1959
LEG #19286

PROJECT MANUAL FOR

OFFICE/CONFERENCE ROOMS
HVAC REPLACEMENT
CLOVIS VETERANS MEMORIAL DISTRICT
808 4TH STREET
CLOVIS, CA 93612

CLOVIS VETERANS MEMORIAL DISTRICT
808 FOURTH STREET
CLOVIS, CA 93612

PREPARED BY:

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Exp. 6/30/20
MECHANICAL
STATE OF CALIFORNIA

PROJECT / MECHANICAL ENGINEER:

LICENSED ARCHITECT
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11-30-21
RENEWAL DATE
STATE OF CALIFORNIA

CONSULTING ARCHITECT:

REGISTERED PROFESSIONAL ENGINEER
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EXPIRES
3-31-20
STRUCTURAL
STATE OF CALIFORNIA

CONSULTING STRUCTURAL ENGINEER:

REGISTERED PROFESSIONAL ENGINEER
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ELECTRICAL
STATE OF CALIFORNIA

CONSULTING ELECTRICAL ENGINEER:

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FOR

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IDENTIFICATION NO. 2020-01

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NOTICE INVITING BIDS
FOR

HVAC REPLACEMENT [the "Project"]

Identification number: 2020-01

NOTICE IS HEREBY GIVEN that the Clovis Veterans Memorial District, Clovis, California ("District") invites sealed Bids for the Project. The District will receive such Bids at the Rex Phebus Veterans Building, 808 Fourth Street, Clovis, CA 93612 up to 2p.m. on March 2, 2020, at which time they will be publicly opened and read aloud.

SCOPE OF WORK. The Project includes, without limitation, furnishing all necessary labor, materials, equipment and other incidental and appurtenant Work necessary to satisfactorily complete the Project, as more specifically described in the Contract Documents. This Work will be performed in strict conformance with the Contract Documents, permits from regulatory agencies with jurisdiction, and applicable regulations. The quantity of Work to be performed and materials to be furnished are approximations only, being given as a basis for the comparison of Bids. Actual quantities of Work to be performed may vary at the discretion of the District.

OBTAINING BID DOCUMENTS. Bidders may obtain free copies of the Plans, Specifications and other Contract Documents online by visiting www.cvmdistrict.org/opportunities and obtaining the password from District Staff.

REGISTRATION WITH THE DEPARTMENT OF INDUSTRIAL RELATIONS. In accordance with Labor Code Sections 1725.5 and 1771.1, no contractor or subcontractor shall be qualified to bid on, be listed in a bid proposal, subject to the requirements of Section 4104 of the Public Contract Code, or engage in the performance of any contract for public work, unless currently registered and qualified to perform public work pursuant to Section 1725.5 [with limited exceptions for bid purposes only under Labor Code Section 1771.1(a)].

PREVAILING WAGES. In accordance with Labor Code Section 1770 *et seq*., the Project is a "public work." The selected Bidder (Contractor) and any Subcontractors shall pay wages in accordance with the determination of the Director of the Department of Industrial Relations ("DIR") regarding the prevailing rate of per diem wages. Copies of those rates are on file with the Director of Public Works, and are available to any interested party upon request. The Contractor shall post a copy of the DIR's determination of the prevailing rate of per diem wages at each job site. This Project is subject to compliance monitoring and enforcement by the DIR.

BONDS. Each Bid must be accompanied by a cash deposit, cashier's check, certified check or Bidder's Bond issued by a Surety insurer, made payable to the District and in an amount not less than ten percent (10%) of the total Bid submitted. Personal or company checks are not acceptable. Upon Contract award, the Contractor shall provide faithful performance and payment Bonds, each in a sum equal to the Contract Price. All Bonds must be issued by a California admitted Surety insurer using the forms set forth in the Contract Documents, or in any other form approved by the District Counsel. Failure to enter into the Contract with the District, including the submission of all required Bonds and insurance coverages, within fifteen (15) Days after the date of the mailing of written notice of contract award to the Bidder, shall subject the Bid security to forfeiture to the extent provided by law.

LICENSES. Each Bidder shall possess a valid Class B or C20 Contractor's license issued by the California State Contractors License Board at the time of the Bid submission, unless this Project has any federal funding, in which case the successful Bidder must possess such a license at the time of Contract award. The successful Contractor must also possess a current City business license.

RETENTION SUBSTITUTION. Five percent (5%) of any progress payment will be withheld as retention. In accordance with Public Contract Code Section 22300, and at the request and expense of the Contractor, securities equivalent to the amount withheld may be deposited with the City or with a State or federally chartered bank as escrow agent, which shall then pay such moneys to the Contractor. Upon satisfactory completion of the Project, the securities shall be returned to the Contractor. Alternatively, the Contractor may request that the District make payments of earned retentions directly to an escrow agent at the Contractor's expense. No such substitutions shall be accepted until all related documents are approved by the District Counsel.

BIDDING PROCESS. The District reserves the right to reject any Bid or all Bids, and to waive any irregularities or informalities in any Bid or in the bidding, as deemed to be in its best interest.

By: _____ _____

District Official Date

INSTRUCTIONS TO BIDDERS

FORM OF BID. Bids shall be made on the Bid forms found herein. Bidders shall include all forms and fill in all blank spaces, including inserting "N/A" (for not applicable) where necessary. Each Bid must be submitted in a sealed envelope bearing the Bidder's name and addressed to the Clovis Veterans Memorial District with the Project name and identification number (as described in the Notice Inviting Bids) typed or clearly printed on the lower left corner of the envelope.

DELIVERY OF BIDS. The Bid shall be delivered by the time and date, and to the place specified in the Notice Inviting Bids. No oral, faxed, emailed, or telephonic Bids or alternatives will be considered. The time of delivery shall be conclusively determined by the time-stamping clock located at the Clovis Veterans Memorial District Office. Bidders are solely responsible for ensuring that their Bids are received in proper time, and Bidders assume all risks arising out of their chosen means of delivery. Any Bid received after the Bid submission deadline shall be returned unopened. Bidders are invited to be present for Bid opening. Accepted Bids shall become the property of the District.

AMENDED BIDS. Unauthorized conditions, limitations or provisos attached to a Bid may cause the Bid to be deemed incomplete and non-responsive.

WITHDRAWAL OF BID. A Bid may be withdrawn without prejudice upon written request by the Bidder filed with the District before the Bid submission deadline. Bids must remain valid and shall not be subject to withdrawal for sixty (60) Days after the Bid opening date.

BIDDER'S SECURITY. Each Bid shall be accompanied by cash, a certified or cashier's check payable to the District, or a satisfactory Bid Bond in favor of the District executed by the Bidder as principal and an admitted surety insurer as Surety, in an amount not less than ten percent (10%) of the amount set forth in the Bid. The cash, check or Bid Bond shall be given as a guarantee that, if selected, the Bidder will execute the Contract in conformity with the Contract Documents, and will provide the evidence of insurance and furnish the specified Bonds, within fifteen (15) Days after the date of delivery of the Contract Documents to the Bidder. In case of the Bidder's refusal or failure to do so, the District may award the Contract to the next lowest responsible bidder, and the cash, check, or Bond (as applicable) of the lowest Bidder shall be forfeited to the District to the extent permitted by law. No Bid Bond will be accepted unless it conforms substantially to the form provided in these Contract Documents.

QUANTITIES APPROXIMATE. Any quantities shown in the Bid form or elsewhere herein shall be considered as approximations listed to serve as a general indication of the amount of Work or materials to be performed or furnished, and as basis for the Bid comparison. The District does not guarantee that the actual amounts required will correspond with those shown. As deemed necessary or convenient, the District may increase or decrease the amount of any item or portion of Work or material to be performed or furnished or omit any such item or portion, in accordance with the Contract Documents.

ADDENDA. The District may, from time to time, issue Addenda to the Contract Documents. Bidders are responsible for ensuring that they have received any and all Addenda. Each Bidder is responsible for verifying that it has received all Addenda issued, if any. Bidders must acknowledge receipt of all Addenda, if any, in their bids. Failure to acknowledge receipt of all Addenda may cause a Bid to be deemed incomplete and non-responsive.

FACSIMILE NUMBER AND EMAIL ADDRESS. Bidders shall supply the District with a facsimile number and email address to facilitate transmission of Addenda and other information related to these Contract Documents. If the Addenda and other information are emailed, the District shall also send all documents by facsimile or U.S. Mail. Failure to provide such a facsimile number and email address may result in late notification. The District does not guarantee that it will provide any information by facsimile, email, or both. A Bidder shall be responsible for all Addenda regardless of whether Bidder received any such fax or email, and a Bidder shall have no recourse due to not receiving such facsimile, email or both.

DISCREPANCIES IN BIDS. Each bidder shall set forth as to each item of Work, in clearly legible words and figures, a unit or line item Bid amount for the item in the respective spaces provided for this purpose.

In case of discrepancy between the unit price and the extended amount set forth for the item, the unit price shall prevail. However, if the amount set forth as a unit price is ambiguous, unintelligible or uncertain for any cause, or is omitted, or if the unit price is the same amount as the entry in the "extended amount" column, then the amount set forth in the "extended amount" column for the item shall prevail in accordance with the following:

(1) As to lump sum items, the amount set forth in the "extended amount" column shall be the unit price.

(2) As to unit price items, the amount set forth in the "extended amount" column shall be divided by the estimated quantity for the item set forth in the Bid documents, and the price thus obtained shall be the unit price.

In case of discrepancy between words and figures, the words shall prevail.

COMPETENCY OF BIDDERS. In evaluating Bidder responsibility, consideration will be given not only to the financial standing, but also to the general competency of the Bidder for the performance of the Project. Each Bidder shall set forth in the designated area of the Bid form a statement of its experience. No Contract will be executed with a Bidder that is not licensed and registered with the DIR in accordance with State law, and with any applicable specific licensing requirements specified in these Contract Documents. These licensing and registration requirements for Contractors shall also apply to all Subcontractors.

BIDDER'S EXAMINATION OF SITE AND CONTRACT DOCUMENTS. Each Bidder must carefully examine the Project site and the entirety of the Contract Documents. Upon submission of a Bid, it will be conclusively presumed that the Bidder has thoroughly investigated the Work and is satisfied as to the conditions to be encountered and the character, quality, and quantities of Work to be performed and materials to be furnished. Upon Bid submission, it also shall be conclusively presumed that the Bidder is familiar with and agrees to the requirements of the Contract Documents, including all Addenda. No information derived from an inspection of records or investigation will in any way relieve the Contractor from its obligations under the Contract Documents nor entitle the Contractor to any additional compensation. The Contractor shall not make any claim against the District based upon ignorance or misunderstanding of any condition of the Project site or of the requirements set forth in the Contract Documents. No claim for additional compensation will be allowed which is based on a lack of knowledge of the above items. Bidders assume all risks in connection with performance of the Work in accordance with the Contract Documents, regardless of actual conditions encountered, and

waive and release the District with respect to any and all claims and liabilities in connection therewith, to the extent permitted by law.

TRADE NAMES OR EQUALS. Requests to substitute an equivalent item for a brand or trade name item must be made by written request submitted no later than the date specified in Section 4-6 of the General Provisions. Requests received after this time shall not be considered. Requests shall clearly describe the product for which approval is requested, including all data necessary to demonstrate acceptability.

DISQUALIFICATION OF BIDDERS. No Person shall be allowed to make, file or be interested in more than one Bid for the Project, unless alternate Bids are specifically called for. A Person that has submitted a sub-bid to a Bidder, or that has quoted prices of materials to a Bidder, is not thereby disqualified from submitting a sub-proposal or quoting prices to other Bidders or from making a prime Bid. If there is a reason to believe that collusion exists among the Bidders, all affected Bids will be rejected.

RETURN OF BID SECURITY. The successful Bidder's Bid security shall be held until the Contract is executed. Bid security shall be returned to the unsuccessful Bidders within a reasonable time, which in any case shall not exceed sixty (60) Days after the successful Bidder has signed the Contract.

AWARD OF CONTRACT. The District reserves the right to reject any or all Bids or any parts thereof or to waive any irregularities or informalities in any Bid or in the bidding. The Contract award, if made, will be to the lowest responsible, responsive Bidder and is anticipated to occur within sixty (60) Days after the Bid opening. The Contract award may be made after that period if the selected Bidder has not given the District written notice of the withdrawal of its Bid.

TRENCHING. If the Project involves the construction of a pipeline, sewer, sewage disposal system, boring and jacking pits, or similar trenches or open excavations, which are five (5) feet deep or more, then each Bidder must submit, as a Bid item, adequate sheeting, shoring, and bracing, or an equivalent method, for the protection of life or limb, which shall conform to applicable safety orders. This final submission must be accepted by the District in advance of excavation and must include a detailed plan showing the design of shoring, bracing, sloping, or other provisions to be made for worker protection from caving ground during the excavation Work. If such plan varies from the shoring system standards, the plan shall be prepared by a registered civil or structural engineer.

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 Section 4100, *et seq*.).

EXECUTION OF CONTRACT. The selected Bidder shall execute the Contract in the form included in these Contract Documents within fifteen (15) Days from the date of delivery of the Contract Documents to the Bidder. Additionally, the selected Bidder shall also secure all insurance and Bonds as herein specified, and provide copies to the District, within fifteen (15) Days from the date of delivery of the Contract Documents to the Bidder. Failure or refusal to execute the Contract or to conform to any of the stipulated requirements shall be just cause for the annulment of the award and forfeiture of the Bidder's security. In such event, the District may declare the Bidder's security forfeited to the extent permitted by law, and the District may award the Contract to the next lowest responsible Bidder or may reject all bids.

SIGNATURES. The Bidder shall execute all documents requiring signatures and shall cause to be notarized all documents that indicate such a requirement. Bids submitted as joint ventures must so state and be signed by each joint venturer. The Bidder shall provide evidence satisfactory to the District, such as an authenticated resolution of its board of directors, a certified copy of a certificate of partnership acknowledging the signer to be a general partner, or a power of attorney, indicating the capacity of the person(s) signing the Bid to bind the Bidder to the Bid and any Contract arising therefrom. Alternatively, Bids submitted by corporations must be executed as specified in Corporations Code Section 313, and Bids submitted by partnerships must be executed by all partners comprising the partnership.

INSURANCE AND BONDS. The Contractor shall not begin Work until it has given the District evidence of all required insurance coverage (including all additional insured endorsements), a Bond guaranteeing the Contractor's faithful performance of the Contract, and a Bond securing the payment of claims for labor and materials.

TELEPHONES. Bidders are hereby notified that the District will not provide telephones for their use at the time of Bid submission.

INTERPRETATION OF CONTRACT DOCUMENTS. Any Bidder that is in doubt as to the intended meaning of any part of the Contract Documents, or that finds discrepancies in or omissions from the Contract Documents, may submit to the District a written request for an interpretation or correction not later than ten (10) Days before the Bid submission deadline. Requests for clarification received after this date will be disregarded. Please indicate the Project and identification number in the request for clarification. Telephonic requests will not be taken. Any interpretation or correction of the Contract Documents will be made only by a written Addendum. No oral interpretation of any provision in the Contract Documents shall be binding.

TAXES. Except as may be otherwise specifically provided herein, all sales and/or use taxes assessed by federal, State or local authorities on materials used or furnished by the Contractor in performing the Work shall be paid by the Contractor. The Bidder shall calculate payment for all sales, unemployment, pension and other taxes imposed by federal, State, and local law and shall include these payments in computing the Bid.

CHECKLIST FOR BIDDERS

The following information is required of all Bidders at the time of Bid submission:

____ Completed and Signed Bid Cover Form

____ Completed and Signed Bid Sheets

____ Completed, Signed and Notarized Questionnaire

____ Completed References Form

____ Resume of General Construction Superintendent/On-Site Construction Manager

____ Completed Subcontractor Designation Form

____ Completed and Signed Industrial Safety Record Form

____ Completed, Signed and Notarized Bid Bond or Other Security Form

____ Signed and Notarized Noncollusion Declaration Form

____ Evidence satisfactory to the District indicating the capacity of the person(s) signing the Bid to bind the Bidder

Failure of the Bidder to provide all required information in a complete and accurate manner may cause the Bid to be considered non-responsive.

BID

Clovis Veterans Memorial District

HVAC REPLACEMENT [PROJECT]

TO THE CHAIRMAN OF THE CLOVIS VETERANS MEMORIAL DISTRICT & BOARD OF DIRECTORS

The undersigned, as Bidder, declares that: (1) this Bid is made without collusion with any other person and that the only persons or parties interested as principals are those named herein; (2) the undersigned has carefully examined the Contract Documents (including all Addenda) and the Project site; and (3) the undersigned has investigated and is satisfied as to the conditions to be encountered, the character, quality and quantities of Work to be performed, and the materials to be furnished. Furthermore, the undersigned agrees that submission of this Bid shall be conclusive evidence that such examination and investigation have been made and agrees, in the event the Contract be awarded to it, to execute the Contract with the Clovis Veterans Memorial District to perform the Project in accordance with the Contract Documents in the time and manner therein prescribed, and to furnish or provide all materials, labor, tools, equipment, apparatus and other means necessary so to do, except as may otherwise be furnished or provided under the terms of the Contract Documents, for the following stated unit prices or lump-sum price as submitted on the Bid herein.

Bidder acknowledges receipt of all addenda, as follows:

Addendum No. _____ Date: _____

Addendum No. _____ Date: _____

Addendum No. _____ Date: _____

Addendum No. _____ Date: _____

The undersigned submits as part of this Bid a completed copy of its Industrial Safety Record. This Safety Record includes all construction Work undertaken in California by the undersigned and any partnership, joint venture or corporation that any principal of the undersigned participated in as a principal or owner for the last five (5) calendar years and the current calendar year before the date of Bid submittal. Separate information is being submitted for each such partnership, joint venture, or corporate or individual Bidder. The undersigned may attach any additional information or explanation of data that it would like to be taken into consideration in evaluating the Safety Record. An explanation of the circumstances surrounding any and all fatalities is attached.

Accompanying this Bid is cash, a cashier's check, a certified check or a Bid Bond in an amount equal to at least ten percent (10%) of the total aggregate Bid price based on the quantities shown and the unit prices quoted. The undersigned further agrees that, should it be awarded the Contract and thereafter fail or refuse to execute the Contract and provide the required evidence of insurance and Bonds within fifteen (15) Days after delivery of the Contract to the undersigned, then the cash, check or Bid Bond shall be forfeited to the District to the extent permitted by law.

The undersigned certifies to have a minimum of three (3) consecutive years of current experience in the type of Work related to the Project and that this experience is in actual operation of the firm with permanent employees performing a part of the Work as distinct from a firm operating entirely by subcontracting all phases of the Work. The undersigned also certifies to be properly licensed by the State as a contractor to perform this type of Work. The undersigned possesses California Contractor's License Number _____, Class _____, which expires on _____.

Bidder's Name: _____

Signature: _____ Title: _____ Date: _____

Signature: _____ Title: _____ Date: _____

CLOVIS VETERANS MEMORIAL DISTRICT

BID SHEETS FOR

HVAC REPLACEMENT

Bidder's Name: _____

To the Chairman of the Board and the Board of Directors of the Clovis Veterans Memorial District:

In compliance with the Notice Inviting Bids, the undersigned hereby agrees to execute the Contract to furnish all labor, materials, equipment and supplies for the Project in accordance with the Contract Documents to the satisfaction and under the direction of the District, at the following price.

TOTAL BID PRICE IN DIGITS: $_____

TOTAL BID PRICE IN WORDS: _____

Signature: _____ Title: _____ Date: _____

Signature: _____ Title: _____ Date: _____

QUESTIONNAIRE FORM

Fill out all of the following information. Attach additional sheets if necessary.

(1) Bidder's Name: _____

(2) If the Bidder's name is a fictitious name, who or what is the full name of the registered owner? If the Bidder's name is not a fictitious name, write "N/A" in the response to this question. If you are doing business under a fictitious name, provide a copy of the filed valid Fictitious Business Name Statement.

_____

(3) Business Address: _____

(4) Telephone: _____ Facsimile: _____

(5) Type of Firm – Individual, Partnership, LLC or Corporation: _____

(6) Corporation organized under the laws of the State of: _____

(7) California State Contractor's License Number and Class: _____

Original Date Issued: _____ Expiration Date: _____

(8) DIR Contractor Registration Number: _____

(9) List the name and title of the person(s) who inspected the Project site for your firm:

_____

(10) Number of years' experience the company has as a contractor in construction work: ____

(11) List the names, titles, addresses and telephone numbers of all individuals, firm members, partners, joint venturers, and company or corporate officers having a principal interest in this Bid:

_____

_____

_____

(12) List all current and prior D.B.A.'s, aliases, and fictitious business names for any principal having interest in this Bid:

_____

_____

_____

(13) List the dates of any voluntary or involuntary bankruptcy judgments against any principal having an interest in this Bid:

_____

_____

_____

(14) For all arbitrations, lawsuits, settlements and the like (in or out of court) that the company or any principal having an interest in this Bid has been involved with in the past five (5) years:

a. List the names, addresses and telephone numbers of contact persons for the parties:

_____

_____

_____

b. Briefly summarize the parties' claims and defenses:

_____

_____

_____

c. State the tribunal (e.g., Superior Court, American Arbitration Association, etc.), the matter number, and the outcome:

_____

_____

_____

(15) Has the company or any principal having an interest in this Bid ever had a contract terminated by the owner or agency? If yes, explain.

_____

_____

_____

(16) Has the company or any principal having an interest in this Bid ever failed to complete a project? If yes, explain.

_____

_____

_____

(17) Has the company or any principal having an interest in this Bid ever been terminated for cause, even if it was converted to a "termination of convenience"? If yes, explain.

_____

_____

_____

(18) For projects that the company or any principal having an interest in this Bid has been involved with in the last five (5) years, did you have any claims or actions:

a. By you against the owner? Circle one: Yes No

b. By the owner against you? Circle one: Yes No

c. By any outside agency or individual for labor compliance?
Circle one: Yes No

d. By Subcontractors? Circle one: Yes No

e. Are any of these claims or actions unresolved or outstanding?
Circle one: Yes No

If your answer is "yes" to any part or parts of this question, explain.

_____

_____

_____

(19) List the last three (3) projects you have worked on or are currently working on for the Clovis Veterans Memorial District (if applicable):

_____

_____

_____

Upon request of the District, the Bidder shall furnish evidence showing a notarized financial statement, financial data, construction experience, or other additional information.

Failure to provide truthful answers to the questions above or in the following References Form may result in the Bid being deemed non-responsive.

The Bidder certifies under penalty of perjury under the laws of the State of California that the information provided above is true and correct.

Notary Public

Subscribed and sworn to me: _____

_____

Signature:_____

This ____ day of _____, 20_____

Title: _____

Signature: _____

(SEAL)

Company

Signature: _____

Title: _____

Date: _____

Signature: _____

Title: _____

Date: _____

REFERENCES FORM

For all public agency projects in excess of $15,000 that you are currently working on or have worked on in the past two (2) years, provide the following information:

Project 1 Name/Number _____

Project Description _____

Approximate Construction Dates From: _____ To: _____

Agency Name: _____

Contact Person: _____Telephone: _____

Address: _____

Original Contract Amount: $_____ Final Contract Amount: $_____

If final amount is different from original amount, please explain (change orders, extra work, etc.).

_____

_____

Did you or any Subcontractor, file any claims against the Agency?
Circle one: Yes No

Did the Agency file any claims against you? Circle one: Yes No

If you answered yes to either of the above two questions, please explain and indicate outcome of claims.

_____

_____

Project 2 Name/Number _____

Project Description _____

Approximate Construction Date From: _____ To: _____

Agency Name: _____

Contact Person: _____Telephone: _____

Address: _____

Original Contract Amount: $_____ Final Contract Amount: $_____

If final amount is different from original amount, please explain (change orders, extra work, etc.).

_____

_____

Did you or any Subcontractor, file any claims against the Agency?
Circle one: Yes No

Did the Agency file any claims against you? Circle one: Yes No

If you answered yes to either of the above two questions, please explain and indicate outcome of claims.

_____

_____

Project 3 Name/Number _____

Project Description _____

Approximate Construction Dates From: _____ To: _____

Agency Name: _____

Contact Person: _____ Telephone: _____

Address: _____

Original Contract Amount: $_____ Final Contract Amount: $_____

If final amount is different from original amount, please explain (change orders, extra work, etc.).

_____

_____

Did you or any Subcontractor, file any claims against the Agency?
Circle one: Yes No

Did the Agency file any claims against you? Circle one: Yes No

If you answered yes to either of the above two questions, please explain and indicate outcome of claims.

_____

_____

Project 4 Name/Number _____

Project Description _____

Approximate Construction Dates From: _____ To: _____

Agency Name: _____

Contact Person: _____ Telephone: _____

Address: _____

Original Contract Amount: $_____ Final Contract Amount: $_____

If final amount is different from original amount, please explain (change orders, extra work, etc.).

_____

_____

Did you or any Subcontractor, file any claims against the Agency?
Circle one: Yes No

Did the Agency file any claims against you? Circle one: Yes No

If you answered yes to either of the above two questions, please explain and indicate outcome of claims.

_____

_____

Project 5 Name/Number _____

Project Description _____

Approximate Construction Dates From: _____ To: _____

Agency Name: _____

Contact Person: _____ Telephone: _____

Address: _____

Original Contract Amount: $_____ Final Contract Amount: $_____

If final amount is different from original amount, please explain (change orders, extra work, etc.).

_____

_____

Did you or any Subcontractor, file any claims against the Agency?
Circle one: Yes No

Did the Agency file any claims against you? Circle one: Yes No

If you answered yes to either of the above two questions, please explain and indicate outcome of claims.

_____

_____

Project 6 Name/Number _____

Project Description _____

Approximate Construction Dates From: _____ To: _____

Agency Name: _____

Contact Person: _____ Telephone: _____

Address: _____

Original Contract Amount: $_____ Final Contract Amount: $_____

If final amount is different from original amount, please explain (change orders, extra work, etc.).

_____

_____

Did you or any Subcontractor, file any claims against the Agency?
Circle one: Yes No

Did the Agency file any claims against you? Circle one: Yes No

If you answered yes to either of the above two questions, please explain and indicate outcome of claims.

_____

_____

RESUME

Attach to this Bid the experience resume of the person who will be designated as General Construction Superintendent or on-site Construction Manager for the Project.

DESIGNATION OF SUBCONTRACTORS
[Public Contract Code Section 4104]

List all Subcontractors who will perform Work or labor or render service to the Contractor in or about the construction of the Work or improvement, or a Subcontractor licensed by the State of California who, under subcontract to the Contractor, specially fabricates and installs a portion of the Work or improvement according to detailed drawings contained in the Plans and Specifications, in an amount in excess of one-half percent (0.5%) of the 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 percent (0.5%) of the Contractor's total Bid or $10,000, whichever is greater. If all Subcontractors do not fit on this page, attach another page listing all information for all other Subcontractors.

Name under which Subcontractor is Licensed and Registered	CSLB License Number(s) and Class(es)	DIR Contractor Registration Number	Address and Phone Number	Type of Work (e.g., Electrical)	Percentage of Total Bid (e.g., 10%)*

* The percentage of the total Bid shall represent the "portion of the work" for the purposes of Public Contract Code Section 4104(b).

INDUSTRIAL SAFETY RECORD FORM

Bidder's Name _____

	Current Year of Record	2018	2017	2016	2015	2014	Total
Number of contracts							
Total dollar amount of contracts (in thousands of dollars)							
Number of fatalities							
Number of lost workday cases							
Number of lost workday cases involving permanent transfer to another job or termination of employment							

The above information was compiled from the records that are available to me at this time and I declare under penalty of perjury under the laws of the State of California that the information is true and accurate within the limitations of those records.

Signature: _____
Title: _____
Date: _____

Signature: _____
Title: _____
Date: _____

Bond No. _____

BID BOND

KNOW ALL PERSONS BY THESE PRESENTS that:

WHEREAS the Clovis Veterans Memorial District ("District"), has issued an invitation for Bids for the Work described as follows: _____
_____

WHEREAS _____
(Name and address of Bidder)

("Principal"), desires to submit a Bid to District for the Work.

WHEREAS, Bidders are required to furnish a form of Bidder's security with their Bids.

NOW, THEREFORE, we, the undersigned Principal, and _____

_____
(Name and address of Surety)

("Surety"), a duly admitted surety insurer under the laws of the State of California, as Surety, are held and firmly bound unto the District in the penal sum of _____
_____
Dollars ($_____), being not less than ten percent (10%) of the total Bid price, in lawful money of the United States of America, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH THAT, if the hereby bounded Principal is awarded the Contract for the Work by the District and, within the time and in the manner required by the bidding specifications, enters into the written form of Contract included with the bidding specifications, furnishes the required Bonds (one to guarantee faithful performance and the other to guarantee payment for labor and materials), and furnishes the required insurance coverage, 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 instrument, Surety further agrees to pay all court costs incurred by the District in the suit and reasonable attorneys' fees in an amount fixed by the court. Surety hereby waives the provisions of Civil Code Section 2845.

IN WITNESS WHEREOF, this instrument has been duly executed by Principal and Surety, on the date set forth below, the name of each corporate party being hereto affixed and these presents duly signed by its undersigned representative(s) pursuant to authority of its governing body.

Dated: _____

"Principal"	"Surety"
_____	_____
_____	_____
By: _____	By: _____
Its: _____	Its: _____
By: _____	By: _____
Its: _____	Its: _____

Note: This Bond must be dated, all signatures must be notarized, and evidence of the authority of any person signing as attorney-in-fact must be attached.

NONCOLLUSION DECLARATION FORM
TO BE EXECUTED BY BIDDER AND SUBMITTED WITH BID
[Public Contract Code Section 7106]

The undersigned declares:

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

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

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

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

Signature:	_____	Signature:	_____
Printed Name:	_____	Printed Name:	_____
Date:	_____	Date:	_____

This form must be notarized.

CHECKLIST FOR EXECUTION OF CONTRACT

TO BE SUBMITTED BY SUCCESSFUL BIDDER:

____ Two (2) executed and notarized copies of the Contract

____ Payment Bond in amount of the Contract

____ Performance Bond in amount of the Contract

____ Workers' Compensation Certificate

____ Liability insurance certificate in the amounts specified in Section 5-4.2 of the General Provisions, naming the District as a co-insured

____ Automobile insurance certificate in the amount specified in Section 5-4.4 of the General Provisions, naming the District as a co-insured

____ Copy of City business license

____ Additional insured endorsement – comprehensive general liability

____ Additional insured endorsement – automobile liability

____ Additional insured endorsement – excess liability

CONTRACT

CLOVIS VETERANS MEMORIAL DISTRICT CONTRACT FOR

_____

THIS CONTRACT ("Contract") is made and entered this _____, 20__ ("Effective Date"), by and between the CLOVIS VETERANS MEMROAIL DISTRICT, a California special district ("District") and _____, a _____ [Legal Form of Entity and state of formation, e.g., California corporation, limited partnership, limited liability company] ("Contractor"). Contractor's California State Contractor's license number is _____; Class ____). Contractor's DIR registration number is _____.

In consideration of the mutual covenants hereinafter set forth, the parties hereto agree as follows:

1. Contract Documents. The Contract Documents consist of this Contract, the Notice Inviting Bids, Instructions to Bidders, Bid (including documentation accompanying the Bid and any post-Bid documentation submitted before the Notice of Award), the Bonds, permits from regulatory agencies with jurisdiction, General Provisions, Special Provisions, Plans, Standard Plans, Standard Specifications, Reference Specifications, Addenda, Change Orders, and Supplemental Agreements. The Contract Documents are attached hereto and incorporated herein by reference.

2. Scope of Services. Contractor shall perform the Work in a good and workmanlike manner for the project identified as _____ ("Project"), as described in this Contract and in the Contract Documents.

3. Compensation. In consideration of the services rendered hereunder, District shall pay Contractor a not to exceed amount of _____ dollars ($_____) in accordance with the prices as submitted in the Bid.

4. Incorporation by Reference. All of the following documents are attached hereto and incorporated herein by this reference: Workers' Compensation Certificate of Insurance, Additional Insured Endorsement (Comprehensive General Liability), Additional Insured Endorsement (Automobile Liability), and Additional Insured Endorsement (Excess Liability).

5. Antitrust Claims. In entering into this Contract, Contractor offers and agrees to assign to District 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. Sec. § 15) or under the Cartwright Act (Business and Professions Code Section 16700 *et seq.*) arising from purchases of goods, services, or materials pursuant to the Contract. This assignment shall be made and become effective at the time District tenders final payment to Contractor without further acknowledgment by the parties.

6. Prevailing Wages. District and Contractor acknowledge that the Project is a public work to which prevailing wages apply.

7. Workers' Compensation. Labor Code Sections 1860 and 3700 provide that every contractor will be required to secure the payment of compensation to its employees. In accordance with the provisions of Labor Code Section 1861, by signing this Contract, the Contractor certifies as follows:

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

8. Titles. The titles used in this Contract are for convenience only and shall in no way define, limit or describe the scope or intent of this Contract or any part of it.

9. Authority. Any person executing this Contract on behalf of Contractor warrants and represents that he or she has the authority to execute this Contract on behalf of Contractor and has the authority to bind Contractor to the performance of its obligations hereunder.

10. Entire Agreement. This Contract, including the Contract Documents and any other documents incorporated herein by specific reference, represents the entire and integrated agreement between District and Contractor. This Contract supersedes all prior oral or written negotiations, representations or agreements. This Contract may not be modified or amended, nor any provision or breach waived, except in a writing signed by both parties that expressly refers to this Contract.

11. Counterparts. This Contract may be executed in counterpart originals, duplicate originals, or both, each of which is deemed to be an original for all purposes.

IN WITNESS WHEREOF, the parties hereto have executed the Contract the day and year first above written.

Clovis Veterans Memorial District

By: _____
Chairman of the Board

ATTEST:

By: _____
Secretary of the Board

APPROVED AS TO FORM:

By: _____
District Counsel

Dated: _____

_____
("CONTRACTOR")

By: _____

By: _____

Richards, Watson & Gershon - 2019

Bond No. _____

PAYMENT BOND
(LABOR AND MATERIALS)

KNOW ALL PERSONS BY THESE PRESENTS that:

WHEREAS the Clovis Veterans Memorial District ("District"), State of California, has awarded to _____

_____

_____ ("Principal")

(Name and address of Contractor)

a contract (the "Contract") for the Work described as follows:

_____

(Project name)

WHEREAS, under the terms of the Contract, the Principal is required before entering upon the performance of the Work, to file a good and sufficient payment Bond with the District to secure the claims to which reference is made in Title 3 (commencing with Section 9000) of Part 6 of Division 4 of the Civil Code.

NOW, THEREFORE, we, the undersigned Principal, and _____

_____

_____

(Name and address of Surety)

("Surety") a duly admitted surety insurer under the laws of the State of California, as Surety, are held and firmly bound unto the District and all contractors, subcontractors, laborers, material suppliers, and other persons employed in the performance of the Contract and referred to in Title 3 (commencing with Section 9000) of Part 6 of Division 4 of the Civil Code in the penal sum of _____
Dollars ($_____), for materials furnished or labor thereon of any kind, or for amounts due under the Unemployment Insurance Act with respect to this Work or labor, that the Surety will pay the same in an amount not exceeding the amount hereinabove set forth, and also in case suit is brought upon this Bond, will pay, in addition to the face amount thereof, costs and reasonable expenses and fees, including reasonable attorneys' fees, incurred by District in successfully enforcing this obligation, to be awarded and fixed by the court, and to be taxed as costs and to be included in the judgment therein rendered.

It is hereby expressly stipulated and agreed that this Bond shall inure to the benefit of any and all persons, companies, and corporations entitled to file claims under Title 3 (commencing with Section 9000) of Part 6 of Division 4 of the Civil Code, so as to give a right of action to them or their assigns in any suit brought upon this Bond.

Upon expiration of the time within which the California Labor Commissioner may serve a civil wage and penalty assessment against the principal, any of its subcontractors, or both the principal and its subcontractors pursuant to Labor Code Section 1741, and upon expiration of the time within which a joint labor management committee may commence an action against the principal, any of its subcontractors, or both the principal and its subcontractors pursuant to

Labor Code Section 1771.2, if the condition of this Bond be fully performed, then this obligation shall become null and void; otherwise, it shall be and remain in full force and effect.

The Surety hereby stipulates and agrees that no change, extension of time, alteration, or addition to the terms of the Contract or the Specifications accompanying the same shall in any manner affect its obligations on this Bond, and it does hereby waive notice of any such change, extension, alteration, or addition.

IN WITNESS WHEREOF, two (2) identical counterparts of this instrument, each of which shall for all purposes be deemed an original hereof, have been duly executed by Principal and Surety, on the date set forth below, the name of each corporate party being hereto affixed and these presents duly signed by its undersigned representative(s) pursuant to authority of its governing body.

Dated: _____

"Principal"	"Surety"
_____	_____
_____	_____
By: _____	By: _____
Its	Its
By: _____	By: _____
Its	Its
(Seal)	*(Seal)*

Note: This Bond must be executed in duplicate and dated, all signatures must be notarized, and evidence of the authority of any person signing as attorney-in-fact must be attached. ***DATE OF BOND MUST NOT BE BEFORE DATE OF CONTRACT.*** Surety companies executing Bonds must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the State where the project is located.

Bond No. _____

PERFORMANCE BOND

KNOW ALL PERSONS BY THESE PRESENTS that:

WHEREAS the Clovis Veterans Memorial District ("District"), has awarded to _____
_____
_____ ("Principal")
(Name and address of Contractor)

a contract (the "Contract") for the Work described as follows:

_____
(Project name)

WHEREAS, Principal is required under the terms of the Contract to furnish a Bond for the faithful performance of the Contract.

NOW, THEREFORE, we, the undersigned Principal, and _____
_____
_____,
(Name and address of Surety)

("Surety") a duly admitted surety insurer under the laws of the State of California, as Surety, are held and firmly bound unto the District in the penal sum of _____
_____
Dollars ($_____), this amount being not less than the total Contract Price, in lawful money of the United States of America, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, successors executors and administrators, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH THAT, if the hereby bounded Principal, his, her 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 provisions in the Contract and any alteration thereof made as therein provided, on the Principal's part, to be kept and performed at the time and in the manner therein specified, and in all respects according to their true intent and meaning, and shall indemnify and save harmless the District, its officers, agents and employees, as therein stipulated, then this obligation shall become null and void; otherwise, it shall be and remain in full force and effect.

As a part of the obligation secured hereby and in addition to the face amount specified therefor, there shall be included costs and reasonable expenses and fees, including reasonable attorneys' fees, incurred by District in successfully enforcing such obligation, all to be taxed as costs and included in any judgment rendered. Surety hereby waives any statute of limitations as it applies to an action on this Bond.

The Surety hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract or of the Work to be performed thereunder or the specifications accompanying the same shall in anywise affect its obligations under 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. Surety hereby waives the

provisions of California Civil Code Sections 2845 and 2849. The District is the principal beneficiary of this Bond and has all rights of a party hereto.

IN WITNESS WHEREOF, two (2) identical counterparts of this instrument, each of which shall for all purposes be deemed an original hereof, have been duly executed by Principal and Surety, on the date set forth below, the name of each corporate party being hereto affixed and these presents duly signed by its undersigned representative(s) pursuant to authority of its governing body.

Dated: _____

"Principal"	"Surety"
_____	_____
_____	_____
By: _____ Its	By: _____ Its
By: _____ Its	By: _____ Its
(Seal)	*(Seal)*

Note: This Bond must be executed in duplicate and dated, all signatures must be notarized, and evidence of the authority of any person signing as attorney-in-fact must be attached. ***DATE OF BOND MUST NOT BE BEFORE DATE OF CONTRACT****. Surety companies executing Bonds must appear on the Treasury Department's most current list (Circular 570 as amended) and be authorized to transact business in the State where the project is located.*

WORKERS' COMPENSATION
CERTIFICATE OF INSURANCE

WHEREAS, the Clovis Veterans Memorial District ("Distrct") has required certain insurance to be provided by:

_____

NOW THEREFORE, the undersigned insurance company does hereby certify that it has issued the policy or policies described below to the following named insureds and that the same are in force at this time:

1. This certificate is issued to:

   Clovis Veterans Memorial District
   808 Fourth Street
   Clovis, CA 93612

   The insureds under such policy or policies are:
   _____

2. Workers' Compensation Policy or Policies in a form approved by the Insurance Commissioner of California covering all operations of the named insureds as follows:

Policy Number	Effective Date	Expiration Date

_____

_____

_____

By: _____
Its Authorized Representative

Clovis Veterans Memorial District 2020

ADDITIONAL INSURED ENDORSEMENT
COMPREHENSIVE GENERAL LIABILITY

_____

Name and address of named insured ("Named Insured"):

_____

Name and address of insurance company ("Company"):

_____

General description of agreement(s), permit(s), license(s), and/or activity(ies) insured:

Notwithstanding any inconsistent statement in the policy to which this endorsement is attached (the "Policy") or in any endorsement now or hereafter attached thereto, it is agreed as follows:

1. The Clovis Veterans Memorial District ("District"), its elected officials, officers, attorneys, agents, employees, and volunteers are additional insureds (the above named additional insureds are hereafter referred to as the "Additional Insureds") under the Policy in relation to those activities described generally above with regard to operations performed by or on behalf of the Named Insured. The Additional Insureds have no liability for the payment of any premiums or assessments under the Policy.

2. The insurance coverages afforded the Additional Insureds under the Policy shall be primary insurance, and no other insurance maintained by the Additional Insureds shall be called upon to contribute with the insurance coverages provided by the Policy.

3. Each insurance coverage under the Policy shall apply separately to each Additional Insured against whom claim is made or suit is brought except with respect to the limits of the Company's liability.

4. Nothing in this contract of insurance shall be construed to preclude coverage of a claim by one insured under the policy against another insured under the policy. All such claims shall be covered as third-party claims, i.e., in the same manner as if separate policies had been issued to each insured. Nothing contained in this provision shall operate to increase or replicate the Company's limits of liability as provided under the policy.

5. The insurance afforded by the Policy for contractual liability insurance (subject to the terms, conditions and exclusions applicable to such insurance) includes liability assumed by the Named Insured under the indemnification and/or hold harmless provision(s) contained in or executed in conjunction with the written agreement(s) or permit(s) designated above, between the Named Insured and the Additional Insureds.

6. The policy to which this endorsement is attached shall not be subject to cancellation, change in coverage, reduction of limits (except as the result of the payment of claims), or non-renewal except after written notice to District, by certified mail, return receipt requested, not less than thirty (30) Days before the effective date thereof. In the event of Company's failure to comply with this notice provision, the policy as initially drafted will continue in full force and effect until compliance with this notice requirement.

7. Company hereby waives all rights of subrogation and contribution against the Additional Insureds, while acting within the scope of their duties, from all claims, losses and liabilities arising out of or incident to the perils insured against in relation to those activities described generally above with regard to operations performed by or on behalf of the Named Insured regardless of any prior, concurrent, or subsequent active or passive negligence by the Additional Insureds.

8. It is hereby agreed that the laws of the State of California shall apply to and govern the validity, construction, interpretation, and enforcement of this contract of insurance.

9. This endorsement and all notices given hereunder shall be sent to District at:

CEO
Clovis Veterans Memorial District
808 Fourth Street
Clovis, CA 93612

10. Except as stated above and not in conflict with this endorsement, nothing contained herein shall be held to waive, alter or extend any of the limits, agreements, or exclusions of the policy to which this endorsement is attached.

TYPE OF COVERAGES TO WHICH THIS ENDORSEMENT ATTACHES	POLICY PERIOD FROM/TO	LIMITS OF LIABILITY

11. Scheduled items or locations are to be identified on an attached sheet. The following inclusions relate to the above coverages. Includes:

- □ Contractual Liability
- □ Owners/Landlords/Tenants
- □ Manufacturers/Contractors
- □ Products/Completed Operations
- □ Broad Form Property Damage
- □ Extended Bodily Injury
- □ Broad Form Comprehensive
- □ General Liability Endorsement
- □ Explosion Hazard
- □ Collapse Hazard
- □ Underground Property Damage
- □ Pollution Liability
- □ Liquor Liability
- □ _____
- □ _____
- □ _____

12. A □ deductible or □ self-insured retention *(check one)* of $_____ applies to all coverage(s) except: _____ *if none, so state)*. The deductible is applicable □ per claim or □ per occurrence *(check one)*.

13. This is an □ occurrence or □ claims made policy *(check one)*.

14. This endorsement is effective on _____ at 12:01 a.m. and forms a part of Policy Number _____.

I, _____ *(print name)*, hereby declare under penalty of perjury under the laws of the State of California, that I have the authority to bind the Company to this endorsement and that by my execution hereof, I do so bind the Company.

Executed _____, 20____

_____
Signature of Authorized Representative
(Original signature only; no facsimile signature or initialed signature accepted)

Telephone No.: (_____) _____

ADDITIONAL INSURED ENDORSEMENT
AUTOMOBILE LIABILITY

_____

Name and address of named insured ("Named Insured"):

_____

Name and address of insurance company ("Company"):

_____

General description of agreement(s), permit(s), license(s), and/or activity(ies) insured:

Notwithstanding any inconsistent statement in the policy to which this endorsement is attached (the "Policy") or in any endorsement now or hereafter attached thereto, it is agreed as follows:

1. The Clovis Veterans Memorial District ("District"), its elected officials, officers, attorneys, agents, employees, and volunteers are additional insureds (the above named additional insureds are hereafter referred to as the "Additional Insureds") under the Policy in relation to those activities described generally above with regard to operations performed by or on behalf of the Named Insured. The Additional Insureds have no liability for the payment of any premiums or assessments under the Policy.

2. The insurance coverages afforded the Additional Insureds under the Policy shall be primary insurance, and no other insurance maintained by the Additional Insureds shall be called upon to contribute with the insurance coverages provided by the Policy.

3. Each insurance coverage under the Policy shall apply separately to each Additional Insured against whom claim is made or suit is brought except with respect to the limits of the Company's liability.

4. Nothing in this contract of insurance shall be construed to preclude coverage of a claim by one insured under the policy against another insured under the policy. All such claims shall be covered as third-party claims, i.e., in the same manner as if separate policies had been issued to each insured. Nothing contained in this provision shall operate to increase or replicate the Company's limits of liability as provided under the policy.

5. The insurance afforded by the Policy for contractual liability insurance (subject to the terms, conditions and exclusions applicable to such insurance) includes liability assumed by the Named Insured under the indemnification and/or hold harmless provision(s) contained or executed in conjunction with the written agreement(s) or permit(s) designated above, between the Named Insured and the Additional Insureds.

6. The policy to which this endorsement is attached shall not be subject to cancellation, change in coverage, reduction of limits (except as the result of the payment of claims), or non-renewal except after written notice to District, by certified mail, return receipt requested, not less than thirty (30) Days before the effective date thereto. In the event of Company's failure to comply with this notice provision, the policy as initially drafted will continue in full force and effect until compliance with this notice requirement.

7. Company hereby waives all rights of subrogation and contribution against the Additional Insureds, while acting within the scope of their duties, from all claims, losses and liabilities arising out of or incident to the perils insured against in relation to those activities described generally above with regard to operations performed by or on behalf of the Named Insured regardless of any prior, concurrent, or subsequent active or passive negligence by the Additional Insureds.

8. It is hereby agreed that the laws of the State of California shall apply to and govern the validity, construction, interpretation, and enforcement of this contract of insurance.

9. This endorsement and all notices given hereunder shall be sent to District at:

CEO
Clovis Veterans Memorial District
808 Fourth Street
Clovis, CA 93612

10. Except as stated above and not in conflict with this endorsement, nothing contained herein shall be held to waive, alter or extend any of the limits, agreements, or exclusions of the policy to which this endorsement is attached.

TYPE OF COVERAGES TO WHICH THIS ENDORSEMENT ATTACHES	POLICY PERIOD FROM/TO	LIMITS OF LIABILITY

11. Scheduled items or locations are to be identified on an attached sheet. The following inclusions relate to the above coverages. Includes:

- □ Any Automobiles
- □ All Owned Automobiles
- □ Non-owned Automobiles
- □ Hired Automobiles
- □ Scheduled Automobiles
- □ Garage Coverage
- □ Truckers Coverage
- □ Motor Carrier Act
- □ Bus Regulatory Reform Act
- □ Public Livery Coverage
- □ _____
- □ _____

12. A □ deductible or □ self-insured retention *(check one)* of $_____ applies to all coverage(s) except: _____ *(if none, so state)*. The deductible is applicable □ per claim or □ per occurrence *(check one)*.

13. This is an □ occurrence or □ claims made policy *(check one)*.

14. This endorsement is effective on _____ at 12:01 a.m. and forms a part of Policy Number _____.

I, _____ *(print name)*, hereby declare under penalty of perjury under the laws of the State of California, that I have the authority to bind the Company to this endorsement and that by my execution hereof, I do so bind the Company.

Executed _____, 20____

_____
Signature of Authorized Representative
(Original signature only; no facsimile signature or initialed signature accepted)

Telephone No.: (_____) _____

ADDITIONAL INSURED ENDORSEMENT
EXCESS LIABILITY

_____

Name and address of named insured ("Named Insured"):

_____

Name and address of insurance company ("Company"):

_____

General description of agreement(s), permit(s), license(s), and/or activity(ies) insured:

Notwithstanding any inconsistent statement in the policy to which this endorsement is attached (the "Policy") or in any endorsement now or hereafter attached thereto, it is agreed as follows:

1. The Clovis Veterans Memorial District ("District"), its elected officials, officers, attorneys, agents, employees, and volunteers are additional insureds (the above named additional insureds are hereafter referred to as the "Additional Insureds") under the Policy in relation to those activities described generally above with regard to operations performed by or on behalf of the Named Insured. The Additional Insureds have no liability for the payment of any premiums or assessments under the Policy.

2. The insurance coverages afforded the Additional Insureds under the Policy shall be primary insurance, and no other insurance maintained by the Additional Insureds shall be called upon to contribute with the insurance coverages provided by the Policy.

3. Each insurance coverage under the Policy shall apply separately to each Additional Insured against whom claim is made or suit is brought, except with respect to the limits of the Company's liability.

4. Nothing in this contract of insurance shall be construed to preclude coverage of a claim by one insured under the policy against another insured under the policy. All such claims shall be covered as third-party claims, i.e., in the same manner as if separate policies had been issued to each insured. Nothing contained in this provision shall operate to increase or replicate the Company's limits of liability as provided under the policy.

5. The insurance afforded by the Policy for contractual liability insurance (subject to the terms, conditions and exclusions applicable to such insurance) includes liability assumed by the Named Insured under the indemnification and/or hold harmless provision(s) contained in or executed in conjunction with the written agreement(s) or permit(s) designated above, between the Named Insured and the Additional Insureds.

6. The policy to which this endorsement is attached shall not be subject to cancellation, change in coverage, reduction of limits (except as the result of the payment of claims), or non-renewal except after written notice to District, by certified mail, return receipt requested, not less than thirty (30) Days before the effective date thereto. In the event of Company's failure to comply with this notice provision, the policy as initially drafted will continue in full force and effect until compliance with this notice requirement.

7. Company hereby waives all rights of subrogation and contribution against the Additional Insureds, while acting within the scope of their duties, from all claims, losses and liabilities arising out of or incident to the perils insured against in relation to those activities described generally above with

regard to operations performed by or on behalf of the Named Insured regardless of any prior, concurrent, or subsequent active or passive negligence by the Additional Insureds.

8. It is hereby agreed that the laws of the State of California shall apply to and govern the validity, construction, interpretation, and enforcement of this contract of insurance.

9. This endorsement and all notices given hereunder shall be sent to District at:

CEO
Clovis Veterans Memorial District
808 Fourth Street
Clovis, CA 93612

10. Except as stated above and not in conflict with this endorsement, nothing contained herein shall be held to waive, alter or extend any of the limits, agreements, or exclusions of the policy to which this endorsement is attached.

TYPE OF COVERAGES TO WHICH THIS ENDORSEMENT ATTACHES	POLICY PERIOD FROM/TO	LIMITS OF LIABILITY

□ Following Form
□ Umbrella Liability
□ _____

11. Applicable underlying coverages:

INSURANCE COMPANY	POLICY NUMBER	AMOUNT

12. The following inclusions, exclusions, extensions or specific provisions relate to the above coverages:

13. A □ deductible or □ self-insured retention *(check one)* of $_____ _____ applies to all coverage(s) except: _____ _____ *(if none, so state)*. The deductible is applicable □ per claim or □ per occurrence *(check one)*.

14. This is an □ occurrence or □ claims made policy *(check one)*.

15. This endorsement is effective on _____ at 12:01 a.m. and forms a part of Policy Number _____.

I, _____ *(print name)*, hereby declare under penalty of perjury under the laws of the State of California, that I have the authority to bind the Company to this endorsement and that by my execution hereof, I do so bind the Company.

Executed _____, 20____

_____
Signature of Authorized Representative
(Original signature only; no facsimile signature or initialed signature accepted)

Telephone No.: (_____) _____

GENERAL PROVISIONS

SECTION 0. GENERAL PROVISIONS DEFINED

0-1 STANDARD SPECIFICATIONS

The 2018 edition of "Standard Specifications for Public Works Construction" ("Standard Specifications"), as amended by the Contract Documents, is incorporated into the Contract Documents by this reference. The Work described herein shall be done in accordance with the provisions of the Standard Specifications, as amended by the Contract Documents.

0-2 NUMBERING OF SECTIONS

The number of sections and subsections in these General Provisions are compatible with the numbering in the Standard Specifications.

0-3 SUPPLEMENTATION OF STANDARD SPECIFICATIONS

The Sections that follow supplement, but do not replace, the corresponding provisions in Part 1 (General Provisions) of the Standard Specifications, except as otherwise indicated herein. In the event of any conflict between the Standard Specifications and these General Provisions, these General Provisions shall control.

SECTION 1. GENERAL, TERMS, DEFINITIONS, ABBREVIATIONS, UNITS OF MEASURE, AND SYMBOLS

1-2 TERMS AND DEFINITIONS

Whenever in the Standard Specifications or in the Contract Documents the following terms are used, they shall be understood to mean the following:

Agency – The Clovis Veterans Memorial District.

Board – The Board of Directors of the Clovis Veterans Memorial District.

City – The City of Clovis, California.

Contract Documents – As defined in Standard Specifications Section 1-2, but also including these General Provisions.

Engineer – The Project Engineer, acting either directly or through properly authorized agents. Such agents shall act within the scope of the particular duties entrusted to them.

Inspector – An authorized representative of the District, assigned by the District to make inspections of Work performed by or materials supplied by the Contractor.

Laboratory – A laboratory authorized by the District to test materials and Work involved in the Contract.

Notice of Completion – The notice authorized by Civil Code Section 9204.

Project – See Work.

Submittal – Any drawing, calculation, specification, product data, samples, manuals, requests for substitutes, spare parts, photographs, survey data, traffic control plans, record drawings, Bonds or similar items required to be submitted to the District under the terms of the Contract.

1-3.3 Institutions

The institutions listed in Section 1-3.3 of Part 1 of the Standard Specifications shall be supplemented by the list below:

Abbreviation	**Word or Words**
AAN	American Association of Nurserymen
AGCA	Associated General Contractors of America
APWA	American Public Works Association
CRSI	Concrete Reinforcing Steel Institute
CSI	Construction Specifications Institute
NEC	National Electric Code
NFPA	National Fire Protection Association
SSS	State of California Standard Specifications, Latest edition, Department of Transportation
SSP	State of California Standard Plans, Latest edition, Department of Transportation

1-7.2 CONTRACT BONDS

The Faithful Performance Bond shall remain in force until the date of recordation of the Notice of Completion and the end of all warranty periods set forth in the Contract Documents. The Material and Labor Bond shall remain in force until expiration of the time within which the California Labor Commissioner may serve a civil wage and penalty assessment against the principal, any of its subcontractors, or both the principal and its subcontractors pursuant to Labor Code Section 1741, and until the expiration of the time within which a joint labor management committee may commence an action against the principal, any of its subcontractors, or both the principal and its subcontractors pursuant to Labor Code Section 1771.2.

All Bonds must be submitted using the required forms, which are in the Contract Documents, or on any other form approved by the District's General Counsel.

SECTION 2. SCOPE OF THE WORK

2.2 PERMITS

Before starting any construction work, the Contractor will be required to obtain all necessary permits from the City, which may include obtaining a no fee encroachment permit for Work within the public right-of-way, as well as all other permits required from all other agencies. Should this Project require construction of trenches or excavations which are five (5) feet or deeper and into which a person is required to descend, the Contractor shall obtain a Cal/OSHA permit and furnish the District with a copy before Work can commence on this Project. Contractor shall bear all cost for fees for all agencies.

2.4 COOPERATION AND COLLATERAL WORK

The Contractor shall be responsible for coordinating all Work with the City's street sweeping, trash pick-up, and street maintenance contractors, emergency services departments, utility companies' crews, and others when necessary. Payment for conforming to these requirements shall be included in other items of Work, and no additional payment shall be made thereof.

2-5.4 Haul Routes

Subsection 2-5.4 of Part 1 of the Standard Specifications shall be deleted and replaced as follows:

> The Contractor must obtain the Project Engineer's and the City's approval before using any haul routes. Further detail requirements for haul traffic are delineated in the Special Provisions.

2-7 CHANGES INITIATED BY THE AGENCY

2-7.1 General.

The District reserves the right, without notice to the Surety, to increase or decrease the quantity of any item or portion of the Work described in the Contract Documents or to alter or omit portions of the Work so described, as may be deemed necessary or expedient by the Project Engineer, without in any way making the Contract void. Such increases, alterations or decreases of Work shall be considered and treated as though originally contracted for, and shall be subject to all the terms, conditions and provisions of the original Contract. The Contractor shall not claim or bring suit for damages, whether for loss of profits or otherwise, on account of any decrease, alteration or omission of any kind of Work to be done.

2-8 EXTRA WORK

New and unforeseen work will be classified as Extra Work only when the Work is not covered and cannot be paid for under any of the various items or combination of items for which a Bid price appears on the Bid. The Contractor shall not do any Extra Work except upon written order from the District.

SECTION 3. CONTROL OF THE WORK

3-1 ASSIGNMENT

Any purported assignment without written consent of the District shall be null, void, and of no effect, and the Contractor shall hold harmless, defend and indemnify the District and its officers, officials, employees, agents and representatives with respect to any claim, demand or action arising from or relating to any unauthorized assignment.

If the District opts to consent to assignment, the District's consent shall be contingent upon: (1) a letter from the Surety agreeing to the assignment and assigning all of the Bonds to the assignee without any reduction, or the assignee supplying all new Bonds in the amounts originally required under the Contract Documents; and (2) the assignee supplying all of the required insurance in the amounts required in the Contract Documents. Until the Surety assigns all of the Bonds or the assignee supplies all of the new Bonds, and until the assignee supplies

all of the required insurance, an assignment otherwise consented to in writing by the District shall not be effective. Even if the District consents to assignment, no assignment shall relieve the Contractor of liability under the Contract.

3-5 INSPECTION

The Contractor shall arrange and pay for all off-site inspection of the Work required by any ordinance or governing authorities. The Contractor shall also arrange and pay for other inspections, including tests in connection therewith, as may be assigned or required.

3.7 CONTRACT DOCUMENTS

3-7.1 General

In addition to the requirements under Section 3-7.1 in the Standard Specifications, the Contractor shall maintain a control set of Plans and Specifications on the Project site at all times. All final locations determined in the field, and any deviations from the Plans and Specifications, shall be marked in red on the control set to show the as-built conditions. This control set of Plans shall also be edited for all Addenda, Requests for Information, Change Orders, field changes not involving cost, and any other variation that occurred during construction. Upon completion of all Work, the Contractor shall return the control set to the District. Final payment will not be made until this requirement is met.

Where a work feature is shown on the drawings or identified in the Specifications but is not specifically indicated as an item in the Bid sheets, and there is no ambiguity regarding the requirement to construct, install, or construct and install that work feature, the Contractor is required to complete the work feature. All costs to the Contractor for constructing, installing, or both constructing and installing such a work feature shall be included in the Bid.

3-7.2 Precedence of the Contract Documents

With regard to Section 3-7.2 in the Standard Specifications, the General Provisions shall control over the Special Provisions, and the Notice Inviting Bids and Instructions to Bidders (in that order) shall control over the Bid, such that the order of precedence shall be as follows:

1. Permits issued by regulatory agencies with jurisdiction.
2. Change Orders and Supplemental Agreements, whichever occurs last.
3. Contract/Agreement.
4. Addenda.
5. Notice Inviting Bids.
6. Instructions to Bidders.
7. Bid/Proposal.
8. General Provisions.
9. Special Provisions.
10. Plans.
11. Standard Plans.
12. Standard Specifications.
13. Reference Specifications.

3-9 SUBSURFACE DATA

If the District or its consultants have made investigations of subsurface conditions in areas where the Work is to be performed, such investigations shall be deemed made only for the purpose of study and design. If a geotechnical or other report has been prepared for the Project, the Contractor may inspect the records pertaining to such investigations subject to and upon the conditions hereinafter set forth. The inspection of the records shall be made in the office of the Project Engineer or the District. It is the Contractor's sole responsibility to determine whether such investigations exist, and the District makes no affirmative or negative representation concerning the existence of such investigations.

The records of any such investigations are made available solely for the convenience of the Contractor. It is expressly understood and agreed that the District, the Project Engineer, their agents, consultants or employees assume no responsibility whatsoever with respect to the sufficiency or accuracy of any investigations, the records thereof, and the interpretations set forth therein. No warranty or guarantee is expressed or implied that the conditions indicated by any such investigations or records are representative of those existing in the Project area. The Contractor agrees to make such independent investigations and examination as necessary to be satisfied of the conditions to be encountered in the performance of the Work.

The Contractor represents that it has studied the Plans, Specifications and other Contract Documents, and all surveys and investigation reports of subsurface and latent physical conditions, has made such additional surveys and investigations as necessary for the performance of the Work at the Contract Price in accordance with the requirements of the Contract Documents, and that it has correlated the results of all such data with the requirements of the Contract Documents. No claim of any kind shall be made or allowed for any error, omission or claimed error or omission, in whole or in part, of any geotechnical exploration or any other report or data furnished or not furnished by the District.

3-10 SURVEYING

3-10.1 General

The Contractor shall verify all dimensions on the drawings and shall report to the Project Engineer any discrepancies before proceeding with related Work. The Contractor shall perform all survey and layout Work per the benchmark information on the Project Plans. All surveying Work must conform to the Professional Land Surveyors' Act (Business and Professions Code Section 8700 *et seq*). All Project surveying notes and "cut-sheets" are to be provided to the District after the completion of each surveying activity and all final surveying notes shall be provided before final payment to the Contractor.

Construction stakes shall be set and stationed by Contractor at its expense. Unless otherwise indicated in the Special Provisions, surveying costs shall be included in the price of items bid. No separate payment will be made. Re-staking and replacement of construction survey markers damaged as a result of the Work, vandalism, or accident shall be at the Contractor's expense.

3-11 CONTRACT INFORMATION SIGNS

The names, addresses and specialties of the Contractor, Subcontractors, architects or engineers may <u>not</u> be displayed on any signage within the public right-of-way. This signage

prohibition includes advertising banners hung from truck beds or other equipment.

3-12 WORKSITE MAINTENANCE

3-12.1 General.

Clean-up shall be done as Work progresses at the end of each day and thoroughly before weekends. The Contractor shall not allow the Work site to become littered with trash and waste material, but shall maintain the same in a neat and orderly condition throughout the construction operation. Materials which need to be disposed shall not be stored at the Project site, but shall be removed by the end of each Working Day. If the job site is not cleaned to the satisfaction of the District, the cleaning will be done or contracted by the District and shall be back-charged to the Contractor and deducted from the Contract Price.

The Contractor shall promptly remove from the vicinity of the completed Work, all rubbish, debris, unused materials, concrete forms, construction equipment, and temporary structures and facilities used during construction. Final acceptance of the Work by the District will be withheld until the Contractor has satisfactorily complied with the foregoing requirements for final clean-up of the Project site.

3.12.4 Storage of Equipment and Materials.

3-12.4.1 General

The Contractor shall make arrangements for storing its equipment and materials. The Contractor shall make its own arrangements for any necessary off-site storage or shop areas necessary for the proper execution of the Work. Approved areas within Work site may be used for temporary storage; however, the Contractor shall be responsible for obtaining any necessary permits from the City. In any case, the Contractor's equipment and personal vehicles of the Contractor's employees shall not be parked on the traveled way or on any section where traffic is restricted at any time.

The Contractor shall deliver, handle, and store materials in accordance with the manufacturer's written recommendations and by methods and means that will prevent damage, deterioration, and loss including theft. Delivery schedules shall be controlled to minimize long-term storage of products at the Project site and overcrowding of construction spaces. In particular, the Contractor shall provide delivery and installation coordination to ensure minimum holding or storage times for materials recognized to be flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other sources of loss.

Storage shall be arranged to provide access for inspection. The Contractor shall periodically inspect to assure materials are undamaged and are maintained under required conditions.

All costs associated with the clean-up and storage required to complete the Project shall be the sole responsibility of the Contractor.

3-12.4.2 Storage in Public Streets

The first sentence of Section 3-12.4.2 shall not be incorporated and shall instead be replaced with the following:

Construction materials and equipment shall not be stored in Streets, roads, or highways unless otherwise specified in the Special Provisions or approved by the City Engineer.

3-13 COMPLETION, ACCEPTANCE, AND WARRANTY

3-13.1 Completion.

The Contractor shall complete all Work under the Contract within forty five (45) Working Days from the Notice to Proceed.

3-13.2 Acceptance

The Project will not be considered complete and ready for Board of Directors direction to staff regarding recordation of the Notice of Completion until all required Work is completed, the Work site is cleaned up in accordance with Section 3-12 of Part 1 of the Standard Specifications and the Special Provisions, and all of the following items have been received by the District:

1. A form of Notice of Completion, with all information required by the California Civil Code;

All written guarantees and warranties;

All “as-builts”;

Duplicate copies of all operating instructions and manufacturer’s operating catalogs and data, together with such field instructions as necessary to fully instruct District personnel in correct operation and maintenance procedures for all equipment installed listed under the electrical, air conditioning, heating, ventilating and other trades. This data and instructions shall be furnished for all equipment requiring periodic adjustments, maintenance or other operation procedures.

The Contractor shall allow at least seven (7) Working Days’ notice for final inspection. Such notice shall be submitted to the Project Engineer in writing.

3-13.3 Warranty

For the purposes of the calculation of the start of the warranty period, the Work shall be deemed to be completed upon the date of recordation of the Notice of Completion. If that direction is contingent on the completion of any items remaining on a punchlist, the Work shall be deemed to be completed upon the date of the District’s acceptance of the final item(s) on that punchlist.

The Contractor shall repair or replace defective materials and workmanship as required in this Section 3-13.3 at its own expense. Additionally, the Contractor agrees to defend, indemnify and hold the District harmless from claims of any kind arising from damage, injury or death due to such defects.

The parties agree that no certificate given shall be conclusive evidence of the faithful performance of the Contract, either in whole or in part, and that no payment shall be construed

to be in acceptance of any defective Work or improper materials. Further, the certificate or final payment shall not terminate the Contractor's obligations under the warranty herein. The Contractor agrees that payment of the amount due under the Contract and the adjustments and payments due for any Work done in accordance with any alterations of the same, shall release the District, the Board of Directors and its officers and employees from any and all claims or liability on account of Work performed under the Contract or any alteration thereof.

SECTION 4. CONTROL OF MATERIALS

4-1 GENERAL

The Contractor and all Subcontractors, suppliers, and vendors shall guarantee that the Work will meet all requirements of this Contract as to the quality of materials, equipment, and workmanship.

4-4 TESTING

Except as elsewhere specified, the District shall bear the cost of testing materials and workmanship that meet or exceed the requirements indicated in the Standard Specifications and the Special Provisions. The cost of all other tests, including the retesting of material or workmanship that fails to pass the first test, shall be borne by the Contractor.

4-6 TRADE NAMES

If the Contractor requests to substitute an equivalent item for a brand or trade name item, the burden of proof as to the comparative quality and suitability of alternative equipment or articles or materials shall be upon the Contractor, and the Contractor shall furnish, at its own expense, all information necessary or related thereto as required by the Project Engineer or the District. All requests for substitution shall be submitted, together with all documentation necessary for the Project Engineer to determine equivalence, no later than seven (7) Days after the award of Contract, unless a different deadline is listed in the Special Provisions.

SECTION 5. LEGAL RELATIONS AND RESPONSIBILITIES

5-3 LABOR

5-3.1 Public Work

The Contractor acknowledges that the Project is a "public work" as defined in Labor Code Section 1720 *et seq*. ("Chapter 1"), and that this Project is subject to (a) Chapter 1, including without limitation Labor Code Section 1771 and (b) the rules and regulations established by the Director of Industrial Relations ("DIR") implementing such statutes. The Contractor shall perform all Work on the Project as a public work. The Contractor shall comply with and be bound by all the terms, rules and regulations described in (a) and (b) as though set forth in full herein.

5-3.2 Copies of Wage Rates

Pursuant to Labor Code Section 1773.2, copies of the prevailing rate of per diem wages for each craft, classification, or type of worker needed to perform the Project are on file at the District and will be made available to any interested party on request. By initiating any Work,

the Contractor acknowledges receipt of a copy of the DIR determination of such prevailing rate of per diem wages, and the Contractor shall post such rates at each job site covered by these Contract Documents.

The Contractor shall comply with and be bound by the provisions of Labor Code Sections 1774 and 1775 concerning the payment of prevailing rates of wages to workers and the penalties for failure to pay prevailing wages. The Contractor shall, as a penalty paid to the District, forfeit two hundred dollars ($200) for each calendar day, or portion thereof, for each worker paid less than the prevailing rates as determined by the DIR for the work or craft in which the worker is employed for any public work done pursuant to these Contract Documents by the Contractor or by any Subcontractor.

5-3.3 Payroll Records

The Contractor shall comply with and be bound by the provisions of Labor Code Section 1776, which requires the Contractor and each Subcontractor to (1) keep accurate payroll records and verify such records in writing under penalty of perjury, as specified in Section 1776, (2) certify and make such payroll records available for inspection as provided by Section 1776, and (3) inform the District of the location of the records. The Contractor has ten (10) days in which to comply subsequent to receipt of a written notice requesting these records, or as a penalty to the District, the Contractor shall forfeit one hundred dollars ($100) for each Day, or portion thereof, for each worker, until strict compliance is effectuated. Upon the request of the Division of Labor Standards Enforcement, these penalties shall be withheld from progress payments then due.

The Contractor and each Subcontractor shall comply with and be bound by the provisions of Labor Code Section 1771.4(a)(3), which requires that each Contractor and each Subcontractor shall furnish the records specified in Section 1776 directly to the Labor Commissioner at least monthly, in a format prescribed by the Labor Commissioner.

5-3.4 Hours of Labor

The Contractor acknowledges that eight (8) hours labor constitutes a legal day's work. The Contractor shall comply with and be bound by Labor Code Section 1810. The Contractor shall comply with and be bound by the provisions of Labor Code Section 1813 concerning penalties for workers who work excess hours. The Contractor shall, as a penalty paid to the District, forfeit twenty-five dollars ($25) for each worker employed in the performance of this Project 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 one (1) calendar day and forty (40) hours in any one calendar week in violation of the provisions of Division 2, Part 7, Chapter 1, Article 3 of the Labor Code. Pursuant to Labor Code Section 1815, work performed by employees of the Contractor in excess of eight (8) hours per day, and forty (40) hours during any one week shall be permitted upon public work upon compensation for all hours worked in excess of eight (8) hours per day at not less than one and one-half (1-1/2) times the basic rate of pay.

5-3.5 Apprentices

The Contractor shall comply with and be bound by the provisions of Labor Code Sections 1777.5, 1777.6 and 1777.7 and California Code of Regulations Title 8, Section 200 *et seq*. concerning the employment of apprentices on public works projects. The Contractor shall be

responsible for compliance with these Sections for all apprenticeable occupations. Before commencing Work on this Project, the Contractor shall provide the District with a copy of the information submitted to any applicable apprenticeship program. Within sixty (60) Days after concluding Work, Contractor and each of its Subcontractors shall submit to the District a verified statement of the journeyman and apprentice hours performed under this Contract.

5-3.6 Debarment or Suspension

The Contractor shall not perform Work with any Subcontractor that has been debarred or suspended pursuant to California Labor Code Section 1777.1 or any other federal or State law providing for the debarment of contractors from public works. The Contractor and Subcontractors shall not be debarred or suspended throughout the duration of this Contract pursuant to Labor Code Section 1777.1 or any other federal or State law providing for the debarment of contractors from public works. If the Contractor or any Subcontractor becomes debarred or suspended during the duration of the Project, the Contractor shall immediately notify the District.

5-3.7 Registration with the DIR

In accordance with Labor Code Sections 1725.5 and 1771.1, no contractor or subcontractor shall be qualified to bid on, be listed in a bid proposal, subject to the requirements of Section 4104 of the Public Contract Code, or engage in the performance of any contract for public work, unless currently registered and qualified to perform public work pursuant to Section 1725.5.

5-3.8 Compliance Monitoring and Posting Job Sites

This Project is subject to compliance monitoring and enforcement by the DIR. The Contractor shall post job site notices, as prescribed by regulation.

5-3.9 Subcontractors

For every Subcontractor who will perform Work on the Project, the Contractor shall be responsible for such Subcontractor's compliance with Chapter 1 and Labor Code Sections 1860 and 3700, and the Contractor shall include in the written Contract between it and each Subcontractor a copy of the provisions in this Section 5-3 of the General Provisions and a requirement that each Subcontractor shall comply with those provisions. The Contractor shall be required to take all actions necessary to enforce such contractual provisions and ensure Subcontractor's compliance, including without limitation, conducting a periodic review of the certified payroll records of the Subcontractor and upon becoming aware of the failure of the Subcontractor to pay its workers the specified prevailing rate of wages. The Contractor shall diligently take corrective action to halt or rectify any failure.

5-3.10 Prevailing Wage Indemnity

To the maximum extent permitted by law, the Contractor shall indemnify, hold harmless and defend (at the Contractor's expense with counsel reasonably acceptable to the District) the District, its officials, officers, employees, agents and independent contractors serving in the role of District officials, and volunteers from and against any demand or claim for damages, compensation, fines, penalties or other amounts arising out of or incidental to any acts or omissions listed in Section 5-3 of the General Provisions by any Person (including the

Contractor, its Subcontractors, and each of their officials, officers, employees and agents) in connection with any Work undertaken or in connection with the Contract Documents, including without limitation the payment of all consequential damages, attorneys' fees, and other related costs and expenses. All duties of the Contractor under this Section 5-3.10 shall survive expiration or termination of the Contract.

5-4 INSURANCE

5-4.1 General

The first paragraph of Section 5-4.1 of Part 1 of the Standard Specifications shall not be incorporated and shall instead be replaced with the following:

> The Contractor shall provide and maintain insurance naming the District, its elected and appointed officials, officers, employees, attorneys, agents, designated volunteers, and independent contractors in the role of District officials as insureds or additional insureds regardless of any inconsistent statement in the policy or any subsequent endorsement whether liability is attributable to the Contractor or the District. The insurance provisions shall not be construed to limit the Contractor's indemnity obligations contained in the Contract. The District will not be liable for any accident, loss, or damage to the Work before completion, except as otherwise specified in Section 6-5.

5-4.2 General Liability Insurance

The Contractor shall at all times during the term of the Contract carry, maintain, and keep in full force and effect the insurance referenced in Section 5-4 of Part 1 of the Standard Specifications, as modified below.

5-4.2.1 Additional Insureds

The District, its elected and appointed officials, officers, employees, attorneys, agents, designated volunteers, and independent contractors in the role of District officials, shall be the insured or named as additional insureds covering the Work, regardless of any inconsistent statement in the policy or any subsequent endorsement, whether liability is attributable to the Contractor or the District.

5-4.2.2 No Limitation on Indemnity

The insurance provisions shall not be construed to limit the Contractor's indemnity obligations contained in these Contract Documents.

5-4.2.3 Replacement Insurance

The Contractor agrees that it will not cancel, reduce or otherwise modify the insurance coverage. The Contractor agrees that if it does not keep the required insurance in full force and effect, and such insurance is available at a reasonable cost, the District may take out the necessary insurance and pay the premium thereon, and the repayment thereof shall be deemed an obligation of the Contractor and the cost of such insurance may be deducted, at the option of the District, from payments due the Contractor. This shall be in addition to all other legal options available to the District to enforce the insurance requirements.

5-4.2.4 Certificates of Insurance with Original Endorsements

The Contractor shall submit to the District certificates of insurance with the original endorsements, both of which reference the same policy number, for each of the insurance policies that meet the insurance requirements, not less than one (1) day before beginning of performance under the Contract. The endorsements are to be signed by a person authorized by that insurer to bind coverage on its behalf. Endorsements may be executed on the District's standard forms titled "Additional Insured Endorsement," copies of which are provided in the Contract Documents, or on any other form that contains substantially the same terms and is approved by the District's CEO. In any case, the endorsements must specifically name the Clovis Veterans Memorial District and its elected and appointed officials, officers, employees, attorneys, agents, designated volunteers, and independent contractors in the role of District officials as insureds or additional insureds. Current insurance certificates and endorsements shall be kept on file with the District at all times during the term of this Contract. The District reserves the right to require complete, certified copies of all required insurance policies at any time.

5-4.2.5 Subcontractors

The Contractor shall ensure all Subcontractors and their employees are listed as additional insureds on all of the Contractor's insurance.

5-4.5 Insurance Requirements not Limiting

If the Contractor maintains broader coverage and/or higher limits than the minimums required in this Section 5-4, the District requires and shall be entitled to the broader coverage and/or the higher limits maintained by the Contractor. Any available insurance proceeds in excess of the specified minimum limits of insurance and coverage shall be available to the District.

5.7 SAFETY

5-7.8 Steel Plate Covers

5-7.8.1 General

The Contractor shall cover all openings, trenches and excavations at the end of each Work Day with steel plate covers.

Section 5-8 is hereby added to Section 1 of Part 1 of the Standard Specifications, as follows:

5-8 INDEMNIFICATION

5-8.1 Contractor's Duty

To the maximum extent permitted by law, the Contractor hereby agrees, at its sole cost and expense, to defend with competent defense counsel approved by the District's General Counsel, protect, indemnify, and hold harmless the District, its elected and appointed officials, officers, employees, volunteers, attorneys, agents (including those District agents serving as independent contractors in the role of District representatives), successors, and assigns (collectively "Indemnitees") from and against any and all claims (including, without limitation, claims for bodily injury, death or damage to property), demands, charges, obligations, damages,

causes of action, proceedings, suits, losses, stop payment notices, judgments, fines, liens, penalties, liabilities, costs and expenses of every kind and nature whatsoever, in any manner arising out of, incident to, related to, in connection with or resulting from any act, failure to act, error or omission of the Contractor or any of its officers, agents, attorneys, servants, employees, Subcontractors, material suppliers or any of their officers, agents, servants or employees, and/or arising out of, incident to, related to, in connection with or resulting from any term, provision, image, plan, covenant, or condition in the Contract Documents; including, without limitation, the payment of all consequential damages, attorneys' fees, experts' fees, and other related costs and expenses (individually, a "Claim," or collectively, "Claims"). The Contractor shall promptly pay and satisfy any judgment, award or decree that may be rendered against any of the Indemnitees as to any such Claim. The Contractor shall reimburse Indemnitees for any and all legal expenses and costs incurred by each of them in connection therewith or in enforcing the indemnity herein provided. The Contractor's obligation to indemnify shall not be restricted to insurance proceeds, if any, received by the Contractor or Indemnitees. This indemnity shall apply to all Claims regardless of whether any insurance policies are applicable or whether the Claim was caused in part or contributed to by an Indemnitees.

5-8.2 Civil Code Exception

Nothing in this Section 5-8 shall be construed to encompass Indemnitees' sole negligence or willful misconduct to the limited extent that the underlying Contract is subject to Civil Code Section 2782(a) or the District's active negligence to the limited extent that the underlying Contract Documents are subject to Civil Code Section 2782(b), provided such sole negligence, willful misconduct or active negligence is determined by agreement between the parties or by the findings of a court of competent jurisdiction.

5-8.3 Nonwaiver of Rights

Indemnitees do not and shall not waive any rights that they may possess against the Contractor because the acceptance by the District, or the deposit with the District, of any insurance policy or certificate required pursuant to these Contract Documents. This indemnity provision is effective regardless of any prior, concurrent, or subsequent active or passive negligence by Indemnitees and shall operate to fully indemnify Indemnitees against any such negligence.

5-8.4 Waiver of Right of Subrogation

The Contractor, on behalf of itself and all parties claiming under or through it, hereby waives all rights of subrogation and contribution against the Indemnitees, while acting within the scope of their duties, from all Claims arising out of or incident to the activities or operations performed by or on behalf of the Contractor regardless of any prior, concurrent or subsequent active or passive negligence by Indemnitees.

5-8.5 Survival

The provisions of this Section 5-8 shall survive the term and termination of the Contract, are intended to be as broad and inclusive as is permitted by the law of the State, and are in addition to any other rights or remedies that Indemnitees may have under the law. Payment is not required as a condition precedent to an Indemnitee's right to recover under this indemnity provision, and an entry of judgment against the Contractor shall be conclusive in favor of the Indemnitee's right to recover under this indemnity provision.

SECTION 6. PROSECUTION AND PROGRESS OF THE WORK

6-1 CONSTRUCTION SCHEDULE AND COMMENCEMENT OF THE WORK

6-1.1 Construction Schedule

One (1) week before the scheduled pre-construction meeting, the Contractor must submit to the Project Engineer for review and approval the construction schedule required by the first paragraph of Section 6-1.1. The Contractor shall make revisions as required by the Project Engineer. The schedule must account for all subcontract work, as well as the work of the Contractor, submittals, coordination with the other contractors performing concurrent work and the Traffic Control Plan. The Contractor shall update this Construction Schedule when directed by the Project Engineer, or when:

a. A Change Order significantly affects the Contract completion date or the sequence of construction approach or activities; or

b. The actual sequence of the Work, or the planned sequence of the Work, is changed and does not conform to the Contractor's current accepted Project construction schedule.

The Contractor shall submit an updated construction schedule with its monthly invoice every month. Progress payments shall be contingent upon the receipt of monthly updated construction schedules.

6-1.1.1 Pre-Construction Conference

Approximately five (5) Days before the commencement of Work at the site, a pre-construction conference will be held at the District and shall be attended by the Contractor's Project manager, its on-site field superintendent, and any Subcontractors that the Contractor deems appropriate. Attendance by the Contractor and any Subcontractors designated is mandatory.

Contractor shall submit its twenty-four (24) hour emergency telephone numbers to the Project Engineer for approval a minimum of two (2) Working Days before the pre-construction conference. Unless previously submitted to the Project Engineer, the Contractor shall bring to the pre-construction conference copies of each of the following:

1) Construction Schedule.
2) Procurement schedule of major equipment and materials and items requiring long lead time.
3) Shop drawing/sample submittal schedule.
4) Preliminary schedule of values (lump sum price breakdown) for progress payment purposes.
5) Written designation of the on-site field superintendent and the Project manager. Both daytime and emergency telephone numbers shall be included in the written designation.

The purpose of the conference is to designate responsible personnel and establish a working relationship. The parties will discuss matters requiring coordination and establish procedures for handling such matters. The complete agenda will be furnished to the Contractor before the meeting date. The Contractor shall be prepared to discuss all of the items listed below.

1) The Contractor's construction schedule.
2) Notification of local residents before starting any Work and keeping them informed throughout the Project.
3) Procedures for transmittal, review, and distribution of the Contractor's submittals.
4) Processing applications for payment.
5) Maintaining record documents.
6) Critical Work sequencing.
7) Maintaining sewage service during construction, including proposed by-passes.
8) NPDES requirements, if any.
9) Field decisions and Change Orders.
10) Use of Project site, office and storage areas, security, housekeeping, and the City's needs.
11) Major equipment deliveries and priorities.
12) Traffic control.
13) Any other item that the City representative states is relevant to the meeting.

6-1.1.2 Weekly Progress Meetings

Progress meetings will be held each week during the course of the Project. The meeting location, day of the week and time of day will be mutually agreed to by the District and the Contractor. The Contractor shall provide a two (2) week "look ahead" schedule for each meeting. The construction manager will preside at these meetings and will prepare the meeting agenda, meeting minutes and will distribute minutes to all persons in attendance. As the Work progresses, if it is determined by agreement of the attendees, that weekly meetings are not necessary, the weekly progress meetings may be changed to bi-weekly progress meetings.

6-1.2 Commencement of the Work

The Contractor shall not begin any construction activity at the site before the issuance of the Notice to Proceed. Any Work that is done by the Contractor in advance of the Notice to Proceed shall be considered as being done at the Contractor's own risk and responsibility, and as a consequence will be subject to rejection.

Section 6-1.3 is hereby added to Section 6 of Part 1 of the Standard Specifications, as follows:

6-1.3 Working Days And Hours

The Contractor shall do all Work between the hours of 6 a.m. to 10 p.m. No Work will be allowed on holidays, which are as follows: New Year's Day, Martin Luther King, Jr. Day, President's Day, Independence Day, Labor Day, Thanksgiving, day after Thanksgiving, and Christmas Day.

In addition, no Work will be allowed on any special election Day that may be declared. Should a special election Day be declared, a time extension of one (1) Working Day will be granted for each such Day.

A permit may have other hours or Days for the Contractor to do the Work, and those hours and Days shall supersede any hours and Days written in this Section.

Whenever the Contractor is permitted or directed to perform night Work or to vary the period during which Work is performed during the Working Day, the Contractor shall give twelve (12) hours' notice to the Project Engineer so that inspection may be provided. A charge may be

made to the Contractor for approved overtime or weekend inspections requested by the Contractor.

6-4 DELAYS AND EXTENSIONS OF TIME

6-4.1 General.

Unless otherwise agreed in writing, an adjustment to the Contract time by reason of a Change Order shall be agreed to at the time the Change Order is issued and accepted by Contractor. If the Change Order does not reserve the right of the parties, or either of them, to seek an adjustment to the Contract time, then the parties forever relinquish and waive such right and there shall be no further adjustments to the Contract time.

6-4.2 Extensions of Time

In the event it is deemed appropriate by the District to extend the time for completion of the Work, any such extension shall not release any guarantee for the Work required by the Contract Documents, nor shall any such extension of time relieve or release the Sureties on the Bonds executed. In executing such Bonds, the Sureties shall be deemed to have expressly agreed to any such extensions of time. The amount of time allowed by an extension of time shall be limited to the period of the delay giving rise to the same as determined by the District. Notwithstanding any dispute which may arise in connection with a claim for adjustment of the Contract time, the Contractor shall promptly proceed with the Work.

6-4.3 Payment for Delays

Notwithstanding any other terms and conditions of the Contract Documents, the District shall have no obligation whatsoever to increase the Contract Price or extend the time for delays.

Unless compensation and/or markup is agreed upon by the District, the Contractor agrees that no payment of compensation of any kind shall be made to the Contractor for damages or increased overhead costs caused by any delays in the progress of the Contract, whether such delays are avoidable or unavoidable or caused by any act or omission of the District or its agents. Any accepted delay claim shall be fully compensated for by an extension of time to complete the performance of the Work.

This Section shall not apply to compensable delays caused solely by the District. If a compensable delay is caused solely by the District, the Contractor shall be entitled to a Change Order that: (1) extends the time for completion of the Contract by the amount of delay caused by the District; and (2) provides equitable adjustment, as determined by the District, to the Contractor.

6-8 TERMINATION OF THE CONTRACT FOR CONVENIENCE

The following sentence is added to Section 6-8:

In no event (including termination for impossibility or impracticability, due to conditions or events beyond the control of the District, for any other reason or for no reason) shall the total amount of money to Contractor exceed the amount which would have been paid to Contractor for the full performance of the services described in the Contract.

6-9 LIQUIDATED DAMAGES

For the purposes of the calculation of the start of the liquidated damages, the Work shall be deemed to be completed when the same has been completed in accordance with the Plans and Specifications therefor and to the satisfaction of the Project Engineer, and the Project Engineer has certified such completion in accordance with Section 3-13.1 of Part 1 of the Standard Specifications.

SECTION 7. MEASUREMENT AND PAYMENT

7.3 PAYMENT

7.3.1 General

The unit and lump sum prices to be paid shall constitute full compensation for all labor, equipment, materials, tools and incidentals required to complete the Project as outlined in these Contract Documents and as directed by the District's CEO. In accordance with Public Contract Code Section 7107, if no claims have been filed and are still pending, the amount deducted from the final estimate and retained by the District will be paid to the Contractor except such amounts as are required by law to be withheld by properly executed and filed notices to stop payment, or as may be withheld for any other lawful purposes.

7-3.2 Partial and Final Payment

7-3.2.1 Monthly Closure Date and Invoice Date

For purposes of Section 7-3.2, the monthly closure date shall be the last Day of each month. A measurement of Work performed and a progress estimate of the value thereof based on the Contract and of the monthly payment shall be prepared by the Contractor and submitted to the District before the tenth (10th) Day of the following month for verification and payment consideration.

7-3.2.2 Payments

The District shall make payments within thirty (30) Days after receipt of the Contractor's undisputed and properly submitted payment request, including an updated construction schedule pursuant to Section 6-1.1 of the General Provisions. The District shall return to the Contractor any payment request determined not to be a proper payment request as soon as practicable, but not later than seven (7) Days after receipt, and shall explain in writing the reasons why the payment request is not proper.

7-3.2.3 Retention

The District shall withhold not less than five percent (5%) from each progress payment. However, at any time after fifty percent (50%) of the Work has been completed, if the District finds that satisfactory progress is being made, it may, at its discretion, make any of the remaining progress payments in full for actual Work completed. The District shall withhold not less than five percent (5%) of the Contract Price from the Final Payment Amount (defined in Section 7-3.2.4) until at least thirty-five (35) days after recordation of the Notice of Completion, or recordation of a notice of completion or cessation, but not later than the period permitted by Public Contract Code Section 7107.

7-3.2.4 Final Invoice and Payment

Whenever the Contractor shall have completely performed the Contract in the opinion of the Project Engineer and the District. The Contractor shall then submit to the District a written statement of the final quantities of Contract items for inclusion in the final invoice. Upon receipt of such statement, the District shall check the quantities included therein and shall authorize a payment amount, which in the District's opinion shall be just and fair, covering the value of the total amount of Work done by the Contractor, less all previous payments and all amounts to be retained under the provisions of the Contract Documents ("Final Payment Amount"). In addition, the final payment will not be released until the Contractor returns the control set of Plans and Specifications showing the redlined as-built conditions.

7-3.2.5 Substitute Security

In accordance with Public Contract Code Section 22300, the Contractor may request that it be permitted to substitute securities in lieu of having retention withheld by the District from progress payments when such payments become due or, in the alternative, the Contractor may request that the District make payments of earned retentions directly to an agreed upon designated escrow agent at the Contractor's expense. If the Contractor selects either one of these alternatives, the following shall control.

7.3.2.5.1 Substitution of Securities for Performance Retention

At some reasonable time before any progress payment would otherwise be due and payable to the Contractor in the performance of Work under these Contract Documents, the Contractor may submit a request to the District in writing to permit the substitution of retentions with securities equivalent to the amount estimated by the District ("estimated amount of retention") to be withheld. The Contractor shall deposit such securities with the District or may, in the alternative, deposit such securities in escrow with a State or federally chartered bank in California, as the escrow agent, at the Contractor's expense. Such securities will be the equivalent or greater in value of the estimated amount of retention. If the Contract is modified by written Modifications or Change Orders or the Contractor otherwise becomes entitled to receive an amount more than the Contract Price at the time the securities are deposited, the Contractor shall, at the request of the District, deposit with the District or escrow agent, whichever is applicable, additional securities within a reasonable time so that the amount of securities on deposit with the District or escrow agent is equivalent or greater in value than the amount of retention the District would otherwise be entitled to withhold from progress payments due or to become due to the Contractor as the Work progresses. The District shall withhold any retention amount that exceeds the security amount until the additional securities are deposited and, if the deposit is with an escrow agent, the District has confirmation from that escrow agent of the new total value of securities. Upon satisfactory completion of the Contract, which shall mean, among other things, that the District is not otherwise entitled to retain proceeds from progress payments as elsewhere provided in the Contract or under applicable law, the securities shall be returned to the Contractor. The District shall, within its sole discretion, determine whether the amount of the securities on deposit with the District or escrow agent is equal to or greater than the amount of estimated retention of progress payments that could otherwise be held by the District if the Contractor had not elected to substitute same with securities.

7-3.2.5.2 Deposit of Retention Proceeds with an Escrow Agent

As an alternative to the substitution of securities, as provided above, or the District otherwise retaining and holding retention proceeds from progress payments, the Contractor may request the District to make payments of retentions earned directly to an escrow agent with the same qualifications as required in Section 7-3.2.5.1 above and at the expense of the Contractor. At its sole expense, the Contractor may direct the investment of such retention payments into only such securities as mentioned in Section 7-3.2.5.4 below and shall be entitled to interest earned on such investments on the same terms provided for securities deposited by the Contractor. Upon satisfactory completion of the Contract, which shall mean when the District would not otherwise be entitled to withhold retention proceeds from progress payments had the Contractor not elected to have such proceeds deposited into escrow, the Contractor shall be allowed to receive from the escrow agent all securities, interest and payments deposited into escrow pursuant to the terms of this Section. The Contractor shall pay to each Subcontractor, not later than ten (10) Days of receipt of payment, the respective amount of interest earned, net of costs attributed to retention withheld from each Subcontractor, on the amount withheld to ensure performance of the Contractor.

7-3.2.5.3 Subcontractor Entitlement to Interest

If the Contractor elects to receive interest on any moneys withheld in retention by the District, then the Subcontractor shall receive the identical rate of interest received by the Contractor on any retention moneys withheld from the Subcontractor by the Contractor, less any actual pro rata costs associated with administering and calculating that interest. In the event that the interest rate is a fluctuating rate, the rate for the Subcontractor shall be determined by calculating the interest rate paid during the time that retentions were withheld from the Subcontractor. If the Contractor elects to substitute securities in lieu of retention, then, by mutual consent of the Contractor and the Subcontractor, the Subcontractor may substitute securities in exchange for the release of moneys held in retention by the Contractor. The Contractor shall pay each Subcontractor, not later than ten (10) Days after receipt of escrow moneys, the amount owed to each Subcontractor from the moneys plus the respective amount of interest earned, net of costs attributed to the retention held from each Subcontractor, on the amount of retention withheld to ensure performance of the Subcontractor.

7-3.2.5.4 Securities Eligible for Investment

Securities eligible for investment shall include those listed in Government Code Section 16430, bank or savings and loan certificates of deposit, interest-bearing demand deposit accounts, standby letters of credit, or any other security mutually agreed upon between the Contractor and the District. The Contractor shall be the beneficial owner of any securities substituted for any monies withheld and shall receive any interest thereon.

7-3.2.5.5 Escrow Agreement for Security Deposits in Lieu of Retention

The escrow agreement that shall be used for the deposit of securities in lieu of retention shall substantially conform to the form prescribed in Public Contract Code Section 22300(f).

7-3.2.5.6 Inconsistencies with Prevailing Statutory Requirements

If there is any inconsistency between or differences in Public Contract Code Section 22300 and the terms of this provision, or any future amendments thereto, Section 22300 shall control.

Section 7-3.9 is hereby added to Section 7-3 of Part 1 of the Standard Specifications, as

follows:

7-3.9 AUDIT

The District or its representative shall have the option of inspecting and/or auditing all records and other written materials used by the Contractor in preparing its billings to the District as a condition precedent to any payment to the Contractor or in response to a construction claim or a Public Records Act (Government Code Section 6250 *et seq.*) request. The Contractor will promptly furnish documents requested by the District at no cost. Additionally, the Contractor shall be subject to State Auditor examination and audit at the request of the District or as part of any audit of the District, for a period of three (3) years after final payment under the Contract. The Contractor shall include a copy of this Section 7-3.9 in all contracts with its Subcontractors, and the Contractor shall be responsible for immediately obtaining those records or other written material from its Subcontractors upon a request by the District. If the Project includes other auditing requirements, those additional requirements will be listed in the Special Provisions.

SECTION 8 FACILITIES FOR AGENCY PERSONNEL

8-1 General

No field offices for District personnel shall be required; however, District personnel shall have the right to enter upon the Project at all times and shall be admitted to the offices of the Contractor to use the telephone, desk and sanitary facilities provided by the Contractor for its own personnel.

Section 9 is hereby added to Part 1 of the Standard Specifications, as follows:

SECTION 9. ADDITIONAL TERMS

9-1 NONDISCRIMINATORY EMPLOYMENT

The Contractor shall not unlawfully discriminate against any individual based on race, religious creed, color, national origin, ancestry, physical disability, mental disability, medical condition, genetic information, marital status, sex, gender, gender identity, gender expression, age, sexual orientation or military and veteran status. The Contractor understands and agrees that it is bound by and will comply with the nondiscrimination mandates of all statutes and local ordinances and regulations.

9-3 CONTRACTOR'S RESPONSIBILITY FOR WORK

Until the final acceptance of the Work by the District in accordance with Section 3-13.2 of the General Provisions, the Contractor shall have the charge and care thereof and shall bear the risk of injury or damage to any part of the Work by the action of the elements, criminal acts, or any other cause. The Contractor shall rebuild, repair, restore and make good all injuries or damages to any portion of the Work occasioned by any cause before its completion and acceptance and shall bear the expense thereof, except for such injuries or damages arising from the sole negligence or willful misconduct of the District, its officers, agents or employees. In the case of suspension of Work from any cause whatever, the Contractor shall be responsible for all materials and the protection of Work already completed, shall properly store and protect them if necessary, and shall provide suitable drainage and erect temporary structures where necessary.

9-4 PROCEDURE IN CASE OF DAMAGE TO PUBLIC PROPERTY

Any portions of curb, gutter, sidewalk or any other improvement damaged by the Contractor during the course of construction shall be replaced by the Contractor at its own cost. The cost of additional replacement of curb, gutter or sidewalk in excess of the estimated quantities shown in the Bid form and Specifications, and found necessary during the process of construction (but not due to damage resulting from carelessness on the part of the Contractor during its operation), shall be paid to the Contractor at the unit prices submitted in his or her Bid.

9-5 REMOVAL OF INTERFERING OBSTRUCTIONS

The Contractor shall remove and dispose of all debris, abandoned structures, tree roots and obstructions of any character encountered during the process of excavation. It is understood that the cost of any such removals are made a part of the unit price bid by the Contractor under the item for excavation or removal of existing Work.

9-6 SOILS ENGINEERING AND TESTING

A certified materials testing firm may be retained by the City to perform materials tests during the Contractor's entire operation to ascertain compliance with the Contract requirements. The District shall be responsible for the first series of tests. If the initial tests do not meet the Contract requirements, the Contractor shall bear the cost of all subsequent tests.

If the District requires other tests or more specific requirements for testing regarding this Project, those details will be included in the Special Provisions.

9-7 ACCESS TO PRIVATE PROPERTY

Unless otherwise stated in the Special Provisions, the Contractor shall be responsible for all fees and costs associated with securing permission to access private property for any portion of the Project.

9-9 CLAIM DISPUTE RESOLUTION

In the event of any dispute or controversy with the District over any matter whatsoever, the Contractor shall not cause any delay or cessation in or of Work, but shall proceed with the performance of the Work in dispute. The Contractor shall retain any and all rights provided that pertain to the resolution of disputes and protests between the parties. The Disputed Work will be categorized as an "unresolved dispute" and payment, if any, shall be as later determined by mutual agreement or a court of law. The Contractor shall keep accurate, detailed records of all Disputed Work, claims and other disputed matters.

All claims arising out of or related to the Contract Documents or this Project, and the consideration and payment of such claims, are subject to the Government Claims Act (Government Code Section 810 et seq.) with regard to filing claims. All such claims are also subject to Public Contract Code Section 9204 and Public Contract Code Section 20104 et seq. (Article 1.5), where applicable. This Contract hereby incorporates those provisions as through fully set forth herein. Thus, the Contractor or any Subcontractor must file a claim in accordance with the Government Claims Act as a prerequisite to filing a construction claim in compliance with Section 9204 and Article 1.5 (if applicable), and must then adhere to Section 9204 and Article 1.5 (as applicable), pursuant to the definition of "claim" as individually defined therein.

9-10 THIRD PARTY CLAIMS

The District shall have full authority to compromise or otherwise settle any claim relating to the Project at any time. The District shall timely notify the Contractor of the receipt of any third-party claim relating to the Project. The District shall be entitled to recover its reasonable costs incurred in providing this notice.

9-11 COMPLIANCE WITH LAWS

The Contractor shall comply with all applicable federal, State and local laws, ordinances, codes and regulations in force at the time the Contractor performs pursuant to the Contract Documents.

9-12 CONTRACTOR'S REPRESENTATIONS

By signing the Contract, the Contractor represents, covenants, agrees, and declares under penalty of perjury under the laws of the State of California that: (a) the Contractor is licensed, qualified, and capable of furnishing the labor, materials, and expertise necessary to perform the services in accordance with the terms and conditions set forth in the Contract Documents; (b) there are no obligations, commitments, or impediments of any kind that will limit or prevent its full performance under the Contract Documents; (c) there is no litigation pending against the Contractor that could adversely affect its performance of the Contract, and the Contractor is not the subject of any criminal investigation or proceeding; and (d) to the Contractor's actual knowledge, neither the Contractor nor its personnel have been convicted of a felony.

9-13 CONFLICTS OF INTEREST

The Contractor agrees not to accept any employment or representation during the term of the Contract or within twelve (12) months after acceptance as defined in Section 3-13.2 of the General Provisions that is or may likely make the Contractor "financially interested," as provided in Government Code Sections 1090 and 87100, in any decisions made by the District on any matter in connection with which the Contractor has been retained pursuant to the Contract Documents.

9-14 APPLICABLE LAW

The validity, interpretation, and performance of these Contract Documents shall be controlled by and construed under the laws of the State of California, excluding California's choice of law rules. Venue for any such action relating to the Contract shall be in the Superior Court with geographic jurisdiction over the District.

9-15 TIME

Time is of the essence in these Contract Documents.

9-16 INDEPENDENT CONTRACTOR

The Contractor and Subcontractors shall at all times remain, as to the District, wholly independent contractors. Neither the City nor any of its officials, officers, employees or agents shall have control over the conduct of the Contractor, Subcontractors, or any of their officers, employees, or agents, except as herein set forth, and the Contractor and Subcontractors are

free to dispose of all portions of their time and activities that they are not obligated to devote to the District in such a manner and to such Persons that the Contractor or Subcontractors wish except as expressly provided in these Contract Documents. The Contractor and Subcontractors shall have no power to incur any debt, obligation, or liability on behalf of the District, bind the District in any manner, or otherwise act on behalf of the District as agents. The Contractor and Subcontractors shall not, at any time or in any manner, represent that they or any of their agents, servants or employees, are in any manner agents, servants or employees of the District. The Contractor and Subcontractors agree to pay all required taxes on amounts paid to them under the Contract, and to indemnify and hold the District harmless from any and all taxes, assessments, penalties, and interest asserted against the District by reason of the independent contractor relationship created by the Contract Documents. The Contractor shall include this provision in all contracts with all Subcontractors.

9-17 CONSTRUCTION

In the event of any asserted ambiguity in, or dispute regarding the interpretation of any matter herein, the interpretation of these Contract Documents shall not be resolved by any rules of interpretation providing for interpretation against the party who causes the uncertainty to exist or against the party who drafted the Contract Documents or who drafted that portion of the Contract Documents.

9-18 NON-WAIVER OF TERMS, RIGHTS AND REMEDIES

Waiver by either party of any one (1) or more of the conditions of performance under these Contract Documents shall not be a waiver of any other condition of performance under these Contract Documents. In no event shall the making by the District of any payment to the Contractor constitute or be construed as a waiver by the District of any breach of covenant, or any default that may then exist on the part of the Contractor, and the making of any such payment by the District shall in no way impair or prejudice any right or remedy available to the District with regard to such breach or default.

9-19 TERM

The Contract is effective as of the Effective Date listed, and shall remain in full force and effect until the Contractor has fully rendered the services required by the Contract Documents or the Contract has been otherwise terminated by the District. However, some provisions may survive the term listed within this Section, as stated in those provisions.

9-20 NOTICE

Except as otherwise required by law, any notice or other communication authorized or required by these Contract Documents shall be in writing and shall be deemed received on (a) the day of delivery if delivered by hand or overnight courier service during the District's regular business hours or (b) on the third (3rd) business day following deposit in the United States mail, postage prepaid, to the addresses listed on the Contractor's Bid, or at such other address as one party may notify the other.

9-21 SEVERABILITY

If any term or portion of these Contract Documents is held to be invalid, illegal, or otherwise unenforceable by a court of competent jurisdiction, the remaining provisions of these Contract

Documents shall continue in full force and effect.

SPECIAL PROVISIONS

The Sections that follow supplement, but do not replace, the corresponding provisions in Part 4 (Existing Improvements) of the Standard Specifications, except as otherwise indicated herein. In the event of any conflict between the Standard Specifications and these Special Provisions, these Special Provisions shall control.

SECTION 400 - PROTECTION AND RESTORATION

400-1 GENERAL

All costs to the Contractor for protecting, removing, restoring, relocating, repairing, replacing, or reestablishing existing improvements shall be included in the Bid.

SECTION 402 - UTILITIES

402-1 LOCATION

The location and existence of any underground Utility or substructure has not been obtained. The methods used and costs involved to locate existing elements, points of connection and all construction methods are the Contractor's sole responsibility. Accuracy of information furnished, as to existing conditions, is not guaranteed by the District. The Contractor, at its sole expense, must make all investigations necessary to determine locations of existing elements, which may include contacting Underground Service Alert and other private underground locating firm(s), utilizing specialized locating equipment, hand trenching, or both. For every Dig Alert Identification Number issued by Underground Service Alert during the course of the Project, the Contractor must submit to the District the following form. The Contractor shall be responsible for preserving the integrity of the existing underground utilities at the site.

UNDERGROUND SERVICE ALERT IDENTIFICATION NUMBER FORM

No excavation will be permitted until this form is completed and returned to the District.

Government Code Section 4216 *et seq*. requires a Dig Alert Identification Number to be issued before a permit to excavate will be valid.

To obtain a Dig Alert Identification Number, call Underground Service Alert at **811** a minimum of three (3) Working Days before scheduled excavation. For best response, provide as much notice as possible up to ten (10) Working Days.

Dig Alert Identification Number: _____

Dated: _____

_____
("CONTRACTOR")

By: _____

Printed Name: _____

Title: _____

By: _____

Printed Name: _____

Title: _____

Note: This form is required for every Dig Alert Identification Number issued by Underground Service during the course of the Work. Additional forms may be obtained from the City upon request.

402-1.3 Entry by Utility Owners

The right is reserved to the owners of public Utilities or franchises to enter the Project site for the purpose of making repairs or changes in their property that may be necessary as a result of the Work as well as any other reason authorized by the District. When the Contract Documents provide for the Utility owners to alter, relocate or reconstruct a Utility, or when the Contract Documents are silent in this regard and it is determined by the City Engineer that the Utility owners must alter, relocate or reconstruct a Utility, the Contractor shall schedule and allow adequate time for those alterations, relocations or reconstructions by the respective Utility owners. District employees and agents shall likewise have the right to enter upon the Project site at any time and for any reason or no reason at all.

402-2 PROTECTION

If Contractor damages or breaks the Utilities, it will be the Contractor's responsibility to repair the Utility at no cost to the Utility or the District.

402-3 REMOVAL

Facilities encountered during the prosecution of the Work that are determined to be abandoned shall be removed by the Contractor as required for the Work, unless directed otherwise by the District. The remaining portion of the existing Utility which is left in place shall be accurately recorded, in elevation and plan, on the control set of Contract Drawings.

402-4 RELOCATION

The Contractor shall cooperate fully with all Utility forces of the District or forces of other public or private agencies engaged in the relocation, altering, or otherwise rearranging of any facilities that interfere with the progress of the Work. The Contractor shall schedule the Work so as to minimize interference with the relocation, altering, or other rearranging of facilities.

402-6 COOPERATION

The Contractor's attention is directed to the fact that Work may be conducted at or adjacent to the site by other contractors during the performance of the Work under this Contract. The Contractor shall conduct its operations so as to cause a minimum of interference with the work of such other contractors, and shall cooperate fully with such contractors to provide continued safe access to their respective portions of the site, as required to perform work under their respective contracts. Compensation for compliance shall be included in the various items of the Work, and no additional compensation shall be allowed therefor.

402-7 NOTIFICATION

The Contractor shall notify the District and the owners of all Utilities and substructures not less than forty-eight (48) hours before starting construction. The following list of names and telephone numbers is intended for the convenience of the Contractor and is not guaranteed to be complete or accurate:

Agency: _____
Phone Number: _____
Contact Person:_____

Agency: _____
Phone Number: _____
Contact Person:_____

Agency: _____
Phone Number: _____
Contact Person:_____

SECTION 011113 - SUMMARY OF WORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Work included: Construction of the work for Office/Conference Rooms HVAC Replacement Clovis Veterans Memorial District 808 Fourth Street, Clovis, California. The work is defined as all material, labor, equipment and services necessary to do all work shown on the drawings and called for in the Specifications. The Work shall be as indicated on the Contract Documents and shall include, but not limited to, the following description:
   1. All material, labor, equipment, and services to do all work for the HVAC Modifications to existing HVAC and related Architectural, Structural, Mechanical and Electrical modifications.

B. Section Includes:
   1. Project information.
   2. Work covered by Contract Documents.
   3. Access to site.
   4. Coordination with occupants.
   5. Work restrictions.

C. Related Sections: The following Project Manual Sections contain requirements that relate to this section:
   1. 01 50 00 TEMPORARY FACILITIES AND CONTROLS for limitations and procedures governing temporary use of Owner's facilities.
   2. ALL SPECIFICATION SECTIONS IN THE FACILITY CONSTRUCTION SUBGROUP.
   3. ALL SPECIFICATION SECTIONS IN THE FACILITY SERVICES SUBGROUP.
   4. ALL SPECIFICATION SECTIONS IN THE SITE AND INFRASTRUCTURE SUBGROUP.

1.3 DEFINITIONS

A. The words "OWNER" and "DISTRICT" are synonymous and interchangeable, when used throughout this Project Manual.

1.4 PROJECT INFORMATION

A. Project Identification: Clovis Veterans Memorial District - Community Heritage Center

1. Project Location: 808 Fourth Street, Clovis, CA 93612

B. Owner:
1. Clovis Veterans Memorial District:
   a. 808 4th Street, Clovis, CA 93612
   b. Phone: (559) 299-0471
   c. Fax: (559) 299-2151
2. Owner's Representative:
   a. Lorenzo Rios, Chief Executive Officer
   b. Email: lorenzo@cvmdistrict.org

C. Project / Mechanical Engineer:
1. Lawrence Engineering Group:
   a. 7084 N. Maple Avenue Suite 101, Fresno, CA 93720
   b. Phone: (559) 431-0101
   c. Fax: (559) 431-1362
2. Mechanical Engineer's Representative:
   a. Eric Anderson, PE
   b. Email: eric@legfresno.com

D. Consulting Architect:
1. Darden Architects, Inc.:
   a. 6790 N. West Avenue, Fresno, CA 93711
   b. Phone: (559) 448-8051
   c. Fax: (559) 446-1765
2. Architect's Representative:
   a. Robert Petithomme, Architect AIA
   b. Email: bobp@dardenarchitects.com

E. Consulting Structural Engineer:
1. Brooks Ransom Associates:
   a. 7415 N. Palm Avenue #100, Fresno, CA 93711
   b. Phone: (559) 449-8444
   c. Fax: (559) 449-8404
2. Structural Engineer's Representative:
   a. Arturo Lopez, Vice President
   b. Email: art@brooksransom.com

F. Consulting Electrical Engineer:
1. Hardin-Davidson Engineering:
   a. 356 Pollasky Avenue Suite 200, Clovis, CA 93612
   b. Phone: (559) 323-4995
   c. Fax: (559) 323-4928
2. Electrical Engineer's Representative:
   a. Rich Hardin, PE
   b. rh@hardin-davison.com

1.5 QUALITY ASSURANCE

A. Qualifications:
1. Contractor's Qualifications:
a. Contractor shall have experience and have successfully completed three (3) projects of similar scope and size to that indicated for this project.
b. Contractor shall have demonstrated that they have the resources to perform all of the requirements of this project.

B. Regulatory Requirements:
1. Comply with codes, ordinances, rules, regulations, orders and other legal requirements of public authorities which bear on performance of Work, and in accordance with Specification Section - REGULATORY REQUIREMENTS:
a. CARB Materials and equipment used for this Project shall comply with the current applicable regulations of the California Air Resources Board (CARB) and the Environmental Protection Agency (EPA), in the area where the Project is located.
b. City of Clovis.

C. Certifications:
1. The Contractor shall certify in writing that no materials containing Asbestos are incorporated in the work, in accordance with the Asbestos Hazard Emergency Regulations Act.

D. Contractor's Duties:
1. Except as specifically noted, provide and pay for:
a. Labor, material and equipment.
b. Tools, construction equipment and machinery.
c. Heat and utilities required for construction. See Specification Section - TEMPORARY FACILITIES AND CONTROLS.
d. Other facilities and services necessary for proper execution and completion of Work.
2. Pay legally required sales, consumer and use taxes.
3. Secure and pay for all site specific permits and fees as necessary for proper execution and completion of Work.
a. Licenses.
b. Construction, encroachment, grading, connections, and any other fees and permits.
c. Government Fees .
d. Royalties.
4. Give required notices.
5. Promptly submit written notice to Project Engineer of observed variance.
6. Enforce strict discipline and good order among employees. Do not employ on Work:
a. Unfit persons.
b. Persons not skilled in assigned task.

1.6 PROJECT CONDITIONS OR SITE CONDITIONS

A. Access to Site:

1. General: Contractor shall have limited use of Project site for construction operations during construction period. Contractor's use of Project site is limited only by Owner's right to occupy and use the facility.
2. Contractor shall be responsible for coordinating access to and from the site throughout the duration of the project. Access to and from the site may vary, based upon timing and duration of Owner's use.
3. Use of Site: Limit use of Project Site to work in areas indicated. Do not disturb portions of Project site beyond areas in which the Work is indicated.
    a. Confine construction operations to Laws, Ordinances, Permits, and Contract Documents.
    b. Driveways, Walkways and Entrances: Keep driveways loading areas, and entrances serving premises clear and available to Owner, Owner's employees, and emergency vehicles at all times. Do not use these areas for parking or storage of materials.
        1) Schedule deliveries to minimize use of driveways and entrances by construction operations.
        2) Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

B. Condition of Existing Building:
1. General Contractor shall limited use of Project for construction operations during the construction period.
2. Contractor shall be responsible for coordinating access to and from the building throughout the duration of the project. Access to and from the building may vary based upon timing and duration of the work and Owner's use of the facility.
3. Use of Building: Limit use of Project Building to work in areas indicated. Do not disturb portions of Project Building beyond areas in which the work is indicated.
    a. Confine construction operations to Laws, Ordinances, Permits, and Contract Documents.
    b. Entrances, Exits and Rooms: Keep access of all entrances, exits and rooms not in work areas of work clear and available to Owner, Owner's Employees, and event participants at all times. Don not use these areas for storage of mateirals and equipment.
        1) Schedule deliveries to minimize use of entrances, hallways and rooms by construction operations.
        2) Schedule deliveries to minimize space and time requirements for storage of materials and equipment in the building.

C. Conditions of Existing Grounds: Maintain portion of existing grounds, landscaping, and hardscaping affected by construction operations throughout construction period. Repair damage caused by construction operations.

D. Contractor Use of Premises:
1. Confine operations at sites to areas permitted by:
    a. Laws.
    b. Ordinances.
    c. Permits.
    d. Contract Documents.
2. Do not unreasonably encumber site with materials or equipment.

3. Assume full responsibility for protection and safekeeping of Contractor's and Owner's material stored on premises, and keep the site and building secure at all times.
4. Obtain and pay for use of additional storage Work areas needed for operations.
5. Limit use of Site Work and storage.

1.7 COORDINATION WITH OCCUPANTS

A. Owner Occupancy: Owner will occupy the Building during entire construction period, including the areas under construction. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner usage. Perform the Work so as not to interfere with Owner's operations. Maintain existing exits unless otherwise indicated.
   1. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities. Do not close or obstruct walkways, corridors, and other occupied or used facilities without written permission from Owner and authorities having jurisdiction.
   2. Provide not less than 72 hours notice to Owner of activities that will affect Owner's operations.

B. Owner Limited Occupancy of Completed Areas of Construction: Owner reserves the right to occupy and to place and install equipment in completed portions of the Work, prior to Substantial Completion of the Work, provided such occupancy does not interfere with completion of the Work. Such placement of equipment and limited occupancy shall not constitute acceptance of the total Work.
   1. Project Engineer will prepare a Certificate of Substantial Completion for each specific portion of the Work to be occupied prior to Owner acceptance of the completed Work.
   2. Obtain a Certificate of Occupancy from authorities having jurisdiction before limited Owner occupancy.
   3. Before limited Owner occupancy, mechanical and electrical systems shall be fully operational, and required tests and inspections shall be successfully completed. On occupancy, Owner will operate and maintain mechanical and electrical systems serving occupied portions of Work.
   4. On occupancy, Owner will assume responsibility for maintenance and custodial service for occupied portions of Work.

1.8 WORK RESTRICTIONS

A. Work Restrictions, General: Comply with restrictions on construction operations.
   1. Comply with limitations on use of public streets and with other requirements of the City of Clovis.

B. On-Site Work Hours: Limit work in the existing building to normal business working hours per City of Clovis, Monday through Friday, unless otherwise indicated.
   1. Weekend Hours: To be scheduled with Owner Approval in advance.
   2. Early Morning Hours: References to regulations by the City of Clovis for restrictions on noisy work.
   3. Late Night Hours: References to regulations by the City of Clovis for restrictions on noisy work.
   4. Hours for Utility Shutdowns: To be scheduled with Owner Approval in advance.

C. Existing Utility Interruptions: Do not interrupt utilities serving facilities occupied by Owner or others unless permitted under the following conditions and then only after providing temporary utility services according to requirements indicated:
   1. Notify Owner not less than two days in advance of proposed utility interruptions.
   2. Obtain Owner's written permission before proceeding with utility interruptions.

D. Noise, Vibration, and Odors: Coordinate operations that may result in high levels of noise and vibration, odors, or other disruption to Owner occupancy with Owner.
   1. Notify Owner not less than two days in advance of proposed disruptive operations.
   2. Obtain Owner's written permission before proceeding with disruptive operations.

E. Restricted Substances: Use of tobacco product and other controlled substances in Project site is not permitted.

F. Employee Identification: Provide identification tags for Contractor personnel working on Project site. Require personnel to use identification tags at all times.

G. Employee Screening: Comply with Owner's requirements for drug and background screening of Contractor personnel working on Project site.
   1. Maintain list of approved screened personnel with Owner's representative.

1.9 PHASED CONSTRUCTION

A. The Work of this Project will be constructed under a single contract.

B. The Work can be conducted in phases as contractor deems necessary to complete the work with the Owner's Agreement.

PART 2 - PRODUCTS
NOT APPLICABLE

PART 3 - EXECUTION
NOT APPLICABLE

END OF SECTION

SECTION 012500 – SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:
   1. Work that is substituted for Work specified in DIVISIONS 02 through 49 shall meet the requirements of this Section.
   2. Provide all material, labor, equipment and services necessary to completely install all approved substituted materials, accessories and other related items necessary to complete the Project as indicated by the Contract Documents.
   3. Substitutions can be requested in two ways: a. "Prior to Bid Opening", and b. "After Award of the Contract":
      a. "Prior to Bid Opening": The Contractor or Bidder must insure that proposed substitutions of materials by the Contractor or Bidder are submitted to the Project Engineer's office no later than fourteen (14) calendar days prior to the Bid Opening for review and possible approval of any equipment or materials thought to be equal to or better than those specified in the drawings or specifications. An Addendum will be issued no later than three (3) calendar days prior to Bid Opening including all equipment and materials deemed equivalent to those specified and approved by the Project Engineer.
      b. "After Award of the Contract": In accordance with the provisions of Section 3400 of the California Public Contract Code, the Contractor awarded the Contract will be provided a period of thirty-five (35) calendar days after the award of the Contract for submission of data substantiating a request for a substitution of "an equal" item or items.

B. Related Sections: The following Project Manual Sections contain requirements that relate to this section:
   1. ALL DIVISION 00 SPECIFICATION SECTIONS.
   2. ALL DIVISION 01 SPECIFICATION SECTIONS.
   3. ALL SPECIFICATION SECTIONS IN THE FACILITY CONSTRUCTION SUBGROUP.
   4. ALL SPECIFICATION SECTIONS IN THE FACILITY SERVICES SUBGROUP.
   5. ALL SPECIFICATION SECTIONS IN THE SITE AND INFRASTRUCTURE SUBGROUP.

1.2 DEFINITIONS

A. Claimant: Bidder, Sub-Contractor, Contractor, Distributor, Supplier, Manufacturer or other entity that is submitting a claim for a substitution.

B. Substitutions: Substitutions are not a part of the Submittal Process described in Specification Section – SUBMITTAL PROCEDURES. Substitution Requests by a claimant must be reviewed and approved by the Project Engineer before any submittal will be accepted. It is the claimant's responsibility to provide clear and concise documentation to expedite the Project Engineer's review. If the Substitution Request requires re-submission(s) due to the Claimant's inadequate documentation, no time extension will be allowed.

C. "Or Equal" / "Or Approved Equivalent": Claimant shall request a substitution in accordance with this Specification Section – SUBSTITUTION PROCEDURES.

D. The Project Manual employs the following methods of specifying products. Claimant shall conform to the directives below for this Project:
   1. Product, system or design specified only by reference standards:
      a. Select any product, system or design meeting reference standards.
   2. Product, system or design specified by naming several products, systems, designs and/or manufacturers:
      a. Select any product, system, design and/or manufacturer named.
   3. Product, system or design specified by naming several products, systems and/or manufacturers and reference standards:
      a. Products, systems, designs and/or manufacturer names indicate products, systems, designs and/or manufacturers that (in the Project Engineer's opinion) meets the reference standards.
      b. Select any of the named manufacturer's products, systems or designs meeting the reference standards.
   4. Product, system or design specified by naming one or more products, systems, designs and stating "or equal to", "or approved equivalent" with the specified products, systems or designs:
      a. Select product, system or design specified, "or approved equivalent".
   5. Product, system or design specified by naming only one product, system or design:
      a. Select product, system or design specified, "or approved equivalent".
   6. Product, system or design specified by naming only one product, system or design and followed by the statement "DISTRICT STANDARD – NO SUBSTITUTIONS":
      a. Provide product, system or design specified. No substitutions allowed.

E. Cost to Claimant for review of Substitution Request:
   1. Each review of a Substitution Request by the Project Engineer and/or it's Consultant(s) will be billed to the Claimant at an hourly rate of **$200.00** an hour, two hour minimum for each review, whether approved or rejected.
      a. Waiver of review fees:
         1) When the product has been discontinued or is unavailable.
            a) EXCEPTION: Where the claimant has failed to order in a timely manner and waits until the last minute, no consideration of the waiver of fees will be allowed; no time extensions will be allowed.
         2) When the Owner has requested a substitution.

1.3 SUBMITTALS

A. Submit in accordance with Specification Section - INSTRUCTIONS TO BIDDERS:

B. Content of Request:
1. Check made payable to LAWRENCE ENGINEERING GROUP for the minimum two hour review period for **$400.00**, non-refundable.
   a. When additional time is required to review a substitution request beyond the first two hours, the Project Engineer or its consultants will bill the claimant for the time expended in the review process.
2. Complete the attached **SUBSTITUTION REQUEST FORM** substantiating compliance of proposed substitution with Contract Documents. **NO OTHER FORMS WILL BE ACCEPTED.**
3. Attach to the SUBSTITUTION REQUEST FORM an itemized comparison of proposed substitution with product, system or design specified.
4. For products or systems, attach to the SUBSTITUTION REQUEST FORM:
   a. Product, system or design identification, including manufacturer's name and address.
5. Manufacturer's product information: MUST BE HIGHLIGHTED AND PROJECT SPECIFIC. SUBMITTALS NOT ADEQUATELY MARKED-UP ACCORDING TO PROJECT SPECIFICS WILL BE REJECTED:
   a. Literature including product, system or design description, performance and test data and reference standards.
   b. Samples.
   c. Warranties.
6. For construction methods, attach to the SUBSTITUTION REQUEST FORM:
   a. Detailed description of proposed methods.
   b. Drawings illustrating methods.

C. Submit three (3) copies of Substitution Request including all attached data.

1.4 QUALITY ASSURANCE

A. Qualifications:
1. Product, system or design qualifications:
   a. In making a request for substitution, Claimant certifies that:
      1) Claimant has personally investigated proposed product, system or design, and determined that it is equal or superior in all respects to that specified.
      2) Claimant shall provide the same guarantee or warranty for substitution as for product, system or design specified.
      3) Claimant shall coordinate installation of accepted substitution into the Project, making such changes as may be required for the Project to be complete in all respects.
      4) Claimant waives all claims for additional costs related to substitution which subsequently become apparent for integrating the substituted product, system or design into the Project.
      5) Claimant waives all claims for time extension(s) due to improper documentation requiring re-submission(s) of a Substitution Request Review.

B. Regulatory Requirements:
1. In accordance with Specification Section - REGULATORY REQUIREMENTS, and the following:

a. Products (and installation standards), systems or methods used for this Project shall comply with CARB standards in effect at the Project Site, and at the time of installation.

C. Acceptance of Substitutions:
1. Procedures:
a. The Contract is based on products, systems or designs described in the Contract Documents.
b. Project Engineer will consider proposals submitted in accordance with time limits set within the Specification Section - INSTRUCTIONS TO BIDDERS.
c. Project Engineer is solely responsible for judging the acceptance of substitutions.
1) Acceptance of a substitution does not waive the product manufacturer's responsibility for product liability. The Project Engineer will judge (based on the substitution submission data) for function and use – product liability shall remain the responsibility of the product manufacturer.
d. Substitute products, systems or designs shall not be used unless the substitutions have been specifically approved for this Project by the Project Engineer.
1) Substitute products, systems or designs that are related to structural, fire and life safety or access compliance shall not be used unless such substitution have been specifically approved for this Project by the Project Engineer and the appropriate authority having jurisdiction.
2. Substitutions will not be considered if:
a. They are indicated or implied on product submittals in accordance with Specification Section - SUBMITTAL PROCEDURES. Substitutions are not Submittals, and must be reviewed and approved prior to being submitted as a Submittal.
b. Acceptance will require substantial revision of Contract Documents.
c. They are submitted after the date set for substitutions within this Contract, unless:
1) The specified or drawing item that has been verified to be discontinued or is otherwise unavailable.
2) The Owner proposes a cost savings for the product, system or method.
3) The Owner proposes early occupancy, and the proposed substitution allows for that convenience.

PART 2 - PRODUCTS
NOT APPLICABLE

PART 3 - EXECUTION

3.1 SCHEDULES

A. Substitution Request Form:
1. See the form attached to the end of this section.
2. The attached form will be reproduced (and sequentially numbered by the Contractor after the award of the Contract) by the Claimant for any and all proposed substitutions.
3. **NO OTHER FORMS WILL BE ACCEPTED.**

(Attachment)

SUBSTITUTION REQUEST FORM

TO: LAWRENCE ENGINEERING GROUP _____ Check attached for minimum review $400.00.
7084 N. Maple Avenue, Suite #101
Fresno, CA 93720

CHECK APPROPRIATE LINE:

_____ Substitution Request Prior to Bid (During Bid Period)
_____ Product or System Substitution
_____ Design Change Substitution

_____ Substitution Request After Award of the Contract
_____ Product or System Substitution
_____ Design Change Substitution

The Contractor Awarded the Contract for this Project shall assign sequential Substitution Request # below.
Leave blank if submitted during the Bid Period.

SUBSTITUTION REQUEST #_____

WE HEREBY SUBMIT FOR YOUR CONSIDERATION THE FOLLOWING PRODUCT OR METHOD AS SUBSTITUTION FOR THE SPECIFIED OR DRAWING ITEM FOR THIS PROJECT:

PROJECT: _____

SPECIFIED ITEM: _____

_____	_____	_____	_____
Specification Section #	Page #	Paragraph #	Description

OR
DRAWING ITEM: _____

_____	_____	_____
Drawing #	Detail Cut #	Description

PROPOSED CREDIT IF ANY: _____

PROPOSED SUBSTITUTION:
_____
_____
_____
_____

Attached data includes product description, specifications, drawings, photographs, performance and test data adequate for evaluation of the request; applicable portions of the data are clearly identified.

Attached data also includes a description of changes to the Contract Documents to which the proposed substitution will require for its proper installation.

The undersigned claimant certifies: (Modifications by the claimant to the following list is cause for automatic rejection without further review)

1. The proposed substitution does not affect dimensions shown on drawings or code requirements indicated.
2. The undersigned claimant shall compensate the Project Engineer at a rate of **$200.00** an hour, two hour minimum for each review (check for **$400.00** must be attached to this form), for investigation and comments whether or not the request is approved for changes required to the building design, including engineering design, detailing, and construction costs caused by the requested substitution. The Project Engineer is herein defined as any of those firms or individuals listed by reference on the Drawings, including all Consultants identified herein.
3. The proposed substitution will have no adverse affect on other trades, the construction schedule, or specified warranty requirements.
4. Maintenance and service parts will be locally available for the proposed substitution.
5. Attach information for a minimum of three projects where the substitution has been used locally within a 200 mile distance of this project, including names, addresses and telephone numbers of Owners who have accepted this product into their projects.
6. Attach all cost data with explanations if different from Specified or Drawing item. Include in that explanation a discussion on quality of proposed substitution and cost differential.
7. The undersigned claimant shall pay for any subsequent changes in incorporating the proposed substitution that were not apparent at the time of approval into the Work, including compensation to the Project Engineer as described in item 2 above.

The undersigned Claimant(s) declares under penalty of perjury per the California Government Code Section 12650, et seq., that the claim of function, appearance and quality are equivalent or superior to the specified or drawing item, and further know and understand that submission for certification of a false claim may lead to fines, imprisonment and/or other severe legal consequences.

SUBMITTED BY CLAIMANT:

Signature_____
Firm_____

Address_____
_____
Date_____
Telephone_____

ADDITIONAL CLAIMANT SIGNATURE REQUIRED:

The Contractor or Construction Manager if submitted after the Award:

Signature_____
Firm_____

DESIGN CONSULTANT USE ONLY:

___ Check Not Attached - Not Accepted
___ Accepted
___ Accepted as Noted
___ Not Accepted
___ Received Past Time Period Allowed by Public Contract Code #3400.

By _____Date _____
Remarks_____

END OF SECTION

SECTION 012973 – SCHEDULE OF VALUES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This section includes the administrative and procedural requirements necessary to prepare and process the following:
   1. Schedule of Values
      a. Schedule of Bid Values.
      b. Complete Schedule of Values.
   2. Unit Price Schedules.
   3. Application for Payment with Certification.

B. Related Requirements: The following Project Manual Sections contain requirements that relate to this section:
   1. 01 11 13 SUMMARY OF WORK.
   2. 01 32 36 FORMS AND REPORTS.
   3. 01 32 16 CONSTRUCTION SCHEDULE.
   4. 01 33 00 SUBMITTAL PROCEDURES.
   5. 01 41 00 REGULATORY REQUIREMENTS.

1.3 DEFINITIONS

A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring and controlling the construction project. Activities included in a Schedule of Values and Payment Request consume cost for time and resources.

B. Activity Code: Identifies each activity so as to be organized, group and sorted into Sub-Schedules, Areas of Work, and Reports.

C. Allowances: Contract amounts allocated for specific activities of the project as identified in the contract documents.

D. Application for Payments: A statement furnished by the Contractor allocating portions of the Contract Sum to various portions of the Work stipulating the amount of work that has been completed to date.

E. Contingency: Contract amounts allocated for non-specific activities, to cover changes in the contract document work, unforeseen conditions and added scope of work to the project.

F. Major Scope: Significant portions of work identified as, but not limited to, Base Bid, Alternate Bids, and Construction Phases, and Funding Criteria.

G. Responsible Party: Entity that is responsible for performing the work of each activity as identified, but not limited to, General Contractor, and Sub-Contractor, second and tertiary tier Sub-Contractors, Manufacturers, Fabricators and Vendors.

H. Schedule of Values: A statement furnished by the Contractor allocating portions of the Contract Sum to various portions of the Work.

I. Scope Type: Segments of work identified as, but not limited to, Building ID, On-Site, and Off-Site.

J. Sub-Schedules: Separated activities identified as part of the same element of work and arranged to show correlation with related elements.

K. Unit Prices: A price per unit of measurement for materials, equipment, or services, or a portion of the Work that are applicable during the duration of the Work.

1.4 SUBMITTALS

A. General:
1. Submit in accordance with Specification Section - SUBMITTAL PROCEDURES.

B. Format for Submittals: A tabular form type schedules.
1. Provide a working electronic copy of schedule file.
   a. Provide schedule files on Compact Disc (CD) or Digital Versatile Disc (DVD) (WINDOWS Formatted Disks) in a form that can be reviewed and used by the Owner, and Project Engineer.
2. Provide PDF electronic copy of schedule file.
3. Provide Two (2) paper copies of schedules.
   a. Sheet size shall be of adequate size to clearly show the required information for the entire construction period.
   b. All required documentation shall have the Submittal number posted in the upper-right hand corner of the page.

C. Assurance/Control Submittals:
1. Schedule of Values.
   a. Schedule of Bid Values.
      1) Submit within fourteen (14) days after the Award of Contract.
   b. Complete Schedule of Values.
      1) Submit at the earliest possible date, but no later than fifteen (15) days prior to the date scheduled for submittal of initial Application for Payment.
2. Application for Payment and Certification.
   a. Application for Payment and Certification Forms.
      1) Submit along with the Complete Schedule of Values submittal.
   b. Initial Application for Payment.
      1) Submit seven (7) prior to due date.
   c. Application for Payment for Progress of Work.

1) Submit monthly by the date directed by Owner.

d. Application for Payment at Substantial Completion.

1) Submit after Project Engineer issues the Certificate of Substantial Completion.

e. Final Application for Payment.

1) Submit after competing Project Closeout requirements.

1.5 SYSTEM DESCRIPTON

A. General:

1. The Project Engineer considers the project Schedule of Values requirements to be significant to both the Contractor and the Owner. The development, submittal, and acceptance of the Schedule of Values, (Bid and Complete), and subsequent development and maintenance of the Application for Payments must be given high priority.
   a. No payment will be made without the Project Engineer's review and acceptance of the Schedule of Values.
   b. Progress payments may be withheld in whole or part should the Contractor fail to comply with the requirements of this section.
   c. No separate payment will be made to the Contractor for any of the requirements of this section. All such costs shall be part of the Contractor’s planned project overhead costs included in its bid.

B. Performance Requirements:

1. Schedule of Bid Values: The Schedule of Bid Values shall be a breakdown of the Bid(s) submitted in the Bid Proposal and shall include all work that was bid on, regardless the scope of work awarded for construction. The breakdown shall be sufficient for the use by the Owner and Owner’s Consultants to evaluate and determine cost of major scopes of work and the value of other owner agreements that are associated with the dollar value of the bid proposal.
   a. Refer to Specification Section – SUMMARY OF WORK.
2. Complete Schedule of Values: Breakdown of the Contract Sum by specific line-item values, based on the individual activities in the Baseline Project Construction Schedules and to be the basis for the development of the Application for Payment.
   a. Refer to Specification Section – CONSTRUCTION SCHEDULES.
3. Application for Payments: Shall be derived from Baseline Project Construction Schedule utilizing the costs in the Complete Schedule of Values, and from subsequent Project Construction Schedule Updates, reflecting the Work performed as of planned and actual dates.
   a. Refer to Specification Section – CONSTRUCTION SCHEDULES.

1.6 QUALITY ASSURANCE

A. Qualifications:

1. The Contractor must have the capacity and capability of supporting the project by producing schedule-related data within two (2) days of request by the Project Engineer, or Owner.

B. Regulatory Requirements:

1. In accordance with Specification Section - REGULATORY REQUIREMENTS.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS

A. Coordination:
1. Coordinate preparation of the Schedule of Bid Values with the submitted Bid Proposal and reflect the major scope of work breakdown described in Specification Section – SUMMARY OF WORK.
2. Coordinate preparation of the Complete Schedule of Values with the preparation of the Baseline Project Construction Schedule. Refer to Specification Section – CONSTRUCTION SCHEDULES.
3. Correlate line items in the Complete Schedule of Values with other required administrative forms and schedules, including, but not limited to, the following:
   a. Application for Payment forms with continuation sheets.
   b. Submittals Schedule.
   c. Items required to be indicated as separate activities in the Baseline Project Construction Schedule.

B. Project Information:
1. Identification: Include the following Project Identification on all Schedule of Values and Application for Payment.
   a. Project Name and Location.
   b. Name of Owner and Address.
   c. Name of Project Engineer and Address.
   d. Project Engineer's Project Number.
   e. Contractor's Name and Address.
   f. Submittal Date.

2.2 SCHEDULE OF BID VALUES

A. Format:
1. Arrange the Schedule of Bid Values in tabular form.
   a. Provide and identify separate columns to indicate the following ;
      1) SPECIFICATION SECTION.
      2) DESCRIPTION.
      3) RESPONSIBLE PARTY.
      4) MAJOR SCOPE.
      5) DOLLAR VALUE.
      6) PERCENTAGE OF THE CONTRACT SUM.
   b. Provide and identify separate line-items to indicate the following;
      1) Activity.
      2) Contract Conditions.
      3) Allowance(s).
      4) Contingency (ies).
      5) Grand Totals.

B. Content:
1. SPECIFICATION SECTION: Use the specification section number in the Project Manual Table of Contents to identify and establish each line-item.
2. DESCRIPTION: Provide a description of the work for each line-item associated with the specification section and responsible party.
3. RESPONSIBLE PARTY: Identify the responsible party for performing the work of each line-item associated with the specification section and description.
4. MAJOR SCOPE: Designate Major scope of work as identified and itemized in BID PROPOSAL.
   a. Provide separate columns for each Major Scope of Work identified.
5. DOLLAR VALUE: Sub-Total of the cost for each activity line-item, with the amounts rounded to the nearest dollar.
   a. Assign a dollar value for each line-item to each Major Scope of the project excluding General Conditions, General Requirements and General Contractor's Overhead and Profit.
6. PERCENTAGE OF THE CONTRACT SUM: Dollar Value as a percentage of the Contract Sum to the nearest one-hundredth percent, adjusted to total one hundred percent.
7. Activity: Provide at least one activity item-line for the work in each Specification Section.
   a. Provide separate activity line items for each Contractor or Subcontractor providing work under the same specification section.
8. Contract Conditions:
   a. Identify and provide separate activity line-item for cost items that are directly related to Division 01 - GENERAL REQUIREMENTS.
   b. Identify and provide separate activity line-item for cost items that are directly related to Division 00 - CONDITIONS OF THE CONTRACT.
9. Allowances: Identify and provide separate activity line-item for each Allowance that is assigned for specific work in any specification section. Dollar value to exclude General Contractor's Overhead and Profit.
10. Contingencies: If required, identify and provide separate activity line-item for each Contingency that is not assigned to specific work in any specification section. Dollar value to exclude General Contractor's Overhead and Profit.
    a. If required, provide separate line items for Owner Contingency and Contractor Contingency.
11. Grand Total: Summation of dollar value for each column equal to the Bids received.

2.3 COMPLETE SCHEDULE OF VALUES

A. Format:
1. Provide a comprehensive, fully developed, detailed Complete Schedule of Values in tabular form.
   a. Provide and identify the following separate columns to indicate the following for each item listed;
      1) SPECIFICATION SECTION.
      2) ACTIVITY CODE.
      3) DESCRIPTION.
      4) RESPONSIBLE PARTY.
      5) MAJOR SCOPE.
      6) SCOPE TYPE.

7) DOLLAR VALUE.

b. Provide and identify separate line-items to indicate the following;
   1) Activity.
   2) Sub-Schedules.
   3) Contract Conditions.
   4) Allowance(s).
   5) Purchase Contracts (if applicable).
   6) Contingency (ies).
   7) Grand Totals.

B. Content:
1. SPECIFICATION SECTIONS: As described in the Schedule of Bid Values.
2. ACTIVITY CODE: Provide the Activity Identification Code for each line-item indicated as separate activities in the Baseline Project Construction Schedule.
3. DESCRIPTION: As described in the Schedule of Bid Values
4. RESPONSIBLE PARTIES: As described in the Schedule of Bid Values.
5. MAJOR SCOPE: As described in the Schedule of Bid Values.
6. SCOPE TYPE: Identify each line-item that is associated with a segment of work.
7. DOLLAR VALUE: As described in the Schedule of Bid Values.
8. Activity: As described in the Schedule of Bid Values and the following;
   a. Expand to include entities, which is responsible for performing the work of each activity, identified as, but not limited to, General Contractor, and Sub-Contractor, second and tertiary tier Sub-Contractors, Manufacturers, Fabricators and Vendors.
   b. Expand to include separate activity line-items for cost items that are directly related to Division 01 - GENERAL REQUIREMENTS and are direct cost of actual work-in-place. Such items shall be, but not limited to, the following;
      1) Submittals,
      2) Field Engineering
      3) Operation and Maintenance Manuals.
      4) Demonstration and Training.
9. Sub-Schedules:
   a. Major Scope of Work: Provide Sub-Schedules for line-items that are associated with each designated major scope of work as identified in Bid Proposal, and defined in Specification Section – SUMMARY OF WORK and Specification Section – ALTERNATES that requires itemization of each line-item value.
   b. Scope Type: Provide Sub-Schedules for line-items that are associated with each specific scope type.
      1) Building Costs: Detailed cost breakdown of all cost items that are directly related to the Project per Building.
         a) When the Project Building(s) is of sufficient size to warrant, break the building costs down into areas of work compatible with the Contractor's Means and Methods for construction sequences.
         b) Building areas may consist of floor and roof levels and partial floor and roof levels.
      2) Project Site Costs: Detailed cost breakdown of all cost items that are directly related to the Project Site.
         a) When the Project Site is of sufficient size to warrant, break the site costs down into areas of work compatible with the Contractor's Means and Methods for construction sequences.

10. Contract Conditions: As defined in the Schedule of Bid Values and the following;
    a. Expand to include separate activity line-items for cost items that are directly related to Division 01 - GENERAL REQUIREMENTS and are not direct cost of actual work-in-place. Such items shall be, but not limited to, the following;
        1) Temporary Facilities.
        2) Field Supervision.
        3) Project Identification Sign.
        4) Project Closeout Requirements.
            a) Punch List Activities, and Project Record Documents.
    b. Expand to include separate activity line-item for cost items that are directly related to Division 00 - CONDITIONS OF THE CONTRACT REQUIREMENTS and are not direct cost of actual work-in-place. Such items shall be, but not limited to, the following;
        1) On-Site Facilities and Supervision.
        2) General Contractor’s Overhead and Profit.
        3) Performance and Labor and Material Bonds.
11. Allowances: As defined in the Schedule of Bid Values.
12. Purchase Contracts: Provide separate line-item in the Schedule of Values for each Purchase Contract, showing the value of the Purchase Contract.
13. Contingencies: As defined in the Schedule of Bid Values.
14. Grand Total: As defined in the Schedule of Bid Values.

PART 3 - EXECUTION

3.1 APPLICATION AND CERTIFICATION FOR PAYMENT

A. General Requirements:
1. Coordination: Coordinate the preparation of the Application for Payment with the preparation of the Complete Schedule of Values and Project Construction Schedule.
    a. Entries shall match data on the Complete Schedule of Values and Project Construction Schedule and Project Schedule Updates, if revisions were made.
2. Application and Certification for Payment Forms: Use forms accepted by the Project Engineer and Owner for Applications for Payment.
    a. Form shall be based on AIA Document G702 Application and Certification for Payment and AIA Document G703 Continuation Sheets.
    b. Submit form for acceptance with initial submittal of Complete Schedule of Values.
3. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of the Contractor. Project Inspector or Project Engineer will return incomplete applications without action.
    a. Use signed and notarized original copies of each Application for Payment to Project Engineer by a method ensuring receipt. One copy shall include Waivers of Lien and similar attachments if required.
4. Identification: Include the following Project Identification on all Application for Payment:
    a. Project Name and Location.
    b. Owner Name.
    c. Project Engineer's Project Number.
    d. Contractor Name and Address.

e. Application Number.
f. Application Date.
g. Period To:

B. Format.
1. Provide a comprehensive, fully developed, detailed Application for Payment with Continuation Sheets in tabular form.
a. Provide and identify the following separate columns to indicate the following for each item listed;
1) ACTIVITY CODE.
2) DESCRIPTION.
3) SCHEDULED DOLLAR VALUE.
4) WORK COMPLETED.
a) FROM PREVIOUS APPLICATION.
b) THIS PERIOD.
5) TOTAL COMPLETED.
6) PERCENTAGE OF COMPLETION.
7) BALANCE TO FINISH.
8) RETAINAGE.
b. Provide and identify separate line-items to indicate the following the following;
1) Activity.
2) Sub-Schedules.
3) Contract Conditions.
4) Allowance(s).
5) Purchase Contracts (if applicable).
6) Contingency (ies).
7) Grand Totals.
8) Change Orders.

C. Content:
1. ACTIVITY CODE: Provide the Activity Identification Code for each line-item of Work as indicated as separate activities in the Project Construction Schedule
2. DESCRIPTION OF WORK: Provide the same description as indicated in the Schedule of Values for each line item.
3. SCHEDULED DOLLAR VALUE: Provide the same amount as indicated in the Schedule of Values for each line item.
4. WORK COMPLETED: with the following sub-columns.
a. FROM PREVIOUS APPLICATION, include Dollar Value for work completed in previous Application for Payment, whether or not payment has been received.
b. THIS PERIOD, include only the Dollar Value for work completed at the time of Application for Payment.
5. TOTAL COMPLETED: The sum Dollar Value of Work Completed and Materials Presently Stored.
6. PERCENTAGE OF COMPLETION: The percentage value of the total Work Completed and the Stored to Date divided by the Scheduled Value.
7. BALANCE TO FINISH: The dollar value of the Scheduled Value minus the Total Completed.
8. RETAINAGE: The dollar value of the percentage of retention per contract agreement.
9. Activity:

a. Use the Complete Schedule of Values and Baseline Project Schedule as a guide to establish activity line-items for the Application for Payment.
b. Include separate activity line-items when a work activity is separated into stages and requires separate payments for each stage.
c. Provide separate line-items for each part of the Work where separate payments will be requested including, but not limited to, submittals, materials, equipment, fabrication and installation.
d. Provide separate line items for materials stored but not yet installed, where separate payments will be requested.

10. Sub-Schedules: As described in the Complete Schedule of Values.
11. Contract Conditions: As described in the Complete Schedule of Values.
12. Allowances: As described in the Complete Schedule of Values.
13. Purchase Contracts: As described in the Complete Schedule of Values
    a. Indicate Owner payments or deposits, if any, and balance to be paid by the Contractor
14. Contingencies: As described in the Complete Schedule of Values.
15. Grand Totals: As described in the Complete Schedule of Values.
16. Change Orders:
    a. Include amounts of approved Change Orders or Construction Change Directives issued before the last day of construction period covered by application.

D. Supplemental Information:

1. Materials Stored: Include in Application for Payment the amounts applied for materials or equipment purchased or fabricated and stored, but not yet installed.
    a. Differentiate between items stored on-site and items stored off-site.
    b. Provide certificate of insurance or Bonded Warehousing, evidence of transfer of title to Owner, and consent of surety to payment, for stored materials.
    c. Provide supporting documentation that verifies amount requested, such as paid invoices. Match amount requested with amounts indicated on documentation; do not include overhead and profit on stored materials.
    d. Provide summary documentation for stored materials indicating the following:
        1) Materials previously stored and included in previous Applications for Payment.
        2) Work completed for this Application utilizing previously stored materials.
        3) Additional materials stored with this Application.
        4) Total materials remaining stored, including materials with this Application.
2. Waivers of Mechanic's Lien: With each Application for Payment, submit Waivers of Mechanic's Liens from subcontractors, sub-subcontractors, and suppliers for construction period covered by the previous application.
    a. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
    b. When an Application shows completion of an item, submit conditional final or full waivers.
    c. Owner reserves the right to designate which entities involved in the Work must submit waivers.
    d. Submit final Application for Payment with or preceded by conditional final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.
    e. Waiver Forms: Submit waivers of lien on forms executed in a manner acceptable to Owner.

E. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for payment include the following:
   1. List of Subcontractors.
   2. Schedule of Values.
   3. Contractor's Construction Schedule (preliminary if not final).
   4. Products List (preliminary if not final).
   5. Schedule of Unit Prices.
   6. Submittal Schedule (preliminary if not final).
   7. List of Contractor's Staff Assignments.
   8. List of Contractor's Principal Consultants.
   9. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
   10. Initial Progress Report.
   11. Report of Preconstruction Conference.

F. Application for Payment for Progress of Work:
   1. Each Application for Payment shall be consistent with previous applications and payments as certified by the Project Inspector, Project Engineer, and paid for by the Owner.
   2. Payment Applications shall be submitted to the Project Engineer by the date established by the Owner. The maximum period of time covered by each Application for Payment is for one month.
   3. Payments Applications shall be updated to reflect any revised activity in the Project Schedule Updates.

G. Application for Payment at Substantial Completion: After the issuing of the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portions of the Work claimed as substantially complete.
   1. Include documentation supporting the claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
   2. This application shall reflect Certificates of Partial Substantial Completion issued previously for Owner occupancy of designated portions of the Work.

H. Final Application for Payment: Submit Final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:
   1. Evidence of completion of Project closeout requirements.
   2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
   3. Updated final statement accounting for final changes to the Contract Sum.
   4. "Contractor's Affidavit of Payment of Debts and Claims".
   5. "Contractor's Affidavit of Release of Liens".
   6. "Consent of Surety to Final Payment".
   7. Evidence that claims have been settled.
   8. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.
   9. Final liquidated damages settlement statement.

END OF SECTION

SECTION 013113 – CONTRACTOR'S "PROJECT MANAGEMENT" AND COORDINATION

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:
   1. Provide all material, labor, equipment and services necessary to completely manage and coordinate the Project as necessary to construct and complete the Project as indicated by the Contract Documents.

B. Related Sections: The following Project Manual Sections contain requirements that relate to this section:
   1. ALL DIVISION 00 SPECIFICATION SECTIONS.
   2. ALL DIVISION 01 SPECIFICATION SECTIONS.
   3. ALL SPECIFICATION SECTIONS IN THE FACILITY CONSTRUCTION SUBGROUP.
   4. ALL SPECIFICATION SECTIONS IN THE FACILITY SERVICES SUBGROUP.
   5. ALL SPECIFICATION SECTIONS IN THE SITE AND INFRASTRUCTURE SUBGROUP.

1.2 DESCRIPTION:

A. Manage and Coordinate scheduling, submittals, and work of the various sections of the Project Manual to assure efficient and orderly sequence of installation of construction elements with provisions for accommodating items to be installed later.
   1. Coordinate sequence of Work to accommodate Owner Occupancy as specified in the Conditions of the Contract in Division 00 and the General Requirements in Division 01.
   2. The Contractor shall set up control procedures so that "approved schedules" are adhered to. Contractor's responsibility is to correctly notify Owner's Representative of anticipated and actual time delays.
   3. Contractor's job superintendent shall be on site at all times that the Work is in progress. Superintendent shall not perform other functions such as trade work or parts pick-up.
   4. Interruption of Services:
      a. Adequate advance written notice (a minimum of fourteen (14) days) shall be given to the Owner's Representative when interruptions of utility services, or interference with the use of existing building are anticipated.
      b. Any interruption of utility services shall be made by the Contractor with the Owner's Representative in attendance. Contractor shall not interrupt any utility services without the Owner's Representative present.
   5. Planned utility service shutdowns shall be accomplished during periods of minimum usage.
      a. In some cases, this may require work outside of normal (7:00 am to 5:00 pm) work hours, at no additional cost to the Owner.
      b. The Contractor shall program its work so that service will be restored in the minimum possible time, and shall cooperate with the Owner's Representative in reducing shutdowns of utility system.

c. Adequate advance written notice (a minimum of fourteen (14) days) shall be given to the Owner's representative before interruptions to utility services and other interference to the use of, or access to existing buildings and facilities.
d. Required access ways shall be kept open at all times; the use of one way traffic and detours shall be held to a minimum.

6. Coordinate the Work and do not delegate the responsibility for coordination to any sub-contractor.
7. Anticipate the interrelationship of all sub-contractors, and their relationships to one another.
8. Resolve differences or disputes between sub-contractors concerning coordination, interference, or extent of Work.

1.3 SUBMITTALS

A. Schedule and coordinate submittals specified in Specification Section - SUBMITTAL PROCEDURES, and in Specification Section - PROJECT CLOSEOUT.
1. Coordinate work of various Sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.
2. Coordinate requests for substitutions to assure compatibility of space, of operating elements, and effect on work of other sections.

1.4 QUALITY ASSURANCE

A. Coordination of Space:
1. Coordinate use of Project space and sequence of installation of mechanical work, and electrical work, which is indicated diagrammatically on the Drawings. Follow routings shown for pipes, ducts, and conduits as closely as practicable, with due allowance for available physical space.
a. Utilize space efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
2. In finished areas, except as otherwise shown, conceal pipes, ducts, and wiring in the construction.
a. Coordinate locations of fixtures and outlets with finished elements.

B. Coordination of Project Closeout:
1. Coordinate completion and cleanup of work of separate sections in preparation for Owner occupancy.
2. After Owner occupancy of premises, coordinate access to site by various sections for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of Owner's activities.
3. Assemble and coordinate closeout submittals specified in Specification Section - PROJECT CLOSEOUT.

C. Regulatory Requirements:
1. In accordance with Specification Section - REGULATORY REQUIREMENTS.

D. Meetings:
1. Hold coordination meetings and pre-installation meetings with requisite personnel to assure coordination of Work.

PART 2 - PRODUCTS

NOT APPLICABLE

PART 3 - EXECUTION

NOT APPLICABLE

END OF SECTION

SECTION 013216.03 – CONSTRUCTION SCHEDULES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:
   1. Provide all material, labor, equipment and services necessary to completely provide Construction Schedules and other related items necessary to complete the Project as indicated by the Contract Documents.
   2. Provide projected Construction Schedule for entire Work and revise periodically.
   3. Provide separate sub-schedule, showing all submittal information and the time frames in which they are to be submitted, that include the following:
      a. Coordination Drawings (If applicable).
      b. Product Data (If applicable).
      c. Shop Drawings (If applicable).
      d. Samples (If applicable).
      e. Quality Assurance/Control Submittals (If applicable).
      f. Closeout Submittals (If applicable).
   4. Provide sub-schedules to define critical portions of entire schedule.

B. Related Sections: The following Project Manual Sections contain requirements that relate to this section:
   1. ALL DIVISION 00 SPECIFICATION SECTIONS.
   2. ALL DIVISION 01 SPECIFICATION SECTIONS.

1.2 SUBMITTALS

A. Submit in accordance with Specification Section - SUBMITTAL PROCEDURES:
   1. Quality Assurance/Control Submittals:
      a. Submit the Contractor’s Construction Schedule and Submittal Sub-Schedule within 35 calendar days after the Award of Contract date, unless otherwise stated in the General Conditions.
      b. Submit updated schedules as required by change in Work Progress.

1.3 QUALITY ASSURANCE

A. Meetings:
   1. Progress Meetings: Scheduled by the Contractor for the proper performanceof the work.
      a. Minimum agenda shall be to review the work progress, and the following:
         1) Discuss field observations, problems, and decisions;
         2) Identification of any potential problems which may impede planned progress;
         3) Corrective measures to regain projected schedules;
         4) Maintenance of quality and work standards in accordance with manufacturer's warranty requirements.

2. Participants (or designated representative of) invited to attend each of the above meetings shall be as follows:
   a. Contractor.
   b. Owner.
   c. Project Engineer.
   d. Project Inspector.
   e. Installer.
   f. Material Manufacturer(s).
   g. Subcontractors, as appropriate (including any accessory subcontractors).

PART 2 - PRODUCTS

2.1 MATERIALS

A. Contractor's Construction Schedule Form:
   1. Prepare in form of horizontal bar chart.
      a. Provide separate horizontal-box-column for each trade or operation.
      b. Order: Chronological order of beginning of each item of Work.
      c. Identify each column.
         1) By specification section number.
         2) By distinct graphic delineation.
      d. Horizontal time scale: Identify first workday of each week.
      e. Scale and spacing to allow space for updating.
   2. Sheet size and type: 24" x 36", transparency.
   3. Content of Contractor’s Construction Schedule Form.
      a. Provide complete sequence of construction by activity.
      b. Identify Work of separate, logically grouped activities.

B. Submittal Sub-Schedule Form:
   1. Prepare separate Submittal Sub-Schedule, as called for in Specification Section - SUBMITTAL PROCEDURES.

PART 3 - EXECUTION

3.1 SCHEDULES

A. Project Engineer will review schedules and return within 10 days after receipt.
   1. Resubmit within 7 days after return of review copy.

B. Updating:
   1. As a condition of Application Payments (Progress Payments), the Contractor shall show all changes occurring since previous submission of updated schedules, or certify in writing that no changes have occurred. Failure to provide an updated schedule or certification could cause the Project Engineer and Project Inspector to recommend that no payments by the Owner be made until the Contractor has complied with the conditions required for payments.
   2. Indicate progress of each activity and show completion dates.

C. Distribution:
   1. Print copies of schedules for distribution.
   2. Distribute copies of reviewed schedules to:
      a. Job site file.
      b. Project Inspector.
      c. Project Engineer.
      d. Sub-contractors.
      e. Other concerned parties.
   3. Instruct recipients to report any inability to comply and provide detailed explanation with suggested remedies.

END OF SECTION

SECTION 013226 – FORMS AND REPORTS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:
   1. Contractor to provide all Forms and Reports as required by the Project Engineer for Administrative Procedures and other related items necessary to document the Project as required by the Contract Documents, including but not limited to those forms provided under this specification section.
   2. CalGREEN Forms:
      a. Contractor shall provide all California Green Building Standards Code Certification Worksheets and other related items necessary to document the Project as required by the AHJ, including, but not limited to, those forms provided under this specification section.
         1) Obtain the latest documents from the California Building Standards Commission; revisions may have been made since the publication of this Project Manual.

B. Related Sections: The following Project Manual Sections contain requirements that relate to this section:
   1. ALL DIVISION 00 SPECIFICATION SECTIONS.
   2. ALL DIVISION 01 SPECIFICATION SECTIONS.
   3. ALL SPECIFICATION SECTIONS IN THE FACILITY CONSTRUCTION SUBGROUP.
   4. ALL SPECIFICATION SECTIONS IN THE FACILITY SERVICES SUBGROUP.
   5. ALL SPECIFICATION SECTIONS IN THE SITE AND INFRASTRUCTURE SUBGROUP.

1.2 SUBMITTALS

A. Submit in accordance with Specification Section - SUBMITTAL PROCEDURES:
   1. Forms and Reports as attached to this section when required by the Project Engineer.

1.3 QUALITY ASSURANCE

A. Regulatory Requirements:
   1. In accordance with Specification Section - REGULATORY REQUIREMENTS.

PART 2 - PRODUCTS

NOT APPLICABLE

PART 3 - EXECUTION

3.1 SCHEDULES

A. Listing of Project Engineer required Forms and Reports No. of Pages:

1. 01 32 26.01-DAILY SUPERINTENDENT'S REPORT 2
2. 01 32 26.02-SUBCONTRACTOR'S DAILY REPORT 1
3. 01 32 26.03-SHOP DRAWING AND SUBMITTAL TRANSMITTAL 1
4. 01 32 26.04-REQUEST FOR INFORMATION (RFI) 1
5. 01 32 26.05-SUPPLEMENTAL INSTRUCTIONS (SI) 1
6. 01 32 26.06-REQUEST FOR PROPOSAL (RFP) 1
7. 01 32 26.07-CONSTRUCTION CHANGE DIRECTIVE (CCD) 1
8. 01 32 26.08-CHANGE ORDER REQUEST REVIEW (COR) 2
   a. (Review form provided by the Contractor is subject to review and comments by the Owner and Project Engineer).
9. 01 32 26.09-CHANGE ORDER (CO) 1
10. 01 32 26.10-FRAGNET SUBMITTAL FORM 1
11. 01 32 26.11-APPLICATION FOR PAYMENT (AP) 1
12. 01 32 26.12-CONTRACTOR'S TESTING / INSPECTION REQUEST FORM 1
13. 01 32 26.13-CONTRACTOR'S "DEVIATION NOTICE" INSPECTION REPORT FORM 1
14. 01 32 26.14-CONTRACTOR'S FINAL INSPECTION REQUEST FORM 1
15. 01 32 26.15-CONTRACTOR'S PUNCHLIST INSPECTION REQUEST FORM 1
16. 01 32 26.16-CONTRACTOR'S PUNCHLIST 1
17. Periodic field reports issued by the Project Engineer and Project Consultants.
18. Contractor's Punch List Response and Correction form is required for each Punch List Review report, citing the issuing Punch List Review format number(s).
19. Completed Contractor's Punch List and Final Inspection Reports issued by the Project Engineer, Project Consultants and the Owner.
20. See the attached Forms and Reports suitable for reproduction by the Contractor or Subcontractor.

B. Listing of California Green Building Standards Code Certification Worksheets:

1. WORKSHEET (WS-1) BASELINE WATER USE.
2. WORKSHEET (WS-2) WATER USE REDUCTION.
3. CONSTRUCTION WASTE MANAGEMENT (CWM) PLAN (Sample).
4. CONSTRUCTION WASTE MANAGEMENT (CWM) WORKSHEET (Sample).
5. CONSTRUCTION WASTE MANAGEMENT (CWM) ACKNOWLEDGMENT (Sample).

END OF SECTION

(Attachments)

GENERAL CONTRACTOR'S
DAILY SUPERINTENDENT'S REPORT

(JOB NO./REPORT NO.) (DATE/DAY)

(JOB NAME) WEATHER DESCRIPTION

(WORK SHIFT) / FROM / TO (PROJECT MANAGER/SUPERINTENDENT)

PM/	ENGR/	CARPENTERS			LABORERS		CEM FINISHERS			OPER ENGR			
SUPT	TK	FMAN	JRMAN	APP	FMAN	LAB	FMAN	JRMAN	APP	JRMAN	APP	OTHER	TOTAL

CONCRETE: CY TODAY:_____ LOCATION: _____ CY TO DATE: _____

WORK SUMMARY:

DELAYS / WORK RELEASED BY OWNER:

CHANGE ORDERS / EXTRA WORK ORDERS:

INSTRUCTIONS FROM PROJECT ENGINEER / OWNER:

MATERIALS / EQUIP. DELIVERED TO JOB:

INSPECTIONS / TESTS PERFORMED

SAFETY / ACCIDENTS:

MAJOR EQUIP. ON SITE:

BACKSIDE OF GENERAL CONTRACTOR'S REPORT

SUBCONTRACTORS ON JOB	NO. OF MEN	FOREMAN'S NAME	WORK DESCRIPTION / LOCATION

MAJOR EQUIPMENT ON SITE:

BACK CHARGES:

REMARKS:

SUBCONTRACTOR'S DAILY REPORT

PROJECT: DATE:

SHIFT TIME FOREMAN: WEATHER:

WORK DESCRIPTION AND LOCATION:

SUB-SUBCONTRACTOR	CREW SIZE	CRAFT	WORK DESCRIPTION / LOCATION

DELAYS:

CHANGE ORDERS / EXTRA WORK ORDERS:

INSTRUCTIONS RECEIVED FROM GC:

TESTS / INSPECTIONS PERFORMED:

MATERAL / EQUIPMENT DELIVERIES:

MAJOR EQUIPMENT ON SITE:

SAFETY / ACCIDENTS:

SHOP DRAWING AND SUBMITTAL TRANSMITTAL

DESCRIPTION:

SUBMITTAL NO.:

SPEC SECTION:

PROJECT ENGINEER:

PROJECT:

CONTRACTOR:

SUPPLIER:

Substitution: **Yes:** ☐ **DSA Approval Req'd**

DATE RECEIVED: _____ **NO. RECEIVED:** _____ **DATE RETURNED:** _____

Contractor Remarks:

Other Required Information:

CPM Activity / Submittal Task No.: _____

Early Start (ES) Date: _____ Late Finish (LF) Date: _____

WARRANTY: ☐ **O and M MANUALS** ☐

Early Finish (EF) Date: _____ Scheduled Float Time: 0

DESIGN CONSULTANT'S REVIEW:

TRANSMITTED BY PROJECT ENGINEER TO:_____DATE RETURNED: _____

DATE SENT:

NO. SENT: _____

Consultants Remarks:

ACTION:

- ☐ NO EXCEPTION TAKEN RELATIVE TO DESIGN
- ☐ NO EXCEPTION TAKEN WITH MODIFICATION NOTED
- ☐ AMEND AS NOTED AND RESUBMIT
- ☐ REJECTED AND RESUBMIT
- ☐ SEE ATTACHED LETTER

PROJECT ENGINEER'S REVIEW:

Project Engineer's Remarks:

ACTION:

- ☐ NO EXCEPTION TAKEN RELATIVE TO DESIGN
- ☐ NO EXCEPTION TAKEN WITH MODIFICATION NOTED
- ☐ AMEND AS NOTED AND RESUBMIT
- ☐ REJECTED AND RESUBMIT

Approved Substitution ☐

COPIES TO:

DATE RETURNED: _____

Contractor: **Owner:** **Inspector:** **File:** **Other:**

REQUEST FOR INFORMATION

RFI No.:

To: Project Engineer

Date:

Respond By:

Attn:

Project Engineer Project No.

DSA/OSHPD Review Required Yes ☐ No ☐ Apprd ☐

Project:

INFORMATION REQUESTED:

Cost Impact: None: $ _____ Signature: _____

Schedule Impact: Probably Not: _____ Days Pages Attached:

Trade/Contractor: Schedule Task No/Item:

The Work shall be carried out in accordance with the following supplemental instructions issued in accordance with the Contract Documents without change in the Contract Sum or Contract Time. Proceeding with the Work in accordance with these instructions indicates your acknowledgement that there will be no change in the Contract Sum or Contract Time.

If the Contractor considers that this supplemental instruction requires a change in the Contract Sum or Contract Time, the Contractor shall not proceed with this Work and shall promptly submit an itemized proposal to the Architect for doing this work. If your proposal is found to be satisfactory and in order, this supplemental instruction will be superseded by a Construction Change Directive.

Referred To: Referred Date: Return Date:

SUPPLEMENTAL INSTRUCTIONS:

Consultant: _____ Project Engineer's Signature: _____

Date: _____ Date: _____

Copy: ☑ Owner ☑ Inspector ☑ Testing Lab ☑ Structural ☑ Mech. ☑ Elec. ☑ File ☑ Other Pages Attached: ____

SUPPLEMENTAL INSTRUCTIONS

PROJECT:

SUPPL. INST. NO.:

DATE OF ISSUANCE:

OWNER:

CONTRACT DATE:

NOTICE TO PROCEED:

CONTRACTOR:

Project Engineer's Project No.:
DSA Appl. No.:
DSA File No.:
OPSC Appl. No.:
OSHPD No.:

The Work shall be carried out in accordance with the following supplemental instructions issued in accordance with the Contract Documents without change in the Contract Sum or Contract Time. Proceeding with the Work in accordance with these instructions indicates your acknowledgement that there will be no change in the Contract Sum or Contract Time.

If the Contractor considers that this supplemental instruction requires a change in the Contract Sum or Contract Time, the Contractor shall not proceed with this Work and shall promptly submit an itemized proposal to the Architect for doing this work. If your proposal is found to be satisfactory and in order, this supplemental instruction will be superseded by a Construction Change Directive.

Description:

Trade/Contractor:

Schedule Task No/Item:

Attachments:

Project Engineer

Issued By:

☐ **OWNER** ☐ **CONTRACTOR** ☐ **INSPECTOR** ☐ **TESTING LAB** ☐ **STRUCTURAL** ☐ **MECHANICAL** ☐ **ELECTRICAL** ☐ **OTHER**

REQUEST FOR PROPOSAL

PROJECT:

REQUEST FOR PROPOSAL NO.:

DATE OF ISSUANCE:

OWNER:

CONTRACT DATE:

NOTICE TO PROCEED:

CONTRACTOR:

Project Engineer's Project No.:
DSA Appl. No.:
DSA File No.:
OPSC Appl. No.:
OSHPD No.:

Please submit an itemized proposal for change in the Contract Sum and Contract Time for proposed modifications to the Contract Documents described herein. Submit proposal promptly or notify the Architect in writing of the date on which you anticipate submitting your proposal.

This is not a Change Order, Construction Change Directive, or a direction to proceed with the Work described in the proposed modifications.

Description:

Attachments

Project Engineer

ISSUED BY:

_____

☐ **OWNER** ☐ **CONTRACTOR** ☐ **PROJECT ENGINEER** ☐ **CONSULTANT** ☐ **INSPECTOR** ☐ **OTHER**

CONSTRUCTION CHANGE DIRECTIVE

PROJECT:

OWNER:

CONTRACTOR:

DIRECTIVE NO.:

DATE OF ISSUANCE:

CONTRACT DATE:

NOTICE TO PROCEED:

Project Engineer's Project No.:
DSA Appl. No.:
DSA File No.:
OPSC Appl. No.:
OSHPD No.:

You are hereby directed to make the following change(s) in this Contract:

CONTRACT ADJUSTMENT

1. The proposed basis of adjustment to the Contract Sum or Guaranteed Maximum Price is:

   ☐ Lump Sum $

   ☐ Unit Price of $

   ☐ As provided for in General Conditions and the Supplemental Conditions of the contract.

   ☐ As Follows:

2. The Contract Time is proposed to (be adjusted) . The proposed adjustment, if any, is increase of _____ days)

When signed by the Owner and Project Engineer and received by the Contractor, this document becomes effective IMMEDIATELY as a Construction Change Directive (CCD), and the Contractor shall proceed with the change(s) described above.

Signature by the Contractor indicates the Contractor's agreement with the proposed adjustments in Contract Sum and Contract Time set forth in this Construction Change Directive.

PROJECT ENGINEER	OWNER	CONTRACTOR
..		
.		
.		
By:	By:	By:
Date:	Date:	Date:

☐ **OWNER** ☐ **CONTRACTOR** ☐ **PROJECT ENGINEER** ☐ **CONSULTANT** ☐ **INSPECTOR** ☐ **OTHER**

CHANGE ORDER REQUEST REVIEW

PROJECT:

CHANGE ORDER REQUEST NO.:

DATE OF ISSUANCE:

OWNER:

CONTRACTOR:

Project Engineer Project No.:
DSA Appl. No.:
DSA File No.:
OPSC Appl. No.:
OSHPD No.:

DESCRIPTION OF PROPOSED CHANGE:

Requested By:

Scope:

Necessary for:

DESIGN CONSULTANT'S REVIEW:

Date Sent:
Referred To:
Date Returned:

ACTION:

- ☐ NO EXCEPTION TAKEN RELATIVE TO COST
- ☐ NO EXCEPTION TAKEN RELATIVE TO TIME
- ☐ AMEND AS NOTED AND RESUBMIT
- ☐ REJECTED

Consultants Remarks:

PROJECT ENGINEER'S REVIEW:

Date Returned:

ACTION:

Project Engineer's Remarks:

- ☐ NO EXCEPTION TAKEN RELATIVE TO COST
- ☐ NO EXCEPTION TAKEN RELATIVE TO TIME
- ☐ AMEND AS NOTED AND RESUBMIT
- ☐ REJECTED

Attachments:

REVIEWED:

APPROVED:

Project Engineer: **Date:**

Owner: **Date:**

The Project Engineer is hereby directed to instruct the Contractor to make the above changes in the Project and to include these changes in a subsequent Change Order:

☐ **OWNER** ☐ **CONTRACTOR** ☐ **INSPECTOR** ☐ **STRUCTURAL** ☐ **MECHANICAL** ☐ **ELECTRICAL** ☐ **OTHER**

CHANGE ORDER REQUEST NO.

Project Engineer's Project No.:

CHANGE ORDER REQUEST- BREAKDOWN WORKSHEET

WORK DELETED:

Contractor				
Materials	$0.00			
Equipment	$0.00			
Labor	$0.00			
Material, Equipment, & Labor		$0.00		
TOTAL:				**$0.00**

ADDITIONAL WORK PERFORMED BY SUB-CONTRACTOR

Sub-Contractor				
Materials	$0.00			
Equipment	$0.00			
Labor	$0.00			
Material, Equipment, & Labor		$0.00		
Overhead		$0.00		
Profit		$0.00		
Sub-Total:			$0.00	
Contractor				
Overhead			$0.00	
Profit			$0.00	
TOTAL:				**$0.00**

ADDITIONAL WORK PERFORMED BY CONTRACTOR

Contractor				
Materials	$0.00			
Equipment	$0.00			
Labor	$0.00			
Material, Equipment, & Labor		$0.00		
Overhead		$0.00		
Profit		$0.00		
TOTAL:				**$0.00**

TOTAL COST: **$0.00**

TOTAL COST: _____$_____

TOTAL DAYS: _____

PROJECT ENGINEER'S ADMINISTRATIVE FEES:

Proposal Request Administration $

Construction Administration _____$_____

TOTAL: $

DSA Fees: $

CHANGE ORDER

PROJECT:

OWNER:

CONTRACTOR:

CHANGE ORDER NO.:

DATE OF ISSUANCE:

CONTRACT DATE:

NOTICE TO PROCEED:

Project Engineer Project No.:
DSA Appl. No.:
DSA File No.:
OPSC Appl. No.:
OSHPD No.:

The Contract is changed as follows:

Description:

It is mutually agreed that the affixed signature to this Change Order is evidence that all compensation with respects to the changes defined herein have been satisfied with the execution of this document. Furthermore, no additional compensation either monetarily or via time extension to this contract will be sought in respect to this Change Order.

The Original Contract Sum and Contract Completion Date:	$	
Net change (Contract Sum and Contract Time) by previous Change Orders:	$	days
Contract Sum and Contract Completion Date prior to this Change Order:	$	
Contract Sum and Contract Time (increased or decreased) by this Change Order:	$	days
New Contract Sum and Contract Completion Date including this Change Order:	$	

CONTRACTOR	PROJECT ENGINEER	OWNER
By:	By:	By:
Date:	Date:	Date:

☐ **OWNER** ☐ **CONTRACTOR** ☐ **PROJECT ENGINEER** ☐ **CONSULTANT** ☐ **INSPECTOR** ☐ **OTHER**

FRAGNET SUBMITTAL FORM

Date: _____ Sheet _____ of _____

From: _____ Fragnet No.: _____

To: Project Engineer

Description of Delay: By reference to attached schedule fragnet, the following delay occurred:

_____

_____

_____

Continued on Sheets _____ of _____

Time Extension Requested: _____ wds, _____ cds.

Time Requested for Activity: Time Requested for Project:

Related Documents: The following construction documents provide evidence of the delay event:

RFI Nos.: _____ SI Nos.: _____

CCD Nos: _____ RFP Nos.: _____

Daily Reports Dated: _____ and attached.

Project Correspondence Dated: _____ and attached.

Other Documentation: _____

Schedule-Related Information: By reference to the attached fragnet, provide the following:

Predecessor Activity to Fragnet:

Successor Activity to Fragnet:

Affected CPM Schedule Activities (list IDs and descriptions):

_____

_____

New CPM Schedule Activities (list IDs and descriptions):

_____

_____

END OF FORM

APPLICATION FOR PAYMENT

To:

Project:

Pay Application No: _____

Distribution to: _____

Owner: _____

Bid Package No: _____

Application Date: _____

Architect: _____

Contractor: _____

FROM: _____

Prime Contractor

Period Ending: _____

Const Mgr.: _____

Inspector: _____

Address: _____ Phone: _____

CONTRACTOR'S APPLICATION FOR PAYMENT:

CHANGE ORDER SUMMARY		
APPROVED CHANGE ORDERS:		
Change Order No.	Approved Date.	Amount:
		$
		$
		$
		$
		$
		$
		$
		$
TOTALS		
Net change by Change Order		$

The undersigned Contractor certifies that in the best of his knowledge, information, and belief the Work covered by this Application for Payment has been completed in accordance with the Contract Documents, that all amounts have been paid by the contractor for work for which previous Certificates for Payment were issuesd and payment received from the Owner and that current payment show herein is now due.

Contractor:

_____ **DATE:** _____

The present status of the account for this Contract is as follows:

ORIGINAL CONTRACT SUM:..... $ _____

Net Change by Change Orders:..... $ _____

CONTRACT SUM TO DATE:..... $ _____

TOTAL COMPLETE & STORED TO DATE:..... $ _____

RETAINAGE:_____%:..... $ _____

TOTAL EARNED LESS RETAINAGE:..... $ _____

LESS STOP NOTICE(S):..... $ _____

LESS PREVIOUS PAYMENT:..... $ _____

CURRENT PAYMENT DUE:..... $ _____

This Certificate is not negotiable. This AMOUNT CERTIFIED is payable only to the Contractor named herein, issuance, payment and acceptance of payment, are without prejudice to any rights of the Owner or Contractor under this contract.

CONTRACTOR:

_____ **DATE:** _____

INSPECTOR:

_____ **DATE:** _____

CONSTRUCTION MANAGER:

_____ **DATE:** _____

PROJECT ENGINEER:

_____ **DATE:** _____

CONTRACTOR'S TESTING / INSPECTION REQUEST FORM

PROJECT: _____

DATE RECEIVED: _____ (by Inspector)

TIME RECEIVED: _____ (by Inspector)

BUILDING: _____

SITE/OFFSITE: _____

CONSTRUCTION PHASE (1, 2, 3, etc.): _____

SPECIFICATION SECTION (No.): _____

PLAN SHEET AND DETAIL: _____

SCOPE OF WORK: _____

(concrete, electrical, etc.)

INSPECTION REQUESTED BY: _____

(contractor name)

LOCATION (bldg., room, floor, wall, ceiling, etc.) _____

_____

_____

TYPE OF INSPECTION (concrete, framing, welding, masonry, electrical, etc.) _____

_____

_____

INSPECTION REQUESTED ON: _____ at _____ am/pm

(date) (time)

Note 1: A Minimum Notice of 48 hours is Required to be Received by the Inspection Officer Prior to the Time the Testing / Inspection is Requested to Begin.

_____

PRINT NAME AND TITLE OF PERSON REQUESTING INSPECTION

_____

SIGNATURE OF PERSON REQUESTING INSPECTION

Note 2: Contractor Must Accompany Inspector on Inspection, if Requested.

PASSED: _____ FAILED: _____

Note 3: See Attached Sheet for Explanation if Inspection Failed. Re-inspection Required.

INSPECTOR SIGNATURE: _____ Date: _____

CONTRACTOR'S "DEVIATION NOTICE" INSPECTION REQUEST FORM

PROJECT: _____

DATE RECEIVED: _____ (by Inspector)
TIME RECEIVED: _____ (by Inspector)

DEVIATION NOTICE(S) (No.): _____

BUILDING: _____
SITE/OFFSITE: _____
CONSTRUCTION PHASE (1, 2, 3, etc.): _____
SPECIFICATION SECTION (No.): _____
SCOPE OF WORK: _____
(concrete, electrical, etc.)

INSPECTION REQUESTED BY: _____
(contractor company name)

LOCATION(S) OF WORK FOR INSPECTION (be specific- bldg.(s), room(s), etc.)

_____

_____

INSPECTION REQUESTED ON: _____ at _____ am/pm
(date) (time)

Note 1: A Minimum Notice of 48 hours is Required to be Received by the Inspection Officer Prior to the Time the "Deviation Notice" Inspection is Requested to Begin.

_____
PRINT NAME OF PERSON REQUESTING DEVIATION NOTICE INSPECTION

_____
SIGNATURE OF PERSON REQUESTING DEVIATION NOTICE INSPECTION

Note 2: Contractor Must Accompany Project Inspector on "Deviation Notice" Inspection, if Requested.

Note 3: See Attached "Deviation Notice" for Inspector's Comments and/or Date Completed.

PASSED: _____ FAILED: _____

PROJECT INSPECTOR SIGNATURE: _____
DATE: _____

CONTRACTOR'S FINAL INSPECTION REQUEST FORM

PROJECT: _____

DATE RECEIVED: _____ (by Inspector)

TIME RECEIVED: _____ (by Inspector)

BUILDING: _____

SITE/OFFSITE: _____

CONSTRUCTION PHASE (1, 2, 3, etc.): _____

SPECIFICATION SECTION (No.): _____

SCOPE OF WORK: _____

(concrete, electrical, etc.)

INSPECTION REQUESTED BY: _____

(contractor company name)

INSPECTION REQUESTED ON: _____ at _____ am/pm

(date) (time)

Note 1: A Minimum Notice of 48 hours is Required to be Received by the Inspection Officer Prior to the Time the Final Inspection is Requested to Begin. Contractor to be Notified by the Construction Manager in Regards to the Actual Date and Time of the Final Inspection.

_____

PRINT NAME AND TITLE OF PERSON REQUESTING FINAL INSPECTION

_____

SIGNATURE OF PERSON REQUESTING FINAL INSPECTION

Note 2: Contractor Must Accompany Project Inspector, Architect and/or Engineer(s) on Final Inspection, if Requested.

PASSED: _____ FAILED: _____

Note 3: If the Final Inspection Fails Re-Inspection is Required. See Attached Sheet for Comment(s).

PROJECT INSPECTOR SIGNATURE: _____

DATE: _____

PROJECT ARCHITECT SIGNATURE: _____

DATE: _____

CONTRACTOR'S PUNCHLIST INSPECTION REQUEST FORM

PROJECT: _____

DATE RECEIVED: _____ (by Inspector)

TIME RECEIVED: _____ (by Inspector)

BUILDING: _____

SITE/OFFSITE: _____

CONSTRUCTION PHASE (1, 2, 3, etc.): _____

SPECIFICATION SECTION (No.): _____

SCOPE OF WORK: _____

(concrete, electrical, etc.)

INSPECTION REQUESTED BY: _____

(contractor company name)

LOCATION(S) OF WORK FOR INSPECTION: (be specific- bldg.(s), room(s), etc.)

_____

_____

DESCRIPTION OF WORK TO BE INSPECTED: (item number(s) from punchlist)

_____

_____

INSPECTION REQUESTED ON: _____ at _____ am/pm

(date) (time)

Note 1: A Minimum Notice of 48 hours is Required to be Received by the Inspection Officer Prior to the Time the Punchlist Inspection is Requested to Begin.

_____

PRINT NAME OF PERSON REQUESTING PUNCHLIST INSPECTION

_____

SIGNATURE OF PERSON REQUESTING PUNCHLIST INSPECTION

Note 2: Contractor Must Accompany Project Inspector on Punchlist Inspection, if Requested. Items Must Have Already Been Signed Off by Contractor.

Note 3: Attached Sheet for Contractor's Signoff and/or Inspector's Comments and/or Date Completed for the Specific Punchlist Items Noted Above.

Note 4: This Inspection is NOT A FINAL INSPECTION but Only an Acknowledgement That a Particular Item(s) is/are completed.

PROJECT: _____ - CONTRACTOR'S PUNCHLIST

CONTRACTOR NAME: _____ Page _____ of _____

ITEM NO.	DESCRIPTION	BUILDING & ROOM NO.	FLOOR	CEILING	_____WALLS_____ N. S. E. W.	DATE OBSERVED	SIGNOFF/ COMMENTS

01.32.26.16.xls

SECTION 013300 – SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:
   1. Provide all material, labor, equipment and services necessary to completely provide all required submittals and other related items necessary to complete the Project as indicated by the Contract Documents.

B. Related Sections: The following Project Manual Sections contain requirements that relate to this section:
   1. ALL DIVISION 00 SPECIFICATION SECTIONS.
   2. ALL DIVISION 01 SPECIFICATION SECTIONS.
   3. ALL SPECIFICATION SECTIONS IN THE FACILITY CONSTRUCTION SUBGROUP.
   4. ALL SPECIFICATION SECTIONS IN THE FACILITY SERVICES SUBGROUP.
   5. ALL SPECIFICATION SECTIONS IN THE SITE AND INFRASTRUCTURE SUBGROUP.

1.2 SUBMITTALS

A. Request for Electronic Files:
   1. Submit in accordance with the following:
      a. Contractor's Usage Agreement for Electronic Files:
         1) See attachment.

B. Contractor's responsibilities:
   1. The Contractor shall check, verify, and be responsible for all field measurements.
   2. The Contractor shall submit a schedule indicating when the required shop drawings and submittals will be submitted to the Project Engineer.
      a. Submit schedule within the amount of days as indicated in Specification Section - CONSTRUCTION SCHEDULES.
   3. Submit copies as scheduled below, checked and approved by the Contractor for all submittals required for the work of the various trades. Deliver submittals promptly to avoid delays in delivery of materials or execution of the work.
      a. The Contractor (or Subcontractor) shall mark-up the submittals as to project specifics. If the specifications contains a schedule prepared by the Project Engineer (i.e. paint symbols such as DW-1, M-1, CB-1, etc., or tile symbols such as CT-1,CT-2, or IWA, IWB, IWC, etc.), then the submittal will also contain those designations. Submittals without project specifics will be returned to the Contractor as not being properly prepared.
      b. The Contractor shall stamp the Submittals utilizing any language requested by the Owner in the General Conditions and the following minimum language:

"This submittal has been reviewed by (Name of Contractor) and approved with respect to the means,

methods, techniques, sequences, and procedures of construction, and safety precautions and programs incidental thereto. The Contractor has reviewed and approved not only the field dimensions, but the construction criteria, and has also made written notation regarding any information in the Shop Drawings that does not conform to the Contract Documents. The Contractor has reviewed this submittal and coordinated with all other Shop Drawings received to date by the Contractor and this duty of coordination has not been delegated to subcontractors, material suppliers, the Project Engineer, or the design consultants on this project. The Contractor shall also have indicated that it has not relied upon the dimensions shown on the drawings, specifications and schedules, and that the Contractor has double-checked all dimensions for accuracy and fit. (Name of Contractor) also warrants that this submittal complies with the Contract Documents and comprises no variation thereto."

By: _____ Contractor's Signature

_____ Contractor's Typed Name

Date: _____

c. Substitutions on shop drawings or in product submittals will not be considered without prior approval in accordance with Specification Section - SUBSTITUTION PROCEDURES. Submittals containing unacceptable items will be rejected.

d. The Contractor shall make any corrections required by the Project Engineer during the Project Engineer's initial review, and re-submit the required corrected copies for final review and distribution.

C. Project Engineer's responsibilities:

1. The Project Engineer will make any desired corrections with reasonable promptness, and return the submittal to the Contractor.
2. The Project Engineer's review of such drawings or schedules shall not relieve the Contractor of responsibility for deviations from the drawings or specifications, unless he has, in writing, called the Project Engineer's attention to such deviations at the time of submission, and secured written acceptance.
   a. The Project Engineer's review shall be for general conformance with the design concept for the project and general compliance with the information given in the Contract Documents.
   b. The Project Engineer's review shall not be construed as an "approval", or to relieve the Contractor(s) and material suppliers of responsibility for errors or omissions in the submitted documents.
   c. Modifications or comments made on the submittals or shop drawings during this review do not relieve the Contractor from compliance with the requirements of the drawings and specifications.
   d. Acceptance of a specific item does not include acceptance of the assembly of which the item is a component.

D. The following list of items, definitions and required quantities is a minimum required for this project. Verify with FACILITY SERVICES SUBGROUP sections for additional quantities required within those divisions.

1. Product Data: Illustrations, standard schedules, performance charts, instructions, brochures, diagrams, other product information, color choices and/or manufacturer's catalog sheets shall be specially prepared for the Project (marked-up with project specifics) and shall be submitted in sequential sets for each category of work:
   a. Quantity:

1) Unless otherwise indicated in the Contract Documents, provide Six (6) sets.

b. Material Safety Data Sheets (MSDS): MSDS are not required, but it is recognized that applicable federal and state laws require the submission of these data sheets to an Owner. MSDS shall be turned over to the Owner (without review by the Project Engineer or it's consultants) in compliance with federal and state laws.

2. Shop Drawings: Newly prepared information, drawn to accurate scale, consisting of drawings, diagrams, schedules, and other data specifically prepared for the Project by the Contractor, a Subcontractor, manufacturer, supplier or distributor to illustrate some portion of the Project. Do not reproduce Contract Documents or copy Standard information as the basis of Shop Drawings. Standard information prepared without specific reference to the Project is not considered Shop Drawings.

a. Quantity: Provide One (1) reproducible original (vellum, sepia or mylar) and Three (3) opaque (blue-line or black-line xerographic) prints for each sheet or detail.

1) The contractor shall receive the marked-up reproducibles and copy the required number of sets to the subcontractor, manufacturer's and/or material suppliers.

b. Contractor's use of Project Engineer's Electronic CAD Files.

1) Upon written request by Contractor, copies of the Project Engineer's electronic CAD files may be available for Contractor's use in connection with this Project.

a) Contractor's written request shall be on the Project Engineer's "Contractor's Document Usage Agreement for Requested Documents" and may include an additional Project Engineer's Consultant's Agreements, outlining conditions for providing files.

b) Contractor's request shall be limited to drawings directly applicable to the Shop Drawings the Contractor wishes to create for submittal.

c) Contractor shall pay the Project Engineer for work incurred for providing the requested files. Payment shall be submitted with the request.

2) The Project Engineer's electronic CAD files are limited to files that already exist and that not all files may be available at the Project Engineer's and Project Engineer's Consultant's discretion.

3) The Project Engineer's electronic CAD files are not part of the Contract Documents and have limitations to the accuracy, incorporating modifications, CAD system formats, CAD entity attributes and layering.

4) The Project Engineer's electronic CAD files have restrictions on Contractor's use, transmittal and delivery of files.

3. Samples: Physical examples specially prepared for the Project (marked-up with project specifics) which illustrate materials, equipment, or workmanship and establish standards by which the Work will be judged.

a. Quantity:

1) Unless otherwise indicated in the Contract Documents, provide Four (4) sets.

b. Color samples shall be submitted on 8-1/2" x 11" cards for all colors scheduling paint types specified utilizing the paint symbols designated by the Project Engineer in the drawings and specifications.

c. Manufactured devices or equipment items:

1) Quantity: One (1) sample, returned to supplier and which, when approved, may be incorporated into the Project.

4. Quality Assurance/Control submittals: Consists of design data, test reports, certificates, manufacturers instructions, and /or manufacturer's field reports.
   a. Quantity:
      1) Unless otherwise indicated in the Contract Documents, provide Six (6) sets.
5. Closeout submittals: Maintenance data, operating manuals, project documents, engineering calculations, and/or warranties shall be submitted when required in the various specification sections:
   a. Quantity:
      1) Unless otherwise indicated in the Contract Documents, provide Two (2) sets.
6. Field Samples: Sample panels of in place construction, or selected area of completed substrates or work showing the anticipated compliance with specified characteristics in order to establish a standard of quality.
   a. Quantity:
      1) See specific specification section requirements.
7. Mockups: Full-sized erected assemblies, used for coordination purposes or for testing in a laboratory, or required for approval in a finish form before the actual Project construction begins.
   a. Quantity:
      1) See specific specification section requirements.

E. Substitution, Dispute or Claim Submittals:
   1. Any substitution, dispute or claim submittals relating to this contract, or any Contract breach, which are not disposed of by agreement shall be promptly submitted in accordance with the GENERAL CONDITIONS, as a claim to and decided by the Project Engineer who shall issue a written decision on the dispute.
   2. Adequate supporting data shall include, but is not limited; a statement of the reasons for the asserted entitlement, the certified payroll, invoice for material and equipment rental, and an itemized breakdown of any adjustment sought.
   3. If no "SUBMISSION UNDER PENALTY OF PERJURY" clause is provided within the GENERAL CONDITIONS, then the Contractor shall certify, at the time of submission of a substitution, dispute or claim, as follows:

(The rest of this page is left intentionally blank)

SUBMISSION UNDER PENALTY OF PERJURY

I _____, being the _____(Must be an officer), declare under penalty of perjury under the laws of the State of California, and do personally certify and attest that: I have thoroughly reviewed the attached substitution, dispute or claim for additional compensation and/or extension of time, and know its contents, and said claim is made in good faith; the supporting data is truthful and accurate; that the amount required accurately reflects the contract adjustment for which the Contractor believes the Owner is liable; and further, that I am familiar with California Government Code Section 12650, et seq, pertaining to false claims, and further know and understand that submission of certification of a false claim may lead to fines, imprisonment and/or other severe legal consequences.

By: _____ Contractor's Signature

_____ Contractor's Typed Name

Date: _____

Submission of a substitution, dispute or claim, properly certified, with all required supporting documentation, and written rejection or denial or all or part of the claim by Owner, is a condition precedent to any action, proceeding, litigation, suit or demand for arbitration by Contractor.

(This page is left intentionally blank)

PART 2 - PRODUCTS

NOT APPLICABLE

PART 3 - EXECUTION

3.1 SCHEDULES

A. Usage Agreement For Electronic Documents:
   1. Contractor's Usage Agreement for Electronic Files:
      a. See attachment.

B. The following schedule was prepared to assist the Contractor in knowing the required submittals for this project, but may not be complete. Specific submittal information as to what is required is contained within the individual specification sections and those individual sections shall govern in the event of a question.

C. SUBMITTAL SCHEDULE
   1. 01 11 13 - SUMMARY OF WORK
      a. QUALITY ASSURANCE/ CONTROL SUBMITTALS
   2. 01 25 00 - SUBSTITUTION PROCEDURES
      a. SUBSTITUTION REQUEST FORMS
   3. 01 29 73 - SCHEDULE OF VALUES
      a. SCHEDULE OF VALUES
   4. 01 32 16 - CONSTRUCTION SCHEDULES
      a. CONSTRUCTION SCHEDULE, SHOP DRAWING SUBMITTAL SCHEDULE, CRITICAL PATH SCHEDULES, FRAGNETS.
   5. 01 32 26 - FORMS AND REPORTS
      a. AS REQUIRED BY THIS SPECIFICATION SECTION AND OTHER SPECIFICATION SECTIONS.
   6. 01 33 00 - SUBMITTAL PROCEDURES
      a. SHOP DRAWING AND SUBMITTAL SCHEDULE, COLOR SAMPLES OF ALL FINISH MATERIALS FOR COLOR BOARD SELECTION.
   7. 01 45 29 - TESTING LABORATORY SERVICES
      a. TESTING SCHEDULE, TEST REPORTS
   8. 01 77 20 - PROJECT CLOSEOUT
      a. COORDINATION DRAWINGS, QUALITY ASSURANCE/CONTROL SUBMITTALS, CLOSEOUT SUBMITTALS.
   9. 01 78 36 - WARRANTIES
      a. ALL GUARANTEES AND WARRANTIES
   10. 01 78 39 - PROJECT DOCUMENTS
      a. PROJECT "AS-BUILT" DOCUMENTS, PROJECT "RECORD" DOCUMENTS AND PROJECT "CERTIFICATION" DOCUMENTS.
   11. 06 10 00 - ROUGH CARPENTRY
      a. PRODUCT DATA, CERTIFIACTES OF COMPLIANCE, AND WARRANTIES.
   12. 07 31 13 - SHINGLES

a. PRODUCT DATA, SHOP DRAWINGS, SAMPLES, CLOSOUT SUBMITTALS.
13. 07 57 00 - COATED FOAM ROOFING
    a. PRODUCT DATA, SHOP DRAWINGS AND WARRANTIES.
14. 07 53 16 - ELASTOMERIC MEMBRANE ROOFING ("Dur-O-Last" CPA)
    a. PRODUCT DATA, SHOP DRAWINGS AND WARRANTIES.
15. 07 53 29 - ELASTOMERIC MEMBRANE ROOFING (PIB)
    a. PRODUCT DATA, SHOP DRAWINGS AND WARRANTIES.
16. 07 60 00 - SHEET METAL
    a. SHOP DRAWINGS
17. 07 92 00 - SEALANTS
    a. PRODUCT DATA, COLORS AND WARRANTIES.
18. 07 95 00 - EXPANSION JOINTS
    a. MATERIALS LIST, SHOP DRAWINGS, AND WARRANTIES.
19. DIV. 22 - PLUMBING SECTIONS
    a. REFER TO APPROPRIATE SPECIFICATION SECTION REQUIREMENTS.
20. DIV. 23 -HEATING, VENTILATING AND AIR CONDITIONING SECTIONS
    a. REFER TO APPROPRIATE SPECIFICATION SECTION REQUIREMENTS.
21. DIV. 26- ELECTRICAL SECTIONS
    a. REFER TO APPROPRIATE SPECIFICATION SECTION REQUIREMENTS.

CONTRACTOR'S
USAGE AGREEMENT FOR ELECTRONIC FILES -

ELECTRONIC FILE REQUEST FORM

Project Name: _____

Project No.: _____

TO: LAWRENCE ENGINEERING GROUP

7084 N. Maple Avenue, Suite #101

Fresno CA 93720

A. I _____as a duly authorized agent of

_____, have a contract with the Owner to perform work on the above project in the following capacity:

___ Lease-Lease Back Agent
___ Construction Manager
___ General Contractor

B. We hereby submit for your consideration a request for Electronic Files on the behalf of

_____, and certify that they have a contract or subcontract to perform work on the above named project in the following capacity:

___ General Contractor
___ Sub-Contractor

___ Others under contract to a sub-contractor

C. I _____, certify the required attachments are included as follows:

___ Completed "Usage Agreement for Electronic Files Agreement• " along with appropriate related supplemental Agreements.

___ Files requested are specific and are not deemed vague or excessive and with individual sheet numbers identified, and the total number of sheets are correct.

___ The enclosed Payment is accurate ($120 per sheet) and is made payable to Darden Project Engineers, Inc..

_____ _____
Print Name, Title

_____ _____
Signature Date

CONTRACTOR'S USAGE AGREEMENT
FOR ELECTRONIC FILES

PROJECT NAME: _____

PROJECT NO.: _____

PROJECT ENGINEER: _____

I _____, as a duly authorized agent of_____ - (Contractor) have a contract or subcontract to perform work on the above named project. The Contractor acknowledges having received at least one (1) complete set of Contract Documents for the project and has posted all Addenda and all other contract documents issued to date.

Contractor Document Usage Agreement

The Contractor is requesting the electronic CAD files of work prepared by the Project Engineer and/or Project Engineer's Consultants (Design Team) on the subject project, so that the information therein may be utilized in the Contractor's work on the same project. The Contractor understands that these files are being provided as a courtesy and they are strictly intended for the Contractor's sole convenience and they are not recognized Contract Documents. This request is subject to the following conditions, which the Contractor hereby agrees to abide by:

1. It is understood and agreed to that any files and/or documents provided are instruments of professional service by the Design Team and are intended for one-time use solely in the construction of this project. They are and shall remain the property of the Project Engineer or the Project Engineer's Consultants, who is deemed to be the author of the drawings and data, and who shall retain all common law, statutory law, and all other rights, including copyrights.

2. The Contractor shall indemnify and hold harmless, the Design Team, its officers, directors, employees or subcontractors, to the fullest extent permitted by law, against all claims, liabilities, losses, damages, and costs, including but not limited to attorney's fees and defense costs arising out of or resulting from contractor's use of these electronic files, or in any way connected with the modification, misinterpretation, misuse, or reuse by the Contractor or by others.

3. The Contractor agrees that by using these electronic files, the Contractor is in no way relieved of the duty to fully comply with the Contract Documents, including and without limitation, the need to check, confirm and coordinate all dimensions and other details, take field measurements, verify field conditions and coordinate with all other contractors for the project.

4. It is agreed to that these electronic files are not Contract Documents. Differences may exist between electronic files and corresponding hard-copy Contract documents. The Design Team makes no representation regarding the accuracy or completeness of the electronic files provided to the contractor. In the event that a conflict arises, the signed and sealed hard-copy Contract Documents shall govern. Contractor is responsible for determining if any conflict exists.

5. The Contractor understands that the Design Team makes no representation as to the compatibility of these files with Contractor's computer hardware or software. The Contractor understands that the accuracy of the information is an artifact of the techniques used to generate it and is in no way intended to imply actual accuracy. It is also understood that the automated conversion of information and data

from the system and format used by the Design Team to an alternate system or format cannot be accomplished without the possibility of introduction of inexactitudes, anomalies and errors.

6. Because information presented on the electronic files can be modified, unintentionally or otherwise, the Design Team reserves the right to edit the drawings to remove information deemed not necessary and/or remove all indications of ownership and/or involvement from each electronic display.

7. The Design Team will only furnish those drawings directly applicable to the shop drawings the contractor wishes to create. The Contractor understands that not all electronic files may be available at the Design Team's discretion.

8. The Contractor understands that the Project Engineer's Consultants may have Additional Conditions for release of their electronic files or documents, and the Contractor hereby agree to abide by the Consultants conditions in addition to the stated conditions in this agreement. Additional Conditions (if any) are attached to this agreement.

9. The Contractor understands that the Project Engineer and the Project Engineer's Consultants will incur certain costs in providing the requested electronic files. The Contractor agrees to pay the Design Team a service fee of $120.00 per sheet, per delivery, prior to any delivery of the electronic files to compensate the Design Team for the labor to prepare and transmit the files and for the additional risk that this transfer will occasion.

10. Under no circumstances shall delivery of the electronic files for use by the Contractor be deemed a sale by the Owner, the Design Team, or any member of the Design Team. The Design Team makes no warranties, either expressed or implied, of merchantability or fitness for any particular purpose. In no event shall the Design Team be liable for any loss of profit or any consequential damages as a result of Contractor's use or reuse of the electronic files.

LAWRENCE ENGINEERING GROUP

Attachments:
___ Civil ___ Structural ___ Mechanical ___ Electrical ___ Others

Description of the requested documents and/or CAD files:
_____

_____ _____
Printed Name Title

_____ _____
Signed Dated

FOR USE BY PROJECT ENGINEER ONLY
___ Check Not Attached – Not Accepted
___ Accepted
___ Accepted as Noted
___ Not Accepted
By_____
Date_____
Remarks_____

END OF SECTION

SECTION 014100 – REGULATORY REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:
   1. Provide all material, labor, equipment and services necessary to completely install all materials, accessories and other related items necessary to complete the Project as indicated by the Contract Documents.
   2. Section 4-317 (c), Part 1, Title 24, CCR, requires the following:
      a. "The intent of these drawings and specifications is that the work of the alteration, rehabilitation or reconstruction is to be in accordance with Title 24, California Code of Regulations. Should any existing conditions such as deterioration of non-complying construction be discovered which is not covered by the contract documents wherein the finished work will not comply with Title 24, California Code of Regulations, a change order, or a separate set of plans and specifications, detailing and specifying the required work shall be submitted to and approved by the AHJ before proceeding with the work."

B. Related Sections: The following Project Manual Sections contain requirements that relate to this section:
   1. ALL DIVISION 00 SPECIFICATION SECTIONS.
   2. ALL DIVISION 01 SPECIFICATION SECTIONS.
   3. ALL SPECIFICATION SECTIONS IN THE FACILITY CONSTRUCTION SUBGROUP.
   4. ALL SPECIFICATION SECTIONS IN THE FACILITY SERVICES SUBGROUP.
   5. ALL SPECIFICATION SECTIONS IN THE SITE AND INFRASTRUCTURE SUBGROUP.

1.2 REFERENCES

A. References to standards, codes, specifications, recommendations and regulations, refer to the latest edition or printing in effect at the date of issue shown in the Documents unless another date is implied by the suffix number of the Standards.

B. Applicable portions of the Standards listed that are not in conflict with the Contract Documents shall be construed as specification for this work.

C. General Standards:
   1. AFPA American Forest and Paper Association
   2. ANSI American National Standards Institute
   3. ASTM American Society for Testing and Materials
   4. CAL/OSHA California Occupational Safety and Health Administration
      a. State of California Construction Safety Orders
   5. CS Commercial Standards of the US Department of Commerce
   6. EPA Environmental Protection Agency

7. FMG Factory Mutual Group
8. NIBS National Institute of Building Sciences
9. NIST National Institute of Standards and Technology
10. NFPA National Fire Protection Association
11. OSHA Occupational Safety and Health Administration
    a. Federal Construction Safety Orders
12. PS Product Standards of the US Department of Commerce
13. SS-CDOT "Standard Specification":
    a. State of California Department of Transportation (CalTrans)
14. UL Underwriters Laboratory Incorporated
15. WH Warnock Hersey

1.3 SUBMITTALS

1. Submit in accordance with Specification Section - SUBMITTAL PROCEDURES:
2. Quality Assurance/Control Submittals:
    a. Certificates:
        1) Submit three (3) copies of certificates written on the Contractor's Letterhead indicating that the required codes shall be present at the Job Site.

1.4 QUALITY ASSURANCE

A. Regulatory Requirements:

1. All codes, laws, ordinances, rules, regulations, orders and other legal requirements of City, County, State, Federal and other public authorities which bear on performances of Work shall be applicable to Project. Latest editions shall be applicable unless specified otherwise.
2. Relationship between Applicable Codes and Contract Documents. The Contract Documents have been developed with the intent to conform to the applicable codes. Nothing within the Contract Documents shall be construed to permit Work not conforming to the applicable codes.

B. Major Governing Codes And Regulations:

1. General: All work shall comply with the requirements of the following codes and regulations. Special reference in other Sections of the Specifications to a specific code will be by use of the abbreviation given in front of the Code.
    a. Freestanding equipment (if applicable) shall be provided and installed in accordance with the seismic requirements where the Project is located.
2. NOTE: * -Indicates that a copy of these codes shall be at the job site at all times.
3. AUTHORITY HAVING JURISDICTION:
    a. AHJ Authority Having Jurisdiction
4. FEDERAL LAW:
    a. ADA Americans with Disabilities Act
5. CALIFORNIA CODE OF REGULATIONS (Previously known as the California Administrative Codes)
    a. CCR-T8: California Code of Regulations, Title 8-Industrial Safety
    b. CCR-T19: California Code of Regulations, Title 19-Public Safety.
    c. CCR-T21: California Code of Regulations, Title 21-Public Works.

6. CALIFORNIA BUILDING, ELECTRICAL, MECHANICAL, PLUMBING, ENERGY, FIRE, and REFERENCED CODES
   a. |*CBC: California Building Code 2016
   b. *CEC: California Electrical Code 2016
   c. *CMC: California Mechanical Code 2016
   d. *CPC: California Plumbing Code 2016
   e. *CEnC: California Energy Code 2016
   f. *CFC California Fire Code 2016
      1) In addition to all other Chapters in the CFC to be followed, attention is specifically called out to comply with Chapter 33 - "Fire Safety During Construction and Demolition".
   g. CGBSC California Green Building Standards Code 2016
7. OTHER STATE AGENCIES:
   a. SJVAPCD: San Joaquin Valley Air Pollution Control District
   b. FMFCD: Fresno Metropolitan Flood Control District.

C. Governing Authority:
   1. AHJ:
      a. This Project will be under the authority of:
         1) The City of Clovis Codes and Standards.

PART 2 - |PRODUCTS

NOT APPLICABLE

PART 3 - EXECUTION

NOT APPLICABLE

END OF SECTION

SECTION 014200 – REFERENCES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:
   1. Provide all material, labor, equipment and services necessary to completely install all materials, accessories and other related items necessary to complete the Project as indicated by the Contract Documents.
      a. The abbreviations, symbols and work meanings not defined in the Contract Documents are in accordance with building industry usage and convention. Questions which arise as to "meaning," or intent shall be referred to the Project Engineer prior to bidding for interpretation.
      b. Refer to drawings for additional abbreviations and symbols.
      c. Refer to GENERAL and SPECIAL or SUPPLEMENTAL CONDITIONS and specific specification Sections for additional definitions.

B. Related Sections: The following Project Manual Sections contain requirements that relate to this section:
   1. ALL DIVISION 00 SPECIFICATION SECTIONS.
   2. ALL DIVISION 01 SPECIFICATION SECTIONS.
   3. ALL SPECIFICATION SECTIONS IN THE FACILITY CONSTRUCTION SUBGROUP.
   4. ALL SPECIFICATION SECTIONS IN THE FACILITY SERVICES SUBGROUP.
   5. ALL SPECIFICATION SECTIONS IN THE SITE AND INFRASTRUCTURE SUBGROUP.

1.2 DEFINITIONS

A. EXECUTE Perform what is required to install, apply, erect and otherwise incorporate products in to this Project.

B. FURNISH Supply products required, deliver to Project, unload, store and install as required in location as directed by Contractor, Owner or Project Engineer.

C. GUARANTEE An assurance by the seller or installer that products or Work are as represented or will be as promised in compliance with Specifications. Synonymous and interchangeable with WARRANTY.

D. INSTALL Incorporate into this Project.

E. PRODUCTS The material, equipment, fixtures and other physical substances required to execute the Project.

F. PROVIDE Furnish and Install into this Project.

G. WARRANTY An assurance by the seller or installer that products or Work are as represented or will be as promised in compliance with Specifications. Synonymous and interchangable with GUARANTEE.

PART 2 - PRODUCTS

NOT APPLICABLE

PART 3 - EXECUTION

NOT APPLICABLE

END OF SECTION

SECTION 014523 – TESTING AND INSPECTION SERVICES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:
   1. One Project Inspector (Owner's Inspector), will be employed by the Owner, and will be assigned to the Project.
      a. Duties of a Project Inspector are specifically defined in CCR-Title 24, Part 1, and the latest amendments.
      b. Special Inspections (not within the Project Inspector's abilities) shall be performed by the Testing Laboratory or other Special Inspector as approved by the Owner.
         1) All Special Inspections shall be approved by the AHJ.
   2. The Project Inspector shall be employed by the Owner and approved by the Project Engineer, Structural Engineer, and AHJ if required.
      a. See the Title Page of this Project Manual for the name of this Project.
      b. Payment of the Project Inspector will be by the Owner.
   3. Provide all access, facilities and information required by the Project Inspector for the Project.

B. Related Sections: The following Project Manual Sections contain requirements that relate to this section:
   1. ALL DIVISION 00 SPECIFICATION SECTIONS.
   2. ALL DIVISION 01 SPECIFICATION SECTIONS.
   3. ALL SPECIFICATION SECTIONS IN THE FACILITY CONSTRUCTION SUBGROUP.
   4. ALL SPECIFICATION SECTIONS IN THE FACILITY SERVICES SUBGROUP.
   5. ALL SPECIFICATION SECTIONS IN THE SITE AND INFRASTRUCTURE SUBGROUP.

1.2 DEFINITIONS

A. Responsibilities of the Project Inspector:
   1. The Project Inspector will be required to provide inspection of the Work (including "Continuous Inspection").
   2. The Project Inspector will report to the Owner, the Project Engineer and AHJ as required during the progress of the Work.
   3. The Project Inspector shall review all Pay Requests prior to submittal to the Project Engineer.

B. Responsibilities of the Contractor:
   1. Written Statement of Responsibility to the Owner and the Authority Having Jurisdiction - AHJ per CBC Chapter 17A:

a. Provide a written Statement of Responsibility regarding the Contractor's understanding of the special inspection requirements and identifying individuals in their firm responsible for exercising control over the conformance to the construction documents.

2. Provide the Project Inspector free access to any and all parts of the Project at all times.
3. Provide the Project Inspector information necessary to keep him fully informed with respect to the progress, manner and character of Work.
4. Perform no Work in absence of the Project Inspector unless alternate arrangements have been made in advance and agreed to by the Owner, the Project Engineer and AHJ.
5. The Owner's "Inspection of Work" by the Project Inspector shall not relieve the Contractor from any conditions of this Contract.

1.3 SUBMITTALS

A. Submit in accordance with Specification Section - SUBMITTAL PROCEDURES:
1. Quality Assurance/Control Submittals:
a. Written Statement of Responsibility to the Owner and the Authority Having Jurisdiction per CBC Chapter 17A.
b. Project Inspector's Field Reports:
1) Submit four (4) copies of reports.

1.4 QUALITY ASSURANCE

A. Regulatory Requirements:
1. In accordance with Specification Section - REGULATORY REQUIREMENTS.

PART 2 - PRODUCTS

NOT APPLICABLE

PART 3 - EXECUTION

NOT APPLICABLE

END OF SECTION

SECTION 014529 – TESTING LABORATORY SERVICES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:
   1. The Owner's Testing Laboratory shall be employed by the Owner and approved by the Project Engineer, Structural Engineer, and AHJ if required.
      a. Payment of the Owner's Testing Laboratory will be by the Owner.
      b. The Owner shall pay for all initial testing indicated as paid for by Owner except as specified otherwise or in the schedule at the end of this section.
         1) Cost of re-testing (due to initial failures) shall be back-charged to the Contractor, and those excess costs will be deducted from the Contract Price.
         2) Cost of testing (due to shop fabrication or in-plant testing out of state and beyond a 75 mile radius of the Project Site) shall be back-charged to the Contractor, and those excess costs will be deducted from the Contract Price.
   2. Provide all access, facilities and information required for the testing of the various portions of the Work as required by Regulatory Agencies, Planning, Agencies, Building Agencies, and other Governmental Inspectors, the Contract Documents and the Owner.

B. Related Sections: The following Project Manual Sections contain requirements that relate to this section:
   1. ALL DIVISION 00 SPECIFICATION SECTIONS.
   2. ALL DIVISION 01 SPECIFICATION SECTIONS.
   3. ALL SPECIFICATION SECTIONS IN THE FACILITY CONSTRUCTION SUBGROUP.
   4. ALL SPECIFICATION SECTIONS IN THE FACILITY SERVICES SUBGROUP.
   5. ALL SPECIFICATION SECTIONS IN THE SITE AND INFRASTRUCTURE SUBGROUP.

1.2 DEFINITIONS

A. Responsibility of the Testing Laboratory:
   1. Taking all specimens.
   2. Performing Tests.
      a. The Testing Laboratory's duties shall include all tests required and prepared at the time of AHJ Approvals, and any other testing as determined by authorities or the Project Inspector during the course of the work.
      b. Special Inspections (not within the Project Inspector's abilities) shall be performed by the Testing Laboratory or other Special Inspector as approved by the Owner and AHJ if required.
         1) All Special Inspections shall be approved by AHJ.
   3. Writing Test Reports
      a. Information to include on each report:
         1) Name and Title of Person performing the tests.
         2) Project Engineer's Project Number and Project Name.

3) Facility/Building name.
4) T. I. & O. Code reference.

4. Review of "Continuous Inspection" reports by the Project Inspector.
   a. Portions of the Work requiring "Continuous Inspection" shall be performed by the Project Inspector (if qualified) and all reports will be reviewed by the Testing Laboratory.
5. Distribute Test Reports to the Owner, Project Engineer, applicable Engineer, Contractor and to AHJ if required.

B. Responsibilities of the Contractor:
1. Contractor shall provide a Testing Schedule that is in accordance with the following:
   a. Format of the Testing Schedule shall be in accordance with Specification Section – CONSTRUCTION SCHEDULES.
   b. Cooperates with the Testing Laboratory's schedule of required testing.
   c. Contractor shall coordinate Construction Schedule and Testing Schedule.
      1) Format of testing schedule in accordance with Specification Section – CONSTRUCTION SCHEDULES.
2. Cooperation with testing laboratory:
   a. Provide access to Work being tested.
   b. Provide test samples as selected by testing laboratory.
   c. Schedule Work so that there shall be no excessive inspection time.
      1) At times that an inspector is required, sufficient work shall be laid out and adequate personnel supplied so that the inspector's time shall be used to full advantage.
      2) If inspection costs become excessive because of poor shop or construction procedure, such excess costs will be paid for by the Owner, but deducted from the Contract Price.
   d. Inspections and tests required by regulatory agencies shall be the responsibility of and shall be paid for by the Owner unless specified otherwise.
   e. Inspections and testing performed exclusively for the Contractor's convenience shall be the sole responsibility of the Contractor.
   f. Test Reports:
      1) Distribute test reports and related instruction to insure all required re-testing and/or replacement of materials.
   g. Payment of Testing:
      1) All testing shall be paid for by the Owner.
3. Contractor shall be backcharged for re-testing, excessive distance from the Project Site, or extra testing required because of initial failures.

1.3 SUBMITTALS

A. Submit in accordance with Specification Section - SUBMITTAL PROCEDURES:
1. Quality Assurance/Control Submittals:
   a. Test Reports:
      1) Submit four (4) copies of testing laboratory's report.

1.4 QUALITY ASSURANCE

A. Qualifications:
1. Testing Laboratory Qualifications:
a. In accordance with the latest Edition of ASTM E-329.

B. Regulatory Requirements and Reference Standards:
1. In accordance with Specification Section - REGULATORY REQUIREMENTS, and the following:
a. In accordance with regulatory agencies and appropriate ASTM Standards.

PART 2 - PRODUCTS

NOT APPLICABLE

PART 3 - EXECUTION

3.1 SCHEDULES

A. Testing Schedule at the end of this section should be used as a guide only and it is not considered a complete list. Refer to regulatory agency requirements and specific specification section for complete testing requirements.

B. TESTING SCHEDULE
1. 09 51 00 - ACOUSTICAL CEILINGS
a. Main and cross runners, intersection connectors and expansion devices
1) Paid by Contractor
2. DIV. 22 - PLUMBING
a. Non-Leaking System
1) Paid by Contractor
b. Bacteriological Purity
1) Paid by Contractor
3. DIV. 23 - HEATING, VENTILATING AND AIR CONDITIONING
a. Equipment Operation
1) Paid by Contractor
b. System Energy Balance
1) Paid by Contractor
c. Non-Leaking Hydronic System.
1) Paid by Contractor
4. DIV. 26 - COMMON WORK RESULTS FOR ELECTRICAL
a. Equipment Operation
1) Paid by Contractor

END OF SECTION

SECTION 015000 – TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:
   1. Provide all material, labor, equipment and services necessary to completely install all Temporary Utilities, Support Facilities, and Protection Facilities materials, accessories and other related items necessary to complete the Project as indicated by the Contract Documents.

B. Related Sections: The following Project Manual Sections contain requirements that relate to this section:
   1. ALL DIVISION 00 SPECIFICATION SECTIONS.
   2. ALL DIVISION 01 SPECIFICATION SECTIONS.
   3. ALL SPECIFICATION SECTIONS IN THE FACILITY CONSTRUCTION SUBGROUP.
   4. ALL SPECIFICATION SECTIONS IN THE FACILITY SERVICES SUBGROUP.
   5. ALL SPECIFICATION SECTIONS IN THE SITE AND INFRASTRUCTURE SUBGROUP.

1.2 SUBMITTALS

A. Submit in accordance with Specification Section - SUBMITTAL PROCEDURES:
   a. Project Phasing Plan:
      1) Indicate how work is to progress in orderly progression as to minimize disruption of Owner's use of the facility.

1.3 QUALITY ASSURANCE

A. Regulatory Requirements:
   1. In accordance with Specification Section - REGULATORY REQUIREMENTS, and the following:
      a. CARB Materials and equipment used for this Project shall comply with the current applicable regulations of the California Air Resources Board (CARB) and the Environmental Protection Agency (EPA), in the area where the project is located.
      b. CAL/OSHA California Division of Occupational Safety and Health Administration
      c. CC City of Clovis, Codes and Ordinances.
      d. EPA Environmental Protection Agency

B. Traffic Control Plan:
   1. Prior to commencing the Work, prepare a Traffic Control Plan and obtain approval of the local City or County Engineer in the area where the project is located.

a. Prepare application and file with appropriate fees to the local City or County Engineer upon completion of Traffic Control Plan.

2. The Traffic Control Plan shall include information on construction timing and phasing and proposed methods of alleviating potential hazardous and/or inconvenient conditions. Such methods can include, but are not limited to, the use of flagmen, barricades, signs, warning lights, detours, phased lane closures, coordination with adjacent property owners, and coordination with law enforcement, fire protection and other emergency service agencies.

C. Project Phasing Plan:

1. Prior to commencing the Work, prepare a Temporary Project Enclosure Plan indicating the protection of people, animals, and partial and fully completed work until occupancy by the Owner.
2. Identify temporary egress from existing occupied facilities and as required by authorities having jurisdiction.
3. The Temporary Project Enclosure Plan shall include, but not be limited to, the following:
   a. Contractor's name and project identification information.
   b. Indicate the duration of the proposed measures based on the completion of the work as a whole and if any phases of work are identified.
   c. Indicate proposed temporary fencing and potential exit and entry paths.
      1) Show gate and door locations and indicate who has access.
   d. Indicate proposed temporary wall location(s) and potential exit and entry paths.
      1) Show door location(s) and indicate who has access.
   e. Indicate type of material used for temporary fencing, walls, gates, and doors.
   f. Indicate proposed temporary offices and storage areas.

1.4 PROJECT CONDITIONS

A. Environmental Requirements:

1. Heating and Cooling:
   a. Provide temporary heating and cooling required by construction activities for curing, acclimating the building or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed, and is maintained prior, during and after the installation in accordance with the exterior or interior building materials temperature and humidity guidelines.
      1) Do not use heating units that contribute moisture to the enclosed spaces under construction.
2. Ventilation and Humidity Control:
   a. Provide temporary ventilation required by construction activities for curing, acclimating the building or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.
      1) Interior Moisture Control:

a) Perform the installation of all interior moisture sensitive building materials only after the building or space is acclimated to the final environmental conditions under which the building is to be operated in accordance within the Owner's humidity control guidelines.

b. Maintain a consistent humidity in accordance with the guidelines for those materials in the space at least seven (7) days prior to installation of any moisture sensitive materials (i.e. Veneer Plaster, Gypsum Board, Ceiling Tiles, Wood Sensitive Floors, other Flooring sensitive to moisture levels, Interior Painting, etc.).

c. Maintain the same levels or temperature and humidity during the installation of those materials, and after the installation of those materials until the building's own mechanical systems can be turned on to maintain the facility within the Owner's temperature and humidity control guidelines.

d. Replace any materials that have become wet and damaged due to the Contractor not properly protecting installed building materials at no additional cost to the Owner.

3. Dust control:

a. Perform work in a manner as to minimize the spread of dust and flying particles.

4. Burning: No burning will be allowed on-site.

5. Noise Control:

a. Stationary noise sources shall be of a low-noise emission design, consistent with the best available noise reduction technology.

b. The hours of operation of noise-generating equipment shall be restricted to 6:00 a.m. to 7:00 p.m. Monday through Friday, and to 8:00 a.m. to 6:00 p.m. on Saturday and Sunday.

c. Mufflers shall be required on all gas and diesel-powered equipment.

B. Existing Conditions:

1. Examine site and compare it with the drawings and specifications. Thoroughly investigate and verify conditions under which the work is to be performed. No allowance will be made for extra work resulting from negligence or failure to be acquainted with all available information concerning conditions necessary to estimate the difficulty or cost of the work.

PART 2 - PRODUCTS

2.1 EQUIPMENT

A. Fire Protection During Construction:

1. Provide Temporary Fire Protection per CFC Chapter 33 during demolition and construction.

2. Coordinate with the Owner for available space to use for Field Office.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Site verification of conditions:

1. Report unacceptable conditions to the Project Engineer. Do not begin work until unacceptable conditions have been corrected.
2. Execution of work under this specification section shall constitute acceptance of existing conditions.
3. Obtain all necessary permits and authorizations by regulatory agencies required to perform the work under this section.

3.2 PREPARATION

A. Coordination:
1. Before proceeding, verify plans match existing conditions.
2. Coordinate work under this specification with work specified under other sections to ensure proper and adequate interface of work.

B. Protection:
1. The Contractor shall verify and protect existing landscaping, asphalt area, concrete walkways, and other site improvmeents to remain on the site before proceeding with the Work.
2. Prior to starting Work, hose bibbs, utility lines, etc., to be abandoned and removed within the construction area shall be stubbed off outside the limits of construction.
3. Verify and protect utilities to remain within the construction area and provide special construction for their protection.

3.3 IMPLEMENTATION

A. General:
1. Perform Work and provide and maintain Temporary Utilities and Temporary Facilities in accordance with the requirements of all regulatory authorities having jurisdiction.
2. Contractors shall cooperate with other contractors and the Owner in the use of the site, Temporary Utilities, Temporary Facilities and shall adjust their operations to maintain harmonious relations and uninterrupted progress of the Work.
3. The Contractor shall assume all responsibility for the provision and maintenance of these Temporary Utilities and Temporary Facilities and for the provisions of public safety where the operations under this Contract interface with public areas.
4. Relocate and modify Temporary Utilities and Temporary Facilities, as required by progress of the Work.
5. Remove Temporary Utilities and Temporary Facilities upon completion of the Project.
6. Temporary Utilities and Temporary Facilities are to be provided and maintained from commencement of Work until final acceptance.
   a. The Contractor shall pay all charges required of him for the duration of the project, including a 1 month period following the date of the Notice of Substantial Completion.

B. Temporary Utilities:
1. Install temporary service or connect to existing service.
   a. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
      1) Minimum forty-eight (48) hours prior notice to any interruption.
2. Sewers:

a. Provide temporary service to remove effluent lawfully.

3. Water:
   a. The Owner will pay for all water supply for all purposes of construction at a location to be designated at the site. Extensions within the site shall be provided by the Contractor and maintained in a safe and efficient manner.
4. Electrical:
   a. The Owner will pay and the Contractor shall provide for all electrical facilities and services for all purposes of power and lighting for construction at a location to be designated at the site. Extensions within the site shall be provided by the Contractor and maintained in a safe and efficient manner.
      1) The Contractor shall pay for cost of electrical energy required in connection with the testing of such equipment as generators, transformers, power machinery, and similar equipment installed in the work.
   b. The Contractor will provide power outlets having adequate electrical characteristics and lighting of adequate intensity for the use of other contractors within reasonable distances from their needs and within a reasonable period of time after the other contractors have requested them.
5. Heating:
   a. Provide temporary heat required by construction activities, for curing or drying of completed installations or protection of installed construction from adverse effects of low temperatures or high humidity.
   b. Select UL or FM approved equipment that will not have a harmful effect on completed installations or elements being installed.
      1) Except where use of the permanent heating system is authorized, provide temporary units that do not introduce moisture into the newly constructed building spaces.
      2) Use of gasoline-burning space heaters, open flame, or salamander type heating units is prohibited.
   c. Coordinate ventilation requirements to produce the ambient condition required and minimize consumption of energy.

C. Temporary Facilities:
1. Support Facilities:
   a. Offices and Storage:
      1) Provide temporary offices and storage facilities located within the construction area.
      2) Protect materials, construction work and their operations from weather, vandalism, and theft.
   b. Sanitary Facilities:
      1) Provide adequate, self-contained toilets as required for all persons employed on the Project.
      2) In no case shall the permanent plumbing fixtures of the Project be used for this purpose.
   c. Traffic Controls:
      1) Implement procedures and measures outlined in the local jurisdiction’s approved Traffic Control Plan.
      2) Maintain access for fire-fighting equipment and access to fire hydrants.
      3) Conduct work and comply with applicable building codes and regulations regarding the use of public streets and sidewalks and the proper barricading and lighting of public thoroughfares surrounding the construction activities.

4) Provide and maintain access as required to perform work.
5) Repair all damage as a result of work performed on the project to adjacent roads, streets, drives and walks. Restore to condition as good as existed at commencement of the Work.

2. Protection Facilities:
   a. Existing Facilities:
      1) Protect existing vegetation, equipment, structures, utilities, and other improvements at project site and on adjacent properties, except those indicated to be removed or altered. Damage occurring during the course of construction shall be repaired to condition at the start of the Work.
   b. Environmental:
      1) Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, contamination or pollution or other undesirable effects.
   c. Project Enclosure:
      1) Implement procedures and measures outlined in Temporary Project Enclosure Plan.
      2) Project enclosure shall protect materials, construction work, and operations from vandalism, theft, and to exclude the intrusion of the public into the construction area.
      3) Provide floor-to-ceiling dustproof partitions to limit dust and dirt migration and to separate areas occupied by the Owner from fumes and noise.
      4) Maintain security by limiting number of keys and restricting distribution to authorized personnel.

3.4 CLEANING

A. Clean in accordance with Specification Section – PROJECT CLOSEOUT.
   1. At all times, keep the premises free from accumulations of waste materials or rubbish caused by employees or the Work.
   2. Clean all soiled surfaces to remain immediately.
   3. At the completion of the Work, remove all rubbish from and about the building and all tools, scaffolding, and surplus materials and shall leave the Work "broom clean" or its equivalent.

END OF SECTION

SECTION 017329 – CUTTING AND PATCHING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:
   1. Provide all material, labor, equipment and services necessary for cutting and patching existing materials, accessories and other related items necessary to remodel the Project as indicated by the Contract Documents.

B. Related Sections: The following Project Manual Sections contain requirements that relate to this section:
   1. ALL DIVISION 00 SPECIFICATION SECTIONS.
   2. ALL DIVISION 01 SPECIFICATION SECTIONS.
   3. ALL SPECIFICATION SECTIONS IN THE FACILITY CONSTRUCTION SUBGROUP.
   4. ALL SPECIFICATION SECTIONS IN THE FACILITY SERVICES SUBGROUP.
   5. ALL SPECIFICATION SECTIONS IN THE SITE AND INFRASTRUCTURE SUBGROUP.

1.2 DEFINITIONS

A. Cutting: Removal of existing construction necessary to permit installation or performance of Work.

B. Patching: Fitting and repair work required to restore surfaces to original conditions after installation of Work.

1.3 SUBMITTALS

A. Submit in accordance with Specification Section - SUBMITTAL PROCEDURES:
   1. Coordination Drawings:
      a. Submit any installer's coordination drawings indicating the work of this section with that of related work of other sections for proper interface of the completed work. Installer shall coordinate and obtain approvals from the work of other related sections prior to submitting to the Project Engineer.

1.4 QUALITY ASSURANCE

A. Cutting and Patching Conference: Before proceeding, meet at Project site with parties involved in cutting and patching, including mechanical and electrical trades.
   1. Review areas of potential interference and conflict.
   2. Coordinate procedures and resolve potential conflicts before proceeding.

B. Structural Elements: Do not cut and patch structural elements in a manner that could change their load-carrying capacity or load-deflection ratio.

C. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety.

D. Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in Project Engineer's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

E. The Contractor shall do all cutting, fitting or patching of existing construction and his work as may be required to make the several parts come together properly and ready to receive or be received by work of other contractors as shown, or reasonably implied by the drawings and specifications for the completed structure. All work shall be as directed by the Project Engineer to achieve the intended work and degree of finish shown.

F. Any cost caused by defective or ill-timed work shall be borne by the party responsible therefor.

1.5 WARRANTY

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during cutting and patching operations, by methods and with materials so as not to void existing warranties.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Comply with requirements specified in other Sections of these Specifications.

B. Existing Materials: Use materials identical to existing materials. For exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.
   1. If identical materials are unavailable or cannot be used, use materials that, when installed, will match the visual and functional performance of existing materials.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.
   1. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.

2. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Temporary Support: Provide temporary support of Work to be cut.

B. Protection: Protect existing construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.

C. Adjoining Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.

D. Existing Services: Where existing services are required to be removed, relocated, or abandoned, bypass such services before cutting to avoid interruption of services to occupied areas.

3.3 FIELD QUALITY CONTROL

A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
   1. Cut existing construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.

B. Cutting: Cut existing construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
   1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
   2. Existing Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
   3. Concrete or Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill. ***Do not overcut concrete corners*** – hand chip all corners to prevent over-cutting lines. Cut any masonry pavers at grout lines, and ***don't overcut*** into adjacent brick that is to remain.
   4. Excavating and Backfilling: Comply with requirements in applicable Division 2 Sections where required by cutting and patching operations.
   5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
   6. Proceed with patching after construction operations requiring cutting are complete.

C. Grinding and Sandblasting: Where grinding and sandblasting is required of existing construction, perform in accordance with industry standards for proper preparation of new construction or finishes.

D. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections of these Specifications.
   1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.
   2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
   3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove existing floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
      a. Where patching occurs in a painted surface, apply primer and intermediate paint coats over the patch and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.
   4. Ceilings: Patch, repair, or rehang existing ceilings as necessary to provide an even-plane surface of uniform appearance.

END OF SECTION

SECTION 017419 – CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.1 SUMMARY

A. This section includes the following:
   1. Requirements governing execution of the work including, but not limited to, the following:
      a. Salvaging non-hazardous demolition waste.
      b. Recycling non-hazardous construction and demolition waste.
      c. Disposing of non-hazardous construction and demolition waste.

B. Related Sections: The following Project Manuel Sections contain requirements that relate to this section:
   1. ALL DIVISION 00 SPECIFICATION SECTIONS
   2. ALL DIVISION 01 SPECIFICATION SECTIONS
   3. ALL SPECIFICATION SECTIONS IN THE FACILITY CONSTRUCTION SUBGROUP
   4. ALL SPECIFICATION SECTIONS IN THE FACILITY SERVICES SUBGROUP
   5. ALL SPECIFICATION SECTIONS IN THE SITE AND INFRASTRUCTURE SUBGROUP

1.2 DEFINITIONS

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

B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition and site clearing operations.

C. Disposal: Removal off-site of construction and demolition waste and subsequent sale, recycling, reuse, or deposit in landfill acceptable to authorities having jurisdiction.

D. Recycle: Recovery of construction or demolition waste for subsequent processing in preparation for reuse.

E. Salvage: Recovery of construction or demolition waste and subsequent sale or reuse in another facility.

1.3 SYSTEM DESCRIPTION

A. Performance Requirements
   1. General:

a. Achieve end-of-project rate for salvage/recycling of minimum 65 percent by weight of total non-hazardous construction and demolition waste generated by the Work.
b. Practice efficient waste management in the use of materials in the course of the Work.
c. Use all reasonable means to divert construction demolition waste from landfills and incinerators.

1.4 SUBMITTALS

A. Submit in accordance with Specification Section – SUBMITTAL PROCEDURES:
1. Quality Assurance/Control Submittal:
a. Waste Management Plan
b. Waste Management Progress Reports

1.5 QUALITY ASSURANCE

A. Regulatory Requirements:
1. In accordance with Specification Section - REGULATORY REQUIREMENTS and the following:
a. CARB Materials and equipment used for this project shall comply with the current applicable regulations of the California Air Resources Board and the Environmental Protection Agency (EPA), in the area where the project is located.
b. CAL/OSHA California Division of Occupational Safety and Health Administration.
c. CF County of Fresno, codes and ordinances
d. EPA Environmental Protection Agency
e. CC City of Clovis, Codes and Ordinances.

B. Waste Management Plan:
1. Prior to commencing the Work, submit Waste Management Plan. The Plan must include, but not limited to, the following:
a. Contractor's name and project identification information.
b. Procedures to be implemented.
c. Materials to be salvaged, recycled, or disposed.
d. Estimated quantities of material broken down by material categories.
e. Names and locations of entities who receive salvaged and recycled materials.
f. Tonnage calculations that demonstrate that the Contractor will salvage, re-use, or recycle the minimum percentage by weight of the construction and demolition waste materials generated by the Work.

C. Waste Management Progress Reports:
1. Submit the Report with each application for progress payment.
a. Failure to submit the Report and it supporting documentation can render the application for progress payment incomplete and delay the progress payment.
2. Each Report must include, but not limited to, the following:
a. List of material categories.
b. Weight quantity of waste by material category.

c. Weight quantity of waste salvaged.
d. Weight quantity of waste recycled.
e. Total weight quantity of salvaged and recycled waste by material category.
f. Weight percentage of waste salvaged and recycled by material category.
g. Include manifests, weight tickets, receipts, and invoices specifically identifying the salvaged, reused, and recycled materials.
h. Signature line for Contractor.

D. Meetings:
1. Pre- Demolition……Schedule prior to the start of work.
a. Coordinate the work with other work being performed.
b. Identify any potential problems, which may impede the proper disposal of materials.
c. Review areas where waste and recycle bins will be located.
d. Review where salvaged materials will be stored.
e. Review demolition waste disposal and material recycling procedures and environmental goals per Waste Management Plan with all subcontractors and waste haulers.
2. Progress:……Scheduled by the Contactor during the performance of the work.
a. Review for maintaining proper procedures.
b. Inspect and identify any problems and acceptable corrective measures.
3. Completion:……Scheduled by the Contactor upon proper completion of the work.
a. Inspect and identify any problems.
b. Submit final Progress Report summarizing total construction and demolition waste weights, percentages salvaged, recycled, and disposed.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Cleaning, handling, and packing:
1. Salvaged Items shall be handled in such a manner as to assure that they are free from damage.
2. Salvaged Items shall be cleaned and packed or cleaned and palleted before off-site transport.

B. Storage and protection
1. Salvaged Items shall be stored in a dry, protected area prior to transport.
2. Cover with protective waterproof covering providing for adequate air circulation and ventilation.

1.7 PROJECT CONDITIONS

A. Environmental requirements;
1. Comply with federal, state, and local regulations pertaining to solid waste, recycling, chemical waste, sanitary waste, and noise pollution.
2. Perform work in a manner as to minimize the spread of dust and flying particles.
3. No burning will be allowed on-site.

B. Existing conditions:

1. Examine project site and building(s) and compare it with the drawings and specifications. Thoroughly investigate and verify conditions under which the work is to be performed. No allowance will be made for extra work resulting from negligence or failure to be acquainted with all available information concerning conditions necessary to estimate the difficulty or cost of the work.
2. Conduct work so as not to interfere unnecessarily with adjacent buildings, roads, streets, drives, and walks.
   a. Do not close or obstruct streets, alleys, walks, or passageways without permission from authorities having jurisdiction and coordinating same with immediate neighbors whose business operation may be affected.
   b. Safety measures shall be taken to insure an uninterrupted flow of traffic around the site as required by local Police and Fire Departments
3. Storage or sale of removed items on-site is not permitted.
4. It is not expected that hazardous materials will be encountered in the Work.
   a. Hazardous materials will be removed and disposed of by Owner prior to start of the Work.
   b. If suspected hazardous materials are encountered, do not disturb; immediately notify Project Engineer and Owner.
5. Hazardous materials are present in buildings and structures to be selectively demolished. The Owner has prepared a report for the Contractor to review and use.
   a. Hazardous material remediation is specified in Specification Section - HAZARDOUS MATERIAL PROCEDURES.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Furnish all materials, tools, equipment, facilities, and services as required for performing the construction and demolition waste disposal work.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification of conditions:
   1. Report unacceptable conditions to the Project Engineer. Do not begin work until unacceptable conditions have been corrected.
   2. Execution of work under this specification section shall constitute acceptance of existing conditions.
   3. Obtain all necessary permits and authorizations by regulatory agencies required to perform the Work under this Section.

3.2 PREPARATION

   a. Coordination:
   b. Before proceeding, verify plans match existing conditions.

c. Review documents of existing construction provided by Owner against existing conditions.
d. If conflicts are encountered, report it to the Project Engineer. Then prepare recommendation(s) for correction and submit to Project Engineer for review.
e. Coordinate work under this specification section with work specified under other sections.

B. Protection:
1. Property:
a. Provide temporary weather protection to prevent damage to salvage and recycled items.
b. All damage inflicted on public and private property and the property of the Owner shall be repaired or restored to the original condition prior to the start of this Work. All repair or replacement work shall be done at no additional cost to the owner.

3.3 IMPLEMENTATION

A. General:
1. Implement waste management plan as submitted.
2. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the contract.
3. Designate and label specific areas on project site necessary for separating materials that are to be salvaged, recycled, reused, and donated.

B. Demolition Waste:
1. Salvaged items for delivery to Owner or other entity:
a. Clean salvaged items.
b. Pack or crate items after cleaning. Identify contents of containers.
c. Store items in a secure area until pick-up or delivery to Owner.
d. Transport item to Owner’s storage area off-site.
e. Protect items from damage during transport and storage.
2. Salvaged items for reuse in the work:
a. Clean salvaged items.
b. Store items in a secure and dry area until ready for installation.
3. Recyclable materials:
a. Prepare and maintain recyclable waste materials according to recycling facility requirements.
b. Maintain materials free of dirt, adhesives, solvents, petroleum contamination, and other substances deleterious to the recycling process.
c. Separate recyclable demolition waste from other waste materials. Separate recyclable waste by material type at project site to the maximum extent practical according to approved waste management plan.
d. Separate recyclable demolition waste from other waste materials. All recyclables may be co-mingled into one bin and separated off-site at the appropriate recycling facility.
1) Provide appropriately marked containers or bins for controlling recyclable waste until they are removed from the project site.
2) Include a list of acceptable and unacceptable materials at each container or bin.

3) Inspect containers and bins for contamination and remove contaminated materials if found.
4) Processed materials stockpiled on site shall not be mixed with other materials. Shape stockpiles to drain surface water. Cover stockpiles to prevent windblown dust.
5) Processed material shall be stockpiled away from construction. Do not stockpile within drip line of remaining trees.

e. Remove recyclable demolition waste off project property and transport to recycling receiver or processor.

f. The following list is of common material types which can be recycled. The list of material types is in no way complete but is representative of materials that can be sorted and recycled as per the intent of this specification section.
1) Wood: Sort and stack members according to size, type, and length of member.
2) Metals: Separate metal by type. Stack structural steel members according to size and length. Remove bolts, nuts, washers, and other hardware from members.
3) Gypsum Board: Stack large clean pieces on wood pallets in a dry location. Remove edge trim and sort with other metals.
4) Acoustical Ceiling Tile: Stack large clean pieces on wood pallets in a dry location.
5) Metal Suspension System: Separate metal members including trim and other metals from acoustical ceiling tile and sort with other metals.
6) Piping: Reduce piping to straight lengths and store by type and size. Separate supports, hangers, valves, sprinklers, and other components by type and size.
7) Conduit: Reduce conduit to straight lengths and store by type and size.

C. Construction Waste:
1. Recyclable materials:
a. Prepare and maintain recyclable waste materials according to recycling facility requirements.
b. Maintain materials free of dirt, adhesives, solvents, petroleum contamination, and other substances deleterious to the recycling process.
c. Recycle paper and beverage containers used by on-site workers.
d. Separate recyclable construction waste from other waste materials. All recyclables may be co-mingled into one bin and separated off-site at the appropriate recycling facility.
1) Provide appropriately marked containers or bins for controlling recyclable waste until they are removed from the project site.
2) Include a list of acceptable and unacceptable materials at each container or bin.
3) Inspect containers and bins for contamination and remove contaminated materials if found.
e. Remove recyclable construction waste off project property and transport to recycling receiver or processor.
f. The following list is of common material types which can be recycled. The list of material types is in no way complete but is representative of materials that can be sorted and recycled as per the intent of this specification section.

1) Cardboard Packaging: Breakdown into flat sheets. Bundle and store in a dry place.
2) Polystyrene Packaging: Separate and bag materials.
3) Pallets: As much as possible, require deliveries using pallets to remove pallets from the project site. For pallets that remain on-site, breakdown pallets into component wood pieces and comply with requirements for recycling wood.
4) Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.
5) Wood: Clean cut-Offs of lumber and grind or chip into small pieces.
6) Gypsum Board: Stack large clean pieces on wood pallets in a dry location.

D. Disposal of Waste:
1. Except for items or materials to be salvaged, recycled, or otherwise reused remove and transport waste materials from project site and legally dispose of them in a manner acceptable to authorities having jurisdiction.
2. Do not allow waste material to accumulate on site.
3. Transport waste in a manner that will prevent spillage on adjacent surfaces and areas.

3.4 CLEANING
1. Clean in accordance with Specification Section – PROJECT CLOSEOUT:
a. Immediately clean any soiled surfaces to remain.

END OF SECTION

SECTION 017720 – PROJECT CLOSEOUT

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:
   1. Provide all material, labor, equipment and services necessary to completely install all materials, accessories and other related items necessary to complete the Project as indicated by the Contract Documents.

B. Related Sections: The following Project Manual Sections contain requirements that relate to this section:
   1. ALL DIVISION 00 SPECIFICATION SECTIONS.
   2. ALL DIVISION 01 SPECIFICATION SECTIONS.
   3. ALL SPECIFICATION SECTIONS IN THE FACILITY CONSTRUCTION SUBGROUP.
   4. ALL SPECIFICATION SECTIONS IN THE FACILITY SERVICES SUBGROUP.
   5. ALL SPECIFICATION SECTIONS IN THE SITE AND INFRASTRUCTURE SUBGROUP.

C. Work Included:
   1. Project cleanup and coordination of all cleaning work required under all sections of this specification.
   2. Collection of and processing for delivery to the Project Engineer of all Project Record Drawings required under this and other various Sections of the Specifications.
   3. Compile and assemble all required documents, operation data, maintenance manuals, and parts lists for all equipment items provided for this project.
   4. Start-up of all mechanical, electrical, and miscellaneous equipment items; and adjustment required for the performance specified.
   5. Compile and assemble all guarantees, warranties, or other written documentation to establish the requirements outlined under all sections of this specification.
   6. Repair and touch-up on all items damaged during the construction and handling processes.
   7. Furnish maintenance material and spare parts as specified within DIVISIONS 02 through 49 of these specifications.
   8. Deliver to the Project Engineer all assembled copies of those items required in Articles 1 through 6 above for presentation to the Owner.

D. It shall be the responsibility of the Contractor to provide all labor and materials necessary to achieve completion of the items listed under Paragraph A, B and C above, although certain items may be specified under the work of other trades. Periodic removal of debris, cleaning, repair, and testing of times in various areas of the construction site shall be carried out under the direction of the Contractor.

1.2 SUBMITTALS

A. Submit in accordance with Specification Section - SUBMITTAL PROCEDURES:
1. Quality Assurance/Control Submittals:
a. Design Data.
1) All design data as required by the Contract Documents.
b. Test Reports:
1) Submit four (4) copies of reports.
2) Submit four (4) copies of reports required by regulatory requirements.
3) Submit four (4) copies of ICC Evaluation Service Report.
4) Submit four (4) copies of Testing Laboratory's report.
5) All other Test Reports as required by the Contract Documents.
c. Certificates:
1) Submit three (3) copies of certificates.
d. Manufacturer's Instructions:
1) Submit three (3) copies of manufacturer's instructions.
e. Manufacturer's Field Reports:
1) Submit three (3) copies of manufacturer's field reports.
f. Engineering Calculations:
1) Submit four (4) copies of engineering calculations computed and signed by a registered Civil or Structural Engineer in the State of California.
2. Closeout Submittals in accordance with Specification Sections in Division One:
a. Maintenance Data in accordance with Specification Section - PROJECT CLOSEOUT.
b. Operation Data in accordance with Specification Section - PROJECT CLOSEOUT.
c. Warranty in accordance with Specification Section - WARRANTIES.
3. Project Record Documents:
a. Various Sections of the detailed specifications require Project Record Drawings to be prepared by the Contractor(s). These drawings shall be collected by the Contractor, checked for conformance to the specific requirements, and when completed, delivered to the Project Engineer. The Contractor shall also be responsible for collecting bound operating and maintenance manuals required of all trades supplying equipment, and for delivering them to the Project Engineer.
4. Documents Required for Project Certification
a. Compile and neatly assemble with indexed and labeled tabs, three (3) sets of the required documents for project certification. The required documents include, but are not limited to, the following;
1) Document Required List for Project Certification. This document shall be used to organize and index the required documents.
2) Project Information Forms
a) Project Site Inspector(s)
b) Contract Information
3) Final Verified Reports from the Project Engineer and Engineers
a) Project Engineer’s Final Verified Report
b) Structural Engineer's Final Verified Report
c) Mechanical Engineer's Final Verified Report
d) Electrical Engineer's Final Verified Report
4) Final Verified Reports from the Contractor(s) and Inspector(s)

a) Project Site Inspector(s) Final Verified Report
b) Contractor(s) Final Verified Report

5) Other Final Verified Reports and Affidavits for:
   a) Laboratory - To be signed by Licensed Professional Engineer
   b) Shop Welding and Fabrication - To be signed by AWS/CWI Welding Inspector
   c) Field Welding - To be signed by AWS/CWI Welding Inspector
   d) High Strength Bolt Installation

6) Notices, Certificates, and Change Orders
   a) Notice of Completion - Signed by the Owner, Notarized and recorded with the County Recorders Office.
   b) Automatic Fire Sprinkler System
   c) Fire Alarm System Components
   d) Fire Suppression System
   e) Change Orders - Signed and fully executed.
   f) Other documents and/or requirements required by the State Agencies

7) Field Visit Reports, Correction Reports, Punch Lists & Final Review Reports
   a) Field Visit Reports from Project Engineer and Consulting Engineers
   b) Inspector's Correction Reports
   c) Contractor Punch Lists
   d) Project Engineer, Consulting Engineers and Owner Final Review Reports
   e) A signed and notarized Affidavit from the Contractor indicating that any and all items of correction noted in the above documents have been corrected (including Testing Laboratory Reports).

1.3 QUALITY ASSURANCE:

A. Safety, Fire and Environmental Protection, and Insurance standards shall be strictly adhered to in all phases of the construction work. It shall be the responsibility of the Contractor to determine the standards applicable to this project as set forth in all codes, regulations, and ordinances having jurisdiction, and as set forth elsewhere in the Specifications.

B. All specific requirements stipulated in, or required by code references included under all sections of DIVISIONS 02 through 49 inclusive of this specification, and as detailed under Article 3.4 of this Section, shall be required under this Contract.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Cleaning Materials:
   1. Use only those specified materials or types of materials recommended and approved by the manufacturer of the item to be cleaned.

B. Touch-Up Materials:

1. Use only those materials furnished by or as recommended and approved by the manufacturer of the item to be touched up. Colors and finish characteristics shall exactly match the base material and extra materials, labor, and services required to achieve this result shall be provided by the Contractor(s).

C. Replacement Materials:
1. Materials that are damaged and not repairable, or materials that are destroyed shall be replaced with equal and identical materials of the same manufacture and shall function in conjunction with the remaining portions of that material. Items no longer manufactured or available shall be replaced with comparable materials as approved by the Project Engineer and at no additional cost to the Owner.
2. Materials that are required for maintenance replacement by the owner after the guarantee period has expired, or by the contractor during the guarantee period shall exactly match those materials installed as to make, style, color lot, etc., under this contract, and shall be delivered to the owner in marked, identified containers.

D. Extra Materials:
1. Carefully examine the requirements of the applicable Sections of all DIVISIONS and specifically of DIVISION 09 and deliver the materials required to the Owner.

PART 3 - EXECUTION

3.1 REPAIR AND RESTORATION

A. All damaged items shall be repaired and replaced as directed using proper materials and craftsmen skilled in that particular trade. Materials shall be as follows:
1. All repair or replacement parts shall be of the same equality and manufacturer as the item being repaired.
2. All touch-up paint shall be as provided by the item manufacturer for that purpose and shall exactly match the original color and finish.

3.2 FIELD QUALITY CONTROL

A. Final Reviews:
1. In addition to all items covered under those Sections of Divisions 02 through 49 inclusive, the Contractor shall comply with the requirements stated herein.
   a. The Contractor shall request in writing a final review (see Contractor's Request for Final Review form at the end of this Specification Section).
      1) The Contractor shall allow a forty-eight (48) hour time period of advance notification prior to the requested date and time indicated on the Review Request form.
      2) The Contractor represents that the work has been carefully inspected by the Contractor to determine that the work is complete and in compliance with all requirements set forth.
   b. The Contractor shall prepare and shall submit the initial Contractor's Punch List identifying the items that remain uncompleted forty-eight (48) hours prior to the scheduled final review by the Project Engineer.

c. Under no circumstances shall the Contractor ask the Project Engineer or his representative to make these determinations for him.

2. The Project Engineer shall review the initial Contractor's Punch List along with the Owner's Project Inspector, and determine together whether or not the Project is ready for final review. If approved, the Project Engineer or its representative will make the final review on the date and time requested in the Contractor's Request for Final Review form, except under the following conditions:
   a. Upon reviewing a portion of the Project and finding quantities of work incomplete or not in compliance, the review shall cease, and the Project Engineer will notify the Contractor.
   b. If the Contractor has assured the Project Engineer of the completeness and/or accuracy of the work, and the review does not bear this contention out.
3. The above conditions will be adhered to rigidly to prevent the Project Engineer from being required to act as a supervisory agent of the Contractor by being asked to determine the degree of completion,.
   a. When the Contractor requests additional reviews, he shall reimburse the Project Engineer for all time and expense incurred as indicated on the Contractor's Request for Final Review form at the end of this Specification Section.
   b. The Project Engineer is herein defined as any of those firms or individuals listed by references on the drawings, including all consultants identified herein.
   c. All requests for Project Final Review (and re-review) shall be made in writing on the form provided at the end of this Specification Section.
4. When the Project Engineer does approve of the degree of readiness for the Project based on the initial Contractor's Punch List and the readiness of the Project, the Project Engineer will make his final review, adding to the Contractor's Punch List any other items that require further completion.
5. The Contractor shall take the initial Contractor's Punch List, together with the Project Engineer's Punch List, and initial and date each item on each list as to when it was completed.
6. Once both lists are completed and signed by the Project Inspector, the Contractor shall submit to the Project Engineer the completed lists for final review and approval prior to filing for Substantial Completion.

3.3 CLEANING

A. During Construction:
   1. Oversee cleaning and ensure that building and grounds are maintained free from accumulations of waste materials and rubbish.
   2. Sprinkle dusty debris with water.
   3. At reasonable intervals during progress of work, clean up site and access and dispose of waste materials, rubbish, and debris.
   4. Provide suitable containers and locate on site for collection of waste materials, rubbish, and debris.
   5. Do not allow waste materials, rubbish and debris to accumulate and become an unsightly or hazardous condition.
   6. Remove waste materials, rubbish and debris form the site and legally dispose of at public or private dumping areas off the Owner's property.

7. Vacuum clean interior building areas when ready to receive finish painting and continue vacuum cleaning on an as-needed basis until building is ready for acceptance or occupancy.
8. Lower waste materials in a controlled manner with as few handling as possible; do not drop or throw materials from heights.
9. Schedule cleaning operations so that dust and other contaminants resulting from cleaning process will not fall on wet, newly painted surfaces.

B. Final Cleaning:
1. Use experienced professional cleaners for final cleaning.
2. At completion of construction and just prior to acceptance or occupancy, conduct a final review of exposed interior and exterior surfaces.
3. Remove grease, dust, dirt, stains, labels, fingerprints, and other foreign materials from interior and exterior surfaces.
4. Repair, patch, and touch-up marred surfaces to match adjacent finishes.
5. Broom clean paved surfaces; rake clean other surfaces of grounds.
6. Replace air conditioning filters if units were operated during construction.
7. Clean ducts, blowers, and coils if air conditioning units were operated during construction
8. Maintain cleaning until the building, or portion thereof, is accepted by the Owner.

3.4 DEMONSTRATION

A. During Construction and as each piece of equipment is installed, provide the following tests:
1. Verify that all external service connections have been properly completed, and that piping and/or wiring is properly sized, and contain all necessary safety devices.
2. Verify that the equipment is free of shipping materials, tie downs, or other internal obstructions.
3. Conduct tests employing the manufacturer's operating instructions as a sequential guide.
4. Verify that all portions of the equipment function properly and that the total performance criteria is satisfied.
5. Make adjustments, replacements, or repairs necessary to achieve full operational capability and repeat tests until performance is achieved and approval obtained.

B. Prior to acceptance, verify that all conditions specified in the Article titled FIELD QUALITY CONTROL, Final Review, have been satisfied and that equipment is ready for continuous use. Provide the following services preparatory to acceptance:
1. Clean or replace all filters and/or strainers.
2. Adjust all belts and drive mechanisms.
3. Lubricate all moving parts as required by manufacturer's operating instructions.
4. Demonstrate to the Owner's representative and the Project Engineer or Engineer the method and sequence of operation, and provide testing devices and/or data to verify that performance equals that specified.
5. Provide operating instructions in bound form along with manufacturer's parts list and written warranties.

3.5 SCHEDULES

A. See next page for Request for Final Review from the Contractor(s):

(The rest of this page is left intentionally blank)

CONTRACTOR'S REQUEST
FOR
FINAL REVIEW FORM

PROJECT:_____
(Name of Project and Project Number)

TO: **LAWRENCE ENGINEERING GROUP**
7084 N. Maple Avenue, Suite #101
FRESNO, CA 93720

FROM:_____
(Contractor)
_____
(Address)
_____

WE HEREBY request Final Review on _____ and _____.
(Date) (Time)

WE HEREBY, request and certify:

1. The project is ready for Final Review.
2. The undersigned will compensate the Project Engineer at a rate of $176.00 an hour for further review, investigation and comments if it is determined that the Project is not ready for final review as indicated earlier within this Specification Section. The Project Engineer is herein defined as any of those firms or individuals listed by reference on the Drawings, including all Consultants identified herein.

Submitted By (Contractor)

Signature_____
Firm_____
Address_____
Date_____
Telephone_____

Below is
for Use by Design Consultant only
___ Conditions for Final Review Accepted
___ Final Review Accepted as Noted
___ Final Review Not Accepted
By_____
Date_____
Remarks_____
_____
_____
_____

END OF SECTION

SECTION 017836 – WARRANTIES

PART 1 - GENERAL

1.1 SUMMARY

A. In addition to providing all other warranties specified in the Project Manual and without affecting any rights of Owner under State or Federal law, Contractor shall warrant that the Work done under this Project Manual will be free from faulty materials or workmanship and hereby agrees, upon receiving notification from the Owner or his Agent, to immediately remedy, repair or replace, without cost to the Owners and to his entire satisfaction, all defects, damages or imperfections appearing in said work within a period of one (1) year unless specified otherwise, after date of final acceptance by the Owner of all work done under this Project Manual, regardless of whether or not the Owner or persons operating under contract with the Owner partially or wholly occupies any portion of the work prior to acceptance. For work performed after completion, the one (1) year period shall be extended by the period of time between the date of final acceptance by Owner and actual performance of the work. This obligation shall survive acceptance of the work and termination of the Contract.

1. Warranties shall be in the form outlined below and shall be submitted in duplicate to the Contractor and submitted on his own letterhead.

B. Related Sections: The following Project Manual Sections contain requirements that relate to this section:

1. ALL DIVISION 00 SPECIFICATION SECTIONS.
2. ALL DIVISION 01 SPECIFICATION SECTIONS.
3. ALL SPECIFICATION SECTIONS IN THE FACILITY CONSTRUCTION SUBGROUP.
4. ALL SPECIFICATION SECTIONS IN THE FACILITY SERVICES SUBGROUP.
5. ALL SPECIFICATION SECTIONS IN THE SITE AND INFRASTRUCTURE SUBGROUP.

1.2 SUBMITTALS

A. Warranty Form: *(following page.)*

B. *(Contractor's Letterhead)*

C. Project Number: _____

D. Project Name: _____

WARRANTY FOR

_____

We hereby warrant and the General Contractor warranties that

_____

_____

_____

has been done in accordance with the Drawings and the Specifications and that the Work as installed will fulfill the requirements of the warranty included in the Project Manual. We agree to repair, replace any or all of our work together with any other adjacent work which may be displaced or damaged by so doing that may prove to be defective in its workmanship or materials within a period of _____ years from date of acceptance of the above-named without any expense to the Owner, ordinary wear and tear and unusual abuse or neglect excepted. In the event of our failure to comply with above-mentioned conditions within ten (10) days after being notified in writing by the Owner or his agent, we collectively or separately, do hereby authorize the Owner to proceed to have said defects repaired and made good at our expense and we will honor and pay the costs and charges therefor upon demand.

_____
(Signature of Subcontractor)

_____
(Signature of Contractor)

Date: _____

E. Submit 2 copies of all manufacturer's or installer/applicator's warranties and bonds as specified within Division 02 –49.

F. Submit to Project Engineer together with Project Record Documents.

G. Accompany submittals with transmittal letter in duplicate.

H. When Product Submittals are required, submit copy of warranty with product submittal.

PART 2 - PRODUCTS

NOT APPLICABLE

PART 3 - EXECUTION

NOT APPLICABLE

END OF SECTION

SECTION 017839 – PROJECT DOCUMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes the administrative and procedural requirements for Project Record Documents, including the following:
   1. Project As-Built Drawings.
   2. Project Record Drawings.
   3. Record Specifications.
   4. Record Product Data.

B. Related Requirements: The following Project Manual Sections contain requirements that relate to this Section:
   1. Specification Section 013226- FORMS AND REPORTS
   2. Specification Section 017720- PROJECT CLOSEOUT

1.3 DEFINITIONS

A. CONTRACT DOCUMENTS: Contract Documents include Contract Forms, Project Manual (Contract Requirements and Specifications), Drawings, Addenda, Change Orders and Modification Documents (Supplemental Instructions, Request for Information, Construction Change Directives).

B. PROJECT "AS-BUILT" DOCUMENTS: A set of Contract Documents used during construction for recording of actual construction information during construction. The recording of construction information shall be maintained on the Contract Drawings and in the Project Manual.

C. PROJECT "RECORD" DOCUMENTS: A set of Contract Documents used at the completion of construction for transferring and documenting the actual construction information recorded on the PROJECT "AS-BUILT" DOCUMENTS.

D. RECORD PRODUCT DATA: A set of Submittals and Shop Drawings that have documentation of field changes made after review.

E. AGENCY DOCUMENTATION: Documents required by the Agency Having Jurisdiction to be prepared and submitted by the contractor.

1.4 SUBMITTALS:

A. Submit the following in accordance with specification Section SUBMITTAL PROCEDURES.

B. Format for Submittals:
1. Accompany each submittal with a SHOP DRAWING AND SUBMITTAL TRANSMITTAL:
2. PDF electronic file names shall match the Sheet Numbers of the Contract Documents.
3. Provide labels on DVD's and DVD Cases and include the following:
4. First Line: CLOSE-OUT DOCUMENTS
5. If submittal contains multiple disks append to first line Disk, i.e. (1 of 2)
6. Second Line: Project Name and Year
7. Third Line: Project Engineer Firm Name and Project Engineer's Project Number
8. Fourth Line: DSA or OSHPD Number (if applicable)
9. Fifth Line: Contractor Company Name
10. PDF files for Project "Record" Documents and Record Product Data shall be combined with PROJECT CLOSEOUT, Maintenance Data and Operations Data, and WARRANTIES on a single set of DVD's.

C. PROJECT "AS-BUILT" DOCUMENTS: Comply with the following:
1. Number of Copies: Submit one paper-copy set of marked-up as-built drawings and one paper-copy of marked-up as-built specifications.
2. Clearly Label each copy "PROJECT 'AS BUILT' DOCUMENTS" in two-inch-high printed letters.

D. PROJECT "RECORD" DOCUMENTS: Comply with the following:
1. Number of copies: Submit copies of the Record Documents as follows:
   a. Initial Submittal:
      1) Submit one paper-copy of marked-up record drawings and one paper copy of marked-up record specifications,
      2) Alternatively, submit PDF electronic files of scanned marked-up record drawings and marked-up record specifications on one set of DVD Üs
      3) Project Engineer will indicate whether general scope of changes, additional information recorded, and quality of drafting are acceptable.
2. Final Submittal:
3. Submit one paper-copy of marked-up record drawings, one paper copy of marked-up record specifications, and PDF electronic files of scanned marked-up record drawings and marked-up record specifications on three sets of DVD's.
4. Each record drawing sheet shall be labeled, "PROJECT "RECORD" DOCUMENT.•
5. Print each drawing, whether or not changes and additional information were recorded.
6. Clearly Label each copy "PROJECT "RECORD" DOCUMENTS in two-inch-high printed letters in a prominent location.

E. RECORD PRODUCT DATA: Comply with the following:
1. Number of Copies:
   a. Submit one paper-copy set of marked-up shop drawings.
   b. Submit three DVD's of PDF electronic files of scanned marked-up shop drawings.

F. AGENCY DOCUMENTATION: Comply with the following:

1. Submit Documentation Required by the Agency Having Jurisdiction utilizing the format and system established by the Agency.

1.5 SYSTEM DESCRIPTION

A. The Project Engineer considers the Project Record Documents to be of significant importance to the Owner.

B. Project Record Documents provide important information for the Owner's records, they form an invaluable record for future reference for concealed conditions, facilities management processes, and future additions and renovations.

PART 2 - PRODUCTS

2.1 General:

A. All costs (including the time) required for recording, transferring, and copying all documentation shall be part of the Contractor's Overhead Expense.

B. Provide red pencil or ink (contrasting color) for all marking of the PROJECT "AS-BUILT DOCUMENTS, PROJECT "RECORD" DOCUMENTS, and RECORD PROJECT DATA.

C. Do not permanently conceal any work until required information has been recorded.

2.2 RECORD DRAWINGS

A. PROJECT "AS-BUILT" DOCUMENTS: Maintain one set of marked-up paper copies of the Contract Drawings: and Specifications, incorporating new and revised drawings as modifications are issued.
   1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.
      a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
      b. Accurately record information in an acceptable drawing technique.
      c. Record data as soon as possible after obtaining it.
      d. Record and check the markup before enclosing concealed installations.
   2. Content: Types of items requiring marking include, but are not limited to, the following:
      a. Location of internal utilities and appurtenances concealed in construction referenced to visible and accessible features of structure.
      b. Revisions to routing of piping and conduits.
      c. Revisions to electrical circuitry.
      d. Actual equipment locations.
      e. Duct size and routing.
      f. Locations of concealed internal utilities Field changes of dimensions and details.
      g. Changes made by Addenda, Change Orders and other Modification Documents.

h. Details not on original Contract Documents.
i. Changes made on Shop Drawings.

3. Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.
   a. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
   b. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
   c. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
   d. For each principal product, indicate whether record Product Data has been submitted in operation and maintenance manuals instead of submitted as record Product Data.
   e. Note related Changes Orders, record Product Data, and record Drawings where applicable.
4. Mark the Contract Drawings and Specifications completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
5. Note Request for Information numbers, Supplemental Instruction numbers, Construction Change Directive numbers, Change Order numbers, and similar identification, where applicable.

2.3 PROJECT "RECORD" DOCUMENTS:

A. General: Transfer all changes, notations, etc. from the "AS-BUILT" PROJECT DOCUMENTS to the "PROJECT RECORD" DOCUMENTS in the same quality as the original Contract Documents.

2.4 RECORD PRODUCT DATA

A. Maintain one set of marked-up paper copies of the Shop Drawings and Product Data, incorporating any modifications to the reviewed documents.

B. Preparation: Mark Product Data to indicate the actual product installation where installation varies from that indicated in Product Data submittal.
   1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
   2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
   3. Note related Change Orders and record Drawings where applicable.
   4. Include record Product Data directory organized by Specification Section number and title, electronically linked to each item of record Product Data.

PART 3 - EXECUTION

3.1 RECORDING AND MAINTENANCE:

A. Recording:
1. Keep all documents current, PROJECT "AS-BUILT" DOCUMENTS shall be kept current at all times. Post changes and revisions to project as-built documents as they occur; do not wait until end of Project
2. The Project Inspector will review the PROJECT "AS-BUILT" DOCUMENTS periodically for the Project Engineer at the time Payment Requests are processed. Should the PROJECT "AS-BUILT DOCUMENTS not be current and up to date, the Owner reserves the right to hold the Payment Request until compliance with the Contract Documents has occurred.

B. Maintenance of Documents:
1. Maintain at job site the following:
   a. Contract Drawings.
   b. Project Manual/Specifications.
   c. Addenda.
   d. Reviewed shop drawings.
   e. Change Orders.
   f. All Modification Documents.
   g. Field test records.
2. Store documents in field office apart from documents used for construction.
3. Provide files and racks for storage of documents.
4. File documents in accordance with Project Filing Format or Uniform Construction Index.
5. Maintain documents in clean, dry, legible condition.
6. Do not use record documents for construction purposes.
7. Make documents available at all times for inspection by Project Engineer, Owner and Owner's Inspector.

END OF SECTION

SECTION 024919 - SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

A. This section includes the following:
   1. Section includes requirements governing execution of the work including, but not limited to, the following:
      a. Demolition and removal of selected portions of building or structure.
      b. Salvage of existing items to be reused or recycled.

B. Related Sections: The following Project Manual Sections contain requirements that relate to this section:
   1. ALL DIVISION 00 SPECIFICATION SECTIONS
   2. ALL DIVISION 01 SPECIFICATION SECTIONS
   3. 06 10 00 ROUGH CARPENTRY
   4. 09 29 00 GYPSUM BOARD
   5. 09 50 00 ACOUSTICAL CEILINGS
   6. ALL SPECIFICATION SECTIONS IN THE FACILITY SERVICES SUBGROUP

1.2 REFERENCES

A. Standards:

B. In accordance with the latest edition of the following standards:
   1. ANSI A10.6 American National Standards Institute

1.3 DEFINITIONS

A. Remove: Detach items from existing building and legally dispose or recycle off-site.

B. Remove and Salvage to Owner: Carefully detach from existing building, in a manner to prevent damage, and deliver to Owner.

C. Remove and Reinstall: Detach items from existing building, prepare for reuse, and reinstall where indicated.

D. Existing to Remain: Existing item(s) within project that are not to be permanently removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

1.4 SUBMITTALS

A. Submit in accordance with Specification Section - SUBMITTAL PROCEDURES:

1. Shop Drawings:
   a. Proposed Protection Measures - Submit report and drawings that indicates the measures proposed for protecting individuals and property for dust and noise control.
      1) Indicate proposed locations and construction of barriers.
      2) Indicate occupant paths of egress and travel.
      3) Indicate how long utility services will be interrupted.
   b. Salvaged Item Inventory List
      1) Indicate items to be salvaged and delivered to Owner.
2. Closeout Submittals:
   a. Existing Warranties
   b. Pre-demolition Photographs

1.5 QUALITY ASSURANCE

A. Regulatory Requirements:
   1. In accordance with Specification Section - REGULATORY REQUIREMENTS and the following:
      a. CARB Materials and equipment used for this project shall comply with the current applicable regulations of the California Air Resources Board and the Environmental Protection Agency (EPA), in the area where the project is located.
      b. CAL/OSHA California Division of Occupational Safety and Health Administration.
      c. CF County of Fresno, codes and ordinances
      d. EPA Environmental Protection Agency

B. Meetings:
   1. Pre- Demolition……Schedule prior to the start of work.
      a. Coordinate the work with other work being performed.
      b. Review requirements of work performed by others that rely on substrates exposed by selective demolition work.
      c. Identify any potential problems that may impede planned progress and proper demolition of work.
      d. Review structural load limitations of existing structure.
      e. Review areas where existing construction is to remain and requires protection.
      f. Review demolition waste disposal and material recycling procedures.
   2. Progress:……Scheduled by the Contractor during the performance of the work.
      a. Review for proper work progress.
      b. Identify any problems and acceptable corrective measures.
      c. Identify any measures to maintain or regain project schedule if necessary.
   3. Completion:……Scheduled by the Contractor upon proper completion of the work.
      a. Inspect and identify any problems.
      b. Establish method and procedures to maintain protections while progressing to project completion.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Cleaning, handling, and packing:

1. Salvaged Items and Reinstalled Items shall be handled in such a manner as to assure that they are free from damage.
2. Salvaged Items shall be cleaned and packed or cleaned and palleted.
3. Reinstalled Items shall be cleaned.

B. Storage and protection
1. Salvaged Items and Reinstalled Items shall be stored in a dry, protected area.
2. Salvaged Items and Reinstalled Items shall be stored above ground on level platforms, six (6) inches above ground, allowing air circulation underneath.
3. Cover with protective waterproof covering providing for adequate air circulation and ventilation.

C. Waste Management and Disposal:
1. Disposal of all selective demolition items shall be per Specification Section - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL.

1.7 PROJECT CONDITIONS

A. Environmental requirements:
1. Dust control - perform site, exterior, and interior work in a manner as to minimize the spread of dust and flying particles.
   a. Thoroughly moisten appropriate surfaces as required to prevent dust from being a nuisance to the occupants, public, and neighbors.
2. Noise control - perform work in a manner as to minimize construction noise.
   a. When a certain level of noise is unavoidable and is objectionable to the occupants of the adjacent spaces, buildings, or premises, coordinate with Owner and make arrangements to perform such work at the most appropriate time periods of the day.
3. Infection control -
4. Vibration control -

B. Existing conditions:
1. Examine project site and building and compare it with the drawings and specifications. Thoroughly investigate and verify conditions under which the work is to be performed. No allowance will be made for extra work resulting from negligence or failure to be acquainted with all available information concerning conditions necessary to estimate the difficulty or cost of the work.
2. Conduct work so as not to interfere unnecessarily with adjacent buildings, roads, streets, drives, and walks.
   a. Do not close or obstruct streets, alleys, walks, or passageways without permission from authorities having jurisdiction and coordinating same with immediate neighbors whose business operation may be affected.
   b. Safety measures shall be taken to insure an uninterrupted flow of traffic around the site as required by local Police and Fire Departments
3. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.
4. Maintain existing utilities indicated to remain in service and protect against damage during selective demolition work.
   a. Maintain fire-protection facilities in service during the work.
5. Demolition waste becomes the property of the Contractor.

6. Storage or sale of removed items on-site is not permitted.
7. It is not expected that hazardous materials will be encountered in the Work.
   a. Hazardous materials will be removed by Owner before start of the Work.
   b. If suspected hazardous materials are encountered, do not disturb; immediately notify Project Engineer and Owner.
8. Hazardous materials are present in buildings and structures to be selectively demolished. The Owner has prepared a report for the Contractor to review and use.

1.8 WARRANTY

A. Existing Warranties:
   1. Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials so as not to void existing warranties. Notify warranter before proceeding. Existing warranties include the following:
      a. Roofing system
      b. HVAC System
      c. Fire Sprinklers
      d. Smoke Detection System
      e. Fire Alarm System
      f. Electrical Systems
      g. Low Voltage System
   2. Notify warranter on completion of selective demolition, and obtain documentation verifying that existing system has been inspected and warranty remains in effect.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Furnish all materials, tools, equipment, facilities, and services as required for performing the selective demolition and removal work.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verification of conditions:
   1. Report unacceptable conditions to the Project Engineer. Do not begin work until unacceptable conditions have been corrected.
   2. Execution of work under this specification section shall constitute acceptance of existing conditions.
   3. Obtain all necessary permits and authorizations by regulatory agencies required to perform the Work under this Section.
   4. Verify that utilities have been disconnected and capped before starting selective demolition operations.
   5. Verify that rooftop utilities and service piping have been shut-off prior to roof selective demolition.

6. Record existing conditions by use of Pre-demolition Photographs.
   a. Inventory and record the condition of items to be salvaged and/or re-installed.

3.2 PREPARATION

A. Coordination:
   1. Before proceeding, verify plans match existing conditions.
   2. Review documents of existing construction provided by Owner against existing conditions.
   3. If conflicts are encountered, report it to the Project Engineer. Then prepare recommendation(s) for correction and submit to Project Engineer for review.
   4. Coordinate work under this specification section with work specified under other sections.
   5. Coordinate any utility and HVAC unit shut-down with owner 48 hours in advance of the anticipated shut-down.
      a. Do not interrupt utilities and HVAC units serving occupied or used facilities, except when authorized in writing by the Owner.
      b. Provide temporary service during interruptions to existing facilities, as may be required by the Owner to maintain essential services.
   6. Prior to site selective demolition, review status of trees and shrubs with Project Engineer and Owner. The Owner may wish to relocate trees or shrubs outside the limits of construction.
   7. Prior to roofing selective demolition, coordinate with Owner to shut down air intake equipment and service piping in the vicinity of work.

B. Protection:
   1. Structure and Property:
      a. Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings, landscape, and facilities to remain.
      b. All damage inflicted on public and private property and the property of the Owner shall be repaired or restored to the original condition prior to the start of this Work. All repair or replacement work shall be done at no additional cost to the owner.
      c. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building and site.
      d. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and other weather damage to building envelope, structure, and interior areas.
      e. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
      f. Protect and maintain utility services and mechanical/electrical systems to remain.
      g. Cover and protect furniture, furnishings, and equipment that have not been removed.
      h. Cover all air supply and return ducts to remain before proceeding with demolition work.
      i. Cover air intake louvers before proceeding with work that will affect indoor air quality.
      j. During roof selective demolition have sufficient and suitable materials on-site to facilitate rapid installation of temporary protection in the event of unexpected rain.

2. Temporary Shoring:
   a. 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.
      1) Strengthen or add new supports when required during progress of selective demolition.

3.3 APPLICATION

A. General:
   1. Selective demolition shall include the removal of all components of the existing building and/or site described in the documents to be removed. Unless otherwise specified, the component identified for removal shall include all materials, accessories and fabrications associated with that component.
   2. 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.
      a. Temporarily cover opening to remain.
      b. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping, to minimize disturbance of adjacent surfaces.
   3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
   4. When removing structural framing members, lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
   5. Locate selective demolition equipment and demolished debris so as not to impose excessive loads on supporting walls, floors, or framing.
   6. Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems.
   7. Demolished items and materials that are recyclable or slated for disposal shall be promptly dealt with per Specification Section - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL.
   8. Removed and Salvaged items:
      a. Clean salvaged items.
      b. Pack or crate items after cleaning. Identify contents of containers.
      c. Store items in a secure area until delivery to Owner.
      d. Transport item to Owner's storage area off-site.
      e. Protect items from damage during transport and storage.
      f. In addition to items indicated elsewhere, salvaged items that the Owner wants to retain in usable condition are as follows:
         1) All unit heater and controls
         2) All energy management controls
         3) All security system devices
   9. Removed and Reinstalled items:
      a. Clean and repair items to functional condition adequate for intended reuse.
      b. Pack or crate items after cleaning and repairing. Identify contents of containers.
      c. Protect items from damage during transport and storage.
      d. 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.

10. Existing Items to Remain:
    a. Protect construction indicated to remain against damage and soiling during selective demolition.

B. Roofing Selective Demolition:
1. Maintain roof drains in functioning condition to ensure roof drainage at end of each work day. Prevent debris from entering or blocking roof drains and conductors. Use roof drain plugs specifically for this purpose. Remove roof drain plugs at end of each work day, when no work is taking place, or when rain is forecast.
2. Remove existing roofing membrane and other roofing system membrane components down to the deck including flashings, copings, and roof accessories.

3.4 CLEANING

A. Clean in accordance with Specification Section - PROJECT CLOSEOUT:
1. Clean any soiled surfaces to remain immediately.
2. Existing substrates shall be clean and ready for the installation of any additional materials.
3. Leave site areas level and free of any ruts or debris. Appearance of earth surface shall be equal to or better than adjacent undisturbed surfaces.

END OF SECTION

SECTION 061000 – ROUGH CARPENTRY

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:
   1. Provide all material, labor, equipment and services necessary to complete all rough carpentry, accessories and other related items necessary to complete the Project as indicated by the Construction Documents unless specifically excluded.

B. Related Sections: The following Sections contain requirements that relate to this Section:
   1. ALL DIVISION 00 SPECIFICATION SECTIONS.
   2. ALL DIVISION 01 SPECIFICATION SECTIONS.
   3. 06 10 00 ROUGH CARPENTRY
   4. 07 21 00 INSULATION
   5. 07 53 16 ELASTOMERIC MEMBRANE ROOFING
   6. 07 57 00 COATED FOAM ROOFING
   7. 07 84 00 FIRESTOPPING
   8. 07 92 00 SEALANTS
   9. 09 22 16 METAL FRAMING
   10. 09 29 00 GYPSUM BOARD
   11. 09 50 00 ACOUSTICAL CEILINGS
   12. ALL SPECIFICATION SECTIONS IN THE FACILITY SERVICES SUBGROUP.
   13. ALL SPECIFICATION SECTIONS IN THE SITE AND INFRASTRUCTURE SUBGROUP.

1.2 REFERENCES

A. Standards:
   1. In accordance with the following standards:
      a. ALSC American Lumber Standards Committee
      b. ANSI American National Standards Institute
      c. APA The Engineered Wood Association (Formerly the American Plywood Association)
      d. ASME American Society of Mechanical Engineers International
      e. AWPA American Wood Protection Association
      f. CABO Council of American Building Officials
      g. FS Federal Specification
      h. ICC International Code Council
      i. NDS National Design Specification for Wood Construction
      j. NIST National Institute of Standards and Technology
      k. PS Product Standards of the U.S. Department of Commerce
      l. RIS Redwood Inspection Service
      m. WCLIB West Coast Lumber Inspection Bureau
      n. WWPA Western Wood Products Association

1.3 SUBMITTALS

A. Submit in accordance with Specification Section - SUBMITTAL PROCEDURES:
   1. Product Data:
      a. Submit manufacturer's data for Wood-Preservative Treatment.
      b. Submit manufacturer's data for Fire-Retardant Treatment.
      c. Submit manufacturer's data for power driven fasteners, metal-framing connectors, and metal framing anchors.
   2. Quality Assurance/Control Submittals:
      a. Material Certificates: Submit Material Certificates of Compliance to Standards and Regulatory Requirements.

1.4 QUALITY ASSURANCE

A. Qualifications:
   1. Installer Qualifications:
      a. Engage an experienced Installer who has successfully completed three (3) projects of similar scope and size to that indicated for this Project.

B. Regulatory Requirements:
   1. In accordance with Specification Section - REGULATORY REQUIREMENTS, and the following:
      a. CARB Materials and equipment used for this Project shall comply with the current applicable regulations of the California Air Resources Board (CARB) and the Environmental Protection Agency (EPA), in the area where the project is located.

C. Meetings:
   1. Pre-Installation: Scheduled by the Contractor prior to the start of work.
      a. Coordinate the work with other work being performed.
      b. Identify any potential problems that may impede planned progress and proper installation of work regarding quality of installation and warranty requirements.
   2. Progress: Scheduled by the Contractor during the performance of the work.
      a. Review for proper installation of work progress.
      b. Identify any installation problems and acceptable corrective measures.
      c. Identify any measures to maintain or regain project schedule if necessary.
   3. Completion: Scheduled by the Contractor upon proper completion of the work.
      a. Inspect and identify any problems that may impede issuance of warranties or guaranties.
      b. Maintaining installed work until the Notice of Substantial Completion has been executed.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver undamaged products to project site in manufacturer's sealed containers or bundles with tags and labels intact.

B. Storage and Protection:

1. Products shall be stored above ground on level platforms, six (6) inches above ground, allowing air circulation under stacked units.
2. Cover materials with protective waterproof covering providing for adequate air circulation and ventilation.

1.6 PROJECT CONDITIONS

A. Environmental Requirements:
1. Dust Control: Perform work in a manner as to minimize the spread of dust and flying particles.
2. Burning: No burning will be allowed on-site.
3. Rain: Work under this section shall not be started or maintained under threat of rain unless the work is not affected by the rain.

B. Existing Conditions:
1. Examine site and compare it with the drawings and specifications. Thoroughly investigate and verify conditions under which the work is to be performed. No allowance will be made for extra work resulting from negligence or failure to be acquainted with all available information concerning conditions necessary to estimate the difficulty or cost of the work.

1.7 WARRANTY

A. Contractor's General Warranty:
1. In accordance with Specification Section - WARRANTIES.

B. Manufacturer's Warranty:
1. In accordance with manufacturer's written standard warranty:
a. Warranty Period One (1) Year.

C. Installer's Warranty:
1. In accordance with the terms of the Specification Section - WARRANTIES
a. Warranty Period One (1) Year.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. These products listed herein establish the size, pattern, color range and function selected by the Project Engineer for this Project. Manufacturers that are listed as acceptable alternative manufacturers and substitutions must still comply with the requirements of this project and the products listed in order to be approved as an equivalent during the Submittal Process. If the acceptable alternative manufacturers listed or substitutions are not approved during the Submittal Process due to non-compliance with the contract documents, then the Contractor shall submit product specified.
1. Power Driven Fastener specified product manufacturer:
a. HILTI FASTENING SYSTEMS.

2. Metal Framing Anchor specified product manufacturer:
   a. SIMPSON STRONG-TIE COMPANY.
   b. Acceptable alternative manufacturers:
      1) Manufacturers of Alternative Metal Framing Anchors shall have Model Code Research Evaluation Reports and Published allowable design loads that are determined from empirical data, or by rational engineering analysis, that are demonstrated by comprehensive testing performed by a qualified testing agency acceptable by the Project Engineer or its Designated Design Consultant and AHJ.
3. Metal Timber Framing Connector specified product manufacturer:
   a. SIMPSON STRONG-TIE COMPANY.
   b. Acceptable alternative manufacturers:
      1) Do not substitute connectors manufactured by others than SIMPSON STRONG-TIE COMPANY without prior written review by the Project Engineer or its Designated Design Consultant and AHJ.

B. Products from other manufacturers not listed must submit in accordance with Specification Section - SUBSTITUTION PROCEDURES.

2.2 MATERIALS

A. Wood:
1. Douglas Fir - Larch:
   a. Standards and Requirements: In accordance with WCLIB “Standard Grading and Dressing Rules” No. 17, latest edition, and WWPA “Western Lumber Grading Rules”, latest edition.
      1) All wood shall be “DRY” and having a moisture content of less than 19 percent at the time of installation, in accordance with WWPA.
      2) Provide wood of S4S unless otherwise noted.
      3) Factory mark each piece of wood with the grade stamp of the grading agency.
   b. Grading and Use Requirements:

Item	Sizes	Grade	Maximum Moisture Content at Initial Use (Installation)
Studs	2x	No. 1	19%
Studs	3x, 4x, 6x	No. 1	19%
Sills & Plates	2x	Construction	19%
Sills & Plates	3x, 4x, 6x	Construction	19%
Beams	4x, 6x	No. 1	19%
Joists	2x	No. 1	19%
Posts	4x, 6x, 8x	No. 1	19%
Ledgers	2x	No. 1	19%
Ledgers	3x, 4x, 6x	No. 1	19%
Blocking	2x, 3x, 4x, 6x	Construction	19%
Sheathing and Stripping	Up to 1-1/2” thick 2” width and wider	Construction	19%
Stripping	2x, 3x, 4x, 6x	Construction	19%

Item	Sizes	Grade	Maximum Moisture Content at Initial Use (Installation)
Nailers & Grounds	2x, 3x, 4x, 6x	Construction	19%
Furring	2x, 3x, 4x, 6x	Construction	19%
T & G Decking	2x	Select Dex	15%

1) Initial use shall be that point at which screws or other fasteners or the holes for said fasteners are installed into the wood.
2) The Contractor shall use whatever means necessary, including site drying to ensure that the moisture contents listed above are not exceeded.

B. Plywood:
1. Soft Plywood:
a. Standards and Requirements: In accordance with PS1-09, Group 1 Douglas-Fir and PS2-10.
1) Factory mark each piece of plywood with the APA Grade Stamp.
2) Maximum Moisture Content at Initial Use (Installation) shall be 15 percent.
b. Grading and Use Requirements:
1) Wall, Roof, and Parapet Sheathing:
a) APA Rated Sheathing - Structural 1.
b) Span Rating as required to suit stud or joist spacing.
c) Exposure Durability Classification - Exposure 1.
d) Species Group 1.
e) Grade C-C 3 ply for 1/4 inch thickness and C-D 5 ply for 1/2 and 5/8 inch thickness.

2.3 FINISHES

A. Preservative Treatment:
1. Pressure Treat Wood and Plywood, with CARB Complying, EPA Registered, preservatives in accordance with AWPA Standards “U”, “T”, and “P”.
a. Do not use material that does not comply with the requirements for untreated material.
b. After treatment, kiln-dry wood to a maximum moisture content of 19 percent.
c. After treatment, dry plywood to a maximum moisture content of 15 percent.
d. Factory mark each treated item with the treatment quality mark of an Independent Inspection Agency approved by the ALSC Treated Wood Program.
2. Non-pressure treat Wood and Plywood, with CARB Complying, EPA Registered preservatives in accordance with AWPA Standards “U• ,“T• ,“P• and “N”.

B. Fire Retardant Treatment:
1. Fire Retardant Treat Wood and Plywood with pressure treatment materials that comply with performance requirements of CBS 2303.2.
a. Use Exterior Type.
b. Use treatment for which chemical manufacturer publishes physical properties of treated wood after exposure to elevated temperatures when tested by a qualified independent testing agency and is acceptable to Fire and Life Safety authorities.
c. Use treatment that does not promote corrosion of metal fasteners.

d. After treatment, kiln-dry wood to a maximum moisture content of 19 percent.
e. After treatment, dry plywood to a maximum moisture content of 15 percent.
f. Factory mark each treated item with the treatment quality mark of an Independent Inspection Agency.

2.4 ACCESSORIES

A. Fasteners: All types shall comply with standards and dimensions of the latest edition of NDS. All types of fasteners exposed to wet or exterior conditions, in-ground contact, in pressure or preservative treated woods, in concrete or masonry, or in an area of high relative humidity shall be hot-dipped galvanized in accordance with ASTM A 153 "Specification for Zinc Coating (Hot Dip) on Iron and Steel Hardware".
1. Nails: Common wire nails or spikes complying with ASTM F 1667 "Specification for Driven Fasteners: Nails, Spikes, and Staples", and CBC Section 2304.10. Box nails and sinker nails are not permitted. Vinyl coating is permitted on common nails.
2. Bolts: Steel bolts complying with ASTM A 307 "Specification for Carbon Steel Bolts and Standards, 60,000 PSI Tensile Strength", Grade A, hex head.
   a. Provide hex head nuts complying with ASTM A 307 "Specification for Carbon Steel Bolts and Standards, 60,000 PSI Tensile Strength", and standard flat washers complying with ANSI/ASME B18.22.1, Type A, Wide pattern.
3. Lag Bolts: Shall comply with ANSI/ASME B18.2.1, hex head.
   a. Provide standard flat washers complying with ANSI/ASME B18.22.1, Type A, Wide pattern.
4. Wood Screws: Shall comply with ANSI/ASME B18.6.1.
   a. Screws for fastening wood to Metal Framing shall comply with ASTM C 954 "Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs from 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness".
5. Power Driven Fasteners: Tempered Steel pins with corrosive resistant plating or coating complying with ICC ESR-1539.

B. Metal Framing Anchors: All anchors shall comply with ASTM A 653 "Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process", G60 Coating Designation for hot-dipped zinc-coated steel sheet. Provide structural, commercial, or lock-forming quality as standard with manufacturer for type of anchor indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Site verification of conditions:
1. Prior to the execution of the work under this specification section, inspect the installed work executed under other sections of this Project Manual, which affect the execution of work under this specification section.
2. Report unacceptable conditions to the Project Engineer. Do not begin work until unacceptable conditions have been corrected.

3. Execution of work under this specification section shall constitute acceptance of existing conditions.
4. Verify that work under this Section may be performed in strict accordance with the original design and all pertinent codes and regulations.

3.2 PREPARATION

A. Coordination:
1. Coordinate work under this specification section with work specified under other sections to ensure proper and adequate interface of work.

B. Protection:
1. Protect all materials from damage occurring from work called for under this specification section.

C. Preservative Treatment:
1. Members requiring pressure treatment:
   a. Sills, Plates, Ledgers, Studs, Joists, Blocking, Nailers and Furring attached or resting on or against concrete or masonry construction.
   b. Pressure treated members cut in the field shall have the cut ends painted with preservative until the wood or plywood absorbs no more preservative.

D. Fire Retardant Treatment:
1. All wood and plywood members as indicated.

3.3 INSTALLATION

A. General:
1. In accordance with manufacturer’s instructions and recommendations unless specifically noted otherwise.
2. In accordance with approved submittals.
3. In accordance with Regulatory Requirements.
4. Selection of wood and plywood pieces:
   a. Carefully select all members.
   b. Select individual pieces so that knots and obvious defects will not interfere with placing bolts, proper nailing, and making proper connections.
   c. Cut out and discard all defects which will render a piece unable to serve its intended function.
   d. Wood and plywood may be rejected by the Project Engineer or its Designated Design Consultant, and whether or not it has been installed for excessive warp, twist, bow, crook, mildew, fungus, or mold as well as for improper cutting, fitting and treatment when required.
5. All wood and plywood shall be accurately cut to lengths required.
6. All work shall produce joints true, tight, level, plumb, and all members are securely anchored.
   a. Do not shim any framing member.

B. Layout:
1. Lines shall be straight and true.

C. Fastening:
1. Nails:
   a. All nailing shall be as required by CBC Table 2304.10.1 "Fastening Schedule".
   b. Machine nailing may be approved subject to the approval of the Project Engineer or its Designated Design Consultant, and .
      1) The use of machine nailing is subject to a satisfactory job site demonstration for each project. The approval is subject to continued satisfactory performance.
      2) In plywood, if the nail heads penetrate beyond flush with the surface of the sheathing, or if minimum allowable edge distances are not maintained, the performance will be deemed unsatisfactory.
      3) Machine nailing will not be accepted in 5/16” plywood.
   c. Penetration of nails or spikes shall be one-half the length of the nail or spike into the piece receiving the point.
   d. 16d nails shall be used to connect pieces 2” in thickness unless otherwise indicated.
   e. Clinch nails protruding through members.
   f. Bore holes for nails where necessary to prevent splitting.
   g. Use Finish or Casing Nails for finish work.
2. Lag Bolts:
   a. Lag Bolts shall be screwed into place. No driving is allowed.
   b. For the Shank portion, holes shall be bored the same depth and diameter as the shank. For threaded portion, holes shall be between 60% and 75% of the shank diameter.
   c. Malleable Iron or Steel plate washers shall be used where bolt heads bear on wood or plywood. Washers shall have an area equal to 16 times the area of the bolt.
      1) Steel plate washers shall have a thickness not less than 1/10 the length of the washer’s longest side.
      2) Malleable Iron washers shall have a bearing surface for the head equal in diameter to not less that the long diameter of the head.
   d. Tighten all bolts and screws prior to concealing within structure.
3. Bolts:
   a. Holes shall be 1/16” larger than bolt diameter.
   b. Malleable Iron or Steel plate washers shall be used where bolt head and nuts bear on wood or plywood. Washers shall have an area equal to 16 times the area of the bolt.
      1) Steel plate washers shall have a thickness not less than 1/10 the length of the washer’s longest side.
      2) Malleable Iron washers shall have a bearing surface for the head or nut equal in diameter to not less that the long diameter of the head or nut.
   c. Tighten all bolts prior to concealing within structure.
4. Power Driven Anchors
   a. Fastening shall be accomplished by low-velocity piston-driven power activated tool.
   b. Pins shall have guide washers to accurately control penetration.
5. Expansion Anchors (Post-Installed Concrete Anchors):
   a. Refer to Specification Section - DRILLED ANCHORS.
6. Metal Framing Anchors
   a. Use half-length nails where required or indicated.

D. Studs and Posts:

a. Shall be full length.

E. Plates:
1. Shall be in long lengths and spliced as indicated.

F. Joists and Beams:
1. Shall be in long lengths and spliced over bearings unless otherwise indicated. Do not overcut.
2. Install with crown side up.
3. Beams or headers indicated to be built-up of two or more joists shall be constructed on the project site using full length members.

G. Blocking:
1. Blocking shall be same thickness and width of studs or joists unless otherwise indicated.
2. Install blocking at all wall, floor, or roof penetrations.
   a. Blocking shall provide surface for fastening applied interior or exterior flashings or flanges.
3. Install blocking at all plywood joints.
   a. Install blocking at plywood edges including crickets and parapet wall bracing.
4. Shall be provided for all fixtures, equipment, identifying devices, flashing, wall and ceiling finishes, and other existing and new items.
5. Fireblocking shall be provided to cut off all horizontal and vertical concealed draft openings in accordance with CBC Section 718.2.
   a. Horizontal Fireblocking in walls shall be typically placed at 4’-0” above finished floor, at 8’-0” above finished floor, at mezzanine floor plane unless otherwise indicated, and at ceiling line plane.
6. Bridging shall be installed in all joist members deeper than 8 inches unless otherwise indicated.
   a. Bridging shall extend the full depth of the joists.
   b. Drill bridging within attics to provide ventilation as indicated.

H. Plywood Sheathing Panels:
1. For panels with different veneer face grades, the exposed face shall always be the higher grade.
2. Space panels 1/8 inch at all edge and end joints, and in accordance with APA.
3. Panels shall be applied with the long dimension (or strength axis) across the framing.
4. Fasten from the field of the panel first and then to the ends and edges to reduce stressing of the panel surfaces.
5. Center all joints over bearing supports.
6. Wall panels shall continue uninterrupted by ceilings or soffits from floor to floor or roof unless otherwise indicated.

I. Sheathing:
1. Shall be in accordance with the following:
   a. Floor and Roof Sheathing: CBC Section 2304.7.
   b. Structural Roof Sheathing: CBC Section 2304.7.2.
   c. Lumber Decking: CBC Section 2304.8.

J. Nailers and Grounds:
1. Shall be installed as indicated and where required for attaching other work.

2. Form to shapes indicated.
3. Coordinate locations with other work involved.
4. Provide nailers at all flashing and edge terminations when required by roofing manufacturer for metal and concrete roof decks. When the roof system is required to be Class A use fire-retardant treated wood.
5. Provide permanent Grounds of dressed, pressure-preservative-treated, Key-beveled wood and of thickness required to bring face of ground to exact finish thickness of finish material. Remove temporary grounds when no longer required.

K. Furring and Stripping
1. Shall be installed as indicated and where required to provide fastening material or space for the passage of pipes, conduits, etc. not accommodated including ceiling stripping.

L. Sealant:
1. When indicated, Primer shall be in accordance with sealant manufacturer recommendations.
2. When indicated, Joint Sealer shall be in accordance with Specification Section - SEALANTS.

3.4 CONSTRUCTION

A. Pipes:
1. Frame to avoid cutting or drilling for passage of pipes, ducts, and conduit.
2. Follow criteria as indicated for cutting or drilling. Unusual edge distances and awkward spacing and sizes shall be brought to the Project Engineers attention for remedy.

B. Cant Strips and Crickets:
1. Shape to sizes indicated.
2. Rigidly fasten to construction.
3. Block all joints of plywood panel construction.
4. Form neat and mitered corners.

C. Shoring or Bracing:
1. Shore or brace for temporary support of all work as required during the construction period except any shoring and bracing specified and included under other sections of this Project Manual.

D. Wood Curbs for Equipment:
1. Construct all wood curbs for roof mounted equipment.
2. Provide all miscellaneous blocking, bracing, supports, and other wood items to complete the work.

3.5 FIELD QUALITY CONTROL

A. Site Tests:
1. As required by Regulatory Requirements.
2. Project Inspector shall verify by means of a handheld moisture content meter that all wood and plywood supplied at the time of incorporation into structure(s) has met applicable moisture content requirements.

3. Project Inspector shall test all stud cavity walls to ensure that studs are a maximum of 19 percent moisture content prior to any other construction that encloses the wall cavity.

B. Inspection:
1. As required by Regulatory Requirements.
2. Schedule inspections and notify the Project Engineer, Project Inspector and any other regulatory agencies of the time at least 48 hours prior to the inspection.
3. No work shall be without the inspections required by Regulatory Requirements.

3.6 CLEANING

A. Removal of Debris:
1. Remove all Wood, including form lumber, chips, shavings and sawdust in or on the ground from the areas inside buildings. Do not bury debris in fill.

END OF SECTION

SECTION 072100 – INSULATION

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

B. Provide all material, labor, equipment and services necessary to replace existing insulation removed and not salvageable, accessories and other related items necessary to complete the Project.

C. Related Sections: The following Sections contain requirements that relate to this Section:
1. ALL DIVISION 00 SPECIFICATION SECTIONS.
2. ALL DIVISION 01 SPECIFICATION SECTIONS.
3. 06 10 00 ROUGH CARPENTRY
4. 07 51 13 BUILT-UP ROOFING
5. 07 53 XX ELASTOMERIC MEMBRANE ROOFING
6. 07 84 00 FIRESTOPPING
7. 09 22 16 METAL FRAMING
8. 09 29 00 GYPSUM BOARD
9. 09 50 00 ACOUSTICAL CEILINGS
10. ALL SPECIFICATION SECTIONS IN THE FACILITY SERVICES SUBGROUP.
11. ALL SPECIFICATION SECTIONS IN THE SITE AND INFRASTRUCTURE SUBGROUP.

1.2 REFERENCES

A. Standards:
1. In accordance with the following standards:
   a. MIMA Mineral Insulation Manufacturers Association
   b. NFPA National Fire Protection Association
   c. TIMA Thermal Insulation Manufacturers Association

1.3 SUBMITTALS

A. Submit in accordance with Specification Section - SUBMITTAL PROCEDURES:
1. Product Data.
   a. Product Data on materials and accessories.
2. Quality Assurance/Control Submittals:
   a. Manufacturer's Written Instructions:
      1) Submit three (3) copies of manufacturer's written instructions.
3. Closeout Submittals in accordance with the following:
   a. Warranty in accordance with Specification Section - WARRANTIES.

1.4 QUALITY ASSURANCE

A. In accordance with California Quality Standards.

B. The R values for the insulation materials shall be in accordance with "The Standard Mineral Wool Building Insulation" latest Edition of the MIMA.

C. Regulatory Requirements:
1. In accordance with Specification Section - REGULATORY REQUIREMENTS, and the following:
a. ASTM American Society for Testing and Materials

1.5 DELIVERY, STORAGE, AND HANDLING

A. Delivery and Storage of Materials:
1. All Materials shall be delivered and stored in original unopened packages with manufacturer's name and contents legibly indicated. Materials shall be stored in a dry place, and protected from damage.

1.6 WARRANTY

A. Contractor's General Warranty:
1. In accordance with Specification Section - WARRANTIES.

B. Manufacturer's Warranty:
1. In accordance with manufacturer's written standard warranty:
a. Warranty Period One (1) Year.

C. Installer's Warranty:
1. In accordance with the terms of the Specification Section - WARRANTIES
a. Warranty Period One (1) Year.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. These products listed herein establish the size, pattern, color range and function selected by the Architect for this Project. Manufacturers that are listed as acceptable alternative manufacturers and substitutions must still comply with the requirements of this project and the products listed in order to be approved as an equivalent during the Submittal Process. If the acceptable alternative manufacturers listed or substitutions are not approved during the Submittal Process due to non-compliance with the contract documents, then the Contractor shall submit product specified.
1. Specified blanket insulation product manufacturer:
a. OWENS CORNING
b. Acceptable alternative manufacturers:
1) CERTAINTEED

2) JOHNS MANVILLE CORPORATION

2. Specified sound blanket insulation product manufacturer:
   a. OWENS CORNING
   b. Acceptable alternative manufacturers:
      1) CERTAINTEED
      2) JOHNS MANVILLE CORPORATION
3. Specified sound deadening board product supplier:
   a. BLUE RIDGE FIBERBOARD "SoundStop".
4. Specified draft stop insulation product manufacturer :
   a. THERMAFIBER "Thermafiber".
5. Specified foundation insulation product manufacturer:
   a. DOW CHEMICAL COMPANY "Styrofoam".
6. Specified rigid roof board insulation product manufacturer:
   a. RMAX (a SIKA company) "Multi-Max FA-3".
   b. Acceptable Alternative Manufacturers:
      1) ATLAS.
      2) JOHNS MANVILLE CORPORATION.
      3) TREMCO.
7. Specified welded stud stick pins and self-locking washers product manufacturer or approved equivalent:
   a. SUNBELT STUD WELDING.

B. Products from other manufacturers not listed must submit in accordance with Specification Section - SUBSTITUTION PROCEDURES.

C. Products specified represent the quality and standards of materials to be used. Actual products to be installed are to match existing materials needing to be replaced.

2.2 MATERIALS

A. Thermal Blanket:
   1. Construction in accordance with the following:
      a. Type I: Unfaced, Glass-Fiber Blanket Insulation: ASTM C 665, Type I; with a maximum flame-spread and smoke-developed indices of 25 and 50, respectively, per ASTM E 84 "Test Method for Surface Burning Characteristics of Building Materials"; passing ASTM E 136 "Test Method for Behavior of Materials in a Vertical Tube Furnace at 750 degrees C", for combustion characteristics.
         1) Unless otherwise noted, blankets without vapor-retarder membrane coverings, used in Interior partitions not subject to moisture.
      b. Type II: Kraft-faced, Glass-Fiber Blanket Insulation: ASTM C 665 "Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing", Type II (non-reflective faced), Class C (faced surface not rated for flame propagation); Category I (membrane is a vapor barrier).
         1) Unless otherwise noted, this type of insulation should only be used in conditions not "subject to view" (enclosed cavities) or in attics where a finished ceiling is provided and the attic is <u>not</u> used as a return air plenum.

c. Type III: Reinforced-Foil-Faced, Glass-Fiber Blanket Insulation: ASTM C 665 "Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing", Type III (reflective faced), Class A (faced surface with a foil-scrim or foil-scrim-kraft facing)
   1) Unless otherwise noted, this product shall be used when the attic (although enclosed by a finished ceiling) is used as a return air plenum, or used in "exposed-to-view" exterior and interior walls and ceilings or attics subject to moisture and fire-rated conditions.

2. Thermal Resistance (R) values required (minimum) for blanket insulation, unless otherwise indicated on the drawings:
   a. Roof Blanket Insulation: R-30.
   b. Wall Blanket Insulation: R-19.
   c. Floor Blanket Insulation: R-30.
   d. Attic Spaces: All attic spaces shall have continuous insulation of the proper type and with a minimum thermal resistance "R" value of R-30 for insulation only. Where attic spaces have vertical elements above ceilings, these shall be insulated as part of the attic space to R-30 minimum.
3. Thickness: No more than will fit into the space available without compressing. Where insulation is confined between finishes, which would compress the material, high efficiency insulation shall be used to provide the required resistance value.

B. Sound Blanket:

C. Sound Deadening Board: "SoundStop" 1/2 inch thick Sound Deadening Board, manufactured in accordance with ASTM C 208 "Specification for Cellulosic Fiber Insulating Board", as supplied by BLUE RIDGE FIBERBOARD.

D. Draft Stop:

E. Foundation:

F. Foamed-In-Place Insulation:
1. Low Pressure Type: Semi-flexible soft, single-component polyurethane sealant, to CAN/ULC-S710.1, and having the following properties:
   a. Core Density (ASTM D 1622) 1.7 pcf.
   b. Fire Resistance (ASTM E 84) Flame Spread = 10, Smoke Developed = 20.
   c. Color: Yellow.
   d. Cure Time: Approximately 12 hours.
   e. Tack Free Time: 6 - 9 minutes.
   f. Applicator: Gun applied.

2.3 ACCESSORIES

A. Staples:
1. Hammer type.

B. Wire:
1. Sixteen (16) gage line wire.

C. All other materials such as fasteners (i.e. insulation netting, line wires, stick-pins), and retainers not specifically described, but required to complete the work, shall be as recommended by approved manufacturer, and installed by the Contractor. Contractor shall choose the appropriate fastener or system for the cavity space or area to be insulated without letting the insulation sag.
   1. FSK Tape: As distributed by INSULATION MATERIALS.
      a. VENTURE TAPE product #1525CW.
   2. Welded Stud Stick Pins: As distributed by SUNBELT STUD WELDING.
      a. Provide low-carbon "mild" steel, with the following properties:
         1) Tensile Strength: 60,000 psi.
         2) Yield: 50,000 psi.
         3) Elongation: 20% (in 2 inches).
      b. Size: 12 gage.
      c. Length sufficient to hold insulation to underside of decking, and extended enough to allow self-locking washers to hold insulation in place without crushing the insulation.
      d. Spacing: 24 inches o.c.
         1) Pins shall be placed within 3 to 5 inches of all area edges.
      e. Self-Locking Washers:
         1) 2 inch diameter, galvanized, compatible with welded stud stick pin size and gage.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General:
   1. All building(s) shall have a complete thermal envelope of thermal blanket or rigid board insulation.
      a. Do not install insulation until the construction has progressed to the point that inclement weather will not damage or wet the insulation material.
      b. Install in accordance with manufacturer's written recommendations.
      c. Insulation shall fit snugly between framing members without voids. Fully insulate all areas between all framing members, cutting and fitting as required.
      d. Attach insulation to inside face of framing members.
         1) Wood Framing: Friction fit to keep from falling down within wall cavity. Attach with Hammer Staples at 6 inches on center with minimum staple penetration of 3/8 inch when insulation has a membrane facing.
         2) Metal Framing: Friction fit to keep from falling down within the cavity and use line wire across metal studs. Omit wire and spot tape with FSK Tape when insulation has a membrane facing.
      e. Vapor-Retarder Membrane: Shall be continuous and without unnecessary joints.
         1) At roof structure and exterior walls, after securing the insulation facing flanges, provide FSK Tape over all of the insulation facing butt joints and all overlapping facing flanges, so as to create a continuous vapor-retarder membrane at underside of the roof deck and inside of walls.
         2) Patch all tears, rips and holes in the vapor-retarder membrane.

f. Cut and fit insulation material around pipes, conduits and outlet boxes, as necessary to maintain the full integrity of the insulation.

B. At Roof Framing:
1. Install thermal roof blanket Insulation between all exterior roof framing members.
a. Wood Framing: Attach wire to framing with staples with minimum staple penetration of 5/8 inch.
b. Metal framing: Attach with line wires perpendicular to framing at 12 inches on center.

C. Sound Insulation:
1. Install sound attenuation batts between all interior wall framing members.
2. Install sound attenuation batts between all floor framing members.
3. Install sound deadening board over interior wall framing members.

D. Draft Stop Insulation:

END OF SECTION

SECTION 075113 - BUILT-UP ROOFING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:
   1. Provide all material, labor, transportation, equipment and services necessary to replace and repair existing bituminous roofing materials, accessories and other related items necessary that was removed during the course of construction for this project.
   2. Prior to proceeding with work, obtain any and all warranties regarding existing roofing system. All materials and installation is to match existing roofing system as to maintain existing warranties.

B. Related Sections: The following Sections contain requirements that relate to this Section:
   1. ALL DIVISION 00 SPECIFICATION SECTIONS.
   2. ALL DIVISION 01 SPECIFICATION SECTIONS.
   3. 02 41 19 SELECTIVE DEMOLITION
   4. 06 10 00 ROUGH CARPENTRY
   5. 07 21 00 INSULATION
   6. 09 11 00 METAL FRAMING
   7. ALL SPECIFICATION SECTIONS IN THE FACILITY SERVICES SUBGROUP.
   8. ALL SPECIFICATION SECTIONS IN THE SITE AND INFRASTRUCTURE SUBGROUP.

1.2 REFERENCES

A. Standards:
   1. In accordance with the following standards:
      a. FMG Factory Mutual for FMG 1-60 wind uplift requirements.
      b. NIST BSS #55, Building Series #55: Preliminary performance criteria of Bituminous Membrane Roofing, National Institute of Standards and Technology, Gaithersburg, MD.
      c. NRCA National Roofing Contractor's Association (NRCA).
      d. SMACNA Sheet Metal and Air Conditioning Contractors National Association, Vienna, VA.
      e. UL Underwriter's Laboratory (UL) test certification labels or equivalent testing agency with same follow-up testing and certified label program must be displayed on related roof assembly materials.
      f. UL 790 Underwriter's Laboratory, certified roof assembly to roof type identified on the drawings.

1.3 SYSTEM DESCRIPTION

A. Assume existing typical wood deck roof system section for this project:

1. Plywood deck with one bottom layer of 1/2 inch thick Cover Board (Fiberboard) insulation, a layer of Rigid Board (Isocyanurate Board) insulation of varying thickness for any crickets, a top layer of 1/2 inch thick Cover Board insulation (with staggered edges so that no edges of bottom layers of insulation align with top layers of insulation), and a two (2) ply cold process bituminous roofing system with SBS(-SIS) Modified Cap Sheet and Reflective surface coating conforming to the performance requirements stated herein.
    a. The completed roofing system requires a Class A rating.
    b. The completed roofing system requires fastening to comply with FMG 1A-90 wind uplift requirements.
    c. Thermal insulation will be achieved by others with batt insulation at the underside of the plywood decking.

B. The extent of cold process bituminous roofing system work is indicated by provisions of this section, and is defined to include roofing, insulation immediately under the roofing systems, flashings, stripping, and roofing accessories integrally related to roofing installation with all compatible with manufacturer's warranty requirements.

1.4 SUBMITTALS

A. Submit in accordance with Specification Section - SUBMITTAL PROCEDURES:
1. Coordination Drawings:
    a. Submit installer's coordination drawings indicating the work of this section coordinates with that of related sections for proper interface of the completed work. Installer shall coordinate and obtain approvals of other related sections prior to submitting to the Project Engineer.
2. Product Data.
    a. Submit manufacturer's product data including performance requirements of all materials.
    b. Material Safety Data Sheets will not be reviewed, but if submitted will be turned over to the Owner in compliance with local rules and regulations.
3. Shop Drawings.
    a. The Roofing Contractor, in concert with the Material Manufacturer, is to submit detailed drawings of all flashing and roofing system details compatible with the existing requirements to maintain the existing roofing system warranties, for review and approval, prior to start of roof framing by the General Contractor.
4. Quality Assurance/Control Submittals:
    a. Certificates:
        1) Submit three (3) copies of certification from a Corporate Officer of the Roofing Material Manufacturer stating that major roofing system components including insulation, flashing, coatings, cold process adhesives; roofing ply sheets; reinforcement fabrics, felts, walkpads, mastics, and sealants are compatible with all the other components of the existing roofing system and the existing warranties, for single source liability.
        2) Submit three (3) copies of certification from Roofing Material Manufacturer that cold process coatings and adhesives are not "Red Label".
        3) Submit three (3) copies of certification from Underwriter's Laboratory (or approved equivalent prior to submittal) that the roofing systems meet or exceed listed performance requirements listed herein.

4) Submit three (3) copies of certification from an independent laboratory showing test results (utilizing the ASTM testing criteria listed herein) for all roofing materials and completed assemblies, indicating compliance with the performance requirements listed herein.

b. Manufacturer's Written Instructions:

1) Submit three (3) copies of Manufacturer's Written Instructions for all roofing materials and recommended installation requirements.

5. Closeout Submittals in accordance with Specification Sections in Division One:

a. Project Record Documents in accordance with Specification Section - PROJECT RECORD DOCUMENTS.

b. Warranty in accordance with Specification Section - WARRANTIES.

1) Special warranties:

a) Certification that the roofing repairs and patching maintains existing Roofing System Warranties.

1.5 QUALITY ASSURANCE

A. General Requirements:

1. The Roofing Contractor shall ensure that all products used in conjunction with the installation of the new roofing materials are totally free of asbestos. Products containing asbestos are prohibited on this project.
2. Deliver all roof materials in original manufacturer labeled packages. All roofing products delivered to the site and used on this project will bear Class A Fire Rating Labels.
3. All adhesives and cements shall be compliant with current applicable VOC Requirements State and Local on the project. Contractor shall use products with personal protection when applicable. The Roofing Contractor shall insure that all product users read container labels and MSDS information prior to use.

B. Qualifications:

1. Material Qualifications:

a. Roofing Material Manufacturer shall:

1) Be nationally recognized in roofing and waterproofing industry for at least ten (10) years.

2) Provide local Field Representative to make periodic site visits, report work quality and job progress.

3) Be approved by Owner and the Project Engineer.

4) The presence and activity of the manufacturer's representative and/or Owner's representative shall in no way relieve the roofing contractor of their contractual liabilities/responsibilities.

2. Installer Qualifications:

a. The Roofing Contractor shall be experienced and certified in writing by the Roofing Material Manufacturer to install manufacturer's products and systems in accordance with manufacturer's warranty requirements.

b. The Roofing Contractor and their installers shall:

1) The Roofing Contractor shall be experienced and certified in writing by the Roofing Material Manufacturer to install manufacturer's products and systems in accordance with manufacturer's warranty requirements.

2) Be acceptable to the Owner, Project Engineer and Roofing Material Manufacturer.

3) Be responsible for obtaining all data required from Roofing Material Manufacturer.
4) Obtain and provide all required data from Roofing Material Manufacturer.
   a) These specifications are based on minimum performance requirements of both the Roofing Contractor and Roofing Material Manufacturer.

C. Regulatory Requirements:
1. In accordance with Specification Section - Regulatory Requirements, and the following:
   a. CARB Materials and equipment used for this Project shall comply with the current applicable regulations of the California Air Resources Board (CARB)and the Environmental Protection Agency (EPA), in the area where the project is located.
   b. CRRC Cool Roof Rating Council
   c. FMG Factory Mutual for FMG 1-90 wind uplift requirements.
   d. NIST BSS #55, Building Series #55: Preliminary performance criteria of Bituminous Membrane Roofing, National Institute of Standards and Technology, Gaithersburg, MD.
   e. NRCA National Roofing Contractor's Association (NRCA).
   f. SMACNA Sheet Metal and Air Conditioning Contractors National Association, Vienna, VA.
   g. UL Underwriter's Laboratory (UL) test certification labels or equivalent testing agency with same follow-up testing and certified label program must be displayed on related roof assembly materials.
   h. UL 790 Underwriter's Laboratory, certified roof assembly to roof type identified on the drawings.

D. Meetings:
1. Pre-installation: Scheduled by the Contractor prior to the start of work.
   a. Coordinate the work with all other related work.
   b. Identify any potential problems that may impede planned progress and proper installation of work regarding quality of installation and warranty requirements.
2. Progress Meetings: Scheduled by the Contractor during the performance of the work.
   a. Review for proper installation of work progress.
   b. Identify any installation problems and acceptable corrective measures.
   c. Identify any measures to maintain or regain project schedule of necessary.
3. Completion: Scheduled by the Contractor upon proper completion of the work.
   a. Inspect and identify any problems that may impede issuance of warranties or guaranties.
   b. Maintain installed work until the Notice of Substantial Completion has been executed.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Packing, shipping, handling, and unloading:
1. Products shall be handled in such a manner as to assure that they are free from dents, scratches and other damage.
2. Handle materials to avoid bending, tearing, or other damage during transportation and installation.

3. Material handling equipment shall be selected and operated so as not to damage existing construction or applied roofing.
    a. Do not operate or situate material handling equipment in locations that will hinder smooth flow of vehicular or pedestrian traffic.

B. Acceptance at Site:
1. Coordinate delivery with Contractor.
2. Products delivered to the job-site must be in manufacturer's original, new, dry and unopened containers with labels indicating brand name, grade and ASTM number.
3. Deliver materials in sufficient quantity to allow continuity of work.
4. Damaged products will not be accepted.

C. Storage and protection:
1. Products shall be stored above ground on level platforms, six (6) inches above ground, allowing air circulation under stacked units.
    a. Cover materials with protective waterproof covering providing for adequate air circulation and ventilation.
    b. Store roll goods on ends only and protect from moisture contamination of any kind.
    c. Discard rolls and insulation which have flattened, creased, allowed to become damp/wet, or otherwise damaged.
    d. Place and store materials on pallets.
    e. Do not stack pallets.
2. Store materials marked "keep from freezing" in areas where temperatures will remain above 40 degrees Fahrenheit.
3. Neatly stack products on dunnage.
4. Remove breathable waterproof covering. Cover top and sides of all stored materials at interior and exterior storage areas with canvas tarpaulin or equivalent cover to allow the materials to "breathe".
    a. Secure cover.
    b. Do not use polyethylene to cover materials.
5. Rooftop Storage: Disperse material to avoid concentrated loading. Any damage to the structure resulting from non-conformance to this requirement will be the sole responsibility of the roofing contractor.
6. Materials necessary for two day's work may be stockpiled on roof under the provisions outlined in paragraph 5 above.
7. No materials may be stored in opening or in contact with ground or roof/deck surface.
8. The Roofing Contractor shall assume full responsibility for the protection and safekeeping of roofing materials and products stored on the job-site premises.

1.7 PROJECT CONDITIONS

A. Environmental requirements:
1. Do not work in rain, snow, or in presence of moisture, including dew or fog.
2. Do not work in temperatures at or below 40 deg. F.
3. Do not install materials marked "keep from freezing" in areas where temperatures will remain below 40 deg. F.
4. Remove any work exposed to freezing and replace with new.

B. Existing Conditions:

1. Examine site and compare it with the drawings and specifications. Thoroughly investigate and verify conditions under which the work is to be performed. No allowance will be made for extra work resulting from negligence or failure to be acquainted with all available information concerning conditions necessary to estimate the difficulty or cost of the work. Conduct work so as not to interfere unnecessarily with adjacent roads, streets, drives and walks.
2. Conduct work so as not to interfere unnecessarily with adjacent roads, streets, drives and walks.
3. The Roofing Contractor shall have SOLE responsibility for accuracy of all measurements, estimates or material quantities and sizes, and site conditions that will affect work.

1.8 WARRANTY

A. Contractor's General Warranty:
   1. In accordance with Specification Section - WARRANTIES.

B. Manufacturer's and Roofing Contractor's Warranty:
   1. Roofing Contractor and Roofing Materials Manufacturer’s Guarantee:
      a. Upon project completion and Roofing Material Manufacturer's acceptance of the completed roofing system, the roofing contractor shall deliver to the Owner a certification that materials and workmanship complies and maintains the existing roofing system warranty.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Products specified represent the quality and standard of mateirals to be used. Actual products are to match existing materials.
   1. The products listed herein establish the size, weight, pattern, color range and function selected by the Project Engineer for this Project. The intent is not to limit competition, but to utilize only those products which have been employed previously on projects of a similar nature and found acceptable.

B. Insulation Materials:
   1. Cover Board:
      a. Fiberboard: Regular density, asphalt impregnated on two sides, in accordance with ASTM C 208 "Specification for Cellulosic Fiber Insulating Board".
   2. Cricket Board:
      a. Isocyanurate Insulation Board: FS HH-1-1972/2(1), Type II, Class 1, isocyanurate with surface fiber/organic mat facers on both sides, conditioned "R" value of 5.70 per inch.
      b. Flame Spread and Smoke Developed in accordance with ASTM E84 "Test method for Surface Burning Characteristics of Building Materials":
         1) Flame Spread Index: 25 - 60.
         2) Smoke Density Developed Index: 75 – 160 range.
   3. Insulation Board Sizes:

a. Rigid Board: 4' x 8' x thickness as indicated on the drawings (minimum thickness as required for a Class A Roof System), and as indicated on the drawings for roof slope.
   1) Cricket Board: 2' x 4' dimension minimum, tapered thicknesses, slope as indicated
b. Cover Board: 4' x 8' x 1/2 inch minimum thickness (or as required for a Class A roof system).

4. Cant Strip:
   a. Fiberboard, in accordance with ASTM C 208 "Specification for Cellulosic Fiber Insulating Board". Length: Forty-eight (48) inches.
      1) Minimum thickness: Three (3) inches nominal, face 4 inches nominal.
5. Insulation adhesive:
   a. ASTM D 312 "Specification for Asphalt Used in Roofing", Type IV asphalt.

C. Vapor Retarders:
1. RP Vapor Retarder (Reinforced-Polyethylene Vapor Retarders): 2 outer layers of polyethylene film laminated to an inner reinforcing layer consisting of either nylon cord or polyester scrim and weighing not less than 25 lb/1000 sq. ft., with maximum permeance rating of 0.0507 perm.

D. Mechanical Fasteners:
1. Provide industry-standard, non-corrosive types of mechanical fasteners (i.e.: screws and plates, termination bars, drawbands) for cold process built-up roofing system work, tested by manufacturer for required pull-out strength where applicable and compatible with substrate type, roofing products used and warranties required. Size of fasteners and plates shall be as recommended by roofing manufacturer in accordance with manufacturer’s warranty requirements, and sufficient to comply with FMG 1-90 wind uplift requirements.

E. Roofing Materials:
1. Roof Cement: Fibrated asphalt mastic meeting or exceeding ASTM D 4586 "Specification for Asphalt Roof Cement, Asbestos-Free".
2. Primer for all sheet metal and concrete surfaces:
   a. Quick drying, asphaltic primer meeting or exceeding ASTM D 41 "Specification for Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing" and complying with CARB requirements.
3. Interply Adhesive Cold Adhesive
4. Interply Felts and Base Sheet:
   a. Nonperforated, SBS Modified, asphalt-coated, polyester/fiberglass/polyester reinforced sheet dusted with fine mineral surfacing on both sides which meets the requirements of ASTM D 4601 "Specification for Asphalt-Coated Glass Fiber Base Sheet Used in Roofing", Type II.
5. Flashing Sheet and Wall Flashing: Polyester Reinforced SBS Modified Membrane.
6. Flashing Adhesive: Asphalt Mastic.
7. Reinforcement Webbing: Vinyl-Coated Fiberglass Webbing.
8. Stripping Ply: Trilaminate reinforced ply sheet.
9. Cap Sheet (SBS-SIS) Modified Membrane.
   a. ASTM D 6163 “Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Glass Fiber Reinforcements”, Grade G, Type I, glass-fiber-reinforced, SBS(-SIS) Modified Asphalt Sheet.

10. Surfacing Coating: High Solids Elastomeric Silicone Coating.
11. Caulking:
    a. Single component, non-sag, epoxidized polyurethane sealant, per Federal Specification TT-S-00230C.

2.2 SOURCE QUALITY CONTROL

A. Cold Process Interply Adhesive:

Property	Typical Value	Test Method
Asbestos content	None	ASTM D 276-87
Viscosity @ 25 deg. C.	80 - 200 Pa's	ASTM D 2196-86
Density @ 25 deg. C.	970 kg/m3 (8.2 lb/gal.)	ASTM D 1475-90
Nonvolatile Matter	67%	ASTM D 4479-93
Asphalt content, min	42%	ASTM D 4479-93
Flash Point	> 100 deg. F	ASTM D 93-94
Uniformly & consistency	Pass	ASTM D 4479-93

B. SBS Modified Composite Base/Ply Sheet (ASTM D 4601-86, Type II):

Property	Typical Value	Test Method
Tensile Strength	161 lbf/in MD; 137 lbf/in XMD	ASTM D 5147
Tear Strength	265 lbf MD; 212 lbf XMD	ASTM D 5147
Elongation (77 deg. F)	5.5% MD; 6.6% XMD	ASTM D 5147
Thickness	0.055 inch (1.4 mm)	ASTM D 146-90
Weight	31.0 lb/100 sf	ASTM D 228-90a
Asphalt	10.0 lb/100 sf	ASTM 228-90a

C. Trilaminate Stripping Ply:

Property	Typical Value	Test Method
Weight min	1.5 kg/m2 (31 lb/100 ft2)	ASTM D 228-90a
Breaking Strength	600 n/mm MD (135 lbf/in.)	ASTM D 146-90
	575 N/mm XD (130 lbf/in.)	ASTM D 146-90
Pliability, 12.7 mm	No Failures (1/2 inch radius)	ASTM D 146-90
Mass of desaturated	107 g/m2 (2.2 lb/100 ft2)	ASTM D 146-90
a. Polyester/glass mat, min.		
Surfacing and stabilizer max.	65%	ASTM D 146-90
Asphalt	488 gm/2 (10 lb/100 ft2)	ASTM D 228-90a
Resistance to Puncture	530 N (120 lbf)	ASTM E 154-83

D. Cap Sheet -- Fiberglass Reinforced SBS[-SIS] Modified Membrane:

Property	Typical Value	Test Method
Thickness	.134 in.(3.4 mm)	ASTM D 5147-95
Tensile Strength	140 lbf/in MD; 140 lbf/in XMD	ASTM D 5147-95
Elongation	6.0% MD; 6.0% XMD	ASTM D 5147-95
Tear Strength	210 lbf MD; 210 lbf XMD	ASTM D 5147-95
Puncture	70 lbf	ASTM 154-99

E. Three (2 base +1 cap) Ply SBS Modified Composite Cold-Process Roofing System:

Property	Typical Value	Test Method

2. Tensile strength @ 848 lbf/in MD ASTM D 2523.
3. -18 deg C. (0 deg. F) 752 lbf/in XMD ASTM D 2523.
4. Tensile strength @ 798 lbf/in MD ASTM D 2523.

F. Flashing Sheet -- Polyester Reinforced SBS Modified Membrane:

	Property	Typical Value	Test Method
2.	Thickness	.160 in. (4.0 mm)	ASTM D 5147-91.
3.	Tensile Strength	148 lbf/in MD; 122 lbf/in XMD	ASTM D 5147-91.
4.	Elongation	58% MD; 55% XMD	ASTM D 5147-91.
5.	Tear Strength	150 lbf MD; 96 lbf XMD	ASTM D 5147-91ow Temp.
6.	Flexibility	-15 Deg. F	ASTM 5147-91.

G. Surfacing Coating:
1. The elastomeric silicon roof coating shall be Energy Star listed and meet ASTM D 6694-08 & 07 standards, along with the physical property requirements listed herein.
2. Approved Manufacturers:
   a. GACO; G.E.; KM; and GENERAL COATINGS.

	Property	Typical Value	Test Method
4.	Initial Tensile Strength (psi)	300	ASTM D 412.
5.	Initial Elongation (%)	250% (+/-15%).	ASTM D 412
6.	Adhesion to SPF	2.3 pli	ASTM C 794.
7.	Tear Strength (lbf/in)	45	ASTM D 624.
8.	10,000-hr Accler. Weathering	No degradation	ASTM D 822.
9.	Permanent Change-Heat Aged	0%	ASTM D 412.
10.	Duometer Hardness-Shore A	45-55	ASTM 2240.
11.	Permeability (U.S. Perms)	7.9	ASTM E 96.
12.	Water Absorption	0.2	ASTM D 570.
13.	Cure Time Min./Max.	Min. 2 Hrs/Max. 8 Hrs.	ASTM D 6694.
14.	Volume Solids (%)	98	ASTM D 2697.
15.	Weight Solids (%)	98	ASTM D 1644.
16.	Flashpoint	244 F	ASTM D 56.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Site verification of conditions:
1. Prior to the execution of the work under this specification section, inspect the installed work executed under other specification sections of this Project Manual which affect the execution of work under this specification section. Report unacceptable conditions to the Project Engineer. Do not begin work until unacceptable conditions have been corrected.
2. Prior to installation of roofing, the Roofing Contractor shall inspect the new deck conditions and verify that the new roof system may be installed in strict accordance with original design, the manufacturer's current recommendations, and all other pertinent codes and regulations.
3. Report unacceptable conditions to the Project Engineer. Do not begin work until unacceptable conditions have been corrected.

4. Execution of work under this specification section shall constitute acceptance of existing conditions.
5. Check projections, curbs, and deck for inadequate anchorage, foreign material, moisture, or unevenness that would prevent quality and execution of the new roofing system.

B. General quality of work:
1. Substrate free of foreign particles prior to laying roof membrane.
2. Phased application:
   a. Not permitted.
   b. All plies shall be completed each day.

C. Surfacing Coating Inspection:
1. Prior to the application of the Surfacing Coating, inspect the roofing surfaces so that they are free of dust, dirt, debris and other contaminants that would impair the adhesion of the coating system.
2. The roof surfaces must be dry prior to the coating application.
3. Make sure all environmental conditions are met prior to coating application.

3.2 PREPARATION

A. Coordination:
1. Coordinate work under this specification section with work specified under other specification sections to ensure proper and adequate interface of work.

B. Protection:
1. Protect all adjacent surfaces from drips, spray, air pollution of surrounding environment, and other damage from work under this specification section.
2. Roofing Contractor shall be responsible for protection of property during course of work.
   a. Lawns, shrubbery, paved areas, and building shall be protected from damage.
   b. Repair damage at no extra cost to Owner.
3. Provide at site prior to commencing removal of debris, a dumpster or dump truck to be located adjacent to building where directed by General Contractor.
4. Roofing, flashing, membrane repairs, and insulation shall be installed and sealed in a watertight manner on same day of installation or before arrival of inclement weather.
5. At start of each work day drains within daily work area shall be plugged.
   a. Plugs to be removed at end of each work day.
6. Preparation work shall be limited to those areas that can be covered with installed roofing material on same day.
7. Arrange work sequence to avoid use of newly constructed roofing for storage, walking surface, and equipment movement.
8. At end of each working day, completed segment shall be sealed with water stops along edges to prevent water infiltration. Refer to INSTALLATION for specific instruction.
9. Provide clean plywood walkways and take other precautions required to prevent tracking of debris into new membrane area where debris pieces can be trapped within new roofing membrane.
   a. Contractor shall instruct and police their workers to ensure that debris is not tracked into or allowed to be wind driven into the new membrane.
   b. Discovery of entrapped debris or other foreign matter within new membrane is sufficient cause for rejection of the membrane.

3.3 INSTALLATION

A. General:
1. In accordance with manufacturer's written instructions and recommendations unless specifically noted otherwise.
2. In accordance with approved submittals.
3. In accordance with Regulatory Requirements.

B. Insulation Installation:
1. General: All insulation will extend over horizontal surfaces, including parapet braces, until the insulation boards meet the vertical parapet wall surfaces.
   a. Flush all insulation board surfaces that meet adjacent surfaces to be free from any uneven or gapped joints, sharp edges or other irregularities.
2. Wood Deck:
   a. Mechanically attach single layer Cover Board insulation to deck.
   b. Fastener Density:
      1) Perimeter 16 fasteners per 4' x 8' insulation board.
      2) Field 12 fasteners per every 4' x 8' insulation board.
   c. Install additional fasteners to ensure insulation is firm under foot.
   d. Drive mechanical fasteners flush to top surface.
   e. Filler insulation requires two (2) fasteners per piece minimum.
   f. Use Cold Process Adhesive to attach cover board insulation to bottom layer.
      1) Follow manufacturer's written instructions as to coverage rate to achieve wind uplift of insulation in accordance with FMG 1A-90.

C. Flashing:
1. General Flashing Specifications:
   a. All other flashings not specifically detailed herein will be applied in accordance with manufacturer's written recommendations and approved by the Project Engineer.
   b. All sheet metal that will come in contact with bituminous materials shall be primed with the specified asphaltic primer and allowed to dry before applying bitumen.
   c. The bottom edge of all flashing shall be three-coursed.

D. Roofing Contractor shall tie onto all flanged metal components in the following manner:
1. Prime all metal that is to come into contact with asphaltic compounds with specified primer.
2. All flanges shall be set into asphaltic mastic over the finished roofing plies. Galvanized metal flanges will be fastened to the underlying wood nailers at three (3) inches on. center, staggered.
3. All flanges, including pipe flashing, edge flashing, flanged vents, flanged units, pitch pans, etc., will be flashed on the roof with two plies of trilaminate stripping ply sheet. Install a two (2) ply stripping using specified trilaminate base sheet. First ply shall be embedded in a asphaltic mastic and shall cover the lead completely and extend onto the field of the roof 6" in all directions. Second ply shall be embedded in cold process adhesive, fully covering the first stripping ply and extending past the first ply a minimum of 6" in all directions.

E. Contractor shall install all edge metal in the following manner:
1. Set edge metal into layer of asphaltic mastic over finished field plies.
2. Install metal cleats. Cleats shall be at least one gage heavier than the metal edge.

3. Metal sections shall be a maximum of ten (10) feet in length. Leave a minimum of 1/2" space between metal sections. Install a minimum of 4" wide lap over and nail in place through 1/2" gap in metal sections. Nail metal edge 3" o.c. staggered.
4. Install two plies of trilaminate stripping ply sheet to metal flange and roof surface. Apply five-coursing by installing a 12 inch trilaminate flashing ply embedded into and covered with cold-process adhesive over a 6 inch trilaminate flashing ply embedded into and covered with asphaltic mastic. Ensure asphaltic mastic is feathered smooth and 3/4 inch from inside outside metal edge.

F. Roofing system application:
1. Install two (2) plies of specified composite reinforced roofing felts over the cover board and the roof deck system, set into solid spray applications of cold-process asphalt in the following manner:
   a. Starting at the low point of the roof, apply one 18 inch side strip, and then over starter strip, apply a full 36 inch wide specified roofing felt. Following plies are to be applied full width, overlapping the preceding felt by 18 inches in such a manner that there be at least two (2) plies of interply felt at any point.
   b. Cut 12 to 18 foot lengths of specified felt, allow to relax thirty (30) minutes at 55 deg. F+ or sixty (60) minutes at 55 deg. F-. Flop shingle fashion into a full width application of cold-process asphalt applied at a nominal rate of 1.5 to 2.0 gallons per 100 square feet. The specified felt must be firmly and uniformly set into the asphalt with all edges well sealed.
   c. Lightly broom and/or roll each ply of specified felt into place, full width, immediately after installation. Felts shall lay flat and be fully bonded in such a manner that in no area shall felt touch felt. Use only a squeegee or conduit type broom.
   d. Apply uniform and continuous pressure to exposed edge and end laps to ensure complete adhesion.
   e. Lap ply ends 6 inches. Stagger end laps 3 feet minimum.
   f. Header laps in roof field shall be at least 2 feet.
   g. Overlap previous day's work 18 inches.
   h. Cut out and patch all fishmouths and side laps which are not completely sealed. Replace all sheets which are not fully and continuously bonded.
   i. Roof surface will be rolled after each work day to smooth fishmouths.

G. Contractor shall adhere to the following guidelines:
1. Roofing materials shall not be installed during inclement weather. Roofing materials shall not be applied when moisture in any form, such as dew, can be seen or felt on the surface to which those materials are to be applied.
2. Valleys and waterways shall receive an additional ply of fiberglass felt which shall be at least 36 inches wide. This ply shall be laid on top of the insulation prior to the application of the other plies and shall extend at least 18 inches up the inclines, out of the valleys.
3. Interply applications of cold-process asphalt shall be continuous and applied at a nominal rate of 1.5 to 2.0 gallons per 100 square feet. Application methods shall insure that all plies are completely embedded in asphalt.
4. All exposed deck and insulation must be covered with the completed roof membrane system, at the end of each day's work. All roof terminations and openings shall be water sealed.

5. Staging of the roof membrane application or temporary membrane is not acceptable. Membrane shall be installed in final form, with the exception of the cap sheet, on a daily basis.
   a. If phased roofing occurs, following prior approval of the Project Engineer, as a result of emergency conditions, install additional plies over phased areas so that a continuous three (3) ply system is installed.
6. Foot and wheeled traffic shall be kept off the newly installed membrane until asphalt has sufficiently cured to prevent displacement voids.
7. All membrane deficiencies such as voids, bridging, fishmouths, cuts, tears, etc., shall be repaired in an acceptable manner. Incorporate into such repairs as many plies as are affected by the deficiency.
8. Air void pockets, as determined by test samples, shall not exceed eight percent (8) per interply mopping for individual sample and average of all samples shall be not less than five percent (5) per interply adhesive. If corrective action is required, cut the roofing felts down to the void and cover with three plies of fiberglass felt set into cold-process asphalt applied at a nominal rate of 3 gallons per 100 square feet.

3.4 APPLICATION

A. Cap Sheet: Install lapped cap sheet starting at low point of roofing system. Offset laps from laps of preceding ply sheets and align cap sheet without stretching. Lap in direction to shed water. Extend cap sheet over and terminate beyond cants.
   1. Embed cap sheet in a solid application of cold fluid-applied adhesive applied at rate required by roofing system manufacturer.

B. Apply Surfacing Coating over completed cap sheet and flashings in the following manner:
   1. Remove all dirt, dust, and other loose debris from the roof. Area to be coated must be a clean, sound, and dry surface.
   2. Apply bleed blocker and/or primer as required by the manufacturer to prevent asphalt bleed-thru and lack of proper coating adhesion to roof surfaces.
   3. The coating shall not be subjected to foot traffic or be disturbed until it is sured.
   4. Apply coating system over entire roof surface at specified rate.
      a. Apply coating in a uniform manner to achieve a total protective coating system dry film thickness of 36 mils (approximately 2 gallons per 100 square feet) for coating alone, not including granules.
      b. Silicone coating shall be Energy Star approved.
      c. Apply granules at the specified rate in additional 1 gallon (approximately 18 dry mils) of coating.
         1) Granules applied at rate of #40 per 100 square feet of surface area.
         2) Total coating system shall have not less than 54 dry mils.
   5. Allow the new silicone coating to cure and inspect the finished coating surface for pinholes, cracks, thin areas or other deviations.
      a. Repair any deviations observed with buttergrade sealant and/or additional silicone roof coating.
   6. Fully incorporate new roof drain fixtures into coating system.
      a. Caulk prior to coating application as required to provide a long-term, wateright condition.
   7. It is the contractor's responsibility to ensure the minimum total dry film thickness specified is achieved throughout the entire roof area.

3.5 REPAIR / RESTORATION

A. Repair of deficiencies:
   1. Installations of details noted as deficient during Final inspection must be repaired and corrected by the Roofing Contractor and made ready for re-inspection, within five (5) working days of notification.

3.6 FIELD QUALITY CONTROL

A. Inspection:
   1. Schedule inspections and notify the Project Engineer, Owner’s Inspector and any other regulatory agencies of the time at least 48 hours prior to the inspection.

B. Manufacturer's field services:
   1. Provide the services of a factory-authorized service representative to supervise the field assembly of components and installation of products or systems and related connections specified within this section, with weekly reports of the results in writing to the Project Engineer.

3.7 CLEANING

A. Clean in accordance with Specification Section – PROJECT CLOSEOUT.
   1. Clean any soiled surfaces at the end of each day, minimum.
   2. Finish shall be clean and ready for the application of any additional finishes.

3.8 PROTECTION

A. Protection from weather:
   1. Protect newly installed work from freezing for 24 hours after erection, installation or application.

B. Protection from traffic:
   1. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and installer, which ensures the work of this section being without damage or deterioration until the time of Substantial Completion.

END OF SECTION

SECTION 075329 – ELASTOMERIC MEMBRANE ROOFING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:
   1. Provide all material, labor, equipment and services necessary to replace existing materials, accessories and other related items necessary that was removed or patched during the course of construction.
   2. Prior to proceeding with work, obtain any and all warranties regarding existing Roofing System. All materials and work shall match existing system as to maintain existing warranties.

B. Related Sections: The following Sections contain requirements that relate to this Section:
   1. ALL DIVISION 00 SPECIFICATION SECTIONS.
   2. ALL DIVISION 01 SPECIFICATION SECTIONS.
   3. 02 41 19 SELECTIVE DEMOLITION
   4. 06 10 00 ROUGH CARPENTRY
   5. 07 21 00 INSULATION
   6. ALL SPECIFICATION SECTIONS IN THE FACILITY SERVICES SUBGROUP.
   7. ALL SPECIFICATION SECTIONS IN THE SITE AND INFRASTRUCTURE SUBGROUP.

1.2 SYSTEM DESCRIPTION

A. Assume existing 60 mil single-ply membrane roofing system that is fabricated of a single ply membrane roofing system composed of a thermoplastic membrane with polyester reinforcement, lacquer coating and with non-woven synthetic fleece backing and produced with a prefabricated sealing edge.

B. Performance Requirements: It is the intention of this specification section and the drawings to form a guide for a complete and operable system. Any items not specifically noted but necessary for a complete and operable system shall be provided under this section.
   1. Physical Properties: The single ply membrane shall allow installation at any time of the year and shall provide: resistance to ultra-violet rays, superb tear and puncture strength, the ability to be impervious to most caustic chemicals and acids, and show no ill effects to heat or cold.
   2. Fire Classification: Membrane and related items shall be classified by Underwriters Laboratories, Inc. as a Class A Sheathing Material for use in construction of Class A coverings and amendments.
   3. Wind Up-Lift Requirements: FMG 1A-90.

1.3 SUBMITTALS

A. Submit in accordance with Specification Section - SUBMITTAL PROCEDURES:

1. Coordination Drawings:
   a. Submit installer's coordination drawings indicating the work of this section with that of related work of other sections for proper interface of the completed work. Installer shall coordinate and obtain approvals from the work of other related sections prior to submitting to the Project Engineer.
2. Product Data.
   a. Submit literature on the following: Roofing membrane with welded seams; pre-manufactured parapet flashings; pre-manufactured pipe flashing; urethane sealant; PVC weldable drip-edge, gravel/water stop, termination bar; self-leveling pourable sealer; and maintenance & repair instructions.
3. Shop Drawings.
   a. Submit shop drawings as approved by the manufacturer detailing equipment assemblies and indicating the outline of the roof and roof size, perimeter and penetration details, special details and section layouts, weights, loading, required clearances, method of field assembly, flashing requirements, location of factory die-electric and field welds, and accessory and materials list.
4. Samples.
   a. Provide 6 inch long samples of the following (as necessary): Sample of membrane; mechanical fasteners; lap splice sample (factory and field); roofing insulation; and penetration flashing.
5. Quality Assurance/Control Submittals:
   a. Test Reports:
      1) Submit four (4) copies of reports indicating the engineering results of random location pull tests (a minimum of four tests are required). Submit pull test results with drawing indicating the locations of the tests. Engineering results shall demonstrate the manufacturer's reasons for selection of anchorage, frequency and the seaming patterns, and in accordance with the performance requirements.
   b. Manufacturer's Written Instructions:
      1) Submit three (3) copies of manufacturer's written instructions.
6. Closeout Submittals in accordance with Specification Sections in Division One:
   a. Maintenance Data in accordance with Specification Section - PROJECT CLOSEOUT.
   b. Project Record Documents in accordance with Specification Section - PROJECT RECORD DOCUMENTS.
   c. Warranty in accordance with Specification Section - WARRANTIES.
      1) Special Warranties:
         a) Certification that roofing and patching retains existing Roof System Warranty.

1.4 QUALITY ASSURANCE

A. Qualifications:
   1. Material Qualifications:
      a. All components of the roofing system shall conform to the current published specifications and details of the membrane manufacturer.
      b. There shall be no deviation made from this specification without prior written approval of the membrane manufacturer and building owner or his/her duly appointed representative.

c. Provide primary flexible sheet factory prefabricated roofing system from a single manufacturer, which has successfully manufactured raw materials into specified products for not less than five (5) years. No secondary private labels are acceptable. Provide secondary materials, such as but not limited to insulation, gypsum board, vapor barriers, etc. as recommended and approved by manufacturer of primary materials.
d. Manufacturer of specified roofing system shall solely own and manufacture all roofing materials and components.

2. Installer Qualifications:
   a. Engage an experienced Installer who is certified in writing by the manufacturer listed herein as qualified to install manufacturer's product (or system) in accordance with manufacturer's warranty requirements.

B. Regulatory Requirements:
1. In accordance with Specification Section - REGULATORY REQUIREMENTS, and the following:
   a. CARB Materials and equipment used for this Project shall comply with the current applicable regulations of the California Air Resources Board (CARB) and the Environmental Protection Agency (EPA), in the area where the project is located.
   b. FMG Factory Mutual Group.
   c. SMACNA Sheet Metal and Air Conditioning Contractors National Association, Inc.
   d. UL Underwriter's Laboratories.

C. Meetings:
1. Pre-Installation: Scheduled by the Contractor prior to the start of work.
   a. Coordinate the work with all other related work.
   b. Identify any potential problems that may impede planned progress and proper installation of work regarding quality of installation and warranty requirements.
2. Progress: Scheduled by the Contractor during the performance of the work.
   a. Review for proper installation of work progress.
   b. Identify any installation problems and acceptable corrective measures.
   c. Identify any measures to maintain or regain project schedule if necessary.
3. Completion: Scheduled by the Contractor upon proper completion of the work.
   a. Inspect and identify any problems that may impede issuance of warranties or guaranties.
   b. Maintain installed work until the Notice of Substantial Completion has been executed.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Packing, shipping, handling, and unloading:
1. Products shall be handled in such a manner as to assure that they are free from dents, scratches and other damage. Damaged products will not be accepted at final inspection.

B. Acceptance at Site:
1. Products must be in manufacturer's original unopened containers with labels indicating brand name, model, and grade.

2. Damaged products will not be accepted.

C. Storage and protection:
1. Products shall be stored in a dry, protected area.
2. Do not allow roofing membrane to come in contact or be exposed to any materials that would be detrimental to or cause degradation of the roofing membrane.

1.6 PROJECT CONDITIONS

A. Environmental requirements:
1. In making field welds, make sure all welding surfaces are clean and free of moisture or foreign items.
2. Weather precautions: Proceed with roofing work when existing and forecasted weather conditions permit work performance in compliance with manufacturer's written recommendations.
3. Roofing system shall not be applied when the surrounding air, surface temperature, relative humidity or wind velocity is not within the range acceptable under the manufacturer's written recommendations.

B. Existing Conditions:
1. Prior to starting work, protect all work in an approved manner including all paving and faces of building walls. Provide special protection of the face of the building wall adjacent to hoist.
2. Complete the whole roofing section or any portion of the roof in a single day to avoid exposure to rain, dew, or moisture of any kind. If rain threatens during the day or in an emergency, protect the unfinished exposed roofing components and provide temporary water cut-offs around exposed edges and incomplete flashing areas.
3. All hoisting equipment shall bear on solid pad blocking. If on the roof surface, pad shall be large enough to evenly distribute the load to avoid crushing insulation and roof system. Pad shall consist of two separate layers of material to eliminate vibration and movement to directly affect the roofing membrane. Pad shall be of sufficient size to accommodate work tools and weights used around hoisting operations.
4. Repairs: Clean or repair surfaces damaged or soiled by operations under this contract to the satisfaction of the Owner or Owner's representative without additional cost to the Owner. These would include, but not limited to, windows, doors, floors, walls, stairs, elevators, steps, walks, curbs, lawn areas, or other roofs.

1.7 WARRANTY

A. Contractor's General Warranty:
1. In accordance with Specification Section - WARRANTIES.

B. Manufacturer's Warranty:
1. The warranty shall be full roofing system repair and/or replacement warranty covering materials and labor. The warranty shall be a no-dollar limit type and provide for completion of repairs or total replacement of the "roofing system" at the then current material and labor prices throughout the life of the warranty. The manufacturer shall provide Certification of financial stability enough to insure the value of their warranty in order to protect the interests of the owner.

a. Warranty Period: Fifteen (15) Years, or in compliance with the terms of the existing Roofing System Warranty.

2. Corrective measures on leaks shall be undertaken within seventy-two (72) hours after notification has been received by the Contractor or membrane manufacturer from the Owner.

C. Installer's Warranty:

1. The contractor shall warrant the roof application with respect to workmanship and proper application from the date of acceptance by the membrane manufacturer. Should any leaks covered under the warranty occur during this period, corrective action will be taken by the contractor to repair the roof to the satisfaction of the owner and membrane manufacturer. **ALL CORRECTIVE WORK WILL BE DONE AT NO COST TO THE OWNER.**

a. Warranty Period: Five (5) Years, or in compliance with the terms of the existing Roofing System Warranty.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. These products listed herein establish the size, pattern, color range and function selected by the Project Engineer for this Project. Manufacturers that are listed as acceptable alternative manufacturers and substitutions must still comply with the requirements of this project and the products listed in order to be approved as an equivalent during the Submittal Process. If the acceptable alternative manufacturers listed or substitutions are not approved during the Submittal Process due to non-compliance with the contract documents, then the Contractor shall submit product specified.

1. Specified product manufacturer, or approved equivalent:

a. SARNAFIL, felt-backed S37-15, 60 mil (1.5 mm).

1) SARNAFIL G410 for flashing, pipes, corners, and unusual shaped penetrations.

b. Acceptable alternative manufacturers, subject to meeting the warranty requirements specified.

B. Products from other manufacturers not listed must submit in accordance with Specification Section - SUBSTITUTION PROCEDURES.

C. Products specified represent the quality and standard of materials to be used. Actual products are to match existing.

2.2 MATERIALS

A. Roofing Membrane shall conform to:

1. ASTM D4434 (latest version), "Standard for Polyvinyl Chloride Sheet Roofing". Classification: Type III.

2. NSF/ANSI Standard 347 "Sustainability Assessment for Single Ply Roofing Membranes". Certification Level: Platinum.

3. The manufacturer to guarantee that the membrane thickness meets or exceeds the specified thickness when tested according to ASTM D751.
4. Sarnafil S327 thermoplastic membrane with polyester reinforcement, lacquer coating, and with a factory applied 9 oz. geotextile felt backing.
5. Thickness:
   a. Sarnafil S327-15, 60 mil (1.5 mm)
6. Color of Membrane
   a. EnergySmart White, initial solar reflectance of 0.83, emittance of 0.90, and solar reflective index (SRI) of 104 (ENERGY STAR listed).

B. Typical Physical Properties (In accordance with):

Property	**ASTM Test Method**	**ASTM TypeIII D-4434 Spec. Requirement**	**Typical Results**
Overall Thickness, mil	D751	45	60
Thickness Over Scrim, mil	--	16	27
Reinforcing Material	--	--	Polyester
Felt Weight, oz/yd^2 (feltback membrane only)	--	--	9
Breaking Strength, lbf/in (N)	D751	200 (890)	305 (1356)
Elongation at Break, % M. D.[1] & C.M.D.[1]	D751	15 & 15	28.5 & 29.5
Seam Strength, % of original[2]	D751	75	Pass
Retention of Properties After Heat Aging	D3045	--	--
Tensile Strength, % of original	D751	90	Pass
Elongation, % of original	D751	90	Pass
Tearing Resistance, lbf (N)	D1004	45 (200)	48 (213)
Low Temperature Bend, -40°F (-40°C)	D2136	Pass	Pass
Accelerated Weathering Test (Florescent Light UV exposure), Hours	G154	5,000	10,000
Cracking (7x magnification)	--	None	None
Discoloration (by observation)	--	Negligible	Negligible
Crazing (7x magnification)	--	None	None
Linear Dimensional Change, %	D1204	0.5	-0.12
Weight Change After Immersion in Water, %	D570	± 3.0	2.0
Static Puncture Resistance	D5602	Pass	Pass
Dynamic Puncture Resistance, ft-lbf (J)	D5635	14.7 (20)	Pass
Recycled Content (10' & 5' sheet only)	9% Pre-Consumer / 1% Post-Consumer		

2.3 ACCESSORIES

A. Membrane-Related Materials:
1. All membrane related materials and components, including pipe and curb flashings must be factory prefabricated from the same fabric reinforced material and color used for the deck membrane.
2. Flashing membrane same color, thickness, weight and material as the roof membrane.
3. Tape shall be self-sealing covering tape with removable release paper.
4. Paste shall be gun grade material compatible with roof membrane material, and approved by the roofing materials manufacturer.
5. Solvent for cleaning membrane under self-sealing edge shall be in compliance with local air-pollution requirements and be approved by the manufacturer.
6. Adhesive shall be manufacturer's written recommended cold adhesive for membrane installation.
7. Contact adhesive shall be manufacturer's written recommended material for adhering reinforced membrane to sloped areas and vertical surfaces up to counter-flashing conditions.
8. Primers shall be as recommended by the manufacturer for material to material seal, as well as adhering self-sealing edge to metal, concrete masonry or other materials.
9. Termination Sealant: Compatible with materials to which membrane is to be bonded.
10. Water Cut-Off Mastic: Compatible with materials with which it is used and furnished by the membrane manufacturer.
11. Fasteners: Compatible with roof deck as furnished by the membrane manufacturer.
12. Terminations/Edge Details: Shall be manufactured and approved and warranted by the membrane manufacturer.
13. Miscellaneous flashings:
    a. Detail Membrane: A 60 mil (1.5 mm) fiberglass reinforced membrane, available 12″ x 50′ (30.5 cm x 15.2 m) roll and 24″ x 50′ (61 cm x 15.2 m) roll, more pliable than Sarnafil G410 membrane, good use for flashing pipes, corners, and unusual shaped penetrations.
    b. Circles: A 60 mil (1.5mm) thick prefabricated 4 1/2 in. round circle patch injection molded.
    c. Corners - Inside: A 60 mil (1.5 mm) thick prefabricated inside corner injection molded.
    d. Corners - Outside: A 60 mil (1.5 mm) thick prefabricated outside corner injection molded.
    e. Stack Universal, A, B, or C.: A 60 mil (1.5 mm) thick prefabricated stack/pipe boot injection molded.
    f. Open Post Flashing: A 48 mil (1.2 mm) thick prefabricated flashing using weld technology convenient to flash obstructed rooftop conduits and pipes. Open post flashings are fabricated with an open seam and are available in different sizes.

B. Insulation:
1. DENS-DECK (if applicable): Provide 1/4" thick DENS-DECK board at horizontal applications, and 5/8" thick board at vertical applications. Composition shall be nonstructural, glass mat-embedded, water resistant gypsum core panel, Flame Spread 0, Smoke Developed 0, when tested in accordance with ASTM E 84 "Test Method for Surface Burning Characteristics of Building Materials".
2. Other accessories:

a. Primary accessories shall be factory prefabricated or manufactured by or under the direction of roofing membrane manufacturer. All other shall be furnished and approved by the membrane manufacturer. These items are, but not limited to, the following: Gutter edges, termination bars, parapet caps, roof drains, miscellaneous flashings, expansion joint and valley flashings.

2.4 FABRICATION

A. Shop Assembly:
1. Factory fabricate as many welds as possible to minimize the amount of field welds required.

2.5 SOURCE QUALITY CONTROL

A. Tests, Inspection:
1. The Owner reserves the right to retain, at the Owner's expense, an independent inspection service to provide full-time inspection of the roofing system installation. The inspector shall have free access to the work area.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Site Verification of Conditions:
1. Prior to the execution of the work under this specification section, inspect the installed work executed under other specification sections of this Project Manual, which affect the execution of work under this specification section.
2. Report unacceptable conditions to the Project Engineer. Do not begin work until unacceptable conditions have been corrected.
3. Execution of work under this specification section shall constitute acceptance of existing conditions.
4. All roof surfaces and all sloped surfaces to drains and outlets shall be checked and approved by the roofing contractor prior to the start of the roofing work.
5. Install roofing material only under satisfactory conditions as specified by the membrane manufacturer.
6. Scheduling: Schedule the roofing work in areas and sections in such a manner as to keep the new and existing insulation, roofing materials, and building absolutely dry and watertight during new roofing work.
7. Any damage sustained to the facility or contents as a result of improper scheduling of roofing work shall be the contractor's responsibility.

3.2 PREPARATION

A. Coordination:
1. Coordinate work under this specification section with work specified under other sections to ensure proper and adequate interface of work.

B. Protection:
1. Protect all adjacent surfaces from drips, spray, air pollution of surrounding environment, and other damage from work under this specification section.
2. Do not lay out or expose any insulation on the deck that cannot be covered by membrane on the same day.
3. In making all field welds, make sure all edges are clean and free of tar, mastic or other foreign items.
4. Do not expose membrane and accessories to a constant temperature in excess of 110 degrees Fahrenheit.
5. Sealants and adhesives should be applied according to the manufacturer's specifications and all containers shall be disposed of properly.
6. Start securing the membrane at the highest point and work towards the drains.
7. Storing, wheeling, or trucking directly on roof insulation or membrane surface is not recommended. Smooth, clean plywood or plank walkways, runways and platforms shall be provided as necessary.

C. Surface Preparation:
1. Contractor's proposal shall include all costs for the removal of wet or damaged existing roofing insulation and replacement as required, repair of blisters, existing flashings, expansion and control joint covers, and repair or replacement of required treated wood nailers or blocking.
   a. The total extent of preparation shall include the above and comply with the membrane manufacturer's written recommendations.
2. Mechanically secure separation material units to roofing deck independent of membrane attachment and cover immediately with membrane. Butt units tightly together, limiting joint separation to 1/8 inch, maximum. Meet attachment pattern requirements of the membrane manufacturer.

3.3 INSTALLATION

A. General:
1. In accordance with manufacturer's written instructions and recommendations unless specifically noted otherwise.
2. In accordance with approved shop drawings.
3. In accordance with Regulatory Requirements.
4. Set plumb, level, and square.

B. Insulation Installation:
1. The roof insulation (Dens-Deck) shall be installed in accordance with manufacturer's written recommendations over the existing prepared substrate after removal of the existing roofing system, and in compliance with FMG 1A-90 wind uplift requirements.

C. Membrane Installation:
1. Cut, trim, lay, seal, and install in All Purpose Cold Adhesive in strict accordance with manufacturer's published instructions and as directed by the manufacturer's field service representative over the installed Dens-Deck Board.
2. Thoroughly clean all required surfaces with solvent. Replace solvent, which has become contaminated through use.
3. Flash all roof penetrations, drains, and projections with flashing membrane solvent welded and with self-adhesive covering tape.

4. Adhere base flashing conditions by using approved Contact Adhesive.
5. Roll all side lap seams. Thoroughly check with seam probe to insure water integrity of the seams.
6. Flashings:
   a. Prime metal and concrete surfaces prior to flashing applications per manufacturer's written recommendations.
   b. Securely apply flashings as recommended in writing by the manufacturer.
7. Curbs: After securing cut-out as stated, weld the bottom of the skirt to the deck membrane. If the square or rectangle penetration has a removable top, i.e. roof hatch, skylight, etc., remove the unit and fold the custom curb flashing over the top, secure, then replace unit. If top is not removable, secure the top of the custom curb flashing with termination bar and seal with factory approved sealant. Use this same procedure on existing or new pitch pockets.

3.4 REPAIR / RESTORATION

A. Upon completion of work, repair or replace as required, all building materials damaged as a result of the roofing operations. Match existing materials as close as possible. Owner and/or Owner's representative will be involved in the selection of matching materials.

B. Future repairs or additions to the roofing system shall be made using the heat welding process. Adhesive bonded or butyl tape repairs shall not be allowed for the life of the roof. Provide repair procedures to the Owner and/or Owner's representative.

3.5 FIELD QUALITY CONTROL

A. Site Tests:
   1. As required by Regulatory Requirements.

B. Inspection:
   1. As required by Regulatory Requirements.
   2. Schedule inspections and notify the Project Engineer, Owner's Inspector and any other regulatory agencies of the time at least 48 hours prior to the inspection.
   3. No work shall be without the inspections required by Regulatory Requirements.
   4. Roofing manufacturer's technical representative, architect and roofing contractor shall conduct all required inspections. Submit all required drawings, details, and completed questionnaires to the roofing manufacturer before obtaining the specified warranty. After an authorized Technical Representative has inspected the roof for determining acceptability for warranty issuance, any deficiencies on the final inspection report shall be corrected by the contractor/applicator and made ready for re-inspection within five (5) working days.
   5. Upon receipt of required materials, certifying inspection, and acceptance of the roofing system by the roofing manufacturer, the warranty shall be duly executed and issued to the Owner.

3.6 CLEANING

A. Clean in accordance with Specification Section - PROJECT CLOSEOUT.

1. Clean any soiled surfaces at the end of each day, minimum.
2. Upon completion of the membrane installation, the contractor shall remove all foreign matter, rubbish and scrap material from the roof. The membrane surface shall be cleaned using cleaners recommended by the membrane manufacturer.

END OF SECTION

SECTION 078400 – FIRESTOPPING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:
   1. Provide all material, labor, equipment and services necessary to completely repair and maintain existingl Firestopping (a.k.a. Through-Penetration Firestop Systems) materials, accessories and other related items necessary that have been removed during course of construction on this project.

B. Related Sections: The following Project Manual Sections contain requirements that relate to this section:
   1. ALL DIVISION 00 SPECIFICATION SECTIONS.
   2. ALL DIVISION 01 SPECIFICATION SECTIONS.
   3. 06 10 00 ROUGH CARPENTRY
   4. 07 21 00 INSULATION
   5. 09 22 16 METAL FRAMING
   6. 09 29 00 GYPSUM BOARD
   7. ALL SPECIFICATION SECTIONS IN THE FACILITY SERVICES SUBGROUP.
   8. ALL SPECIFICATION SECTIONS IN THE SITE AND INFRASTRUCTURE SUBGROUP.

1.2 REFERENCES:

A. Standards:
   1. In accordance with the following standards:
      a. UL Underwriters Laboratory Inc.
         1) Fire Resistance – Volume 2A.
         2) Fire Resistance – Volume 2B.

1.3 SYSTEM DESCRIPTION

A. Performance Requirements: It is the intention of this specification and the drawings to form a guide for a complete firestopping system that resists the spread of fire and the passage of smoke and other gases, and maintain original fire-resistance rating of assembly penetrated, according to the requirements indicated herein. Any items not specifically noted but necessary for a complete and operable firestopping system shall be provided under this section.
   1. Provide only products that when securely installed and capable of maintaining its integrity when subjected to the time-temperature curve of CRSC, Table 12-7-3A.
      a. Provide firestopping systems with F-ratings that comply with hourly wall, ceiling, floor or roof ratings indicated on the drawings, as determined per ASTM E 814 "Test Method for Fire Tests of Through-Penetration Fire Stops", but not less than that equaling or exceeding the fire-resistance rating of the constructions penetrated and UL 479..

b. Provide firestopping systems with T-ratings that comply with hourly wall, ceiling, floor or roof ratings indicated on the drawings, in addition to F-ratings, as determined per ASTM E 814 "Test Method for Fire Tests of Through-Penetration Fire Stops", and where systems protect penetrating items exposed to contact with adjacent materials in occupiable floor areas.
c. Provide joint sealants with fire-resistance ratings that comply with hourly wall, ceiling, floor or roof ratings as indicated on the drawings, as determined per ASTM E 119 "Test Method for Fire Tests of Through-Penetration Fire Stops", with hose stream test, but not less than that equaling or exceeding the fire-resistance rating of the construction in which the joint occurs.
d. For firestopping systems exposed to view, traffic, moisture, and physical damage, provide products that after curing do not deteriorate when exposed to these conditions both during and after construction.
e. For all firestopping, provide products with flame-spread values of less than 25 and smoke-developed values of less than 450, as determined per ASTM E 84 "Test Method for Surface Burning Characteristics of Building Materials".
f. Comply with "L" Rating where penetrating Smoke Barrier for Walls & Floors, per CBC 714.5, and CBC 714.4.4 for penetrations in smoke barriers and meeting the requirements of UL 1479 for air leakage.

1.4 SUBMITTALS

A. Submit in accordance with Specification Section - SUBMITTAL PROCEDURES:
1. Product Data.
a. Provide the manufacturer's full-line of products showing the UL Number listings and the products associated for each UL Number Listing.
1) The installer shall pick from the manufacturer selected for this Project the appropriate firestopping system from the manufacturer's full-line product catalog and compile a record of each penetration indicating compliance with the firestopping UL Number used.
2. Shop Drawings:
a. For each through-penetration firestop system, show each kind of construction condition penetrated, relationships to adjoining construction, and kind of penetrating item. Include firestop design designation of testing and inspecting agency acceptable to authorities having jurisdiction that evidences compliance with requirements for each condition indicated.
1) Submit documentation, including illustrations, from a qualified testing and inspecting agency that is applicable to each firestopping system configuration for construction and penetrating items.
3. Quality Assurance/Control Submittals:
a. Design Data.
b. Test Reports:
1) Product Test Reports: From a qualified testing agency indicating firestopping system complies with requirements, based on comprehensive testing of current products.
c. Certificates:
1) Certification by firestopping manufacturer that products supplied comply with local regulations controlling use of volatile organic compounds (VOC's) and are nontoxic to building occupants.

2) Product Certificates: Signed by manufacturers of firestopping system products certifying that products furnished comply with requirements.

d. Manufacturer's Written Instructions:

4. Closeout Submittals in accordance with the following:

a. Record Documents in accordance with Specification Section - RECORD DOCUMENTS.

1) Record Documents shall consist of the the compilation of actual firestopping UL Numbers used along with the comparable Manufacturer's Product associated with that UL Number, indicating the actual location of the firestopping installation within this project.

b. Warranty in accordance with Specification Section - WARRANTIES.

1.5 QUALITY ASSURANCE

A. Qualifications:

1. Material Qualifications:

a. All products shall have UL Number Listings and be approved and listed by the California State Fire Marshal.

2. Installer Qualifications:

a. Engage an experienced Installer who has successfully completed three (3) projects of similar scope and size to that indicated for this Project.

b. Engage an experienced Installer who is certified in writing by the manufacturer listed herein as qualified to install manufacturer's product (or system) in accordance with manufacturer's warranty requirements.

3. Manufacturer/Supplier Qualifications:

a. Manufacturer shall demonstrate a full-line of firestopping products capable of meeting the conditions associated with the scope of this Project, that have UL numbers and be approved and listed by the California State Fire Marshal.

b. Firm experienced in successfully producing/supplying products similar to that indicated for this Project, with sufficient production/supply capacity to produce/supply required units without causing delay in the work.

4. Regulatory Requirements:

a. In accordance with Specification Section - REGULATORY REQUIREMENTS, and the following:

1) CARB Materials and equipment used for this Project shall comply with the current applicable regulations of the California Air Resources Board (CARB)and the Environmental Protection Agency (EPA), in the area where the project is located.

1.6 DELIVERY, STORAGE, AND HANDLING

1. Packing, shipping, handling, and unloading:

a. Products shall be individually wrapped.

b. Products shall be handled in such a manner as to assure that they are free from dents, scratches and other damage. Damaged products will not be accepted.

2. Acceptance at Site:

a. Products must be in manufacturer's original unopened containers with labels indicating brand name, model, and grade.

b. Damaged products will not be accepted.

3. Storage and protection:
   a. Products shall be stored above ground on level platforms, six (6) inches above ground, allowing air circulation under stacked units.
   b. Cover materials with protective waterproof covering providing for adequate air circulation and ventilation.

1.7 PROJECT CONDITIONS

A. Environmental Requirements:
   1. Do not install firestopping when ambient or substrate temperatures are outside limits permitted by firestopping manufacturers or when substrates are wet due to rain, frost, condensation, or other causes.
   2. Ventilate firestopping per firestopping manufacturers' written instructions by natural means or, where this is inadequate, forced air circulation.
   3. Existing Conditions:
      a. Examine site and compare it with the drawings and specifications. Thoroughly investigate and verify conditions under which the work is to be performed. No allowance will be made for extra work resulting from negligence or failure to be acquainted with all available information concerning conditions necessary to estimate the difficulty or cost of the work.
      b. Conduct work so as not to interfere unnecessarily with adjacent roads, streets, drives and walks.

1.8 SEQUENCING AND SCHEDULING

A. Notify Owner's inspection agency at least one (1) week in advance of firestopping installations; confirm dates and times on days preceding each series of installations.

B. Do not cover up firestopping installations that will become concealed behind other construction until Owner's inspection agency and authorities having jurisdiction have examined each installation.

1.9 WARRANTY

A. Contractor's General Warranty:
   1. In accordance with Specification Section - WARRANTIES.

B. Manufacturer’s Warranty:
   1. In accordance with manufacturer's written standard warranty:
      a. Warranty Period One (1) Year.

C. Installer's Warranty:
   1. In accordance with the terms of the Specification Section - WARRANTIES:
      a. Warranty period One (1) Year.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. These products listed herein establish the size, pattern, color range and function selected by the Project Engineer for this Project. Manufacturers that are listed as acceptable alternative manufacturers and substitutions must still comply with the requirements of this project and the products listed in order to be approved as an equivalent during the Submittal Process. If the acceptable alternative manufacturers listed or substitutions are not approved during the Submittal Process due to non-compliance with the contract documents, then the Contractor shall submit product specified.
   1. Specified firestopping product manufacturer:
      a. 3M FIRE PROTECTION PRODUCTS.
      b. Acceptable alternative manufacturers:
         1) A/D FIRE PROTECTION SYSTEMS INC.
         2) HILTI CONSTRUCTION CHEMICALS, INC.
         3) SPECIFIED TECHNOLOGIES INC.
   2. Specified Safing Insulation product manufacturer:
      a. THERMAFIBER

B. Products from other manufacturers not listed must submit in accordance with Specification Section - SUBSTITUTION PROCEDURES.

C. Products specified represent the quality and standards of materials to be used. Actual products to be installed shall match existing materials.

2.2 MATERIALS

A. Compatibility: Provide firestopping systems from only one manufacturer per penetration protective, with the substrates, and provide firestopping systems that are compatible with one another, with the substrates forming openings, and with the items, if any, penetrating firestopping systems, under conditions of service and application, as demonstrated by firestopping system manufacturer based on testing and field experience.
   1. Firestopping of Fire-Rated Construction:
      a. Provide systems or devices listed in the UL Fire Resistive Directory under categories XHBN for Joint Systems and XHEZ for Firestops, providing those products conform to the construction type, penetrate type, annular space requirements and fire rating involved in each separate instance, and that the system be symmetrical for wall applications. Systems or devices must be asbestos-free.
      b. In addition, products must withstand the passage of cold smoke either as an inherent property of the system, or by the use of a separate product included as a part of the UL system or device, and designed to perform this function.
   2. Construction-Gap Firestopping of Fire-Rated Construction: Provide products from the manufacturer listed in the Systems and Applications Schedule at the end of this section for the following conditions (if applicable):
      a. Firestopping at construction gaps between edges of floor slabs and exterior wall construction (Perimeter Fire Containment Systems).
      b. Firestopping at construction gaps between tops of partitions and underside of structural systems (Joint Systems).

c. Firestopping at construction gaps between tops of partitions and underside of ceiling or ceiling assembly (Joint Systems).
d. Firestopping of control joints in fire-rated masonry partitions.
e. Firestopping of expansion joints not indicated by another proprietory expansion system manufacturer.

3. Smoke-Stopping at Smoke Partitions:
   a. Through-penetration smoke-stopping: Provide any system or devices complying with the requirements for firestopping in fire-rated construction listed in the Systems and Applications Schedule at the end of this section, provided that the system includes the specified smoke seal or will provide a smoke seal.
   b. Construction-gap smoke-stopping: Provide any system or devices complying with the requirements for construction-gap firestopping in fire-rated construction listed in the Systems and Applications Schedule at the end of this section, provided that the system includes the specified smoke seal or will provide a smoke seal.

B. Accessories: Provide components for each firestopping system that are needed to install fill materials and to comply with "Performance Requirements" Article. Use only components specified by firestopping system manufacturer and approved by the qualified testing and inspecting agency for firestop systems indicated. Accessories include, but are not limited to, the following items:
1. Permanent forming/damming/backing materials, including the following:
   a. Slag-/rock-wool-fiber insulation.
   b. Sealants used in combination with other forming/damming/backing materials to prevent leakage of fill materials in liquid state.
   c. Fire-rated form board.
   d. Fillers for sealants.
2. Temporary forming materials.
3. Substrate primers.
4. Collars.
5. Steel sleeves.
6. Identification Labels: Provide pressure-sensitive, self-adhesive, preprinted vinyl labels, with the following information on the labels:
   a. The words: "Warning--Firestopping System--Do Not Disturb. Notify Building Management of Any Damage."
   b. Contractor's name, address, and phone number.
   c. Firestopping system designation of applicable testing and inspecting agency.
   d. Date of installation.
   e. Firestopping system manufacturer's name.
   f. Installer's name.

C. Fill Materials:
1. General: Provide firestopping systems containing the types of fill materials indicated in the Firestopping System Schedule at the end of Part 3 by reference to the types of materials described in this Article. Fill materials are those referred to in directories of the referenced testing and inspecting agencies as fill, void, or cavity materials.
2. Latex Sealants: Single-component latex formulations that after cure do not re-emulsify during exposure to moisture.
3. Firestop Devices: Factory-assembled collars formed from galvanized steel and lined with intumescent material sized to fit specific diameter of penetrant.

4. Intumescent Composite Sheets: Rigid panels consisting of aluminum-foil-faced elastomeric sheet bonded to galvanized steel sheet.
5. Intumescent Putties: Nonhardening dielectric, water-resistant putties containing no solvents, inorganic fibers, or silicone compounds.
6. Intumescent Wrap Strips: Single-component intumescent elastomeric sheets with aluminum foil on one side.
7. Pillows/Bags: Reusable, heat-expanding pillows/bags consisting of glass-fiber cloth cases filled with a combination of mineral-fiber, water-insoluble expansion agents and fire-retardant additives.
8. Safing Insulation: 2" minimum to 4" thick Safing Insulation, as required on the drawings. Provide manufacturer's recommended fasteners as required for the specific installation requirements.
    a. Flame Spread and Smoke Developed Index maximum as follows in accordance with ASTM E 84 "Test Method for Surface Burning Characteristics of Building Materials":
        1) Unfaced Safing Insulation: Flame Spread Index 15, Smoke Developed Index 0.
        2) Foil Faced Safing Insulation: Flame Spread Index 25, Smoke Developed Index 5.
9. Silicone Foams: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.
10. Silicone Sealants: Moisture-curing, single-component, silicone-based, neutral-curing elastomeric sealants of grade indicated below:
    a. Grade for Horizontal Surfaces: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces.
    b. Grade for Vertical Surfaces: Nonsag formulation for openings in vertical and other surfaces.

2.3 MIXES

A. For those products requiring mixing before application, comply with firestopping system manufacturer's written instructions for accurate proportioning of materials, water (if required), type of mixing equipment, selection of mixer speeds, mixing containers, mixing time, and other items or procedures needed to produce products of uniform quality with optimum performance characteristics for application indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Site verification of conditions:
    1. Prior to the execution of the work under this specification section, inspect the installed work executed under other sections of this Project Manual which affect the execution of work under this specification section.
    2. Report unacceptable conditions to the Project Engineer. Do not begin work until unacceptable conditions have been corrected.
    3. Execution of work under this specification section shall constitute acceptance of existing conditions.

3.2 PREPARATION

A. Coordination:
   1. Coordinate work under this specification section with work specified under other sections to ensure proper and adequate interface of work.

B. Protection:
   1. Protect all adjacent surfaces from drips, spray, air pollution of surrounding environment, and other damage from work under this specification section.

C. Surface preparation:
   1. Prepare surface in accordance with manufacturer's written instructions and recommendations.
   2. Clean substrates of substances (laitance, form-release agents from concrete, oil, grease, rolling compounds, incompatible primers, loose mill scale, etc.) which could impair bond of materials specified within this section.
   3. Primers: Prime substrates where recommended in writing by firestopping system manufacturer using that manufacturer's written recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.
   4. Masking Tape: Use masking tape to prevent firestopping systems from contacting adjoining surfaces that will remain exposed on completion of Work and that would otherwise be permanently stained or damaged by such contact or by cleaning methods used to remove smears from firestop system materials. Remove tape as soon as possible without disturbing firestop system's seal with substrates.

3.3 INSTALLATION

A. General:
   1. All firestop system installers shall be certified in writing for each firesafing and firestopping assembly by the product manufacturer.
   2. In accordance with manufacturer's written instructions and recommendations unless specifically noted otherwise.
   3. In accordance with approved submittals.
   4. In accordance with Regulatory Requirements.
   5. Set plumb, level, and square.
   6. General: Install through-penetration firestop systems to comply with "Performance Requirements" Article and firestop system manufacturer's written installation instructions and published drawings for products and applications indicated.
   7. Install forming/damming/backing materials and other accessories of types required to support fill materials during their application and in the position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated.
      a. After installing fill materials, remove combustible forming materials and other accessories not indicated as permanent components of firestop systems.
   8. Install fill materials for firestop systems by proven techniques to produce the following results:
      a. Fill voids and cavities formed by openings, forming materials, accessories, and penetrating items as required to achieve fire-resistance ratings indicated.

b. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.
c. For fill materials that will remain exposed after completing Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

9. Identification Labels:
a. Attach labels (see Part 2) permanently to surfaces of penetrated construction on both sides of each firestop system installation where labels will be visible to anyone seeking to remove penetrating items or firestop systems.

3.4 FIELD QUALITY CONTROL

A. Site Tests:
1. As required by Regulatory Requirements.

B. Inspection:
1. As required by Regulatory Requirements.
2. Schedule inspections and notify the Project Engineer, Project Inspector and any other regulatory agencies of the time at least 48 hours prior to the inspection.
3. No work shall be without the inspections required by Regulatory Requirements.
4. Where deficiencies are found, repair or replace through-penetration firestop systems so they comply with requirements at no cost to the Owner.

3.5 CLEANING

A. Clean in accordance with Specification Section - PROJECT CLOSEOUT.
1. Clean any soiled surfaces immediately.
2. Finish shall be clean and ready for the application of any additional finishes.
3. Clean off excess fill materials adjacent to openings as Work progresses by methods and with cleaning materials that are approved in writing by firestopping system manufacturers and that do not damage materials in which openings occur.

3.6 PROTECTION

A. Provide final protection and maintain conditions during and after installation that ensure through-penetration firestop systems are without damage or deterioration at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated through-penetration firestop systems immediately and install new materials to produce through-penetration firestop systems complying with specified requirements.

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3.7 SCHEDULES

FIRESTOPPING SYSTEM SCHEDULE Firestop Systems Are Listed Using the Alpha-Alpha-Numeric Identification System Published in UL's Fire Resistance Directory, Vol. 2	
	CONSTRUCTION

TYPE OF PENETRANT	FLOOR PENETRATION SYSTEMS (First Alpha Component = C or F)			WALL PENETRATION SYSTEMS (First Alpha Component = C or F)		
	Concrete Floors with a minimum Thickness Less Than or Equal to 5 inches	Concrete Floors with a minimum Thickness Greater Than 5 inches	Framed Floors	Concrete or Masonry Walls with a minimum Thickness Less Than or Qual to 8 inches	Concrete or Masonry Walls with a minimum Thickness Greater Than 8 inches	Framed Walls
NO PENETRAT-ING ITEMS	C-AJ-0001-0999 OR F-A-0001-0999	C-BJ-0001-0999		C-AJ-0001-0999 C-BJ-0001-0999 OR W-J-0001-0999		W-L-0001-0999
METALLIC PIPE, CONDUIT, OR TUBING	C-AJ-1001-1999 OR F-A-1001-1999	C-BJ-1001-1999 C-BK-1001-1999 OR F-B-1001-1999	F-C-1001-1999	C-AJ-1001-1999 C-BJ-1001-1999 OR W-J-1001-1999	C-BK-1001-1999 OR W-K-1001-1999	W-L-1001-1999
NON-METALLIC PIPE, CONDUIT, OR TUBING	C-AJ-2001-2999 OR F-A-2001-2999	C-BJ-2001-2999 OR F-B-2001-2999	F-C-2001-2999	C-AJ-2001-2999 C-BJ-2001-2999 OR W-J-2001-2999		W-L-2001-2999
ELECTRICAL CABLES	C-AJ-3001-3999 OR F-A-3001-3999	C-BJ-3001-3999 OR F-B-3001-3999	F-C-3001-3999	C-AJ-3001-3999 C-BJ-3001-3999 OR W-J-3001-3999		W-L-3001-3999
CABLE TRAYS WITH ELECTRICAL CABLES	C-AJ-4001-4999 OR F-A-4001-4999	C-BJ-4001-4999		C-AJ-4001-4999 C-BJ-4001-4999 OR W-J-4001-4999	W-K-4001-4999	W-L-4001-4999
INSULATED PIPES	C-AJ-5001-5999 OR F-A-5001-5999	C-BJ-5001-5999	F-C-5001-5999	C-AJ-5001-5999 OR W-J-5001-5999		W-L-5001-5999

FIRESTOPPING SYSTEM SCHEDULE Firestop Systems Are Listed Using the Alpha-Alpha-Numeric Identification System Published in UL's Fire Resistance Directory, Vol. 2						
TYPE OF PENETRANT	CONSTRUCTION					
	FLOOR PENETRATION SYSTEMS (First Alpha Component = C or F)			WALL PENETRATION SYSTEMS (First Alpha Component = C or F)		
	Concrete Floors with a minimum Thickness Less Than or Equal to 5 inches	Concrete Floors with a minimum Thickness Greater Than 5 inches	Framed Floors	Concrete or Masonry Walls with a minimum Thickness Less Than or Qual to 8 inches	Concrete or Masonry Walls with a minimum Thickness Greater Than 8 inches	Framed Walls
MISC. ELECTRICAL PENETRANTS	C-AJ-6001-6999 OR F-A-6001-6999			C-AJ-6001-6999		W-L-6001-6999
MISC. MECHANI-CAL PENETRANTS	C-AJ-7001-7999 OR F-A-7001-7999		F-C-7001-7999	C-AJ-7001-7999 OR W-J-7001-7999		W-L-7001-7999
GROUPINGS OF PENETRA-TIONS	C-AJ-8001-8999 OR F-A-8001-8999	C-BJ-8001-8999	F-C-8001-8999	C-AJ-8001-8999 C-BJ-8001-8999 OR W-J-8001-8999		W-L-8001-8999
For each location where a fire-resistance-rated floor or wall assembly is penetrated, provide a UL-listed throughpenetration firestop system selected from the applicable UL number range listed above that complies with this Specification Section - FIRESTOPPING, and is suitable for the penetration conditions indicated for the Project.						

END OF SECTION

SECTION 079200 – SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:
   1. Provide all material, labor, equipment and services necessary to replace and maintain existing oint sealant materials, accessories and other related items necessary that may have been removed during the course of construction on this project.

B. Related Sections: The following Project Manual Sections contain requirements that relate to this section:
   1. ALL DIVISION 00 SPECIFICATION SECTIONS.
   2. ALL DIVISION 01 SPECIFICATION SECTIONS.
   3. ALL SPECIFICATION SECTIONS IN THE FACILITY CONSTRUCTION SUBGROUP.
   4. ALL SPECIFICATION SECTIONS IN THE FACILITY SERVICES SUBGROUP.
   5. ALL SPECIFICATION SECTIONS IN THE SITE AND INFRASTRUCTURE SUBGROUP.

1.2 SYSTEM DESCRIPTION

A. Performance Requirements: It is the intention of this specification section and the drawings to form a guide for a complete and operable system. Any items not specifically noted but necessary for a complete and operable system shall be provided under this section.
   1. Provide elastomeric sealants for exterior applications that have been produced and installed to establish and to maintain watertight and airtight continuous seals without causing staining or deterioration of joint substrates.
   2. Provide sealants for interior applications that have been produced and installed to establish and maintain airtight continuous seals that are water-resistant and cause no staining or deterioration of joint substrates.

1.3 SUBMITTALS

A. Submit in accordance with Specification Section - SUBMITTAL PROCEDURES:
   1. Product data from manufacturers for each joint sealant product required.
   2. Shop drawings:
      a. Provide full details of all sealants and accessories proposed for use for approval by the Project Engineer. All materials and products proposed shall be compatible with each other and with the substrates and adjacent wall colors, and shall be non-staining and non-bleeding. Submit an affidavit from the manufacturer confirming the acceptance of the use of the selected products in the manner and on the substrates proposed.
   3. Samples.

a. Samples for initial selection purposes in form of manufacturer's bead samples, consisting of strips of actual products showing full range of colors (standard, premium and custom) available, for each product exposed to view.
   1) Provide color chips of adjacent wall surface colors; to be used in evaluating the sealant color samples.

4. Quality Assurance/Control Submittals:
   a. Provide UL Assembly Classification appropriate for each fire rated penetration.
   b. Certificates:
      1) Submit three (3) copies of certificates.
         a) Certification by each joint sealant manufacturer that sealants plus the primers and cleaners required for sealant installation comply with local regulations controlling use of volatile organic compounds.
         b) Certified test reports for elastomeric sealants on aged performance as specified, including hardness stain resistance, adhesion, cohesion or tensile strength, elongation, low temperature flexibility, compression set, modulus of elasticity, water absorption, and resistance (aging, weight loss, deterioration) and heat and exposure to ozone and ultra violet light. Adhesion data shall include long-term adhesion characteristics of all adhesion surfaces including silicone, aluminum and glass coatings and long term weathering test on the silicone on contact with similar materials.
         c) Certificate of Installation: Signed by the installer and sealant manufacturer stating that sealant installed complies with specifications, and that installation methods comply with manufacturer's printed instructions for each condition of installation and use on the project. The sealant installer shall have no less that five years of continuous experience in installing the specified products. Their experience shall include similar work to this subject project. In addition, the manufacturers will provide written approval of the material installers.
   c. Manufacturer's Written Instructions:
      1) Submit three (3) copies of manufacturer's written instruction
   d. Closeout Submittals in accordance with Specification Sections in Division One:
   e. Warranty in accordance with Specification Section - WARRANTIES.

1.4 QUALITY ASSURANCE

A. Qualifications:
   1. Material Qualifications:
      a. Single Source Responsibility for Joint Sealant Materials: Obtain joint sealant materials from a single manufacturer for each different product required.
   2. Installer Qualifications:
      a. Engage an experienced Installer who has successfully completed three (3) projects of similar scope and size to that indicated for this Project.
   3. Manufacturer/Supplier Qualifications:
      a. Firm experienced in successfully producing/supplying products similar to that indicated for this Project, with sufficient production/supply capacity to produce/supply required units and colors without causing delay in the work.

B. Regulatory Requirements:
1. In accordance with Specification Section - REGULATORY REQUIREMENTS, and the following:
a. AAMA American Project Engineerural Manufacturer's Association
1) AAMA 800-92 - "VOLUNTARY SPECIFICATIONS AND TEST METHODS FOR SEALANTS.
b. ASTM American Society for Testing and Materials.
1) ASTM C 1193 - "STANDARD GUIDE FOR USE OF JOINT SEALANTS".
c. CA-CHPS - California High Performance Schools
d. CARB Materials and equipment used for this Project shall comply with the current applicable regulations of the California Air Resources Board (CARB) and the Environmental Protection Agency (EPA), in the area where the project is located.
e. GANA Glass Association of North America, 1997 Edition of the Glazing Manual, and the most recent Edition of the Sealant Manual.
f. SWRI Sealant Waterproofing Restoration Institute - Types of standards as found in Chapter III "Sealants: The Professionals' Guide".

C. Meetings:
1. Pre-Installation: Scheduled by the Contractor prior to the start of work.
a. Coordinate the work with all other related work.
b. Identify any potential problems that may impede planned progress and proper installation of work regarding quality of installation and warranty requirements.
2. Progress: Scheduled by the Contractor during the performance of the work.
a. Review for proper installation of work progress.
b. Identify any installation problems and acceptable corrective measures.
c. Identify any measures to maintain or regain project schedule if necessary.
3. Completion: Scheduled by the Contractor upon proper completion of the work.
a. Inspect and identify any problems that may impede issuance of warranties or guaranties.
b. Maintain installed work until the Notice of Substantial Completion has been executed.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to Project site in original unopened containers or bundles with labels indicating manufacturer, product name and designation, color, expiration period for use, pot life, curing time, and mixing instructions for multi-component materials.
1. Comply with the Sealant Requirements of the GANA Glazing Manual and GANA Sealant Manual.

B. Store and handle materials in compliance with manufacturer's written recommendations to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.
1. Store sealant containers in a protected location in accordance with their manufacturer's printed instructions until their use.

1.6 PROJECT CONDITIONS

A. Environmental requirements:
   1. Apply materials within manufacturer's written recommended surface and ambient temperature ranges.
   2. Apply materials when working joints are most likely to be normal size.
   3. Do not install sealants under adverse weather conditions, or when temperatures are beyond manufacturer's written recommended limits.
      a. Proceed with the installation only when forecasted weather conditions are favorable for proper sealant cure, and development of early bond strength. Allow a minimum of three days after rain.
      b. Where joint width is affected by ambient temperature variations, install sealants only when temperatures are in the lower third of manufacturer's written recommended installation temperature range, so that sealant will not be subjected to excessive elongation and bond stress at low temperatures.

1.7 WARRANTY

A. Contractor's General Warranty:
   1. In accordance with Specification Section - WARRANTIES.

B. Manufacturer's Warranty:
   1. In accordance with Specification Section - WARRANTIES.
   2. Manufacturer shall warrant exterior joint sealant after substantial completion of work.
      a. Warranty Period Ten (10) Years.

C. Installer's Warranty:
   1. Sealant Contractor shall warrant sealants against defective materials and workmanship after substantial completion of work.
      a. Warranty Period Five (5) Years.
      b. Warranty shall further state that installed sealants are warranted against the following:
         1) Water leakage through sealed joints.
         2) Adhesive or cohesive failure of sealant.
         3) Staining of adjacent surfaces caused by migration of primer or sealant.
         4) Chalking or visible color change of the cured materials.
      c. The installer shall make repairs during the warranty period at no cost to the Owner.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. These products listed herein establish the size, pattern, color range and function selected by the Project Engineer for this Project. Manufacturers that are listed as acceptable alternative manufacturers and substitutions must still comply with the requirements of this project and the products listed in order to be approved as an equivalent during the Submittal Process. If the acceptable alternative manufacturers listed or substitutions are not approved during the Submittal Process due to non-compliance with the contract documents, then the Contractor shall submit product specified.

1. Specified product manufacturer, or approved equivalent:
   a. One-Part Neutral Cure Silicone Sealant:
      1) PECORA "#890".
         a) NOTE: For continual immersion in water conditions, provide PECORA "Dynatred".
         b) If the water contains a chlorine content of 5ppm, then PECORA "Synthacalk GC2+" shall be used.
      2) Acceptable alternative manufacturers for 1) only above:
         a) BONDAFLEX "Sil 290".
         b) DOW PERFORMANCE SILICONES "#790".
         c) SONNEBORN "Sonolastic 150" or "Sonolastic 150 VLM".
   b. One-Part Acid-Curing Silicone Sealant:
      1) PECORA "#860".
      2) Acceptable alternative manufacturers:
         a) BONDAFLEX "Sil 100 GP".
         b) DOW PERFORMANCE SILICONES "#999-A".
         c) SONNEBORN "Omniplus".
   c. One-Part Mildew-Resistant Silicone Sealant:
      1) PECORA:
         a) White Color Only "#345".
         b) Available in multiple colors for selection "#898".
      2) Acceptable alternative manufacturers to 1), a), above:
         a) BONDAFLEX "Sil 100 WF".
         b) DOW PERFORMANCE SILICONES "#786".
         c) SONNEBORN "Omniplus".
   d. One-Part Gun Grade Urethane Sealant:
      1) PECORA "Dynatrol I-XL".
      2) Acceptable alternative manufacturers:
         a) BONDAFLEX "Pur 25" or "Pur 25 Tex".
         b) SIKA "Sikaflex 1a" or "Sika Textured".
         c) SONNEBORN "NP1 Smooth" or "X1 Textured".
         d) VULKEM "#116".
   e. Multi-Component Gun Grade Urethane Sealant:
      1) PECORA "Dynatred".
      2) Acceptable alternative manufacturers:
         a) BONDAFLEX "Pur 2 NS".
         b) SIKA "Sikaflex 2c NS".
         c) SONNEBORN "NP2".

f. Multi-Component Gun Grade Urethane Sealant (Fast Curing):
   1) PECORA "Dynatred".
   2) Acceptable alternative manufacturers:
      a) BONDAFLEX "Pur 2 NS".
      b) SIKA "Sikaflex 2c NS".
      c) SONNEBORN "NP2" with manufacturer's accelerator.
      d) VULKEM "#227".
g. One-Part or Multi-Component Gun Grade Urethane Sealant (Security Sealant) :
   1) PECORA "Dynaflex".
   2) Acceptable alternative manufacturers:
      a) BONDAFLEX "Pur 2 NS".
      b) SIKA "Sikaflex 2c NS TG".
      c) SONNEBORN "Ultra".
h. One-Part Pourable Self-Leveling Urethane Sealant:
   1) PECORA "Urexpan NR-201" or "Dynatred".
   2) Acceptable alternative manufacturers:
      a) BONDAFLEX "Pur 35 SL".
      b) SIKA "Sikaflex 1c SL".
      c) SONNEBORN "Sonolastic SL 1".
      d) VULKEM "#45".
i. Multi-Component Pourable Self-Leveling Urethane Sealant (Fast Curing):
   1) PECORA "Urexpan NR-200".
   2) Acceptable alternative manufacturers:
      a) BONDAFLEX "Pur 2 SL".
      b) SIKA "Sikaflex 2c SL".
      c) SONNEBORN "Sonolastic SL 2".
      d) VULKEM "#245/255".
j. Acrylic-Emulsion Sealant:
   1) PECORA "AC-20".
   2) Acceptable alternative manufacturers:
      a) BONDAFLEX "Sil-A 700".
      b) SONNEBORN "Sonolac".
k. One-Part Butyl Sealant:
   1) PECORA "BC-158".
   2) Acceptable alternative manufacturers:
      a) PTI (by H.B. FULLER) "#707".
l. Acoustical Sealant:
   1) PECORA:
      a) Exposed and Fire Rated areas; Pecora"AC-20 FTR".
      b) Concealed areas: Pecora "AIS-919".
   2) Acceptable alternative manufacturers:
      a) BONDAFLEX "Sil-A 700".
      b) OSI "GRABBER" #GSCS.
      c) TREMCO INC. 834.
      d) W.W. HENRY "#413".
m. Firestop Sealants: Use in designated Fire-Rated Assemblies in accordance with approved UL Classified Assemblies.
   1) HILTI
   2) Acceptable alternative manufacturers:

a) 3M
b) PECORA

n. Firestop Putty Pads: Use in Fire-Rated Assemblies where penetration holes are too large for caulk, in accordance with approved UL Classified assemblies:
1) HEVI-DUTY / NELSON "Putty Pads".

o. Glazing Tape Sealants:
1) Butyl Glazing Tape:
a) PECORA "Extru-Seal".
b) Acceptable alternative manufacturers:
c) TREMCO, INC. "440 Tape".
2) Butyl Pressure Glazing Tape:
a) PECORA "Dyna-Seal".

p. Pre-Compressed Foam Sealants:
1) EMSEAL CORP. "Emseal".

q. Sheet Caulking (Electrical Junction Box Sealers):
1) LOWRY "Electrical Box Sealer".
2) Acceptable alternative manufacturer:
a) TREMCO INC. "Sheet Caulking".

r. EIFS preformed paintable Urethane Tape:
1) SIKA "Sikaflex PUR" Tape System.

B. Products from other manufacturers not listed must submit in accordance with Specification Section - SUBSTITUTION PROCEDURES.

2.2 MATERIALS

A. General:
1. Compatibility: Provide sealants, joint fillers, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
a. Colors: Provide color of exposed sealants to comply with the following:
1) Sealant colors shall match adjacent wall color.
2) Provide selections made by Project Engineer from manufacturer's full range of standard colors for products of type indicated.

B. Elastomeric Sealant Standard: Provide manufacturer's standard chemically curing elastomeric sealants (Silicones, Urethanes, and Acrylics) that comply with ASTM C 920 "Specification for Elastomeric Joint Sealants", and other requirements indicated on each Elastomeric Joint Sealant listed, including those requirements referencing ASTM C 920 "Specification for Elastomeric Joint Sealants", classifications for Type, Grade, Class, and Uses.
1. Additional Movement Capability: Where additional movement capability is specified in Elastomeric Joint Sealant listed, provide products with the capability, when tested for adhesion and cohesion under maximum cyclic movement per ASTM C 719 "Test Method for Adhesion and Cohesion of Elastomeric Joint Sealants Under Cyclic Movement (Hockman Cycle)", to withstand the specified percentage change in the joint width existing at time of installation.

C. Acrylic-Emulsion Sealant: Provide product complying with ASTM C 834 "Specification for Latex Sealants", that accommodates joint movement of not more than 5 percent in both extension and compression for a total of 10 percent.

D. Butyl Sealant: Manufacturer's standard one-part, non-sag, solvent-release-curing, polymerized butyl sealant complying with ASTM C 1311 "Standard Specification for Solvent Release Sealants", and formulated with minimum of 75 percent solids to be nonstaining, paintable, and have a tack-free time of 24 hours or less.

E. Acoustical Sealant: Manufacturer's non-drying, non-bleeding and non-hardening butyl sealant complying with ASTM C 834 "Specification for Latex Sealants", and the following requirements:
   1. Product is effective in reducing airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies per ASTM E 90 "Test method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements".
   2. For fire rated conditions, use an acoustical sealant that has at least Class II Flame Spread and Smoke Developed ratings in accordance with ASTM E-84 "Test method for Surface Burning Characteristics of Building Materials", as follows:
      a. Flame Spread Rating 53.
      b. Smoke Developed Rating 117.

F. Firestop Pillows / Bags: In accordance with UL Classified systems. Reusable, heat-expanding pillows / bags consisting of glass-fiber cloth cases filled with a combination of mineral-fiber, water-insoluble expansion agents and fire-retardant additives.

G. Firestop Sealants: In accordance with ASTM E 814 "Specification for Latex Sealants", and ANSI/UL 1479 Classified systems.
   1. Grade for Horizontal Surfaces: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces.
   2. Grade for Vertical Surfaces: Nonsag formulation for openings in vertical and other surfaces.

2.3 ACCESSORIES

A. Tape: Manufacturer's standard, solvent-free, butyl-based tape sealant with a solids content of 100 percent formulated to be nonstaining, paintable, and nonmigrating in contact with nonporous surfaces with or without reinforcement thread to prevent stretch and packaged on rolls with a release paper on one side.

B. Pre-compressed Foam: Manufacturer's standard preformed, pre-compressed, impregnated open-cell foam sealant manufactured from high-density urethane foam impregnated with a nondrying, water repellent agent; factory-produced in pre-compressed sizes and in roll or stick form to fit joint widths indicated and to develop a watertight and airtight seal when compressed to the degree specified by manufacturer; and complying with the following requirements:
   1. Properties: Permanently elastic, mildew-resistant, nonmigratory, nonstaining, and compatible with joint substrates and other sealants.
   2. Impregnating Agent: Manufacturer's standard.
   3. Density: Manufacturer's standard.

4. Backing: Pressure-sensitive adhesive factory applied to one side with protective wrapping.

C. Backing Rods (Joint Sealant Backing):
1. General: Provide sealant backings of material and type that are nonstaining; are compatible with joint substrates, sealants, primers and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
2. Plastic Foam Joint Fillers: Preformed, compressible, resilient, nonstaining, nonwaxing, nonextruding strips of flexible plastic foam of material indicated below and of size, shape, and density to control sealant depth and otherwise contribute to producing optimum sealant performance:
   a. Open-cell polyurethane foam.
   b. Closed-cell polyethylene foam, nonabsorbent to liquid water and gas, nonoutgassing in unruptured state.
   c. Closed-cell polyethylene foam, nonabsorbent to liquid water and gas, nonoutgassing in unruptured state.
   d. Any material indicated above.
3. Elastomeric Tubing Joint Fillers: Neoprene, butyl, EPDM, or silicone tubing complying with ASTM D 1056, nonabsorbent to water and gas, capable of remaining resilient at temperatures down to -26 deg F. Provide products with low compression set and of size and shape to provide a secondary seal, to control sealant depth, and otherwise contribute to optimum sealant performance.
4. Bond-Breaker Tape: Polyethylene tape or other plastic tape as recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.
5. Acoustical Sheet Caulking for junction boxes: LOWRY'S Electrical Box Sealer, or TREMCO INC. sheet caulking

D. Miscellaneous Materials:
1. Primer: Material recommended by joint sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint sealant-substrate tests and field tests.
2. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming in any way joint substrates and adjacent nonporous surfaces, and formulated to promote optimum adhesion of sealants with joint substrates.
3. Masking Tape: Non-staining, nonabsorbent material compatible with sealants and surfaces adjacent to joints. Use the type of masking tapes available that is compatible to the substrate being masked without damaging the surface material of finish when removed.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Site verification of conditions:

1. Prior to the execution of the work under this specification section, inspect the installed work executed under other specification sections of this Project Manual which, affect the execution of work under this specification section.
2. Report unacceptable conditions to the Project Engineer. Do not begin work until unacceptable conditions have been corrected.
3. Execution of work under this specification section shall constitute acceptance of existing conditions.

3.2 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing sealants to comply with recommendations of joint sealant manufacturer and the following requirements:
   1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
   2. Clean concrete, masonry, unglazed surfaces of ceramic tile, and similar porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with sealants. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil-free compressed air.
   3. Remove laitance and form release agents from concrete.
   4. Clean metal, glass, porcelain enamel, glazed surfaces of ceramic tile, and other nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of sealants.

B. Joint Priming: Prime joint substrates where indicated or where recommended by joint sealant manufacturer based on preconstruction joint sealant-substrate tests or prior experience. Apply primer to comply with joint sealant manufacturer's written recommendations. Confine primers to areas of joint sealant bond; do not allow spillage or migration onto adjoining surfaces.
   1. Masking Tape: Use the appropriate masking tape (type selected to the substrate so as not to mar the surface it is protecting) where required to prevent contact of sealant with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION

A. General:
   1. Comply with joint sealant manufacturer's written installation instructions applicable to products and applications indicated, except where more stringent requirements apply. Sealant Installation Standard: Comply with recommendations of ASTM C 1193 "Standard Guide for Use of Joint Sealants", for use of sealants as applicable to materials, applications, and conditions indicated.
      a. Acoustical Sealant Application Standard: Comply with recommendations of ASTM C 919 "Practice for Use of Sealants in Acoustical Applications", as applicable to materials, applications, and conditions indicated.
      b. Use Urethane Sealants at painted joints.
      c. Use Silicone Sealants at exposed, non-painted joints.

d. Installation of Sealant Backings: Install sealant backings to comply with the following requirements:
   1) Install joint fillers of type indicated to provide support of sealants during application and at position required to produce the cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability
      a) Do not leave gaps between ends of joint fillers.
      b) Do not stretch, twist, puncture, or tear joint fillers.
      c) Remove absorbent joint fillers that have become wet prior to sealant application and replace with dry material.
   2) Install bond breaker tape between sealants where backer rods are not used between sealants and joint fillers or back of joints.

e. Installation of Sealants: Install sealants by proven techniques that result in sealants directly contacting and fully wetting joint substrates, completely filling recesses provided for each joint configuration, and providing uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability. Install sealants at the same time sealant backings are installed.
   1) For normal moving joints not subject to traffic: Fill joints to a depth equal to 50% of joint width, but not less than 1/4" deep or more than 1/2" deep. In no case shall the applied sealant width exceed the sealant depth.
   2) Assure that the *bond line* surface is a minimum of 1/4" wide. Install approved backer material at a proper depth to provide sealant bead profiles as detailed on approved shop drawings. Backer material shall be of appropriate size and shape and shall be compressed between 25% and 50% when installed.
   3) Backer material may not be modified in-lieu of using the properly dimensioned material. Install, when required a polyethylene, or other approved, bond backer tape to provide sealant bead profiles as detailed on approved shop drawings.

f. Do not allow sealants, primers, or other compounds to overflow, spill or migrate into voids of adjacent construction.

g. Remove excess sealant spillage promptly as this work progresses. Clean adjacent surfaces by recommended means to remove sealant, but not damage the surfaces. Remove all cartons and debris from the site as the work progresses and at the end of each work day. Joints shall be prepared and sealed on the same working day.

h. Tooling of Non-sag Sealants: Immediately after sealant application and prior to time skinning or curing begins, tool sealants to form smooth, uniform beads of configuration indicated, to eliminate air pockets, and to ensure contact and adhesion of sealant with sides of joint. Remove excess sealants from surfaces adjacent to joint. Do not use tooling agents that discolor sealants or adjacent surfaces or are not approved by sealant manufacturer.
   1) Provide concave joint configuration per Figure 5A in ASTM C 1193 "Standard Guide for Use of Joint Sealants", unless otherwise indicated.
   2) Provide flush joint configuration, per Figure 5B in ASTM C 1193 "Standard Guide for Use of Joint Sealants", where indicated.
      a) Use masking tape to protect adjacent surfaces of recessed and tooled joints.
   3) Provide recessed joint configuration, per Figure 5C in ASTM C 1193 "Standard Guide for Use of Joint Sealants", of recess depth and at locations indicated.

i. Installation of Preformed Foam Sealants: Install each length of sealant immediately after removing protective wrapping, taking care not to pull or stretch material, and to comply with sealant manufacturer's written directions for installation methods, materials, and tools that produce seal continuity at ends, turns, and intersections of joints. For applications at low ambient temperatures where expansion of sealant requires acceleration to produce seal, apply heat to sealant in conformance with sealant manufacturer's written recommendations.

j. Acoustical Sealant Applications:
   1) Provide acoustical sealant to form an airtight seal at all penetrations and perimeter of sound-rated partitions, floors and ceilings. Comply with requirements of specification section titled Gypsum Board. Use backer-rod where gaps to be sealed exceed 3/8 inches.
   2) Provide sheet caulking to seal the back and sides of all junction boxes (4 gang and smaller) recessed in acoustically-rated partitions.
   3) Provide acoustical sealant as a continuous bead along gypsum board face layer at all head and sill conditions of sound-rated partitions and around the perimeter of resilient ceilings.

k. Firestop Sealants: In accordance with applicable UL Classified numbers compatible with products provided.

3.4 CLEANING

A. Clean in accordance with Specification - PROJECT CLOSEOUT.
   1. Clean any soiled surfaces immediately.
   2. Clean off excess sealants or sealant smears adjacent to joints as work progresses by methods and with cleaning materials approved by manufacturers of sealants and of products in which joints occur.

3.5 PROTECTION

A. Protect sealants during and after curing period from contact with contaminating substances or from damage resulting from construction operations or other causes so that they are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated sealants immediately so that and installations with repaired areas are indistinguishable from original work.

3.6 SCHEDULES

A. Sealant Schedule:

B. Sealants: Description of joint construction and location where sealant is typically applied
   1. One-Part Neutral Cure Silicone Sealant:
      a. Exterior and interior joints in vertical surfaces of concrete and masonry.
      b. Between concrete masonry and stone.
      c. Between metal and concrete, mortar, and stone.
      d. Interior and exterior perimeter joints of metal frames in exterior walls.
      e. Exterior overhead joints.

f. Use the applicable sealant for continual immersion in water applications, such as swimming pools, fountains and cooling towers – USDA Approved.

2. One-Part Acid-Curing Silicone Sealant:
   a. Exposed joints within glazed curtain wall framing systems, skylight framing systems, and aluminum entrance framing systems, if applicable.
3. One-Part Mildew-Resistant Silicone Sealant:
   a. White Grout Joints: Provide white silicone sealant material to match adjacent white grout joints in interior joints in vertical surfaces of ceramic tile in toilet rooms, showers, and kitchens.
   b. Colored Grout Joints: Provide colored silicone sealant material to match adjacent colored grout joints in interior joints in vertical surfaces of ceramic tile in toilet rooms, showers, and kitchens.
4. One-Part Gun Grade Urethane Sealant:
   a. Exposed joints in pre-cast, masonry, window frame perimeters and similar types of construction joints.
5. Multi-Component Gun Grade Urethane Sealant:
   a. Control joints and window and door perimeters.
6. Multi-Component Gun Grade Urethane Sealant (Fast Curing):
   a. Plaza Decks.
7. One-Part or Multi-Component Gun Grade Urethane Sealant (Security Sealant):
   a. Control joints and window and door perimeters where sealant is exposed to physical abuse.
8. One-Part Pourable Self-Leveling Urethane Sealant:
   a. Exterior and interior joints in horizontal surfaces of concrete.
   b. Exterior and interior joints in horizontal surfaces between metal and concrete, mortar, stone, and masonry surfaces.
9. Multi-Component Pourable Self-Leveling Urethane Sealant (Fast Curing):
   a. For use when walking surfaces require use within 24 hours of application without damage to joint surfaces.
   b. Exterior and interior joints in horizontal surfaces of concrete.
10. Acrylic-Emulsion Sealant:
    a. Paintable joints for the following surfaces expected to receive field painting:
       1) Interior joints in vertical and overhead surfaces at perimeter of elevator door frames and door frames (not requiring security grade sealant).
       2) Interior joints in gypsum board, plaster, concrete, and concrete masonry.
       3) All other interior field paintable joints not indicated otherwise.
11. One-Part Butyl Sealant:
    a. Primarily used for glazing seals where little or no movement is expected.
12. Acoustical Sealant:
    a. Joints to control dust, air, smoke and sound transmission, including under all exterior wall sill plates placed on top of Cast-In-Place Concrete slabs.
13. Firestop Sealants:
    a. In fire-rated walls, compatible with wall ratings and in accordance with applicable penetration types in walls and floors, and in accordance with UL Classified numbers.

END OF SECTION

SECTION 092216 – METAL FRAMING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:
   1. Provide all material, labor, equipment and services necessary to replace existing metal framing materials (both Cold-Formed Framing and Lightgage Metal Framing), accessories and other related items that was removed durring the course of construction of this project.

B. Related Sections: The following Project Manual Sections contain requirements that relate to this section:
   1. ALL DIVISION 00 SPECIFICATION SECTIONS.
   2. ALL DIVISION 01 SPECIFICATION SECTIONS.
   3. 06 10 00 ROUGH CARPENTRY
   4. 07 21 00 INSULATION
   5. 07 51 13 BUILT-UP ROOFING
   6. 07 57 00 COATED FOAM ROOFING
   7. 07 53 16 ELASTOMERIC MEMBRANE ROOFING
   8. 07 53 29 ELASTOMERIC MEMBRANE ROOFING
   9. 07 84 00 FIRESTOPPING
   10. 07 92 00 SEALANTS
   11. 09 29 00 GYPSUM BOARD
   12. 09 50 00 ACOUSTICAL CEILINGS
   13. ALL SPECIFICATION SECTIONS IN THE FACILITY SERVICES SUBGROUP.

1.2 REFERENCES

A. In accordance with the following:
   1. AISI American Iron and Steel Institute
   2. ASTM American Society for Testing Materials
   3. AWS American Welding Society
   4. ICC International Code Council.

1.3 DEFINITIONS

A. Minimum Uncoated Steel Thickness: Minimum uncoated thickness of metal framing delivered to the Project site shall be not less than 95 percent of the thickness used in the metal framing design. Lesser thicknesses shall be permitted at bends due to cold forming.

1.4 SYSTEM DESCRIPTION

A. Performance Requirements: It is the intention of this section and the drawings to form a guide for a complete framing system. Any items not specifically noted but necessary for a complete framing system shall be provided under this section.
   1. Wall systems shall accommodate tolerances, deflection of building structural members, and clearances of intended openings.
   2. Fire-Test-Response Characteristics: Where indicated, provide metal framing materials and construction identical to that of assemblies tested for fire resistance.
      a. Per ASTM E 119 "Test methods for Fire Tests of Building Construction and Materials" by a testing and inspecting agency acceptable to Authorities Having Jurisdiction (AHJ), products used in the assembly shall carry a classification label from a testing laboratory acceptable to the AHJ.

1.5 SUBMITTALS

A. Submit in accordance with Specification Section - SUBMITTAL PROCEDURES:
   1. Product Data: For each type of product indicated.
      a. Materials list of items proposed to be provided under this section.
   2. Quality Assurance/Control Submittals:
      a. Test Reports:
         1) Current ICC ES Report.
         2) Welding inspection report per DSA/SSS "T & I" List.
      b. Certificates:
         1) Welding certificates indicating qualifications.
         2) Mill certificates, per ICC AC46 "Acceptance Criteria for Cold-Formed Steel Framing Members", indicating steel sheet complies with requirements, including base-metal thickness, yield strength, tensile strength, total elongation, and metallic-coating thickness. Comply also with CBC Section 2203A.1.
      c. Manufacturer's Written Instructions:
         1) Manufacturer's written recommended installation procedures shall become the basis for accepting or rejecting actual installation procedures on the work.
   3. Closeout Submittals in accordance with the following:
      a. Warranty in accordance with Specification Section –WARRANTIES.

1.6 QUALITY ASSURANCE

A. Qualifications:
   1. Material Qualifications:
      a. Galvanized and carbon sheet steel products formed from steel with a minimum yield stress of 33 ksi for 18 gage and lighter member and 50 ksi for 16 gage and heavier members.
      b. All products shall be engineered to meet the latest Edition of the American Iron and Steel Institute (AISI), "North American Specification for the Design of Metal Steel Structural Members".

c. All products manufactured shall comply with the CBC and AISI, and shall have a current ICC Evaluation Service Report (ICC ESR).
   1) AISI "Code of Standard Practice for Cold-Formed Steel Structural Framing".

2. Installer Qualifications:
   a. Engage an experienced Installer who has successfully completed three (3) projects of similar scope and size to that indicated for this Project.
   b. Welders shall be qualified for welding in horizontal, vertical, and overhead positions in accordance with AWS D1.3.
3. Manufacturer/Supplier Qualifications:
   a. Firm experienced in successfully producing/supplying products similar to that indicated for this Project, with sufficient production/supply capacity to produce/supply required units without causing delay in the work.

B. Regulatory Requirements:
1. In accordance with Specification Section - REGULATORY REQUIREMENTS, and the following:
   a. CARB Materials and equipment used for this Project shall comply with the current applicable regulations of the California Air Resources Board (CARB) and the Environmental Protection Agency (EPA), in the area where the project is located.

C. Meetings:
1. Pre-Installation: Scheduled by the Contractor prior to the start of work.
   a. Coordinate the work with other work being performed.
   b. Identify any potential problems that may impede planned progress and proper installation of work regarding quality of installation and warranty requirements.
2. Progress: Scheduled by the Contractor during the performance of the work.
   a. Review for proper installation of work progress.
   b. Identify any installation problems and acceptable corrective measures.
   c. Identify any measures to maintain or regain project schedule if necessary.
3. Completion: Scheduled by the Contractor upon proper completion of the work.
   a. Inspect and identify any problems that may impede issuance of warranties or guaranties.
   b. Maintaining installed work until the Notice of Substantial Completion has been executed.

1.7 DELIVERY, STORAGE, AND HANDLING

A. General: Steel Framing and related accessories shall be stored and handled in accordance with AISI "Code of Standard Practice for Cold-Formed Steel Structural Members".

B. Packing, shipping, handling, and unloading:
1. Products shall be handled in such a manner as to assure that they are free from corrosion, deformation, dents, scratches and other damage.

C. Acceptance at Site:
1. Products must be in manufacturer's original unopened bundles and containers with labels indicating brand name, size, and grade.

2. Damaged products will not be accepted.

D. Storage and protection:
1. Metal Framing and related accessories shall be stored and handled in accordance with the AISI "Code of Standard Practice".
2. Products shall be stored above ground on level platforms, six (6) inches above ground, allowing air circulation under stacked units.
   a. Cover materials with protective waterproof covering providing for adequate air circulation and ventilation.

1.8 PROJECT CONDITIONS

A. Existing Conditions:
1. Examine project and compare it with the drawings and specifications. Thoroughly investigate and verify conditions under which the work is to be performed. No allowance will be made for extra work resulting from negligence or failure to be acquainted with all available information concerning conditions necessary to estimate the difficulty or cost of the work.
2. Field Measurements: Take and be responsible for field measurements as required. Report any significant differences between field dimensions and the contract document conditions to Project Engineer.
3. Carefully coordinate work under this Section with that of the structural framing sections and details so that the interface between structural framing and non structural framing shall provide the lines and degree of finish shown and specified.

1.9 Describe special or extended warranty or bonds covering the conformance and performance of the work of the section. Coordinate with Contracting Requirements. Do not make statements that will limit or void those provisions. Ensure that procedures complement Division 01 Closeout Submittals. Include statements specific to this section that supplement or extend warranties contained in Div 01 WarrantiesWARRANTY

A. Contractor's General Warranty:
1. In accordance with Specification Section - WARRANTIES.

B. Manufacturer’s Warranty:
1. In accordance with manufacturer's written standard warranty:
   a. Warranty Period One (1) Year.

C. Installer's Warranty:
1. In accordance with the terms of the Specification Section - WARRANTIES:
   a. Warranty period One (1) Year.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. The products listed herein establish the size, pattern, color range and function selected by the Project Engineer for this Project. Manufacturers that are listed as acceptable alternative manufacturers and substitutions must still comply with the requirements of this project and the products listed in order to be approved as an equivalent during the Submittal Process. If the acceptable alternative manufacturers listed or substitutions are not approved during the Submittal Process due to non-compliance with the contract documents, then the Contractor shall submit product specified.

1. Studs, Tracks, Ceiling Joists, Channels and Steel Accessories specified product manufacturer:
   a. CLARK DIETRICH BUILDING SYSTEMS, LLC (CDBS).
   b. Acceptable alternative manufacturers:
      1) CEMCO.
      2) STUDCO.
2. Slotted Deflection Track and Vertical Deflection Clip accessories specified product manufacturer, unless otherwise noted:
   a. BRADY INNOVATIONS "SLP-TRK" Slotted Deflection Track.
   b. CLARK DIETRICH BUILDING SYSTEMS, LLC (CDBS).
      1) Vertical Deflection Clips:
         a) "Fast TopTM Clips".
         b) "Fast ClipTM Slide Clips".
         c) "Quick ClipTM".
         d) "Slide ClipTM.
   c. Acceptable alternative manufacturers:
      1) CEMCO.
      2) STUDCO.
3. Shaftwall specified product manufacturer:
   a. CLARK DIETRICH BUILDING SYSTEMS, LLC (CDBS).
   b. Acceptable alternative manufacturers:
      1) CEMCO.
      2) STUDCO.
4. Flat Strap and Backing Plate:
   a. CLARK DIETRICH BUILDING SYSTEMS, LLC (CDBS):
      1) "DanBackTM" Fire Treated Wood Backing Plate.
   b. Acceptable alternative manufacturers:
      1) CEMCO.
      2) STUDCO.
5. Channel Bridging or Bracing:
   a. CLARK DIETRICH BUILDING SYSTEMS, LLC (CDBS):
      1) "Spazzer® 9200" Bridging and Spacer bar.
      2) "EasyClipTM" and "U-SeriesTM" Clip Angle.
   b. Acceptable alternative manufacturers:
      1) CEMCO.
      2) STUDCO.
6. Metal screw specified product manufacturer:

a. GRABBER CONSTRUCTION PRODUCTS.

B. Products from other manufacturers not listed must submit in accordance with Specification Section - SUBSTITUTION PROCEDURES.

C. Products specified represent the quality and standards of materials that are to be used. Actual products are to match existing materials.

2.2 MATERIALS

A. Steel Sheet:
1. Steel sheet for 16 gage and heavier shall comply with ASTM A 1003 "Specification for Steel Sheet, Carbon, Metallic- and Nonmetallic-Coated for Cold-Formed Framing Members", structural steel classification, Grade 50 ksi, Class 1 or 2.
2. Steel sheet for 18 gage and lighter shall comply with ASTM A 1003 "Specification for Steel Sheet, Carbon, Metallic- and Nonmetallic-Coated for Cold-Formed Framing Members", structural steel classification, Grade 33 ksi, Class 1 or 2.
3. When hot-rolled steel sheet and strip is used in fabrication of metal members they shall comply with ASTM A1011 "Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength", structural steel classification, Grade 50 ksi.

B. Coating:
1. Steel sheet shall be galvanized in accordance with ASTM A 1003 "Specification for Steel Sheet, Carbon, Metallic- and Nonmetallic-Coated for Cold-Formed Framing Members", G60 minimum and comply with ASTM A 924 "Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process".
   a. Vertical Deflection Clips shall be in accordance with ASTM A 1003 "Specification for Steel Sheet, Carbon, Metallic- and Nonmetallic-Coated for Cold-Formed Framing Members", G90 minimum and ASTM A 924 "Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process".
2. When hot-rolled steel sheet and strip is used in fabrication of metal members, hot-dip galvanize coating shall be in accordance with ASTM A 123 "Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products".

C. Thickness:

REFERENCE GAGE	MILS	MINIMUM BASE METAL THICKNESS (INCH)	MINIMUM DESIGN THICKNESS (INCH)
20	33	0.0329	0.0346
18	43	0.0428	0.0451
16	54	0.0538	0.0566
14	68	0.0677	0.0713
12	97	0.0966	0.1017
10	118	0.1180	0.1240

2.3 COMPONENTS

A. Studs: Manufacturer's standard C-shaped steel studs, punched, with stiffened flanges, complying with ASTM C 645 "Specification for Nonstructural Steel Framing Members".

B. Track: Manufacturer's standard U-shaped steel track, unpunched, with unstiffened flanges, complying with ASTM C 645 "Specification for Nonstructural Steel Framing Members".
   1. Slotted Deflection Track: Manufacturer's single, 20 gage minimum, deep-leg, U-shaped steel track; unpunched, with unstiffened flanges with vertical slotted holes, of web depth to contain studs while allowing free vertical movement, with flanges designed to support horizontal and lateral loads.
      a. Product, or approved equivalent, must be approved by DSA/SSS.
      b. Slotted Deflection Track must be rated for both 1 and 2 hour "T" and "F" Fire-Rated Assemblies.
   2. Double Deflection Tracks: Manufacturer's double, deep-leg, U-shaped steel tracks, consisting of nested inner and outer tracks; unpunched, with unstiffened flanges.
      a. Outer Track: Of web depth to allow free vertical movement of inner track, with flanges designed to support horizontal and lateral loads.

C. Vertical Deflection Clips: Manufacturer's standard head clips, capable of accommodating upward and downward vertical displacement of primary structure.

D. Ceiling Joists: Manufacturer's standard C-Shaped steel sections, with stiffened flanges, complying with ASTM C 645 "Specification for Nonstructural Steel Framing Members".

E. Channels: In sizes as shown in the Contract Documents:
   1. 16 gage, 3/4 inch with 1/2 inch flange 300 lbs/1000 feet weight.
   2. 16 gage, 1-1/2 inch with 17/32 inch flange 500 lbs/1000 feet weight.
   3. 16 gage, 2 inch with 17/32 inch flange 590 lbs/1000 feet weight.

F. Shaftwall: Manufacturer's standard shapes for fire-rated assemblies and complying with ASTM C 645 "Specification for Nonstructural Steel Framing Members". Shapes shall be 20 gage minimum, unless noted otherwise.
   1. Track: Manufacturer's standard J-Runner Shaped Track (JR), tabbed, with un-stiffened flanges.
   2. Studs: Manufacturer's standard C-H (CH), E-S (ES), I-S (IS) Shaftwall Studs, punched with stiffened flanges.
   3. Jamb Strut: Manufacturer's standard corner and Jamb Strut (JS), un-punched, with un-stiffened flanges.

G. Flat Strap and Backing Plate: Galvanized Steel Sheet for blocking and bracing in length and width required.
   1. Standard Backing shall be 16 gage minimum and continuous. Notch backing at studs.

H. Channel Bridging or Bracing:
   1. U-Channel Assembly per ASTM C 645 "Specification for Nonstructural Steel Framing Members", Base Metal Thickness of 0.0538 inch and minimum 1/2 inch wide flanges.

I. Steel Accessories: Fabricate Backing, Bridging, Clip Angles, Strap and Shapes in configurations shown and in compliance with ASTM C 645 "Specification for Nonstructural Steel Framing Members".

1. Standard Backing shall be 16 gage minimum and continuous. Notch backing at studs.

2.4 ACCESSORIES

A. Fasteners:
   1. Metal Screws: Provide corrosion-resistant-coated, self-drilling or self-tapping steel screws complying with ASTM C 1513 "Specification for Steel Tapping Screws for Cold-Formed Steel Framing Connections" and ICC ESR 2196 "HILTI Self-Drilling and Self-Piercing Screws".
      a. Provide low profile "Truss Head" framing screws so that subsequent substrates lay flat over fasteners.
   2. Power-Actuated Anchors: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with capability to sustain, without failure, a load equal to 10 times design load, as determined by testing per ASTM E 1190 "Test Methods for Strength of Power-Actuated Fasteners Installed in Structural Members" conducted by a qualified independent testing agency.
   3. Expansion Anchors: Refer to Specification Section – DRILLED ANCHORS.

B. Welding Electrodes: Comply with AWS Standards.

C. Galvanized Repair Paint: Provide product complying with ASTM A 780 "Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings".

D. Drypack Grout: Refer to Specification Section – CAST-IN-PLACE CONCRETE.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Site verification of conditions:
   1. Prior to the execution of the work under this specification section, inspect the installed work executed under other sections of this Project Manual which affect the execution of work under this specification section.
   2. Before sprayed fire-resistive materials are applied, attach continuous angles, supplementary framing, or tracks to structural members indicated to receive sprayed fire-resistive materials.
   3. Carefully coordinate all requirements for pipes and other items designed to be housed within the partition, wall or ceiling systems.
   4. Carefully coordinate all requirements for backing support of items to be mounted on finished walls.
   5. Space metal framing as required for compliance with all pertinent regulations, to give proper support for the facing material, and as indicated on the Drawings.

3.2 PREPARATION

A. Protection:
   1. Protect all adjacent surfaces from damage from work under this specification section.

2. Remove any fireproofing only as much of these materials as needed to complete installation of metal framing without reducing thickness of fire-resistive materials below that are required to obtain fire-resistance rating indicated. Protect remaining fire-resistive materials from damage.

B. Surface preparation:
1. Prepare surface in accordance with manufacturer's written instructions and recommendations.
2. Clean substrates of substances (oil, grease, rolling compounds, incompatible primers, loose mill scale, etc.) which could impair bond of materials specified within this section.
3. Grout bearing surfaces uniform and level to ensure full contact of bearing flanges or track webs on supporting concrete or masonry construction.

3.3 INSTALLATION

A. General:
1. In accordance with drawings and manufacturer's written instructions and recommendations, and procedures described in ASTM C 754 "Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products".
2. In accordance with approved submittals.
3. In accordance with Regulatory Requirements.
4. Set plumb, level, and square.
5. Metal Framing may be shop or field fabricated for installation, or it may be field assembled.

B. Layout:
1. Lines shall be straight and true.
2. Install Metal Framing according to ASTM C 754 "Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products", unless more stringent requirements are indicated.

C. Installation:
1. Install shop or field fabricated, Metal Framing and securely anchor to supporting structure.
   a. Bolt or weld wall panels at horizontal and vertical junctures to produce flush, even, true-to-line joints with maximum variation in plane and true position between fabricated panels not exceeding 1/16 inch in ten (10) feet.
2. Install Metal Framing and accessories plumb, square, and true to line, and with connections securely fastened, according to manufacturer's written recommendations and requirements of the Contract Documents.
   a. Cut framing members by sawing or shearing; do not torch cut.
   b. Fasten Metal Framing members by welding or screw fastening. Wire tying of framing members is not permitted.
      1) Comply with AWS D1.3 requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
      2) Locate mechanical fasteners and install, with screw penetrating joined members by not less than three exposed screw threads.

3) Beneath sheathing provide low-profile screw heads (i.e. "Wafer Head").
4) Fasten both flanges of studs to track, unless otherwise indicated.

3. Install framing members in one-piece lengths, unless splice connections are indicated for track or tension members.
4. Punched openings in studs must align when placed in final position.
5. Install temporary bracing and supports to secure framing and support loads comparable in intensity to those for which structure was designed. Maintain braces and supports in place, undisturbed, until entire integrated supporting structure has been completed and permanent connections to framing are secured.
6. Install horizontal bridging in wall studs, spaced in rows as indicated on the drawings. Fasten at each stud intersection.
7. Do not bridge building expansion and control joints with Metal Framing. Independently frame both sides of joints.
8. Install insulation in built-up exterior framing members, such as headers, sills, boxed joists, and multiple studs at openings, that are inaccessible on completion of framing work.
9. Fasten hole reinforcing plate over web penetrations that exceed size of manufacturer's standard punched openings.
10. Erection Tolerances: Install Metal Framing level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet and as follows:
    a. Space individual framing members no more than plus or minus 1/8 inch from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.
11. At all sound partitions, set floor runners in two 1/4 inch diameter continuous beads of acoustical sealant as prescribed in Specification Section - SEALANTS.
12. At all smoke barrier partitions, set floor and ceiling runners in two 1/4 inch diameter continuous beads of Class II Flame Spread and Smoke Developed rated acoustical sealant as prescribed in Specification Section - SEALANTS.
13. Install supplementary backing and bracing wherever walls or partitions are indicated to support equipment, services, casework, heavy trim and furnishings, and similar work requiring attachment to wall or partition. Comply with stud manufacturer's written instructions and industry standards.
14. Frame wall openings larger than 2-foot square with double stud at each jamb.
15. Install continuous strapping to side of studs that do not receive sheathing at 3'-6" o.c. vertically.

D. Ceiling Joist Installation:
1. Align and install joist track and ceiling joists plumb, square, and true to line bearing on supporting frame. Securely fasten connections according to manufacturer's written recommendations and requirements of the Contract Documents.
2. Install bridging at interval indicated on the drawings. Fasten at each joist intersection.

3.4 REPAIR / RESTORATION

A. Galvanizing Repairs: Prepare and repair damaged galvanized coatings on fabricated and installed Metal Framing with galvanized repair paint and manufacturer's written instructions.

B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and installer, that ensure Metal Framing is without damage or deterioration at time of Substantial Completion.

3.5 FIELD QUALITY CONTROL

A. Site Tests:
   1. As required by Regulatory Requirements.

B. Inspection:
   1. As required by Regulatory Requirements.
   2. Schedule inspections and notify the Project Engineer, Project Inspector and any other regulatory agencies of the time at least 48 hours prior to the inspection.
   3. Project Inspector shall verify that all stud cavity walls are free of moisture and dry prior to any other construction that encloses the wall cavity.

END OF SECTION

SECTION 092900 – GYPSUM BOARD

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:
   1. Provide all material, labor, equipment and services necessary to replace existing gypsum board materials, suspension systems, furring, accessories and other related items that was removed during the course of construction of this project.

B. Related Sections: The following Project Manual Sections contain requirements that relate to this section:
   1. ALL DIVISION 00 SPECIFICATION SECTIONS.
   2. ALL DIVISION 01 SPECIFICATION SECTIONS.
   3. 06 10 00 ROUGH CARPENTRY
   4. 07 21 00 INSULATION
   5. 07 84 00 FIRESTOPPING
   6. 07 92 00 SEALANTS
   7. 09 22 16 METAL FRAMING
   8. 09 50 00 ACOUSTICAL CEILINGS
   9. 09 91 00 PAINTING
   10. 10 26 00 WALL AND CORNER GUARDS
   11. ALL SPECIFICATION SECTIONS IN THE FACILITY SERVICES SUBGROUP.

1.2 REFERENCES

A. Standards:
   1. In accordance with the following standards:
      a. CISCA Ceilings & Interior Systems Construction Association.
      b. DITF Drywall Industry Trust Fund.
      c. GA Gypsum Association.
      d. MPI Master Painters Institute
      e. PDCA Painting and Decorating Contractors of America.
      f. PDSM Plaster and Drywall Systems Manual, ©1988 by BNI and McGraw-Hill, Inc., Third Edition.

1.3 SYSTEM DESCRIPTION

A. Suspension System Design Requirements: In accordance with allowable values and properties assigned and approved by CBC.
   1. Lateral Load Design: ASCE 7, Chapter 13.
   2. Design Weight for lateral loads: Total Weight does not exceed four (4) pounds per square foot, including air conditioning grilles and light fixtures.
   3. System is not to support lateral loads from partitions.
   4. Fasteners into concrete:

a. Must be capable of sustaining, without failure, a load equal to 200 lbs. tension for hangar wires and 440 lbs. tension for bracing wires.

5. Gypsum board suspended ceiling systems shall not support materials or building components other than grills, light fixtures, small electrical conduits, small ducts and the like.
   a. All such components shall be supported either directly from main runners, or by supplemental framing, which is supported by main runners.
   b. No vertical loads other than gypsum board dead load shall be applied to cross-furring.

1.4 SUBMITTALS

A. Submit in accordance with Specification Section - SUBMITTAL PROCEDURES:
   1. Product Data.
      a. Gypsum board fastening schedule: Indicate type, size and spacing of fasteners for each type of framing and fire resistive condition.
      b. Manufacturer's written recommended construction instructions or handbook for all gypsum board panel products and accessories.
      c. Manufacturer's written recommended construction instructions or handbook for all suspension system products and accessories
      d. Manufacturer's data for all types of gypsum board used on this project.
   2. Samples.
      a. Provide 24 inch square samples for all textures for each level of finish.
      b. Provide 4 inch lineal samples of each piece of metal trim accessory specified.
      c. Provide 12 inch lineal samples of Suspension System components for each type of system specified.
   3. Quality Assurance/Control Submittals:
      a. Test Reports:
         1) Site Tests of suspended gypsum board ceiling fasteners and anchors provided by Testing Agency.
      b. Certificates:
         1) General Construction: Certificate signed by the Contractor on Contractor's letterhead.
         2) Products: Certificates signed by manufacturers of gypsum board assembly components.
   4. Closeout Submittals in accordance with Specification Section -PROJECT DOCUMENTS.
      a. Warranty in accordance with Specification Section - WARRANTIES.

1.5 QUALITY ASSURANCE

A. Qualifications:
   1. Material Qualifications:
      a. Where fire-rated gypsum board assemblies are indicated, provide materials and construction identical to those of assemblies tested for fire resistance per ASTM E 119 "Test methods for Fire Tests of Building Construction and Materials", by an independent testing and inspecting agency acceptable to CSFM.

b. Empty containers shall not be removed from site without the Project Inspector's approval.

2. Installer Qualifications:
   a. Engage an experienced Installer who has successfully completed three (3) projects of similar scope and size to that indicated for this Project.
      1) Helpers and apprentices used for such work shall be under full and constant supervision at all times by thoroughly skilled gypsum board installers.
      2) In the acceptance or rejection of installed gypsum board, no allowance will be made for lack of skill on the part of installers.

B. Regulatory Requirements:
   1. In accordance with Specification Section - REGULATORY REQUIREMENTS, and the following:
      a. CARB Materials and equipment used for this Project shall comply with the current applicable regulations of the California Air Resources Board (CARB) and the Environmental Protection Agency (EPA), in the area where the project is located.
      b. IR Interpretation of Regulations.

C. Certificates:
   1. General Construction: Contractor to certify that work provided, meets or exceeds the requirements of this section.
   2. Manufacturers of gypsum board assembly components certify that their products comply with specified requirements.
      a. Certify that all adhesive and compound materials have a good shelf life longer than the construction period of this project.

D. Mockups:
   1. Before starting the finishing of gypsum board surfaces, install mockups of at least 100 sq. ft. in surface area to demonstrate aesthetic effects and qualities of materials and execution.
      a. Install mockups for the following applications:
         1) All surfaces without finish texture.
         2) All surfaces without finish texture to be painted.
         3) All surfaces with finish texture to be painted.
      b. Simulate finished lighting conditions for review of mockups.
      c. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

E. Meetings:
   1. Pre-Installation: Scheduled by the Contractor prior to the start of work.
      a. Coordinate the work with other work being performed.
      b. Identify any potential problems that may impede planned progress and proper installation of work regarding quality of installation and warranty requirements.
   2. Progress: Scheduled by the Contractor during the performance of the work.
      a. Review for proper installation of work progress.
      b. Identify any installation problems and acceptable corrective measures.
      c. Identify any measures to maintain or regain project schedule if necessary.
   3. Completion: Scheduled by the Contractor upon proper completion of the work.

a. Inspect and identify any problems that may impede issuance of warranties or guaranties.
b. Maintain installed work until the Notice of Substantial Completion has been executed.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Packing, shipping, handling, and unloading:
1. Products shall be handled in such a manner as to assure that they are free from dents, scratches and other damage.

B. Acceptance at Site:
1. Products must be in manufacturer's original unopened containers with labels indicating brand name, model, and grade.
2. Damaged products will not be accepted.

C. Storage and protection:
1. Products shall be stored above ground on level platforms, six (6) inches above ground, allowing air circulation under stacked units.
a. Cover materials with protective waterproof covering providing for adequate air circulation and ventilation.

1.7 WARRANTY

A. Contractor's General Warranty:
1. In accordance with Specification Section - WARRANTIES.

B. Manufacturer’s Warranty:
1. In accordance with manufacturer's written standard warranty:
a. Warranty Period One (1) Year.

C. Installer's Warranty:
1. In accordance with the terms of the Specification Section - WARRANTIES:
a. Warranty period One (1) Year.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. These products listed herein establish the size, pattern, color range and function selected by the Project Engineer for this Project. Manufacturers that are listed as acceptable alternative manufacturers and substitutions must still comply with the requirements of this project and the products listed in order to be approved as an equivalent during the Submittal Process. If the acceptable alternative manufacturers listed or substitutions are not approved during the Submittal Process due to non-compliance with the contract documents, then the Contractor shall submit product specified.
1. Specified gypsum board products manufacturer:

a. NATIONAL GYPSUM COMPANY.
   1) Wallboard "REGULAR".
   2) Water-Resistant "XP GYPSUM BOARD".
   3) Shaftwall "SHAFTLINER".
   4) Sheathing "GYPSUM SHEATHING".
   5) Soffit "EXTERIOR SOFFIT BOARD".
b. Acceptable alternative manufacturers:
   1) PABCO:
      a) Wallboard "REGULAR" AND "TYPE X".
      b) Water-Resistant "MOLD CURB PLUS".
      c) Shaftwall "MOLD CURB PLUS SHAFLINER".
      d) Sheathing "GLASS SHEATHING".
      e) Soffit "EXTERIOR SOFFIT".
   2) UNITED STATES GYPSUM COMPANY - "SHEETROCK".
      a) Wallboard "SW EDGE".
      b) Water-Resistant Walls: "MOLD TOUGH", Ceilings: "ULTRALIGHT MOLD TOUGH".
      c) Shaftwall "LINER PANEL-MOLD TOUGH".
      d) Sheathing "SECUROCK GLASS-MAT SHEATHING".
      e) Soffit "EXTERIOR GYPSUM CEILING BOARD".

2. Specified gypsum board accessories product manufacturer:
   a. Prep. Coat (Drywall Primer):
      1) WESTPAC MATERIALS "PREP COAT".
      2) Acceptable alternative manufacturer:
         a) UNITED STATES GYPSUM - SECUROCK First Coat Primer.
   b. Primer-Surfacer: "TUFF-HIDE".
      1) UNITED STATES GYPSUM COMPANY.
   c. Other Accessories:
      1) CLARK DIETRICH BUILDING SYSTEMS, LLC (CDBS).

B. Products from other manufacturers not listed must submit in accordance with Specification Section - SUBSTITUTION PROCEDURES.

C. Products specified represents the quality and standards of materials to be used. Actual products to be installed are to match existing construction materials.

2.2 MATERIALS

A. Furring:
   1. Metal Angles: 24 gage galvanized steel.
      a. 1-3/8 inch x 7/8 inch 190 lbs./1000 feet weight.
   2. Cold Rolled Channels: 16 gage galvanized steel
      a. For furred walls and ceilings.
         1) 3/4 inch x 1/2 inch flange: 300 lbs./1000 feet weight.
         2) 1-1/2 inch x 17/32 inch flange: 500 lbs./feet weight.
         3) 2 inch x 17/32 inch flange: 590 lbs./1000 feet weight.
   3. Resilient Channels (USG's RC-1): 25 gage corrosion resistant steel.

a. Pre-punched holes at 4 inches on center in the flange to facilitate screw attachment only into framing. For improving sound transmission loss through framed partitions and ceilings.
1) 1/2 inch flange x 2-1/2 inch overall w/1-1/2 inch offset flange x 1/2 inch offset:
a) 200 lbs./1000 feet weight.

4. Zee Channels: 24 gage corrosion resistant steel.
a. 1 inch thick x 7/8 inch x 1-1/4 inch 224 lbs./1000 feet weight.
b. 1-1/2 inch x 7/8 inch x 1-1/4 inch 269 lbs./1000 feet weight.
c. 2 inch x 7/8 inch x 1-1/4 inch 313 lbs./1000 feet weight.
d. 3 inch x 7/8 inch x 1-1/4 inch 400 lbs./1000 feet weight.

5. Hat Channels:
a. 7/8 inch x 2-9/16 inch 276 lbs./1000 feet weight (25 gage).
b. 7/8 inch x 2-9/16 inch 515 lbs./1000 feet weight (20 gage).

6. Channel Clips:
a. Pre-formed galvanized wire used for attaching metal furring channels to cold rolled channels and single gypsum panel systems only.
1) 1-1/2 inch x 2-3/4 inch 38 lbs./1000 feet weight.

B. Suspension System:
1. General: Comply with ASTM C754 "Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products", for conditions indicated.
2. Wires: ASTM A641 "Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire", Class 1 zinc coating, soft temper:
a. Tie: 0.0625 inch diameter wire (16 gage), or double strand of 0.0475 inch diameter (18 gage) wire.
b. Hanger: 0.162 inch diameter (8 gage).
c. Brace: 0.106 inch diameter (12 gage).

3. Anchors:
a. General: Fabricate from corrosion-resistant material with holes or loops for attaching hanger and brace wires.
1) Ceiling Clips: 3/4 inch wide x 0.0934 inch galvanized sheet (13 gage).
2) Steel Straps:
a) 1 inch wide x length as required x 0.108 inch galvanized sheet (12 gage).
b) 3 inches wide x 4 inches long x 0.108 inch galvanized sheet (12 gage).

4. Main Runners:
a. Hot Rolled Channels:
1) 1-1/2 inch web x 1/2 inch flange x 1/8 inch thick 1,120 lbs./1000 feet weight.

5. Cross Furring:
a. Hat Channels:
1) 7/8 inch thick x 2-9/16 inch 276 lbs./1000 feet weight.

6. Compression Struts (Metal angles, galvanized steel):
a. 1/8 inch thick x 1 inch x 1 inch 800 lbs./1000 feet weight.
b. 3/16 inch thick x 1-1/4 inch x 1-1/4 inch 1,480 lbs./1000 feet weight.
c. 3/16 inch thick x 1-1/2 inch x 1-1/2 inch 1,800 lbs./1000 feet weight.

d. 3/16 inch thick x 1-3/4 inch x 1-3/4 inch 2,120 lbs./1000 feet weight.
e. 3/16 inch thick x 2 inch x 2 inch 2,440 lbs./1000 feet weight.
f. 3/16 inch thick x 2 inch x 2-1/2 inch 3,070 lbs./1000 feet weight.
g. 3/16 inch thick x 3 inch x 3 inch 3,710 lbs./1000 feet weight.
h. 1/4 inch thick x 3-1/2 inch x 3-1/2 inch 5,800 lbs./1000 feet weight.
i. 1/4 inch thick x 4 inch x 4 inch 6,600 lbs./1000 feet weight
j. Alternate Compression Struts Refer to drawings.
1) Must be submitted to and approved by DSA.

7. Shaft Wall Framing: Shaft Wall Steel Framing listed below are manufactured by USG, or approved equivalent.
a. CR-Runners:
1) 2"-width 25 gage.
b. J-Runners:
1) 2-1/2", 4" or 6" as required 20 gage.
c. E-Studs:
1) 2-1/2", 4" or 6" as required 20 gage.
d. C-H Studs:
1) 2-1/2", 4" or 6" as required 20 gage.
e. Jamb Studs:
1) 2-1/2", 4" or 6" as required 20 gage.
f. H-Studs:
1) 2"-width 25 gage.

C. Wallboard: For interior walls and ceilings.
1. Standard: In accordance with ASTM C 1396 "Standard Specification for Gypsum Board".
2. Size: See drawings for specific thickness locations:
a. 5/8 inch thick by 4 foot wide maximum by practical length to minimize joints.
1) When curved walls are indicated on the drawings, provide multiple layers of 1/4 inch & 3/8 inch thick by 4 foot wide maximum by practical length to minimize joints.
3. Long Edges: SW Tapered.
4. Core Type:
a. Non-Fire Rated: Regular.
b. Fire Rated Type X at fire-resistive-rated assemblies.
5. Finish: Natural-finish face paper suitable for paint, wallpaper or other decorations.

D. Water-Resistant: For interior walls subjected to, but not constant, moisture and humidity and at adhesive application of ceramic tile and wallcoverings.
1. Standard: In accordance with ASTM C 1396 "Standard Specification for Gypsum Board".
a. Surface Burning Characteristics: ASTM E 84 "Test Method for Surface Burning Characteristics of Building Materials":
1) Flame Spread: 20.
2) Smoke Developed: 0.
2. Size - see drawings for specific thickness locations:
a. 5/8 inch thick by 4 foot wide maximum by practical length to minimize joints.
3. Long Edges: Tapered.

4. Core Type:
   a. Non-Fire Rated: Regular water-resistant core all the way through.
   b. Fire Rated: Type X and water-resistant additives all the way through, at fire-resistive-rated assemblies.
5. Finish: Multi-layered paper facings, chemically treated to resist moisture penetration.
   a. Color of the face paper is dependent on the manufacturer.

E. Metal Accessories:
1. Corner Beads:
   a. Outside Corner, 1-1/4 inch x 1-1/4 inch galvanized:
      1) CDBS / USG "Dur-A-Bead" #103.
2. Edge Trim:
   a. "U"-Shaped 1 inch galvanized CDBS / USG #200-A, size to fit gypsum board.
   b. "L"-Shaped 1 inch galvanized CDBS / USG #200-B, size to fit gypsum board.
      1) When "U"-Shaped molding above cannot be used.
3. Control Joint:
   a. 1-3/4" wide, 1/4" wide center channel with removable tape strip:
      1) CDBS / USG #093.

2.3 ACCESSORIES

A. Water:
1. Clean, fresh and free from deleterious amounts of foreign material.

B. Fasteners:
1. At Gypsum Board: In accordance with the manufacturer's written recommendations and the following:
   a. Nails: In accordance with CBC Chapter 7 and ASTM C 514 "Standard Specification for Nails for the Application of Gypsum Board".
   b. Screws: In accordance with CBC Chapter 7, ASTM C 1002 "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", type S, G, and W, and ASTM C 954 "Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs from 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness", Type S-12.
      1) Provide "Bugle Head" screws that help prevent damage to the gypsum core and face paper.
   c. Adhesives: In accordance with ASTM C 475 "Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board".
      1) Commercial adhesives bridging minor irregularities in the base or framing at "non-fire-rated" construction.
         a) In accordance with ASTM C 557 "Standard Specification for Adhesives for Fastening Gypsum Wallboard to Wood Framing".
2. At Suspension Systems:
   a. Wood Construction:
      1) Eye screws, minimum 1/4 inch diameter, 1-1/4 inch minimum embedment.
      2) Staples, 1-1/2 inch x 0.148 inch diameter (9 gage).
      3) Nails, "STRONGHOLD-J" nails.
   b. Steel Framing:

1) Shot-in Anchors.
2) Metal Deck or Metal Deck without Structural Concrete:
3) Screws, self-tapping, minimum #8 x 1/2 inch.

C. Joint reinforcement tape and joint compounds:
1. In accordance with ASTM C 474 "Standard Test Methods for Joint Treatment Materials for Gypsum Board Construction" and C 475 "Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board", and Gypsum Board Manufacturer's written recommendations of both the manufacturers of sheet products and of joint treatment materials for each application indicated.
a. Joint Tapes:
1) Paper reinforcing tape, unless otherwise indicated.
2) Polymer-coated, open glass-fiber mesh for cementitious backer units.
b. Setting-Type Joint compounds for gypsum board: Factory-packaged, job-mixed, chemical-hardening powder products formulated for uses indicated.
1) When used for taping and filling only, use formulation that is compatible with other joint compounds applied over it.
2) When used for pre-filling gypsum board joints, use formulation recommended by gypsum board manufacturer for this purpose.
3) When used for filling joints and treating fasteners of water-resistant gypsum backing board behind base for ceramic tile, use formulation recommended by the gypsum board manufacturer for this purpose.
4) When used for topping compound, use sandable formulation.

D. Prep. Coat: Provide a preparation coat of the specified material to gypsum board surfaces to be decorated with all paints.

E. Textured Finish Coats: Gypsum Board manufacturer supplying the products to this project shall also supply the Texture Finishes to provide distinctive appearance and surface decoration to gypsum board panel walls and ceilings, and as scheduled at the end of this Specification Section.

F. Other Materials: All other miscellaneous materials, not specifically described, but required for a complete and proper installation of gypsum board, shall be as selected by the Contractor subject to the approval of the Project Engineer.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Site verification of conditions:
1. Prior to the execution of the work under this specification section, inspect the installed work executed under other sections of this Project Manual which affect the execution of work under this specification section.
2. Report unacceptable conditions to the Project Engineer. Do not begin work until unacceptable conditions have been corrected.
3. Execution of work under this specification section shall constitute acceptance of existing conditions.

3.2 PREPARATION

A. Coordination:
1. Coordinate work under this specification section with work specified under other sections to ensure proper and adequate interface of work.
2. Coordinate proper placement of ceiling mounted tracks, accessories, light fixtures, HVAC, registers and other items, which are to be integrated with gypsum board ceilings.

B. Protection:
1. Do not begin work until all rooms have been protected against the weather, and the building is covered and fully enclosed. Wet gypsum board after installation shall be removed and replaced at no extra cost to the Owner.
2. Protect all adjacent surfaces from drips, spray, air pollution of surrounding environment, and other damage from work under this specification section.

C. Surface preparation:
1. Prepare surface in accordance with manufacturer's written instructions and recommendations.
2. Clean substrates of substances (oil, grease, rolling compounds, incompatible primers, loose mill scale, etc.) which could impair bond of materials specified within this section.

3.3 INSTALLATION

A. General:
1. In accordance with manufacturer's written instructions and recommendations unless specifically noted otherwise.
2. In accordance with Regulatory Requirements.
   a. DSA's IR 25-3 "Drywall Ceiling Suspension Conventional Construction-One Layer".
3. Set plumb, level, and square.

B. Layout:
1. Lines shall be straight and true.
2. Control Joints:
   a. Layout in accordance with GA-234-08 for both Non-Rated and Rated wall and ceiling conditions as follows:
      1) Provide Control Joints at in an uninterupted straight plane exceeding 30 ft. in length and total area between control joints, such that no area exceeds 900 sq.ft.

C. Suspension System Installation: In accordance with DSA's IR 25-3.
1. Hanger and Main Runner Installation:
   a. Vertical hanger wires shall be #8 gage and galvanized; use #12 gage wire in "non-accessible" ceiling areas.
   b. Hanger spacing shall be 4'-0" o.c. with 1-1/2 inch hot rolled main runners (weighing 1.12 lbs./ft.).
   c. Bracing assemblies shall not be greater than a 12' by 12' on center spacing.
      1) Provide bracing assemblies at locations not more than 1/2 the spacing given above, from each perimeter wall and at edge of vertical ceiling offsets.

2) The slope of these wires shall not exceed 45 degrees from the plane of the ceiling and shall be taut. Splices in bracing wires are not to be permitted without special AHJ approval.
3) Ceiling grid members may be attached to not more than two (2) adjacent walls. Ceiling grid members shall be at least 1/2" free of other walls.
4) If walls run diagonally to ceiling grid system runners, one end of main and cross runners shall be free, and a minimum of 1/2" clear of wall.
5) Suspended ceiling systems with an area of 144 square feet or less, and fire rated ceiling systems with an area of 96 square feet or less, surrounded by walls which connect directly to the structure above, do not require bracing assemblies when attached to at least two adjacent walls.

d. Fasten hanger wires with not less than three tight turns.
1) Fasten bracing wires with not less than four tight turns.
2) Make all tight turns within a distance of 1-1/2 inches.
3) Hanger or Bracing Wire anchors to the structure shall be installed in such a manner that the direction of the wire aligns as closely as possible with the direction of the forces acting on the wire.
a) Wire turns made by machine where both strands have been deformed or bent in wrapping can waive the 1-1/2" requirement, but the number of turns shall be maintained, and be as tight as possible.
4) Separate all ceiling and bracing wires at least six inches (6") from all unbraced ducts, pipes, conduit, etc. It is acceptable to attach lightweight items, such as single electrical conduit not exceeding 3/4" nominal diameter, to hanger wires using connectors acceptable to AHJ.

e. Hangers shall be saddle-tied around main runners to develop the full strength of the hangers.
f. Main Runners shall be spliced by lapping and interlocking flanges 12 inches minimum and tying near each end with double loops of #16 gage wire.
g. Provide trapeze or other supplementary support members at obstructions to typical hanger spacing. Provide additional hangers, struts or braces as required at all ceiling breaks, soffits or discontinuous areas. Hanger wires that are more than 1 in 6 out of plumb shall have countersloping wires.
h. All recessed or drop-in light fixtures, as well as ceiling mounted mechanical air terminals and services, shall be supported directly by main runners or by supplemental framing which is supported by main runners and positively attached with screws or other approved connectors.
i. Surface mounted fixtures shall be attached to a main runner with a positive clamping device made of material with a minimum of 14 gage. ROTATIONAL SPRING CLAMPS DO NOT COMPLY.

2. Cross-Furring:
a. Cross-Furring shall be 7/8 inch, 25 gage galvanized hat sections at 24 inches on center maximum.
b. Cross-Furring shall be saddle-tied to the main runners with one strand of #16 gage, or two strands of #18 gage tie wire.
c. Cross-Furring shall be spliced by lapping and interlocking the pieces eight inches minimum and tying near each end with double loops of #16 gage wire.

D. Furring Channels:

1. Attach hat channels at 16" o.c. to framing members at 24" o.c. maximum with one 1-1/2" Type "G" screw at each bearing point. Stagger screws to opposite sides at every bearing surface.

E. Gypsum Board:
1. General:
   a. During Winter Weather Installation periods, follow the GA-220 GYPSUM BOARD WINTER RELATED INSTALLATION RECOMMENDATIONS.
2. Install in accordance with CBC Chapter 25, DITF and GA recommendations, gypsum board panel manufacturer's written recommendations and in accordance with fire-rated design numbers.
   a. At Ceilings and Soffits:
      1) At gypsum board ceilings and soffit areas, install the ceiling prior to installing the walls.
      2) Float the interior ceiling angles, and where permitted by code,
   b. At Sound and Acoustical Walls:
      1) Set all gypsum board panels on each side of the partition in a continuous 1/4 inch bead of acoustical sealant furnished and installed in accordance with the provisions of Specification Section – SEALANTS.
   c. At Water Resistant Walls:
      1) Install where scheduled and in all areas where high moisture conditions are present, or ceramic tile, or wall coverings are scheduled over gypsum board.
      2) In all areas to be tiled, treat all edges, cutouts, utility holes and joints, corners and nailheads with an approved sealant material in lieu of standard taping. Joints not to be covered by tile shall be treated as regular gypsum board. Do not use standard joint compound under ceramic tile.
   d. At Sheathing:
      1) Screw-attach sheathing to exterior of each stud with 1" Type "S-12" corrosion resistant screws spaced 3/8" from ends and edges and approximately 8" o.c. Apply sealant around sheathing perimeter at interface with other materials and install flashing.
3. Install gypsum board panels horizontally on walls, floor to ceiling.
4. At metal frames terminate wall board panel edge inside frame. Do not terminate gypsum board panel edge against metal frame trim unless otherwise indicated.

F. Cutting:
1. Cut gypsum board panels by scoring and breaking or by sawing, working from the face side.
   a. When cutting by scoring, cut through the face paper and then snap the panel back away from the cut face; then break the backpaper by snapping the panel in the reverse direction or by cutting the back paper.
2. Smooth all cut ends and edges of panels as necessary to obtain a smooth joint.
3. For cut-outs in panels for pipes, fixtures, and other small openings, make holes and cut-outs by sawing or by such other method as will not fracture the core or tear the covering and with such accuracy that plates, escutcheons, or trim will cover the edges.
4. The use of "score-and-knockout" method will not be permitted.

G. Metal Accessories:
1. Corner Beads:

a. Install at all corners with galvanized screws at nine (9) inch intervals in both flanges with fasteners placed opposite one another the full length of the corner bead. Clinch-on fastening is not allowed.
   1) Fasteners shall be driven below the anticipated finished joint compound surface.
b. Install in one piece except when length of corner exceeds stock lengths – then put splice up high away from people traffic.

2. Edge Trim: Install at all exposed joints where gypsum board panels abut another material with galvanized screws at nine (9) inch intervals the full length of the edge trim. Clinch-on fastening is not allowed.
   a. Fasteners shall be driven below the anticipated finished joint compound surface.
   b. Provide joint sealer in accordance with Specification Section – SEALANTS.
      1) Provide fire sealant in accordance with Specification Section – FIRSTOPPING or Specification Section – SEALANTS, when the wall or ceiling is part of a fire-rated situation.
3. Control Joints:
   a. Install at 30'-0" o.c. maximum at all interior walls or partitions with uninterrupted planes that exceed 30' in length.
      1) Opening frames that are full height of wall or partition may be considered a control joint.
   b. Install at 50'-0" o.c. maximum at all interior ceilings and shall not exceed 2,500 sq.ft. in total area with perimeter relief.
   c. Install at 30'-0" o.c. maximum at all interior ceilings and shall not exceed 900 sq.ft. in total area without perimeter relief.

H. Fastening:
1. Properly space all fasteners in careful accordance with the manufacturer's written recommendations and code requirements, with heads driven slightly below the surface for proper cementing, but without breaking the paper face.
2. Loosely butt all joints to be taped; firmly butt all joints to be left untreated.
3. Stagger all end joints and the joints between panels to achieve a maximum of bridging and a minimum of continued joints.

I. Taping and Finishing:
1. First Coat:
   a. Spread compound evenly over all joints, using suitable tools designed for the purpose.
   b. Fill all joint recesses and metal trim.
   c. Center the reinforcing tape on the joint and press into the fresh compound at all joints, wiping down with sufficient pressure to remove excess compound but leaving sufficient compound under the tape for proper bond.
   d. Feather all edges and leave the surface free from blisters and tape wrinkles.
   e. Apply compound to all fastener recesses, leaving flush with the adjacent surfaces.
   f. Fold reinforcing tape along its centerline and apply to all interior angles, following the same procedure as for joints.
   g. Surfaces shall be free of excess joint compound.
2. Second Coat:
   a. Lightly sand the dry compound with fine sandpaper to remove all irregularities.
   b. Apply a second coat of compound to all joints, feathering approximately three inches beyond edges of tape.

c. Apply second coat to all fastener recesses.
d. Surfaces shall be free of excess joint compound.

3. Third Coat:
a. Lightly sand the dry compound with fine sandpaper to remove irregularities.
b. Apply final skim coat, feathering out approximately two inches beyond second coat.
c. Third coat all fastener recesses and metal trim, and all interior angles; allow to dry.
d. Surfaces shall be free of excess joint compound.

J. Prep. Coat (Drywall Primer):
1. Apply Prep. Coat material at approximately 200 sq.ft. per gallon for all painted wall surfaces. Follow manufacturer's written recommendations for proper preparation of material, mixing and installation at recommended minimum coverage rates.
a. For smooth walls with no texture, provide airless sprayer application in accordance with manufacturer's written recommendations.
1) Fine finish: Sand wall surface with 220 grit mesh screen after application of Prep. Coat. **Do not oversand!**
b. For textured walls: Provide roller application with a 3/8" to 1/2" nap roller before texture application is applied in accordance with manufacturer's written recommendations.

K. Primer - Surfacer:
1. Apply Primer - Surfacer material at manufacturer's written recommendations for proper preparation of material, mixing and installation, and at recommended minimum coverage rates.
a. For smooth walls with no texture, provide airless sprayer application in accordance with manufacturer's written recommendations.
1) Fine finish: Sand wall surface with 220 grit mesh screen after application of Primer - Surfacer. **Do not oversand!**
b. For textured walls: Provide roller application with a 3/8" to 1/2" nap roller before texture application is applied in accordance with manufacturer's written recommendations.

L. Textured Finish Coats: After taping and finishing, apply Textured Finish Coats as indicated in the schedule at the end of this Specification Section.

3.4 FIELD QUALITY CONTROL

A. Site Tests:
1. Testing Agency: The Owner's Testing Laboratory Agency shall perform field tests and Inspections and prepare test reports.
a. Testing and inspecting of completed installations of suspended gypsum board ceiling fasteners and anchors shall take place in successive stages, in areas of extent and using methods as follows. Do not proceed with installations of gypsum board ceiling hangers for the next area until test results for previously completed installations of acoustical panel ceiling hangers show compliance with requirements.

2. Extent of Each Test Area: When installation of ceiling suspension systems on each floor has reached 20 percent completion but no panels have been installed:
   a. Concrete Anchors:
      1) Must be capable of sustaining, without failure, a load equal to 200 lbs. tension for hanger wires and 440 lbs. tension for bracing wires by construction as determined by testing according to ASTM E 488 "Test Methods for Strength of Anchors in Concrete and Masonry Elements", by a qualified independent testing agency.
         a) Hanger Wire Anchors 1 in 10 must be field tested.
         b) Bracing Wire Anchors 1 in 2 must be field tested.
3. Remove and replace gypsum board ceiling hangers where test results indicate that they do not comply with specified requirements.
4. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
   a. When testing discovers fasteners and anchors that do not comply with requirements, testing agency will test those anchors ot previously tested until 20 pass consecutively and then will resume initial testing frequency.

B. Inspection:
   1. As required by Regulatory Requirements.
   2. Schedule inspections and notify the Project Engineer, Project Inspector and any other regulatory agencies of the time at least 48 hours prior to the inspection.
   3. No work shall be without the inspections required by Regulatory Requirements.

3.5 CLEANING

A. Clean in accordance with Specification Section - PROJECT CLOSEOUT.
   1. Clean any soiled surfaces immediately.
   2. Clean any soiled surfaces at the end of each day, minimum.
   3. Finish shall be clean and ready for the application of any additional finishes.
   4. In accordance with manufacturer's written instructions and recommendations.

3.6 PROTECTION

A. Protection from weather:
   1. Protect newly installed work from moisture after installation.

B. Protection from traffic:
   1. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and installer, which ensures the work of this section being without damage or deterioration until the time of Substantial Completion.

3.7 SCHEDULES

A. The following textured finish coat finishes shall be applied to the board surfaces within the scope of this section prior to covering with other finish materials.
   1. Refer to the Material and Finish Schedule for specific locations of each substrate finish.

2. Where no specific substrate finish is called for on the drawings, select the appropriate level of substrate finish from the descriptions below for the final finish material.
3. Where no determination can be made from the descriptions below, provide a minimum of GB-2 substrate finish.
4. Where sound, smoke control or fire-ratings are required, details of construction shall be in accordance with reports of tested assemblies meeting the requirements.

B. GB-1 - Project Engineer's Finish Designation:
1. Level 5 - GYPSUM ASSOCIATION'S LEVEL OF GYSPSUM BOARD FINISH:
   a. All joints 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. A thin skim coat of joint compound or a material manufactured especially for this purpose, shall be applied to the entire surface. The surface shall be smooth and free of tool marks and ridges.
   b. Project Engineer’s Finish:
      1) Uniformly smooth and ready to receive light grade wallcoverings, or fine textured finishes, or flat, semi-gloss, or gloss paints over flat surfaces.
      2) Use “Fog and Splatter” fine textured finish where walls and ceilings are scheduled to be painted, unless otherwise noted.

C. GB-2 - Project Engineer's Finish Designation:
1. Level 4 - GYPSUM ASSOCIATION'S LEVEL OF GYSPSUM BOARD FINISH:
   a. All joints 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 surfaces shall be smooth and free of tool marks and ridges.
   b. Project Engineer’s Finish:
      1) Uniformly smooth and ready to receive light textures (“Spray-Splatter”, “Orange Peel” (light or heavy) ‘Stipple” or “Skip Trowel” finishes), or medium grade wall-coverings.
      2) Use “Orange Peel” light texture finish when walls and ceilings are scheduled to be painted, unless otherwise noted.

D. GB-3 - Project Engineer's Finish Designation:
1. Level 2 - GYPSUM ASSOCIATION'S LEVEL OF GYSPSUM BOARD FINISH:
   a. All joints and interior angles shall have tape embedded in joint compound and wiped with a joint knife leaving a thin coating of joint compound over all joints and interior angles. Fastener heads and accessories shall be covered with a coat of joint compound. Surface shall be free of excess joint compound. Tool marks and ridges are acceptable. Joint compound applied over the body of the tape at the time of tape embedment shall be considered a separate coat of joint compound and shall satisfy the conditions of this level.
   b. Project Engineer’s Finish:
      1) Total surface must be sufficiently smooth to create a good bonding plane acceptable for installation of scheduled materials (ceramic tile, plywood, acoustical tile or similar materials).

E. GB-4 - Project Engineer's Finish Designation:

1. Level 3 - GYPSUM ASSOCIATION'S LEVEL OF GYSPSUM BOARD FINISH:
   a. All joints and interior angles shall have tape embedded in joint compound and one additional coat of joint compound applied over all joints and interior angles. Fastener heads and accessories shall be covered with two separate coats of joint compound. All joint compound shall be smooth and free of tool marks and ridges.
   b. Project Engineer’s Finish:
      1) Uniformly smooth and ready to receive heavy grade wallcoverings or medium heavy texture finishes (spray or hand applied).
      2) Use medium textured finishes where walls and ceilings are scheduled to be painted, unless otherwise noted.

F. GB-5 - Project Engineer's Finish Designation:
   1. Level 1 - GYPSUM ASSOCIATION'S LEVEL OF GYSPSUM BOARD FINISH:
      a. 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.
      b. Project Engineer’s Finish:
         1) No applied texture. Use at areas that are above finished ceilings, in attics, in areas where the assembly would generally be concealed.

G. GB-6 - Project Engineer's Finish Designation:
   1. Level 0 - GYPSUM ASSOCIATION'S LEVEL OF GYSPSUM BOARD FINISH:
      a. No taping, finishing, or accessories required.
      b. Project Engineer’s Finish:
   2. Intended for “Temporary Partitions” and not for permanent construction. Not suitable for Fire-resistive construction.

H. Non-rated and fire-rated wall signage:
   1. Provide identification on both sides of all non-rated, fire-rated, and area separation walls with 3" high stenciled letters above ceiling line and no further than 30' from the adjacent identification symbol. Intersecting walls with different ratings shall be identified 5' from such intersection. All identification symbols shall be visible without the aid of a ladder or other similar devices. Colors listed below are from PPG/ICI's "DEV-GUARD" 4208 Series Industrial Interior Enamel line.

	IDENTIFICATION	**COLOR OF IDENTIFICATION**
a.		
b.	Non-Rated Wall	Semi-Gloss Black
c.	1-HR Fire Wall	Fire Red
d.	1-HR Occupancy Separation Wall	International Orange
e.	2-HR Fire Wall	Safety Blue
f.	2-HR Occupancy Separation Wall	Cobalt Blue
g.	2-HR Shaft Wall	Safety Green
h.	3-HR Fire Wall	Prairie Beige
i.	4-HR Fire Wall	Safety Yellow

END OF SECTION

SECTION 095000 – ACOUSTICAL CEILINGS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:
   1. Provide all material, labor, equipment and services necessary to replace existing Acoustical Ceiling Materials, Suspension Systems, accessories and other related items that was removed during the course of construction.

B. Related Sections: The following Project Manual Sections contain requirements that relate to this section:
   1. ALL DIVISION 00 SPECIFICATION SECTIONS.
   2. ALL DIVISION 01 SPECIFICATION SECTIONS.
   3. 06 10 00 ROUGH CARPENTRY
   4. 07 21 00 INSULATION
   5. 09 22 16 METAL FRAMING
   6. 09 29 00 GYPSUM BOARD
   7. 09 91 00 PAINTING
   8. ALL SPECIFICATION SECTIONS IN THE FACILITY SERVICES SUBGROUP.

1.2 REFERENCES

A. Standards:
   1. In accordance with the following standards:
      a. CISCA Ceilings & Interior Systems Construction Association.

1.3 SYSTEM DESCRIPTION

A. Suspension System Design Requirements: In accordance with allowable values and properties assigned and approved by CBC.
   1. Heavy Duty in accordance with ASTM C 635 "Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and lay-in Panel Ceilings," ASTM E 580 “Practice for Application of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Requiring Seismic Restraint”, Section 5.1, ASCE 7 as modified by CBC Sections 1616A.1.20, 2506.2.1, and IR 25-2.13.
   2. Design Weight: Total Weight does not exceed four (4) pounds per square foot, including air conditioning grilles and light fixtures.
   3. System is not to support lateral loads from partitions.
   4. Fasteners must be capable of sustaining, without failure, hanger wires with 200 lbs. tension load and bracing wires with 440 lbs. tension load.

1.4 SUBMITTALS

A. Submit in accordance with Specification Section - SUBMITTAL PROCEDURES:
1. Product Data.
a. Manufacturers Product Information for each type of Acoustical Ceiling Tile or Panel scheduled to be used.
b. Manufacturers Product Information for each component of the Suspension System specified or scheduled.
2. Shop Drawings.
a. Submit shop drawings from manufacturer detailing ceiling suspension system assemblies and indicating dimensions, method of field assembly (including hanger and bracing wires, compression struts, wall angle attachments), other components, and location and detail of each suspension system grid connection.
1) Submit drawings showing details of Hanger Wires, Brace Wires, expansion joint locations, and Compression Strut connections to structure and to suspension system.
3. Samples.
a. Provide 4 to 6 inch square sample for each type of Acoustical Ceiling Tile or Panel scheduled to be used.
b. Provide 12 inch lineal sample of Suspension System components for each type of system specified or scheduled.
4. Quality Assurance/Control Submittals:
a. Test Reports:
1) Tension Tests of acoustical ceiling wire anchors provided by Testing Agency.
b. Certificates:
1) General Construction: Certification signed by the Contractor on Contractor's letterhead.
2) Certificates signed by manufacturers of Acoustical Ceiling components certifying that their products comply with specified requirements.
c. Manufacturer's Written Instructions:
1) Manufacturer's written instructions showing their suspension grid installation methods.
5. Closeout Submittals in accordance with the following:
a. In accordance with Specification Section - PROJECT DOCUMENTS.
b. Warranty in accordance with Specification Section - WARRANTIES.

1.5 QUALITY ASSURANCE

A. Qualifications:
1. Material Qualifications:
a. Where fire-rated Acoustical Ceiling assemblies are indicated, provide materials and construction identical to those of assemblies tested for fire resistance per UL or ASTM E 119 "Test Methods for Fire Tests of Building Construction and Materials", by an independent testing and inspecting agency acceptable to the California State Fire Marshal.
b. Source Limitations:
1) Acoustical Ceiling Tiles or Panels: Obtain each type through one source from a single manufacturer.

2) Suspension Systems: Obtain each type through one source from a single manufacturer.

2. Installer Qualifications:
   a. Engage an experienced Installer who has successfully completed three (3) projects of similar scope and size to that indicated for this Project.
      1) Helpers and apprentices used for such work shall be under full and constant supervision at all times by thoroughly skilled Acoustical Ceiling and Suspension System installers.
      2) In the acceptance or rejection of installed Acoustical Ceiling or Suspension Systems, no allowance will be made for lack of skill on the part of the installers.
3. Manufacturer/Supplier Qualifications:
   a. Firm experienced in successfully producing/supplying products similar to that indicated for this Project, with sufficient production/supply capacity to produce/supply required units without causing delay in the work.
   b. Products, materials and evaluation reports to comply with IR-A5.

B. Regulatory Requirements:
1. In accordance with Specification Section - REGULATORY REQUIREMENTS, and the following:
   a. CARB Materials and equipment used for this Project shall comply with the current applicable regulations of the California Air Resources Board (CARB) and the Environmental Protection Agency (EPA), in the area where the project is located.
   b. CBC California Building Code (CBC 803.1.1)
   c. CSFM California State Fire Marshal.
   d. FDA Food and Drug Administration, a department of US Department of Health and Human Services.
   e. IR Interpretation of Regulations.
   f. USDA/FSIS United States Department of Agriculture., Food Safety and Inspection Service.

C. Certificates:
1. General Construction: Contractor to certify that work provided, meets or exceeds the requirements of this section.
2. Products: Manufacturers of Acoustical Ceiling components shall certify that their products comply with specified requirements.

D. Meetings:
1. Pre-Installation: Scheduled by the Contractor prior to the start of work.
   a. Coordinate the work with other work being performed.
   b. Identify any potential problems that may impede planned progress and proper installation of work regarding quality of installation and warranty requirements.
2. Progress: Scheduled by the Contractor during the performance of the work.
   a. Review for proper installation of work progress.
   b. Identify any installation problems and acceptable corrective measures.
   c. Identify any measures to maintain or regain project schedule if necessary.
3. Completion: Scheduled by the Contractor upon proper completion of the work.
   a. Inspect and identify any problems that may impede issuance of warranties or guaranties.

b. Maintain installed work until the Notice of Substantial Completion has been executed.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Packing, shipping, handling, and unloading:
1. Products shall be handled in such a manner as to assure that they are free from dents, scratches and other damage.

B. Acceptance at Site:
1. Products must be in manufacturer's original unopened containers with labels indicating brand name, model, and grade.
2. Damaged products will not be accepted.

C. Storage and protection:
1. Products shall be stored in a fully enclosed, conditioned space and protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination and other causes.

1.7 PROJECT CONDITIONS

A. Environmental requirements:
1. Do not install acoustical ceilings until spaces are enclosed and weatherproof.
2. Wet work and dry work in spaces is completed, dry and dust free.
3. Work above ceilings is completed.
4. Ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

B. Existing Conditions:
1. Examine site and compare it with the drawings and specifications. Thoroughly investigate and verify conditions under which the work is to be performed. No allowance will be made for extra work resulting from negligence or failure to be acquainted with all available information concerning conditions necessary to estimate the difficulty or cost of the work.

1.8 SEQUENCING AND SCHEDULING

A. Coordination:
1. Coordinate layout and installation of Acoustical Ceiling Tiles, Panels and the Suspension Systems with other construction that penetrates ceilings or is supported, including light fixtures, HVAC equipment, smoke monitoring and fire-suppression systems.

1.9 WARRANTY

A. Contractor's General Warranty:
1. In accordance with Specification Section - WARRANTIES.

B. Manufacturer’s Warranty:
1. In accordance with manufacturer's written standard warranty:
a. Warranty Period One (1) Year.

C. Installer's Warranty:
1. In accordance with the terms of the Specification Section - WARRANTIES:
a. Warranty period [One (1) Year.][Five (5) years.]

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Products specified are from companies listed below, or approved equivalent. These products listed herein establish the size, pattern, color range and function selected by the Project Engineer for this Project. Manufacturers listed as acceptable alternative manufacturers must still comply with the requirements of the products listed in order to be approved as an equivalent during the Submittal Process. If the acceptable alternative manufacturers listed are not approved during the Submittal Process due to non-compliance with the contract documents, then the Contractor shall submit product specified.
1. Specified Tile and Panel product manufacturer:
a. ARMSTRONG WORLD INDUSTRIES.
b. Acceptable alternative manufacturers:
1) CERTAINTEED.
2) UNITED STATES GYPSUM COMPANY, USG INTERIORS.
2. Specified Suspension System product manufacturer:
a. ARMSTRONG WORLD INDUSTRIES.
b. Acceptable alternative manufacturers:
1) CHICAGO METALLIC CORPORATION.

B. Products from other manufacturers not listed must submit in accordance with Specification Section - SUBSTITUTION PROCEDURES.

C. Products specified represent the quality and standard of materials to be used. Actual products to be installed are to match existing materials.

2.2 MATERIALS

A. Tile or Panel:
1. General:
a. Standard: Provide manufacturer's standard tile or panels of configuration indicated that comply with ASTM E 1264 "Standard Classification for Acoustical Ceiling Products" classifications as designed by type, pattern, acoustical rating, light reflectance, and fire-rating, unless otherwise indicated.
b. Colors and Patterns: Match appearance characteristics indicated for each product type.
c. Antimicrobial Treated:

1) Coating-Based: Provide tile or panel face surfaces (front and back) with coated antimicrobial treatment consisting of manufacturer's standard formulation with fungicide added to inhibit growth of mold and mildew and showing no mold or mildew growth when tested according to ASTM D 3273 "Standard Test method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber".
2) Panel-Base: Provide tiles or panels treated with manufacturers standard antimicrobial solution that inhibits fungus, mold, mildew, gram-positive and gram-negative bacteria.

2. See the Acoustical Tile and Panel Schedule at the end of this section for specified tile or panel types.

B. Suspension Systems:
1. General:
a. Classification of Suspension System Grid is Heavy Duty in accordance with ASTM C 635 "Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and lay-in Panel Ceilings," ASTM E 580 “Practice for Application of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Requiring Seismic Restraint”, Section 5.1, ASCE 7 as modified by CBC Sections 1616A.1.20, 2506.2.1.
b. Provide Underwriter's Laboratory (UL) design number or California State Fire Marshal (CSFM) Listing number for the fire-rated ceiling assembly.
1) The components and installation details must conform in every respect with the UL or CSFM approval for the design number specified.
2) Custom designs which combine components from different approval designs but have not been tested as a complete assembly are not acceptable.
3) See Exposed Grid at end of this section for specified system numbers.
2. Wire:
a. Soft temper, Class 1 zinc coating, in accordance with ASTM A 641 "Specification for Zinc-Coated (Galvanized) Carbon Steel Wire".
1) Hanger: 12 gage (0.106 inch diameter).
2) Brace: 12 gage (0.106 inch diameter).
3. Clip Attachments:
a. General: Fabricate from corrosion-resistant material with holes or loops for attaching hanger and brace wires.
1) Ceiling Clips: 3/4" wide x 13 gage, galvanized steel.
2) Steel Straps:
a) 1" wide x length as required, 12 gage galvanized steel.
b) 3" wide x 4" long x 12 gage galvanized steel.
4. Grid:
a. Grid System shall be manufactured from commercial quality galvanized steel.
b. All Tee Grid System Numbers are from ARMSTRONG WORLD INDUSTRIES.
1) Exposed Non-Rated 15/16" Tee Grid System "Prelude XL" (P-XL).
2) Exposed Fire-Rated 15/16" Tee Grid System, "Prelude XL Fire Guard" (P-XL).
3) Exposed Non-Rated 9/16" Tee Grid System"Suprafine XL" (S-XL).
c. Main Runners:
1) Main Runner – Non-Rated 15/16" #P-XL 7301.
2) Main Runner – Fire-Rated 15/16" #P-XL 8301.
3) Main Runner - Non-Rated 9/16" #S-XL 7501.

4) Capped, Double-Web roll-formed from cold-rolled steel sheets, pre-painted with factory punched cross runner slots, hanger holes and integral bayonet style and couplings.
5) Fire-rated: Manufactured with fire-expansion reliefs.

d. Cross Runners:
1) 2' Non-Rated Cross Runner 15/16" #P-XL 7328.
2) 4' Non-Rated Cross Runner 15/16" #P-XL 7341.
3) 2' Fire-Rated Cross Runner 15/16" #P-XL 8323.
4) 4' Fire-Rated Cross Runner 15/16" #P-XL 8341.
5) 2' Non-Rated Cross Runner 9/16" #S-XL 7520.
6) 4' Non-Rated Cross Runner 9/16" #S-XL 7540.
7) Capped, Double-Web roll-formed from cold-rolled steel sheets, pre-painted with factory punched cross runner slots and hanger holes.
8) Fire-rated: Manufactured with fire-expansion reliefs.

e. Wall Angles:
1) "Angle" Ceiling Edge Trim, hemmed exposed edges, 7/8" x 7/8", #7800.
2) "Angle" Ceiling Edge Trim, hemmed exposed edges, 2" x 2", #7808.
3) Roll-formed of sheet metal of same gage and finish as the main runners.
4) Provide wall angles fabricated to diameter required to fit circular penetrations of ceilings exactly.

f. Panel Hold Down Clips:
1) Hold Down Clip #P-XL 414.

g. Compression Struts (Metal angles, galvanized steel):
1) 1/8 inch thick x 1 inch x 1 inch 800 lbs./1000 feet weight.
2) 3/16 inch thick x 1-1/4 inch x 1-1/4 inch 1,480 lbs./1000 feet weight.
3) 3/16 inch thick x 1-1/2 inch x 1-1/2 inch 1,800 lbs./1000 feet weight.
4) 3/16 inch thick x 1-3/4 inch x 1-3/4 inch 2,120 lbs./1000 feet weight.
5) 3/16 inch thick x 2 inch x 2 inch 2,440 lbs./1000 feet weight.
6) 3/16 inch thick x 2 inch x 2-1/2 inch 3,070 lbs./1000 feet weight.
7) 3/16 inch thick x 3 inch x 3 inch 3,710 lbs./1000 feet weight.
8) 1/4 inch thick x 3-1/2 inch x 3-1/2 inch 5,800 lbs./1000 feet weight.
9) 1/4 inch thick x 4 inch x 4 inch 6,600 lbs./1000 feet weight
10) Alternate Compression Struts Refer to drawings.
a) Must be submitted to and approved by DSAAHJ.

h. Seismic Clips:
1) Seismic Perimeter Clips #BERC2.

i. Cold Rolled Channels, 16 gage galvanized steel:
1) 1-1/2" x 17/32" flange 475 lbs/1000 feet weight.

2.3 ACCESSORIES

A. Fasteners:
1. Wood Construction:
a. Provide corrosion-resistant materials.
b. Eye screws, minimum 1/4 inch diameter, 1-1/4 inch minimum embedment.
c. Staples, 1-1/2 inch x 0.148 inch diameter (9 gage).
d. Nails, STRONGHOLD "J" nails.
2. Steel Framing:
a. Shot-in Anchors.

3. Suspension System Fasteners, runner to wall angle:
   a. Pop rivets as standard with the manufacturer, heads to match the finish of the main runners.
      1) Pop-rivets, screws or other attachments are not acceptable unless specifically detailed on the manufacturer's drawings and approved by UL and the CSFM.

B. Adhesives:
   1. Provide adhesives that comply with all requirements of ASTM D 1779 "Standard Specification for Adhesive for Acoustical Materials", for non-rated and fire-rated assemblies, and shall be compatible with the substrate to which the tile is to be installed as well as the tile material selected, and shall be UL Labeled for Class 0 - 25 Flame Spread..

C. Sealants:
   1. Acoustical Sealant for Exposed and Concealed Joints: Manufacturer's standard non-sag, paintable, non-staining latex sealant complying with ASTM C 834 "Specification for Latex Sealants", and effective in reducing airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90 "Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements".
   2. Acoustical Sealant for Concealed Joints: Manufacturer's standard non-drying, non-hardening, non-skinning, non-staining, gunnable, synthetic-rubber sealant recommended for sealing interior concealed joints to reduce airborne sound transmission.

D. Other Materials: All other miscellaneous materials, not specifically described, but required for a complete and proper installation of acoustical ceilings, shall be as selected by the Contractor subject to the approval of the Project Engineer.

2.4 FINISHES

A. Factory Finish:
   1. Suspension System: Manufacturer's standard baked-on enamel finish to all members. All fasteners shall match the main runner finishes.
      a. General: Comply with NAAMM's "Metal Finishes manual for Project Engineerural and Metal Products" for recommendations for applying and designating finishes.
   2. Tile or Panel: Refer to Tile and Panel Schedule for finishes.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Site verification of conditions:

1. Prior to the execution of the work under this specification section, examine substrates, areas, and conditions, including structural framing to which acoustical ceilings attach or abut, with installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage and with requirements for installation tolerances and other conditions affecting performance of acoustical ceilings.
2. Report unacceptable conditions to the Project Engineer. Do not begin work until unacceptable conditions have been corrected.
3. Execution of work under this specification section shall constitute acceptance of existing conditions.

3.2 PREPARATION

A. Coordination:
1. Coordinate work under this specification section with work specified under other sections to ensure proper and adequate interface of work.
2. Coordinate proper placement of ceiling mounted tracks, accessories, light fixtures, HVAC registers and other items which are to be integrated with acoustical ceilings.
3. Measure each ceiling area and establish layout of acoustical tiles or panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width tiles or panels at borders, and comply with layout shown on reflected ceiling plans.

B. Protection:
1. Do not begin work until all rooms have been protected against the weather.
2. Protect all adjacent surfaces from drips, spray, air pollution of surrounding environment, and other damage from work under this specification section.

C. Surface preparation:
1. Prepare surface in accordance with manufacturer's written instructions and recommendations.
2. Clean substrates of substances (oil, grease, rolling compounds, incompatible primers, loose mill scale, etc.) which could impair bond of materials specified within this section.

3.3 INSTALLATION

A. General:
1. In accordance with manufacturer's written instructions and recommendations along with CISCA's "Ceiling Systems Handbook" and USDA.
2. In accordance with approved Submittals.
3. In accordance with Regulatory Requirements.
4. Installation shall comply with ASTM C 636 ""Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels", and ASTM E 580 “Practice for Application of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Requiring Seismic Restraint”, Section 5.2.
5. Installation shall also comply with CBC Section 1616A.1.20, 2506.2.1.

B. Layout:
1. Lines shall be straight and true.
2. Set plumb, level, and square.

C. Suspension System:
1. 12 gage (minimum) hanger wires may be used for up to and including 4'-0" x 4'-0" grid spacing and attached to main runners. Splices will not be permitted in any hanger wires unless specifically approved by AHJ.
2. Provide 12 gage hanger wires at ends of all main and cross runners within 8" from the support or within 1/4 of the length of the end tee, whichever is least, for the perimeter of the ceiling area.
   a. End connections for runners, which are designed and detailed to resist the applied horizontal forces may be used in lieu of the 12 gage hanger wires subject to AHJ review and approval.
   b. Perimeter wires are not required when the length of the end tee is 8" or less.
3. Provide trapeze or other supplementary support members at obstructions to maintain hanger spacing.
   a. Provide additional hangers, struts or braces as required at all ceiling breaks, soffits or discontinuous areas.
   b. Hanger wires that are more than 1 in 6 out of plumb are to have counter-sloping wires.
4. Ceiling grid members may be attached to not more than 2 adjacent walls. Ceiling grid members should be at least 3/4 inch free of other walls.
   a. If walls run diagonally to ceiling grid system runners, one end of main and cross runners should be free and a minimum of 3/4 inch clear of wall.
   b. Pop rivets, screws, or other attachments in fire-rated ceilings shall not be acceptable unless specifically detailed on the manufacturer's drawings and approved by UL and AHJ.
5. At the perimeter of the ceiling area where main or cross runners are not connected to the adjacent wall, provide Seismic Perimeter Clip, installed in accordance with manufacturer's instructions and ICC-ES Evaluation Report.
6. Provide bracing assemblies consisting of a compression strut and slotted angle spacer of four (4) 12 gage splayed bracing wires oriented 90 degrees from each other.
   a. Bracing assemblies shall be provided for each 144 square feet of ceiling area.
      1) Spaced not more than 12 feet by 12 feet on center.
   b. Bracing assemblies shall be located not more than 1/2 the above spacing from each perimeter wall or at the edge of vertical ceiling offsets.
   c. The slope of these wires should not exceed 45 degrees from the plane of the ceiling and should be taut without causing the ceiling to lift.
   d. Splices in bracing wires are not permitted unless specifically approved by AHJ.
   e. Fire-Rated Asemblies shall have a bracing assembly for each 96 square feet.
      1) The first bracing assembly is required not more than four feet (4'-0") from each wall.
      2) A minimum of one bracing assembly is required between any two adjacent expansion cut-outs on runners being braced.
   f. Bracing assemblies are not required where the ceiling area is:
      1) 144 sq.ft. or less.
7. Fasten hanger wires with not less than 3 tight turns. Fasten bracing wires with 4 tight turns.
   a. Make all tight turns within a distance of 1-1/2 inches.
   b. Hanger or bracing wire anchors to the structure should be installed in such a manner that the direction of the wire aligns as closely as possible with the direction of the forces acting on the wire.
8. Separate all ceiling hanging and bracing wires at least 6 inches from all unbraced ducts, pipes, conduit, etc.

a. It is acceptable to attach lightweight items, such as single electrical conduit not exceeding 3/4" nominal diameter, to hanger wires using connectors acceptable to AHJ.

9. Attach all light fixtures and ceiling mounted air terminals or services to the ceiling grid runners to resist a horizontal force equal to the weight of the fixtures.
   a. Approved screws or fasteners are required.
10. Flush or recessed light fixtures weighing less than 56 pounds and mechanical terminals and services weighing less than 20 lbs. may be supported directly on the runners of a heavy duty grid system but, in addition, they must have a minimum of two (2) 12 gage slack safety wires attached to the fixture at diagonal corners and anchored to the structure above.
   a. All 4 ft. x 4 ft. fixtures must have slack safety wires at each corner.
11. All flush or recessed light fixtures weighing 56 pounds or more and mechanical terminals and services weighing 20 lbs. or more shall be independently supported by not less than four (4) taut #12 gage wires each attached to the fixture.
   a. Wires and their attachment to the structure must be capable of supporting 4 times the weight of the unit and attached to the structure above regardless of the type of ceiling grid system used.
12. Support surface mounted light fixtures by at least two positive devices which surround the runner and which are each supported from the structure above with 12 gage wire.
   a. Spring clips or clamps that connect only the runner are not acceptable.
   b. Provide additional supports when light fixtures are 8'-0" or longer.
13. Support pendant mounted light fixtures directly from the structure above with hanger wires or cables passing through each pendant hanger and capable of supporting four (4) times the weight of the fixture.
   a. Bracing assembly is required where the pendant hanger penetrates the ceiling.
   b. Pendant hanger is required to attach to the bracing assembly to transmit horizontal forces.
   c. Maximum spacing between supports shall not exceed 8 feet.
14. Ceiling Edge Condition:
   a. Where Grid System abuts wall, fasten wall angles to framing in wall structure.
      1) At Wood Framing, attach to backing with No. 10 x 3" Screws at 16" o.c.
      2) At Metal Framing, attach to metal framing backing with No. 8 self-tapping sheet metal screws at 16" o.c.
   b. Where Grid System terminates free from wall, fasten wall angles to Grid system with Fasteners. No screw or rivets shall appear on any exposed surface.
15. Supplemental Support Members:
   a. Where the width of ducts or other obstructions interfere with typical hangers and bracing assemblies, provide and install supplemental members and hangers in the form of trapeze or equivalent devices.
   b. Provide additional hangers, struts, or braces at all ceiling breaks, soffits, or discontinuous areas.
   c. Hanger wires that are more than one (1) horizontal in six (6) vertical shall have counter-sloping wires.
16. Expansion Joints:
   a. Expansion Joints shall be provided and installed in the ceiling at intersections of corridors and junctions of corridors with lobbies or other similar areas.
17. Expansion Joints shall be provided and installed in ceiling areas exceeding 2,500 sq.ft. in order to separate ceilings into areas not exceeding 2,500 sq.ft.

D. Suspended Acoustical Ceiling Panels:

1. Install acoustical ceiling panels with undamaged edges and fit accurately into suspension system runners and wall angles. Scribe and cut panels at borders and penetrations to provide a neat, precise fit.
   a. Install panels with pattern running in one direction.
2. Paint cut edges of panels remaining exposed after installation.
   a. Match color of exposed panel surfaces using coating recommended in writing for this purpose by acoustical ceiling manufacturer.
3. Install hold down clips at all Fire-Rated acoustical ceiling assemblies, food preparation areas, and at locker/shower areas.
4. Penetrations through the ceiling for sprinkler heads and other similar devices that are not integrally tied to the ceiling system in the lateral direction shall have a two (2) inch oversized ring, sleeve, or adapter through the ceiling tile to allow free movement of one (1) inch in all horizontal directions. Alternatively, swing joints may be provided per ASTM E 580, Section 5.2.8.5.

E. Adhesively applied Acoustical Tiles:
1. Installation shall comply to ASTM D 1779 "Standard Specification for Adhesive for Acoustical Materials".

3.4 FIELD QUALITY CONTROL

A. Site Tests:
1. Testing Agency: The Owner's Testing Laboratory Agency shall perform field tests and Inspections and prepare test reports.
   a. Testing and inspecting of completed installations of acoustical ceiling fasteners and anchors shall take place in successive stages, in areas of extent and using methods as follows.
   b. Do not proceed with installations of acoustical panel ceiling hangers for the next area until test results for previously completed installations of acoustical panel ceiling hangers show compliance with requirements.
2. Extent of Each Test Area: When installation of ceiling suspension systems on each floor has reached 20 percent completion but no panels have been installed:
   a. Concrete Anchors:
      1) Must be capable of sustaining, without failure, a load equal to 200 lbs. tension for hanger wires and 440 lbs. tension for bracing wires by construction as determined by testing according to ASTM E 488 "Test methods for Strength of Anchors in Concrete and Masonry Elements", by a qualified independent testing agency.
         a) Hanger Wire Anchors 1 in 10 must be field tested.
         b) Bracing Wire Anchors 1 in 2 must be field tested.
3. Remove and replace acoustical panel ceiling hangers where test results indicate that they do not comply with specified requirements.
4. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
   a. When testing discovers fasteners and anchors that do not comply with requirements, testing agency will test those anchors not previously tested until 20 pass consecutively and then will resume initial testing frequency.

B. Inspection:

1. As required by Regulatory Requirements.
2. Schedule inspections and notify the Project Engineer, Project Inspector and any other regulatory agencies of the time at least 48 hours prior to the inspection.
3. No work shall be without the inspections required by Regulatory Requirements.

3.5 CLEANING

A. Clean in accordance with Specification Section - PROJECT CLOSEOUT.
   1. Clean any soiled surfaces immediately.
   2. Clean any soiled surfaces at the end of each day, minimum.
   3. Finish shall be clean and ready for the application of any additional finishes.

B. Clean exposed surfaces of acoustical ceilings, including trim, edge moldings, and suspension system members. Comply with manufacturers written instructions for cleaning and touchup of minor finish damage. Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

3.6 SCHEDULES

A. Tile and Panel Schedule:
   1. TYPE ACT-I:
      a. Design "Fissured Medium Texture", No. 755, Minaboard Panel.
      b. Manufacturer ARMSTRONG WORLD INDUSTRIES.
      c. Material:
         1) Wet-Formed mineral fiber, with factory-applied vinyl latex paint surface finish.
      d. Size 24" x 48" x 5/8" panel – "Square Cut" lay-in edge.
      e. Mounting 15/16" Non-Rated exposed tee grid.
      f. NRC Rating 0.55.
      g. CAC 30.
      h. Light Reflectance per ASTM E 1477 "Test method for Luminous Reflectance Factor of Acoustical Materials by Use of Integrating-Sphere Reflectometers":
         1) 0.81.
      i. ASTM Classification per ASTM E 1264 "Classification for Acoustical Ceiling Products":
         1) Type III, Form 2, Pattern C D.
      j. Class A per ASTM E 84 "Test method for Surface burning Characteristics of Building Materials":
         1) Flame Spread Index 25 or under.
         2) Smoke Density Developed Index 50 or less.
      k. Color "White".
      l. Antimicrobial Treatment None.
   2. TYPE ACT II - NOT USED.
   3. TYPE ACT-III:
      a. Manufacturer ARMSTRONG WORLD INDUSTRIES.
      b. Design "Fine Fissured Texture", No. 746, Tile.
      c. Material:
         1) Wet-Formed mineral fiber, with factory-applied vinyl latex paint surface finish.

d. Size 12" x 12" x 3/4" tile – concealed Beveled edge (K4C4).
e. Mounting Adhesively applied over 5/8" gypsum board.
f. NRC Rating 0.55.
g. CAC 55.
h. Light Reflectance per ASTM E1477 "Test method for Luminous Reflectance Factor of Acoustical Materials by Use of Integrating-Sphere Reflectometers":
   1) 0.65.
i. ASTM Classification per ASTM E 1264 "Classification for Acoustical Ceiling Products":
   1) Type III, Form 2, Pattern C L.
j. Class A per ASTM E84 "Test method for Surface burning Characteristics of Building Materials":
   1) Flame Spread Index 25 or under.
   2) Smoke Density Developed Index 50 or less.
k. Color "White".
l. Antimicrobial Treatment Bio Block.

4. TYPE ACT-IV (NOT USED):
5. TYPE ACT-V:
   a. Manufacturer ARMSTRONG WORLD INDUSTRIES.
   b. Design "Cirrus Tegular, Fine Texture", No. 584, Panel.
   c. Material:
      1) Wet-Formed mineral fiber, with factory-applied vinyl latex paint surface finish.
   d. Size 24" x 24" x 3/4" panel – Angled "Tegular" lay-in edge.
   e. Mounting 15/16" Non-Rated exposed tee grid.
   f. NRC Rating 0.70.
   g. CAC Range 35.
   h. Light Reflectance per ASTM E 1477 "Test method for Luminous Reflectance Factor of Acoustical Materials by Use of Integrating-Sphere Reflectometers":
      1) 0.86.
   i. ASTM Classification per ASTM E 1264 "Classification for Acoustical Ceiling Products":
      1) Type III, Form 1, Pattern E L.
   j. Class A per ASTM E 84 "Test method for Surface burning Characteristics of Building Materials":
      1) Flame Spread Index 25 or under.
      2) Smoke Density Developed Index 50 or less.
   k. Color "White".
   l. Antimicrobial Treatment None.
6. TYPE ACT-VI:
   a. Manufacturer ARMSTRONG WORLD INDUSTRIES.
   b. Design "Cirrus Tegular, Fine Texture", "FireGuard", No. 578, Panel.
   c. Material:
      1) Wet-Formed mineral fiber, with factory-applied vinyl latex paint surface finish.
   d. Size 24" x 24" x 3/4" panel – Angled Tegular lay-in edge.
   e. Mounting 15/16" Fire-Rated exposed tee grid.
   f. NRC Rating 0.35.
   g. CAC 35.

h. Light Reflectance per ASTM E 1477 "Test method for Luminous Reflectance Factor of Acoustical Materials by Use of Integrating-Sphere Reflectometers":
   1) 0.86.
i. ASTM Classification per ASTM E 1264 "Classification for Acoustical Ceiling Products":
   1) Type III, Form 1, Pattern E L.
j. Class A per ASTM E 84 "Test method for Surface burning Characteristics of Building Materials":
   1) Flame Spread Index 25 or under.
   2) Smoke Density Developed Index 50 or less.
k. Color "White".
l. Antimicrobial Treatment None.

7. TYPE ACT-VII:
   a. Manufacturer ARMSTRONG WORLD INDUSTRIES.
   b. Design "Cirrus Tegular, Fine Texture", No. 535, Panel.
   c. Material:
      1) Wet-Formed mineral fiber, with factory-applied vinyl latex paint surface finish.
   d. Size 24" x 48" x 3/4" panel – Angled Tegular lay-in edge.
   e. Mounting 15/16" Non-Rated exposed tee grid.
   f. NRC Rating 0.70.
   g. CAC 35.
   h. Light Reflectance per ASTM E 1477 "Test method for Luminous Reflectance Factor of Acoustical Materials by Use of Integrating-Sphere Reflectometers":
      1) 0.86.
   i. ASTM Classification per ASTM E 1264 "Classification for Acoustical Ceiling Products":
      1) Type III, Form 1, Pattern E L.
   j. Class A per ASTM E 84 "Test method for Surface burning Characteristics of Building Materials":
      1) Flame Spread Index 25 or under.
      2) Smoke Density Developed Index 50 or less.
   k. Color "White".
   l. Antimicrobial Treatment None.

END OF SECTION

SECTION 099100 - PAINTING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:
   1. Provide all material, labor, equipment and services necessary to furnish and install Painting, accessories and other related items necessary to complete the Project as indicated by the Contract Documents unless specifically excluded.
      a. Material and Equipment to be Painted: Paint all piping, unwrapped ductwork, electric conduits exposed to view. Prime and paint all factory finished mechanical and electrical equipment and accessories exposed to view.
      b. Material and Equipment not to be Painted: Do not paint piping, ductwork, equipment and machinery located in attic spaces, above furred or suspended ceilings, in furred pipe or duct spaces. Do not paint factory finished equipment or machinery located in mechanical rooms or mechanical buildings, attics, furred or suspended ceilings.

B. Related Sections: The following Project Manual Sections contain requirements that relate to this section:
   1. ALL DIVISION 00 SPECIFICATION SECTIONS.
   2. ALL DIVISION 01 SPECIFICATION SECTIONS.
   3. 07 92 00 SEALANTS
   4. 09 29 00 GYPSUM BOARD
   5. 09 50 00 ACOUSTICAL CEILINGS
   6. ALL SPECIFICATION SECTIONS IN THE FACILITY SERVICES SUBGROUP.

1.2 REFERENCES

A. Standards:
   1. In accordance with the following standards:
      a. CA-CHPS California High Performance Schools
         1) 2011-CA-CHPS Addendum.
      b. MPI Master Painters Institute
         1) MPI - Project Engineerural Painting Specification Manual.
         2) MPI – Maintenance Repainting Manual.
            a) MPI RSP Master Painters Institute Repaint Surface Preparation Standards, Chapter 6, Section 2.
         3) MPI – Glossary.
      c. PDCA Painting and Decorating Contractors of America, latest edition of the Project Engineerural Specification Manual, as prepared by Specification Services, Inc., Washington State Council of the PDCA.

1.3 DEFINITIONS

A. The following definitions are just some of the more important definitions used within this section, and were taken from the MPI Glossary Manual, or used to simplify language used by the Project Engineer. These definitions and others stated within the Manual apply for this Specification Section.
   1. Acrylic Latex An aqueous dispersion of acrylic resins.
   2. Acrylic Resin A/R - Synthetic resins made by polymerizing esters of acrylic acid.
   3. A/U Aliphatic Urethane
   4. A/A/U Aliphatic Acrylic Urethane
   5. Blocking Sticking or bonding together of two painted surfaces that are in direct contact. Most often caused by stacking painted articles before dry or reaching a "block free" (or "non-blocking") stage.
   6. DFT Dry Film Thickness – the depth or thickness of a coating in the dry state. Expressed in mils (1/1000 inch) or microns.
   7. DRY FALL A Fog Paint designed to be applied by spray and dries fast enough that the overspray will be a dry powder after falling a certain distance. The dust can then be swept or vacuumed up.
   8. ODFT "Overall Dry Film Thickness" – the depth or thickness of a complete coating system in the dry state. Expressed in mils (1/1000 inch) or microns.

1.4 SUBMITTALS

A. Submit in accordance with Specification Section - SUBMITTAL PROCEDURES:
   1. Product Data.
      a. Submit manufacturer's full color range (including any standard, premium and custom colors) for selection by the Project Engineer.
      b. Material Safety Data Sheets will be turned over to the Owner in compliance with local rules and regulations, but will not be reviewed.
      c. Materials Lists:
         1) Format in accordance with Article in this section titled "Paint Finish Schedule".
      d. Additional submittals to substantiate proposed equivalent systems.
   2. Samples.
      a. Brushouts: In accordance with Specification Section - SUBMITTAL PROCEDURES.
      b. For each color and finish selected provide paint brushouts showing color tint graduation of each coat to and including the final color coat.
         1) Selected colors and finishes:
            a) Size: 8 1/2" x 11" boards.
            b) Quantity: 3 boards of each color and finish.
            c) Board material wherever possible and for transparent finishes shall be same as material to be finished. Opaque finishes may be on heavy card stock.
   3. Closeout Submittals in accordance with the following:
      a. Maintenance Data in accordance with Specification Section - PROJECT CLOSEOUT.
      b. Project Documents in accordance with Specification Section - PROJECT DOCUMENTS.

c. Warranty in accordance with Specification Section - WARRANTIES.

1.5 QUALITY ASSURANCE

A. Qualifications:
1. Material Qualifications:
a. Where possible (except for specified materials), paint materials shall be products of only one manufacturer.
b. All materials, preparation and workmanship shall conform to requirements of the specified edition of the Project Engineerural Painting Specification Manual by the Master Painters Institute (hereafter referred to as the MPI Painting Manual), unless otherwise indicated.
c. Flame Spread Ratings in accordance with ASTM E 84 "Standard Test Method for Surface Burning Characteristics of Building Materials":
1) Paint finishes in required exit stairways, corridors and exitways must meet flame spread ratings as required by regulatory agencies.
2) Class A - Tunnel Test 0-25 for enclosed required exit stairways and other exit ways.
3) No interior paint or wall finish will be permitted having a tunnel test in excess of 200. All paint materials must be certified that materials meet these requirements.
d. Manufacturer's Written Instructions - One for the Project Engineer, Contractor and the Owner:
1) Submit three (3) copies of manufacturer's written instructions.
e. Compatibility:
1) Paint materials and equipment shall be compatible in use.
2) Finish coats shall be compatible with prime coat.
3) Prime coats shall be compatible with surface to be coated.
4) Tools and materials shall be compatible with coating to be applied.
f. Air Quality:
1) Paint materials and equipment used for application will comply with CARB Air Quality Control Standards in effect at the Project Site and at the time of application.
2. Installer Qualifications:
a. Engage an experienced Installer who has successfully completed three (3) projects of similar scope and size to that indicated for this Project.
1) Only qualified journeypersons, as defined by local jurisdiction, shall be engaged in painting and decorating work. Apprentices may be employed provided they work under the direct supervision of a qualified journeyperson in accordance with trade regulations.
3. Manufacturer/Supplier Qualifications:
a. Firm experienced in successfully producing/supplying products similar to that indicated for this Project, with sufficient production/supply capacity to produce/supply required units without causing delay in the work.

B. Regulatory Requirements:
1. In accordance with Specification Section - REGULATORY REQUIREMENTS, and the following:
a. CAL/OSHA California/Occupational Safety and Health Act

b. CARB Materials and equipment used for this Project shall comply with the current applicable regulations of the California Air Resources Board (CARB) and the Environmental Protection Agency (EPA), in the area where the project is located.
c. CBC California Building Code (CBC 803.1.1)

C. Mockups: Provide a full-coat benchmark finish sample for each type of coating and substrate required for Project Engineer's review. Duplicate finish of approved sample Submittals.
1. Wall Finishes shall be at least 100 sq. ft., suitably marked "MOCKUPS" and protected for the duration of the construction Project.
2. Small areas and items can be selected by the Contractor, suitably marked "MOCKUPS" and protected for the duration of the construction Project.
3. Apply benchmark samples, according to requirements for the completed Work, after permanent lighting and other environmental services have been activated. Provide required sheen, color, and texture on each surface.
4. Approved mockups (wall areas and small areas or items) may become part of the completed Work if undisturbed at time of Substantial Completion.

D. Meetings:
1. Pre-Installation: Scheduled by the Contractor prior to the start of work.
a. Coordinate the work with all other related work.
b. Identify any potential problems that may impede planned progress and proper installation of work regarding quality of installation and warranty requirements.
2. Progress: Scheduled by the Contractor during the performance of the work.
a. Review for proper installation of work progress.
b. Identify any installation problems and acceptable corrective measures.
c. Identify any measures to maintain or regain project schedule if necessary.
3. Completion: Scheduled by the Contractor upon proper completion of the work.
a. Inspect and identify any problems that may impede issuance of warranties and guaranties.
b. Maintain installed work until the Notice of Substantial Completion has been executed.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Acceptance at Site:
1. Products must be in manufacturer's original unopened containers with labels indicating brand name, model, and grade.
2. Damaged products will not be accepted.

B. Storage and protection:
1. Products shall be stored above ground on level platforms, six (6) inches above ground, allowing air circulation under stacked units, in a locked, clean and neat, well ventilated area.
a. All receiving, opening and mixing shall be done in this area.
b. Oily rags and waste shall be removed from area each night and all other precautions shall be taken to avoid danger of fire.
c. Empty containers shall not be removed from site, unless otherwise approved by the Project Engineer.

d. Cover materials with protective waterproof covering providing for adequate air circulation and ventilation.

1.7 PROJECT CONDITIONS

A. Environmental requirements:
1. Rain or Fog:
a. No work under this section shall be started or maintained under threat of rain.
b. Surfaces shall be painted only when they are free from moisture.
c. No painting of exterior surfaces shall be done less than 72 hours of actual drying weather after a rain or during periods of dew or fog.
d. Perform no painting or decorating work when the maximum moisture content of the substrate exceeds:
1) 12 percent for concrete and masonry (clay and concrete brick / block).
2) 15 percent for wood.
3) 12 percent for plaster and gypsum board.
e. Perform no painting or decorating work when the relative humidity is above 85 percent or when the dew point is less than 5 degrees F variance between the air / substrate temperature.
2. Temperature: No painting shall be done when ambient air and substrate temperatures are below 50 degrees F.
3. Alkalinity: An alkali level of between 7.0 and 8.5 pH is suitable for painting. Any reading above that level, then the surface shall be neutralized as required for the surface to be painted.
a. Methods shall be consistent with MPI - Project Engineerural Painting Specification Manual, and shall not result in any adverse condition causing inadequate adhesion, improper curing and drying, or durability of paint system.
4. No exterior painting shall be done during winds or dusty conditions.
5. Perform no exterior painting and decorating work unless environmental conditions are within MPI and paint manufacturer's requirements or until adequate weather protection is provided.
a. Where required to meet project schedules, suitable weatherproof covering and sufficient heating facilities shall be in place to maintain minimum ambient air and substrate temperatures for 24 hours before, during and after paint application.
6. Perform no interior painting or decorating work unless adequate continuous ventilation and sufficient heating facilities are in place to maintain minimum ambient air and substrate temperatures above minimum requirements for 24 hours before, during and after paint application.
a. Where required to meet project schedules, provide supplemental ventilating and heating equipment if ventilation and heating from existing system is inadequate to meet minimum requirements.

B. Existing Conditions:
1. Examine site and compare it with the drawings and specifications. Thoroughly investigate and verify conditions under which the work is to be performed. No allowance will be made for extra work resulting from negligence or failure to be acquainted with all available information concerning conditions necessary to estimate the difficulty or cost of the work.

2. Conduct all moisture tests using a properly calibrated electronic Moisture Meter, except test concrete floors for moisture using a simple cover patch test.
3. Contractor shall provide a minimum lighting level of 323 Lux (30 foot candles) on surfaces to be painted or decorated.

1.8 WARRANTY

A. Contractor's General Warranty:
1. In accordance with Specification Section - WARRANTIES.
   a. Original adherence of all materials and no evidence of any surface defect shall be maintained during warranty period.
   b. Color at end of warranty period shall remain free from serious fading and any discernible variations shall be uniform.

B. Manufacturer's Warranty:
1. In accordance with manufacturer's written standard warranty:
2. Provide Paint Manufacturer's special ten (10) year Material Warranty co-endorsed by the installer for exterior paint application of cement plaster surfaces.
   a. Warranty period: Ten (10) Years.
3. Provide Water-Repellent Manufacturer's special Weatherproofing Warranty co-endorsed by the installer for exterior sealer application of concrete or concrete block surfaces.
   a. Warranty period: Ten (10) Years.

C. Installer's Warranty:
1. Paint Installer's Warranty:
   a. Installer will certify that a Paint Manufacturer's Representative tested the substrate according to Paint Manufacturer's standard procedures and have submitted project information and test patch forms.
   b. Installer shall certify that Paint Manufacturer's products were installed on the structure in accordance with manufacturer's specification requirements.
   c. Installer further agrees that if installer fails to fulfill their obligation under this certification statement within 30 days notice of the complaint, Paint Manufacturer may proceed with the investigation and repairs and shall pay the entire material cost, providing it wasn't the installer's responsibility.
2. Water-Repellent Installer's Warranty:
   a. Warranty period: Two (2) Years.
   b. Installer will certify that a Water-Repellent Manufacturer's Representative tested the substrate according to Water-Repellent Manufacturer's standard procedures and have submitted project information and test patch forms.
   c. Installer shall certify that Water-Repellent Manufacturer's products were installed on the structure in accordance with manufacturer's specification requirements.
   d. Installer agrees:
      1) Investigate all complaints of leakage and/or water absorption on surfaces to which Water-Repellent Manufacturer's weatherproofing products were applied and provide a written report of the cause to Water-Repellent Manufacturer within thirty (30) days of the complaint.

2) Re-apply Water-Repellent Manufacturer's weatherproofing products according to Water-Repellent Manufacturer's standard procedures at installer's cost for labor and material if the leakage and/or water absorption is due to improper surface preparation, application and/or improper use of material.
3) Request authority from Water-Repellent Manufacturer to re-apply Water-Repellent Manufacturer's weatherproofing products at Water-Repellent Manufacturer's expense to areas, which were not rendered hydrophobic due to imperfect weatherproofing materials.

e. Installer further agrees that if installer fails to fulfill their obligation under this certification statement within 30 days notice of the complaint, Water-Repellant Manufacturer may proceed with the investigation and repairs and shall pay the entire cost, providing it wasn't the installer's responsibility.

1.9 MAINTENANCE

A. Extra Materials:
1. Quantity: 10 percent of quantity needed to paint Project, but not to exceed one gallon, of each type and color of finish coat used.
2. Identification: At project completion, provide an itemized list complete with manufacturer, paint type and color coding for all colors used, and locations within the Project for Owner's later use in maintenance.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. These products listed herein establish the size, pattern, color range and function selected by the Project Engineer for this Project. Manufacturers that are listed as acceptable alternative manufacturers and substitutions must still comply with the requirements of this project and the products listed in order to be approved as an equivalent during the Submittal Process. If the acceptable alternative manufacturers listed or substitutions are not approved during the Submittal Process due to non-compliance with the contract documents, then the Contractor shall submit product specified.
1. Specified paint coating product manufacturer, or approved equivalent:
a. PPG PAINTS.
1) Composed of the following companies: AMERITONE PAINT, DECRATREND, DEFT, DEVOE COATINGS, DEVOE PAINT, FLOOD WOOD CARE, FULLER O'BRIEN, GLIDDEN, and SINCLAIR PAINT.
b. Also specified: GEMINI and MONOPOLE.
c. Acceptable alternative manufacturers:
1) DUNN EDWARDS, KELLY MOORE PAINTS, SHERWIN WILLIAMS and VISTA PAINT. Submittals by these manufacturers, subject to specification requirements, must be in accordance with Section - SUBMITTAL PROCEDURES.
a) Paint material quality and systems shall be equal to numbers and systems listed in Paint Finish Schedule at the end of this section.

b) If submitted paint numbers differ from Darden Project Engineers, Inc. Paint Equivalency List, additionally submit explanation of difference and certification letter from the installer attesting that the different product is equal to or better than specified; i.e. equivalent or better percentage of solids, system ODFT, and VOC compliant. Paint Equivalency List published by Darden Project Engineers, Inc. is available only for this project at written request.

2. Specified water-borne Alkyltrialkoxy Silane water repellent product manufacturer, or approved equivalent:
   a. EVONIK DEGUSSA
   b. CORPORATION.
3. Specified Graffiti coating manufacturer, or approved equivalent:
   a. Sacrificial:
      1) VISUAL POLLUTION TECH, INC.
   b. Non-sacrificial:
      1) BASF HYDROZO.
      2) EVONIK DEGUSSA CORPORATION.
      3) THIS STUFF WORKS - TSW
4. Specified Intumescent Paint Manufacturer, or approved equivalent:
   a. ISOLATEK INTERNATIONAL
5. Specified High Gloss Epoxy Pool Paint and Primer Manufacturer, or approved equivalent:
6. RAMUC.

B. Products from other manufacturers not listed must submit in accordance with Specification Section - SUBSTITUTION PROCEDURES.

2.2 MATERIALS

A. Material Compatibility: Provide block fillers, primers, and finish-coat materials that are compatible with one another and with the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
   1. Shop Primers or Coil-Coated Primers: It shall be assumed that all Shop Primed or Coil-Coated primed metals do not meet the requirements for primer material and mil thickness as defined herein. As such, all Shop Primed or Coil-Coated primed metals shall be field primed as indicated in the schedule.

B. Material Quality: Provide manufacturer's best-quality coating material of the various coating types specified that are factory formulated and recommended by manufacturer for application indicated. Paint-material containers not displaying manufacturer's product identification will not be acceptable.
   1. All materials used shall be lead and mercury free and shall have low VOC content to meet the applicable CARB standards in the area where the Project is located.
   2. All paint materials shall have good flowing and brushing properties and shall dry or cure free of blemishes, sags, air entrapment, etc.
   3. All Water-Repellant Coatings shall comply with the following:

a. Provide Alkyltrialkoxy Silane combination with a ratio concentration and application procedure as recommended by the manufacturer with the ability to cover in one or more applications for a ten year warranty in accordance with the following substrates:
   1) Thin Brick.
   2) Concrete.
   3) Concrete Masonry Units
   4) Split-Faced Concrete Masonry Units.
b. Color: Clear.
c. Active Substance: Alkyltrialkoxy Silane.
d. Active Content: 100 percent.
e. Solvent: Water.
f. Flash Point (Concentrate): 93 degrees F.
g. Flash Point (Mixed): 200 degrees F.
h. Density: 7.77 lbs./gallon.
i. VOC (19:1): 50 g/liter (Maximum).
j. VOC (9:1): 100 g/liter (Maximum).
k. VOC (6:1): 200 g/liter (Maximum).

4. All Bituminous Paint:
   a. Shall comply with Cold-Applied Asphalt-Mastic paint complying with SSPC-Paint 12 requirements, except containing no asbestos, formulated for 30-mil thickness per coat.

2.3 MIXES

A. Mixing and Tinting:
   1. Unless otherwise specified herein or pre-approved, all paint shall be ready-mixed and pre-tinted at the factory. Re-mix all paint in containers prior to and during application to ensure break-up of lumps, complete dispersion of settled pigment, and color and gloss uniformity.
   2. Paste, powder or catalyzed paint mixes shall be mixed in strict accordance with manufacturer's written instructions.
   3. Where thinner is used, addition shall not exceed paint manufacturer's written recommendations.
   4. Do not use kerosene or any such organic solvents to thin water-based paints.
   5. Thin paint for spraying in strict accordance with paint manufacturer's written instructions. If directions are not on the container, obtain instructions in writing from the manufacturer and provide one copy of instructions to the Project Inspector.

2.4 FINISHES

A. Finish Colors:
   1. Unless otherwise specified herein, all painting work shall be in accordance with MPI Premium Grade finish requirements as a minimum.
   2. Determined by Project Engineer prior to or as work progresses.
      a. Colors to be selected from paint manufacturer's full color systems, including standard, premium and custom colors.

3. When deep or ‘Ultra colors’ are selected, submit to Project Engineer proposed revision to specified system product numbers, according to manufacturer’s written recommendations.
   a. When deep or ultra colors are selected for use on walls or special color treatments such as graphics or many color changes are desired, the areas and extent of use will be clarified upon request of the Contractor.
4. Gloss standards, in accordance with MPI standards, using the ASTM D 523 "Test for Specular Gloss", are as follows:
5.

Gloss Level	**Description**	**Units at 60 degrees**	**Units at 85 degrees**
G1	Matte or Flat Finish	0 to 5	10 max.
G2	Velvet Finish	0 to 10	10 to 35
G3	Eggshell Finish	10 to 25	10 to 35
G4	Low Sheen or Satin Finish	20 to 35	35 min.
G5	Semi-Gloss Finish	35 to 70	
G6	Gloss Finish	70 to 85	
G7	High-Gloss Finish	Greater than 85	

PART 3 - EXECUTION

3.1 EXAMINATION

A. Site verification of conditions:
   1. Prior to the execution of the work under this specification section, inspect the installed work executed under other sections of this Project Manual that affects the execution of work under this specification section.
      a. Thoroughly examine (and test as required, if necessary) all conditions and surfaces to be painted and report in writing to the Contractor and the Project Engineer any conditions or surfaces that will adversely affect the work of this section.
      b. The Installer is responsible for verifying the compatibility of items primed by others and the finish coat or coats required by the Contract Documents. Should an incompatibility occur, the Installer (along with the manufacturer's technical representative) will recommend compatible alternatives for the Project Engineer's approval.
   2. Report unacceptable conditions to the Project Engineer. Do not begin work until unacceptable conditions have been corrected.
   3. Execution of work under this specification section shall constitute acceptance of existing conditions.

3.2 PREPARATION

A. Protection before Application:
   1. Protect all adjacent surfaces from drips, spray, air pollution of surrounding environment, and other damage from work under this specification section.
   2. Removal of Hardware and Miscellaneous Items:

a. Coordinate the work with other trades so that they remove electrical outlet and switch plates, mechanical diffusers, escutcheons, registers, surface hardware, fittings, fastenings, and the like prior to starting work under this Section.
b. Store during painting work. Coordinate cleaning and reinstallation after painting work is finished.
c. Do not use solvent or cleaning agents detrimental to permanent finishes.
d. Remove doors before painting to paint bottom and top edges, and then re-hang.

3. Protect adjacent surfaces against damage from painting operations. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Project Engineer, and leave in an undamaged condition.
   a. Protective means include: Drop cloths, shields, masking templates, etc.
   b. Exterior surfaces include: landscaping, walks, drives, adjacent building surfaces, glazing, aluminum surfaces, etc.
   c. Interior surfaces include: rating and instruction labels on doors, frames, equipment, piping, etc.

B. Surface preparation:
1. General:
   a. In accordance with MPI Standards.
   b. Surfaces to be finished shall be clean, dry and free of dirt, passivators, oils, loose paint and any other contamination that would adversely affect adhesion, protective properties or appearance of the coating.
   c. All oil, grease, dirt or other foreign matter shall be removed by washing with a solution of cleaner and water, rinse and allow to dry.
   d. If efflorescence, alkali or glazed surfaces exist, neutralize with acid wash followed by thorough water rinsing.
      1) Protect all adjacent substrates or materials that could be affected by acid washing or water rinsing. Collect all washing & rinsing residue and dispose of away from structures.
2. Wood Substrates - (New and Repaint Surfaces):
   a. Interior Surfaces: MPI Interior Surface Preparation, Chapter 3, Section 3.
   b. Exterior Surfaces: MPI Exterior Surface Preparation, Chapter 2, Section 3.
   c. Fill holes and other imperfections with putty or plastic wood to match natural finish before and after application of prime or seal coat.
   d. Provide necessary extra treatment over knots, pitch pockets, sappy portions and other defects to produce a proper base for painting.
   e. Sand down raised grain or rough surfaces.
   f. Clean surfaces free of dust, soil and other foreign material.
3. Gypsum Board Substrates - (New and Repaint Surfaces):
   a. Interior Surfaces: MPI Interior Surface Preparation, Chapter 3, Section 3.
   b. Clean surfaces of dirt, laitance
   c. , excess mortar and foreign matter.
   d. Do all necessary minor sanding.
   e. Fill minor cracks, scratches, holes and nail heads.

3.3 APPLICATION

A. Standards:
1. In accordance with MPI Painting Manual.

2. In accordance with manufacturer's specifications.

B. Method:
1. Apply by brush, roller or spray in accordance with MPI Painting Manual and the coating manufacturer's written recommendations except where specified otherwise in Schedule of Paint Finishes.
2. Painting of doors by rollers shall only be allowed only if the applicator uses a 1/4 inch nap or less roller.

C. Coatings:
1. All coatings shall be applied without reduction except as specifically required by label directions, or required to be reduced by this Specification. In such cases, reduction shall be the minimum permitted and shall not exceed VOC limits.
2. Apply each coat evenly and allow each coat to dry prior to applying succeeding coats. Each coat to have enough consistency to conceal work to which it is applied.
   a. Follow manufacturer's recommendations for recoat windows when using high performance coatings, epoxys, and urethanes.
3. Cut into a true line and leave smooth and clean without overlapping. Coat doors and windows in open position.
4. Sand finishes on smooth surfaces to assure proper adhesion of subsequent coats.
5. Tint each undercoat a lighter shade to facilitate identification of each coat, if multiple coats of same material are to be applied. Tint undercoats to match color of topcoat, but provide sufficient difference in shade of undercoats to distinguish each separate coat.
6. Apply coating systems so as to obtain not less than the dry film mil thickness recommended by the manufacturer.
7. Sand metal work only as necessary to provide for the complete bonding of coats.
8. Project Inspector to inspect and approve each coat and operation before succeeding coats are applied.
9. Finish work to be free from runs, sags, defective application and improper workmanship.
10. Back prime all woodwork and casework coming in contact with plaster, masonry or concrete immediately upon delivery to project.
11. Post sign promptly following application of coatings.

3.4 FIELD QUALITY CONTROL

A. All surfaces, preparation and paint applications shall be inspected by the Project Inspector:
1. Painted exterior and interior surfaces shall be considered to lack uniformity and soundness if any of the following defects are apparent to the Painting Inspection by the Project Inspector:
   a. Brush / Roller marks, streaks, laps, runs, sags, drips, heavy stippling, hiding or shadowing by inefficient application methods, skipped or missed areas, and foreign materials in paint coatings.
   b. Evidence of poor coverage at rivet heads, plate edges, lap joints, crevices, pockets, corners and re-entrant angles.
   c. Damage due to touching before paint is sufficiently dry or any other contributory cause.
   d. Damage due to application on moist surfaces or caused by inadequate protection from the weather.
   e. Damage and / or contamination of paint due to blown contaminants (dust, spray paint, etc.).

2. Painted surfaces shall be considered unacceptable if any of the following are evident under natural lighting source for exterior surfaces and final lighting source (including daylight) for interior surfaces:
   a. Visible defects are evident on vertical surfaces when viewed at normal viewing angles from a distance of not less than 39 inches.
   b. Visible defects are evident on horizontal surfaces when viewed at normal viewing angles from a distance of not less than 39 inches.
   c. Visible defects are evident on ceiling, soffit and other overhead surfaces when viewed at normal viewing angles.
   d. When the final coat on any surface exhibits a lack of uniformity of color, sheen, texture, and hiding across full surface area.
3. Painted surfaces rejected by the Project Inspector shall be made good at the expense of the Contractor. Small affected areas may be touched up; large affected areas or areas without sufficient dry film thickness of paint shall be repainted. Runs, sags of damaged paint shall be removed by scraper or by sanding prior to application of paint.

3.5 CLEANING

A. Clean in accordance with Specification Section - TEMPORARY FACILITIES AND CONTROLS and PROJECT CLOSEOUT.
   1. Remove all paint where spilled, splashed, splattered or sprayed as work progresses using means and materials that are not detrimental to affected surfaces.
   2. Keep work area free from unnecessary accumulation of tools, equipment, surplus materials and debris.
   3. Remove combustible rubbish materials and empty paint cans each day and safely dispose of same in accordance with requirements of authorities having jurisdiction.
   4. Clean equipment and dispose of wash water / solvents as well as all other cleaning and protective materials (e.g., rags, drop cloths, masking papers, etc.), paints, thinners, paint removers / strippers in accordance with the safety requirements of authorities having jurisdiction in the place where the Project is located.
   5. Protect and safeguard work of other trades.

3.6 PROTECTION

A. Protection from Weather:
   1. Protect newly installed work from moisture for a period of time as recommended by the manufacturer after application.

B. Protection from Traffic:
   1. Erect barriers or screens and post signs to warn of or limit or direct traffic away or around work area as required.

C. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and installer, which ensures the work of this section being without damage or deterioration until the time of Substantial Completion.

3.7 SCHEDULES

A. Refer to Exterior and Interior Finish Schedules on Drawings for applicable finishes used. This is a guide only and paint sub-contractor is responsible to check all drawings and be responsible for all paint work required to cover the complete painting and finishing of the interior and exterior including specialty items.

B. It is the intent of the specifications and drawings to cover the complete painting and finishing of the Project whether or not it is specifically called for in the Specifications, Schedule of Paint Finishes, or indicated on the Drawings. Surfaces not specified in Paint Finishes Schedule shall be in accordance with manufacturer's written recommendations.
   a. The following schedule was compliant with CARB Air Quality Standards at press time.
      1) Inform the Project Engineer of any changes caused by stricter Air Quality Standards as part of the submittal process.
      2) Provide products compliant with CARB Air Quality Standards and Local Air Quality Control District requirements at the time of installation.

C. Exception: When the Project involves remodel work, the scope of work is limited to the remodel area and adjacent existing substrates to minimize visible color incompatibility.

D. Provide coating system minimum ODFT specified.
   1. Provide DFT per coat specified.
      a. Do not apply thicker coats than specified to achieve ODFT. Apply additional coats if necessary.
   2. "Ultra Color" Note: A fourth and/or fifth coat may be required to achieve uniform chromatic hue without ghosting from undercoat or substrate.
      a. The Contractor shall consider all Metal Paint Finishes noted "Ultra-color" as requiring as many as five (5) total coats.

E. INTERIOR PAINT FINISHES:
   1. INTERIOR WOODWORK
      a. <u>W-1 Flat Latex Minimum ODFT 4.2 MILS.</u>
         1) 1st Coat SPEEDHIDE ZERO (SPH-0) Primer 6-4900XI DFT 1.4 mils.
         2) 2nd Coat Flat 0 VOC (SPH-0) 6-4110XI DFT 1.4 mils.
         3) 3rd Coat Flat 0 VOC (SPH-0) 6-4110XI DFT 1.4 mils.
      b. <u>W-2 Semi-Gloss Acrylic Non-Blocking Enamel Minimum ODFT 4.0 MILS.</u>
         1) 1st Coat SPEEDHIDE ZERO (SPH-0) Primer 6-4900XI DFT 1.4 mils.
         2) 2nd Coat Semi-Gloss 0 VOC (SPH-0) 6-4510XI DFT 1.3 mils.
         3) 3rd Coat Semi-Gloss 0 VOC (SPH-0) 6-4510XI DFT 1.3 mils.
      c. <u>W-3 Gloss Waterborne Acrylic Non-Blocking Enamel Minimum ODFT 9.4 MILS.</u>
         1) 1st Coat SPEEDHIDE ZERO (SPH-0) Primer 6-4900XI DFT 1.4 mils.
         2) 2nd Coat Gloss Acrylic PITT-TECH PLUS 90-1310 DFT 4.0 mils.
         3) 3rd Coat Gloss Acrylic PITT-TECH PLUS 90-1310 DFT 4.0 mils.
      d. <u>W-4 Semi-Transparent Resin Stain Minimum ODFT 1.9 MILS.</u>
         1) 1st Coat Resin Wiping Stain DEFT Int. Stain DFT 0.5 mils.
         2) 2nd Coat Clear Acrylic DEFT Clear Wood DFT 1.4 mils.
      e. <u>W-5 Semi-Transparent Resin Stain Minimum ODFT 3.3 MILS.</u>
         1) 1st Coat Resin Wiping Stain DEFT Int. Stain DFT 0.5 mils.
         2) 2nd Coat Clear Acrylic DEFT Clear Wood DFT 1.4 mils.

3) 3rd Coat Clear Acrylic DEFT Clear Wood DFT 1.4 mils.

f. W-6 Stained and Water Clear Lacquer Minimum ODFT 3.8 MILS.
1) 1st Coat Resin Wiping Stain DEFT Int. Stain DFT 0.5 mils.
2) 2nd Coat Lacq. Sanding Sealer DEFT WB Sanding Sealer DFT 0.5 mils.
3) 3rd Coat Clear Acrylic DEFT WB 109/S DFT 1.4 mil.
4) 4th Coat Clear Acrylic DEFT WB 109/S DFT 1.4 mil.

g. W-7 Filled and Sealed Floor Finish Minimum ODFT 3.0 MILS.
1) 1st Coat Paste Filler As recommended by Flooring Manufacturer
2) 2nd Coat Satin Polyurethane DEFT 26 DFT 1.5 mils.
3) 3rd Coat Satin Polyurethane DEFT 26 DFT 1.5 mils.

h. W-8 Velvet Lacquered Finish Minimum ODFT 4.7 MILS.
1) 1st Coat Lacq. Sanding Sealer DEFT WB Sanding Sealer DFT 0.5 mils.
2) 2nd Coat Clear Acrylic DEFT WB 109/S DFT 1.4 mil.
3) 3rd Coat Clear Acrylic DEFT WB 109/S DFT 1.4 mil.
4) 4th Coat Clear Acrylic DEFT WB 109/S DFT 1.4 mil.

2. INTERIOR GYPSUM BOARD

a. DW-1 Flat Latex Minimum ODFT 4.2 MILS.
1) 1st Coat SPEEDHIDE ZERO (SPH-0) Primer/Sealer 6-4900XI DFT 1.4 mils.
2) 2nd Coat Flat 0 VOC (SPH-0) 6-4110XI DFT 1.4 mils.
3) 3rd Coat Flat 0 VOC (SPH-0) 6-4110XI DFT 1.4 mils.

b. DW-2 Semi-Gloss Acrylic Non-Blocking Enamel Minimum ODFT 4.0 MILS.
1) 1st Coat SPEEDHIDE ZERO (SPH-0) Primer 6-4900XI DFT 1.4 mils.
2) 2nd Coat Semi-Gloss 0 VOC (SPH-0) 6-4510XI DFT 1.3 mils.
3) 3rd Coat Semi-Gloss 0 VOC (SPH-0) 6-4510XI DFT 1.3 mils.

c. DW-3 Gloss Acrylic Non-Blocking Enamel Minimum ODFT 9.4 MILS.
1) 1st Coat SPEEDHIDE ZERO (SPH-0) Primer 6-4900XI DFT 1.4 mils.
2) 2nd Coat Gloss Acrylic PITT-TECH PLUS 90-1310 DFT 4.0 mils.
3) 3rd Coat Gloss Acrylic PITT-TECH PLUS 90-1310 DFT 4.0 mils.

d. DW-4 Gloss Epoxy Polyamide (Corrosion Resistant) Minimum ODFT 7.6 MILS.
1) 1st Coat Acrylic Primer SEAL GRIP 17-921 DFT 1.6 mils.
2) 2nd Coat Epoxy Gloss AQUAPON 98-1 DFT 3.0 mils.
3) 3rd Coat Epoxy Gloss AQUAPON 98-1 DFT 3.0 mils.

e. DW-4 WB Semi-Gloss Epoxy (Corrosion Resistant) Minimum ODFT 7.6 MILS.
1) 1st Coat Acrylic Primer SEAL GRIP 17-921 DFT 1.6 mils.
2) 2nd Coat Epoxy Semi-Gloss PITT-GLAZE 16-510 DFT 3.0 mils.
3) 3rd Coat Epoxy Semi-Gloss PITT-GLAZE 16-510 DFT 3.0 mils.

3. INTERIOR CEMENT PLASTER, VENEER PLASTER OR GYPSUM PLASTER

a. P-1 Flat Latex Minimum ODFT 4.8 MILS.
1) 1st Coat Acrylic Primer-Sealer 3210 DFT 2.0 mils.
2) 2nd Coat Flat 0 VOC (SPH-0) 6-4110XI DFT 1.4 mils.
3) 3rd Coat Flat 0 VOC (SPH-0) 6-4110XI DFT 1.4 mils.

b. P-2 Semi-Gloss Acrylic Non-Blocking Enamel Minimum ODFT 4.6 MILS.
1) 1st Coat Acrylic Primer-Sealer 3210 DFT 2.0 mils.
2) 2nd Coat Semi-Gloss 0 VOC (SPH-0) 6-4510XI DFT 1.3 mils.
3) 3rd Coat Semi-Gloss 0 VOC (SPH-0) 6-4510XI DFT 1.3 mils.

c. P-3 Gloss Acrylic Non-Blocking Enamel Minimum ODFT 10.0 MILS.

1) 1st Coat Acrylic Primer-Sealer 3210 DFT 2.0 mils.
2) 2nd Coat Gloss Acrylic PITT-TECH PLUS 90-1310 DFT 4.0 mils.
3) 3rd Coat Gloss Acrylic PITT-TECH PLUS 90-1310 DFT 4.0 mils.

d. P-4 Gloss Epoxy Polyamide (Corrosion Resistant) Minimum ODFT 7.6 MILS.
1) 1st Coat Acrylic Primer SEAL GRIP 17-921 DFT 1.6 mils.
2) 2nd Coat Epoxy Gloss AQUAPON 98-1 DFT 3.0 mils.
3) 3rd Coat Epoxy Gloss AQUAPON 98-1 DFT 3.0 mils.

e. P-4 WB S/G Epoxy (Corrosion Resistant) Minimum ODFT 7.6 MILS.
1) 1st Coat Acrylic Primer SEAL GRIP 17-921 DFT 1.6 mils.
2) 2nd Coat WB Epoxy Semi-Gloss PITT-GLAZE 16-510 DFT 3.0 mils.
3) 3rd Coat WB Epoxy Semi-Gloss PITT-GLAZE 16-510 DFT 3.0 mils.

4. INTERIOR CONCRETE OR CONCRETE MASONRY UNITS

a. CB-1 Clear Water Repellent Sealer
1) One Coat Alkyltrialkoxy Silane
a) EVONIK DEGUSSA "Aqua-Trete®CONCENTRATE".
2) Follow manufacturer's recommended coverage rate and installation recommendations for type of substrate to be covered.
3) Provide manufacturer's 10 year warranty for Concrete Masonry Units and Split Faced Concrete Masonry Units.

b. CB-2 Flat Latex - Fine Texture Minimum ODFT 9.9 MILS.
1) 1st Coat Acrylic Block Filler (SPH-0) 6 - 7 DFT 7.1 mils.
a) Omit at concrete surfaces.
2) 2nd Coat Flat 0 VOC (SPH-0) 6-4110XI DFT 1.4 mils.
3) 3rd Coat Flat 0 VOC (SPH-0) 6-4110XI DFT 1.4 mils.

c. CB-3 Semi-Gloss Acrylic Enamel:
1) Concrete Masonry Units: Minimum ODFT 9.7 MILS.
a) 1st Coat Acrylic Block Filler (SPH-0) 6 - 7 DFT 7.1 mils.
b) 2nd Coat Flat 0 VOC (SPH-0) 6-4510XI DFT 1.3 mils.
c) 3rd Coat Flat 0 VOC (SPH-0) 6-4510XI DFT 1.3 mils.
2) Concrete Surfaces: Minimum ODFT 4.6 MILS.
a) 1st Coat Acrylic Primer-Sealer 3210 DFT 2.0 mils.
b) 2nd Coat Flat 0 VOC (SPH-0) 6-4510XI DFT 1.3 mils.
c) 3rd Coat Flat 0 VOC (SPH-0) 6-4510XI DFT 1.3 mils.

d. CB-4 Color High-Gloss Polyamide Epoxy:
1) Concrete Masonry Units: Minimum ODFT 14.6 MILS.
a) 1st Coat W/B Epoxy Block Filler SPEEDHIDE 6-15 DFT 7.0 mils.
b) 2nd Coat Acrylic Primer SEAL-GRIP 17-921 DFT 1.6 mils.
c) 3rd Coat Epoxy Gloss AQUAPON 98-1 DFT 3.0 mils.
d) 4th Coat Epoxy Gloss AQUAPON 98-1 DFT 3.0 mils.
2) Concrete Surfaces: Minimum ODFT 7.6 MILS.
a) 1st Coat Epoxy Primer SEAL-GRIP 17-921 DFT 1.6 mils.
b) 2nd Coat Epoxy Gloss AQUAPON 98-1 DFT 3.0 mils.
c) 3rd Coat Epoxy Gloss AQUAPON 98-1 DFT 3.0 mils.

e. CB-4 Color WB Semi-Gloss Epoxy:
1) Concrete Masonry Units: Minimum ODFT 14.6 MILS.
a) 1st Coat W/B Epoxy Block Filler SPEEDHIDE 6-15 DFT 7.0 mils.
b) 2nd Coat Epoxy Primer SEAL-GRIP 17-921 DFT 1.6 mils.
c) 3rd Coat Epoxy S/G PITT-GLAZE 16-510 DFT 3.0 mils.

d) 4th Coat Epoxy S/G PITT-GLAZE 16-510 DFT 3.0 mils.

2) Concrete Surfaces: Minimum ODFT 7.6 MILS.

a) 1st Coat Epoxy Primer SEAL-GRIP 17-921 DFT 1.6 mils.

b) 2nd Coat Epoxy S/G PITT-GLAZE 16-510 DFT 3.0 mils.

c) 3rd Coat Epoxy S/G PITT-GLAZE 16-510 DFT 3.0 mils.

f. CB-5 Clear High-Gloss Polyamide Epoxy Minimum ODFT 5.0 MILS.

1) 1st Coat Epoxy Gloss MONOPOLE Permashield 200 DFT 2.5 mils.

2) 2nd Coat Epoxy Gloss MONOPOLE Permashield 200 DFT 2.5 mils.

5. INTERIOR METALS

a. PRIMER NOTE: Metals that are shop primed shall be considered “un-primed” and shall be primed with appropriate primer and thicknesses listed below:

1) Ferrous Metal:

a) PPG DEVFLEX 4020 "Red" Multi-Purpose Metal Primer DFT 3.0 mils.

2) Non-Ferrous Metal, Galvanized Metal or Aluminum:

a) PPG DEVFLEX 4020 "White" Multi-Purpose Metal Primer DFT 3.0 mils.

b. COIL-COATED PRODUCTS NOTE: Metal products primed with coil-coated products are to be assumed to be “un-primed” products and shall be additionally coated (or primed again) as follows:

1) Coil-Coated Products:

a) Field apply manufacturer's recommended primer coat and mil thickness over entire surface compatible with substrate finish and finish coats indicated on paint schedule.

c. M-1 Flat Latex Minimum ODFT 5.8 MILS.

1) 1st Coat Primer See primer note above.

2) 2nd Coat Flat 0 VOC (SPH-0) 6-4110XI DFT 1.4 mils.

3) 3rd Coat Flat 0 VOC (SPH-0) 6-4110XI DFT 1.4 mils.

d. M-2 Semi-Gloss "Ultra Color" Industrial Acrylic Minimum ODFT 9.0 MILS.

1) 1st Coat Primer See primer note above.

2) 2nd Coat Acrylic Semi-Gloss DEFLEX 4216 DFT 2.0 mils.

3) 3rd Coat Acrylic Semi-Gloss DEFLEX 4216 DFT 2.0 mils.

e. M-3 Gloss "Ultra Color" Waterborne Acrylic Minimum ODFT 11.0 MILS.

1) 1st Coat Primer See primer note above.

2) 2nd Coat Gloss Acrylic PITT-TECH PLUS 90-1310 DFT 4.0 mils.

3) 3rd Coat Gloss Acrylic PITT-TECH PLUS 90-1310 DFT 4.0 mils.

f. M-4 Semi-Gloss Epoxy Polyamide Minimum ODFT 9.0 MILS.

1) 1st Coat Satin Epoxy Primer PITT-GLAZE 90-712 DFT 3.0 mils.

2) 2nd Coat Epoxy Semi-Gloss PITT-GLAZE 16-510 DFT 3.0 mils.

3) 3rd Coat Epoxy Semi-Gloss PITT-GLAZE 16-510 DFT 3.0 mils.

g. M-5 Gloss Epoxy Polyamide Minimum ODFT 9.0 MILS.

1) 1st Coat Satin Epoxy Primer PITT-GLAZE 90-712 DFT 3.0 mils.

2) 2nd Coat Epoxy Gloss AQUAPON 98-1 DFT 3.0 mils.

3) 3rd Coat Epoxy Gloss AQUAPON 98-1 DFT 3.0 mils.

h. M-5 Water Base S/G Epoxy (Corrosion Resistant) Minimum ODFT 7.6 MILS.

1) 1st Coat Acrylic Primer SEAL GRIP 17-921 DFT 1.6 mils.

2) 2nd Coat WB Epoxy S/G PITT-GLAZE 16-510 DFT 3.0 mils.

3) 3rd Coat WB Epoxy S/G PITT-GLAZE 16-510 DFT 3.0 mils.

i. M-6 Flat Waterborne Paint Minimum ODFT 4.4 MILS.

1) 1st Coat Flat Dry Fall Prime SUPER TECH 6-726XI DFT 2.2 mils.

2) 2nd Coat Flat Dry Fall Finish SUPER TECH 6-726XI DFT 2.2 mils.

j. M-7 Semi-Gloss Waterborne Paint Minimum ODFT 4.4 MILS.

1) 1st Coat Semi-Gloss Dry Fall Primer SUPER TECH 6-724XI DFT 2.2 mils.

2) 2nd Coat Semi-Gloss Dry Fall Finish SUPER TECH 6-724XI DFT 2.2 mils.

6. INTERIOR ACOUSTICAL TILE

a. A-1 Matte Flat Vinyl Acrylic Minimum ODFT 1.3 MILS.

1) 1st Coat Flat Vinyl Acrylic PRO-EV 0-VOC 12-110 DFT 1.3 mils.

F. EXTERIOR PAINT FINISHES

1. EXTERIOR WOOD

a. EW-1 Flat 100 percent Acrylic Minimum ODFT 5.5 MILS.

1) 1st Coat 100 percent Acrylic Primer-Sealer 6001 DFT 1.7 mils.

2) 2nd Coat 100 percent Acrylic Flat 2200G DFT 1.9 mils.

3) 3rd Coat 100 percent Acrylic Flat 2200G DFT 1.9 mils.

b. EW-2 Semi-Gloss percent Acrylic Minimum ODFT 5.9 MILS.

1) 1st Coat 100 percent Acrylic Primer-Sealer 6001 DFT 1.7 mils.

2) 2nd Coat 100 percent Acrylic Semi-Gloss 2406G DFT 2.1 mils.

3) 3rd Coat 100 percent Acrylic Semi-Gloss 2406G DFT 2.1 mils.

c. EW-3 100 percent Acrylic Resin (A/R) Stain Minimum ODFT 3.0 MILS.

1) 1st Coat 100 percent A/R Stain Coat FLOOD SWF DFT 1.5 mils.

2) 2nd Coat 100 percent A/R Stain Coat FLOOD SWF DFT 1.5 mils.

2. EXTERIOR SOFFIT BOARD

a. ESB-1 Lo-Sheen 100 percent Acrylic Resin (A/R)-Heavy Stipple Minimum ODFT 5.9 MILS.

1) 1st Coat 100 percent Acrylic Primer-Sealer 6001 DFT 1.7 mils.

2) 2nd Coat* 100 percent A/R Heavy Stipple 2406G DFT 2.1 mils.

3) 3rd Coat: 100 percent A/R Lo Sheen 2406G DFT 2.1 mils.

4) *Note: 2nd Coat to have medium size aggregate added to achieve heavy stipple texture.

3. EXTERIOR CEMENT PLASTER

a. EP-1 Flat 100 percent Acrylic Minimum ODFT 5.5 MILS.

1) 1st Coat 100 percent Acrylic Primer-Sealer 6001 DFT 1.7 mils.

2) 2nd Coat 100 percent Acrylic Flat2200G DFT 1.9 mils.

3) 3rd Coat 100 percent Acrylic Flat2200G DFT 1.9 mils.

b. EP-2 Semi-Gloss 100 percent Acrylic Minimum ODFT 9.5 MILS.

1) 1st Coat 100 percent Acrylic Primer-Sealer 6001 DFT 1.5 mils.

2) 2nd Coat 100 percent Acrylic Semi-Gloss 2200G DFT 4.0 mils.

3) 3rd Coat 100 percent Acrylic Semi-Gloss 2200G DFT 4.0 mils.

c. EP-3 Gloss Acrylic Minimum ODFT 9.7 MILS.

1) 1st Coat 100 percent Acrylic Primer-Sealer 6001 DFT 1.7 mils.

2) 2nd Coat Gloss Acrylic PITT-TECH PLUS 90-1310 DFT 4.0 mils.

3) 3rd Coat Gloss Acrylic PITT-TECH PLUS 90-1310 DFT 4.0 mils.

d. EP-4 Smooth Elastomeric, Lo Sheen Acrylic/Resin (A/R) - Minimum ODFT 11.0 MILS.

1) 1st Coat 100 percent Acrylic Primer-Sealer 6001 DFT 1.7 mils.

2) 2nd Coat Smooth Elastomeric PITT-FLEX 4-110 DFT 7.2 mils.

a) Spray and Backroll

3) 3rd Coat 100 percent Acrylic Resin Satin 2402G DFT 2.1 mils.

e. EP-5 Satin Elastomeric, S/G Acrylic/Resin (A/R) Minimum ODFT 9.6 MILS.

1) 1st Coat 100 percent Acrylic Primer-Sealer 6001 DFT 1.7 mils.
2) 2nd Coat Matte Flex Elastomeric PITT-FLEX 4-310 DFT 5.8 mils.
a) Spray and Backroll
3) 3rd Coat 100 percent Acrylic Satin Finish 2406G DFT 2.1 mils.

f. EP-6 Coarse Elastomeric, Satin Acrylic/Resin (A/R) Minimum ODFT 16.8 MILS.
1) 1st Coat 100 percent Acrylic Primer-Sealer 6001 DFT 1.7 mils.
2) 2nd Coat Elastomeric Finish 2290 DFT 13.0 mils.
a) Spray and Backroll
3) 3rd Coat 100 percent Acrylic Satin Finish 2406G DFT 2.1 mils.

4. EXTERIOR CONCRETE OR CONCRETE MASONRY UNITS:
a. ECB-1 Clear Water Repellent Sealer:
1) One Coat Alkyltrialkoxy Silane:
a) EVONIK DEGUSSA "Aqua-Trete® CONCENTRATE"
2) Provide manufacturer's 10 year warranty for Concrete Masonry Units and Split Faced Concrete Masonry Units.
b. ECB-2 Flat 100 percent Acrylic Minimum ODFT 10.9 MILS.
1) 1st Coat W/B Acrylic Block Filler SPEEDHIDE 6-7 DFT 7.1 mils.
a) Omit at concrete surfaces
2) 2nd Coat 100 percent Acrylic Flat 2200G DFT 1.9 mils.
3) 3rd Coat 100 percent Acrylic Flat 2200G DFT 1.9 mils.
c. ECB-3 Flat 100 percent Acrylic Minimum ODFT 5.5 MILS.
1) 1st Coat 100 percent Acrylic Primer-Sealer 6001 DFT 1.7 mils.
2) 2nd Coat 100 percent Acrylic Flat 2200G DFT 1.9 mils.
3) 3rd Coat 100 percent Acrylic Flat 2200G DFT 1.9 mils.

5. EXTERIOR METAL
a. PRIMER NOTE: Metals shop primed shall be considered “un-primed” and shall be primed with appropriate primer and thicknesses listed below:
1) Ferrous Metal, Type 1 Typical:
a) DEVFLEX 4020 "Red" Multi-Purpose Metal Primer DFT 3.0 mils.
2) Ferrous Metal, Type 2 as specified in Specification Section – STEEL AND FABRICATIONS:
a) AMERCOAT 68HS Reinforced Inorganic Zinc-Rich Urethane Metal Primer DFT 5.0 mils.
3) Ferrous Metal, Type 3 when Urethane is used as a finish.
a) AMERLOCK 2VOC/400 VOC Epoxy Metal Primer DFT 6.0 mils.
4) Non-Ferrous Metal, Type 4 Galvanized Metal or Aluminum
a) DEVFLEX 4020 "White" Multi- Purpose Metal Primer DFT 3.0 mils.
5) Non-Ferrous Metal, Type 5 Galvanized Metal or Aluminum, when Urethane is used as a finish.
a) AMERLOCK 2VOC/400 VOC Epoxy Metal Primer DFT 6.0 mils.
b. COIL-COATED PRODUCTS NOTE: Metal products primed with coil-coated products are to be assumed to be unprimed products and shall be re-primed as follows:
1) Coil-Coated Products:
a) Field apply manufacturer's recommended primer coat and mil thickness over entire surface compatible with substrate finish and finish coats indicated on paint schedule.
c. EM-1 Flat 100 percent Acrylic Minimum ODFT 6.8 MILS.

1) 1st Coat Primer See primer note above.
2) 2nd Coat 100 percent Acrylic Flat 2200G DFT 1.9 mils.
3) 3rd Coat 100 percent Acrylic Flat 2200G DFT 1.9 mils.

d. EM-2 Semi-Gloss "Ultra Color" 100 percent Acrylic Minimum ODFT 7.2 MILS.
1) 1st Coat Primer See primer note above.
2) 2nd Coat 100 percent Acrylic Semi-Gloss 2406G DFT 2.1 mils.
3) 3rd Coat 100 percent Acrylic Semi-Gloss 2406G DFT 2.1 mils.

e. EM-3 Gloss "Ultra Color" 100 percent Acrylic Waterborne Minimum ODFT 11.0 MILS.
1) 1st Coat Primer See primer note above.
2) 2nd Coat Gloss Acrylic PITT-TECH PLUS 90-1310 DFT 4.0 mils.
3) 3rd Coat Gloss Acrylic PITT-TECH PLUS 90-1310 DFT 4.0 mils.

f. EM-4 Gloss "Ultra Color" Aliphatic Acrylic Urethane (A/A/U) Finish, Spray Applied, Deep Tone, Custom Color Minimum ODFT 16.0 MILS.
1) 1st Coat Primer See primer note above.
2) 2nd Coat A/A/U Gloss Color AMERSHIELD VOC DFT 5.0 mils.
3) 3rd Coat A/A/U Gloss Color AMERSHIELD VOC DFT 5.0 mils.

g. EM-5 Gloss "Ultra Color" Aliphatic High Solids Finish, Spray Applied, Deep Tone, Custom Color with clear protective coats Minimum ODFT 18.0 MILS.
1) 1st Coat Primer See primer note above
2) 2nd Coat A/A/U Gloss Color AMERSHIELD VOC DFT 3.0 mils.
3) 3rd Coat A/A/U Gloss Color AMERSHIELD VOC DFT 3.0 mils.
4) 4th Coat A/A/U Gloss Clear AMERSHIELD VOC DFT 3.0 mils.
5) 5th Coat A/A/U Gloss Clear AMERSHIELD VOC DFT 3.0 mils.

h. EM-6 Semi-Gloss "Ultra Color" Aliphatic Urethane (A/U) Finish, Spray Applied, Deep Tone, Custom Color Finish Minimum ODFT 16.0 MILS.
1) 1st Coat Primer See primer note above.
2) 2nd Coat A/A/U Semi-Gloss AMERCOAT 450HSG A/U DFT 5.0 mils.
3) 3rd Coat A/A/U Semi-Gloss AMERCOAT 450HSG A/U DFT 5.0 mils.

G. SPECIALTY PAINT FINISHES:

1. PROVIDE SPECIALTY PAINT FINISHES AS SHOWN OR AS FOLLOWS:

a. Finish No. X-1: Minimum ODFT 15.0 MILS.
1) Lines on Concrete or Asphaltic Concrete Paving Exit and Entrance Signs - 10" width lines, maximum. Reflectorize as required:
2) Traffic Paint ENNIS-FLINT Traffic Paint DFT 15.0 mils.

b. Finish No. X-2: Minimum ODFT 15.0 MILS.
1) Lines on Walk Top. Colors as selected by Project Engineer:
2) Line Paint ENNIS-FLINT Traffic Paint DFT 15.0 mils.

c. Finish No. X-3: Minimum ODFT 1.9 MILS.
1) Space above Vents or Grilles:
2) 1st Coat 100 percent Acrylic Flat Black 2200G DFT 1.9 mils.

d. Finish No. X-4: Minimum ODFT 5.1 MILS.
1) Piping Black Steel or Cast Iron:
2) 1st Coat Multi-Purpose Metal Primer:
a) DEVFLEX 4020 "Red" DFT 3.0 mils.
3) 2nd Coat Acrylic Gloss Finish 2406G DFT 2.1 mils.

e. Finish No. X-5: Minimum ODFT 7.0 MILS.

1) Piping Galvanized:
2) 1st Coat General Purpose Metal Primer:
   a) DEVFLEX 4020 "White" DFT 3.0 mils.
3) 2nd Coat Gloss Enamel Finish:
   a) PITT-TECH PLUS 90-1310 DFT 4.0 mils.

f. Finish No. X-6: Minimum ODFT 11.0 MILS.
1) Machinery and Equipment (Coil Coated Products):
2) 1st Coat General Purpose Metal Primer:
   a) DEVFLEX 4020 "White" DFT 3.0 mils.
3) 2nd Coat Gloss Enamel PITT-TECH PLUS 90-1310 DFT 4.0 mils.
4) 3rd Coat Gloss Enamel PITT-TECH PLUS 90-1310 DFT 4.0 mils.

g. Finish No. X-7: Minimum ODFT 7.0 MILS.
1) Sheet Metal Ducts:
2) 1st Coat General Purpose Metal Primer:
   a) DEVFLEX 4020 "White" DFT 3.0 mils.
3) 2nd Coat 100 percent Acrylic Flat
   a) PITT-TECH PLUS 90-1310 DFT 4.0 mils.

h. Finish No. X-8: Minimum ODFT 7.0 MILS.
1) Fire Hydrants:
2) 1st Coat General Purpose Metal Primer
   a) DEVFLEX 4020 "White" DFT 3.0 mils.
3) 2nd Coat 100 percent Acrylic Flat
   a) PITT-TECH PLUS 90-1310 DFT 4.0 mils.

i. Finish No. X-9: Minimum ODFT 6.8 MILS.
1) Following items listed will receive Finish No. X-9 (including, but not limited to), Louvers, Grilles, or Access Panels:
2) 1st Coat General Purpose Metal Primer:
   a) DEVFLEX 4020 "White" DFT 3.0 mils.
3) 2nd Coat 100 percent Acrylic Flat2200G DFT 1.9 mils.
4) 3rd Coat 100 percent Acrylic Flat2200G DFT 1.9 mils.

j. Finish No. X-10: Minimum ODFT 1.9 MILS.
1) Striping under Acoustical Board Surrounding Structure:
2) 1st Coat 100 percent Acrylic Flat Black 2200G DFT 1.9 mils.

k. Finish No. X-11: Minimum ODFT 1.9 MILS.
1) Acoustical Board and Exposed Striping and Structural:
2) 1st Coat 100 percent Acrylic Flat Black 2200G DFT 1.9 mils.

l. Finish No. X-12:
1) Minimum ODFT as recommended by graffiti coating manufacturer.
2) Graffiti Coating, non-toxic, liquid, sacrificial wax-based Coating:
3) 1st Coat Graffiti Coating:
   a) Graffiti-Pruf by VISUAL POLUTION TECH, INC.
4) 2nd Coat Graffiti Coating:
   a) Only if recommended by manufacturer for substrate material type.
   b) Graffiti-Pruf by VISUAL POLUTION TECH, INC.

m. Finish No. X-13 (NOT APPLICABLE):

n. Finish No. X-14 (NOT APPLICABLE):

o. Finish No. X-15:
1) Clear Graffiti Coating, non-toxic, liquid, multi-polymer, non-sacrificial, single component sealer by BASF, or approved equivalent: One Coat

a) **NOTE #1:** Test a small area of the existing substrate in an out-of-the-way spot, as determined by the Project Engineer, for compatibility. Inform the Project Engineer if an incompatibility is found for further direction. If found to be compatible, proceed as follows:

2) 1st Coat Clear, flat matte coat TAGGUARD by BASF

a) **NOTE #2**: Follow manufacturer's recommendations for proper installation over various substrates. Applicator must be certified by the manufacturer as an approved applicator for this product over various substrate materials. Protect at least 24 hours minimum the treated surface until manufacturer's recommended curing time has been achieved against graffiti.

3) REMOVAL COAT: TAGGUARD Cleaner

a) **NOTE #3:** Provide remover in small containers equal to 8-16 oz. containers of material for the Owner's use. Instruct the designated representative of the Owner as to proper application of the remover, and all procedures for removing graffiti.

p. Finish No. X-16: Non-sacraficial, aqueous, silane chemistry, ready-to-use, zero VOC high performance anti-graffiti treatment for masonry, concrete and natural stone, dries clear and will not yellow.

1) Follow manufacturer's printed recommendations prior to use.

2) Do not apply to wet surfaces. If surface is wet, let dry for a minimum of 24 hours prior to application. Do not use if temperature is below 40 degrees F or above 100 degrees F.

3) Protect non-porous surface substrates from overspray. Always do a test patch to confirm the treatment before using to deterimine if there is any problems prior to full coverage of the porous surfaces.

4) Concrete shall be allowed to cure a minimum of 28 days. All pointing or re-pointing shall be completed and allowed to cure for at least 3 days prior to coverage. All patching materials, caulking, sealing materials and traffic paint shall be fully cured before application.

5) 1st Coat Clear, flat matte coat PROTECTOSIL ANTIGRAFFITI

a) 175 to 250 sq. ft. per gallon, diluted by 14 parts of water, using a 1" nap roller.

6) 2nd Coat Clear, flat matte coat PROTECTOSIL ANTIGRAFFITI

a) 175 to 250 sq. ft. per gallon, un-diluted, using a 1" nap roller.

7) 3rd Coat Clear, flat matte coat PROTECTOSIL ANTIGRAFFITI

a) 175 to 250 sq. ft. per gallon, un-diluted, using a 1" nap roller.

b) 3rd Coat shall always be figured in as part of the Base Bid. 3rd Coat may be deleted if it is determined by all concerned that the two coats were sufficient to protect the surfaces. If not needed, then figure on a credit back to the Owner.

8) Most graffiti removal can be achieved with standard non-hazardous cleaners and low-pressure waterblasting. Contact manufacturer for stubborn markings for removal.

q. Finish No. X-17: Non-sacraficial, 100 percent active silane treatment with oleophobic additive, clear penetrating breathable VOC Compliant (400 g/L) surface treatment for use on concrete, brick masonry, concrete masonry units and natural stone.

1) For flat (horizontal) concrete walks.

a) Manufacturer's printed recommendations for rate of coverage, and type of application method to protect porous surfaces from graffiti and for ease of walk-way clean-up.
b) Follow manufacturer's printed recommendations prior to use.
c) Do not apply to wet surfaces. If surface is wet, let dry for a minimu of 24 hours prior to application. Do not use if temperature is below 40 degrees F or above 100 degrees F.
d) Protect non-porous surface substrates from overspray. Always do a test patch to confirm the treatment before using to deterimine if there is any problems prior to full coverage of the porous surfaces.
e) Concrete surfaces shall be allowed to cure a minimum of 28 days. All pointing or re-pointing shall be completed and allowed to cure for at least 3 days prior to coverage. All patching materials, caulking, sealing materials and paint shall be fully cured before application.

2) 1st Coat Clear, flat matte coat PROTECTOSIL BHN PLUS

r. Finish No. X-18: Non-sacraficial, Graffiti Coating, non-toxic, liquid, semi-permanent, acrylic based Coating - Minimum ODFT as recommended by graffiti coating manufacturer.

1) For application on sealed surface, including but not limited to CMU scheduled to be sealed, verify compatibility with sealer manufacturer prior to application of Sealer.
a) Only if recommended by manufacturer for substrate material type.
b) For application on natural porous surface, thin first coat with 40 percent water. All other coats shall be full strength.

2) 1st Coat Graffiti Coating TSW4
3) 2nd Coat Graffiti Coating TSW4
4) 3rd Coat Graffiti Coating TSW4
5) 4th Coat Graffiti Coating TSW4
6) Provide Manufacturer's recommended TSW2G Graffiti Removal Kit.

s. Finish No. X-19 Intumescent Paint - Minimum ODFT per fire rating required.

1) Primer Per manufacturer's Written Recommendations ODFT as required.
2) 1sr Coat Water Based Polymer ISOLATEK INTERNATIONAL "CAFCO Spray Film WB3".
3) 2nd Coat As required if needed - no greater than 62 mils per coat.
4) 3rd Coat As required if needed - no greater than 62 mils per coat.
5) 4th Coat Premium Exterior Latex Semi-Gloss GL68XX in thickness as recommended by manufacturer, and in color as selected by the Project Engineer.

t. Finish No. X-20 Pool Paint High Gloss Epoxy - Minimum ODFT Approximately 3.6 mils.

1) Primer RAMUC "Clean and Prep Solution" per manufacturer's Written Recommendations ODFT as required.
2) 1st Coat Pool Paint by RAMUC ODFT 1.7 mils.
3) Finish Coat Pool Paint by RAMUC ODFT 1.7 mils.

u. Finish No. X-21: "Ceramic Carpet" Flooring System

1) Fresno Unified School District Standard.
2) Surface Preparation:
a) Refer to Specification Section - VAPOR ALKALINITY CONTROL and manufacturer's written instructions.

b) Provide shot-blasted or mechanically abraded surfaces (CSP-4-9).
c) Prepare any metal substrates per SSPC-SP10 "Near White Metal".
d) Threshold preparation: Key in material for flush transition.

3) SHERWIN WILLIAMS / General Polymers, 1/4" Thick "Ceramic Carpet" Flooring System:
   a) 1st Coat - Primer: SHERWIN WILLIAMS GP3477 Epoxy Water Emulsion Primer / Sealer (Part A and Part B).
   b) 2nd Coat - Slurry: SHERWIN WILLIAMS Fastop Urethane Slurry 12S-GP4080 with 55lbs GP 5080 aggregate per 1.8-gallon kit. Applied at 3/16, 5900F aggregate broadcast to excess approx. 0.6 lbs. per sq. ft.
   c) 3rd Coat - Broadcast Alum Oxide: SHERWIN WILLIAMS GP 3744 applied at 100 sq ft per gallon with 5900F aggregate broadcast to excess approx. 0.6 lbs. per sq. ft.
   d) 4th Coat - Grout Coat: GP 3744 applied at 100 sq. ft per gallon.
   e) 5th Coat - Finish Coat: GP 3744 applied at 100 sq. ft per gallon
4) Coved Bases: Extend the "Ceramic Carpet" Flooring System up the coved base, to an extent 6" minimum above the finish floor. Terminate the cove material at an existing grout joint, or at the top of the coved wall base.

END OF SECTION

SECTION 22 00 00 - PLUMBING

PART 1: - GENERAL

1.1 GENERAL MECHANICAL PROVISIONS:

A. The General Mechanical Provisions, Section 23 00 00, shall form a part of this Section with the same force and effect as though repeated here.

1.2 SCOPE:

A. Included: Provide all labor, materials and services necessary for complete, lawful and operating systems as shown or noted on the drawings or as specified here. The work includes, but is not necessarily limited to, the following:
1. Fuel gas system.
2. Drain system (including condensate drain).
3. All equipment as shown or noted on the drawings or as specified.
4. Demolition as indicated on drawings. Where demolition is called for, remove all equipment, piping, braces, housekeeping pads, supports and related items no longer required.

B. Work Specified Elsewhere:
1. Concrete and reinforcing steel unless specifically called for on the drawings or specifications.
2. Painting unless specifically called for in the drawings or specifications.
3. Carpentry.

PART 2: - PRODUCTS

2.1 PIPING MATERIALS:

A. Gas:
1. Gas Piping: Schedule 40 galvanized steel pipe, ASTM A53. 150 psi galvanized malleable iron screwed fittings, ANSI B16.3, ANSI B31.8.
2. Valves and Specialties:
   a. Valves:
      (1) General: Manufacturer's model numbers are listed to complete description. Equivalent models of Crane, Kitz, Milwaukee, Nibco, Stockham, Walworth or Watts are acceptable. All valves of a particular type or for a particular service shall be by the same manufacturer.
      (2) Plug Valve: Valves in gas piping systems must be UL or CSA listed for gas distribution. Eccentric bronze or nickel plated semi-steel plug. Semi-steel body. Bronze bushings. Buna-N-rings. 175 psi WOG. KeyPort Valve Series 400. 2" and smaller above grade may be listed full port ball valves, except in publicly accessible locations. Apollo, Jomar, Nibco.
   b. Miscellaneous Specialties:

(1) Union: 2" and Smaller: AAR malleable iron, bronze to iron ground seat. 300 psi. Unions for copper piping shall be copper or lead free cast bronze. Anvil.

(2) Gas Pressure Reducing Valve: Capacity and pressure ratings as indicated on drawings. American Meter.

B. Drain Piping (including Condensate): Hard temper seamless copper, ASTM B88. Wrought copper fittings, ANSI B16.22. Type L with brazed joints (1100F, min.). 1-1/2" and smaller above grade may be soldered, 95-5 tin-antimony solder. All nipples shall be red brass (85% copper). Piping at ground mounted units shall be galvanized steel.

C. Miscellaneous Piping Items:

1. Pipe Support:

a. Pipe Hanger: Steel "J" hanger with side bolt for piping 4" and smaller; steel clevis hanger for piping 5" and larger. Load and jam nuts. Size and maximum load per manufacturer's recommendation. Felt liner for copper piping. Hanger and rod shall have galvanized finish. B-Line, Anvil, Unistrut.

b. Isolating Shield: Galvanized steel shell and reinforcing ribs. 1/4" non-conducting hair felt pad. Pipe hanger in accordance with paragraph above. Increase hanger size per manufacturer's recommendation. B-Line, Semco, Superstrut.

c. Construction Channel: 12-gage, 1-5/8" x 1-5/8" galvanized steel channel. Single or multiple section. Self-locking nuts and fittings. B-Line, Anvil, Unistrut.

2. Flashing: Vent flashing shall be 4 lb/ft2 lead, 16" sq. flange, length sufficient to be turned down 2" into vent. Oatey. Flashing for other piping through roof shall be prefabricated galvanized steel roof jacks with 16" sq. flange. Provide clamp-on storm collar and seal water tight with mastic. For cold process built-up roof, material shall be 4 lb/ft^2 lead instead of galvanized steel. For single-ply roofing, use the roofing manufacturer’s recommended flashing material.

2.2 FIXTURES:

A. General: Provide rough-in for and install all plumbing fixtures shown on drawings.

B. Schedule: Refer to Plumbing Fixture Schedule on the drawings for list of fixtures and trim. Manufacturer's model numbers are listed to complete description.

PART 3: - EXECUTION

3.1 PIPING INSTALLATION:

A. General:

1. Piping Layout: Piping shall be concealed in walls, above the ceilings, or below grade unless otherwise noted. Exposed piping shall run parallel to room surfaces; location to be approved by Architect. No structural member shall be weakened by cutting, notching, boring or otherwise, unless specifically allowed by structural drawings and/or specifications. Where such cutting is required, reinforcement shall be provided as specified or detailed. All piping shall be installed in a manner to

ensure unrestricted flow, eliminate air pockets, prevent any unusual noise, and permit complete drainage of the system. All piping shall be installed to permit expansion and contraction without strain on piping or equipment. Vertical lines shall be installed to allow for building settlement without damage to piping. Pipe sizes indicated on the drawings are nominal sizes unless otherwise noted.

2. Joints:
   a. Threaded: Pipe shall be cut square and reamed to full size. Threads shall be in accordance with ANSI B2.1. Joint compound or tape suitable for conveyed fluid shall be applied to male thread only. Joints shall be made with three threads exposed.
   b. Brazed: Filler rod shall be of suitable or the same alloy as pipe. Brazing filler metal shall have a minimum melting point of 1100F. Brazing shall be performed by a Certified Brazer as certified by an organization/institution that uses standards recognized by the American Welding Society (AWS) and meets the requirements of the ASME Boiler and Pressure Vessels Code, Section 9.
   c. Open Ends: Open ends of piping shall be capped during progress of work to preclude foreign matter.
   d. Electrical Equipment: Piping shall not be run over electrical panels, motor control centers or switchboards.
3. Fittings and Valves:
   a. Standard Fittings: All joints and changes in direction shall be made with standard fittings. Close nipples shall not be used.
   b. Reducers: Pipe size reduction shall be made with bell reducer fittings. Bushings shall not be used.
   c. Unions: A union shall be installed on the leaving side of each valve, at all sides of automatic valves, at equipment connections, and elsewhere as necessary for assembly or disassembly of piping.
   d. Valves: All valves shall be full line size. Provide shut-off valve for each building and each equipment connection. Provide shut-off valve at each point of connection to existing piping. At equipment connections, valves shall be full size of upstream piping, except that gas valves within 18" of the point of connection to the equipment may be the same size as the equipment connection.
   e. Valve Accessibility: All valves shall be located so that they are easily accessible. Valves located above ceilings shall be installed within 24" of the ceiling. For situations where this is not practical or where valves are greater than 10' above the floor, chain wheel operators shall be provided. Chain shall extend down to 7' above the floor. All such installations must have prior review by the Engineer.
4. Pipe Support:
   a. General: Hangers shall be placed to support piping without strain on joints or fittings. Maximum spacing between supports shall be as specified below. Actual spacing requirements will depend on structural system. Side beam clamps shall be provided with retaining straps to secure the clamp to the opposite side of the beam. Vertical piping shall be supported with riser clamp at 20' on center (maximum). Support pipe within 12" of all changes in direction. Support individual pipes with pipe hanger.
      (1) Pressure Pipe:

Maximum Spacing*

Pipe Size (Inches)	Between Supports (ft.)	
	Copper	Sch. 40 steel
1/2	6	6
3/4	6	8
1	6	8
1-1/4	6	10
1-1/2	6	10
2	10	10
2-1/2	10	10
3	10	10

*Based on straight lengths of pipe with couplings only. Provide additional supports for equipment, valves or other fittings. Seismic requirements may reduce maximum spacing.

(2) Gravity Drain Pipe: Piping shall be supported at each length of pipe or fitting, but in no case at greater spacing than indicated above for pressure pipe.

b. Trapeze: Trapeze hangers of construction channel and pipe clamps may be used. Submit design to Engineer for review.

5. Miscellaneous:

a. Escutcheons: Provide chrome plated metal escutcheons where piping penetrates walls, ceilings, or floors in finished areas.

b. Pipe Sleeves: All piping passing through concrete shall be provided with pipe sleeves. Allow 1" annular clearance between sleeve and pipe for piping 3" and smaller, otherwise 2" annular clearance.

c. Pipes Passing through Fire Rated Surfaces: Pipes passing through fire rated walls, floors, ceilings, partitions, etc. shall have the annular space surrounding the pipe or pipe insulation sealed with fire rated materials in accordance with the requirements of 2016 CBC Section 714.

d. Dielectric Couplings: Dielectric couplings shall be installed wherever piping of dissimilar metals are joined, except that bronze valves may be installed in ferrous piping without dielectric couplings.

B. Gas Piping: Installation shall comply with CPC and NFPA 54 (National Fuel Gas Code). Shall be pitched to drain to drip legs at low points where other than dry gas conditions exist. No unions shall be installed except at connections to equipment. Provide shutoff and dirt leg (sediment trap) at each equipment connection. Only equipment mounted on vibration isolators shall be connected with flexible connectors.
Odor Fade Warning – The odorant in propane (LP) and natural gas is colorless and the intensity of its odor can fade under some circumstances. Contact the utility company for more information.

C. Drain Piping (Including Condensate): Install with constant pitch to receptacle, 1/4" per foot where possible, otherwise 1/8" per foot minimum. Provide TEE with clean-out plug at all changes of direction. Provide trap at each air handling unit to prevent air leakage. Only equipment mounted on vibration isolators shall be connected with flexible connection. Piping not concealed in wall structure, above ceilings or below floors shall be chrome plated brass, except in equipment rooms, piping shall be galvanized steel. P&T relief and water heater drain piping shall be galvanized steel. Provide secondary drain piping where required.

3.2 FIXTURE INSTALLATION:

A. Other Connections: Rough-in and connection for trim or fixtures supplied by others shall be included in this specification section.

3.3 EQUIPMENT INSTALLATION:

A. General: It shall be the responsibility of the equipment installer to insure that no work done under other specification sections shall in any way block, or otherwise hinder the equipment. All equipment shall be securely anchored in place.

B. Connections to Equipment: Where size changes are required for connections to equipment, they shall be made immediately adjacent to the equipment and, if possible, inside the equipment cabinet.

3.4 TESTS AND ADJUSTMENTS:

A. General: Unless otherwise directed, tests shall be witnessed by a representative of the Architect. Work to be concealed shall not be enclosed until prescribed tests are made. Should any work be enclosed before such tests, the Contractor shall, at his expense, uncover, test and repair all work to original conditions. Leaks and defects shown by tests shall be repaired and entire work retested. Tests may be made in sections, however, all connections between sections previously tested and new section shall be included in the new test.

B. Gravity Systems:
   1. Drains (Including Condensate): All ends of the drain system shall be capped and lines filled with water to the top of the highest point, 10' above grade minimum. This test shall be made before any fixtures are equipment has been connected. Test shall be maintained until all joints have been inspected, but no less than 2 hours.

C. Pressure Systems:
   1. General: There shall be no drop in pressure during test except that due to ambient temperature changes. All components of system not rated for test pressure shall be isolated from system before test is made.
   2. Gas Piping: Maintain 100 psig air pressure for 4 hours.

END OF SECTION

SECTION 23 00 00 - GENERAL MECHANICAL PROVISIONS

PART 1: - GENERAL

1.1 GENERAL CONDITIONS:

A. The preceding General and Special Conditions and Divisions 00 and 01 requirements shall form a part of this Section with the same force and effect as though repeated here. The provisions of this Section shall apply to all of the Sections of Divisions 22 and 23 of these Specifications and shall be considered a part of these sections.

1.2 CODES AND REGULATIONS:

A. All work and materials shall be in full accordance with current rules and regulations of all applicable codes. Nothing in these Drawings or Specifications is to be construed to permit work not conforming to these codes. Should the Drawings or Specifications call for material or methods of construction of a higher quality or standard than required by these codes, the Drawings and Specifications shall govern. Applicable codes and regulations include, but are not necessarily limited to, the following:

1. California Code of Regulations (CCR):
   a. Title 8, Industrial Relations
   b. Title 24, Part 1, Administrative Regulations
   c. Title 24, Part 6, California Energy Code, 2016 Edition
   d. Title 24, Part 11, California Green Building Code, 2016 Edition
2. California Building Code - CBC - 2016
3. California Mechanical Code - CMC - 2016
4. California Plumbing Code - CPC - 2016
5. California Fire Code - CFC - 2016
6. California Electrical Code - CEC - 2016
7. Air Diffusion Council - ADC
8. American Gas Association - AGA
9. Air Movement and Control Association - AMCA
10. American National Standards Institute - ANSI
11. Air Conditioning and Refrigeration Institute - ARI
12. American Society of Heating, Refrigerating, and Air Conditioning Engineers - ASHRAE
13. American Society of Mechanical Engineers - ASME
14. American Society for Testing and Materials - ASTM
15. American Water Works Association - AWWA
16. Cast Iron Soil Pipe Institute - CISPI
17. National Electrical Manufacturers Association - NEMA
18. National Fire Protection Association - NFPA
19. National Sanitation Foundation - NSF
20. Occupational Safety and Health Act - OSHA
21. Plumbing and Drainage Institute - PDI
22. Sheet Metal and Air Conditioning Contractors National Association - SMACNA
23. Underwriters' Laboratory – UL
24. Local codes.

1.3 PERMITS AND FEES:

A. The Contractor shall take out all permits and arrange for all tests in connection with his work as required. All charges are to be included in the work. Permits for equipment connected to a particular system are to be considered as part of the work included under each system. All charges or fees for service connections, meters, etc. shall be included in the work.

1.4 COORDINATION OF WORK:

A. Layout of materials, equipment and systems is generally diagrammatic unless specifically dimensioned. Some work may be shown offset for clarity. The actual locations of all materials, piping, ductwork, fixtures, equipment, supports, etc. shall be carefully planned prior to installation of any work in order to avoid all interference with each other, or with structural, electrical, architectural or other elements. Verify the proper voltage and phase of all equipment with the electrical plans. If discrepancies are discovered between drawing and specification requirements, the more stringent requirement shall apply. All conflicts shall be called to the attention of the Architect and the Engineer prior to the installation of any work or the ordering of any equipment. No work shall be prefabricated or installed prior to this coordination. No costs will be allowed to the Contractor for any prefabrication or installation performed prior to this coordination.

1.5 GUARANTEE:

A. Guarantee shall be in accordance with the General Conditions. These Specifications may extend the period of the guarantee for certain items. Where such extensions are called for, or where items are normally provided with guarantee periods in excess of that called for in the General Conditions, the certificate of guarantee shall be furnished to the Owner through the Engineer. Equipment that is started and operated prior to acceptance shall have the guarantee extended to cover that period. Owner guarantee shall start at acceptance.

1.6 QUIETNESS:

A. Piping, ductwork and equipment shall be arranged and supported so that vibration is a minimum and is not transmitted to the structure.

1.7 DAMAGES BY LEAKS:

A. The Contractor shall be responsible for damages caused by leaks in the temporary or permanent piping systems prior to completion of work and during the period of the guarantee, and for damages caused by disconnected pipes or fittings, and the overflow of equipment prior to completion of the work.

1.8 EXAMINATION OF SITE:

A. The Contractor shall examine the site, compare it with Plans and Specifications, and shall have satisfied himself as to the conditions under which the work is to be performed. No allowance shall subsequently be made in his behalf for any extra expense to which he may be put due to failure or neglect on his part to make such an examination.

1.9 COMPATIBILITY WITH EXISTING SYSTEMS:

A. Any work which is done as an addition, expansion or remodel of an existing system shall be compatible with that system.

1.10 MATERIALS AND EQUIPMENT:

A. Materials and equipment shall be new unless otherwise noted. Materials and equipment of a given type shall be by the same manufacturer. Materials and equipment shall be free of dents, scratches, marks, shipping tags and all defacing features at time of project acceptance. Materials and equipment shall be covered or otherwise protected during construction as required to maintain the material and equipment in new factory condition until project acceptance.

1.11 SUBMITTALS:

A. Shop Drawings: Within 30 days of contract award, the Contractor shall submit six copies of shop drawings for all materials, equipment, etc. proposed for use on this project (this includes deferred approval items). Material or equipment shall not be ordered or installed until written review is processed by the Engineer. Any item omitted from the submittal shall be provided as specified without substitution.
All shop drawings must comply with the following:

1. Shop drawings are required for all material and equipment items and shall include manufacturer's name and catalog numbers, dimensions, capacities, performance curves, and all other characteristics and accessories as listed in the specifications or on the drawings. Descriptive literature shall be current factory brochures and submittal sheets. Capacities shall be certified by the factory. FAX submittals are not acceptable.
2. All shop drawings shall be submitted at one time in a neat and orderly fashion in a suitable binder with title sheet including Project, Engineer and Contractor, table of contents, and indexed tabs dividing each group of materials or item of equipment. All items shall be identified by the specification paragraph number for which they are proposed. All equipment shall also be identified by the mark number as indicated on drawings.
3. All capacities, characteristics, and accessories called for in the specifications or on the drawings shall be high-lighted, circled or underlined on the shop drawings. Calculations and other detailed data indicating how the item was selected shall be included for items that are not scheduled. Data must be complete enough to permit detailed comparison of every significant characteristic which is specified, scheduled or detailed.
4. Drawings shall be submitted in both hard copy and electronic form, electronic files shall be in their native format (i.e. DWG for AutoCAD, RVT for Revit, etc).
5. Electronic Submittals: Where allowed by Division 01, electronic submittals are acceptable providing the following requirements are met. Electronic submittals which do not comply with these requirements will be rejected.
   a. Submittal shall be a single file in PDF format, with bookmarks for table of contents and each tab, and sub-bookmarks for each item.
   b. All text shall be searchable (except text that is part of a graphic).
   c. Submittal shall include all items noted in 1 through 3 above, except a binder is not required.

d. Electronic submittals shall be processed through normal channels. Do not submit directly to the Engineer unless the Engineer is the prime consultant for the project.

e. Contractor shall provide Owner and Owner's Representative with hard copies of the final submittal. Coordinate exact number required with Owner through Architect/Engineer.

B. Substitutions:

1. Manufacturers and model numbers listed in the specifications or on the drawings establish the size, standard of quality, features and function selected by the Engineer for this Project. Alternate manufacturers may be submitted for review by the Engineer. If the alternate manufacturers are not approved, then the Contractor shall submit product specified. Calculations and other detailed data indicating how the item was selected shall be included.

2. Due to the complexity of mechanical equipment, features and functions, where equipment is scheduled on the drawings, any equipment submitted other than scheduled equipment is considered a substitution, and shall comply with the requirements of Section 01 25 00 "Substitution Procedures". It is understood that because of this complexity, subsequent reviews of Substitution Requests may be unavoidable. The Mechanical Engineer waives the fees identified in Section 01 25 00, for the initial and first subsequent review of a Substitution Request for mechanical equipment scheduled on the Drawings.

3. The Contractor shall assume full responsibility that substituted items or procedures will meet the specifications and job requirements and shall be responsible for the cost of redesign and modifications to the work caused by these items. At the Engineer's request, furnish locations where equipment similar to the substituted equipment is installed and operating along with the user's phone numbers and contact person. Satisfactory operation and service history will be considered in the acceptance or rejection of the proposed substitution.

C. Review: Submittals will be reviewed for general conformance with the design concept, but this review does not guarantee quantity shown, nor does it supersede the responsibility of the Contractor to provide all materials, equipment and installation in accordance with the drawings and specifications. The Contractor shall agree that shop drawing submittals processed by the Engineer are not Change Orders; that the purpose of shop drawing submittals by the Contractor is to demonstrate to the Engineer that the Contractor understands the design concept, that he demonstrates his understanding by indicating which equipment and material he intends to furnish and install and by detailing the fabrication and installation methods he intends to use. The Contractor shall agree that if deviations, discrepancies or conflicts between shop drawings and design drawings and specifications are discovered either prior to or after shop drawing submittals are processed by the Engineer, the design drawings and specifications shall control and shall be followed. If a resubmittal is required, submit a complete copy of the Engineer's review letter requiring such with the resubmittal.

1.12 MANUFACTURER'S RECOMMENDATIONS:

A. All material, equipment, devices, etc., shall be installed in accordance with the recommendations of the manufacturer of the particular item. The Contractor shall be responsible for all installations contrary to the manufacturer's recommendations. The

Contractor shall make all necessary changes and revisions to achieve such compliance. Manufacturer's installation instructions shall be delivered to and maintained at the job site through the construction of the project.

1.13 SCHEDULING OF WORK:

A. All work shall be scheduled subject to the review of the Architect, Engineer and the Owner. No work shall interfere with the operation of the existing facilities on or adjacent to the site. The Contractor shall have at all times, as conditions permit, a sufficient force of workmen and quantity of materials to install the work contracted for as rapidly as possible consistent with good work, and shall cause no delay to other Contractors engaged upon this project or to the Owner.

1.14 OPENINGS, CUTTING AND PATCHING:

A. The locations and dimensions for openings through walls, floors, ceilings, foundations, footings, etc. required to accomplish the work under this Specification Division shall be provided under this Division. Except as noted below, the actual openings and the required cutting and patching shall be provided by other Divisions. Coring through existing concrete or masonry walls, floors, ceilings, foundations, footings, etc., and saw cutting of concrete floors or asphaltic concrete required to accomplish the work under this Specification Division shall be provided under this Division. Patching of these surfaces shall be provided by other Divisions. Cutting or coring shall not impair the strength of the structure. Any damage resulting from this work shall be repaired at the Contractor's expense to the satisfaction of the Engineer.

1.15 ACCESS DOORS:

A. Provide access doors as required where equipment, piping, valves, ductwork, etc. are not otherwise accessible. Access doors shall match the wall or ceiling finish and fire rating as indicated on the Architectural drawings. 16-gage steel frame and 14-gage steel door with paintable finish, except in ceramic tile, where door shall be 16-gage stainless steel with satin finish. Continuous hinge. Key and cylinder lock (except quick-opening type for Emergency Gas Shutoff Valve). Deliver doors to the General Contractor for installation. Milcor. Unless otherwise noted, the minimum sizes shall be as follows:

1 valve up to 1-1/2"	12" x 12"
1 valve up to 3"	16" x 16"

1.16 CONCRETE ANCHORS:

A. Steel bolt with expansion anchor requiring a drilled hole - powder driven anchors, adhesive anchors and concrete screws are not acceptable. Re-use of screw anchor holes shall not be permitted. Minimum concrete embedment shall be 4-1/2 diameters. Minimum spacing shall be 12 diameters center to center and 6 diameters center to edge of concrete. Post-installed anchors in concrete used for component anchorage shall be pre-qualified for seismic application in accordance with ACI 355.2 and ICC-ES AC193. Post-installed anchors in masonry used for component anchorage shall be pre-qualified for seismic applications in accordance with ICC-ES AC01. Maximum allowable loads for tension and shear shall be as

determined by Calculation in compliance with ACI 318-14, Chapter 17, and the anchor's ICC or IAPMO evaluation report. Hilti, Powers, Red Head.

1.17 EQUIPMENT ANCHORING:

A. All equipment shall be securely anchored in accordance with ASCE 07-10, Chapter 13, as amended by CBC Section 1616A.1. All equipment mounted on concrete shall be secured with a concrete anchor as specified above at each mounting point.

1.18 SEISMIC SUPPORT AND RESTRAINT DESIGN SERVICE:

A. All mechanical systems (equipment, ductwork, piping, etc.) shall be provided with supports and seismic restraints in accordance with the "Seismic Restraint Components for Suspended Utilities", 2016 Edition, as published by Mason West Inc., OPM-0043-13, or other OSHPD pre-approved system, and in accordance with ASCE 07-10, Chapter 13, as amended by CBC Section 1616A.1. Brace spacing shall be reduced by 50% for cast iron, plastic, no-hub, or other non-ductile piping. A copy of this manual shall be kept on site at all times during construction.

B. Contractor shall obtain the services of a Seismic Design service to provide engineered seismic supports and restraints for the project. Mason Industries, or pre-approved equal.
   1. All seismic designs, including designs using OSHPD pre-approvals, shall be submitted as project specific engineered designs sealed and signed by a licensed California structural engineer. All seismic designs shall include project / application specific seismic design demand calculations. Said seismic design demand calculations shall account for seismic forces in all applicable direction including axial, lateral, vertical tension, vertical compression, etc. Designs shall account for prying, eccentricity, uneven loading, weak axis bending, etc.
   2. Seismic restraint layouts for piping, ductwork and electrical raceways shall be furnished on shop drawings or added to the contractor's shop drawings and shall include:
      a. The number, size and location of seismic braces.
      b. Maximum support loads and seismic loads at the seismic brace locations.
      c. Reference to specific details or pages from the OSHPD pre-approved system (OPM).
   3. Installations not addressed by the OPM approval must be designed, detailed and submitted along with the shop drawings.
   4 Submit seismic restraint layout drawings and special details for approval of the project structural engineer per the requirements listed in the OSHPD pre-approval (OPM).
   5. Seismic restraint layout drawings shall bear the stamp and signature of the registered professional structural engineer licensed in the state of California who designed the layout of the braces.

1.19 ASBESTOS CONTAINING MATERIALS:

A. No materials or material coatings containing asbestos shall be allowed on this project.

1.20 SYSTEM IDENTIFICATION:

A. Above Grade Piping: Provide markers on piping which is either exposed or concealed in accessible spaces. For piping systems, other than drain and vent lines, indicate the fluid conveyed or its abbreviation, either by pre-printed markers or stenciled marking, and include arrows to show direction of flow. Pre-printed markers shall be the type that wrap completely around the pipe, requiring no other means of fastening such as tape, adhesive, etc. Comply with ANSI A13.1 for colors. Locate markers at ends of lines, near major branches and other interruptions including equipment in the line, where lines pass through floors, walls or ceilings or otherwise pass into inaccessible spaces, and at 50' maximum intervals along exposed portions of lines. Marking of short branches and repetitive branches for equipment connections is not required.

B. Below Grade Piping: Bury a continuous, pre-printed, bright-colored, metallic ribbon marker capable of being located with a metal detector with each underground pipe. Locate directly over buried pipe, 6" to 8" below finished grade.

C. Equipment: All equipment shall be identified with a plastic laminated, engraved nameplate which bears the unit mark number as indicated on the drawings (e.g. AC-4) and identifies the area or space served by the equipment. Provide 1/2" high lettering - white on black background. Nameplates shall be permanently secured to the exterior of the unit.

1.21 CLEANING:

A. Progressively and at completion of the job, the Contractor shall thoroughly clean all of his work, removing all debris, stain and marks resulting from his work. This includes but is not limited to building surfaces, piping, equipment and ductwork, inside and out. Surfaces shall be free of dirt, grease, labels, tags, tape, rust, and all foreign material.

B. At the end of each work day, the Contractor shall cover all open ends of piping and ductwork with protective plastic.

1.22 ACCEPTANCE TESTING:

A. The Contractor shall perform, document and submit all acceptance testing as required by California Code of Regulations, Title 24, and as noted on the Certificate of Compliance form (MECH-1C), where applicable. Submit a copy of the documentation to the Engineer for review (hardcopy or electronic), prior to submitting to Administrative Authority.

1.23 OPERATION AND MAINTENANCE INSTRUCTIONS:

A. Printed: Three copies of Operation and Maintenance Instructions and Wiring Diagrams for all equipment and parts list for all faucets, trim, valves, etc. shall be submitted to the Engineer. All instructions shall be clearly identified by marking them with the same designation as the equipment item to which they apply (e.g. AC-3). All Wiring Diagrams shall agree with reviewed Shop Drawings and indicate the exact field installation. All instructions shall be submitted at the same time and shall be bound in a suitable binder with tabs dividing each type of equipment (e.g. Pumps, Fans, Motors, etc.). Each binder shall be labeled indicating "Operating and Maintenance Instructions, Project Title, Contractor, Date" and shall have a Table of Contents listing all items included.

B. Verbal: The Contractor shall verbally instruct the Owner's maintenance staff in the operation and maintenance of all equipment and systems. The controls contractor shall present that portion of the instructions that apply to the control system. The Engineer's office shall be notified 48 hours prior to this meeting.

1.24 RECORD DRAWINGS:

A. The Contractor shall obtain one set of blue line prints for the project, upon which a record of all construction changes shall be made. As the work progresses, the Contractor shall maintain a record of all deviations in the work from that indicated on the drawings. Final location of all underground work shall be recorded by depth from finished grade and by offset distance from permanent surface structures, i.e. building, curbs, walks. In addition, the water, gas, sewer, underfloor duct, etc. within the building shall be recorded by offset distances from building walls. As part of the Contractor’s overhead expense, request a full set of reproducible drawings to transfer the changes, notations, etc. from the marked-up prints to the reproducible drawings. The record drawings (marked-up prints and reproducibles) shall be submitted to the Engineer for review.

PART 2: - PRODUCTS (not used)

PART 3: - EXECUTION (not used)

END OF SECTION

SECTION 23 00 01 - HEATING, VENTILATING AND AIR CONDITIONING

PART 1: - GENERAL

1.1 GENERAL MECHANICAL PROVISIONS:

A. The General Mechanical Provisions, Section 23 00 00, shall form a part of this Section with the same force and effect as though repeated here.

1.2 SCOPE:

A. Included: Provide all labor, materials and services necessary for complete, lawful and operating systems as shown or noted on the drawings or as specified here. The work includes, but is not necessarily limited to, the following:
1. Air distribution system.
2. All equipment as shown or noted on the drawings or as specified. Furnish motor starters except where motor control centers are used. Coordinate with Division 26.
3. System energy balance.
4. Direct digital control and energy management system (DDC/EMS).
5. Refrigeration system.

B. Work Specified Elsewhere:
1. Line voltage power wiring, motor starters in motor control centers, disconnect switches and installation of all starters are included in the Electrical Section, unless otherwise noted.
2. Connection of gas and condensate drains to equipment.
3. Concrete and reinforcing steel unless specifically called for in the drawings or specifications.
4. Painting unless specifically called for in the drawings or specifications.
5. Carpentry.

PART 2: - PRODUCTS

2.1 PIPING MATERIALS:

A. Refrigerant Piping: Hard drawn Type ACR copper, dried and capped. Wrought copper fittings, silver alloy brazed, 1100ºF, Silfos. Size 3/8" and smaller may be refrigerant tube, ASTM B280.

B. Miscellaneous Piping Items:
1. Pipe Support:
a. Pipe Hanger: Steel "J" hanger with side bolt. Load and jam nuts. Size and maximum load per manufacturer's recommendations. Felt liner for copper piping. Hanger and rod shall have galvanized finish. B-Line, Anvil, Unistrut.
b. Construction Channel: 12-gage, 1-5/8" x 1-5/8" galvanized steel channel. Single or multiple section. Self-locking nuts and fittings. B-Line, Anvil, Unistrut.

2. Flashing: Flashing for piping through roof shall be prefabricated galvanized steel roof jacks with 16" square flange around pipe. Provide clamp-on storm collar and seal water tight with mastic. Maintain dielectric separation between copper and galvanized materials. For cold process built-up roof, material shall be 4 lb/ft^2 lead instead of galvanized steel. For single-ply roofing, use the roofing manufacturer's recommended flashing material.

2.2 PIPING INSULATION MATERIALS:

A. General: All piping insulation materials shall have fire and smoke hazard ratings as tested under ASTM E-84 and UL 723 not exceeding a flame spread of 25 and smoke developed of 50.

B. PVC Jacket (for pipe, fittings and valves): Pre-molded polyvinyl chloride (PVC) jackets, 0.020" thickness. Size to match application. Provide solvent weld adhesive and PVC vapor barrier pressure sealing tape by same manufacturer. Zeston.

C. Aluminum Jacketing: Aluminum pipe and fitting jacketing, 0.016" thickness for straight pipe. 0.024" thickness for fittings. Integral moisture barrier. Stucco-Embossed finish. Provide pre-fabricated aluminum strapping and seals by same manufacturer. ITW or RPR.

D. Outdoor Weather Barrier Mastic: Childers CP-10/11, Foster 46-50.

E. Metal Jacketing/Flashing Sealant: Childers CP-76, Foster 95-44.

F. Foamed Plastic: Rubber based elastomeric preformed pipe insulation. Thermal conductivity shall not exceed 0.27 Btu-in/hr-ft^2-ºF at a mean temperature of 70ºF. 1/2" thick. Provide adhesive by same manufacturer. Armacell Armaflex.

2.3 DUCTWORK MATERIALS:

A. General: All ductwork materials shall have fire and smoke hazard ratings as tested under ASTM E-84 and UL 723 not exceeding a flame spread of 25 and smoke developed of 50. Shall comply with 2016 CMC.

B. Metal Ductwork: Metal ductwork shall be galvanized sheet steel, lock forming quality, ASTM A-653, with gage and construction to match SMACNA Standard for pressure required (26 gage minimum).

C. Flexible Ductwork: Insulated flexible ductwork. One pound per cubic foot glass fiber insulation, 1-1/2" thick (R-6), 2" thick (R-8) where ductwork is outside the building thermal insulation envelope. Thermal conductivity shall not exceed 0.25 Btu-in/hr-ft2-ºF at a mean temperature of 75ºF. Seamless metalized reinforced polyester vapor barrier jacket. Continuous internal liner bonded to galvanized steel wire helix. Duct shall be capable of continuous operation at 1-1/2" of positive water static pressure and 4,000 ft/min air velocity. Duct shall comply with NFPA 90A. JP Lamborn.

D. Duct Sealants: All Joints Exposed to Weather: Sealant shall be water based, Foster 32-19/32-17, Childers CP-146/148, United Duct Sealer WB or G.E. "SilPruf" SCS2000 silicone sealant. Joints Not Exposed to Weather: Fiber reinforced. White in color. Foster

32-17, Childers CP-148, Design Polymerics DP1030, Hardcast Versa-Grip 181, Hardcast CCWI-181.

2.4 AIR TERMINALS AND DUCT FITTINGS:

A. Grilles: (Grilles, Registers, Diffusers and Louvers)
1. Information on Drawings: Refer to Grille Schedule on the drawings for the list of grilles. Manufacturer's model numbers are listed to complete the description Titus. Equivalent models of Anemostat or Krueger are acceptable. Refer to the floor plans for neck size, CFM, air diffusion pattern and fire damper, if required.
2. Performance: Submit complete performance data (throw, pressure drop, noise level, etc.) for all grilles proposed, other than those scheduled. Testing shall be in accordance with ANSI/ASHRAE 70-1991. If, according to the certified data of the manufacturer of the proposed units, the sizes indicated on the drawings will not perform satisfactorily, the units shall be reselected by the Contractor for the proper diffusion, spread, pressure drop, throw and noise level.
3. Frame and Accessories: All supply, return, and exhaust grilles shall not have an opposed blade volume control damper unless otherwise noted. All surface mounted grilles shall have a perimeter gasket and flanged edge. All grilles shall have frames suitable for mounting in the surfaces designated by the architectural drawings. Key or screwdriver operated, no slide bars.
4. Finish: All ceiling and wall grilles and all louvers shall have a paintable white finish unless otherwise noted. Interior components (everything behind the face plate) shall be flat black. Floor grilles shall have an anodized aluminum finish unless otherwise noted.

B. Branch Duct Volume Damper: Volume control damper (VCD) in rectangular ducts shall be as follows: Opposed blade, 6" maximum blade width, 16-gage blade, 48" maximum length, nylon or oil impregnated bronze bearings, 1/2" diameter pin shaft, 16-gage channel frame, actuating rod and linkage out of air stream. VCD in round duct shall be as follows: Damper blade full height of branch and 1" less than branch width. All branch dampers shall have regulator with stamped steel handle, spring loaded shaft nut, cast body and serrated self-locking die cast core. Regulator for horizontal ducts overhead shall be mounted on sides or bottom of ducts. Secure a 12" length of brightly colored plastic ribbon to handle for ease of location. Where rectangular or round ductwork is insulated, slit insulation to allow handle to protrude. Ventlok 641 (with 607 end bearing for round ducts).

C. Extractor: Curved blade turns in adjustable position rigid frame. Tuttle and Bailey Deflectrol.

D. Turning Vanes: Double wall, hollow metal, air foil shape. Spacing in accordance with manufacturer's recommendations. Aero Dyne HEP.

E. Variable Air Volume Terminal:
1. General: Pressure independent, single-duct electric powered variable volume terminal. Scheduled pressure drop is maximum allowable at inlet static at design conditions. Provide integral flow taps and calibration chart on each unit. Performance testing shall be in accordance with ARI Standards. Carrier.
2. Casing: 22-gage galvanized steel. Provide hanger holes on four corners. Interior insulation shall be 1/2" thick, 1-1/2 lb. density glass fiber with high density facing.

Insulation shall be UL listed and in compliance with NFPA 90A. Maximum allowable leak rate 2% at 3" WC.

3. Controls: Provide integral cross flow velocity sensor furnished and installed at the factory.
4. Sound Performance Data: Discharge sound and radiated sound levels shall not exceed the published sound levels of the terminals which were used as the basis of design. The manufacturer shall submit discharge sound and radiated sound data in both sound power level (ref: 10-12 watts) in octave bands and noise criteria (NC) ratings. Testing shall be in accordance with ARI Standards.

2.5 DUCTWORK INSULATION MATERIALS:

A. General: All ductwork insulation materials shall have fire and smoke hazard ratings as tested under ASTM E-84 and UL 723 not exceeding a flame spread of 25 and smoke developed of 50.

B. Fiberglass Blanket: **Installed** thermal resistance at a mean temperature of 75ºF shall meet or exceed indicated value. 3/4 lb/ft3 or 1 lb/ft3, **R-6** where ductwork is within the building thermal insulation envelope. 3/4 lb/ft3 **R-8** where ductwork is outside the building thermal insulation envelope and/or above the roof. Faced with glass reinforced foil laminated to Kraft paper. Certainteed, Knauf, Johns-Manville, Owens-Corning.

C. Acoustic Lining: Glass fiber duct liner. **Installed** thermal resistance at a mean temperature of 75ºF shall meet or exceed indicated value. One side coated with anti-microbial coating to prevent mold growth and fiber erosion up to 6000 ft/min. Average noise reduction coefficient of 0.80. 1.5 lb/ft^3 density. 1" thick (**R-4.2**) where ductwork is within the building thermal insulation envelope. 2" thick (**R-8**) where ductwork is outside the building thermal insulation envelope and/or above the roof. Certainteed, Knauf, Johns-Manville, Owens-Corning.

D. Bonding Adhesive: Design Polymerics DP2501, Foster 85-60.

2.6 EQUIPMENT:

A. General Requirements:
1. Capacity: Capacities shall be in accordance with schedules shown on drawings. Capacities are to be considered minimum.
2. Dimensions: Equipment must conform to space requirements and limitations as indicated on drawings and as required for operation and maintenance. Where Architectural screening is indicated, equipment shall not extend above or beyond screening. Equipment will not be accepted that does not readily conform to space conditions. Prepare and submit layout drawings for all proposed equipment (different than scheduled units) showing actual job conditions, required clearances for proper operation, maintenance, etc.
3. Ratings:
   a. Gas: Gas burning equipment shall be furnished with 100% safety gas shut-off, intermittent pilot ignition, and be CSA (US) certified, except that boilers shall be CSA (US) certified or UL listed.

b. Electrical: Electrical equipment shall be in accordance with NEMA Standards and UL or ETL listed where applicable standards have been established.

4. Piping: Each item or assembly of items shall be furnished completely piped for connection to services. Control valves and devices shall be provided.

5. Electrical:

a. General: Each item or assembly of items shall be furnished completely wired to individual terminal blocks for connection to single branch electrical circuit. All electrical accessories and controls required by equipment shall be furnished. Provide terminal blocks for controls and interlocks not included in equipment package. Manual and magnetic starters shall have ambient compensating running overcurrent protection in all ungrounded conductors. Magnetic starters shall be manual reset, shall have H-O-A switches and auxiliary contacts. Controllers and other devices shall be in NEMA 1 or 3R enclosures as applicable.

b. Wiring: Conductors, conduit, and wiring shall be in accordance with Electrical Specifications. Individual items within assembly shall be separately protected with dead front, fused disconnect, fuse block, or circuit breaker for each ungrounded conductor, all accessible on operating side of equipment. Switches, contacts and other devices shall be in ungrounded conductors.

c. Motors: Shall be rated, constructed and applied in accordance with NEMA and ANSI Standards without using service factor. Single-phase motor shall be of type to suit application. Three-phase motors shall be open drip proof, NEMA B design on pumps and fans, NEMA C on reciprocating equipment, sealed ball bearing, three-phase induction unless otherwise noted. Design shall limit starting inrush current and running current to values shown on drawings. Motors 1 horsepower and larger shall be the premium efficiency type, tested according to IEEE Standard 112, Method B. Motors exposed to weather shall be TEFC. Motors in a fan air stream shall be TEFC or TEAO. Vertical motors outdoors shall be ODP or TEFC and shall have rain caps.

d. Starters: Motor starters shall be furnished for all equipment except where starter is in a motor control center as designated on the electrical drawings. Deliver starter to Electrical Contractor for installation and wiring.

e. Control Voltage: Equipment connected to greater than 240 volts shall be provided with 120 volt control circuit from integral protected transformer if separate source is not indicated on plans. 240 volt control is acceptable if confined within control panel.

f. Submittals: Included in shop drawings shall be internal wiring diagrams and manufacturer's recommended external wiring.

6. Fan Selection - Static Pressure: Unless otherwise noted, pressure scheduled as external static pressure (ESP) includes all ductwork and accessory losses external to the unit housing. Unless otherwise noted, pressure scheduled as total static pressure includes all ductwork, filter, coil, cabinet, damper and other accessory losses. Unless otherwise noted, pressure scheduled as duct static pressure includes all supply and return ductwork and accessory losses external to the unit housing and plenum (as applicable). The allowance for filter losses is 0.3" WC, unless otherwise noted. Submit itemized static pressure losses for all components.

7. Filters:

a. General: Tested and rated in accordance with ASHRAE Standard 52.2 and Title 24, C.C.R. Furnish and install one complete change of all filters after air balance is completed and prior to acceptance.
b. Filter Media: 2" media. MERV-11. Clean filter resistance 0.25" water at 500 fpm. Throw-away frame. Class 2. Camfil AP-Eleven.

8. Screens: All duct or louver openings to the outside shall be covered with 1/2", 16-gage, galvanized wire mesh screen.
9. Mixing Dampers: Opposed blade, 16-gage. Six-inch maximum blade width, 48" maximum length. Nylon or oil impregnated bronze bearings. One-half inch diameter pin shaft. 16-gage channel frame. One percent maximum leakage at 4" WC in accordance with AMCA 500 for outside air dampers. Actuating rod out of air stream. Arrow.
10. Sound Ratings: Shall be in accordance with ASHRAE 36 - 72. Sound ratings shall not exceed scheduled values.

B. Air Conditioning Unit:
1. General: Self-contained heating/cooling unit designed for outdoor installation. Factory assembled and tested. Refer to Paragraph 2.6A for general requirements. Provide all starters and relays required for operation. 24-volt control circuit from integral transformer. Weatherproof cabinet, galvanized steel with enamel finish. Outside air inlet. Drain pan. Multivane centrifugal supply fan. ARI certified. Gas equipment AGA certified. Carrier.
2. Refrigeration: Sealed hermetic compressor with internal vibration isolating mount. Crankcase heater, high/low pressure switch, recycling timer. Air-cooled condenser with propeller fan. Non-ferrous finned coil. Low ambient control to 45ºF. Single phase units shall have compressor start assist kit. 5-year extended warranty on compressor(s).
3. Heat: Natural gas fired. Low NOx. Aluminized or ceramic coated welded steel heat exchanger. Electric ignition. Automatic gas valve. Fan and limit controls.

C. Indoor/Outdoor Unit (IDU/ODU-1):
1. General: Refer to Paragraph 2.6A for General Requirements. Completely assembled and factory tested. Provide all starters and relays required for operation. All components by same manufacturer. Daikin.
2. Outdoor Unit:
a. Compressor: Sealed hermetic rotary compressor with vibration isolator mountings. Crankcase heater, suction line accumulator, recycling timer. High and low head pressure/temperature protection. Motor overload protection, low ambient feature to 20F cooling mode. High and low side service valves. Recycling timer. Single phase start assist kit. 5-year extended warranty.
b. Fan and Coil: Finned tube non-ferrous coil. Propeller type fan, 1200 RPM maximum, direct drive. Totally enclosed motor, overload protected, permanently lubricated, resiliently mounted.
c. Cabinet: Weatherproof, factory paint.
3. Indoor Unit:
a. Supply Fan: Direct drive, multi-speed forward curve, centrifugal fan, resiliently mounted. Thermally protected motor.
b. Indoor Coil: Copper tube, aluminum fin, DX coil.
c. Condensate Pan: Install under complete coil area with drain connections.

d. Filter: Washable media. Class 2 or better.

4. Controls: Microprocessor control containing temperature selection, room temperature indication, malfunction alarm, power failure automatic restart safety, and emergency operation function.

D. Indoor / Outdoor Units (IDU-2,3,4,5, ODU-2A,2B): Variable capacity, heat pump air conditioning system providing cooling or heating. Refer to Paragraph 2.6A for general requirements. All components shall be by same manufacturer. Daikin.

1. Outdoor Unit: The outdoor unit is designed specifically for use with Daikin VRV IV series components.

a. The condensing unit shall be factory assembled in the USA and pre-wired with all necessary electronic and refrigerant controls. The refrigeration circuit of the condensing unit shall consist of Daikin inverter scroll compressors, motors, fans, condenser coil, electronic expansion valves, solenoid valves, 4-way valve, distribution headers, capillaries, filters, shut off valves, oil separators, service ports and refrigerant accumulator.

b. Liquid and suction lines must be individually insulated between the condensing and indoor units.

c. The condensing unit can be wired and piped with access from the left, right, rear or bottom.

d. The connection ratio of indoor units to condensing unit shall be permitted up to 200%.

e. Each condensing system shall be able to support the connection of up to 64 indoor units dependent on the model of the condensing unit.

f. The sound pressure level standard shall be that value as listed in the Daikin engineering manual for the specified models at 3 feet from the front of the unit. The condensing unit shall be capable of operating automatically at further reduced noise during night time or via an external input

g. The system will automatically restart operation after a power failure and will not cause any settings to be lost, thus eliminating the need for reprogramming.

h. The unit shall incorporate an auto-charging feature to ensure optimum performance. Manual changing should be support with a minimum of 2 hours of system operation data to ensure correct operation

i. The condensing unit shall be modular in design and should allow for side-by-side installation with minimum spacing.

j. The following safety devices shall be included on the condensing unit; high pressure sensor and switch, low pressure switch, control circuit fuses, crankcase heaters, fusible plug, overload relay, inverter overload protector, thermal protectors for compressor and fan motors, over current protection for the inverter and anti-recycling timers.

k. To ensure the liquid refrigerant does not flash when supplying to the various indoor units, the circuit shall be provided with a sub-cooling feature.

l. Oil recovery cycle shall be automatic occurring 2 hours after start of operation and then every 8 hours of operation

m. The condensing unit shall be capable of heating operation at 0°F dry bulb ambient temperature without additional low ambient controls or an auxiliary heat source.

n. Unit Cabinet: The condensing unit shall be completely weatherproof and corrosion resistant. The unit shall be constructed from rust-proofed mild steel panels coated with a baked enamel finish.

o. Fan:

(1) The condensing unit shall consist of one or more propeller type, direct-drive 350 or 750 W fan motors that have multiple speed operation via a DC (digitally commutating) inverter.

(2) The condensing unit fan motor shall have multiple speed operation of the DC (digitally commutating) inverter type, and be of high external static pressure and shall be factory set as standard at 0.12 in. WG. A field setting switch to a maximum 0.32 in. WG pressure is available to accommodate field applied duct for indoor mounting of condensing units.

(3) The fan shall be a vertical discharge configuration with a nominal airflow maximum range of 5,544 CFM to 22,283 CFM dependent on model specified

(4) The fan motor shall have inherent protection and permanently lubricated bearings and be mounted.

(5) The fan motor shall be provided with a fan guard to prevent contact with moving parts.

(6) Night setback control of the fan motor for low noise operation by way of automatically limiting the maximum speed shall be a standard feature. Operation sound level shall be selectable from 3 steps.

p. Condenser Coil:

(1) The condenser coil shall be manufactured from copper tubes expanded into aluminum fins to form a mechanical bond.

(2) The heat exchanger coil shall be of a waffle louver fin and rifled bore tube design to ensure high efficiency performance.

(3) The heat exchanger on the condensing units shall be manufactured from Hi-X seamless copper tube with N-shape internal grooves mechanically bonded on to aluminum fins to an e-Pass Design.

(4) The fins are to be covered with an anti-corrosion Ulta Gold coating as standard with a salt spray test rating of 1000hr(ASTM B117), Acetic acid salt spray test: 500hr(ASTM G85)

(5) The pipe plates shall be treated with powdered polyester resin for corrosion prevention.

q. Compressor:

(1) The Daikin inverter scroll compressors shall be variable speed (PVM inverter) controlled which is capable of changing the speed to follow the variations in total cooling and heating load as determined by the suction gas pressure as measured in the condensing unit. The target suction pressure should be capable of automatic reset based on outdoor temperature and system load to improve efficiency. In addition, samplings of evaporator and condenser temperatures shall be made so that the high/low pressures detected are read every 20 seconds and calculated. With each reading, the compressor capacity (INV frequency) shall be controlled to eliminate deviation from target value.

(2) The inverter driven compressors in the condensing unit shall be of highly efficient reluctance DC (digitally commutating), hermetically sealed scroll “G-type” or “J-type”.

(3) Neodymium magnets shall be adopted in the rotor construction to yield a higher torque and efficiency in the compressor instead of the normal ferrite magnet type. At complete stop of the compressor, the neodymium magnets will position the rotor into the optimum position for a low torque start.

(4) The capacity control range shall be as low as 10% to 100%.

(5) Each compressor shall be equipped with a crankcase heater, high pressure safety switch, and internal thermal overload protector.

(6) Oil separators shall be standard with the equipment together with an intelligent oil management system.

(7) The compressor shall be spring mounted to avoid the transmission of vibration eliminating the standard need for spring insolation

(8) In the event of compressor failure the remaining compressors shall continue to operate and provide heating or cooling as required at a proportionally reduced capacity. The microprocessor and associated controls shall be designed to specifically address this condition for single module and manifolded systems.

(9) In the case of multiple condenser modules, conjoined operation hours of the compressors shall be balanced by means of the Duty Cycling Function, ensuring sequential starting of each module at each start/stop cycle, completion of oil return, completion of defrost or every 8 hours. When connected to a central control system sequential start is activated for all system on each DIII network

r. Electrical:

(1) The power supply to the condensing unit shall be 208-230 volts, 3 phase, 60 hertz +/- 10%.

(2) The control voltage between the indoor and condensing unit shall be 16VDC non-shielded, stranded 2 conductor cable.

(3) The control wiring shall be a two-wire multiplex transmission system, making it possible to connect multiple indoor units to one condensing unit with one 2-cable wire, thus simplifying the wiring installation

2. Indoor Unit – Concealed Ceiling Ducted: Shall be a built-in ceiling concealed fan coil unit, operable with refrigerant R-410A, equipped with an electronic expansion valve, direct-drive DC (ECM) type fan with auto CFM adjustment at commissioning, for installation into the ceiling cavity. It is constructed of a galvanized steel casing. It shall be a horizontal discharge air with horizontal return air configuration. All models feature a low height cabinet making them applicable to ceiling pockets that tend to be shallow. Computerized PID control shall be used to control superheat to deliver a comfortable room temperature condition. The unit shall be equipped with a programmed drying mechanism that dehumidifies while limiting changes in room temperature when used with Daikin remote control BRC1E71 and BRC2A71. Included as standard equipment, a condensate drain pan and drain pump kit that pumps to 18-3/8” from the drain

pipe opening. The indoor units sound pressure shall range from 29 dB(A) to 40 dB(A) at low speed measured 5 feet below the ducted unit.

a. Indoor Unit:
   (1) The indoor unit shall be completely factory assembled and tested. Included in the unit is factory wiring, piping, electronic proportional expansion valve, control circuit board, fan motor thermal protector, flare connections, condensate drain pan, condensate drain pump, condensate safety shutoff and alarm, self-diagnostics, auto-restart function, 3-minute fused time delay, and test run switch. The unit shall be equipment with automatically adjusting external static pressure logic that is selectable during commissioning. This adjusts the airflow based on the installed external static pressure.
   (2) Indoor unit and refrigerant pipes will be charged with dehydrated air prior to shipment from the factory.
   (3) Both refrigerant lines shall be insulated from the outdoor unit.
   (4) The indoor units shall be equipped with a condensate pan and condensate pump. The condensate pump provides up to 18-3/8” of lift from the center of the drain outlet and has a built in safety shutoff and alarm.
   (5) The indoor units shall be equipped with a return air thermistor.
   (6) The indoor unit will be separately powered with 208~230V/1-phase/60Hz.
   (7) The voltage range will be 253 volts maximum and 187 volts minimum.

b. Unit Cabinet:
   (1) The cabinet shall be located into the ceiling and ducted to the supply and return openings.
   (2) The cabinet shall be constructed with sound absorbing foamed polystyrene and polyethylene insulation.

c. Fan:
   (1) The fan shall be direct-drive DC (ECM) type fan, statically and dynamically balanced impeller with three fan speeds available.
   (2) The unit shall be equipment with automatically adjusting external static pressure logic selectable during commissioning.
   (3) The fan motor shall operate on 208/230 volts, 1 phase, 60 hertz with a motor output range of 0.12 to 0.47 HP respectively.
   (4) The airflow rate shall be available in three settings.
   (5) The fan motor shall be thermally protected.
   (6) The fan motor shall be equipped as standard with adjustable external static pressure (ESP) settings.
   (7) Fan motor external static pressure range for nominal airflow:

d. Coil:
   (1) Coils shall be of the direct expansion type constructed from copper tubes expanded into aluminum fins to form a mechanical bond.
   (2) The coil shall be of a waffle louver fin and high heat exchange, rifled bore tube design to ensure highly efficient performance.
   (3) The coil shall be a 3 row cross fin copper evaporator coil with 13 fpi design completely factory tested.

(4) The refrigerant connections shall be flare connections and the condensate will be 1-1/4" outside diameter PVC.
(5) A condensate pan shall be located under the coil.
(6) A condensate pump with an 18-3/8" lift shall be located below the coil in the condensate pan with a built in safety alarm.
(7) A thermistor will be located on the liquid and gas line.

e. Electrical:
(1) A separate power supply will be required of 208/230 volts, 1 phase, 60 hertz. The acceptable voltage range shall be 187 to 253 volts.
(2) Transmission (control) wiring between the indoor and outdoor unit shall be a maximum of 3,280 feet (total 6,560 feet).
(3) Transmission (control) wiring between the indoor unit and remote controller shall be a maximum distance of 1,640 feet.

f. Control:
(1) The unit shall have controls provided by Daikin to perform input functions necessary to operate the system.
(2) The unit shall be compatible with interfacing with a BMS system via optional LonWorks or BACnet gateways.
(3) The unit shall be compatible with a Daikin intelligent Touch advanced multi-zone controller or an intelligent Manager III customizable BMS. Consult with Daikin prior to applying controls.
(4) BRC2A71 "in-room" wired remote controller.

E. Supply Fans:
1. General: All supply fans shall be tested according to AMCA Standard 210 in an AMCA registered laboratory. Fans exposed to weather shall have ventilated weatherproof housing over motor and drive assembly. Refer to Paragraph 2.6A for general requirements. All direct drive fans shall be provided with unit mounted speed controllers, unless otherwise noted. All motors 1 horsepower and larger shall be the premium efficiency type.
2. Inline Fan: Fan shall be inline mounted, direct driven, centrifugal supply fan. Fan wheel housing and integral outlet duct shall be galvanized steel or injection molded from a specially engineered resin exceeding UL requirements for smoke and heat generation. The outlet duct shall have provision for an aluminum backdraft damper with continuous aluminum hinge rod. The inlet box shall be minimum 22 gauge galvanized steel. Motor shall be isolation mounted to a one piece galvanized stamped steel integral motor mount/inlet. A field wiring compartment with disconnect receptacle shall be standard. To accommodate different mounting positions, an adjustable prepunched mounting bracket shall be provided. Wheel shall be centrifugal forward curved type, injection molded of polypropylene resin. Motor shall be open drip proof type with permanently lubricated bearings and include impedance or thermal overload protection and disconnect plug. Motor shall be furnished at the specified voltage. Greenheck.

PART 3: - EXECUTION

3.1 PIPING INSTALLATION:

A. General:

1. Piping Layout: Piping shall be concealed in walls, above the ceilings, or below grade unless otherwise noted. Exposed piping shall run parallel to room surfaces; location to be approved by Architect. No structural member shall be weakened by cutting, notching, boring or otherwise, unless specifically allowed by structural drawings and/or specifications. Where such cutting is required, reinforcement shall be provided as specified or detailed. All piping shall be installed in a manner to ensure unrestricted flow, eliminate air pockets, prevent any unusual noise, and permit complete drainage of the system. All piping shall be installed to permit expansion and contraction without strain on piping or equipment. Vertical lines shall be installed to allow for building settlement without damage to piping. Lines shall be adequately braced against vertical and lateral movement. Pipe sizes indicated on the drawings are nominal sizes unless otherwise noted. Pipe sizes shall not decrease in direction of flow, unless otherwise noted.
2. Joints:
   a. Threaded: Pipe shall be cut square, and reamed to full size. Threads shall be in accordance with ANSI B2.1. Joint compound or tape suitable for conveyed fluid shall be applied to male thread only. Joints shall be made with three threads exposed.
   b. Brazed: Filler rod shall be of suitable or the same alloy as pipe. Brazing filler metal shall have a minimum melting point of 1100ºF. Brazing shall be performed by a Certified Welder or Brazer as certified by an organization/institution that uses standards recognized by the American Welding Society (AWS) and meets the requirements of the ASME Boiler and Pressure Vessels Code, Section 9.
   c. Open Ends: Open ends of piping shall be capped during progress of work to preclude foreign matter.
3. Fittings and Valves:
   a. Standard Fittings: All joints and changes in direction shall be made with standard fittings. Close nipples shall not be used.
   b. Reducers: Pipe size reduction shall be made with bell reducer fittings. Bushings shall not be used.
4. Pipe Support:
   a. General: Hangers shall be placed to support piping without strain on joints or fittings. Maximum spacing between supports shall be as specified below (based on straight lengths of pipe with couplings only). Provide additional supports for equipment, valves or other fittings. Seismic requirements may reduce maximum spacing. Actual spacing requirements will depend on structural system. Refer to drawings for additional requirements and attachment to structure. Side beam clamps shall be provided with retaining straps to secure the clamp to the opposite side of the beam. Vertical piping shall be supported with riser clamp at 20' on center (maximum). Support pipe within 12" of all changes in direction.
   b. Refrigerant Piping: Support insulated refrigerant line with construction channel and sheet metal support saddle or Cooper B-Line Armafix clamps. 5' spacing. Use isolation shield for uninsulated pipe. When using pre-charged tubing, all changes of direction shall be made with bending tools producing neat uniform bends. Free hand bends will not be accepted.

c. Plastic Piping: Support individual pipes with pipe hanger. Plastic piping shall be supported at maximum 4’ intervals and per the manufacturer's recommendations.

d. Trapeze: Trapeze hangers of construction channel and pipe clamps may be used. Submit design to Engineer for review.

5. Miscellaneous:

a. Escutcheons: Provide chrome plated escutcheons where piping penetrates walls, ceilings, or floors in finished areas.

b. Pipe Sleeves: All piping passing through concrete or concrete block shall be provided with pipe sleeves. Allow 1" (nominal) clearance between sleeve and pipe or pipe insulation.

c. Pipes Passing through Fire Rated Surfaces: Pipes passing through fire rated walls, floors, ceilings, partitions, etc. shall have the annular space surrounding the pipe or pipe insulation sealed with fire rated materials in accordance with the requirements of 2010 CBC Section 713.

B. Refrigerant Piping: Pipe shall be cut square. Joint surfaces shall be thoroughly cleaned, fitted and erected before brazing. After installation, evacuate to 29 inches of mercury, ambient temperature during evacuation shall not be less than 70ºF. After evacuation, fill with dry nitrogen to 250 psi and maintain for two-hour period without additional charge. After nitrogen test, purge with refrigerant charged through dryer and maintain holding charge in system and equipment. Refrigerant piping below grade shall be run in 4" (min.) PVC conduit with long radius ells. Seal ends of conduit watertight.

3.2 PIPING INSULATION INSTALLATION:

A. Refrigerant Piping: Cover piping with foamed plastic insulation. Longitudinal and end seams shall be thoroughly cemented with adhesive in accordance with manufacturer's recommendations. Cover all fittings, unions, valves and connections. Piping exposed to view shall be covered with PVC jacketing. Piping exposed to weather shall be covered with aluminum jacketing, seal all joints and seams with 1/8” bead of gray metal jacketing sealant.

3.3 DUCTWORK INSTALLATION:

A. General:

1. Standards: Unless otherwise noted, all ductwork shall be constructed and installed in accordance with current SMACNA Standards. Ductwork shall be built to a pressure classification equal to or greater than the maximum operating pressure at that point in the ductwork. A copy of these standards shall be maintained at the job site at all times. Duct work and accessories shall be installed in a manner to prevent vibration and rattling.

2. Access: Provide duct access doors as required to adjust equipment and dampers. Provide wall or ceiling access panels, or remote actuators as required where equipment and dampers are not otherwise accessible. Remote regulator shall be as detailed on drawings.

3. Flanges and Escutcheon: Where ductwork penetrates walls, ceilings, or floors, furnish and install flange or escutcheon of same material as duct.

B. Low Velocity-Low Pressure (up to 2,000 ft/min and up to 2.0 in water):

1. Sheet Metal Ductwork:
   a. Ells: Ells with less than standard radius and square ells shall be fitted with turning vanes.
   b. Tees: Tees in supply ductwork shall be straight tap-in with extractor or 45 degree take-off as shown on drawings. Grilles or branches in supply ductwork shall be a minimum of 8 duct diameters downstream of tees.
   c. Duct Joints and Seams: All joints and seams which are not exposed to weather shall be sealed airtight with duct sealant. All joints and seams exposed to weather shall be sealed air and water tight with silicone sealant. (See Part 2 of this Specification). All joints on metal ductwork not exposed to weather but exposed to view shall be sealed air tight with grey duct sealant.
   d. Dampers: Install volume control damper and damper regulator in all branch ducts.
2. Flexible Glass Fiber Ductwork: The use of flexible duct is limited to the last 5 feet of each branch duct (i.e. one 5 foot section of flexible duct may be used to connect the grille to the sheet metal branch duct). No joints are permitted in this 5' length. Hangers shall be 4" wide metal straps spaced to prevent sagging, 42" spacing maximum. Insert 6" wide fiberglass pad between duct and hanging strap. Joints shall be installed with stainless steel or nylon draw bands, Duro Dyne Dyn-O-Tie. Minimum turn radius shall be in accordance with SMACNA Standards (turn radius of duct centerline not less than 1.5 times the duct diameter).

3.4 AIR TERMINALS AND DUCT FITTINGS INSTALLATION:

A. General: Unless otherwise noted, all air terminals and duct fittings shall be installed in accordance with current SMACNA Standards. Terminals and fittings shall be installed in a manner to prevent vibration and rattling. Metal surfaces exposed to view behind grilles and registers shall be painted flat black.

3.5 DUCTWORK INSULATION INSTALLATION:

A. General: Insulate all sheet metal supply, return and outside air intake ductwork except as noted below. Insulation shall be continuous through walls and floors except at fire dampers.

B. Where Insulation Is Not Required: Do not insulate factory-insulated ducts or casings, acoustic lined ducts, fibrous glass ducts, underground ductwork, supply or return ductwork exposed to view in the space that it serves, or exhaust ductwork.

C. Concealed Ductwork: Wrap concealed ductwork including outside air intakes with fiberglass blanket lapped 2" minimum. Secure with staples 4" on centers maximum on straight runs and 3" maximum at elbows and fittings. Insulation on bottom of ducts wider than 36" shall also be secured with mechanical fasteners at 24" on center.

D. Acoustic Lining: Unless otherwise indicated, all supply and return ductwork in equipment rooms, all ductwork exposed to weather and other ducts as indicated on drawings, shall have acoustic lining. Do not acoustic line outside air intakes. Where acoustic lining is installed, increase each sheet metal dimension to accommodate lining and maintain clear inside duct dimensions shown on drawings. Apply lining with bonding adhesive in accordance with manufacturer's recommendations and also secure with mechanical

fasteners in accordance with SMACNA Standards. Seal exposed edges of lining with bonding adhesive.

3.6 EQUIPMENT INSTALLATION:

A. General: It shall be the responsibility of the equipment installer to ensure that no work done under other specification sections shall in any way block or otherwise hinder the equipment. All equipment shall be securely anchored in place. All equipment shall be installed level.

B. Connections to Equipment: Where size changes are required for connections to equipment, they shall be made immediately adjacent to the equipment and, if possible, inside the equipment cabinet.

3.7 TESTS AND ADJUSTMENTS:

A. General: Unless otherwise directed, tests shall be witnessed by a representative of the Architect. Work to be concealed shall not be enclosed until prescribed tests are made. Should any work be enclosed before such tests, the Contractor shall, at his expense, uncover, test and repair all work to original conditions. Leaks and defects shown by tests shall be repaired and entire work retested.

3.8 SYSTEM ENERGY BALANCE:

A. Scope: Provide the services of an independent test and balance agency to test, adjust and balance, retest and record performance of the system to obtain design quantities as specified. The agency must prove that they have no affiliation with any equipment manufacturer, design engineer, installing contractor, or any other party which might lead to a conflict of interest, in order to provide an unbiased, third party system balance and report.

B. Qualifications: Prior to commencing work, the agency shall be reviewed by the Engineer and shall be certified by the Associated Air Balance Council, National Environmental Balancing Bureau or Testing, Adjusting and Balancing Bureau. The agency shall provide documentation of having successfully completed at least five projects of similar size and scope.

C. Instruments: All instruments shall be accurately calibrated; calibration histories shall be available for examination. Application of instrumentation shall be in accordance with AABC, NEBB or TABB standards.

D. Submittals: Include in shop drawings copies of forms to be used for testing and balancing showing all data which is to be recorded. Three copies of completed balance report shall be submitted to and reviewed by the Mechanical Engineer prior to the final mechanical construction review.

E. Procedure - General: Procedure shall be in accordance with Associated Air Balance Council's "National Standards for Field Measurements and Instrumentation - Total System Balance", Volume Two, No. 12173, or equivalent NEBB or TABB standards. System shall be in full, continuous operation during test. Balanced quantities shall be plus 10%, minus

0% of design quantities. All nameplate data, manufacturer, model and serial numbers shall be recorded for each item tested.

F. Extended Warranty: The test and balance agency shall include an extended warranty of 90 days after completion of test and balance work, during which time the Engineer, at his discretion, may request a recheck or resetting of any item or items in test report. The agency shall provide technicians to assist the Engineer in making any tests he may require during this period of time.

G. Air Balance Procedure (For Each Air Handling System):
1. All air filters shall be clean when air balance is performed.
2. Provide a sketch of the equipment showing exactly where all pressure readings were taken.
3. Adjust blower RPM to design requirements.
4. Record motor full load amperes.
5. Make pitot tube traverse of main supply and return ducts and obtain design CFM at fans.
6. Record system static pressures, inlet and discharge.
7. Record filter quantity, size(s) and pressure drop across filter(s) at each filter bank.
8. Adjust system for design CFM recirculated air.
9. Adjust system for design CFM outside air.
10. Record entering air temperatures. (DB heating, DB and WB cooling.)
11. Record leaving air temperatures. (DB heating, DB and WB cooling.)
12. Adjust all main supply and return air ducts to design CFM.
13. Adjust all zones to design CFM, supply and return.
14. Adjust all diffusers, grilles and registers to plus 10%, minus 0% of design requirements.
15. Adjust CFM at all exhaust fans, make-up units, etc. (high and low speed, where applicable). Record applicable data from items 1 through 11 above.
16. Each grille, diffuser and register shall be identified as to location.
17. Verify proper diffusion pattern for all ceiling grilles and that all sidewall grilles are set for 5 degrees upward deflection unless otherwise noted. Make a notation of any that are not set properly.
18. Size, type and manufacturer of diffusers, grilles, registers and all tested items shall be identified and listed. Manufacturer's ratings shall be used to make required calculations on all items.
19. Readings and tests of diffusers, grilles, and registers shall include required FPM velocity and test resultant velocity, required CFM and test resultant CFM after adjustments.
20. In cooperation with the control manufacturer's representative, set adjustments of automatically operated dampers to operate as specified. Testing agency shall check all controls for proper calibrations and list all controls requiring adjustment by control installers.
21. All diffusers, grilles and registers shall be adjusted for required air patterns and to minimize drafts.
22. As a part of the work of this contract, THE AIR CONDITIONING CONTRACTOR shall make any changes in pulleys, belts and dampers or the addition of dampers required for correct balance as recommended by air balance agency, at no additional cost to Owner.

23. Set, test and adjust packaged heating/cooling unit economizer operation in cooperation with controls contractor. Record minimum and maximum outside and exhaust airflows.

3.9 TEMPERATURE CONTROL SYSTEM:

A. Scope: The control system includes controllers, control panels, control devices, line and low voltage control and interlock wiring, conduit and related equipment as required for proper operation of all controlled systems. Control and interlock wiring includes wiring to controllers, switches, timers, relays, etc. Power wiring and disconnect switches are included in the Electrical Specifications except that power wiring required for control devices such as controllers, etc., is included in the control system.

B. Type of system: The control system shall be direct digital, **Distech ECLYPSE with ENVYSION interface, without substitution, to match existing**.

C. Contractor Qualifications: All controls shall be furnished and installed by a Contractor who is licensed, certified or contracted by the controls manufacturer for design, installation, start-up and service of their product. The Contractor must have factory supplied training and support. The Contractor must have sufficient personnel to respond to a trouble call at the site within two hours. The Contractor's local manager shall have a minimum of five years of experience in the design, installation, start-up and service of similar systems. The Contractor shall submit a list of at least five projects which are similar in size, scope and contract value to this project. This list shall include the Owner's contact person, phone number and controls contract value.

D. Submittals: Submittals shall include the following:
1. Contractor qualifications. Manufacturer licenses, contracts or certifications for the installer shall be submitted on manufacturer's letterhead.
2. Manufacturer's data for all devices.
3. Manufacturer's data for all software.
4. Diagrams showing control schematics. Diagrams shall include all sensors, terminal strips, panels and control devices. Locations of all devices shall be indicated.
5. Sequence of operation.

E. System Components:
1. Temperature Sensors: Shall match existing.
2. Wall Switches: Plates for all wall switches and timers shall match those specified in Division 16.
3. Labels: All labels, signs, etc. shall be engraved, laminated plastic, white on black background, 1/8" high lettering, minimum.
4. Temperature Control Panels: Hinged, lockable front panel. Each panel and each control device or readout on the front of the panel shall be identified with an engraved plastic label with 1/4" high lettering, white on black background. Pilot lights shall be the push-to-test type.
5. Status Sensor: Current sensing status sensor, with sensitivity adjustment for belt driven equipment.
6. Smoke Detectors: Smoke detector shall be ionization type, 115 VAC. The detector shall operate at air velocities from 300 FPM to 4000 FPM. The detector head shall not require additional filters or screens. The detector shall be mounted in a sheet

metal housing with removable cover. A visual indication of alarm and pilot must be provided on detector front mounted at 30 degrees angle for a wide viewing angle. Manual test and reset switch on the front of the detector. Terminal connections shall be of the screw type. Power supervisory relay. Minimum of two sets of alarm contacts (one reserved for fire alarm system). UL listed. California State Fire Marshal listing #3240-1004:105. Air Products and Controls, Ltd. SL-2000 Series.

F. System Shall Function as Follows:

1. Remove the existing ACC-1-1 Office/Meeting Rooms VRF system controls. The ACC-1-2 Auditorium VRF system controls shall remain. Connect the new equipment to the existing Distech ECLYPSE with ENVYSION interface EMS. Provide all points required to connect the equipment as shown on drawings to the DDC/EMS. Provide graphics and sequences as indicated below. System shall function as follows:
2. Heating/Cooling Unit (HC-1):
   a. General: The unit shall run per the system operation schedule through the DDC/EMS. The DDC/EMS shall interface with the unit controller to monitor system status/control points. Unit fans shall run continuously on start by the DDC/EMS. The unit controller shall control the VAV system operation and outside air reset. The unit shall be capable of an economizer cycle. A static pressure sensor within the unit shall modulate the VFD at the supply fan to maintain a constant supply duct pressure. The system shall operate either in the Heating Mode or the Cooling Mode. In the Heating Mode, all VAV boxes on the system shall be reverse acting and use the heating temperature setpoint. In the Cooling Mode, all VAV boxes on the system shall be direct acting and use the cooling temperature setpoint. A smoke detector in the supply duct shall shut off the unit on alarm and signal the fire alarm system (Div. 28).
   A factory furnished static pressure sensor shall be installed in the ceiling to control the power exhauster to maintain a 0.05" W.C. (adj.) setpoint when unit is in economizer operation. Provide a co-axial cable switch plate cover for mounting the room pressure sensing port. The indoor port for the pressure sensor for HC-1 shall be in Room 116: Meeting Room.
   b. Heating Mode: On system startup, if the temperature sensors for all VAV boxes call for heating, the furnace shall activate. When the temperature sensors for all VAV/VVH boxes reach setpoint, the furnace shall deactivate.
   c. Cooling Mode: (Initial leaving air temperature setpoint 55°F) The refrigeration system shall maintain a 55°F leaving air temperature. If the outside air temperature is less than 55°F (adj.), the economizer shall function and the refrigeration system shall be off.
   d. Minimum Outside Air Reset: Two factory wall mounted CO2 sensors furnished with the HC unit (one for each Meeting Room) shall control the unit outside air damper to reset the minimum outside airflow. The CO2 sensor setpoints and the outside air damper setpoints shall be developed in coordination with the Balance Contractor.
      (1) CO2 Sensor Setpoints: The Control Contractor shall determine the base ambient CO2 concentration level after the unit system has

been balanced and the building is unoccupied. The upper and lower CO2 concentration setpoints shall be developed as follows:
The lower CO2 concentration setpoint shall be 200 ppm (adj.) above the base ambient CO2 concentration level.
The upper CO2 concentration setpoint shall be 600 ppm (adj.) above the base ambient CO2 concentration level.

(2) Outside Air Damper Minimum Airflow Setpoints: The CO2 sensors in the Meeting Rooms served by VAV-1A and VAV-1B shall be used to set the minimum outside air at HC-1, with each one providing half of the OSA setting at HC-1 combined. The Control Contractor shall set the outside air damper position airflow setpoints for the upper and lower CO2 concentration setpoints as follows:

Unit	Lower CO2 Concentration OSA Damper Position Airflow Setpoint	Upper CO2 Concentration OSA Damper Position Airflow Setpoint
VAV-1A	115 CFM	600 CFM
VAV-1B	115 CFM	600 CFM
Combined at HC-1	230 CFM	1,200 CFM

e. DDC/EMS Monitoring Points: The DDC/EMS shall monitor the following points:
Unit fan status (current sensor at each fan, alarms on no power or belt loss)
Supply air temperature
Supply air duct pressure
Room air temperatures (through the VAV boxes temperature sensors
Outside air damper relative position (Min. to Max. in percent of opening)

f. Alarms: If the unit shuts off from the smoke detector, the DDC/EMS shall indicate a unit smoke detection alarm.
If the unit is to be on and the current sensor indicates the unit fan is not running, the DDC/EMS shall indicate a unit fan failure alarm. The current sensor shall differentiate between a motor failure and a belt failure and indicate the type of failure.
If the power exhaust is to be on and the current sensor indicates the power exhaust fan is not running, the DDC/EMS shall indicate a power exhaust fan failure alarm. The current sensor shall differentiate between a motor failure and a belt failure and indicate the type of failure.
If the unit is to be cooling and the room air temperature sensor indicates a greater than 5°F (adj.) above room setpoint for 5 minutes (adj.) after call for cooling, the DDC/EMS shall indicate a unit cooling system failure alarm.
If the unit is to be heating and the room air temperature sensor indicates greater than 5°F (adj.) below room setpoint for 5 minutes (adj.) after call for heating, the DDC/EMS shall indicate a unit heating system failure alarm.

g. Off Mode: The outside air damper goes to the closed position, the fans shut off, the refrigeration system and furnace shuts off.

3. Variable Air Volume Box (VAV-1A, 1B): (Heating setpoint 72°F, Cooling setpoint 75°F) A factory furnished wall mounted temperature sensor shall control each pressure independent VAV box through the HC-1 controls. When the room temperature is above cooling setpoint, the box shall operate in Cooling Mode. When the room temperature is below heating setpoint, the box shall operate in Heating Mode.
   a. Cooling Mode: The box damper shall modulate to maintain cooling setpoint. If the box damper is in minimum position and the room temperature drops to 3°F (adj.) below setpoint and the supply air temperature is less than 65°F (adj.), the box shall go to Intermittent Cooling Mode.
      In Intermittent Cooling Mode, the box damper shall close until the room temperature rises to 3°F (adj.) above setpoint at which time the box damper shall open to minimum position.
   b. Heating Mode: The DDC/EMS shall switch to reverse acting control of the box. The box damper shall modulate to maintain heating setpoint. If the box damper is in minimum position and the room temperature rises to 3°F (adj.) above setpoint, the box shall go to Intermittent Heating Mode.
      In Intermittent Heating Mode, the box damper shall close until the room temperature drops to 3°F (adj.) below setpoint at which time the box damper shall open to minimum position.
   c. DDC/EMS Monitoring Points: The DDC/EMS shall monitor the following points through the HC-1 DDC/EMS interface:
      Room temperature
      Box airflow
      Supply air temperature
   d. Alarm: If the DDC/EMS sends a signal to the change the box airflow and the airflow does not change, the DDC/EMS shall signal a VAV box failure.
      If the room temperature rises above setpoint in Cooling Mode, or drops below setpoint in Heating Mode; the DDC/EMS shall signal a VAV box room temperature failure.
      On all VAV box failures, the DDC/EMS shall identify the box experiencing the alarm.
4. Split System Heat Pump (ODU/IDU-1): (Heating setpoint 72°F, Cooling setpoint 75°F) System shall be enabled through the DDC/EMS. The system shall run per the system operation schedule through the DDC/EMS. System operation shall be controlled by a factory furnished controller to be mounted on the wall. The control contractor shall provide the interlock wiring between the controller and the indoor unit, and the interlock wiring between the indoor and outdoor unit.
   A wall mounted temperature sensor next to the controller shall monitor room temperature to the DDC/EMS. DDC/EMS shall monitor system status with current sensors (one each for ODU and IDU). On unit failure, the DDC/EMS shall indicate a unit failure alarm.
5. Split System Heat Pump (ODU-2A/IDU-2, 3; ODU-2B/IDU-4, 5): (Heating setpoint 72°F, Cooling setpoint 75°F) System shall be enabled through the DDC/EMS. The system shall run per the system operation schedule through the

DDC/EMS. Each indoor unit shall be controlled by a separate factory furnished controller to be mounted on the wall. The control contractor shall provide the interlock wiring between the controller and its associated indoor unit, the interlock wiring between each indoor unit, and the interlock wiring between the indoor unit closest to the outdoor unit and the outdoor unit.
A wall mounted temperature sensor next to the controller shall monitor room temperature to the DDC/EMS. DDC/EMS shall monitor system status with current sensors (one each for ODU and IDU). On unit failure, the DDC/EMS shall indicate a unit failure alarm.

6. Supply Fan (SF-1): The unit shall run when indoor units IDU-1, 2, 3 are running through the DDC/EMS. Unit fan shall run continuously on start by the DDC/EMS. A current sensor at the fan shall monitor fan operation to the DDC/EMS. The current sensor shall differentiate between a motor failure and a belt failure and indicate the type of failure. If the supply fan is to be running and the current sensor indicates that the fan is not running, the DDC/EMS shall signal a supply fan failure.

G. Installation: All electrical work shall be in accordance with the California Electrical Code and Electrical Specification Sections. All electric/electronic systems shall be hardwired in conduit. Wiring shall be concealed in walls, above the ceilings, or below grade unless otherwise noted. Exposed wiring shall run parallel to room surfaces; location shall be approved by the Architect. No structural member shall be weakened by cutting, notching, boring or otherwise. Provide a 120 volt circuit for each device requiring external power. Dedicated circuits shall be provided where required. Any devices or wiring exposed to the weather shall be protected in weatherproof enclosures such as NEMA 3R and weatherproof conduit. Set, test and adjust the system for proper operation.

H. Programming: The Contractor shall be responsible for programming the system and shall coordinate the scheduling (on/off times) with the Owner.

I. Training: Prior to final acceptance, the Contractor shall provide operational training to the Owner's personnel. The training sessions shall include a complete demonstration of the system. Dates and times of the training sessions shall be coordinated through the Owner not less than one week prior to session. A total of 16 hours of instruction shall be provided - 8 hours initially, and 8 hours to be spread throughout the first year of operation. The Contractor shall maintain a log of training sessions including dates, times and names/titles of those attending. The Contractor shall submit a copy of this log on request.

J. Testing and Acceptance: The Contractor shall furnish a complete and operating system. The Contractor shall also verify, in the presence of the Owner, the system accuracy and proper function of each controlled device and sensor. The following items shall be successfully demonstrated prior to acceptance by the Owner:

1. All system outputs including controllers, relays, and other control devices shall be addressed and start/stop functions demonstrated.
2. All inputs shall be displayed and all event-initiated functions shall be demonstrated.
3. Demonstrate program integrity and power restore sequence during and after a power failure and restoration.

4. Deliver all As-Built drawings, wiring diagrams, equipment specifications, Operation and Maintenance Manuals and other documentation as required to describe the system.
5. Complete operator training in the use, programming, and operation of the system.

K. Operation and Maintenance Manuals: Furnish Operating and Maintenance Manuals for all components. These manuals shall contain full documentation which shall include, without being limited to, the following:
1. General description and specifications.
2. Installation and initial checkout procedures.
3. Principles and theory of operation.
4. Complete trouble-shooting procedures and diagrams.
5. Complete alignment and calibration procedures for all components.
6. Preventative maintenance requirements.
7. Detailed schematics and assembly drawings.
8. Complete recommended spare parts lists including unit prices.

END OF SECTION

SECTION 26 05 00 – COMMON WORK RESULTS FOR ELECTRICAL

PART 1 - GENERAL

1.01 DESCRIPTION:

A. This Section provides the Basic Electrical Requirements, which supplement the General Requirements of Division 1 and apply to all Sections in Division 26.

1.02 SUBMITTALS:

A. All submittals shall be made in accordance with Section 013300.

1.03 BASIC ELECTRICAL REQUIREMENTS:

A. Drawings and Specifications coordination:

1. For purposes of clearness and legibility, the electrical drawings are essentially diagrammatic. The size and location of equipment is shown to scale whenever possible. The Contractor shall verify all conditions, data and information as indicated on the drawings and in Specifications Sections where electrical work is required prior to installation.

2. The Electrical Drawings show size and points of termination of the conduits, the number and size of wires, and suggest the proper route for the conduit. It shall be the responsibility of the Contractor to install the conduits with minimum number of bends to conform to the structure, avoid obstructions, preserve headroom, keep openings and passageways clear, and meet all applicable Code requirements. The routing of conduits may be changed, if approved by the District Electrical Inspector.

   If the length of a conduit run is increased more than 10% of the length shown on the drawings, the Contractor shall consider worst case voltage drop and adjust wire and conduit size accordingly in compliance with Code. If the length of a conduit run is decreased more than 10% of the length shown on the drawings, the Contractor shall offer a credit to the District for the length and size of the conduit and wire deleted.

3. It is intended that outlets be located symmetrical with Architectural elements notwithstanding the fact that locations shown on the drawings may be distorted for clarity.

4. The Architectural and Structural Drawings take precedence over the electrical drawings in the representation of the general construction work. The drawings of the various trades take precedence in the representation of the work of those trades. The Contractor shall refer to all drawings to coordinate the electrical work with the work of other trades to eliminate all conflicts.

B. Terminology:

1. The term “low voltage” shall apply to systems operating at 600 volts and under.

2. The term “provide” used on the drawings and elsewhere in the Specifications shall be considered to mean furnish and install.

C. Ordinances and Regulations:

1. Electrical work shall meet requirements of local authorities having jurisdiction, including municipal ordinances, City and/or County Building Codes, the California Administrative Code Title 24, the Safety Orders of the State Division of Industrial Safety, and the Fire and Panic Safety Standards of the State Fire Marshal. Material and labor shall conform to the Regulations of the National Board of Fire Underwriters for Electrical Wiring and Apparatus. All new material shall be U.L listed. The latest Electrical Ordinance of the local jurisdiction, including amendments thereto, effective on the date of opening bids for the work, is hereby made a part of this Specification, and shall apply to all work, except for those portions which conflict with the requirements of the local authorities.

2. Meet the requirements of the latest National Electrical Code adopted by the local jurisdiction.

3. Electrical work shall comply with the American National Standards Institute (ANSI), which includes the National Electrical Installation Standards (NEIS).

D. Structural Considerations for Conduit Routing:

1. Where conduits are to pass through or will interfere with any structural member, or where notching, boring or cutting of the structure is necessary, or where special openings are required through walls, floors, footings, or other building elements to accommodate the electrical work, such work shall conform to State Building Code, Title 24, for conduits and pipes embedded in concrete and for notches and bored holes in wood; for steel and when detailed on the Structural Drawings.

E. Electrically Operated Equipment and Appliances:

1. Equipment and appliances furnished by the Contractor:

a. The electrical work shall include furnishing and installing wiring enclosures for and the complete connection of all electrically operated equipment and appliances and any electrical control devices which are specified to be furnished and installed in this or other electrical Sections of the Specifications, except electrical work specified or indicated, to be in the Mechanical Work. All wiring enclosures shall be installed concealed, except where exposed work is indicated on the electrical drawings.

b. Connections shall be made as necessary to completely install the equipment ready for use. The equipment shall be tested for proper operation and, if motorized, for proper rotation. If outlets of incorrect electrical characteristics or if any equipment fails to operate properly, the Contractor shall report to the District's Inspector in writing,

listing the buildings and rooms in which located, the name, make and serial number of the equipment, and a description of the defect.

2. Equipment and appliances furnished by others:

   a. Equipment and appliances shown on the drawings as Not in Contract, Furnished by Others, or Furnished by the District, will be delivered to the Site. Required electrical connections shall be made for all such equipment and appliances in accordance with accepted trade practices under the direction of the District Inspector. All motorized equipment will be furnished factory wired to a motor starter or junction box, unless otherwise indicated. Appliances will be furnished equipped with portable cord and cap. Provide disconnect switches where required.

   b. Connections to equipment furnished under other Sections shall be part of the electrical Work. Work shall include internal wiring, installation, connection and adjustment of bolted drive motors in which the motor is supplied as a separate unit and connections only for equipment furnished with factory installed internal wiring, except as further limited by the drawings and other portions of the Specifications. Work shall include furnishing and installing suitable outlets, disconnecting devices, starters, push-button stations, selector switches, conduit, junction boxes, and the wiring necessary for a complete electrical installation. The work shall also include furnishing and installing the conduit and outlet box, if needed for the control system, furnished under Mechanical. Devices and equipment furnished shall be of the same type used elsewhere on the job or as specified.

   c. Electrical equipment furnished under other Sections for installation and connection under work of this Section shall be delivered to the installation location by the Contractor furnishing the equipment.

   d. Mechanical equipment furnished under other Sections and requiring electrical connection under this Section, will be set in place by Contractor furnishing the equipment.

   e. Suitability and condition of equipment furnished by other Sections shall be determined in advance of installation. Immediate notice shall be given to the District of damage, unsuitability or lack of parts.

F. Protection of materials:

   1. Provide for the safety and good condition of all materials and equipment until final acceptance of the project by the District. Protect all materials and equipment from damage and provide adequate and proper storage facilities during the progress of the work. All damaged and defective work shall be replaced prior to final inspection.

G. Cleaning:

   1. Exposed parts of the electrical work shall be left in a neat, clean, usable condition. Finished painted surfaces shall be un-blemished and metal surfaces shall be polished.

2. Thoroughly clean all parts of the apparatus and equipment. Exposed parts, which are to be painted, shall be thoroughly cleaned of cement, plaster and other materials. Remove grease and oil spots with solvent. Such surfaces shall be wiped and all corners and cracks scraped out. Exposed rough metal work shall be smooth, free of sharp edges, carefully steel brushed to remove rust and other spots, and left in proper condition to receive finish painting.

3. The Contractor shall remove from the site all debris and rubbish occasioned by the electrical work. He shall thoroughly clean the building of dirt, debris, rubbish, and marks caused by the performance of the work.

PART 2 - PRODUCTS

2.01 RACEWAYS, FITTINGS, AND SUPPORTS:

A. Conduit Materials:
1. Metallic conduit and tubing shall be manufactured under the supervision of Underwriters' Laboratory, Factory Inspection and Label Service Program. Each 10' length of conduit and tubing shall bear the Underwriters' Laboratory label and manufacturer's name.
2. Rigid steel conduit shall be heavy wall, mild steel, zinc coated, with an inside and outside protective coating. Couplings, elbows, bends and other fittings shall be the same materials and finish as the rigid steel conduit. Fittings, connectors, and couplings shall be threaded type.
3. Electrical metallic tubing shall be steel tubing, zinc coated with a protective enamel coating inside. Fittings, couplings and connectors shall be gland compression type. Electrical metallic tubing is designated herein after as "EMT".
4. Flexible steel conduit shall be of flexible interlocking steel strip construction with continuous zinc coating on the strips. Connectors and couplings shall be approved fittings of the type which thread into the convolutions of the flexible conduit or clamp type.
5. Liquid-tight flexible metal conduit shall be galvanized, heavy wall, flexible locked steel strip construction with a smooth moisture and oil proof, abrasion-resistant, extruded plastic jacket. Connectors shall be approved for use with liquid-tight flexible conduit and shall be installed to provide a liquid-tight connection.
6. Acceptable Manufacturers: Crouse Hinds or Appleton.
7. No metal clad (MC) cable allowed as alternate.

B. Sleeves for Conduits:
Sleeves shall be adjustable type, of 26 gauge galvanized iron, Adjusto Crete Company, Adjusto-Crete, or Jet Line Products Inc., Jet-Line.

C. Expansion Joints:
Where conduits embedded in masonry or concrete cross seismic separations between buildings, expansion joints or at locations indicated, the Contractor shall provide sliding or a sliding and deflecting fitting, as conditions require in each conduit. Sliding fittings shall be O-Z Electrical Manufacturer Company, Inc., Type AX, with bonding strap and clamps. At exterior locations use O-Z Electrical Manufacturer Company Inc., Type EX.

D. Penetration in Fire Rated Structures:

Provide Dow Corning No. 3-6548, RTV silicone foam for making fire rated seals around penetrations through floors or walls.

2.02 WIRES, CABLES AND CONNECTOR:

A. Pull Wires: A 1/8" polypropylene cord shall be installed in each empty conduit. A 1/8" polypropylene cord shall be installed in each underground service conduit unless otherwise required by the utility company.

B. 600 Volts or Less Wires:
   1. Wire shall be NEC type THHN/THWN-2 in sizes No. 4 and smaller and NEC type THWN-2 in sizes No. 2 and larger, unless otherwise indicated. All wire shall have copper conductors. Wires No. 14 and larger shall be stranded. Wires smaller than 12 gauge shall not be used in the light and power systems.
   2. Wire adjacent to ovens and boilers, in range hoods, and at other dry locations where the operating temperature of the wire may be expected to exceed 60° C, but not to exceed 90° C, shall be National Electric Code Standard Type THHN. Where the temperature may be expected to exceed 90° C, wire shall be a type approved by Underwriters' Laboratory for the temperature and installed conditions involved, silicone type wire 200° C or equivalent.

2.03 BOXES, ENCLOSURES, KEYS AND LOCKS:

A. Outlet Boxes and Fittings:
   1. Outlet boxes used in concealed work shall be galvanized or sherardized steel, pressed or welded type, with knockouts.
   2. In exposed work, outlet boxes and conduit fittings required and where conduit runs change direction or size, shall be cast metal with threaded cast hubs cast integral with the box or fitting. Boxes and fittings shall not have unused spare hubs, except as otherwise indicated or approved manufacturer.
   3. Fittings shall be cast metal and non-corrosive. Ferrous metal fittings shall be cadmium plated or zinc galvanized. The castings shall be true to pattern, smooth, straight, with even edges and corners, of uniform thickness of metal and shall be free of cracks, gas holes, flaws, excessive shrinkage and burnt out sand.
   4. Covers for fittings shall be galvanized steel or non-corrosive aluminum and shall be designed for the fitting with which used.
   5. For all receptacle outlets, use 4” square boxes or larger with single gang plaster rings.
   6. Plaster rings shall be provided on all flush mounted outlet boxes, except where otherwise indicated or specified. All plaster rings shall be same depth as the finished surface.
   7. Factory made knock-out seals shall be installed to seal all box knock-outs, which are not intact.
   8. At each location where flexible conduit is extended from a flush outlet box, provide and install a weatherproof universal box extension adapter by Bell Electric Company.
   9. No more than one box extension or cuffs used anywhere.

B. Junction and Pull Boxes:
   1. Interior and non-weatherproof boxes shall be constructed of blue or galvanized steel with ample laps, spot welded and shall be rigid under torsional and deflecting forces. Boxes shall have auxiliary angle iron framing where necessary to ensure rigidity. Covers shall be fastened to the box with a sufficient number of brass or stainless steel machine screws

to ensure continuous contact all around. Flush type boxes shall be drilled and tapped for cover screws at the site if the boxes are not installed plumb. All surfaces of pull and junction boxes and covers shall be given one coat of metal primer, and one coat of aluminum paint, and shall have permanent labels with box designation or system or circuit numbers.

2. Weatherproof pull and junction boxes shall conform to the foregoing for interior boxes with the following modifications: The cover of flush mounting boxes shall have a weather-tight gasket cemented to and trimmed even with the cover all around. Surface or semi-flush mounting pull and junction boxes shall be Underwriters' Laboratory approved as rain-tight and shall be complete with threaded conduit hubs. All exposed portions of boxes shall be galvanized and finished with a prime coat and standard coat of baked-on enamel. For underground pull-boxes, the cast iron cover shall be permanently marked Electrical, Power, Signal, Telephone or Ground.
3. All junction and pull-boxes shall be rigidly fastened to the structure and shall not depend on the conduits for support.

2.04 RECEPTACLES:

A. Receptacle shall be industrial Specifications grade, back and side wired with binding screws and plaster ears with captive mounting screws. Receptacle bodies shall be phenolic, plastic or bakelite with ivory colored faces, unless otherwise indicated. Receptacles shall have heavy duty, current carrying contacts and double wipe flat ground contacts. Receptacles shall be Hubbell, Arrow-Hart, Bryant or Leviton.
   1. Duplex receptacles shall be 20 amps (NEMA 5-20R), 125 volts, two-pole, three-wire with parallel slots, U-ground.
   2. Single receptacles shall be of the voltage, rating and configuration shown on the drawings.
   3. Ground fault interrupting type receptacles shall consist of a duplex receptacle with a test and a reset device manufactured in a standard configuration for use with a duplex cover plate. Receptacles shall be 20 amps (NEMA 5-20R) or as indicated on the drawings. Exterior receptacles shall be weatherproof.
   4. Weatherproof receptacles, except where otherwise indicated or specified, shall consist of a duplex receptacle, as specified herein, and a metal plate with die cast hinged lid and weatherproof mat.

2.05 IDENTIFICATION AND SIGNS:

A. Name Plates:
   1. The following equipment shall be provided with name plates unless otherwise specified: Switchboards, motor control centers, control panels, push button stations, time switches, contractors, motor starters, motor switches, relays, panel boards and terminal cabinets.
   2. Name plates shall give equipment designation and adequately describe the function, voltage and phase of the particular equipment involved. For panel boards, the nameplates shall indicate the panel designation, voltage and phase of the panel. For terminal cabinets, the nameplates shall indicate the system housed therein.
   3. Nameplates shall be black and white nameplate stock of bakelite with characters cut through the black exposing the white. Plates shall have beveled edges and shall be securely fastened in place with No. 4 Phillips head, cadmium plated steel, self tapping screws. Characters shall be 3/16" high, unless otherwise indicated.

B. Markings:
The following equipment and controls shall have markings: Pull and junction boxes, and other devices controlling motors and appliances. Abbreviations acceptable to the District's Electrical Inspector, along with an identifying number, shall be used. Markings shall be done with locking type stencils using paint of a contrasting color. Figures shall be 3/8" high unless otherwise indicated.

PART 3 - EXECUTION

3.01 CONDUIT INSTALLATION:

A. General Requirements:
1. Provide complete and continuous systems of rigid steel conduit, outlet boxes, junction boxes, fittings and cabinets for all systems of electrical wiring including lighting, power, communications, control and signal systems, except as otherwise specified.
   a. Interior electrical distribution size shall be:
      1. Electrical power and lighting, and control systems distribution – 3/4" minimum.
2. Within buildings EMT may be used in lieu of rigid steel conduit where permitted by ordinance. EMT shall not be used in the following cases: exposed below 8 feet elevations; in concrete; underground.
3. Within buildings flexible steel conduit may be used in lieu of rigid steel conduit where permitted by ordinance, but no metal clad (MC) cable. Flexible steel conduit shall not be used for runs longer than 6 feet or for exposed conduits.
4. Flexible steel conduit shall be used, except where otherwise specified, for final connection of all motor terminal boxes and shall be of sufficient length (not to exceed 36") to allow full travel or adjustment of the motor on its base.
5. Conduit shall be concealed, unless otherwise indicated. Conduits exposed to view (except those in attic spaces and under buildings) shall be installed parallel or at right angles to structural members, walls, or lines of the building. Conduits shall be routed to clear access openings.
6. Bends or offsets will not be permitted, unless absolutely necessary. The radius of each conduit bend or offset shall be as required by ordinance, except for underground conduits, for public telephone conduits, and where otherwise indicated or specified. Bends and offsets shall be made with standard tools and equipment made especially for the purpose or may be factory made bends or elbows complying with the requirements for radius of bend specified herein. Public telephone conduit bends and offsets shall have a radius, which is not less than ten times the trade size of the conduit, unless otherwise approved by the telephone company. Refer to "Underground Conduit Installation" for the radius of bends and offsets required for underground installations.
7. Running threads will not be permitted. Provide approved conduit unions where union joints are necessary. Conduits shall be kept at least 6" from the coverings on hot water and steam pipes and 18" from flues and breechings. The open ends of conduits shall be kept closed with approved conduit seals during construction of the buildings and during the installation of underground systems.
8. The joints in conduits installed in concrete, wet locations, exposed to the weather or underground shall be made liquid tight.
9. Conduits run exposed on roofs shall be rigid conduit (no EMT).
10. Where auxiliary supports, saddles and brackets are required to meet special conditions, they shall be made rigid and secure before the conduit is attached thereto.

11. Conduit in ceiling spaces, in stud walls and under floors, shall be supported with factory made pipe straps or shall be suspended with pipe hangers or pipe racks. The pipe straps shall be attached to and shall hold the conduit tight at the point of support against the ceiling, floor joists, rafters, wall studs or 2" x 4" headers fitted between the joists or wall studs.
12. Conduits installed on exposed steel trusses and rafters shall be fastened with factory made conduit straps or clamps, which shall hold the conduit tight against the supporting member at the point of support.
13. Pipe hangers for individual conduits shall be factory made, consisting of a pipe ring and threaded suspension rod. The pipe ring shall be malleable iron, split and hinged, and shall securely hold the conduit, or shall be springable wrought steel. Rings shall be bolted to or interlocked with the suspension rod socket. Rods shall be 3/8" for 2" conduit hangers and smaller and shall be 1/2” for 2 1/2" conduit hangers and larger.
14. Pipe racks for groups of parallel conduits and for supporting total weights not exceeding 500 pounds shall be trapezed type and shall consist of a cross channel, Steel City Kindorf No. B-900 or Unistrut No. P-1000 suspended with a 3/8" minimum diameter steel rod at each end. Each rod shall be fastened with nuts, top and bottom to the cross channel and with a square washer on top of the channel. Each conduit shall be clamped to the top for the cross channel with conduit clamps, Steel City Kindorf No. C-105 or Unistrut Nos. P-1111 through P-1124. Conduits shall not be stacked one on top of the other, but a maximum of two tiers may be on the same rack by providing an additional cross channel. Where a pipe rack is to be longer than 18" or if the weight it is to support exceeds 500 pounds, submit details of the installation to the Architect for approval.
15. Conduits, which are suspended on rods more than 2' long, shall be rigidly braced per State Seismic Regulations to prevent horizontal motion or swaying.
16. Factory made pipe straps shall be one- or two-hole formed galvanized clamps, heavy duty type, except as otherwise specified.
17. Hangers, straps, rods or pipe supports under concrete shall be attached to inserts set at the time the concrete is poured. Under wood, use bolts, lag bolts or lag screws; under steel joists or trusses, use beam clamps.
18. Conduits shall be supported at intervals required by ordinance, but not to exceed 10'. One inch and smaller conduits installed exposed shall be fastened with 2-hole straps. Perforated strap and plumber's tape shall not be used in the support of conduits.
19. Each conduit stubbed up through a roof or an arcade shall be flashed with a waterproof flashing. The base of the flashing shall extend on the roof not less than 10" from the conduit. Flashing shall extend up the conduit not less than 6" and shall be in contact with the conduit for minimum 1" at the top.
20. Bushings for all sizes of rigid steel conduits shall be threaded insulating type. Set screw bushings are not acceptable.
21. All flex conduits shall be cut square and not at an angle.
22. It shall be the responsibility of the Contractor to install the conduits with a minimum number of bends in such a manner as to conform to the structure and meet all applicable code requirements.
23. The routing of conduits may be changed if approved by the Owner’s Inspector, providing the length of any conduit run is not decreased more than 10% of the length shown on the drawings.

B. Penetration in Concrete Walls, Beams and Floors: Provide sleeves where conduits pierce concrete walls, beams and floors, except floor slabs on earth. Sleeves shall have 1/2" clearance around conduits. Sleeves shall not extend beyond the exposed surfaces of the

concrete and shall be securely fastened to the forms. Where conduits pass through walls below grade, calk with District approved sealant and provide backer materials between the conduit and the sleeve to obtain a watertight joint.

3.02 WIRE INSTALLATION:

A. Wire shall not be installed until all plastering throughout the building is completed, and all debris and moisture removed from the conduits, boxes, and cabinets.

B. Wire-pulling compounds used as lubricants in installing conductors in raceways shall only be compounds approved and listed by Underwriters' Laboratory. No oil, grease, graphite, or similar substances may be used. Pulling of No. 1/0 or larger conductors shall be done only with an approved cable pulling machine.

C. At all outlets for light, power, communications, control, and signal equipment, pigtail splices with 8" circuit conductor leads shall be provided for connection to fixtures, equipment and devices.

D. Pressure cable connectors, pre-insulated "Scotchlok" Type "'Y", "R", or "B" spring loaded twist-on type, may be used for splicing 8 gauge or smaller conductors, in lieu of soldered connectors for all wiring systems, except the public address, District owned telephone system, or system clocks.

E. All joints, splices, taps and connections for cables 6 gauge and larger, shall be made with high-pressure cable connectors approved for use with copper conductors.

F. Wire in switchboards, panels, pull boxes and other cabinets shall be neatly grouped and tied in bundles with nylon ties at 10" maximum intervals. At switchboards, panels and terminal blocks, wires shall be fanned out to the terminals.

G. Each neutral conductor larger than 6 gauge which is not color identified throughout its entire length shall be painted white or taped white wherever it appears in a switchboard, cabinet, gutter or box. Neutral conductors 6 gauge and smaller shall be white color identified throughout their entire length.

H. All systems of wiring shall be so installed that when completed, the systems will be free from short circuits and from grounds, other than required grounds. The Contractor shall provide all instruments for testing and shall demonstrate in the presence of the Owner’s Electrical Inspector that each system of wiring meets the following minimum requirements for insulation resistance:

1. For circuits of No. 1 or larger conductors, a resistance shall be based on the following allowable current-carrying capacities of conductors:

100 to 200 amperes inclusive	50,000 ohms
201 to 400 amperes inclusive	25,000 ohms
401 to 800 amperes inclusive	12,000 ohms
Over 800 amperes inclusive	5,000 ohms

2. The above values shall be obtained with all switchboards, panel boards, fuse holder, switches, and overcurrent devices in place and connected, and with all switches closed.

3. If lamp holders, receptacles, fixtures and appliances for a system are also connected, the minimum insulation resistance permitted shall be one-half the values specified above.

J. The Contractor shall provide a "Megger" insulation tester, which will apply a minimum of 500 volts direct current for these tests when requested by the Owner’s Inspector.

K. 120 volts and 277 volts circuits shall be routed in separate conduits, raceways and enclosures.

L. Other conductors in raceway or cable: Conductors, other than service conductors, shall not be installed in the same service raceway or service cable.

3.03 FEEDER IDENTIFICATION:

Lighting, power, and low voltage feeder wires and cables shall be identified at each point of termination and at each point the conduit run is broken by a cabinet, box and gutter. Identification shall be by means of wrap around type markers, E-Z Code or Brady Perma-Code, and shall include the feeder designation, size and description.

3.04 TAPE:

Splices, joints and connectors joining conductors shall be covered with insulation equivalent to that on the conductors. Free ends of conductors connected to an energized source shall be taped. The voids in irregular connectors shall be filled with insulating compound before taping. Thermo plastic insulating tape approved by Underwriters' Laboratory for use as the sole insulation of splices shall be used and shall be applied according to the manufacturer's printed specifications. Heat shrink tubing may be used as per manufacturer’s specifications.

3.05 BOXES INSTALLATION AND SUPPORT:

A. Outlet boxes shall be flush with finished surface of wall or ceiling. They shall be plumb and securely fastened to the structure independent of the conduit. Except where otherwise indicated, factory made bar hangers shall be used to support outlet boxes.

B. Outlet boxes installed in ceilings suspended or furred with steel runner and/or furring channels shall be supported (except where otherwise indicated) by a Unistrut No. P-4000 channel spanning the main ceiling runner channels. Each box shall be supported from its channel by a 3/8" 16 threaded steel rod with a Unistrut No. P-4008 nut and a Tomic No. 711-B Adapta-Stud. The rod shall be tightened to a jamb fit with the channel and its nut. The box shall be locked to the rod by means of a 1/2” locknut on the stud and a 3/8" 16 hex nut locking the stud to the rod.

3.06 PLATES:

A. Provide an appropriate plate on each outlet. Plates shall be of stainless steel, unless otherwise specified. Public telephone plates shall have single bushed openings. Sectional plates will not be accepted.

B. The designations shall be as indicated on the drawings or as specified and shall be engraved in the plates with 3/16" high block type letters filled with black enamel. Where designations

are not indicated or specified they shall be requested from the Engineer. For estimating purposes, they may be assumed 12", not to exceed more than ten letters per gang.

3.07 IDENTIFICATION OF CIRCUITS AND EQUIPMENT:

A. Switchboards, motor control centers, transformers, panel boards, circuit breakers, disconnectinq switches, starters, pushbutton control stations and other apparatus used for the operation or control of circuits, appliances or equipment, shall be properly identified by means of descriptive nameplates or tags permanently attached to the apparatus or wiring.

B. Nameplates shall be engraved laminated plastic. Shop Drawings with dimensions and format shall be submitted to the District or Architect for approval before installation. Attachment to equipment shall be with self-tapping screws. Self-adhering or adhesive backed nameplates shall not be used.

C. Tags shall be attached to feeder wiring in conduits at every point where runs are broken or terminated, including pull wires in empty conduits. Circuit, phase and function shall be indicated. Branch circuits shall be tagged in distribution boards, panel boards, and motor control centers. Tags shall be made of pressure sensitive plastic or embossed self-attached stainless steel or brass ribbon.

D. Cardholders and cards shall be provided for circuit identification in panel boards. Cardholders shall consist of metal frame retaining a clear plastic cover permanently attached to the inside of panel door. List of circuits shall be typewritten on a card. Circuit description shall include name or number of the circuit, area and connected load.

E. Junction and pull boxes shall have covers stenciled with box number when shown on the drawings, or circuit numbers according to panel schedules. Data shall be lettered in a conspicuous manner with a color contrasting with finish.

END OF SECTION