class II ACM drywall/joint compound, vinyl tiles and associated mastics, mastic to baseboards, and window putty. The following procedure shall be utilized for the removal of non-friable/Class II ACCM drywall/joint compound.

A. Contractor shall coordinate all items of work with SBIAA.

B. Contractor shall shut down and lock out all heating, cooling, and air conditioning system (HVAC) components that are in supply or pass through the work area. The HVAC system shall remain off during the project.

C. In the event that active power is still in the area, the Contractor shall shut down and lock out electric power to all Work Areas. Contractor shall then provide temporary power and lighting sources, ensure safe installation of temporary power sources and equipment by compliance with all applicable electrical code requirements and Cal/OSHA requirements for temporary
electrical systems. Protect each circuit with a Ground Fault Circuit Interrupter (GFCI) of proper size located in the temporary panel.

D. Install worker decontamination unit described in Article 3.5 or as agreed upon with SBIAA.

E. Post warning signs meeting the specifications of 8 CCR 1529, 8 CCR 5208, and 29 CFR 1926.1101, at any location and approaches to a location where airborne concentration of asbestos fibers may exceed ambient background levels. Signs shall be posted at a distance sufficiently far enough away from a work area to permit a person to read the sign and take necessary protective measures to avoid exposure (generally, at roof accesses, or at least twenty feet from removal, if on roof).

F. Asbestos Handlers shall don personnel protective equipment as required in Article 2.2.A. Double-suiting is recommended if decontamination unit is not utilized.

G. Pre-clean all vertical and horizontal surfaces within the work area using HEPA-filtered vacuum and/or wet cleaning techniques, as appropriate. Contractor shall not use methods that would raise dust, such as dry sweeping or vacuuming with equipment not equipped with HEPA filters, and shall not disturb ACM/ACCM during the pre-cleaning phase.

H. Seal off all windows, doorways, drains, ducts, skylights, roof penetrations, and any other openings between the Work Area and uncontaminated areas outside of the Work Area with six-mil fire retardant polyethylene sheeting and tape.

I. Cover all immovable items and/or construct walls around immovable objects with fire-retardant polyethylene sheeting, as appropriate. Walls, where present, shall be decontaminated using HEPA vacuums and wet cleaning techniques. Walls with mortar joints (e.g., tile) are considered porous. Openings through these walls must be sealed by critical barriers, as necessary. Mini containments shall be constructed as follows:

1. Walls and floors in the immediate area of the spot abatement shall be covered with six-mil fire-retardant polyethylene sheeting (sealed airtight with duct tape).

2. Plastic shall be sized to minimize seams.

3. Wall sheeting shall overlap floor sheeting by at least 12 inches beyond the wall/floor joint to provide a better seal against water damage.

4. Wall sheeting shall be secured adequately to prevent it from falling away from the walls.
5. The mini containment shall be equipped with a HEPA filter equipped vacuum or a HEPA ventilation system to maintain negative pressure within the mini containment. Negative pressure must be maintained during the removal process.

6. All exposed ACMs within the mini containment must be encapsulated.

7. Tools and equipment used in the mini containment must be wet wiped until no visible residue remains. Wet wiped tools and equipment must be passed through the mini containment door in a sealed, leakproof container. The leakproof container must be opened only inside another mini containment or decontamination unit.

8. After the removal of the ACMs, encapsulation or enclosure is complete, the interior of the mini containment must be cleaned using HEPA filter equipped vacuuming, wet wiped, or both; or apply an encapsulant to the interior of the mini containment.

9. Before the mini containment is removed, a visual inspection of the interior and abated surfaces must be performed. If debris or material is still present, the interior of the mini containment must be recleaned.

10. Once the visual inspection is completed, the mini containment can be removed by sealing the door and collapsing the containment using a HEPA filter equipped vacuum, or tearing down the mini containment after clearance air sampling indicated the fiber level is within the acceptable levels.

J. The Contractor shall carry out all asbestos removal activities in a manner that will minimize pulverizing, breaking or creation of dust. Generally, manual removal methods will be preferred. Power tools may be utilized as long as they are equipped with proper shrouding and HEPA-filtration equipment.

K. Keep the ACMs being removed wet throughout removal operations. In the event that visible dust is generated during the abatement process, also mist the air within regulated area periodically to reduce airborne asbestos fiber concentrations.

L. Once all removal activities have been completed, clean-up of the work areas shall be conducted in accordance with Article 3.4, Clean-Up.

M. Encapsulate entire work area with a penetrating and/or lock-down type encapsulant following acceptance of clean-up activities.

N. Dispose of all asbestos containing/contaminated waste in accordance with Article 3.6, Disposal Procedures.
3.3 **LBP Stabilization and/or Component Removal**

NOTE: The LBPs observed at the building appeared to be in good condition. No loose, flaking, or peeling paints were observed. Contractor shall be responsible to limit the amount of lead-containing dust generated.

In the event damaged paint (loose, flaking or peeling, etc.) is observed at the time of demolition, the following will need to be followed.

A. Post warning signs meeting the specifications of 8 CCR 1532.1 and 29 CFR 1926.62 at any location and approaches to a location where airborne concentrations of lead dust may exceed ambient background levels. Signs shall be posted at a distance sufficiently far enough away from a work area to permit a person to read the sign and take necessary protective measures to avoid exposure. Barrier tape shall be utilized in conjunction with signs for exterior removal activities, to delineate the extent of regulated work areas.

B. Prepare appropriate fall protection systems in accordance with the requirements of Title 8 California Code of Regulations, Sections 1669, 1670, 1724 and anchoring guidance from Title 8 California Code of Regulations, Section 3283 (where applicable).

C. Install worker decontamination unit described in Article 3.5 or as agreed upon with SBIAA.

D. Abatement workers involved in removal procedures shall wear two disposable Tyvek suits, including gloves, hood and footwear. Minimum respiratory protective equipment shall be half-face air-purifying respirators equipped with P100 filters. Upon exiting the work area the handlers shall HEPA vacuum all visible debris from the outer suit, dispose of it as lead-contaminated waste, and proceed through the decontamination unit for full decontamination.

E. Isolate work area by installing critical barriers or curtained doorways across all openings where airborne lead dust migration may cause secondary lead contamination (for work where components will be removed relatively intact, such as doors, downspouts, and wood trim, drop cloths will suffice). At a minimum, the work area will be delineated with the use of appropriately labeled barrier tape and signs. Plastic sheeting shall be placed out a minimum of five (5) feet from the component to be removed.

F. Cover floors, if appropriate, in each work area with fire retardant polyethylene sheeting (do not cover floors where flooring finishes, such as ceramic flooring, for example, are to be removed).

1. A single layer of six-mil (minimum) sheeting.
2. Containment plastic shall be sized to minimize seams.

3. Where multiple layers of floor poly are utilized, sheeting shall be installed in a fashion so as to prevent slippage between successive layers of material.

G. Cover all immovable items and/or construct walls in the Work Area with fire retardant polyethylene sheeting. Walls that will be demolished do not necessarily need protection (check with SBIAA representative).

1. Walls shall be covered with six-mil fire-retardant polyethylene sheeting (sealed airtight with duct tape).

2. Plastic shall be sized to minimize seams.

3. Wall sheeting shall overlap floor sheeting by at least 12 inches beyond the wall/floor joint to provide a better seal for negative pressure.

4. Wall sheeting shall be secured adequately to prevent it from falling away from the walls. This may require additional support/attachment when Negative Pressure Ventilation Systems are utilized.

5. Fire exits shall be clearly labeled with red tape or equivalent.

H. Paint stabilization activities must utilize wet scraping methods, HEPA vacuums shall be used to clean up small debris generated during lead paint stabilization activities.

I. Where manual demolition is employed for lead removal, periodically mist the work area and materials to be impacted to maintain a wet condition and avoid the creation of airborne dust, which may carry lead.

J. The Contractor shall carry out all impacts to lead-based surface coatings in a manner that will minimize pulverizing, breaking, abrading, or in any other way impacting lead-containing paints and generating airborne lead-containing dust.

K. Once all removal activities have been completed, clean-up of the work areas shall be conducted in accordance with Article 3.4, Clean-Up.

L. Dispose of all lead-containing/contaminated waste in accordance with Article 3.6, Disposal Procedures.

3.4 Clean-up Procedures

A. Remove and containerize all visible accumulations of ACMs, ACCMs, LBPs, and asbestos/lead-contaminated debris utilizing rubber dust pans and rubber
squeegees to move material around. Do not use metal shovels to pick up or move accumulated waste within contained work areas.

Asbestos-containing/contaminated waste shall be placed in leak tight disposal bags. Disposal bags shall be double six-mil polyethylene, pre-printed with labels as required by EPA regulation 40 CFR 61.152 (b) (I) (iv), Cal/OSHA (Title 8 CCR Sections 1529 and 5208), SCAQMD Rule 1403, and if applicable Title 22 CCR Section 66504.

Lead-containing wastes shall be containerized in 55-gallon steel drums with labels as required by 8 CCR 1532.1 and 22 CCR 66504.

All other hazardous wastes shall be containerized as appropriate and disposed of in a manner that satisfies the requirements for waste characterization and disposal in accordance with the requirements of Title 22 of the California Code of Regulations, Sections 66243, et seq., and Sections 25157.8, et al, of the California Health and Safety Code.

B. Whether cleaning an asbestos work area or a lead work area (or both), wet clean all surfaces in the work area utilizing rags, mops and sponges, and clean all horizontal surfaces within each work area with a HEPA-vacuum, as appropriate.

C. Remove the cleaned layer of polyethylene sheeting from floors and walls, as applicable. Windows, doors, HVAC system vents and all other openings (critical barriers, if employed) shall remain sealed. Dispose of as asbestos-contaminated or lead-contaminated as appropriate to the work area in question.

D. After gross cleaning of the work area, HEPA-vacuum and wet clean all objects and surfaces in the work area, remove all containerized waste from the work area.

E. Decontaminate all tools and equipment and remove at the appropriate time in the cleaning sequence.

3.5 Worker Decontamination Systems

The following procedures will be utilized if no mini containments are constructed.

A. Worker decontamination enclosure systems shall be provided at all locations where workers will enter or exit the work area as necessary and if no mini containments are constructed. At a minimum, one three-stage system at a
single location is required. Each work area where negative pressure enclosure is the selected method of engineering controls shall have a worker decontamination unit.

B. Worker decontamination enclosure systems constructed at the Project site shall utilize six-mil, fire-retardant polyethylene sheeting, or other approved materials for privacy.

C. Alternate methods of providing Decontamination facilities may be submitted to SBIAA for approval. Do not proceed with any such method(s) without written authorization.

D. The worker decontamination enclosure system shall consist of at least a cleansing station in accordance with the requirements of 8 CCR 1527 and 8 CCR 1529, equipped with adequate water, towels and cleansing agents to accommodate the entire crew and visitors.

3.6 Disposal Procedures

A. All friable asbestos waste shall be disposed of as Hazardous, Friable Asbestos Waste.

All non-friable asbestos waste shall be disposed of as Non-Hazardous, Non-Friable Asbestos Waste.

All ACCM waste can be disposed of as non-regulated waste (construction debris).

B. Contractor is responsible for characterization of lead waste prior to waste being transported off site. Characterization sample results must be submitted to SBIAA for review prior to waste being transported off site. Refer to Section 1.12, subsection B, paragraph 8 of this specification.

All asbestos-containing waste shall be placed and stored in clear, sealed, leak-tight and appropriately labeled containers, in accordance with 8 CCR 1529 and SCAQMD Rule 1403, and transported to an appropriate landfill for disposal.

B. All lead wastes shall be either disposed of as construction debris (if STLC/TCLP results allow) or lead-containing waste (with attendant RCRA codes, if STLC/TCLP results so require).

C. All hazardous wastes (including non-hazardous asbestos wastes) must be disposed of by a certified waste hauler approved by the Owner.
D. Arrange for proper disposal of any generated hazardous waste stream through an Owner-approved waste disposal facility.

E. Obtain the EPA Hazardous Waste Generator Identification Number and State of California Hazardous Waste Tax Identification Number from the Owner.

F. All hazardous waste manifests or non-hazardous material data forms shall be delivered to the SBIAA representatives. Record keeping format shall utilize a chain of custody form which includes the names and addresses of the Generator (Owner), Contractor, Waste Hauler, pickup site, disposal site, the estimated quantity of the asbestos waste and the type of containers used. The form shall be signed by the Generator, Contractor, Waste Hauler and the Disposal Site Operator, as the responsibility for the material changes hands.

3.7 Reestablishment of the Work Areas

A. Reestablishment of the work area shall only occur following the completion of clean-up procedures to the satisfaction of SBIAA representatives.

B. Contractor shall visually inspect the work area for any remaining visible residue. Evidence of contamination will necessitate additional cleaning and air monitoring requirements at no additional cost to Owner.

C. Upon approval by SBIAA representatives, the Contractor shall remove remaining fire retardant polyethylene sheeting, critical barriers, and decontamination unit.

D. Repair all areas of damage that occurred as a result of abatement activities at no additional cost to Owner, unless other arrangements and written approval have been provided by the Owner.

3.8 OSHA Personnel Air Monitoring

Air monitoring required by OSHA is the responsibility of the contractor. The contractor is responsible for providing daily OSHA compliance monitoring as per 29 CFR 1926.1101, 8 CCR 1529 for asbestos and 29 CFR 1926.62 and 8 CCR 1532.1 for lead.

1. At minimum, Contractor shall conduct representative (25% of crew) breathing zone personal air monitoring of its employees twice each shift (asbestos only) and repeated daily or until a "negative exposure assessment", as derived in
accordance with 29 CFR 1926.1101 (f)(2)(iii) and 8 CCR 1529 for asbestos, and 8 CCR 1532.1 for lead.

2. Monitoring shall be conducted by a qualified air professional experienced and knowledgeable about the methods of air monitoring and in accordance with 29 CFR 1926.1101, 8 CCR 1529 and 8 CCR 1532.1.

3. Monitoring results and appropriate laboratory analysis work shall be submitted to SBIAA representative within twenty-four (24) hours of the monitoring work.

3.9 Alternative Procedures

A. If specified procedures cannot be utilized, a request shall be made in writing to SBIAA providing details of the problem encountered and recommended alternatives.

B. The removal of all “other” hazardous materials shall be handled as an alternative procedure. Contractor shall submit a work plan for the removal, handling, and disposal of all “other” hazardous materials, including but not limited to suspect ACMs not previously sampled (see Article 1.2.M), and suspect LBP not previously sampled.

Work described in said work plan(s) shall not commence until the work plan has been accepted and approved, in writing, by SBIAA.

C. Alternative procedures shall provide equivalent or greater protection than procedures that are replaced.

D. Any alternative procedure must be approved in writing by SBIAA prior to the implementation of the procedure.

End of Section
Structural Calculations

for

Inland Valley Development

264 South Leland Norcon Way
San Bernardino, CA 92408

Date:
September 9, 2016

Prepared By:
HL
USGS-Provided Output

\[ S_s = 1.870 \text{ g} \quad S_{MS} = 1.870 \text{ g} \quad S_{DS} = 1.247 \text{ g} \]
\[ S_s = 0.867 \text{ g} \quad S_{MS} = 1.300 \text{ g} \quad S_{DS} = 0.867 \text{ g} \]

For information on how the SS and S1 values above have been calculated from probabilistic (risk-targeted) and deterministic ground motions in the direction of maximum horizontal response, please return to the application and select the "2009 NEHRP" building code reference document.

Although this information is a product of the U.S. Geological Survey, we provide no warranty, expressed or implied, as to the accuracy of the data contained therein. This tool is not a substitute for technical subject-matter knowledge.
Unit Lateral Seismic Analysis

\[ S_{DS} = 1.247 \]
\[ a_p = 1.0 \quad \text{(From ASCE7-10 Table 13.6-1)} \]
\[ R_p = 2.5 \quad \text{(From ASCE7-10 Table 13.6-1)} \]
\[ \Omega_0 = 2.5 \quad \text{(From ASCE7-10 Table 13.6-1)} \]
\[ l_p = 1.0 \quad \text{(From ASCE7-10 Section 13.1.3)} \]
\[ z = 0.0 \text{ ft} \]
\[ h = 1.0 \text{ ft} \]
\[ W_p = 680 \text{ lbs} \quad \text{(Half of the Unit Weight)} \]

\[ F_p = \frac{0.4a_p S_{DS} W_p}{\left(1 + \frac{z}{h}\right)} \left(\frac{R_p}{l_p}\right) = 135.674 \text{ lbs} \quad \text{(ASCE7-10 Eq. 13.3-1)} \]

\[ F_{p(Min)} = 1.6S_{DS} l_p W_p = 1357 \text{ lbs} \quad \text{(ASCE7-10 Eq. 13.3-2)} \]

\[ F_{p(Max)} = 0.3S_{DS} l_p W_p = 254 \text{ lbs} \quad \text{(ASCE7-10 Eq. 13.3-3)} \]

Lateral Seismic Force, \( F_p = 254 \text{ lbs} \) or \( 0.7F_p = 178 \text{ (ASD)} \)

Anchorage Analysis

**Bolt Design**

- Bolt spacing = 24 in
- \( L = 8 \text{ in} \)
- \( M_{max} = 0.7W_p \times L = 5440 \text{ in-lbs} \)
- Tension, \( T = \frac{M_{max}}{24} = 227 \text{ lbs} \)
- \( T_{TL} = F_p + T_{self wt.} = 405 \text{ lbs} \)
- \( T_{per bolt} = \frac{T_{TL}}{n} = 202 \text{ lbs/bolt} \)
- \( V_{per bolt} = \frac{W_p}{2} = 340 \text{ lbs/bolt} \)

1. Project Information
Customer company:
Customer contact name:
Customer e-mail:
Comment:

2. Input Data & Anchor Parameters

General
Design method: ACI 318-11
Units: Imperial units

Anchor Information:
Anchor type: Concrete screw
Material: Carbon Steel
Diameter (inch): 0.500
Nominal Embedment depth (inch): 3.750
Effective Embedment depth, h-et (inch): 2.780
Code report: ICC-ES ESR-2713
Anchor category: 1
Anchor ductility: No
h_mn (inch): 5.83
c_m (inch): 4.19
c_m (inch): 1.75
S_m (inch): 3.00

Load and Geometry
Load factor source: ACI 318 Appendix C
Load combination: not set
Seismic design: Yes
Anchors subjected to sustained tension: Not applicable
Ductility section for tension: D.3.3.4.3 (c) is satisfied
Ductility section for shear: D.3.3.5.3 (b) is satisfied
D_o factor: not set
Apply entire shear load at front row: No
Anchors only resisting wind and/or seismic loads: Yes

Base Material
Concrete: Normal-weight
Concrete thickness, h (inch): 6.00
State: Cracked
Compressive strength, f_c (psi): 3000
W_0: 1.0
Reinforcement condition: A tension, A shear
Supplemental reinforcement: Not applicable
Reinforcement provided at corners: No
Do not evaluate concrete breakout in tension: No
Do not evaluate concrete breakout in shear: No
Ignore 6do requirement: Not applicable
Build-up grout pad: No

Base Plate
Length x Width x Thickness (inch): 6.00 x 28.00 x 0.25

<Figure 1>
Recommended Anchor
Anchor Name: Titen HD® - 1/2"Ø Titen HD, hnom:3.75" (95mm)
Code Report: ICC-ES ESR-2713
3. Resulting Anchor Forces

<table>
<thead>
<tr>
<th>Anchor</th>
<th>Tension load, $N_{ax}$ (lb)</th>
<th>Shear load $x$, $V_{ax}$ (lb)</th>
<th>Shear load $y$, $V_{ay}$ (lb)</th>
<th>Shear load combined, $V((V_{ax})^{2}+V_{ay})^{0.5}$ (lb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1201.9</td>
<td>340.0</td>
<td>0.0</td>
<td>340.0</td>
</tr>
<tr>
<td>2</td>
<td>1201.9</td>
<td>340.0</td>
<td>0.0</td>
<td>340.0</td>
</tr>
<tr>
<td>Sum</td>
<td>2403.7</td>
<td>680.0</td>
<td>0.0</td>
<td>680.0</td>
</tr>
</tbody>
</table>

Maximum concrete compression strain ($\varepsilon_c$): 0.05
Maximum concrete compression stress (psi): 206
Resultant tension force (lb): 2404
Resultant compression force (lb): 1957
Eccentricity of resultant tension forces in x-axis, $e_{nx}$ (inch): 0.00
Eccentricity of resultant tension forces in y-axis, $e_{ny}$ (inch): 0.00
Eccentricity of resultant shear forces in x-axis, $e_{vx}$ (inch): 0.00
Eccentricity of resultant shear forces in y-axis, $e_{vy}$ (inch): 0.00

<Figure 3>

4. Steel Strength of Anchor in Tension (Sec. D.5.1)

$N_{ax} \leq \frac{\phi}{\rho} \cdot \frac{N_{0}}{\rho}$

<table>
<thead>
<tr>
<th>$N_{0}$ (lb)</th>
<th>$\phi$</th>
<th>$\rho N_{ax}$ (lb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>20130</td>
<td>0.70</td>
<td>14091</td>
</tr>
</tbody>
</table>

5. Concrete Breakout Strength of Anchor in Tension (Sec. D.5.2)

$N_{0} = \frac{f_{a}f_{c}V_{CN}}{\phi_{C}}$ (Eq. D-6)

<table>
<thead>
<tr>
<th>$f_{a}$ (ksi)</th>
<th>$f_{c}$ (ksi)</th>
<th>$V_{CN}$ (in)</th>
<th>$\phi_{C}$</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.75$N_{0}$</td>
<td>0.75$N_{0}$</td>
<td>$V_{CN}$</td>
<td>0.85</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>$A_{NC}$ (in²)</th>
<th>$V_{CN,N}$ (lb)</th>
<th>$V_{CN}$ (lb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>139.11</td>
<td>69.56</td>
<td>1.00</td>
</tr>
</tbody>
</table>

8. Steel Strength of Anchor in Shear (Sec. D.6.1)

$V_{as}$ (lb) = $\phi_{prel}$ + $\phi_{prel}(V_{ax})^{0.5}$ (lb)

<table>
<thead>
<tr>
<th>$V_{ax}$ (lb)</th>
<th>$\phi_{prel}$</th>
<th>$\phi_{prel}(V_{ax})^{0.5}$ (lb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>4790</td>
<td>1.0</td>
<td>0.65</td>
</tr>
</tbody>
</table>

9. Concrete Breakout Strength of Anchor in Shear (Sec. D.6.2)

Shear perpendicular to edge in x-direction:

$V_{ax} = \min\{\alpha_{i}^{0.5}d_{ax}V_{ax}, c_{ax}^{0.5}\}$ (Eq. D-33 & Eq. D-34)

<table>
<thead>
<tr>
<th>$\alpha_{i}$ (in)</th>
<th>$d_{ax}$ (in)</th>
<th>$c_{ax}$ (in)</th>
<th>$V_{ax}$ (lb)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.78</td>
<td>0.50</td>
<td>1.00</td>
<td>3000</td>
</tr>
</tbody>
</table>

$V_{ax} = \min\{\alpha_{i}^{0.5}d_{ax}V_{ax}, c_{ax}^{0.5}\}$ (Eq. D-33 & Eq. D-34)

Shear parallel to edge in x-direction:

$V_{by} = \min\{\alpha_{i}^{0.5}d_{by}V_{by}, c_{by}^{0.5}\}$ (Eq. D-33 & Eq. D-34)
Anchor Designer™ Software
Version 2.4.6025.26

10. Concrete Pryout Strength of Anchor in Shear (Sec. D.6.3)

\[ \phi V_{cd} = \phi K_c N_{cd} = \phi K_c (A_{nc} / A_{na}) V_{sec} V_{yc} \]  

Where:  
- \( K_c \) = 2.0  
- \( A_{nc} \) = 139.11 in²  
- \( A_{na} \) = 69.56 in²  
- \( V_{sec} \) = 1.000  
- \( V_{yc} \) = 1.000  
- \( N_{cd} \) = 12948 lb  
- \( \phi \) = 0.75

\[ \phi V_{cd} = 4316 \text{ lb} \]

11. Results

Interaction of Tensile and Shear Forces (Sec. D.7)

<table>
<thead>
<tr>
<th>Tension</th>
<th>Factored Load, ( N_a ) (lb)</th>
<th>Design Strength, ( \phi N_a ) (lb)</th>
<th>Ratio ( \phi )</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steel</td>
<td>1202</td>
<td>14091</td>
<td>0.09</td>
<td>Pass</td>
</tr>
<tr>
<td>Concrete breakout</td>
<td>2404</td>
<td>5503</td>
<td>0.44</td>
<td>Pass (Govern)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Shear</th>
<th>Factored Load, ( V_a ) (lb)</th>
<th>Design Strength, ( \phi V_a ) (lb)</th>
<th>Ratio ( \phi )</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steel</td>
<td>340</td>
<td>3114</td>
<td>0.11</td>
<td>Pass (Govern)</td>
</tr>
<tr>
<td>T Concrete breakout x+</td>
<td>680</td>
<td>7795</td>
<td>0.09</td>
<td>Pass</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Concrete breakout y-</td>
<td>340</td>
<td>6928</td>
</tr>
<tr>
<td>Pryout</td>
<td>680</td>
<td>12948</td>
<td>0.06</td>
<td>Pass</td>
</tr>
</tbody>
</table>

Interaction check

\[ \frac{N_a}{\phi N_a} \quad \frac{V_a}{\phi V_a} \quad \text{Combined Ratio} \quad \text{Permissible} \quad \text{Status} \]

Sec. D.7.1 0.44 0.00 43.7% 1.0 Pass

1/2"Ø Titen HD, hnom:3.75" (95mm) meets the selected design criteria.

12. Warnings

- Per designer input, ductility requirements for tension have been determined to be satisfied – designer to verify.
- Per designer input, ductility requirements for shear have been determined to be satisfied – designer to verify.
- Designer must exercise own judgement to determine if this design is suitable.
- Refer to manufacturer's product literature for hole cleaning and installation instructions.
EXISTING BEAM CHECK

EXISTING CONCRETE BEAM
10" x 10" W/ 4 #6 CONT.

w_d = 450 PLF

20'-0"
**Concrete Beam**

**Lic. #: KW-06000033**

**Description:** EXISTING CONCRETE BEAM CHECK

**CODE REFERENCES**

Calculations per ACI 318-11, IBC 2012, ASCE 7-10

Load Combination Set: IBC 2012

**Material Properties**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>$f_c$</td>
<td>2.50 ksi</td>
</tr>
<tr>
<td>$f_{cr}$</td>
<td>375.0 psi</td>
</tr>
<tr>
<td>Density</td>
<td>145.0 pcf</td>
</tr>
<tr>
<td>$\lambda$</td>
<td>1.0</td>
</tr>
<tr>
<td>Elastic Modulus</td>
<td>3,122.0 ksi</td>
</tr>
<tr>
<td>$f_y$</td>
<td>60.0 ksi</td>
</tr>
<tr>
<td>$f_E$</td>
<td>29,000.0 ksi</td>
</tr>
<tr>
<td>$\phi$</td>
<td>0.90</td>
</tr>
<tr>
<td>$\beta_1$</td>
<td>0.850</td>
</tr>
<tr>
<td>$\tau$</td>
<td>40.0 ksi</td>
</tr>
</tbody>
</table>

**Cross Section & Reinforcing Details**

Rectangular Section, Width = 10.0 in, Height = 10.0 in

Span #1 Reinforcing...

2-#6 at 1.50 in from Bottom, from 0.0 to 20.0 ft in this span

2-#6 at 1.50 in from Top, from 0.0 to 20.0 ft in this span

**Applied Loads**

**Load for Span Number 1**

Uniform Load: $D = 0.450$ kft, Tributary Width = 1.0 ft

**DESIGN SUMMARY**

Maximum Bending Stress Ratio = 0.712 : 1

<table>
<thead>
<tr>
<th>Section used for this span</th>
<th>Typical Section</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mu : Applied</td>
<td>-21.0 k-ft</td>
</tr>
<tr>
<td>Mn * Phi : Allowable</td>
<td>29.491 k-ft</td>
</tr>
</tbody>
</table>

Location of maximum on span = 20,000 ft

Span # where maximum occurs = Span #1

<table>
<thead>
<tr>
<th>Reaction</th>
<th>Support 1</th>
<th>Support 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall Maximum</td>
<td>4.500</td>
<td>4.500</td>
</tr>
<tr>
<td>Overall Minimum</td>
<td>2.700</td>
<td>2.700</td>
</tr>
<tr>
<td>$+D+H$</td>
<td>4.500</td>
<td>4.500</td>
</tr>
<tr>
<td>$+D+L+H$</td>
<td>4.500</td>
<td>4.500</td>
</tr>
<tr>
<td>$+D+L+R+H$</td>
<td>4.500</td>
<td>4.500</td>
</tr>
<tr>
<td>$+D+D+H$</td>
<td>4.500</td>
<td>4.500</td>
</tr>
<tr>
<td>$+D+0.750L+R+0.750L+H$</td>
<td>4.500</td>
<td>4.500</td>
</tr>
<tr>
<td>$+D+0.750L+0.750S+H$</td>
<td>4.500</td>
<td>4.500</td>
</tr>
<tr>
<td>$+D+0.60W+H$</td>
<td>4.500</td>
<td>4.500</td>
</tr>
<tr>
<td>$+D+0.70E+H$</td>
<td>4.500</td>
<td>4.500</td>
</tr>
<tr>
<td>$+D+0.750L+R+0.750L+0.450W+H$</td>
<td>4.500</td>
<td>4.500</td>
</tr>
<tr>
<td>$+D+0.750L+0.750S+0.450W+H$</td>
<td>4.500</td>
<td>4.500</td>
</tr>
<tr>
<td>$+D+0.750L+0.750S+0.5250E+H$</td>
<td>4.500</td>
<td>4.500</td>
</tr>
<tr>
<td>$+D+0.90D+0.90W+0.60H$</td>
<td>2.700</td>
<td>2.700</td>
</tr>
</tbody>
</table>

**Maximum Deflection**

- Max Downward Transient Deflection: 0.000 in, Ratio = 0 < 360
- Max Upward Transient Deflection: 0.000 in, Ratio = 0 < 360
- Max Downward Total Deflection: 0.227 in, Ratio = 1056 >= 18
- Max Upward Total Deflection: 0.000 in, Ratio = 999 >= 18

**Design OK**

Support notation: Far left is #1
### Concrete Beam

**Description:** EXISTING CONCRETE BEAM CHECK

<table>
<thead>
<tr>
<th>Vertical Reactions</th>
<th>Support 1</th>
<th>Support 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>D Only</td>
<td>4.500</td>
<td>4.500</td>
</tr>
<tr>
<td>Lr Only</td>
<td></td>
<td></td>
</tr>
<tr>
<td>L Only</td>
<td></td>
<td></td>
</tr>
<tr>
<td>S Only</td>
<td></td>
<td></td>
</tr>
<tr>
<td>W Only</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E Only</td>
<td></td>
<td></td>
</tr>
<tr>
<td>H Only</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Support notation:** Far left is #1