Project Manual

For

Ventura College
Translucent Panel Replacement
Learning Resource Center

VOLUME 2

Specifications

for the

Ventura County Community College District
4667 Telegraph Rd
Ventura, CA 93003

February 27, 2026

BEAM Project No.: 240378

Bid Set

Project Manual

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4667 Telegraph Rd
Ventura, CA 93003

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BEAM Project No.: 240378

Consultants:

Building Envelope Consultant
BEAM Professionals
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SECTION 01 10 05 - ADMINISTRATIVE PROCEDURES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Procedures for processing Change Orders

B. Procedures for distribution of Shop Drawings

C. Procedures for correspondence

D. Procedures for Professional Inspector (PI)

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1.2 RELATED DOCUMENTS AND SECTIONS

A. Agreement: Monetary values to be used in computing Change Orders

B. General Conditions: Governing requirements for changes in the Work, in Contract Price and Contract Time

1.3 ADMINISTRATIVE REQUIREMENTS FOR CHANGES IN THE WORK

A. Contract Requirements for Changes in the Work: Comply with provisions of the General Conditions of the Contract.

B. Administrative Requirements for Changes in the Work: All changes to approved Drawings and Specifications shall be made by Change Order.
   1. Comply with administrative requirements specified in this Section preparation, submission, review and approval of changes in the Work.
   2. Administrative procedures are specified for Potential Change Orders and Change Orders.
   3. The District's Representative will prepare and issue a Proposed Change Order or a request for change order proposal which will be presented to the Contractor for action.

C. Responsible Person for Contractor: Submit name of the individual authorized to receive construction change documents, and who is responsible for informing others in Contractor's employ or subcontractors of changes in the Work.

1.4 REQUEST FOR CHANGE ORDER PROPOSAL

A. District-Initiated Request for Change Order Proposal: The District's Representative shall submit a request for change order proposal, which will include a detailed description of a proposed change, with supplementary or revised Drawings and Specifications, as appropriate
   1. Such request for change order proposal may include an estimate of additions or deductions in Contract Time and Contract Price for executing the change and may include stipulations regarding overtime work and the period of time the requested response from the Contractor shall be considered valid.

2. Contractor shall prepare and submit a response to the request for change order proposal within seven (7) days of the date of the request for change order proposal.

B. Contractor - Initiated Request for Proposal: The Contractor may propose a change by submitting a request for a change to the District's Representative, describing the proposed change and its full effect on the Work, with a statement describing the reason for the change, and a full description of effects on the Contract Price, Contract Time, related Work and work being performed under separate contracts:
1. Requests for Substitutions shall be included under this category, with procedures as specified in General Conditions.
2. After review of the Request, District will prepare a Request for Proposal as described above, if approved.
3. Issuance of such a request by the District's Representative shall not indicate authorization for the Contractor to proceed with the proposed change.
4. Changes will be approved only by an approved Potential Change Order and Change Order.

1.5 CONTRACTOR'S RESPONSE TO REQUESTS FOR BID

A. Substantiating Data for Proposed Changes in Contract Price and Contract Time: Contractor shall provide full information required for evaluation of proposed changes and to substantiate costs of changes in the Work.
1. Document each quotation for a change in Contract Price and Contract Time, with sufficient data to allow evaluation of the quotation.
2. Items to be included:
    1) Quantities of products, labor and equipment
    2) Taxes, insurance and bonds
    3) Overhead and Profit
    4) Justification for change in Contract Time, if claimed
    5) Credit for deletions from Contract, similarly documented
    6) Other documents as requested.

B. Cost and Time Resolution: If amounts for changes in Contract Price and Contract Time cannot be agreed upon by District and Contractor, amounts shall be resolved in accordance with provisions of the Conditions of the Contract for resolution of disputes and the following:
1. Contractor shall keep accurate records on a daily basis of time, both labor and calendar days, and cost of materials and equipment. Records are to be signed and submitted to Project Inspector on a daily basis.
2. Contractor shall prepare and submit an itemized account and supporting data after completion of changed Work, within the time limits indicated in the Conditions of the Contract.
3. Contractor shall provide full information as required and requested, for District and Architect to evaluate and substantiate proposed costs and time for the change in Work.
4. When District and Contractor determine mutually-acceptable amounts for changes in Contract Price and Contract Time, a Change Order shall be executed for these amounts.
5. District shall have the right to audit Contractor's invoices and bid quotations to substantiate costs for Change Orders.

C. Construction Changes Based on Stipulated Sum or Time: Based on the Contractor's response to a request for change order proposal or Potential Change Order, the District will review the response.

1. The District and Contractor shall negotiate a mutually acceptable adjustment in Contract Price and Contract Time, as appropriate, prior to performance of the changed Work.
2. A Change Order shall be prepared for the stipulated amounts based on the stipulated sum and change in time.

D. Construction Changes Based on Unit Costs or Quantities: When the scope of a change in the Work cannot be accurately determined in advance, a Potential Change Order shall be executed based on mutually acceptable quantities and pre-determined unit prices. Actual costs shall be determined after completion of the Work and a Change Order for this amount shall be executed.

E. Construction Changes Based on Time and Material Costs: When the scope of a change in the Work cannot be accurately determined in advance, a Potential Change Order shall be executed based upon an agreement that the District will adjust the Contract Price and the Contract Time based on actual costs and time expended by the Contractor in performance of the change.

1.6 CHANGE ORDERS

A. Change Order Preparation, General:
1. In response to each request for change order proposal or Potential Change Order, Contractor shall submit information for review by District, in order to confirm scope of the proposed change and to determine the acceptable amounts, if any, for changes to be made in the Contract Price and Contract Time.
2. When agreement is reached on changes, if any, in the Contract Time and Contract Price, the District's Representative will prepare a Change Order using a form as directed by the District, with supplementary documents as necessary to describe the change and the associated costs and schedule impacts.
    1) District's Representative will prepare four (4) sets of Change Order documents, including drawings, specifications and other supporting documents.

B. District, Construction Manager and Contractor shall sign the Change Order indicating acceptance and approval of the change.

C. Execution of Change Orders: Upon approval of the Change Order by Contractor and District, Contractor shall promptly execute the change in the Work.

1.7 CONSTRUCTION CHANGE DIRECTIVES

A. Potential Change Order: In accordance with provisions of the General Conditions of the Contract, the District may direct the Contractor to proceed with a change in the Work prior to formal preparation, review, agreement and approval of a Change Order, in order to not delay construction.
1. The District's Representative will prepare and issue a Potential Change Order which, when signed by the District shall instruct the Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
2. Potential Change Orders shall follow procedures specified above in Article entitled "CHANGE ORDERS", except that Contractor shall immediately proceed with the change upon receipt of the signed Potential Change Order.
3. Potential Change Orders shall be incorporated into subsequent Change Order prepared, reviewed and approved as specified in Article above titled "CHANGE

ORDERS".

4. Should the Potential Change Order result in disputed costs and time adjustments, such dispute shall be resolved in accordance with the provisions of the Conditions of the Contract.

1.8 RECONCILIATION OF CHANGE ORDERS

A. Schedule of Values: Contractor shall promptly revise the Schedule of Values and Application for Payment forms to record each authorized Change Order as a separate line item and adjustment to the Contract Price.

B. Schedules: Contractor shall promptly revise progress schedules to reflect changes in Contract Time, revising sub-schedules to adjust time for other items of Work as may be affected by the change. Contractor shall submit revised schedules at the next Application for Payment following approval and acceptance of the Change Order.

PART 2 PRODUCTS

Not applicable to this Section

PART 3 EXECUTION

Not applicable to this Section

END OF SECTION 01 10 05

SECTION 01 10 10 – SUMMARY OF WORK

PART 1 GENERAL

1.1 INCLUSION OF OTHER CONTRACT DOCUMENTS

A. The General Conditions, Supplementary Conditions, Division 0 and Division 1 are fully applicable to this Section, as if repeated herein.

1.2 WORK COVERED BY CONTRACT DOCUMENTS

The Project name is Ventura College Translucent Panel Replacement Learning Resource Center, as shown on the Contract Documents.

A. Scope of work:

TRANSLUCENT PANELS

LOBBY SKYLIGHT
1. A COMPLETE REPLACEMENT OF THE PANELS WITH ALL ASSOCIATED FLASHINGS. EX. GUTTER, DOWN SPOUTS, COUNTER FLASHING, DRIP EDGES, BREAK METALS.

LOBBY WALL PANELS
1. REPLACEMENT OF ALL THE WALL PANELS AND ASSOCIATED FLASHINGS. BREAK METALS TO BE REPLACED TO MATCH EXISTING COLOR.

LIBRARY SKYLIGHT
1. COMPLETE REPLACEMENT OF SKYLIGHT SYSTEM. SYSTEM TO MATCH EXISTING WITH NO STRUCTURAL ADDITIONS OR CHANGES TO EXISTING STRUCTURAL SUPPORTS.

SMALL SKYLIGHTS
1. REPLACEMENT OF FOUR SMALL SKYLIGHTS.

TRANSLUCENT PANEL SUPPORT BEAMS

PART 2 1. ONCE ALL PANELS ARE REMOVED ALL THE BEAMS WITH CALCIUM/LIME SCALE WILL BE THOROUGHLY CLEAN AND SCRAPPED IF NEEDED.

PART 3 2. ALL THE AFFECTED AREAS WILL RECEIVE A NEW COAT OF PAINT. PER THE AS BUILT THE PAINT IS TO BE A 1-HOUR FIRE RATED INTUMESCENT PAINT. IT MAY BE NECESSARY TO PAINT ALL BEAMS REGARDLESS OF BUILD UP OR NOT TO KEEP THE COLOR CONSISTENT THROUGHOUT THE BEAMS.

INTERIOR GYPSUM

PART 4 1. ALL WALL GYPSUM TO BE PAINTED WITH A NEW PAINT. ANY SEVERE DAMAGE TO THE GYPSUM WILL BE REPLACED IN-KIND.

PATIO
1. HHS POST REPAIR
ADD SIKALASTIC/ROOF PRO ON ALL POSTS. 3 INCHES ON THE MEMBRANE AND 3" ON THE STEEL. CAN BE APPLIED IN A WHITE COLOR OR A GREY COLOR.

MAIN ROOF
1. SEALANT MAINTENANCE.
REMOVE ALL EXISTING SEALANT FROM BOOT PENETRATIONS. APPLY NEW SEALANT COMPATIBLE WITH MANUFACTURER.

2. REGLET REPAIR.
INSTALL COUNTERFLASHING WITH CLIPS AT THE EXISTING REGLET.

HIGH ROOF

SATELLITE DISH
COMPLETELY REMOVE DISH AND DISPOSE.

4.1 WORK SEQUENCE

A. The work shall be completed according to the project schedule set forth in the front-end documents.

B. Occupancy: The Project will be occupied by District Staff and the premises will be occupied whether or not the work is completed regardless of time extensions (if any). Any work performed after the 4th of August will need to be fully coordinated with District and will be limited to after school hours or weekends.

4.2 WORK BY OTHERS

A. Work on this Project that will be executed during the Work of this Contract which the Contractor shall coordinate with and facilitate: (If needed)
   1. Other trades on same campus doing projects

4.3 EXECUTION, CORRELATION AND INTENT

A. Correlation and Intent
   1. Documents Complementary and Inclusive:
      1) The Contract Documents are complementary and are intended to include all items required for the proper execution and completion of the Work.
      2) Any item of work mentioned in the Specifications and not shown on the Drawings, or shown on the Drawings and not mentioned in the Specifications, shall be provided by Contractor as if shown or mentioned in both.
   2. Coverage of the Drawings and Specifications:
      1) The Drawings and Specifications generally describe the work to be performed. Generally, the Specifications describe work which cannot be readily indicated on the Drawings and indicate types, qualities, and methods of installation of the various materials and equipment required for the Work.
      2) It is not intended to mention every item of Work in the Specifications, which can be adequately shown on the Drawings, or to show on the Drawings all items of Work described or required by the Specifications even if they are of

such nature that they could have been shown.

3) All materials or labor for Work which is shown by either the Drawings or the Specifications (or is reasonably inferable there from as being necessary to complete the Work), shall be provided by the Contractor.
4) It is intended that the Work be of sound, quality construction, and the Contractor shall be responsible, without increase in the Contract Price, for the installation of all items indicated, described.

3. Conflicts. In the event there is a discrepancy between the various Contract Documents, the District /Contractor Contract shall control. Without limiting Contractor's obligation to identify conflicts for resolution by District and/or Architect in accordance with the Contract Documents, it is intended that the more stringent, higher quality and greater quantity of Work shall apply.
4. Conformance With Laws:
    1) Each and every provision of law required to be inserted in the Contract Documents shall be deemed to be inserted herein, and the Contract Documents shall be read and enforced as though it were included herein. If through mistake or otherwise any such provision is not inserted, or is not correctly inserted, then upon application of either party the Contract Documents shall be amended in writing to make such insertion or correction.
    2) Before commencing any portion of the Work, Contractor shall check and review the Drawings and Specifications for such portion for conformance and compliance with all laws, ordinances, codes, rules and regulations of all governmental authorities and public utilities affecting the construction and operation of the physical plant of the Project, all quasi-governmental and other regulations affecting the construction and operation of the physical plant of the Project, and other special requirements, if any, designated in the Contract Documents.
    3) In the event Contractor observes any violation of any law, ordinance, code, rule or regulation, or inconsistency with any such restrictions or special requirements of the Contract Documents, Contractor shall immediately notify District and Architect in writing of same and shall cause to be corrected any such violation or inconsistency in the manner provided hereunder.
5. Ambiguity:
    1) Before commencing any portion of the Work, Contractor shall carefully examine all Drawings and Specifications and other information given to Contractor as to materials and methods of construction and other Project requirements.
    2) Contractor shall immediately notify District and Architect of any perceived or alleged error, inconsistency, ambiguity, or lack of detail or explanation in the Drawings and Specifications in the manner provided in the Contract Documents.
    3) If Contractor and/or its subcontractors, material or equipment suppliers, or any of their officers, agents, and employees performs, permits, or causes the performance of any Work under the Contract Documents, which it knows or suspects to be in error, inconsistent, or ambiguous, or not sufficiently detailed or explained, Contractor shall bear any and all costs arising there from including, without limitation, the cost of correction thereof without increase or adjustment to the Contract Price or the time for performance. If Contractor performs, permits, or causes the performance of any Work under submittals or shop drawings prepared by or on behalf of Contractor which are in error, inconsistent or ambiguous, or not sufficiently detailed or explained, Contractor shall bear any and all resulting costs, including, without limitation, the cost of correction, without increase to or adjustment in the Contract Price or the time for performance.
    4) In no case shall any Contractor proceed with the Work if uncertain, without the

District's and Architect's written direction and/or approval.

B. Addenda and Deferred Approvals
   1. Addenda. Addenda shall govern over all other Contract Documents. Subsequent addenda issued shall govern over prior addenda only to the extent specified. In accordance with Title 24, California Code of Regulations, addenda shall be approved by DSA.
   2. Deferred Approvals. The requirements approved by DSA on any item submitted as a deferred approval in accordance with Title 24, California Code of Regulations, shall take precedence over any previously issued addenda, drawing or specification.

C. Specification Interpretation and Application
   1. Titles. The Specifications are separated into titled sections for convenience only and not to dictate or determine the trade or craft involved.
   2. As shown, etc. Where "as shown," "as indicated," "as detailed," or words of similar import are used, reference is made to the Drawings accompanying the Specifications unless otherwise stated. Where "as directed," "as required," "as permitted," "as authorized," "as accepted," "as selected," or words of similar import are used, the direction, requirement, permission, authorization, approval, acceptance, or selection by District and Architect is intended unless otherwise stated.
   3. Provide. "Provide" means "provided complete in place," that is, furnished, installed, tested, commissioned and ready for operation and use.
   4. General Conditions. The General Conditions and Supplementary Conditions are a part of each and every section of the Specifications.
   5. Abbreviations.
      1) In the interest of brevity, the Specifications are generally written in an abbreviated form in the imperative mood and may not include complete sentences.
      2) Omissions of words or phrases such as "Contractor shall," "shall be," etc., are intentional. Nevertheless, the requirements of the Specifications are mandatory and directed to Contractor.
      3) Omitted words or phrases shall be supplied by inference in the same manner as they are when a "note" occurs on the Drawings.
   6. Plural. Words in the singular shall include the plural whenever applicable or the context so indicates.
   7. Metric. The Specifications may indicate metric units of measurement as a supplement to U.S. customary units. When indicated thus: 1" (25 mm), the U.S. customary unit is specific, and the metric unit is nonspecific. When not shown with parentheses, the unit is specific. The metric units correspond to the "International System of Units" (SI) and generally follow ASTM E 380, "Standard for Metric Practice."
   8. Standard Specifications. Any reference to standard specifications of any society, institute, association, or governmental authority is a reference to the organization's standard specifications, which are in effect at the date of Contractor's Bid.
      1) If applicable specifications are revised prior to completion of any part of the Work, Contractor may, if acceptable to the District and Architect, perform such Work in accordance with the revised specifications.
      2) The standard specifications, except as modified in the Specifications for the Project, shall have full force and effect as though printed in the Specifications. District and/or Architect will furnish, upon request, information as to how copies of the standard specifications referred to may be obtained.
      3) Procurement of reference standards and standard specifications is the sole responsibility of Contractor.
   9. Absence of Modifiers. In the interest of brevity, the Contract Documents frequently omit modifying words such as "all" and "any" and articles such as "the" and "an," but the fact that a modifier or an article is absent from one statement and appears in

another shall not affect the interpretation of either statement.

D. Rules of Document Interpretation.
   1. In the event of conflict within the drawings, the following rules shall apply:
      1) General Notes, when identified as such, shall be incorporated into other portions of Drawings.
      2) Schedules, when identified as such, are complementary with other notes and other portions of Drawings including those identified as General Notes.
      3) Larger scale drawings shall take precedence over smaller scale drawings.
      4) Figured, derived, or numerical dimensions shall govern. At no time shall Contractor base construction on scaled drawings.
   2. Specifications shall govern as to materials, workmanship, and installation procedures.
   3. In the case of disagreement or conflict between or within standards, specifications, and drawings, the more stringent, higher quality, and greater quantity of Work shall apply.

4.4 ACCEPTANCE OF WORK AREA

A. Contractor shall accept the work area in the condition in which it exists at the time it is given Notice to Proceed.

4.5 CONTRACTOR'S USE OF PREMISES

A. Confine operations on the site to areas indicated in the Contract Documents and as directed by District. Portions of the site beyond areas on which work is indicated are not to be disturbed. Conform to site rules and regulations affecting the Work while engaged in project construction.

B. Contractor shall limit its use of the premises for work and storage to allow for work by other contractors as applicable.

C. Contractor will keep existing driveways, fire lanes, and entrances clear of obstructions and available for use. Do not use these areas for parking or storage or materials.

D. Do not unreasonably encumber the site with materials or equipment. Confine stockpiling of materials and location of storage sheds to area approved by District. If additional storage is necessary, Contractor shall obtain and pay for such storage off site without additional expense to District.

E. Do not overload structures with weight that will endanger them.

F. Assume full responsibility for protection and safekeeping of material and tools stored at the site.

G. Lock automotive type vehicles, such as passenger cars and trucks, and other mechanized or motorized construction equipment, when parked and unattended, so as to prevent unauthorized use. Do not leave such vehicles or equipment unattended with the motor running or the ignition key in place. Move any stored products, temporary facilities, controls or fencing, under Contractor's control, which interfere with operations of District or separate contractors, on or off the site, without cost to District.

H. Contractor shall cooperate with District and governing authorities to minimize noise and disturbance. Observe all local ordinances for time of work.

I. In entrance and exit of all workmen and in bringing in, storing and removal of equipment,

Contractor shall avoid unnecessary dust, mud or accumulated debris, or undue interference with the convenience, sanitation or routine of District activities.

J. In connecting new utilities to existing, and similar operations, Contractor shall time and coordinate such operations so that there will be no interference with District's activities.

K. Protect improvements on adjoining properties as well as those on the Project Site.

L. Restore any improvements damaged in performing the Work to their original condition as acceptable to the District.

M. Do not interfere with use of adjacent buildings. Maintain free and safe passage to and from.

N. In the performance of the Work, Contractor shall be responsible for safety and support of structure. Cease operations and notify District and Architect immediately if Contractor's work operations endanger the safety of structure. Precautions to properly support structure should be taken prior to start of work. Do not resume operations until safety is restored. Contractor shall assume liability for such movement, settlement, damage or injury.

O. Provide, erect and maintain barricades and guard rails as required by governing regulatory agencies to protect occupants of building and workers.

P. Where demolition, removal or rework occurs, take all necessary precautions to protect existing finished work remaining in place from damage. Finished work damaged by operations under this Contract shall be repaired or replaced to the satisfaction of District at no extra cost to District.

4.6 DISTRICT OCCUPANCY

A. Refer to General Conditions for requirements for partial occupancy by District.

B. District will not occupy buildings included in this scope of work during the primary construction period. However, occupancy will occur as shown above.

4.7 EXISTING UTILITIES

A. It is recognized by Contractor that the location of existing utility facilities as shown on Contract Drawings and Specifications are approximate; their exact location is unknown.

B. Recognition is given to the fact that there may be additional utilities existing on the property unknown to either party to the Contract. Location of utilities as shown on Drawings and Specifications represent the best information obtainable from utility maps and other information furnished by the various agencies involved. District warrants neither the accuracy nor the extent of actual installations as shown on the drawings and specifications.

C. Because of this uncertainty, it may become necessary to make adjustments in the line or grade of sewers or storm drains. Installation of such adjusted lines shall be made at the regular unit price Bid for the work, and no additional compensation will be paid therefore, unless the scope and character of the work has been changed.

D. Contractor agrees and is required to coordinate and fully cooperate with District and utility owners for the location, relocation, and protection of utilities. Contractor's attention is directed to the existence of utilities, underground and overhead necessary for all buildings within the area of work. Prior to start of trenching operations, Contractor shall meet fully review known

utility locations, which may affect the work.

E. In the event Contractor discovers utilities not identified in the Contract Plans or Specifications, Contractor shall immediately notify District and Architect and the utility owner by the most expeditious means available and later confirm in writing.

4.8 EXISTING CONDITIONS

A. Intent of the Drawings is to show existing conditions with information developed from field surveys and District's records, and to generally show the extent and type of work required to prepare the existing areas for new work. The information shown on the Drawings is not a guarantee of existing conditions.

END OF SECTION 01 10 10

SECTION 01 12 90 – MEASUREMENT AND PAYMENT PROCEDURES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Procedures for preparation and presentation of Applications for Payment

1.2 RELATED DOCUMENTS AND SECTIONS

A. General Conditions - Contract Price, amounts for Progress Payments and Final Payment, retainages and time schedule for presenting Applications for Payment.

B. Administrative Procedure - Accounting of costs for changes to the Work.

C. Contract Closeout Procedures - Final payment procedures.

1.3 FORM

A. Payment Application Form: Unless otherwise directed, prepare Applications for Payment using American Institute of Architects (AIA) Document G702 – Application and Certification for Payment, edition date as directed by District.
   1. Include continuation sheets as necessary, using AIA Document G703 – Continuation Sheet, edition as applicable to edition of AIA Document G 702
   2. AIA Documents G702 and G703 are available, for a nominal charge, from most local chapter offices of The American Institute of Architects. **(Sample Form at the end of this section.)**

1.4 PREPARATION OF APPLICATIONS

A. The following requirements supplement the provisions of the Conditions of the Contract:
   1. Present required information typewritten on the specified forms.
   2. Execute certification by notarized signature of authorized officer of the Contractor.
   3. Use data from reviewed and accepted Schedule of Values. Schedule of values shall be generated from cost loaded schedule.
   4. Provide dollar value in each column of Application for each line item for portion of Work performed and for products stored, if permitted.
   5. Lis teach authorized Change Order as an extension on the continuation sheet, listing the Change Order number and dollar value as for an original portion of Work. No Change Orders shall be included with Application for Payment until approved in writing by District and Architect.

B. Final Payment: Prepare Application for Final Payment as specified in Contract Closeout.

1.5 SUBMISSION OF APPLICATIONS FOR PAYMENT

A. Submission of Applications for Payment: The following requirements supplement the provisions of the Conditions of the Contract:
   1. Submit five (5) copies of each Application for Payment with original signature. Round off values to nearest dollar or as specified for the Schedule of Values.
   2. Submit an updated Construction Schedule with each Application for Payment.
   3. Payment Period: Submit Applications at intervals and covering periods stated in the Agreement. Application submission date may be adjusted by mutual consent of the

District and Contractor to coincide with regularly scheduled progress meetings or to accommodate holiday periods.

B. Lien Releases: Provide with each Application for Payment, lien releases from all subcontractors, workers and materials suppliers employed for the Project.
   1. Lien Releases shall cover portion of Work to date for which payment application is made for the conditional release and an unconditional for the prior payment received.

1.6 SUBSTANTIATING DATA

A. Substantiating Data: Submit substantiating information, as required by District and Architect, to substantiate dollar amounts on Application for Payment.
   1. Substantiating information will normally be required only for those portions of Work whose completion state cannot be readily determined by observation of the completed Work.
   2. Provide one (1) copy of substantiating information with each copy of the Application for Payment.

APPLICATION AND CERTIFICATION FOR PAYMENT

AIA DOCUMENT G702

PAGE ONE OF TWO PAGES

TO Owner: PROJECT:

APPLICATION NO:

Distribution to:
- [x] OWNER
- [x] ARCHITECT
- [x] CONTRACTOR
- [ ]
- [ ]

PERIOD TO:

FROM CONTRACTOR: VIA ARCHITECT: BEAM Professionals

PROJECT NOS:

CONTRACT FOR: Project #

CONTRACT DATE:

CONTRACTOR'S APPLICATION FOR PAYMENT

Application is made for payment, as shown below, in connection with the Contract Continuation Sheet, AIA Document G703, is attached.

1. ORIGINAL CONTRACT SUM		$ -
2. Net change by Change Orders		$
3. CONTRACT SUM TO DATE (Line 1 ± 2)		$ 0.00
4. TOTAL COMPLETED & STORED TO DATE (Column G on G703)		$ 0.00
5. RETAINAGE:		
a. ____ % of Completed Work (Column D + E on G703)	$ 0.00	
b. ____ % of Stored Material (Column F on G703)	$	
Total Retainage (Lines 5a + 5b or Total in Column I of G703)		$ 0.00
6. TOTAL EARNED LESS RETAINAGE (Line 4 Less Line 5 Total)		$ 0.00
7. LESS PREVIOUS CERTIFICATES FOR PAYMENT (Line 6 from prior Certificate)		$ 0.00
8. CURRENT PAYMENT DUE		$ 0.00
9. BALANCE TO FINISH, INCLUDING RETAINAGE (Line 3 less Line 6)	$	0.00

CHANGE ORDER SUMMARY	ADDITIONS	DEDUCTIONS
Total changes approved in previous months by Owner		
Total approved this Month		
TOTALS		
NET CHANGES by Change Order		

The undersigned Contractor certifies that to the best of the Contractor's 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 issued and payments received from the Owner, and that current payment shown herein is now due.

CONTRACTOR:

By: _____ Date: _____

State of: County of:
Subscribed and sworn to before me this
Notary Public:
My Commission expires:

ARCHITECT'S CERTIFICATE FOR PAYMENT

In accordance with the Contract Documents, based on on-site observations and the data comprising the application, the Architect certifies to the Owner that to the best of the Architect's knowledge, information and belief the Work has progressed as indicated the quality of the Work is in accordance with the Contract Documents, and the Contractor is entitled to payment of the AMOUNT CERTIFIED.

AMOUNT CERTIFIED . . . . . $ _____

(Attach explanation if amount certified differs from the amount applied. Initial all figures on this Application and onthe Continuation Sheet that are changed to conform with the amount certified.)
ARCHITECT:

By: _____ Date: _____

This Certificate is not negotiable. The 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.

CONTINUATION SHEET

AIA DOCUMENT G703

PAGE 2 OF 2 PAGES

AIA Document G702, APPLICATION AND CERTIFICATION FOR PAYMENT, containing
Contractor's signed certification is attached.
In tabulations below, amounts are stated to the nearest dollar.
Use Column I on Contracts where variable retainage for line items may apply.

APPLICATION NO:
APPLICATION DATE:
PERIOD TO:
ARCHITECT'S PROJECT NO:

A	B	C	D	E	F	G		H	I
ITEM NO.	DESCRIPTION OF WORK	SCHEDULED VALUE	WORK COMPLETED		MATERIALS PRESENTLY STORED (NOT IN D OR E)	TOTAL COMPLETED AND STORED TO DATE (D+E+F)	% (G ÷ C)	BALANCE TO FINISH (C - G)	RETAINAGE (IF VARIABLE RATE)
			FROM PREVIOUS APPLICATION (D + E)	THIS PERIOD					

G703-1992

END OF SECTION 01 12 90

SECTION 01 13 11 – PROJECT COORDINATION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Coordination of Work under Contract

1.2 RELATED DOCUMENTS AND SECTIONS

A. Section 01 10 10: Summary of Work – Various types of work to be coordinated.

B. Section 01 16 00: Product Requirements – Coordination of products.

1.3 COORDINATION

A. Coordination: Contractor shall coordinate the Work as stated in the General Conditions of the Contract. Contractor shall also coordinate Work under the Contract with work under separate contracts by District. Contractor shall cooperate with District and others as directed by District in scheduling and sequencing the incorporation into the Work of District Furnished /Contractor Installed products identified in the Contract Drawings and Specifications.

B. Relationship of Contract Documents: Drawings, Specifications and other Contract Documents in the Project Manual are intended to be complementary. What is required by one shall be as if required by all. What is shown or required or may be reasonably inferred to be required, or which is usually and customarily provided for similar work, shall be included in the Work.

C. Discrepancies in Contract Documents: In the event of error, omission, ambiguity, or conflict in the Drawings or Specifications, Contractor shall bring the matter to Architect's attention in a timely manner during the bidding period and at any time thereafter during construction of the Work, for Architect's determination and direction in accordance with provisions of the Conditions of the Contract.

D. Construction Interfacing and Coordination: Layout, scheduling and sequencing of Work shall be solely the Contractor's responsibility.
   1. Contractor shall verify, confirm and coordinate field measurements so that new construction correctly and accurately interfaces with conditions existing prior to construction.

1.4 COORDINATION OF SUBCONTRACTS AND SEPARATE CONTRACTS

A. Superintendence of Work: Contractor shall appoint a Project Superintendent and a Project Manager, who shall directly, and full time supervise and coordinate all Work of the Contract as well as other personnel and the required information for each such individual as provided for in the Instruction to Bidders.

END OF SECTION 01 13 11

SECTION 01 13 12 – COORDINATION AND MEETINGS

PART 1 GENERAL

1.1 SUMMARY

A. This section describes general procedural requirements for coordination and meetings. Requirements include:
   1. Pre-construction meeting;
   2. Construction progress meetings;
   3. Pre-installation meetings.

1.2 COORDINATION AND PROJECT CONDITIONS

A. Coordinate scheduling, submittals, and work of the various portions of the Contract Documents to assure efficient and orderly sequence of installation of interdependent construction elements.

B. Coordinate hours and days of Work with local ordinances and requirements, and with District.

C. Verify utility requirements and that characteristics of operating equipment are compatible with building utilities.
   1. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.

D. Coordinate space requirements, supports, and installation of mechanical and electrical Work which are indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building outside of foundation zone of influence. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

E. In finished areas, except as otherwise indicated, conceal pipes, ducts, and wiring within the construction.
   1. Coordinate locations of fixtures and outlets with finish elements.

F. Coordinate completion and cleanup of Work of separate Divisions in preparation for Substantial Completion.

G. After District occupancy of premises, coordinate access to site for correction of defective work and Work not in accordance with Contract Documents, to minimize disruption of District's activities.

H. Contractor shall coordinate its Work with work to be performed by separate contractors, if any, as listed in Section 01 10 10 – Summary of Work.

1.3 RELATED WORK

A. Reference to Specification sections in "Related Work" articles is for convenience only and shall not be construed to limit the coordination of the Contract Documents to referenced sections.

B. Documents affecting the work of all sections include, but are not limited to, General Conditions, Supplementary Conditions, if any, and Sections in Division 0 and Division 1 of these Specifications.

C. Work in any Specification section may relate to other work in these documents. Contractor is responsible to coordinate all Work.

1.4 DISCREPANCIES

A. In the event of discrepancy in the Contract Documents or if uncovered conditions are not as anticipated, immediately notify District and Architect and secure needed direction.

B. Do not proceed in areas of discrepancy until such discrepancies have been fully resolved.

C. Before starting work, field verify governing dimensions at the site, and examine adjoining work on which this work is dependent. No “Extra” or additional compensation will be allowed on account of differences between actual measurements and dimensions shown, unless raised by RFI prior to proceeding with the Work.

D. Any time extension or any increase or decrease of cost resulting from such changes will be adjusted in the manner provided in the General Conditions.

1.5 EXAMINATION

A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent Work. Beginning new Work means acceptance of existing conditions.

B. Examine and verify specific conditions described in individual Specification sections.

C. Verify that utility services are available, of the correct characteristics, and in the correct location.

1.6 PRECONSTRUCTION MEETING

A. Prior to the start of construction, a conference shall be called by the Owner for the purpose of reviewing the construction program with the Contractor. At this conference, the sequence of work, methods of access to the construction site and temporary facilities shall be reviewed by the Contractor and Owner. Coordination of utilities within the project limits, including relocations and maintenance of existing facilities and additions thereto, shall be confirmed in writing by utility representatives and the Contractor at this conference, or within five (5) working days thereafter.

B. Attendance Required: District, Architect, Construction Manager, Project Inspector, Representatives of testing laboratory (if any), Contractor and major subcontractors and suppliers.

C. Agenda:
1. Execution of Owner-Contractor Agreement.
2. Submission of executed bonds and insurance certificates.
3. Distribution of Contract Documents.
4. Submission of schedule of values.
5. Designation of personnel representing the parties in Contract, and the

Architect/Engineer.

6. Procedures and processing of field decisions, submittals, substitutions, applications for payments, Bid requests, Change Orders, and Contract closeout procedures.
7. Construction Schedule, including critical work sequencing
8. Temporary facilities and use of the site.
9. Record Drawings, operation and maintenance data, warranties.
10. Inspection and Testing.
11. Accepted Alternates.
12. Requirements for Commissioning.
13. Inspection and acceptance of equipment put into service during construction period.
14. Security

D. District will record minutes and distribute copies within five days after meeting to District, Architect, Contractor, and other participants.

1.7 PROGRESS MEETINGS

A. Schedule and administer progress and coordination meetings throughout the length of the Project. Meetings will be held weekly as scheduled by the Construction Manager.

B. Attendance Required: Contractor, Job Superintendent, Project Inspector, Construction Manager and Architect shall attend each meeting. Contractor's subcontractors and suppliers may attend as appropriate to agenda topics for each meeting.

C. Construction Manager will record minutes and distribute copies within five days after meeting to participants, with copies to District, Contractor, Architect and other participants.

D. Contractor shall provide an updated Three Week Look Ahead Schedule for construction progress meetings.

1.8 PRE-INSTALLATION MEETING

A. When required in individual Specification sections and as advisable for other item, Contractor shall convene a pre- installation meeting at the site prior to commencing work of the section.

B. Require attendance of parties directly affecting, or affected by, work of the specific section.

C. Contractor shall prepare agenda and preside at meeting:
1. Review conditions of installation, preparation and installation procedures.
2. Review coordination with related work.

D. Contractor will record minutes and distribute copies within five days after meeting to participants, with copies to District and Architect.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

SECTION 01 13 21 – CONSTRUCTION PROGRESS SCHEDULE

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Definitions

B. Submittals

C. Construction Schedule Requirements

D. Revision and Updating Requirements

E. Review

F. Delay Contingency

G. Contractor's Responsibility for Completion

H. Adjustment of Contractor's Time

I. Preliminary Construction Schedule

1.2 DEFINITIONS

A. Critical Path Method (CPM): A method of planning and scheduling a construction project where activities are arranged based on activity relationships and network calculations to determine when activities can be performed and to determine the critical path construction of the project.

B. Critical Path: The longest continuous chain of activities through the network schedule that establishes the minimum overall project duration.

C. Network Diagram: A graphic diagram of a network schedule, showing the activities and activity relationships.

D. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.
   1. Critical activities are activities on the critical path.
   2. Predecessor activity precedes a given activity.
   3. Successor activity succeeds a given activity.

E. Event: an event is the starting or ending point of an activity.

F. Milestone: A key or critical point in time for reference or measurement.

G. Float: The measure of leeway in activity performance.
   1. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the following activity.
   2. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned project completion date.

3. Float time shall accrue to District's benefit.

H. Baseline Schedule: Contractor's as-planned schedule, to be submitted at the start of the Project.

I. Master Construction Schedule: The schedule prepared by Construction Manager which is a representation and incorporation of Contractor's baseline schedule. The Master Construction Schedule is the schedule by which all schedule revisions, accelerations or delays are measured and compared. The schedule shall be in the form of a CPM schedule network diagram.

J. The Preliminary Construction Schedule indicates planned start and substantial completion intervals for significant phases, hereinafter referred to as "Summary Activities," of the Work during the construction period. Substantial completion of an activity is considered to be attained when the work of subsequent dependent activities can proceed in accordance with the Preliminary Construction Schedule. The Preliminary Construction Schedule also indicates anticipated Mobilization dates for each Division or portion thereof, as well as the planned sequence of activities.

K. Weather Allowance: The Preliminary Construction Schedule and the Master Construction Schedule will include in the overall Contract duration an allowance for normal adverse weather. The winter weather period is defined as October 1st through March 31st, inclusive. District approved weather delays will be applied against the allotment. Once the allotment is exhausted the Contractor will be granted non-compensable time extensions for District approved weather delays as provided in the Contract Documents.

1.3 CONSTRUCTION PROGRESS SCHEDULE REQUIREMENTS.

A. Contractor shall regularly update and utilize a Construction Schedule to plan, coordinate and sequence the Work and to monitor progress toward completion of the Work.
   1. The Contractor shall be responsible for the development and maintenance of these schedules in a manner to ensure meeting the Substantial Completion and Substantial Completion review dates, and the Acceptance (final completion) dates within the Contract Time.
   2. Contractor shall be responsible for planning, sequencing and scheduling the Work and for continuous monitoring of progress of the Work.
   3. Contractor shall establish and maintain as part of the Contractor's services under the Contract, a staff knowledgeable in the use application of the computer-generated CPM progress schedules.

B. Format: Prepare schedules using a computerized construction Scheduling program, with publisher, version and format as directed or acceptable to District. The latest version of MS Project or other version and format, as directed. Contractor may be required to provide District with software for construction scheduling program, if District requires.
   1. Construction Schedule shall provide clear indication of Work completed and intended sequencing and scheduling of Work to be accomplished.
   2. Construction Schedule will provide clear indication of "critical path" of construction progress.
   3. Present schedules suing opaque reproductions on substantial paper, with sheet size a multiple of 8 ½ inches by 11 inches and large enough to clearly read characters.
   4. If directed by District, in addition to printed output, schedules shall be provided to District on computer diskette.

C. Content: The chronological order of the start of each item of Work. Use a Critical Path Method (CPM), time-scaled network diagram showing continuous flow from left to right,

computer generated with a software program as described above. Demonstrate adequate planning for the Work, including a practical plan to complete the Work within the Contract Time.

D. Preliminary Construction Schedule:
1. Within seven (7) days of the Contract start date stated in Agreement, or Notice to Proceed, if issued, Contractor shall prepare and submit a Preliminary Construction Schedule using the specified construction schedule program.
2. The Preliminary Construction Schedule shall be feasible workable and reasonable schedule for all Work under the Contract and it shall be the basis upon which the Contractor shall prepare the Construction Schedule.
3. Within seven (7) days of submission of the Preliminary Construction Schedule, District shall provide review comments to Contractor, including recommended revisions.
4. Within seven (7) days of receipt of District's comments, Contractor shall revise and resubmit the Preliminary Construction Schedule, incorporating necessary revisions.
5. Within seven (7) days of receipt of the resubmitted Preliminary Construction Schedule, District will reject or accept the Preliminary Construction Schedule.

E. Construction Schedule:
1. Within seven (7) days of receipt of notification of acceptance of the Preliminary Construction Schedule by the District, Contractor shall prepare and submit the Construction Schedule.
    1) The Construction Schedule shall be Contractor's plan of construction and will, thereafter, be used to monitor progress of Work of the Contract.
    2) Contractor shall develop, revise and update the Construction Schedule during progress of the Work and shall submit update schedules on a weekly basis.
    3) At construction progress meetings, specified in Section 01 13 12, Contractor shall present a three-week "look ahead schedule" as directed by District.
2. The District will use the most recent version of the Construction Schedule in evaluating the progress of Work and determining progress payments to be made to Contractor. The Construction Schedule, as revised, will be the basis for determining the impact of changes to Contract and delays.
3. Failure of the Construction Schedule to include any element of the Work required by the Contract, or any inaccuracy in the Construction Schedule, will not relieve Contractor from responsibility for accomplishing all Work required by the Contract Documents within the Contract Time and will not constitute grounds for delay in completion of the Work.
4. It shall be the responsibility of the Contractor to verify with all authorities having jurisdiction all holidays for each calendar year. No Work requiring inspection shall be scheduled on these dates.
5. If, after acceptance of the Construction Schedule by District, changes to the schedule are caused by changes in the scope of Work only, Contractor shall submit requested revisions to the District along with a written rationale for revisions including a description of the logic for rescheduling the Work and methods of maintaining adherence to Contract completion dates.
6. Format for requested revisions shall be consistent with the Construction Schedule and shall be as acceptable to District.

F. Recovery Plan:
1. If Contractor is behind schedule by more than seven (7) calendar days for any activity that is, or becomes, part of the critical path, based on the Construction Schedule, Contractor shall submit to the District within seven (7) calendar days of being notified of such delay, a "recovery plan."
    1) Recovery plan shall be based on proposed revisions to construction activities of Window Schedule for the next 60 calendar day period and shall show how

Contractor intends to bring work back on schedule.

2) Recovery plan shall also include a written description of the measures that Contractor intends to take without change in the Contract Price or Contract Time to regain schedule compliance.

2. Should Contractor fail to submit and execute such recovery plan, District shall have the option to direct Contractor to employ any or all measures that District may deem fit to regain schedule compliance or to mitigate schedule impact, without change in Contract Time and Contract Price.
3. Should Contractor dispute the determination of the District regarding the status of progress of the Work, such dispute shall not relieve the Contractor of the responsibilities to comply with the requirements of this Section and other related Sections until the dispute is resolved in accordance with the provisions of the Conditions of the Contract and the Agreement.

G. Default: Failure of Contractor to substantially comply with the requirements of this Section will constitute evidence that Contractor is failing to prosecute the Work with such diligence as to ensure completion of the Work within the Contract time and will be considered grounds for termination or other remedy by the District pursuant to provisions of the Conditions of the Contract and the Agreement.

H. Coordination:
1. Construction schedule shall be cost loaded. Coordinate format with Schedule of Values so construction progress can be correlated with Applications for Payment.
2. Coordinate format and content of Construction Schedule with Submittals Schedule, specified in Article below.

1.4 SUBMITTALS SCHEDULE

A. Format: Prepare Submittals Schedule in format comparable to Construction Progress Schedule, specified in Article above.

B. Content: List all items specified to be submitted, indicating submittal number (see instructions specified in Section 01330, Submittal Procedure), submittal type (i.e. product data, shop drawings, sample, quality control report, maintenance and operating data, Contract Closeout Data, etc.), scheduled date for submittal to be made and date review should be complete in order to maintain construction on schedule.

C. Administration: Review of Submittals Schedules by District's Representative and District will be to ascertain the general status of submittals review and shall not be interpreted to establish or approve the means, methods, techniques and sequences of construction.
1. Submit two (2) copies to Construction Manager
2. Submit initial Submittals Schedule within fourteen (14) days of construction start date established in Notice to Proceed.
3. After review, resubmit Submittals Schedule within ten (10) days and thereafter submit updated Submittals Schedules at each Construction Progress Meeting.

1.5 REVIEWS DISTRICT'S REPRESENTATIVE AND DISTRICT

A. Reviews by District's Representative and District: Review by District's Representative and District will be to ascertain the general status of construction and shall not be interpreted to establish or approve the means, methods, techniques and sequences of construction.

1.6 REVIEW BY CONTRACTOR

A. Reviews by Contractor: All schedules shall be reviewed and approved by Contractor prior to

submission for review by District and District's Representative.

B. Changes and Deviations: Identify all deviations from requirements of Drawings and Specifications.
   1. No review action, implicit or explicit shall be interpreted to authorize changes in the Work.
   2. Changes shall only be authorized by separate written Change Order, Construction Change Document or Construction Change Directive in accordance with the Conditions of the Contract.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION 01 13 21

SECTION 01 13 22 – CONSTRUCTION PROGRESS REPORTS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Construction Progress Reports

1.2 RELATED DOCUMENTS AND SECTIONS

A. Section 01 13 12: Project Meetings - Review of construction progress and submittals status at Project meetings.

B. Section 01 13 21: Construction Progress Schedules - Construction Progress Schedule and Submittals Schedule.

1.3 CONSTRUCTION PROGRESS REPORTS

A. Daily Log: Contractor shall maintain a written daily log at the job site with the following information as a minimum:
   1. Date.
   2. Weather Conditions.
   3. Subcontractors and trades performing work under the Agreement on the Site, and number of workers each and number of hours worked by each worker.
   4. Others on Site performing work for District and under separate contracts.
   5. List of visitors to site, giving name, company or agency affiliation and telephone number.
   6. Descriptions of situations and circumstances which could delay normal progress of Work or which could be basis of claim for change in Contract Time or Contract Price.
   7. Changes to Work and who authorized changes.
   8. Comments, as Contractor determines are appropriate for Project record.
   9. Detailed description of all work in progress, itemized by building.

B. Submission of logs: Submit one copy of daily logs to Construction Manager at weekly intervals.

C. Contractor shall issue all Subcontractors' Daily Logs from the previous workday to the Project Inspector and Project Manager each morning at the start of the workday.

END OF SECTION 01 13 22

SECTION 01 13 30 – SUBMITTALS PROCEDURES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Administrative procedures f or shop drawings, product data and samples submittals.

B. Contractor's review of submittals.

C. Architect's and/or District's review of submittals.

D. Distribution of submittals after review.

1.2 RELATED DOCUMENTS AND SECTIONS

A. Section 01 12 90: Measurement and Payment Procedure - Supporting Data.

B. Section 01 13 12: Project Meetings - Submittal status review at meetings.

C. Section 01 14 00: Quality Control - Test and inspection reports.

D. Section 01 17 00: Contract Closeout Procedures – Submittals for Occupancy, Acceptance and Final Payment.

E. Section 01 17 83: Operation and Maintenance Data - Requirements for preparation and submission of operation and maintenance data.

1.3 DEFINITIONS

A. Shop Drawings, Product Data and Samples: Instruments prepared and submitted by Contractor, for Contractor's benefit, to communicate to Architect the Contractor's understanding of the design intent, for review and comment by Architect on the conformance of the submitted information to requirements of the Contract Documents. Shop Drawings, products data and samples are not Contract Documents.

B. Shop Drawings: Drawings, diagrams, schedules and illustrations, with related notes, specially prepared for the Work of the Contract, to illustrate a portion of the Work.

C. Product Data: Standard published information ("catalog cuts") and specially prepared data for the Work of the Contract, including standard illustrations, schedules, brochures, diagrams, performance charts, instructions and other information to illustrate a portion of the Work.

D. Samples: Physical examples that demonstrate the materials, finishes, features, workmanship and other characteristics of a portion of the Work. Accepted samples shall serve as quality basis for evaluating the Work.

E. Other Submittals: Technical data, test reports, calculations, surveys, certifications, special warranties and guarantees, operation and maintenance data, extra stock and other submitted information and products shall not be considered to be Contract Documents but shall be information from Contractor to Architect to illustrate a portion of the Work, for confirmation of understanding of requirements of the Contract Documents.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Administrative Requirements for Submittals: Submittals shall be made in accordance with requirements specified herein and in product Sections of the Specifications. All Submittals shall be made using the Submittal Transmittal Form.

B. Transmission of Submittals: Transmit all submittals with a Submittal Transmittal to Architect, through the Construction/Project Manager. Include all information specified for identification of submittal and for monitoring of review process.

C. Timing of Submittals: Make submittals sufficiently in advance of construction activities to allow shipping, handling and review by the Architect, and other responsible design professionals.

D. Submittals Identification:
   1. Title each submittal with Project name, District's Project number, DSA Application and File numbers, Building Permit number, Architect's Project number, Contractor's Project number and submission date.
   2. Identify each element on submittal by reference to Drawing sheet number, detail, schedule, room number, assembly or equipment number, Specifications article and paragraph, and other pertinent information to clearly correlate submittal with Contract Drawings.
   3. Identify each submittal by a sequential file number.

E. Record Submittals: When record submittals are specified, submit three copies or sets only. Record submittals will not be reviewed but will be retained for historical and maintenance purposes.

1.5 SUBMITTALS SCHEDULE

A. Submittals Schedule: As specified in Section 01 13 21, Construction Progress Schedules and Article 45 of the General Conditions.

1.6 CONTRACTOR'S REVIEW OF SUBMITTALS

A. Contractor's review of submittals: Prior to submission to Architect for review, Contractor shall review each submittal for completeness and conformance to requirements of the Contract Documents. By approving and submitting shop drawings the Contractor represents that he has determined and verified materials, field measurements, and field construction related criteria and that he has checked and coordinated the information contained with such submittals with the requirements of the Work and the Contract Documents.

B. Changes in Work: Changes in the Work shall not be authorized by submittals review actions. No review action, implicit or explicit, shall be interpreted to be an authorized change in the Work.

1.7 ARCHITECT'S REVIEW OF SUBMITTALS

A. Architect's review of submittals: Submittals shall be a communication aid between Contractor and Architect by which interpretation of requirements of the Contract Documents may be confirmed in advance of construction.
   1. Reviews by Architect and Architect's consultants shall be only for general conformance with the design concept of the Project and general compliance with the information given in the Contract Drawings and Specifications.

2. Architect will review submittals as originally submitted. Contractor will revise and resubmit, as required, indicating changes made since previous submittal.

1.8 PRODUCT DATA SUBMITTALS

A. Product Data: Illustrations, standard details, standard schedules, performance charts, material characteristics, color and pattern selections, test data and listing by Code authorities and nationally recognized testing and inspection services.

B. Modifications to Standard Product Data: Modify manufacturer's standard catalog data to indicate precise conditions of the Project. Comply with requirements as for shop drawings following. Provide space for review action stamps and, if required by authorities having jurisdiction, license and seal of Architect, Architect's design consultant and other responsible design professional, as applicable.

C. Copies: Submit six (6) copies, minimum, of original catalog pages or xerographic copies only, with applicable data highlighted and cross referenced to requirements of the Contract Drawings and Contract Specifications.

1.9 SHOP DRAWINGS SUBMITTALS

A. Shop Drawings: Drawings, diagrams, schedules and other graphic depictions to illustrate fabrication and installation of a portion of the Work.
   1. Preparation: Shop drawings shall be original drawings prepared for submittal review, fabrication and execution of Work. Direct copies and modified reproductions of Contract Drawings will not be accepted for review. Provide space for review action stamps and, if required by governing authorities having jurisdiction, license and seal of Architect, Architect's design consultant, and other responsible design professional, as applicable.

B. Coordination: Show all field dimensions and relationships to adjacent or critical features of Work.

C. Copies: Prepare shop drawings on minimum sheet size of 17 inches by 22 inches, or smaller if a multiple of 8-1/2 inches by 11 inches.
   1. Submit one reproducible and five prints, typically, except as noted in Contract Specifications.
   2. The reproducible will be returned to Contractor. The prints will not be returned.

D. Resubmission of Shop Drawings: Should resubmission of shop drawings be required, comply with the following:
   1. Revise shop drawings as necessary and resubmit as required for initial submission.
   2. Indicate on shop drawings all revisions including revisions other than those required for compliance with review comments.
   3. The reproducible will be returned to Contractor. The print will not be returned.

1.10 SAMPLES SUBMITTALS

A. Quantity: Submit minimum of four (4) samples of each color, texture and pattern. Submit one item only of actual assembly or product. Unless otherwise noted, full-size and complete samples will be returned and may be incorporated into field mock-ups and the Work.

B. Color Samples: Architect will review and select colors only after color samples for all related products are received, so that colors may be properly coordinated.

C. Copies: Submit actual samples. Photographic or printed reproductions will not be accepted.
   1. Resubmission of Samples: Should resubmission of samples submittal be required, comply with the following:
      1) Revise or reconstruct sample as necessary and resubmit as required for initial submission.
      2) Indicate with resubmitted sample all revisions, including revisions other than those required for compliance and review comments.

1.11 REPORTS OF RESULTS OF INSPECTIONS AND TESTS

A. Reports of Results of Inspections and Tests: Submit technical data, test reports, calculations, surveys and certifications based on field tests and inspections by independent inspection and testing agency and by authorities having jurisdiction. Reports of results of inspections and test shall not be considered Contract Documents.

1.12 OPERATION AND MAINTENANCE DATA SUBMITTALS

A. Operation and Maintenance Data Submittals: Refer to requirements specified in Section 01 17 83 — Operation and Maintenance Data. Include operation and maintenance data submittals in Submittals Schedule above.

1.13 DISTRIBUTION OF SUBMITTALS AFTER REVIEW

A. Distribution of Submittals after Review: Distribution of reviewed product data, shop drawings and samples will be made by Architect with reasonable promptness to not delay the Work.

END OF SECTION 01 13 30

SECTION 01 14 00 – QUALITY CONTROL

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Regulatory Requirements

B. Workmanship

C. Observation and Supervision

D. Testing Agencies

E. Tests and Inspections

1.2 RELATED DOCUMENTS AND SECTIONS

A. Section 01 13 11: Project Coordination - Coordination of Work under Contract

B. Section 01 13 30: Submittal Procedures - Administrative requirements for submission of results of test and inspections.

C. Section 01 16 00: Product Requirements - Product options and substitutions

1.3 REGULATORY REQUIREMENTS

A. The Work is governed by requirements of Title 21 and Title 24, California Code of Regulations (CCR), and the Contractor shall keep a copy of each available at the job site for ready reference during construction.

B. The Office of Regulation Services (ORS) shall be notified on start of construction.

1.4 OBSERVATION AND SUPERVISION

A. The Architect/Engineer and the Project Manager or their appointed representatives will review the Work and the Contractor shall provide facilities and access to the Work at all times as required to facilitate this review. Administration by the Architect/Engineer and the consulting Structural Engineer will be in accordance with Part 1, Title 24, Section 4-341.

B. One or more inspectors approved by DSA and employed by the District, referred to hereinafter as the “Inspector” or “Project Inspector”, will observe the work full-time in accordance with Part 1, Title 24, Sections 4-333(b) and 4-342.
   1. The Inspector shall have access to the Work wherever it is in preparation or progress for ascertaining that work is in accordance with the Contract Documents. The Contractor shall provide facilities and access as required and shall provide assistance for sampling or measuring materials.
   2. The Inspector will notify the Project Manager and Architect/Engineer and call to the attention of the Contractor any observed failure of work or material to conform to Contract Documents.
   3. The Inspector shall observe and monitor all testing and inspection activities required.

C. The Contractor shall conform to Part 1, Title 24, Section 4-343. The Contractor shall supervise and direct the Work and maintain a competent Project Superintendent on the job who is authorized to act in all matters pertaining to the Work.The Contractor's Project Superintendent shall also inspect all materials, as they arrive, for compliance with the Contract Documents. They shall reject defective work or materials immediately upon performance or delivery. The Contractor shall submit verified reports as required by Part 1, Title 24, Section 4-336.

D. The Contractor shall inspect all material upon delivery and reject any material or equipment not in compliance with the Contract Documents. All materials and equipment shall be neatly stacked and properly protected from the weather.

E. Any material or equipment rejected by the Project Manager, Inspector, and Architect because on non-compliance with the Contract Documents shall promptly be removed from the site at the expense of the contractor.

1.5 TESTING AGENCIES

A. Testing agencies and tests shall be in conformance with requirements of Part 1, Title 24, Section 4-335.

B. Testing and inspection in connection with earthwork shall be under the direction of the District's consulting soils engineer, referred to hereinafter as the "Soils Engineer."

C. Testing and inspection of construction materials and workmanship shall be performed by a qualified laboratory, referred to hereinafter as the "Testing Laboratory." The Testing Laboratory shall be under direction of a civil engineer registered in the State of California, shall conform to requirements of ASTM E329, and shall be employed by the District.

1.6 TESTS AND INSPECTIONS

A. Tests and inspections will comply with California Code of Regulations Title 21, Chapter 4 and Section 42, and Title 24, Chapter 4, Part I. All work shall be under the observation of the Inspector. Contractor shall establish a protocol for requesting inspection with Inspector so as to not delay the Work and provide adequate time for the Inspector to perform inspection. If such a protocol is not established ahead of time, Inspector may utilize the time criteria set by Title 24 of 48 hours in advance of submitting form DSA 156 for each new area. The Inspector shall have free access to any or all parts of the work at any time. The Contractor shall furnish the Inspector such information as may be necessary to keep the Inspector fully informed regarding progress and manner of work and character of materials. Such observations shall not, in any way, relieve the Contractor from responsibility for full compliance with all terms and conditions of the Contract, or be construed to lessen to any degree the Contractor's responsibility for providing efficient and capable superintendence. The Inspector is not authorized to make changes in the Drawings or Specifications nor shall the Inspector's approval of the work and methods relieve the Contractor of responsibility for the correction of subsequently discovered defects, or from its obligation to comply with the Contract Documents.

B. The Contractor shall provide access to Work to be tested and furnish incidental labor, equipment and facilities to facilitate all inspections and tests

C. The District will pay for first inspections and tests required by California Code of Regulations Title 24, and others, which the Architect or the Project Manager may direct to have made including, but not limited to, the following principal items:
   1. Tests and observations for earthwork and paving.
   2. Tests for concrete mix designs, including tests of trial batches.
   3. Tests and inspections for masonry work.
   4. Tests and inspections for structural steel work.
   5. Field tests for framing lumber moisture content.
   6. Additional tests directed by the Project Manager, which establish that materials and installation comply with the Contract Documents.
   7. Test and observation of welding and expansion anchors and glue-lam beams.

D. Inspector shall electronically post DSA required documents on the DSA electronic posting website. It is the Contractor's responsibility to determine the status of posting and determine if all the criteria for sign off of a category of work on the Project Inspection Card (Form DSA 152) as defined more thoroughly in the most current version of the DSA 152 manual posted on the DSA website. Inspector may collaborate with Contractor about approval of areas that may be constructed and approved incrementally under the DSA 152 card pursuant to the guidelines of PR-13. Inspector shall work with Contractor to present incremental approval proposals to DSA.

E. The Inspector shall have the authority to reject work whenever provisions of the Contract Documents are not being complied with, and Contractor shall instruct its subcontractors and employees accordingly. In addition, the Inspector may stop any work that poses a probable risk of harm to persons or property. The Contractor shall instruct its employees, subcontractors, material and equipment suppliers, etc., accordingly. The absence of any Stop Work Order or rejection of any portion of the work shall not relieve the Contractor from any of its obligations pursuant to the Contract Documents.

F. The District will provide inspection and testing at its cost during the normal eight (8) hour day Monday through Friday (except holidays). Work by the Contractor outside of the normal eight (8) hour day shall constitute an authorization from the Contractor to the District to provide inspection and testing as required outside of the normal eight (8) hour day. Contractor shall provide adequate time for inspections so as to not delay the Work. If the Contractor is behind schedule, it is incumbent on the Contractor to provide advance forecast through look ahead of the anticipated date for inspection so the Inspector may plan their activities so as to not delay the Project. Contractor shall reimburse District for any additional costs associated with inspection and testing (including re-inspection and re-testing) outside the normal eight-hour day and for any retests caused by the Contractor.

G. It is the Contractor's responsibility to request special inspections with sufficient time so all testing may be timely completed and posted so work may proceed and the Inspector's signature is attached to the Project Inspection Card (Form 152). Specifically, timely request for special inspection under the DSA Verified Report Forms 291 (laboratory), DSA Verified Report Form 292 (Special Inspection), and DSA Verified Report 293 (geotechnical) since DSA requirements under PR 13-01 specifically gives the Special Inspections 14 days to post to the DSA website.

H. If Contractor has a Subcontractor or supplier that requires in plant or special inspections, inspections or tests that are out of the country, out of the state or a distance of more than 200 miles from the Project site, the District shall provide the Special Inspector or individual performing tests time for inspection and testing during normal work hours. Contractor, however, is responsible for the cost of travel, housing, food, out of area premiums that may be in the Inspector/Testing Agreement with District, or other expenses necessary to ensure proper inspection, special inspection or testing is provided by a DSA Certified Inspector,

Special Inspector, or individual performing tests. In some cases, all three (DSA Inspector, Special Inspector, and Tester) may be required. In addition, if the DSA Certified Inspector, Special Inspector, or individual performing test has contractual travel clauses or special rates for out-of-town inspection, Contractor is responsible for all costs associated with the contractual travel costs in addition to all other costs. Arrangements for inspection and/or testing shall be made far enough in advance so as to not delay the work.

I. DSA may issue a Stop Work Order, or an Order to Comply, when either (1) the work proceeds without DSA approval; (2) the work proceeds without a DSA Inspector or (3) where DSA determines that the work is not being performed in accordance with applicable rules and regulations, and would compromise the structural integrity of the Project or would endanger lives. If a Stop Work Order is issued, the work in the affected area shall cease until DSA withdraws the Stop Work Order. Pursuant to Education Code section 17307.5(b), the District shall not be held liable in any action filed against the District for any delays caused by compliance with the Stop Work Order, except to the extent that an error or omission by the District is the basis for the issuance of the Stop Work Order. Examples of Stop Work Orders that may be issued by DSA include DSA Bulletin 07-04 and Policy 10-01, the installation of automatic fire sprinkler systems without approved Plans, covering work that has not been approved by Inspector on DSA Project Inspection Card (Form 152).

J. Contractor deviation or changes from approved Plans and Specifications may result in the issuance of a Notice of Non-Compliance (See DSA Form 154). Contractor is specifically notified that deviations from the Plans and Specifications, whether major or minor, may result in the requirement to obtain a DSA Construction Change Document (“CCD”) to correct the Notice of Non-Compliance. In some cases, the lack of a DSA approved CCD AND verification from the Inspector that a Notice of Non-Compliance has been corrected may result in a critical path delay to the next stage of work on the Project. Specifically, a deviation from approved Plans and Specifications may prevent approval of the category of work listed in the DSA 152 Project Inspection Card. Any delays that are caused by the Contractor’s deviation from approved Plans and Specifications shall be the Contractor’s responsibility.

K. Where such inspection and testing are to be conducted by an independent laboratory or agency, such materials or samples of materials to be tested shall be selected by such laboratory or agency, or District’s representative, and not by Contractor.

L. Contractor shall notify District, a sufficient time in advance, of manufacture of materials to be supplied by Contractor under Contract, which must by terms of the Contract be tested, in order that District may arrange for testing of same at source of supply. Any materials shipped by Contractor from source of supply prior to having satisfactorily passed such testing and inspection, or prior to receipt of notice from said representative that such testing and inspection will not be required, shall not be incorporated in work without prior approval of District and subsequent testing and inspection.

M. Work shall not be covered without the Inspector's review and the Architect's knowledge that the work conforms to the requirements of the approved Plans and Specifications. Inspector must be timely notified of inspections and of new areas so work can be inspected at least 48 hours before opening a new area (For example, see DSA Form 156 for Commencement/Completion of Work Notification which requires “at least 48 hours” advance notification of a new area). An Inspector must comply with DSA protocols for signing each category or phase of work under DSA Form 152 (in compliance with the Form 152 Manual) or a Notice of Deviation (DSA Form 154) will be issued requiring the work that was not inspected be uncovered for inspection. Thus, if a portion of the work is covered without inspection or Architect approval, is subject to a Notice of Non-Compliance for being undertaken without inspection, or otherwise not in compliance with the Contract Documents,

after issuance of a Written Notice of Non-Compliance (Form 154) or a written notice to uncover work, Contractor shall promptly uncover all work (which includes furnishing all necessary facilities, labor, and material) for the Inspector's or the Architect's observation and be replaced at the Contractor's expense without change in the Contract Price or Time.

N. If a portion of the Work has been covered is believed to be Non-Conforming to the Plans and Specifications, even if the Form 152 for the category of work has been signed by the Inspector, the Inspector or the Architect may request to see such work, and it shall be promptly uncovered by the Contractor. If such work is in accordance with the Contract Documents, costs of uncover and replacement shall, by appropriate Change Order and shall, be charged to the District. If such work is not in accordance with Contract Documents, the Contractor shall be responsible for all costs to uncover the work, delays incurred to uncover the work, and Contractor shall pay all costs to correct the incorrectly construction condition unless the condition was caused by the District or a separate contractor, in which event the District shall be responsible for payment of such costs to the Contractor.

O. The District will pay costs for all tests and inspections and shall be reimbursed by the Contractor for such costs under the following conditions:
   1. When such costs are stipulated in the provisions of the Contract documents to be borne by the Contractor;
   2. When a material is tested or inspected and fails to meet the requirements of the specifications and/or drawings;
   3. When the source of the material is changed after the original test or inspection has been made and approved.

P. If, in the opinion of the District, subsequent delivery of a tested material seems inferior to, or differs from, the original, said material shall be retested upon written order from the District and, should the material fail to meet the requirements of the Specifications and/or Drawings, the Contractor shall pay all costs of such tests, but where the material does pass the requirements, the District will pay the cost.

Q. All tests and inspections specified for each material shall be made in accordance with the detailed Specifications for tests or inspections of the material as specified.

R. If a material is not required to be tested, the District may require the Contractor to furnish a certificate bearing the official and legal signature of the supplier, with each delivery of such material, stating that the material complies with the Specifications.

S. The District will pay and back charge the Contractor for:
   1. Retests or re-inspections, if required, and tests or inspections required due to Contractor error or lack of required identifications of material.
   2. Uncovering of work in accordance with paragraph 7, Inspection of Work and Materials of the General Conditions.
   3. Testing done on weekends, holidays, overtime will be chargeable to the Contractor.
   4. Testing and inspection required by the Contract at locations outside the immediate area that involves airfare, hotel, meals and miscellaneous expenses.

T. Testing and inspection reports and certifications.
   1. A copy of the agency or laboratory report of each test or inspection or certification shall be provided to each of the following:
      1) The District
      2) The Project Manager
      3) The Architect
      4) The Consulting Engineer
      5) The Inspector

6) The Contractor

2. When the test or inspection is one required by CCR Title 24, a copy of the report shall also be provided to the Office of Regulation Services.

1.7 REQUEST FOR INSPECTION

A. Contractor shall establish a protocol for requesting inspection with Inspector so as to not delay the work and provide adequate time for the Inspector to perform inspection. If such a protocol is not established ahead of time, Inspector may utilize the time criteria set by Title 24 of 48 hours in advance of submitting form DSA 156 for each new area. DSA requirements under PR 13-01 specifically give the Special Inspector fourteen (14) days to post to the DSA website. Contractor is responsible for delays and for failure to plan.

B. For some Projects, there may be a need to incrementally install certain assemblies. It is up to Contractor to identify areas and assemblies that may be constructed incrementally. Contractor must identify and establish incremental areas of construction and establish protocols with Inspector for DSA 152 approvals so they may be presented to DSA. See PR-13-01 for further discussion.

PART 2

2.1 TYPE OF TEST AND INSPECTIONS

A. Earthwork observation of all excavations and engineering control of all fills and backfills by Geotechnical Engineer. The Geotechnical Engineer shall submit a final report stating that all work was performed in accordance with the Contract Documents and Foundation Investigation Reports.

B. Cement Tests: Samples by Laboratory to be tested as required by Title 24, Section 1903 A.2 and 1928 A.1.

C. Aggregate Tests As required by Title 24, Section 1903 A.3.

D. Concrete Mix Design As required by Title 24, 1905 A.3.1.1 Method B for stone aggregate concrete.

E. Reinforcement Tests Tensile and bending as required by Title 24, Section 1903 A.5.3 and 1928 A.2.

F. Slump Test UBC STD. 19-7

G. Batch Plant Inspection: Testing agency shall inspect batching facilities and transit equipment for compliance with the requirements of Section 1928 A.5 and has been certified to comply with the requirements of the National Ready Mixed Concrete Association.
1. Testing agency shall receive and review said certificates upon delivery of batches at site, and deliver complete file of same to Architect upon completion of work.

H. Concrete Testing: Testing agency shall test concrete used in the work per the following paragraphs:
1. Compressive Strength:
1) Minimum number of tests required: One (1) set of four (4) cylinders for each 50 cubic yards (Sec. 2-2604(h) (1) of concrete or major fraction thereof, placed in one (1) day. See Title 24, Section 2605(g).
2) One cylinder of each set shall be tested at seven (7) days and two

(2) cylinders at twenty-eight (28) days. One (1) cylinder shall be held in reserve and tested only when directed by the Architect or Project Manager.

3) Concrete shall test the minimum ultimate compressive strength in 28 days, as specified on the structural drawings. In the event that the seven (7) day tests indicate the twenty-eight (28) day test will fall below specified strength, the proportioning of concrete shall be changed by the Contractor and submitted to the Project Manager for review by the Architect/Engineer before subsequent pours.
4) In the event that the twenty-eight (28) day test falls below the minimum specified strength, the effective concrete in place shall be tested by taking cores in accordance with ASTM C42 and tested as required for cylinders.
5) In the event that the test on core specimens falls below the minimum specified strength, the concrete will be deemed defective and shall be removed and replaced upon such direction of the Architect, and in a manner acceptable to the Division of State Architect

I. Structural Steel Per Title 24 and as noted:
1. Material: Steel in Title 24, Section 2202 A.2 and 2212 A.1.
2. Qualification of Welders (Title 24 Std., Section 2209A and 2212 A.5)
3. Shop fabrication (Section 2212A.4 Structural steel only)
4. Shop and field welding (Section 2212A.5)

J. Glue-laminated Lumber:
1. Inspect fabrication and installation as required by Title 24, Section 2327A

K. Plywood Web Joists
1. TRUS JOIST (TJI) member fabrication is to be continuously inspected by a fabrication inspector especially approved for that purpose by the Office of Regulation Services.
2. To be eligible for approval the fabrication inspector shall be examined as to their knowledge and experience in glued construction.
3. Each TJI member shall be stamped with an identifying mark. The fabrication inspector shall make a verified report identifying the members by mark and including pertinent data such as certification of flange material and species, type of glue and other information as may be required. The fabrication inspector's verified report shall show, of their own personal knowledge, the work covered by the report has been performed and materials used in every member in accordance with, and in conformity to, the Office of Regulation Service's approved plans and specifications. The verified report shall be mailed to the Office of Regulation Services upon completion of fabrication.
MICRO=LAM flange material is to be stamped, independent agency certified and visually checked for voids, slip sheets, stacked knots and double laps. Defects as noted shall be cause for rejection. Tests on the material are to be performed at the TJI plant a minimum to two (2) times per shift to:
1) Verify species.
2) Establish M.O.R.
3) The sample is to be third point loaded in a flat wise simple span bend test over a 21 X t span where "t" is the thinness of the MICRO=LAM and width of the specimen is the width of flange material being used for TJI fabrication. Calculated M.O.R.'s shall show a minimum of 7,500 psi.
4) Verify glue bond adequacy by a chisel test on each glue line of a specimen three (3) inches long of the chord material being used with an 80% minimum wood failure.
5) Test results are to be included with the above-mentioned verified report.

4. Every tenth bundle of plywood for webs of the TJI shall be especially checked for grade, squareness and thickness per standards on file at the Office of Regulation Services. A specimen at the top, near the middle and near the bottom of the bundle shall be checked. Plywood webs shall be checked for squareness and width after each change in saw setting and at least once every four hours by measuring five specimens across the width at three points and diagonals, and visually checks on the long edge for curvature.
5. The fabrication Inspector shall continuously check the assembly process to assure proper open time, glue spread and glue tackiness for the butt joint as well as visual check for quality of the plywood edge. They shall check the glue in the rout for placement of the bead and for glue squeeze out. They shall verify push up and alignment of the webs to assure a tight joint. The fabrication Inspector shall check the finished product for full web flange joint penetration, joist depth and straightness.
6. Three test specimens of the finished product shall be randomly selected throughout a shift and tested as follows:
   The specimen shall be eight feet long and contain a butt joint one foot from one end of the sample. The mill supplying the plywood in the specimen shall be recorded. It shall be cured with the production run and tested approximately one hour after removal from the oven. It shall be tested by applying a concentrated load at midspan through a six-inch-long plate.

   If the specimen fails at a center span loading less than:

Minimum TJI/35 Depth	Center Span Loading
10	3310
12	4048
14	4784
16	5510
18	6232
20	6598

END OF SECTION 01 14 00

SECTION 01 15 00 – TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Codes and regulation governing construction facilities and practices

B. Maintenance of construction facilities and temporary controls

C. Temporary utilities and services

D. Heating and cooling during construction

E. Ventilation during construction

F. Temporary water service

G. Temporary sanitary facilities

H. Temporary power and lighting

I. Temporary telephone service

J. Temporary construction barriers, enclosures and passageways

K. Protection of completed Work

L. Security

M. Fire protection

N. Protection of installed Work

O. Runoff control

P. Cleaning during construction

Q. Field offices and sheds

R. Construction parking

S. Vehicular Traffic on occupied campuses

T. Alarm, Communication and Bell Passing Systems

U. Removal of construction facilities and temporary controls

1.2 RELATED DOCUMENTS AND SECTIONS:

A. Section 01 10 10: Summary of the Project.

B. Section 01 17 10: Cleaning Requirements

1.3 CODES AND REGULATIONS

A. Fire Regulations: Comply with requirements of fire authorities having jurisdiction, including California Fire Code (CFC) Article 87 during performance of the Work.

B. Safety Regulations: Comply with requirements of all applicable Federal, State and local safety rules and regulations. Contractor shall be solely responsible for jobsite safety.

C. Barricades and Barriers: As required by governing authorities having jurisdiction, provide substantial barriers, guardrails and enclosures around Work areas and adjacent to embankments and excavations for protection of workers and the public.

D. Noise Abatement Regulations: Comply with requirements of noise abatement regulations, such as use of mufflers on powered equipment and scheduling of construction activities to permitted hours only.

1.4 PROTECTION OF EXISTING CONDITIONS

A. Protection of Adjacent Property: Contractor shall restrict Work to limits indicated on the Drawings and as specified in Section 01 10 10 — Summary of Work. Protect existing adjacent properties from damage, including soiling and debris accumulation.

1.5 MAINTENANCE OF CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

A. Maintenance: Use all means necessary to maintain construction facilities and temporary controls in proper and safe condition throughout progress of the Work.

B. Replacement: In the event of loss or damage, promptly restore temporary construction facilities and controls by repair or replacement at no charge in the Contract Price or Contract Time.

1.6 TEMPORARY UTILITIES AND SERVICES

A. Temporary Utilities and Services, General: All utilities and other services necessary for proper performance of the Work shall be provided by Contractor, unless specifically noted otherwise. Temporary utilities and services shall conform to all applicable requirements of authorities having jurisdiction and serving utility companies and agencies, including the following:
   1. NFPA Document 241 — Building Construction and Demolition Activities
   2. ANSI A10 Series — Safety Requirements for Construction and Demolition
   3. NECA Electrical Design Library — Temporary Electrical Facilities

B. Temporary Connections and Fees: Contractor shall arrange for services and pay for all fees and service charges for temporary power, water, sewer, gas and other utility services necessary for the Work.

C. Permanent Connections and Fees: Contractor shall arrange for utility agencies and companies to make permanent connections. District will arrange for permanent utility account and pay permanent connection fees. After Substantial Completion review and determination that Work is acceptable, District will pay utility service charges for services delivered through permanent connections, for normal quantities.

1.7 HEATING AND COOLING

A. Temporary Heating and Cooling: Provide and pay for temporary heating and cooling devices, fuel and related service charges to provide ambient temperatures as required to maintain specified conditions for construction operations.

B. Use of Permanent Heating and Cooling Systems: Permanent heating and cooling equipment may be used after completion, testing and inspection of systems and approval of code authorities having jurisdiction.
   1. Prior to operation of permanent heating equipment for temporary heating purposes, verify that installation is approved for operation, equipment is lubricated and filters are in place.
   2. Contractor shall provide and pay for operation, maintenance and regular replacement of filters and worn or consumed parts.
   3. Immediately prior to Substantial Completion review, change disposable filters and clean permanent filters of equipment used during construction.

C. Temperature Criteria: Maintain minimum ambient temperature of minimum of 50 degrees F and maximum of 80 degrees F in areas where construction is in progress, unless otherwise specified.

1.8 VENTILATION DURING CONSTRUCTION

A. Ventilation during Construction: Provide and pay for temporary ventilation devices, energy and related service charges.

B. Use of Permanent Ventilation Systems: Permanent ventilation equipment may be used after completion, testing and inspection of systems and approval by District and authorities having jurisdiction.
   1. Prior to operation of permanent ventilation equipment for ventilation purposes during construction, verify that equipment is lubricated and filters are in place.
   2. Contractor shall provide and pay for maintenance and regular replacement of filters and worn or consumed parts of permanent ventilation system used for ventilation during construction.
   3. Immediately prior to Substantial Completion, review change disposable filters and clean permanent filters of equipment used during construction.

C. Ventilation Criteria: Ventilate enclosed areas to assist cure of materials, to dissipate humidity and to prevent accumulation of dust, fumes, vapor and gases.

1.9 TEMPORARY WATER SERVICE

A. Temporary Water Service: Arrangements for temporary water service during construction, including permit, shall be made by Contractor directly with the serving water utility.
   1. Locate and connect to existing water service during construction, including permit, shall be made by Contractor directly with the serving water utility.
   2. Extend branch piping with outlets located so that water is available by use of hoses.
   3. Temporary water service piping, valves, fittings and meters shall comply with requirements of the serving water utility and the Uniform Plumbing Code (UPC).
   4. All costs for temporary construction water system, including water consumption, shall be included in Contract Price.

B. Use of Permanent Water System: Permanent water system may be used for construction water after completion, sterilization, testing and inspection of system, after approval by authorities having jurisdiction and after review by District.
   1. Until permanent water meter is set and utility company account is established for District, Contractor shall pay all costs of water consumed during construction.
   2. After permanent water meter is set and water service account is established, District will pay for reasonable quantities of water consumed during construction. Excessive water usage shall be paid by Contractor through Contract Price adjustment.

1.10 TEMPORARY SANITARY FACILITIES

A. Temporary Sanitary Facilities: Provide and maintain temporary sanitary facilities and enclosures for use by construction personnel.

B. Use of Permanent Sanitary Facilities: Do not use permanent sanitary facilities unless provided by District. Immediately prior to Substantial Completion review, thoroughly clean and sanitize permanent sanitary facilities used during construction.

1.11 TEMPORARY POW ER AND LIGHTING

A. Temporary Power and Lighting, General: Comply with NECA Electrical Design Library Temporary Electrical Facilities.

B. Temporary Power: Provide electric service as required for construction operations, with branch wiring and distribution boxes located to provide electrical service for performance of the Work.
   1. Provide temporary electric feeder connected to electric utility service at location determined by Contractor and as approved by the serving electric utility and County of Sonoma Building Department.
   2. Temporary power conduit, raceways, fittings, conductors, panels, connections, disconnects, over current protection, outlets and meters shall comply with requirements of the serving electric utility, California Electrical Code (CEC) and requirements of City and County authorities having jurisdiction.
   3. Contractor shall pay all costs to establish temporary electric service and shall pay for electric power consumed.
   4. As necessary in order to maintain construction progress, Contractor shall provide and pay all costs associated with electrical generators used for temporary power.

C. Temporary Lighting: Provide temporary lighting as necessary for proper performance of construction activities and for inspection of the Work.
   1. Provide branch wiring from power source to distribution boxes with lighting conductors, pigtails and lamps, as required.
   2. Maintain lighting and provide routine repairs.

D. Protection: Provide weatherproof enclosures for power and lighting components as necessary. Provide over current and ground fault circuit protection, branch wiring and distribution boxes located to allow convenient and safe service about Project site. Provide flexible power cords as required.

E. Use of Permanent Power and Lighting Systems: Permanent power and lighting systems may be used after completion, testing and inspection of systems and approval by District and authorities having jurisdiction.
   1. Contractor shall maintain lighting and make routine repairs and replacements, as necessary.

2. District will pay for reasonable amounts of electricity consumed after permanent power system is operational, approved by authorities having jurisdiction and District's account with serving utility has established.

F. Service Disruptions: When necessary for energizing and de-energizing temporary electric power systems, minimize disruption of service to those served by public mains. Schedule transfers at times convenient to District and to adjacent property owners and occupants.

1.12 TEMPORARY TELEPHONE SERVICE

A. Telephone Service to Field Office: Provide telephone service to field office, including facsimile equipment (FAX Machine) to facilitate graphic communications.
1. All costs of such telephone service shall be included in Contract Price.
2. Restrict use of Contractor's telephone by subcontractors and suppliers, to facilitate communication with District and Architect.

1.13 TEMPORARY BARRIERS, ENCLOSURES AND PASSAGE WAYS

A. Temporary Barriers, General: Provide barriers and guardrails as required to provide for public safety, to prevent unauthorized entry to construction areas and to protect existing facilities and adjacent properties from damage from construction operations.
1. Buildings under renovation shall be completely surrounded with six (6) foot high steel chain link fencing. Construction personnel accessing these areas shall do so in such a manner as not to encroach on any portion of the campus being used for student activities.
2. Open trenches or excavation pits in pedestrian areas shall be covered by a minimum of *3/4"* plywood sheeting, or material appropriate to width of opening, and surrounded with caution tape.

B. Contractor and Architect shall verify that all barriers in the path of travel have been removed in accordance with Section 1023, CBC.

C. Gate hardware at accessible paths of travel to be reviewed and accepted by District. Landscape Barriers: Provide barriers around trees and plants designated to remain.
1. Locate barriers as directed outside of drip line of tree or plant.
2. Protect entire area under trees against vehicular traffic, stored materials, dumping, chemically injurious materials, and puddling or continuous running water.
3. Contractor shall pay all costs to restore trees and plants within barriers that are damaged by construction activities. Restoration shall include replacement with plant materials of equal quality and size. Costs shall include all fines levied by governing authorities having jurisdiction, if any.

D. Guard Rails: Provide guard rails along tops of embankments and excavations. Along public walk ways and are as accessible by the public, adjoining excavations, provide guardrails in addition to fencing.
1. Guardrails shall be substantially and durable constructed of lumber, firmly anchored by posts embedded in concrete, and complying with Code requirements for temporary barriers.
2. Guardrails s hall comply with dimensional requirements and accommodate loads as prescribed by Code for permanent guardrails.

E. Security Closures: Provide temporary closures of openings in exteriors surfaces to prevent

entry of unauthorized persons. Provide doors with self - closing hardware and locks.

F. Weather Closures: Provide temporary weather-tight closures at exterior openings to prevent intrusion of water, to create acceptable working conditions, to protect complete Works and to maintain temporary heating, cooling and ventilation. Provide access doors with self-closing hardware and locks.

G. Dust and Debris Barriers: Provide barriers f or dust and debris to prevent dam age and soiling of existing facilities.

H. Temporary Access, Passage and Exit Ways: Construct temporary stairs, ramps, and covered walkway, with r elated doors, gates, closures, guardrails, handrails, lighting and protective devices, to maintain access and exit ways to existing facilities to remain operational.
   1. Design and location of temporary construction shall be by Contractor, subject to review by District, Architect and authorities having jurisdiction.
   2. Provide temporary lighting, illuminated interior exit signage, non - illuminated directional and instructional signage, and temporary security.
   3. Alarms for temporary exits and exit passageways.
   4. Temporary measures shall suit and connect to existing building systems, and shall be approved by District and authorities having jurisdiction.

1.14 SECURITY

A. Security Responsibility: Security of the Project area shall be solely the Contractor’s responsibility until completion of the Work.

B. Security Provisions, General: Provide security program and facilities to protect Work from unauthorized entry, vandalism and theft.

C. Guard Service: At Contractor’s discretion, employ guards to protect the site after working hours.

1.15 FIRE PROTECTION

A. Fire Protection Responsibility: Protection of Project from fire shall be solely Contractor’s responsibility.

B. Fire Protection Provisions, General: Maintain, at a minimum the Work in conditions to minimize fire hazards and provide adequate fire protection devices, such as suitable fire extinguishers, blankets, warning signs and storage containers.

C. Special Fire Protection Provisions: During hazardous construction activities, maintain fire protection devices immediately available for use at the location of such activities.

D. Temporary Fire Sprinkler Provisions: W here existing fire sprinkler system is affected by demolition and re-construction activities, provide either temporary fire protection measures acceptable to governing authorities having jurisdiction or modify existing system as necessary to maintain fire protection. Include extension and additions to standpipe system, for Fire Department connections. Comply with California Fire Code (CFC) Article 87 during all phases of the Work.

1.16 PROTECTION OF INSTALLED WORK

A. Protection of Installed Work, General: Provide temporary protection for installed products. Control traffic in immediate area to minimize damage.

B. Protective Coverings: Provide protective coverings at walls, projections, jambs, sills, and soffits of openings as necessary to prevent damage from construction activities, such as coatings applications, and as necessary to prevent other than normal atmospheric soling.

C. Traffic Protection: Protect unfinished floors, stairs and other surfaces from traffic, soiling, wear and marring.
   1. Provide temporary covers of plywood, reinforced draft paper or temporary rugs and mates. Temporary covers shall not slip or tear under normal use.
   2. Prohibit traffic and storage on waterproofed and roofed surfaces and on landscaped areas.
   3. Protect newly fine graded, seeded and planted areas with barriers and flags to designate such areas as closed to pedestrian and vehicular traffic.

1.17 RUN-OFF CONTROL

A. Erosion and Sedimentation Control: Erosion and sedimentation control provisions shall meet or exceed minimum requirements of authorities having jurisdiction. When provisions are indicated on Drawings, the y are minimum requirements. If no sedimentation control system is shown, then Contractor shall design and provide system to prevent siltation of adjacent property as required by governing authorities having jurisdiction. See Civil Drawings for additional requirements and details.
   1. Implement erosion and sedimentation control provisions prior to commencing site clearing, grading, backfilling and compacting or other construction activities which will expose soil to erosion and potential for sediment-laden runoff.
   2. Ensure that sediment-laden water does not enter drainage systems.
   3. Maintain erosion and sedimentation control provisions until Substantial Completion review is completed for landscaping, or sooner if approved by authorities having jurisdiction.
   4. Implementation, maintenance, replacement and additions to erosion and sedimentation control provisions shall solely be the responsibility of the Contractor. As construction progresses and seasonal conditions dictate, more erosion and sedimentation controls may be required. If so, Contractor shall provide additional provisions over and above minimum requirements, as necessary.

B. Drainage: Grade site and other Work areas to drain.
   1. Provide temporary drainage ditches and diversion measures as necessary to protect construction.
   2. Provide erosion control measures as necessary and as required by authorities having jurisdiction. Comply with local water quality control requirements, as applicable.

C. De-Watering: Maintain excavations free of water. Provide and operate pumping equipment as necessary.
   1. Removal of contaminated water from excavations, dewatering of contaminated groundwater and discharging of contaminated soils via surface erosion is prohibited.
   2. Dewatering of non-contaminated groundwater shall be performed only after Contractor obtains a National Pollutant Discharge Elimination System Permit from the State or Regional Water Quality Control Board having authority. Costs of such permit shall be included in the Contract Price.

D. Runoff Control: Surface runoff and other waters may be encountered at various times during construction. Contractor, by signing the Agreement, acknowledges that risks arising from surface runoff and other waters have been investigated and considered, and Contract Price

and Contract Time include all costs associated with runoff control.

1. It shall be the responsibility of the Contractor to protect Work from detrimental effects of all waters encountered.

2. It shall be the responsibility of the Contractor to protect Work from detrimental effects of runoff.
3. Should damage to the Work due to surface or other water occur prior to acceptance of the Work by District, Contractor shall repair or replace Work at no change in Contract time or Contract Price.

E. National Pollutant Discharge Elimination System: Contractor shall comply with requirements of environmental protection and storm drainage authorities having jurisdiction.
1. Project Area and other areas affected by Work under the Contract shall be maintained in such condition that anticipated storm runoff does not carry wastes and other pollutants off the site.
2. Discharges of material other than storm water will be allowed only when necessary for performance of the Work and where such discharge does not cause the following:
    1) Cause or contribute to a violation of applicable water quality standard
    2) Cause or threaten to cause pollution, contamination or nuisance, as determined by authorities having jurisdiction. Potential pollutants include but are not limited to:
        a) Solid or liquid chemical spills
        b) Wastes from paints, stains ,sealants , adhesives, limes, pesticides, herbicides, wood preservatives and solvents
        c) Asbestos fibers, paint flakes or fragments of plaster and Painting
        d) Fuels, lubricants, hydraulic fluids, coolants, battery electrolytes
        e) Vehicle or equipment, degreasing, steam cleaning and wash water
        f) Concrete, mortar and plaster mix and cleaning water
        g) Detergents and floatable wastes
        h) Super chlorinated potable water line flushing
    3) Contain hazardous substances in a quantity reportable under Federal Regulations 40 CFR Parts 117 and 302.
3. During performance of the Work, disposal of such materials shall occur at a temporary on-site location, physically separated from potential storm water runoff, with ultimate disposal in compliance with all applicable local, regional, State and Federal requirements.

F. Pavement clearing and Cleaning: Keep site access ways, parking areas and building access and exit facilities clear of mud.
1. Remove mud, soil and debris and dispose in a manner which will not be injurious to persons, property, plant materials and site.
2. Comply with runoff control requirements stated above and as required by authorities having jurisdiction.

1.18 FIELD OFFICES AND SHEDS

A. Contractor’s Field Office: Provide a mobile field office of weather -tight construction, with lighting, power, ventilation, heating and cooling to house Contractor, at the Districts discretion.
1. Contractor shall ensure that neither Contractor’s Field Office nor other jobsite facilities are used for living quarters.
2. Contractors’ Field Office shall present neat, business -like appearance at all times, internally and externally.
3. Contractor is responsible for his own utilities and telephone service; storage trailers; general and special collection and disposal of wastes; rodent and pest control; first aid supplies; fire extinguishers of NFPA recommended types for the exposures; scaffolding, ladders and platforms, barricades, warning signs and lights; power; lighting; water and toilets required by the construction work.

B. Storage Sheds for Tools, Materials and Equipment: Provide weather -tight sheds, with heat and ventilation appropriate for storage of products requiring controlled conditions, with adequate space for organized storage and access, and lighting for inspection of stored materials.

1.19 CONSTRUCTION PARKING

A. Construction Parking: Construction personnel may park in designated areas only.
   1. Do not park on public roadways unless approved by local police authorities.
   2. Do not park in staff parking lots at any time.
   3. Maintain clear access ways and parking for emergency vehicles, as required by local police and fire authorities.

B. Parking Area Cleaning: Keep parking areas clear of construction debris, especially debris hazardous to vehicle tires.

1.20 VEHICULAR TRAFFIC ON OCCUPIED CAMPUSES

A. Spotters: Provide spotters to walk in front of vehicles delivering materials on occupied campuses.
   1. No vehicle shall travel off paved areas without a spotter.
   2. Coordinate with District for appropriate times for material delivery.

1.21 ALARM, COMMUNICATIONS AND BELL PASSING SYSTEMS

A. Communications Systems: Maintain a fully operational communications, bell passing and fire alarm system during construction.

1.22 REMOVAL OF CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

A. Removal of Construction Facilities and Temporary Controls: Unless otherwise mutually agreed by District and Contractor, remove temporary materials, equipment, services and construction prior to Substantial Completion review.

B. Cleaning and Repairs: Clean and repair damage caused by installation or use of temporary facilities on public and private rights of way.

C. Removal of Temporary Utilities and Restoration: Remove temporary underground utility installations to a depth of 2 -feet. Backfill, compact and regrade site as necessary to restore areas or to prepare for indicated paving and landscaping.

END OF SECTION 01 15 00

SECTION 01 15 80 – PROJECT IDENTIFICATION AND SIGNAGE

PART 1 GENERAL

A. On-site temporary informational signs to be maintained during Contract.

1.1 RELATED DOCUMENTS AND SECTIONS

A. Section 01 15 00: Temporary Facilities and Controls

1.2 SUBMITTALS

A. Shop Drawings: Submit layout of sign faces to District and Architect for review and approval. Accurately depict lettering styles, graphics and colors.

1.3 QUALITY ASSURANCE

A. Sign Painter's Qualifications: Sign painter shall be regularly engaged and specializing, for the preceding 3 years, in the design, execution, construction and installation of exterior signage of equivalent type, size and complexity as those required for Project.

PART 2 PRODUCTS

2.1 SIGN MATERIALS

A. Sign Structure and Framing: New materials, wood or metal, structurally adequate to support sign panel and suitable for specified finish.

B. Sign Surfaces: Minimum ¾" thick exterior grade, softwood plywood with medium or high density phenolic sheet overlay, standard large sizes to eliminate joints. Provide sheet thickness as required to span across framing members and provide even, smooth surface without waves or buckles.

C. Rough Hardware: Galvanized steel, as specified in Section 05500 – Miscellaneous Metal Fabrications.

D. Paint, Sign Face: Exterior quality primer and gloss enamel finish, as customarily used f or sign painting, adequate to resist weathering and fading for the scheduled construction period.

E. Paint, Sign Structure: Exterior quality, primer and flat finish paint, adequate to resist weathering and fading for scheduled construction period.

2.2 INFORMATIONAL SIGNS

A. Restrictions: Signs other than Informational Signs specified above and Informational Signs specified below shall not be displayed without approval of District.
   1. Informational Signs: Informational signs, necessary for conduct of construction activities or required by governmental authorities having jurisdiction may be displayed when in conformance to sign construction and graphic requirements specified in this District and Architect may review such signs. If so, review will be for sign construction, and graphic designs only.

2. Adequacy of signage for safety and conformance to requirements of authorities having jurisdiction and trade practices shall be solely Contractor's responsibility.

B. Sign Painting: Informational signage shall be produced by professional sign painters and be of size and lettering style consistent with use. Colors shall be as required by authorities having jurisdiction and, if not otherwise required, of colors consistent with Project graphics.
   1. Sign Face Finish: Gloss enamel.
   2. Structure Finish: Paint exposed surfaces of supports and framing members' one coat of primer and one coat of exterior paint, flat finish.

PART 3 EXECUTION

3.1 INFORMATIONAL SIGNS INSTALLATION

A. Informational Signs Construction: Construct sign support structure and install panels in durable manner, to resist high winds.

B. Informational Signs Installation:
   1. Locate signs as necessary for construction activities and as required by authorities having jurisdiction.
   2. Install informational signs for optimum visibility, on ground-mounted posts or temporarily attached to surfaces of structures.
   3. Attachment methods shall leave no permanent disfiguration or discoloration on completed Work.

C. Field Painting: Paint all surfaces and edges of sign face and support structure for finished appearance.

3.2 SIGNS MAINTENANCE

A. Signs Maintenance: Maintain signs and supports in a neat, clean condition. Repair all damage and weathering to structure, framing and signage.

B. Sign Relocation: Relocate signs as required by progress of the Work.

3.3 REMOVAL

A. Project Information Signs Removal: Remove all informational signs, framing, supports and foundations prior to Substantial Completion review.

END OF SECTION 01 15 80

SECTION 01 16 00 – PRODUCT REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Products

B. Transportation and Handling

C. Storage and Protection

1.2 RELATED DOCUMENTS AND SECTIONS

A. Section 01 13 30: Submittals Procedures - Administrative requirements for submission of results of tests and inspections.

B. Section 01 14 00: Quality Control

1.3 GENERAL PRODUCT REQUIREMENTS

A. Products, General: Items purchased for incorporation in the Work, includes material, equipment and systems.

B. Specific Product Requirements: Refer to requirements of Section 01400, Quality Control and individual product Specifications Sections in Divisions 2 through 16 for specific requirements for products.

C. Minimum Requirements: Specified requirements for products are minimum requirements.

D. Product Selection: Provide products that fully comply with Contract Documents, are undamaged and unused at installation.

1.4 TRANSPORTATION AND HANDLING

A. Transportation, Delivery and Handling, General: Comply with manufacturer’s instructions and recommendations for transportation, delivery and handling.

B. Transportation: Transport product by methods to avoid product damage; deliver in undamaged condition in manufacturer’s unopened containers or packaging, dry.

C. Handling: Provide equipment and personnel to handle products by methods to prevent soiling or damage. Promptly inspect shipments to assure that products comply with requirements, quantities are correct, and products are undamaged.

1.5 STORAGE AND PROTECTION

A. Storage and Protection, General: Store and protect products in accordance with manufacturer’s instructions, with seals and labels intact and legible.
   1. Store sensitive products in weather-tight enclosure, maintain within temperature and humidity ranges required by manufacturer’s instructions.
   2. For exterior storage of fabricated products, place on sloped supports above ground. Cover products subject to deterioration and impervious sheet covering; provide

ventilation to avoid condensation.

3. Store loose granular materials on solid surfaces in a well-drained area; prevent mixing with foreign matter.
4. Arrange storage to provide access for inspection. Periodically inspect to assure products are undamaged, and are maintained under required conditions.

END OF SECTION 01 16 00

SECTION 01 16 30 – PRODUCT SUBSTITUTION PROCEDURES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Section Includes: General procedures for the Bid of substitutions from specified products.

1.2 MATERIAL REFERENCES

A. Reference to equipment, material, article, or patented process by trade name or catalog number shall not be construed as limiting competition.
   1. The Contract Documents indicate or specify materials, articles, and processes by trade, patent, proprietary name, or name of manufacturer.
   2. When known to the Architect, additional products or manufacturers acceptable to the Architect are listed. Bids shall be based only on specified or referenced products and systems.
   3. Referenced manufacturers are generally listed alphabetically to avoid the implication that any one manufacturer is preferred over another. In order to establish Intent and level of quality by listing product characteristics, a particular product may be listed as the basis of design.

B. The naming of more than one manufacturer does not imply that all products of named manufacturers are acceptable for use on the Project. Where only one proprietary name is specified, materials or equipment of another manufacturer may be provided, but only if full compliance with other portions of the Specifications is satisfied, and of the equal basis of the proposed substitution is substantiated.

C. Construction shall be in compliance with the cited standards and building code requirements for' the materials specified.

1.3 SUBSTITUTIONS DURING BIDDING

A. The Substitution Request Form provided in Specification 00675 shall accompany all proposed product substitutions and must be submitted with the bidder's bid. Substitution requests submitted by the Contractor without the Substitution Request Form will be returned to the Contractor unprocessed.

B. Product changes shall not be incorporated into bids unless an Addendum has been issued modifying the original product specification.

C. If the phrase NO SUBSTITUTIONS is used in the Contract Documents, the product is required to be used, in accordance with Public Contract Code section 3400(c).

D. If bidder incorporates a substitute item in its bid, bidder is obligated to obtain approval of that substitute item as described elsewhere in this Section and the bid documents. If approval is not granted, bidder shall furnish the originally specified product.

E. The process for making Substitution requests shall be as follows:
   1. All requests for substitutions shall be made at the time of bid.
   2. Equipment, material, and articles installed or used without required acceptance shall be at the risk of subsequent rejection.

3. The Substitution request shall include the name of the manufacturer, model number, cost savings, and other pertinent data sufficient to prove to the reviewer that the item is in fact an equal or superior product.
    1) A chart comparing key features of specified and proposed substitute products shall be included.
    2) Testing of a proposed substitute material to ensure compliance with the Specifications may be required by the District at Contractor's expense.
    3) When proposing substitutions for door hardware, submit full size samples of both the specified hardware and the proposed hardware for comparison by Architect.
    4) Appearance unsatisfactory to the Architect or District will be valid grounds for rejection.
4. If the proposed Substitution is not approved, Contractor shall furnish and install the originally specified product, at no cost or schedule change to the Contract; otherwise the bid will be deemed non-responsive.
5. If the proposed Substitution is approved:
    1) Contractor shall bear responsibility for costs of other products and installation methods requiring revisions caused by Contractor's substitution. Use of accepted substitutions shall in no way relieve the Contractor from responsibility for compliance with the Contract Documents after installation.
    2) No modifications to Contract schedule shall be granted.
    3) If there is a cost savings, District may initiate a deductive change order.

F. Substitutions that result in a change to the DSA -approved construction Documents of any structural material, member, or connection, or result in increased vertical or lateral loading of the structure, shall not be incorporated into the construction until approved by the DSA Field Engineer.

G. In the event the Substitution request requires drawings or services of the Architect, his consultants, or DSA Approval to facilitate installation or erection of any portion of the work, the Contractor shall accept the responsibility to hire and pay for such professional services. A flat hourly rate, as agreed upon, shall be paid by the Contractor whether the change is accepted or rejected. If such payment is not made in a timely manner, the District may deduct the amount from the Contract Price.

1.4 SUBSTITUTIONS AFTER AWARD OF CONTRACT

A. If the Contractor fails to make a request for substitutions for products, prior to the submission of its bid, and such products subsequently become commercially unavailable, the Contractor may request a substitution for such commercially unavailable item. The decision to grant this request is solely at the District's discretion. The Contractor shall comply with all Substitution request requirements in Section 1.3 above.

B. The District, in its sole discretion, may accept a request for substitution by the Contractor or may request Contractor substitute a specified item after bid. Any substitutions requested after bids are opened shall be subject to the same conditions and requirements set forth in Section 1.3 above. If any substitutions, that in the District or Architect's determination, results in a credit to the District, the credit amount shall be agreed upon in writing, otherwise, the request for substitution shall be deemed denied.

C. Failure to place orders for specified equipment or material sufficiently in advance of the scheduled installation date will not be considered a valid reason for Contractor to make a request for substitution or to deviate from the Contract Documents.

END OF SECTION 01 16 30

SECTION 01 17 00 CONTRACT CLOSEOUT PROCEDURES

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 PRE-CLOSEOUT MEETING

A. Pre-Closeout Meeting: Schedule and convene a pre-closeout meeting with Owner and Architect in accordance with Section 01 13 12: Coordination and Meetings.

1.3 SUBSTANTIAL COMPLETION

A. The items identified in the Contract Documents, including the Supplementary Conditions and the following items shall be completed before Substantial Completion will be granted (also see Section 00 00 98: Completion of the Work):
   1. Contractor’s completion list (punch list): Submit a thorough list of items to be completed or corrected, along with a written request for Substantial Completion and for review of the Work or portion of the Work. Architect’s or Engineer’s Project representative, at their discretion, may attend and assist in the preparation of Contractor's punch list.
   2. Architect’s supplemental punch list: Architect/Engineer, along with Owner at Owner’s discretion, will inspect the Work utilizing Contractor's prepared punch list, noting completed items and incomplete items, and will prepare a supplemental list of items that have been omitted or incomplete items that were not previously noted.
   3. Operations and maintenance manuals: Submit as described.
   4. Final cleaning: Provide final cleaning and adequate protection of installed construction as described.
   5. Starting of systems: Start up equipment and systems as described.
   6. Testing and balancing: Testing and balancing of systems must be performed and completed by Owner’s forces, and the report submitted and accepted by Architect/Engineer and Owner, as described in the Contract Documents. Make adjustments to equipment as required to achieve acceptance.
   7. Demonstrations: If required by individual Specification Sections or by Owner, provide demonstrations and instructions for use of equipment as described.

B. Date of Substantial Completion: Complete or correct items identified on punch list and confirm that all items have been corrected prior to Architect’s re-inspection. Architect/Engineer, along with Owner, will re-inspect the corrected work to establish the Date of Substantial Completion. Incomplete items remaining will be appended to the Certificate of Substantial Completion (AIA G704). The Date of Substantial Completion represents day one of the closeout period and represents the date of commencement of Contractor’s correctional period and all warranty periods as described and required by the Contract Documents, except as amended in the Certificate of Substantial Completion and elsewhere in the Contract Documents.

C. Certificate of Substantial Completion: When the Work or designated portion thereof is substantially complete, Architect will prepare the Certificate of Substantial Completion to be executed by Owner and Contractor. Items on the appended punch list shall be completed or corrected within the time limits established in the Certificate.

1.4 PUNCH LIST

A. A comprehensive list prepared by Contractor prior to Substantial Completion, and attached thereto, to establish all items to be corrected, or limited items of work to be completed, if any. This list is intended to represent a limited number of items needing attention.

B. Punch lists shall be furnished to Architect in Microsoft Excel and PDF formats. The punch list shall be in matrix form and shall include the following information for each punch list item:
   1. Room number or other suitable location identifier.
   2. Description of the Work.
   3. Subcontractor/trade sign-off that the work has been verified to be 100 percent complete and in accordance with the Contract Documents.
   4. Subcontractor/trade sign-off date.
   5. General Contractor sign-off that the work has been verified to be 100 percent complete and in accordance with the Contract Documents.
   6. General Contractor/trade sign-off date.
   7. RC/E consultant sign-off.
   8. RC/E consultant sign-off date.
   9. If requested by Owner, provide two (2) additional similar columns for their sign-off.
   10. In the case of excessive repetition of the same item at various locations, the punch list may contain "general notes/items" that shall be applied to the entire Project. It shall be the responsibility of the Contractor/Subcontractor to thoroughly examine the entire Project and make corrective measures at all applicable locations.

C. Should Architect determine that Contractor's punch list lacks sufficient detail or requires extensive supplementation, the punch list will be returned to Contractor for re-inspection and revision. The date of Substantial Completion will be delayed until the punch list submitted is a reasonable representation of the Work to be done.

D. A significantly large number of items to be completed or corrected will preclude Architect from issuing a Certificate of Substantial Completion. Owner and Architect will be the sole judges of what constitutes a significantly large number of items. It is anticipated that the detailed list of items of Work to be completed or corrected at the Date of Substantial Completion will be no longer than five (5) typed pages.

E. Contractor's superintendent shall participate in the preparation of Contractor's punch list that is submitted to Architect and Owner for supplementation. Upon receipt, Architect and consultants shall perform a spot review to determine the adequacy and completeness of Contractor's punch list.

F. Upon receipt of an acceptable Contractor's punch list, Contractor's superintendent shall accompany Architect, his consultants and Owner (at his discretion) during their observation and the preparation of their supplements to Contractor's punch list:
   1. The superintendent shall record or otherwise take note of all supplementary items.
   2. Architect will endeavor to furnish to Contractor typed, hand written, or recorded supplements to the punch list in a prompt manner; however, any delay in Contractor receiving said supplements from Architect will not be cause for a claim for additional cost or extension of time as Contractor's superintendent shall have been in attendance during the inspections of Architect and his consultants and will have been expected to take his own notes.

1.5 OPERATIONS AND MAINTENANCE MANUAL

A. As a requirement for Substantial Completion, the final operation and maintenance manual shall be submitted to, and reviewed and accepted by Architect prior to issuance of the Certificate.

B. Prepare a 3-ring D-slant binder cover and spline with printed title "OPERATIONS AND MAINTENANCE MANUAL," title of Project, and subject matter of binder when multiple binders are required.

C. Submit one (1) copy of preliminary operations and maintenance manuals to respective consultants (civil, MEP, structural, etc.) for review of conformance with Contract requirements prior to submitting final to Architect. Allow time for proper review.

D. Internally subdivide binder contents with permanent page dividers, logically organized as described below; with tab titling clearly printed under reinforced laminated plastic tabs.

E. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.

F. Contents:
   1. Prepare Table of Contents for each volume, with each product or system description identified, typed on white paper, in three parts as follows:
      a. Part 1: Directory, listing names, addresses, and telephone numbers of Architect/Engineer, Contractor, subcontractors, and major equipment suppliers.
      b. Part 2: Operation and Maintenance, arranged by system and subdivided by Specification Section. For each category, identify names, addresses, and telephone numbers of subcontractors and suppliers. Identify the following:
         1) Significant design criteria.
         2) List of equipment.
         3) Parts list for each component.
         4) Equipment start-up instructions
         5) Operating instructions.
         6) Maintenance instructions for equipment and systems.
         7) Maintenance instructions for finishes, including recommended cleaning methods and materials, and special precautions identifying detrimental agents.
      c. Part 3: Project documents and certificates, including the following:
         1) Product data.
         2) Air and water balance reports.
         3) Photocopies of warranties, certificates and bonds. Submit originals with Closeout Documents as specified below.

G. Submit one (1) final original and two (2) copies to Architect.

H. Contractor shall provide a DVD, in PDF Format, the following documents after approval by Architect, consultants, and Owner: Closeout Manual, MSDS binder, O&M Manuals, Specifications and approved submittals. Documents shall be hyperlinked to the Table of Contents.

1.6 PROJECT CLOSEOUT

A. Final Payment will not be authorized by Architect until Architect finds the Work acceptable under the Contract Documents, subject to the completion and acceptance of the following requirements and other applicable Contract requirements:
   1. Close-out Documents: Provide bound closeout documents as described. Refer to the Supplementary Conditions for additional information.
   2. Record Documents: Submit as described.
   3. Extra materials: Provide extra stock, materials, and products as described when required by individual Specification Sections.
   4. Locks: Make final changeover of permanent locks and transmit keys to Owner. Advise Owner’s personnel of changeover in security provisions.
   5. Temporary Facilities: Discontinue and remove temporary facilities from the site, along with mockups, construction aids, and similar elements.
   6. Warranties, Certificates and Bonds: Execute and assemble transferable warranty documents, certificates, and bonds from subcontractors, suppliers, and manufacturers as described.
   7. Final Inspection and Acceptance by Architect is achieved as described.

1.7 CLOSEOUT DOCUMENTS

A. Coordinate the following items with the requirements of Section 00 00 22, General Conditions of the Contract.

B. Prepare 3-ring D-slant binder cover and spline with printed title "CLOSEOUT DOCUMENTS", title of Project, and subject matter of binder when multiple binders are required. Submit one (1) original and two (2) copies.

C. Internally subdivide binder contents with permanent page dividers, logically organized as described below; with tab titling clearly printed under reinforced laminated plastic tabs.

D. The closeout documents shall be neatly organized and easily useable as determined by Architect and Owner. Separate closeout document binders from operations and maintenance manuals. Documents identified as "affidavit" shall be notarized.

E. Prepare a table of contents for each volume, with each item description identified, typed on white paper, in five (5) parts as follows:
   1. Part 1: Directory listing names, addresses, and telephone numbers of Architect/Engineer, Contractor, subcontractors, and major equipment suppliers. All General Contractor’s vendors/suppliers and subcontractors that provided materials or performed any work related to this Project must be listed on this form. Submit final list of subcontractors on Section 00 00 04 Subcontract List Form.
   2. Part 2: Closeout documents and affidavits, including the following:
      a. AIA G707 - Consent of Surety to Final Payment.
      b. AIA G706 - Contractor's Affidavit of Payment of Debts and Claims.
      c. AIA G706A - Contractor's Affidavit of Release of Liens.
   3. Part 3: Project documents and certificates, including the following:
      a. Copy of Certificate of Substantial Completion (AIA G704).
      b. Copy of All Permits.
      c. Copy of Final Utility Bill or letter of transfer.
      d. Copy of Certificate of Occupancy.
      e. Copy of Certification of Project Compliance: Submit Owner and Architect will initiate form and forward to Contractor for signature once Substantial Completion is established (Owner to be provided original separately).

4. Part 4: Warranties and Release of Liens; compile sequentially based on Specification Sections:
   a. General Contractor's warranty: Submit on company letterhead as described below. This Warranty shall state all sections of Work performed by General Contractor's own forces, and warranty period for each section of Work.
   b. Subcontractor's release of lien: Include Contractor's, Subcontractor's, and direct material and equipment supplier's separate final releases. Submit Subcontractor's Affidavit of Release of Lien.
   c. Hazardous material certificate: Submit Affidavits from Contractor, subcontractors and General Contractor's vendors or suppliers stating that no hazardous materials/products have been used or installed in this Project.
   d. Subcontractor's warranty: Notarized and submitted warranty shall state all sections of Work performed by the Subcontractor and warranty period.
   e. Special/extended warranties: List and provide notarized warranties requested by Owner, or required by or incorporated in the Contract Documents.
   f. Spreadsheet depicting all items and materials that carry a warranty longer than one (1) year. Include information consisting of material/supplier/installer/Specification Section/length of warranty and contact information.
5. Part 5: Receipts:
   a. Extra stock: Provide original receipts for delivery of "extra stock" items as described below. Receipts must be signed by an authorized Owner's representative.
   b. Keys: Provide original receipts for delivery of "keys." Receipts must be signed by an authorized Owner's representative.
   c. Sign-in sheets: Provide signatures of attendees from all demonstrations.

F. In addition to the three (3) required closeout binders listed above, provide Architect with one (1) separate binder for their records containing the following:
   1. Directory listing names, addresses, and telephone numbers of Architect/Engineer, Contractor, subcontractors, and major equipment suppliers.
   2. All MSDS sheets for the Project.
   3. All warranties from Contractor, subcontractors, direct suppliers, and manufacturers.

G. Failure to complete and closeout Project after substantial completion may result in liquidated damages being assessed to Contractor. Refer to Conditions of the Contract for additional requirements and liquidated damages.

1.8 FINAL CLEANING

A. Execute final cleaning prior to final Project inspection and acceptance.

B. Clean interior and exterior glass, and surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces, mop hard floor surfaces.

C. Remove smudges, marks, stains, fingerprints, soil, dirt, spots, dust, lint, and other foreign materials from finished and exposed surfaces

D. Clean equipment and fixtures to sanitary condition with cleaning materials appropriate to surface and material being cleaned.

E. Clean and replace filters of operating equipment as required by Contract Documents

F. Clean debris from roofs, gutters, downspouts, and drainage systems.

G. Clean site; sweep paved areas, rake clean landscaped surfaces.

H. Remove waste and surplus materials, rubbish, and temporary construction facilities from site.

1.9 PROTECTING INSTALLED CONSTRUCTION

A. Protect installed Work and provide special protection where specified in individual Specification Sections until Work is accepted by Architect and Owner.

B. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.

C. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.

D. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.

E. Prohibit traffic or storage upon waterproofed or roofed surfaces. When traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.

F. Prohibit traffic from landscaped areas.

1.10 DEMONSTRATION AND INSTRUCTIONS

A. Demonstrate operation and maintenance of products to Owner's personnel a minimum of 48 hours prior to date of Final Completion in accordance with Owner’s requirements.

B. Demonstrate Project equipment instructed by qualified manufacturer's representative who is knowledgeable about the Project and equipment.

C. For equipment or systems requiring seasonal operation, perform demonstration for other season within six (6) months.

D. Utilize maintenance manual as basis for instruction. Review contents of manual with Owner's personnel to explain all aspects of operation and maintenance.

E. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment.

F. Prepare and insert additional data in maintenance manuals when needed for when additional data becomes apparent during instruction.

G. Review and verify proper start-up and operation of equipment prior to scheduling demonstrations with Owner.

H. All demonstrations are to be documented by video and submitted to Owner in DVD format along with the closeout documents. General Contractor is responsible for all video and compilation onto DVD with linked menus.

1.11 PROJECT RECORD DOCUMENTS

A. Project Record Documents, as described in Section 01 17 89: Project Record Documents, shall be submitted at Project closeout. Final payment will not be authorized by Architect until final review and acceptance by Architect and Engineers is achieved in accordance with Owner's requirements.

B. At Contractor's request, and with associated fee, Architect may provide electronic versions of the construction Drawing and Specification files for Contractor's use, subject to the terms and conditions of Architect's standard electronic document transfer agreement.

C. Submit reproducibles to respective consultants (civil, structural, MEP, etc.) for review. Consultant will mark-up corrections and return to Contractor for final revisions. Make final revisions prior to submitting to Architect:
   1. Format: One (1) set of film positive reproducibles and two (2) sets of bluelines of approved reproducibles.
   2. Provide Owner with one (1) set of Record Drawings on a non-rewritable CD in AutoCAD® latest release.
   3. Provide Owner with one (1) set of Record Drawings on a non-rewritable CD in PDF format.
   4. Label electronic CAD files and PDF files in the same manner as the sheets (example, A2.02 First Floor Area 'A', etc.)

1.12 EXTRA STOCK, MATERIALS, AND MAINTENANCE PRODUCTS

A. Furnish extra stock, maintenance, and extra products in quantities specified in individual Specification Sections.

B. Deliver to Project site or to City Maintenance Department as directed by Owner; obtain signed receipt from Owner's authorized representative prior to final application for payment. Delivery of materials to, or obtaining receipt from anyone other than Owner's authorized representative may constitute breach of this requirement and may require delivery of additional materials at no cost to Owner if original materials are misplaced.

C. Include signed receipts for delivery of extra stock and materials, including keys, with closeout documents.

1.13 WARRANTIES, CERTIFICATES, AND BONDS

A. Definitions:
   1. Standard product warranties: Preprinted written warranties published by individual manufacturers for particular products and are specifically endorsed by the manufacturer to Owner.
   2. Special warranties: Written warranties required by or incorporated in the Contract Documents, either to extend time limits provided by standard warranties or to provide coverage of specific defects, or both.

B. In accordance with the general warranty obligations under the General Conditions as amended by the Supplementary Conditions, General Contractor's warranty shall be for a period of one (1) year following the date of Substantial Completion, hereinafter called the one-year warranty period. Contractor's one (1) year general warranty shall include all labor, material, and delivery costs required to correct defective material and installation. This warranty shall not limit Owner's rights with respect to latent defects, gross mistakes, or fraud.

C. Contractor's one (1) year warranty shall run concurrently with the one (1) year period for correction of Work required in the General Conditions.

D. No service charges or call out charges are allowed to investigate warranty claims.

E. In addition to Contractor's one (1) year warranty, special warranties, as described in individual Specifications Sections, shall extend the warranty period for the period specified without limitation in respect to other obligations for which Contractor has under the Contract Documents.

F. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of the warranty on the Work that incorporates the products, nor does it relieve the suppliers, manufacturers, and subcontractors required to countersign special warranties with Contractor.

G. Warranty Requirements:
1. When correcting warranted Work that has failed, remove and replace other Work that has been damaged as a result of such failure or that must be removed and replaced to provide access for correction of warranted Work.
2. When Work covered by a warranty has failed and been corrected by replacement or reconstruction, reinstate the warranty by written endorsement. The reinstated warranty shall be equal to the original warranty with an equitable adjustment for depreciation.
3. Upon determination that Work covered by a warranty has failed, replace or rebuild the Work to an acceptable condition complying with requirements of Contract Documents. Contractor is responsible for the cost of replacing defective Work regardless of whether Owner has benefited from use of the Work through a portion of its anticipated useful service life.
4. Written warranties made to Owner are in addition to implied warranties, and shall not limit the duties, obligations, rights, and remedies otherwise available under the law, nor shall warranty periods be interpreted as limitations on time in which Owner can enforce such other duties, obligations, rights, or remedies.
5. Owner reserves the right to refuse to accept Work for the Project where a special warranty, certification, or similar commitment is required on such Work or designated portion of the Work, until evidence is presented that entities required to countersign such commitments are willing to do so.

H. Compile copies of each required warranty properly executed by Contractor and the Subcontractor, supplier, or manufacturer. Verify documents are in proper form, contain full information, and are notarized. Co-execute warranties, certificates, and bonds when required and include signed warrantees with Closeout Documents submitted to Architect.

1.14 FINAL COMPLETION AND FINAL PAYMENT

A. Final Notice and Inspection:
1. When all items on the punch list have been corrected, final cleaning has been completed, and installed work has been protected, submit written notice to Architect that the Work is ready for final inspection and acceptance.
2. Upon receipt of written notice that the Work is ready for final inspection and acceptance, Architect and Engineer will make final inspection.

B. Final Change Order: When the Project closeout items described above are successfully completed and the Work is found acceptable to Architect/Engineer and Owner, a Final Change Order will be executed. This Change Order will include any Allowance adjustments as required by the Contract Documents.

C. Final Application for Payment: When all of the above items are successfully complete, submit to Architect a final Application for Payment and request for release of retainage.

D. Release of Retainage: Release of retainage will not be authorized by Architect until Contractor completes all requirements for closeout to the satisfaction of Owner and Architect as described herein.

1.15 TERMINAL INSPECTION

A. Immediately prior to expiration of the one (1) year period for correction of the Work, Contractor shall make an inspection of the Work in the company of Architect and Owner. Architect and Owner shall be given not less than ten (10) days' notice prior to the anticipated date of terminal inspection.

B. Where any portion of the work has proven to be defective and requires replacement, repair, or adjustment, Contractor shall immediately provide materials and labor necessary to remedy such defective work and shall execute such work without delay until completed to the satisfaction of Architect and Owner, even if the date of completion of the corrective work may extend beyond the expiration date of the correction period.

C. Contractor shall not be responsible for correction of Work that has been damaged because of neglect or abuse by Owner, nor the replacement of parts necessitated by normal wear in use.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION 01 17 00

SECTION 01 17 10 – CLEANING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Cleaning during Construction

1.2 RELATED DOCUMENTS AND SECTIONS

A. General Conditions

B. Section 01 10 10: Summary of Work

C. Section 01 17 00: Contract Closeout

PART 2 PRODUCTS

2.1 MATERIALS

A. Use cleaning methods and materials recommended by manufacturer for surface to be cleaned.

PART 3 EXECUTION

3.1 DURING CONSTRUCTION

A. Garbage Control: Control accumulation of debris, waste materials and rubbish; periodically dispose of debris, waste and rubbish off-site in a legal manner.

B. Cleaning, General: Clean sidewalk s, driveways and streets frequently to maintain public thoroughfares free of dust, debris and other contaminants.

C. Parking Area Cleaning: Keep parking areas clear of construction debris, especially debris hazardous to vehicle tires.

D. Thoroughfare clearing and Cleaning: Keep site access ways, parking areas and building access and exit facilities clear of mud.
   1. Remove mud, soil and debris and dispose in a manner which will not be injurious to persons, property, plant materials and site.
   2. Comply with runoff control requirements stated above and as required by governing authorities having jurisdiction.

E. Cleaning Frequency: At a minimum, clean Work areas daily.

F. Failure to Clean: Should cleaning by Contractor not be sufficient or acceptable to District, especially regarding sidewalks, driveways, streets and other public thoroughfares, District may engage cleaning service to perform cleaning and deduct costs for such cleaning from sums owed to Contractor

3.2 INTERIOR CLEANING FOR FINAL COMPLETION

A. Interior Cleaning for Final Completion, General: Complete final cleaning before submitting final Application for Payment. Employ professional building cleaners to thoroughly clean building immediately prior to Final Completion inspection by District and, if applicable, by authorities having jurisdiction.
   1. Remove grease, mastic, adhesives, dust, dirt, stains, fingerprints, labels, and other foreign materials from all visible interior and exterior surfaces.
   2. Remove dust from all horizontal surfaces not exposed to view, including light fixtures, ledges and plumbing fixtures.
   3. Clean all horizontal surfaces to dust-free condition, including tops of door and window frames, tops of doors and interiors of cabinets and casework.
   4. Perform sanitary cleaning of toilet, lava tor y and shower facilities and food service equipment, as applicable.

B. Accessories and Fixtures Cleaning: Clean building accessories, including toilet partitions, fire extinguisher cabinets, lockers and toilet accessories, all plumbing fixtures and all lighting fixtures lenses and trim.

C. Glass and Mirror Cleaning: Clean and polish all glass and mirrors as specified.

D. Metalwork: Clean and buff all metalwork, to be free of soiling and fingerprints. Mirror finished metalwork shall be buffed to high luster.

E. Floor Cleaning:
   1. Exposed concrete floor: Thoroughly s wee p and wet mop floors in enclosed spaces. At parking area and ramps, sweep and hose off floor surface.
   2. Ceramic tile flooring: Thoroughly sweep and mop tile flooring. Comply with specific requirements in tile and installation materials manufacturer’s instructions for cleaning materials.
   3. Resilient flooring: Thoroughly sweep all resilient flooring. Damp wash and wax (as appropriate) all resilient flooring. Comply with specific requirements in applicable resilient flooring Sections, and notes of the Drawings.
   4. Carpeting: Clean and vacuum all carpeting. Clean as necessary to restore to like-new condition.

F. Ventilation System Cleaning: Replace filters and clean heating and ventilating equipment used for temporary heating, cooling and ventilation.

3.3 SITE CLEANING FOR FINAL COMPLETION

A. Site Cleaning for Final Completion: Boom clean exterior paved surfaces. Rake clean other surfaces of the grounds.
   1. Wash down and scrub where necessary all paving soiled as a result of construction activities. Thoroughly remove mortar droppings, paint splatters, stains and adhered soil.
   2. Remove from the site all construction waste, unused materials, excess soil and other debris resulting from the Work

B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to the condition expected in a normal, commercial building cleaning and maintenance program. Comply with manufacturer’s instructions.
   1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion.
      1) Clean exposed exterior hard surfaced finishes, where affected by Contract

work, to a dust-free condition, free of stains, films, and similar foreign substances.

2) Clean the site of rubbish, litter and other foreign substances.

3.4 CLEANING INSPECTION

A. Cleaning Inspection: Prior to Final Payment or acceptance by District for partial occupancy or beneficial use of the premises, District and Contractor shall jointly conduct an inspection of interior and exterior surfaces to verify that entire Work is acceptably clean.

B. Inadequate Cleaning: Should final cleaning be inadequate, as determined by the District, and Contractor fails to correct conditions, the District ma y engage cleaning service under separate contract and deduct cost from Final Payment.

END OF SECTION 01 17 10

SECTION 01 17 32 – CUTTING AND PATCHING

PART 1 GENERAL

1.1 RELATED DOCUMENTS AND PROVISIONS:

A. All Contract Documents should be reviewed for applicable provisions related to the provisions in this document, including without limitation:
   1. General Conditions, including, without limitation, Inspector, Inspections, and Tests, Integration of Work, Nonconforming Work, and Correction of Work, and Uncovering Work;
   2. Special Conditions;
   3. Hazardous Materials Procedures and Requirements;
   4. Hazardous Materials Certification;
   5. Lead-Based Paint Certification;
   6. Imported Materials Certification.

1.2 CUTTING AND PATCHING:

A. Contractor shall be responsible for all cutting, fitting, and patching, including associated excavation and backfill, required to complete the Work or to:

B. Make several parts fit together properly.

C. Uncover portions of Work to provide for installation of ill-timed Work.

D. Remove and replace defective Work.

E. Remove and replace Work not conforming to requirements of Contract Documents.

F. Remove Samples of installed Work as specified for testing.

G. Provide routine penetrations of non-structural surfaces for installation of piping and electrical conduit.

H. Attaching new materials to existing remodeling areas – including painting (or other finishes) to match existing conditions.

I. In addition to Contract requirements, upon written instructions from the District, Contractor shall uncover Work to provide for observations of covered Work in accordance with the Contract Documents; remove samples of installed materials for testing as directed by District; and remove Work to provide for alteration of existing Work.

J. Contractor shall not cut or alter Work, or any part of it, in such a way that endangers or compromises the integrity of the Work, the Project, or work of others.

1.3 SUBMITTALS:

A. Prior to any cutting or alterations that may affect the structural safety of Project, or work of others, and well in advance of executing such cutting or alterations, Contractor shall submit:
   1. Written notice to District pursuant to the applicable notice provisions of the Contract Documents, requesting consent to proceed with the cutting or alteration, including the following:

1) The work of the District or other trades.
2) Structural value or integrity of any element of Project.
3) Integrity or effectiveness of weather-exposed or weather-resistant elements or systems.
4) Efficiency, operational life, maintenance or safety of operational elements.
5) Visual qualities of sight-exposed elements.

B. Contractor's Request shall also include:
1. Identification of Project.
2. Description of affected Work.
3. Necessity for cutting, alteration, or excavations.
4. Affects of Work on District, other trades, or structural or weatherproof integrity of Project.
5. Description of proposed Work:
1) Scope of cutting, patching, alteration, or excavation.
2) Trades that will execute Work.
3) Products proposed to be used.
4) Extent of refinishing to be done.

C. Alternates to cutting and patching.

D. Cost proposal, when applicable.

E. The scheduled date the Contractor intends to perform the Work and the duration of time to complete the Work.

F. Written permission of other trades whose Work will be affected.

1.4 QUALITY ASSURANCE:

A. Contractor shall ensure that cutting, fitting, and patching shall achieve security, strength, weather protection, appearance for aesthetic match, efficiency, operational life, maintenance, safety of operational elements, and the continuity of existing fire ratings.

B. Contractor shall ensure that cutting, fitting, and patching shall successfully duplicate undisturbed adjacent profiles, materials, textures, finishes, colors, and that materials shall match existing construction. Where there is dispute as to whether duplication is successful or has been achieved to a reasonable degree, the District's decision shall be final.

1.5 PAYMENT FOR COSTS:

A. Cost caused by ill-timed or defective Work or Work not conforming to Contract Documents, including costs for additional services of the District, its consultants, including but not limited to the Construction Manager, the Architect, the Project Inspector(s), Engineers, and Agents, will be paid by Contractor and/or deducted from the Contract by the District.

B. District shall only pay for cost of Work if it is part of the original Contract Price or if a change has been made to the contract in compliance with the provisions of the General Conditions. Cost of Work performed upon instructions from the District, other than defective or nonconforming Work, will be paid by District on approval of written Change Order. Contractor shall provide written cost proposals prior to proceeding with cutting and patching.

PART 2 PRODUCTS

2.1 MATERIALS:

A. Contractor shall provide for replacement and restoration of Work removed. Contractor shall comply with the Contract Documents and with the Industry Standard(s), for the type of Work, and the Specification requirements for each specific product involved. If not specified, Contractor shall first recommend a product of a manufacturer or appropriate trade association for approval by the District.

B. Materials to be cut and patched include those damaged by the performance of the Work.

PART 3 EXECUTION

3.1 INSPECTION:

A. Contractor shall inspect existing conditions of the Site and the Work, including elements subject to movement or damage during cutting and patching, excavating and backfilling. After uncovering Work, Contractor shall inspect conditions affecting installation of new products.

B. Contractor shall report unsatisfactory or questionable conditions in writing to District as indicated in the General Conditions and shall proceed with Work as indicated in the General Conditions by District.

3.2 PREPARATION:

A. Contractor shall provide shoring, bracing and supports as required to maintain structural integrity for all portions of the Project, including all requirements of the Project.

B. Contractor shall provide devices and methods to protect other portions of Project from damage.

C. Contractor shall, provide all necessary protection from weather and extremes of temperature and humidity for the Project, including without limitation, any work that may be exposed by cutting and patching Work. Contractor shall keep excavations free from water.

3.3 ERECTION, INSTALLATION AND APPLICATION:

A. With respect to performance, Contractor shall:
   1. Execute fitting and adjustment of products to provide finished installation to comply with and match specified tolerances and finishes.
   2. Execute cutting and demolition by methods that will prevent damage to other Work, and provide proper surfaces to receive installation of repairs and new Work.
   3. Execute cutting, demolition excavating, and backfilling by methods that will prevent damage to other Work and damage from settlement.

B. Contractor shall employ original installer or fabricator to perform cutting and patching for:
   1. Weather-exposed surfaces and moisture-resistant elements such as roofing, sheet metal, sealants, waterproofing, and other trades.
   2. Sight-exposed finished surfaces.

C. Contractor shall execute fitting and adjustment of products to provide a finished installation to comply with specified products, functions, tolerances, and finishes as shown or specified in the Contract Documents including, without limitation, the Drawings and Specifications.

D. Contractor shall fit Work airtight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces. Contractor shall conform to all Code requirements for penetrations or the Drawings and Specifications, whichever calls for a higher quality or more thorough requirement. Contractor shall maintain integrity of both rated and non-rated fire walls, ceilings, floors, etc.

E. Contractor shall restore Work which has been cut or removed. Contractor shall install new products to provide completed Work in accordance with requirements of the Contract Documents and as required to match surrounding areas and surfaces.

F. Contractor shall refinish all continuous surfaces to nearest intersection as necessary to match the existing finish to any new finish.

END OF SECTION 01 17 32

SECTION 01 17 85 – PRODUCT WARRANTY AND BONDS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. General administrative and procedural requirements for preparation and submission of warranties and bonds as required by the Contract Documents, including manufacturer's standard warranties on products and special Project warranties.

1.2 RELATED DOCUMENTS AND SECTIONS

A. General Conditions of the Contract

B. Section 01 10 10: Summary of Work

C. Section 01 13 30: Submittal Procedures

D. Individual Product Specification Sections: Specific project warranty requirements.

1.3 DEFINITIONS

A. Warranty: Assurance to District by Contractor, installer, supplier, manufacturer or other party responsible as warrantor, for the quantity, quality, performance and other representations of a product, system service of the Work, in whole or in part, for the duration of the specified period of time.

B. Guarantee: Assurance to District by Contractor or product manufacturer or other specified party, as guarantor, that the specified warranty will be fulfilled by the guarantor in the event of default by the warrantor.

C. Standard Product Warranty: Preprinted, written warranty published by product manufacturer for particular products and specifically endorsed by the manufacturer to the District.

D. Special Project Warranty: Written warranty required by or incorporated into Contract Documents, to extend time limits provided by standard warranty or to provide greater rights for District.

E. Correction Period: As defined in the Conditions of the Contract, Correction Period shall be synonymous with "warranty period", "guarantee period" and similar terms used in the Contract Specifications.

1.4 WARRANTIES AND GUARANTEES

A. Warranties and Guarantees: General: Provide all warranties and guarantees with District named as beneficiary. For equipment and products or components thereof bearing a manufacturer's warranty or guarantee that extends for a period of time beyond the Contractor's warranty.

B. Provisions for Special Warranties: Refer to Conditions of the Contract for terms of the Contractor's special warranty of workmanship and materials.

C. General Warranty and Guarantee Requirements: Warranty shall be an agreement to repair or replace, without cost and undue hardship to the District, Work performed under the Contract which is found to be defective during the Correction Period (Warranty or Guarantee) period. Repairs and replacements due to improper maintenance or operation, or due to normal wear, usage and weathering are excluded from warranty requirements.

D. Specific Warranty and Guarantee Requirements: Specific requirements are included in product Specification Sections of Divisions 2 through 16, including content and limitations.

E. Disclaimers and Limitations: Manufacturer's disclaimers and limitations on product warranties and guarantees shall not relieve Contractor of responsibility for warranty and guarantee requirements for the Work that incorporates such products, nor shall they relieve suppliers, manufacturers, and installed required to countersign special warranties with Contractor.

1.5 PREPARATION OF WARRANTY AND BOND SUBMITTALS

A. Number of copies: Make all submittals of warranties, guarantees and bonds in duplicate.

B. Project Warranty and Guarantee Forms: Prepare written documents utilizing the appropriate form, ready for execution by the Contractor, or the Contractor and subcontractor, supplier or manufacturer.

1.6 FORM OF WARRANTY AND BOND SUBMITTALS

A. Form of Warranty and Bond Submittals: Prior to final Application and Certificate for Payment, collect and assemble all written warranties and guarantees into binders and delivery binders to Construction Manager for final review and acceptance.

1.7 TIME OF WARRANTY AND BOND SUBMITTALS

A. Submission: Submit fully executed copies of warranties, guarantees and bonds within ten (10) days of date identified in Notice of Completion, but no later than three (3) days prior to date of final Application for Payment.

B. Date of Warranties and Bonds: Unless otherwise directed or specified, commencement date or warranty, guarantee and bond periods shall be the date established in the Notice of Completion.

END OF SECTION 01 17 85

SECTION 01 17 89 – PROJECT RECORD DOCUMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Maintain at the site one full size record copy of the following:
   1. Plain paper copy drawings (Project Record Drawing prints).
   2. Project Manual (Conditions of the Contract and specifications).
   3. Addenda.
   4. Modifications (Proposed Change Orders, RFI's, Change Orders, Construction Change Directives, Construction Change Documents, written orders) and other changes in the work issued by Architect, District or Project Manager.
   5. Submittals (Shop Drawings, product data, and samples)
   6. Quality control documents (field test records).

B. Related Sections:
   1. Section 01 10 05: Administrative Procedures.
   2. Section 01 14 00: Quality Control

1.2 STORAGE OF DOCUMENTS AND SAMPLES

A. Store documents and samples in field office apart from documents used for construction.
   1. Provide files and racks for storage of documents.
   2. Provide secure storage space for storage of samples.

B. Make documents and samples available for review by Construction Manager, Architect, Project Inspector and District.
   1. Maintain documents in a clean, dry, legible condition and in good order. Do not use record documents for construction purposes.
   2. Demonstrate that project record documents are up-to-date each month as a condition to approval of Application and Certificate of Payment.

1.3 RECORDING

A. Record information concurrently with construction progress. Do not conceal work until required information is recorded.

B. Drawings: Provide, and maintain in an up-to-date condition, a complete record set of prints indicating each change from original Contract Drawings. Complete entries in a neat, clear, and professional manner. Legibly record actual construction of the following: Depth of foundation in relation to finish first floor.
   1. Horizontal and vertical locations of underground utilities and appurtenances, with references to permanent surface improvements.
   2. Locations of internal utilities and appurtenances concealed in the construction, including under slab, with references to visible and accessible features of the structure.
   3. Field changes of dimensions and details. Changes made by Addenda, RFI, approved Proposed Change Orders, approved Change Orders and other changes in the work issued by the Architect, District or Project Manager.
   4. Details not issued with original Contract Drawings.

C. Specifications and Addenda: Legibly mark each Section to record:
   1. Manufacturer, trade name, catalog number, and supplier of each product and item of equipment actually installed.
   2. Changes made by Addenda, RFI, approved Proposed Change Orders, approved Change Orders and other changes in the work issued by the Architect, District or Project Manager.

1.4 SUBMITTALS

A. Upon completion of the Work and as a condition precedent to approval of final payment, Contractor shall obtain Inspector's approval of the record set and employ a competent draftsman to transfer the updated project record information to the most current version of AutoCAD, and print a complete set of reproducible documents. When completed Contractor shall deliver reproducible and Diskette with AutoCAD file to Construction Manager.
   1. Sets shall be clearly marked PROJECT RECORD in 3/8-inch high (38-point) letters.
   2. District to provide AutoCAD base drawings for Contractor's use in preparing project records.

B. Deliver to Architect/District upon completion of work two (2) complete sets of contract drawings (white prints) marked up to show all deviations from indicated installations. Markings shall include:
   1. Changes in routings of concealed piping.
   2. Changes in electrical circuitry and home runs.
   3. Other changes to conceal work which affect future maintenance and repair operations.

END OF SECTION 01 17 89

SECTION 02 41 19 SELECTIVE DEMOLITION

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes requirements including but not limited to:
   1. Demolition and removal of selected portions of existing roofing.
   2. Accessories necessary for demolition and deconstruction.

1.3 DEFINITIONS

A. Remove: Detach items from existing construction and dispose offsite.

B. Remove and Reinstall: Detach items from existing construction with care to prevent damage, clean and refurbish, prepare for reuse, store as necessary, and reinstall where indicated.

C. Deconstruct: To remove by disassembling or detaching an item from a surface, using methods and equipment to successfully prevent damage to the item and surfaces; and dispose of items.

1.4 SUBMITTALS

A. Engineering Survey: Submit engineering survey of condition of building, and roof structures.

B. Proposed Protection Measures: Submit report, including Drawings, indicating proposed measures for protecting individuals and property, for environmental protection, dust control and noise control. Indicate proposed locations, types, and construction of barriers.

C. Schedule of Selective Demolition Activities:
   1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure Owner's on site operations are uninterrupted.
   2. Interruption of utility services. Indicate how long utility services will be interrupted.
   3. Coordination for shutoff, capping, and continuation of utility services.
   4. Use of elevator and stairs.
   5. Coordination of Owner's continuing occupancy of portions of existing building and of Owner's partial occupancy of completed Work.

D. Pre-demolition Photographs or Video: Show existing conditions of adjoining construction, including finish surfaces that could be construed as damage caused by demolition operations. Submit prior to commencement of the work.

E. Warranties: Documentation indicating that existing warranties are still in effect after completion of selective demolition.

1.5 QUALITY ASSURANCE

A. Regulatory Requirements:
   1. Demolition Standards: Comply with ASSE A10.6 and NFPA 241.
   2. Comply with EPA regulations prior to commencement of the work. Comply with hauling and disposal regulations of authorities having jurisdiction.
   3. Comply with applicable federal, state, and local codes for demolition work, dust and noise control, safety of structure, and debris removal.
   4. Obtain required permits from authorities having jurisdiction.

B. Pre-demolition conference to be conducted at the site:
   1. Inspect and discuss condition of construction to be selectively demolished.
   2. Review structural load limitations of existing structure.
   3. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.
   4. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.
   5. Review areas where existing construction scheduled to remain and requires protection.
   6. Review with Owner Staging areas for equipment and material storage and removal.

C. Arrange selective demolition schedule to avoid interference with Owner's and the school's operations.

1.6 WARRANTY

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials and using approved contractors so as not to void existing warranties. Notify warrantor prior to proceeding. Existing warranties to be provided by Owner prior to the start of construction.

B. Notify warrantor on completion of selective demolition, and obtain documentation verifying existing system has been inspected and warranty remains in effect. Submit supporting documentation at closeout.

1.7 DELIVERY, STORAGE, AND HANDLING

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

B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and the contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.

PART 2 PRODUCTS

2.1 MATERIALS

A. Repair Materials:
   1. Use repair materials identical to existing materials:
      a. If identical materials are unavailable or cannot be used for exposed surfaces, use materials that visually match existing adjacent surfaces to the fullest extent possible.
      b. Use materials whose installed performance equals or surpasses that of existing materials.

B. Comply with material and installation requirements specified in individual Specification Sections.

PART 3 EXECUTION

3.1 ROOF REMOVAL

A. Roof Assembly:
   1. Remove existing roofing to the extent that can be covered in one day by new roofing. Maintain building interior in watertight and weathertight condition:
      a. Remove existing roof membrane, flashings, copings, and roof accessories.
      b. Remove existing roofing system down to substrate.

B. At new column extensions, cut through roofing as required for welding of new extension. Provide temporary watertight enclosure over stubs and temporarily flash to existing roof to make completely watertight.

C. At existing parapets, remove portions of roofing, flashing, stone, and masonry necessary to weld new steel and set form work. Provide temporary watertight enclosures over areas of open roof and temporarily flash to make watertight.

D. As column forms are placed, temporarily flash columns to existing roofing and cover with watertight tarpaulins before and after pouring. After column forms have been removed, temporarily flash new concrete structure into existing roofing immediately to maintain watertight roof.

E. When removing roofing to place supports for shoring of form work to transfer loads to existing columns or approved structure or to support scaffolding, work platforms, or similar loads, temporarily flash supports to make roof watertight.

F. Remove excess residue. Thoroughly clean and remove asphalt, dust, loose materials and leave ready for new work.

3.2 PATCHING AND REPAIRS

A. Promptly repair damage to adjacent construction caused by selective demolition operations.

B. Repairs:
   1. When necessary to repair to existing surfaces, patch to produce surfaces suitable for new materials:
      a. Fill holes and depressions in existing masonry walls to remain with masonry patching material applied according to manufacturer's written recommendations.

C. Finishes: Restore exposed finishes of patched areas and extend restoration into adjoining construction in a manner that eliminates evidence of patching and refinishing.

3.3 DISPOSAL OF DEMOLISHED MATERIALS

A. Legally remove demolition waste materials from site and dispose in an EPA approved construction and demolition waste landfill acceptable to authorities having jurisdiction recycle or reuse components:
   1. Do not allow demolished materials to accumulate on site.
   2. Remove and transport debris to prevent spillage on adjacent surfaces and areas.
   3. Remove debris from elevated portions of building by chute, hoist, or devices that

conveys debris to grade level in a controlled descent.

B. Burning: Do not burn demolished materials.

3.4 CLEANING

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

END OF SECTION 02 41 19

SECTION 07 54 19 PVC THERMOPLASTIC MEMBRANE ROOFING

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section is related to work pertaining to the roofing system, including mechanical, plumbing, and electrical items penetrating the roof system and includes:
   1. Installation of adhered PVC thermostatic roofing membrane with flashings and other components to comprise a roofing system.
   2. Flashing and caulking.
   3. Tapered roof insulation.
   4. Crickets.
   5. Cover board.
   6. Wood nailers and shims.
   7. Sheet metal terminations.
   8. Walkway protection.
   9. Expansion joints.
   10. Deck repair/replacement.
   11. Other work incidental to the complete and proper installation of a watertight roofing system as shown on the Drawings and specified herein, and in accordance with all applicable requirements of the Contract Documents.

B. Related Sections:
   1. Section 06 10 00: Rough Carpentry.
   2. Section 07 21 00: Thermal Insulation.
   3. Section 07 62 00: Sheet Metal Flashing and Trim.
   4. Section 07 72 00: Roof Accessories.
   5. Section 07 92 00: Joint Sealants.
   6. Section 07 95 00: Expansion Control.

C. Reference Standards:
   1. American Society for Testing and Materials (ASTM):
      a. A385 Practice for Providing High-Quality Zinc Coatings (Hot-Dip).
      b. D570 Water Absorption of Plastics.
      c. D751 Method of Testing Coated Fabrics.
      d. D4434 Poly (Vinyl Chloride) Sheet Roofing.
      e. E84 Standard Test Method for Surface Burning Characteristics of Building Materials.
      f. E108 (Rev. A) Fire Tests of Roof Coatings.
   2. ASCE-7 Wind uplifts requirements for geographical area.
   3. National Roofing Contractors Association (NRCA) Roofing and Waterproofing Manual.
   4. Single Ply Roofing Institute (SPRI).
   5. Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA) Architectural Sheet Metal Manual.
   6. California Building Code (CBC).
   7. Underwriter’s Laboratories Inc. (UL):
      a. UL RMSD Roofing Materials and Systems Directory, Current Edition.
      b. UL 790 Fire Resistance of Roofing Coverings Materials, Current Edition.

c. Exterior Fire Exposure Classification: Class A, ASTM E108, for application and slopes shown.
d. UL 90 Wind uplift requirements.

1.3 DEFINITIONS

A. Roofing Terminology: Definitions in NRCA's The NRCA Roofing and Waterproofing Manual apply to work of this Section.

1.4 SUBMITTALS

A. Product Data: For each type of product. MSDS sheets. Manufacturer's printed instructions, schedules, charts, literature, and illustrations to indicate the performance, fabrication procedures, product variations, adhesive, and accessories to be used in the Work.

B. Shop Drawings:
1. Furnish from copies of the manufacturer's literature or from copies of NRCA Roofing and Waterproofing Manual, current edition:
   a. For roofing system, include plans, elevations, sections, details, and attachments to other work, including:
      1) Base flashings and membrane terminations.
      2) Tapered insulation, including slopes.
      3) Roof plan showing orientation of steel roof deck and orientation of roofing, fastening spacing, and patterns for mechanically fastened roofing.
      4) Insulation fastening patterns for corner, perimeter, and field-of-roof locations including roof drains and roof access panels, per ASCE-7.
      5) Furnish Project sequencing, staging, material loading, manpower plans, and Project construction schedule for approval.

C. Samples:
1. Furnish samples of roof membrane.
2. Furnish sample of metal edge to be installed.

D. Research/evaluation reports for components of roofing system, from ICC-ES.

E. Sample warranties for manufacturer's special warranties.

F. Certifications:
1. Manufacturer's written certification that installer is approved and licensed to install specified roofing system (submit a copy with Proposal Form).
2. Manufacturer's affidavits that materials used in Project contain no asbestos.
3. Installer shall submit resume and project experience list for proposed system for project manager and jobsite superintendent.
4. Installer shall submit written certification that there are no undocumented workers being employed by them or any subcontractor on this Project and that covers all workers on this Project by workmen's compensation.
5. Installer shall submit list of all subcontractors with evidence of subcontractor's insurance coverage in compliance with contract requirements.
6. Manufacturer's written certification of approval/acceptance of these specifications and details.

G. Referenced Standards: Two (2) copies of each referenced standard and retain approved copies at site.

H. Upon substantial completion of work, submit the following to Architect for his submission to

Owner:

1. Manufacturer's warranty: Manufacturer's written warranty as specified.
2. Contractor's warranty: Contractor's written warranty as specified.
3. Maintenance procedures: Three (3) copies of roof system manufacturer's printed instructions for Owner's use regarding care and maintenance of roof. Refer to Section 01 78 23: Operation and Maintenance Data.
4. Affidavits from material manufacturers, suppliers, and sub-contractors for release of liens.
5. Refer to sections: 01 77 00: Closeout Procedures and 01 78 39: Project Record Documents for additional requirements of close-out documents.
6. Maintenance data: For roofing system to include in maintenance manuals.
7. Field quality-control reports.

1.5 PERFORMANCE REQUIREMENTS

A. General Requirements: Provide an installed thermoplastic single ply roofing system, flashing, and related work that is watertight and will not permit the passage of liquid water, able to withstand wind loads, thermally induced movement, and exposure to weather without failure.

B. Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application, as demonstrated by roofing system manufacturer based on testing and field experience.

C. Roofing System Design - Comply with SPRI Wind Design Guide for Fully Adhered Roofing Systems for the following ground roughness exposure and system design:
   1. Exposure: City, suburban areas, towns, and wooded terrain.
   2. Mechanically attached.

D. American Architectural Manufacturer's Association (AAMA).

E. American National Standards Institute (ANSI).

F. 2022 California Building Code (CBC).

G. Occupational Safety and Health ACT (OSHA).

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications: A qualified manufacturer that is ISO 9001 certified for roofing system identical to that used for this Project.

B. Installer Qualifications: A qualified firm that is approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's special warranty.

C. Regulatory Requirements:
   1. Classification by Underwriters' Laboratories, Inc. as a Class A roof covering.
   2. Roof must meet Class A surface flame spread and smoke density measurements, per ASTM E84: Flame spread 0-25, smoke-developed 0-450.
   3. Roofing system shall be installed in accordance with ASCE-7 wind uplift requirements for geographical location and a 90 MPH three (3) second gust wind speed zone with an importance factor of 1.15 based on CBC requirements. Wind-resistance loads listed below have a safety factor of 2.0 incorporated into the calculation.

4. Follow local, state, and federal regulations of safety standards and codes. Refer to applicable building code or California Building Code for roofing system installation requirements and limitations.

D. Installer shall be an experienced single firm specializing in the type of roofing and sheet metal work required, employing only experienced workers for the class of work in which they are employed, having at least five (5) years' successful experience on projects similar in size and scope and acceptable and licensed as applicators by the material manufacturer.

E. Application of materials shall be in accordance with the manufacturer's recommendations. In the instance of a conflict between these specifications and those of the manufacturer, the most stringent shall take precedence.

F. Pre-Installation Conference:
1. Pre-installation roofing conference is to be conducted at Project site:
   a. Meet with Owner, Architect, Owner's insurer if applicable, testing and inspecting agency representative, roofing installer, roofing system manufacturer's representative, deck installer, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof-mounted equipment.
   b. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
   c. Review and finalize construction schedule, and verify availability of materials, installer's personnel, equipment, and facilities needed to make progress and avoid delays.
   d. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
   e. Review structural loading limitations of roof deck during and after roofing.
   f. Review base flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that affects roofing system.
   g. Review governing regulations and requirements for insurance and certificates if applicable.
   h. Review temporary protection requirements for roofing system during and after installation.
   i. Review roof observation and repair procedures after roofing installation.

1.7 WARRANTY

A. Manufacturer System Warranty:
1. Provide 15-year system warranty. The system warranty shall provide for the roof membrane, all accessories that comprise a roof system and contractor labor. The warranty shall be non-prorated, provide for no dollar limit (NDL), and shall not exclude ponding water and no time limited shall be assigned for any such ponding water during the warranty period.

B. Installer Warranty:
1. Provide separate five (5) year workmanship warranty. In the event any work related to roofing, flashing, or metal is found to be within the installer warranty term defective or otherwise not in accordance with the Contract Documents, the installer shall repair that defect to the Owner and copy be sent to the manufacturer.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in manufacturer's original unopened packaging with all tags and labels intact and legible. Carton and can labels shall indicate appropriate warnings, storage conditions, lot numbers, and usage instructions. Handle and store materials and equipment

in such a manner as to avoid damage. The proper storage of materials is the sole responsibility of Contractor. Materials damaged in shipping or storage shall not be used. Wet or damaged roofing materials shall be discarded, removed from jobsite, and replaced with new materials prior to application.

B. Manufacturer's packaging and/or roll plastic is not acceptable for exterior storage. Tarpaulin with grommets shall be accepted minimum for exterior coverings. All materials stored, as above shall be minimum of four inches (4") off the substrate, and the tarpaulin tied off with rope.

C. Moisture sensitive products shall be maintained in dry storage areas or properly covered. Roofing insulation and felts must always be covered or stored in a dry area when not being used.

D. Products liable to degrade as a result of being frozen shall be maintained above 40 degrees F in heated storage.

E. Discard and legally dispose of liquid material that cannot be applied within its stated shelf life.

F. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Store in a dry location. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. PVC Thermoplastic Membrane Roofing is subject to compliance with requirements; provide either the named product or a comparable product by one of the other manufacturers specified:
   1. G410 Feltback, 80mil by Sika Corp. (basis of design).
   2. Or equal (reference Section 01 25 13: Product Substitution Procedures).

2.2 ROOF ASSEMBLY

A. Class A roofing (assembly from bottom up):
   1. Existing or new roof structure:
      a. Plywood roof decking.
      b. Rigid insulation (sloped).
      c. Separation board (1/4-inch DensDeck minimum).
      d. Membrane Roofing.

B. Single ply membrane system shall be a complete system, all components of which are provided by one manufacturer:
   1. G410 Feltback fiberglass reinforced membrane with an integral factory-applied lacquer coating to repel dirt and sustain reflectivity and factory applied nine (9) ounce geotextile felt backing:
      a. Membrane shall conform to ASTM D4434, classification Type II, Grade I.

C. Color: EnergySmart feltback - white, initial reflectivity of 0.83, initial emissivity .092, solar reflective index (SRI) of >104.

D. Provide textured walkway material three-feet (3') wide meeting OSHA requirements and

provided by the membrane manufacturer (see specification this Section).

E. General - Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with roofing:
   1. Wall/curb flashing:
      a. G410 Membrane; 48 mil fiberglass reinforced membrane adhered to approved substrate using adhesive.
      b. Clad: PVC-coated, heat-weldable sheet metal capable of being formed into a variety of shapes and profiles. Clad to be 25-gauge minimum, G90 galvanized metal sheet with a 20 mil unsupported membrane laminated on one side. The dimensions of Clad are four feet by eight feet (4' x 8') or four feet by ten feet (4' x 10').
   2. Perimeter edge flashing:
      a. Clad: PVC-coated, heat-weldable sheet metal capable of being formed into a variety of shapes and profiles. Clad to be 25-gauge minimum, G90 galvanized metal sheet with a 20 mil unsupported membrane laminated on one side.
      b. Non-typical edge: Project-specific perimeter edge detail reviewed and accepted for one-time use by the Sarnafil/Sika Technical Department. Manufacturer to review prior to start of work.
   3. Miscellaneous flashing:
      a. Flashing: Prefabricated expansion joint cover made from the membrane. Flash is designed for securement to wall or horizontal surfaces to span and accommodate the movement of the new and existing expansion gaps; refer to roof expansion details.
      b. Reglet: A heavy-duty, extended aluminum flashing termination reglet used at wall and large curbs. Reglet is produced from 6063-T5, 0.10-inch to 0.12-inch thick extruded aluminum. Reglet profile as detailed and provide min ten-foot (10') lengths. Use prefabricated Reglet mitered inside and outside corners where walls intersect.
      c. Stack: Prefabricated vent pipe flashing made from 0.048-inch thick G410 membrane.
      d. Circle-G: Circular 0.048-inch thick G410 membrane patch welded over T-joints formed by overlapping thick membranes.
      e. Corner: Prefabricated outside and inside flashing corners made of 0.060-inch (60 mil) thick membrane that are heat-welded to membrane of Clad base flashings. Size appropriate to site conditions.
      f. Multi-purpose sealant: A sealant used at flashing terminations approved by manufacturer.
      g. StaBond Adhesive: Solvent based and provided by roofing manufacturer to attach membrane to flashing substrate.
      h. Felt: Non-woven polyester of polypropylene mat cushion layer that is behind G410 or flashing membrane when the flashing substrates are rough-surfaced or incompatible with the flashing membrane.

F. Substrate Cover Board or Separation Board:
   1. Fiberglass mat gypsum roof boards to be DensDeck Prime by Georgia Pacific, complying with ASTM C1177: 1/4-inch thickness.

G. Miscellaneous Accessories: Provide concrete splash blocks at roof leader terminated six-inches (6") above roof. Coordinate bird and bug screens. Roof hatch access steps and flashing. Mechanical equipment curbs and access panels.

H. Tapered Board Insulation (ASTM C578):
   1. Provide one (1) of the following:
      a. Expanded polystyrene (EPS) insulation board.

b. Rigid isocyanurate (ISO) foam insulation with black mat facers.

PART 3 EXECUTION

3.1 FIELD CONDITIONS

A. Weather Limitations - Proceed with installation only when existing and forecasted weather conditions permit roofing system to be installed according to manufacturer's written instructions and warranty requirements:
   1. Environmental requirements:
      a. Apply roofing in dry weather.
      b. Do not expose roof components and flashing in inclement weather or when it is predicted 30 percent or more possibility for inclement weather.
      c. When ambient temperature is below 40 degrees Fahrenheit, expose only enough sensitive cements, sealants, and adhesives as required for use within a four (4) hour period.
      d. Do not expose membrane and accessories to a constant temperature of 180 degrees Fahrenheit.

B. Inspections/Tests:
   1. The Owner’s, Architect’s, and manufacturer’s representatives shall at all times have access to the jobsite and work areas. Contractor will provide proper and safe facilities for such access and inspection:
      a. Owner/Architect inspections:
         1) Provide periodic inspections throughout the duration of the Project. Representative shall inspect after completion of each major phase of construction for approval.
      b. Manufacturer inspections:
         1) An inspection shall be made by a representative of the material manufacturer four (4) times per month during performance of work and at all major phases of construction, to ensure that said project is installed in accordance with the manufacturer’s specifications and illustrated details. Daily written reports by the manufacturer shall be turned over to the Architect, on each Monday following the inspection.
         2) The authorized material manufacturer’s field representative shall be responsible for:
            a) Keeping the Architect informed after periodic inspections as to the progress and quality of the work observed.
            b) Calling to the attention of Contractor those matters observed that are considered to be in violation of the contract requirements.
            c) Reporting to the Architect, in writing, any failure or refusal of Contractor to correct unacceptable practices called to his attention.
            d) Confirming, after completion of the work and based on his observation and test, that he has observed no application procedures in conflict with these specifications. Final payment will not be released until the Architect has received all specified warranties.
   2. Any failure by the Owner’s, Architect’s, or manufacturer’s representatives to detect, pinpoint, or object to any defect or noncompliance of these specifications of work in progress or completed work shall not relieve Contractor, or reduce, or in any way limit, his responsibility of full performance of work required of him under these specifications.
   3. Architect may require tests and inspections as necessary to verify quality of roofing materials and workmanship. Laboratory tests will be performed in accordance with ASTM standard procedures.

C. Existing Conditions:
   1. Examine existing building and new construction to determine existing physical conditions that affect installation of new roofing. Examine substrates, areas, and conditions, with installer present, for compliance with requirements and other conditions affecting performance of the Work:
      a. Verify that roof openings and penetrations are in place, curbs are set and braced, and roof-drain bodies are securely clamped in place.
      b. Verify that wood blocking, curbs, and nailers are securely anchored to roof deck at penetrations and terminations and that nailers match thicknesses of insulation.
      c. Verify that minimum drying period recommended by roofing system manufacturer has passed.
      d. Verify all roof surfaces are smooth and free of dirt, debris, and incompatible materials.
      e. Verify all roof surfaces shall be free of water.

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

E. Protection:
   1. Provide special protection and avoid traffic on completed areas of membrane installation.
   2. Restore to original condition or replace work or materials damaged during handling of roof materials.
   3. Take precautions as required to protect adjacent work and structures.

F. Emergency Equipment: Maintain onsite equipment necessary to apply emergency temporary edge seal in event of sudden storms or inclement weather.

G. Restrictions:
   1. Comply with General Requirements on use of site.
   2. Smoking is prohibited on all roof areas or in existing buildings.
   3. Maintain facility and all utility services in a functional condition.
   4. Provide sanitary facilities for employees.

H. Examine and verify that receiving substrate surfaces of the structure have no defects or errors, which would result in poor or potentially defective application or cause latent defects in workmanship:
   1. Examine substrate to which roofing material is to be applied to ensure that its condition is satisfactory for roofing application. Do not permit voids greater than 1/4-inch wide in the substrate. Substrates for roofing materials shall be dry and free of oil, dirt, grease, sharp edges, and debris. Inspect substrates and correct defects before application of thermoplastic sheets.

3.2 PREPARATION

A. Clean substrate of dust, debris, moisture, and other substances detrimental to roofing installation according to roofing system manufacturer's written instructions. Remove sharp projections.

B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction. Remove roof drain plugs when no work is taking place or when rain is forecast.

3.3 ROOFING INSTALLATION, GENERAL

A. Install roofing system according to roofing system manufacturer's written instructions.

B. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system at end of workday or when rain is forecast. Remove and discard temporary seals before beginning work on adjoining roofing.

C. Base Flashing: Fully adhere base flashings to the substrate in manufacturer provided bonding adhesive. Install termination bar and sealant at the top of base flashing.

D. Install roofing and auxiliary materials to tie into existing roofing where applicable to maintain weather-tightness of transition and to not void warranty for existing roofing system.

3.4 INSULATION INSTALLATION

A. General:
1. Manufacturer's instructions: In regard to attachment, the manufacturer's instructions or specifications shall determine the suitability for an application.
2. Precautions: The surface of the insulation must not be ruptured or damaged prior to installation of the roof membrane. Replace damaged boards.
3. Thermal insulation boards shall be laid on the substrate in parallel rows with end joints staggered and butted as close as possible. All joints shall be tight and at the roof perimeter and roof penetrations; insulation shall be cut neatly and fitted to reduce openings to a minimum. All openings 1/4 inch or larger shall be filled with insulation.
4. Insulation shall be tapered or feathered at drains and scuppers to provide proper drainage (if applicable).
5. No more insulation shall be installed than can be covered by the completed roof system by the end of the day or the onset of inclement weather.
6. Tapered insulation and crickets, when specified, shall be placed in accordance with the drawings and/or as required by NRCA standards.

B. Install tapered insulation under area of roofing to provide positive drainage.

C. Install insulation under area of roofing to achieve designed thickness:
1. Where overall insulation thickness is three inches (3”) or greater, install two (2) or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of six inches (150 mm) in each direction.

D. Trim surface of insulation where necessary at roof drains so completed surface is flush and does not restrict flow of water.

E. Install insulation with long joints of insulation in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4 inch (6 mm) with insulation.

F. Install cover board over the insulation, staggering joints a minimum of 12 inches in all directions. Mechanically attach to the deck a minimum of eight (8) fasteners per board.

3.5 FLASHING INSTALLATION

A. Install sheet flashings and performed flashing accessories and adhere to substrate according to roofing system manufacturer’s written instructions.

B. Apply bonding adhesive to substrate and underside of flashing sheet at required rate and allow to partially dry. Do not apply bonding adhesive to seam area of flashing.

C. Flash penetrations and field-formed inside and outside corners with sheet flashing as

recommended by manufacturer.

D. Clean seam areas, overlap seams, and firmly roll flashings into the adhesive. Weld side and end laps to ensure a watertight seam installation.

E. Test lap edges with probe to verify seam weld continuity. Apply lap sealant if required by roofing manufacturer, and seal exposed edges of sheet flashing terminations per manufacturer's requirements.

F. Terminate and seal top sheet flashings and mechanically anchor to substrate through termination bars.

3.6 WALKWAY INSTALLATION

A. Flexible Walkways: Install walkway products in locations indicated. Heat weld to substrate according to roofing system manufacturer's written instructions. Leave three inches (3”) of space between adjacent walkway.

B. Install around mechanical units and roof top units.

3.7 FIELD QUALITY CONTROL

A. Owner’s Inspector of Record to inspect substrate conditions, surface preparation, membrane application, flashings, protection, and drainage components, and furnish reports to Architect prior to install of finished roof materials. If conditions are not met, Contractor to repair and request re-inspection for verification.

B. Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion.

C. Repair or remove and replace components of roofing system where inspections indicate that they do not comply with specified requirements.

D. Additional testing and inspecting, at Contractor's expense, will be performed to determine if replaced or additional work complies with specified requirements.

E. Manufacturer’s Quality Control Inspection: The manufacturer’s technical representative shall review the on-going work on a minimum of one (1) time every ten (10) working days. All defects noted noncompliance with the specifications or the recommendations of the thermoplastic manufacturer should be itemized in a punch list. These items must be corrected immediately by Contractor to the satisfaction of the Owner's representative and the thermoplastic manufacturer.

3.8 PROTECTING AND CLEANING

A. Protect roofing system from damage and wear during remainder of construction period. When remaining construction does not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to Architect and Owner.

B. Immediately remove all spots, smears, stains, residues, adhesives, etc., from the work of this Section and/or upon adjacent areas or surfaces, which result from the work of this Section.

C. Upon completion of the work of this Section, dispose of, away from the site, all debris, trash, containers, residue, roofing remnants, and scraps resulting from the work of this Section.

D. Correct deficiencies in or remove roofing that does not comply with requirements, repair substrates, reinstall roofing, and repair sheet flashings to a condition free of damage and deterioration at the time of Substantial Completion and according to warranty requirements.

E. All warranties, as required for the Project by this specification, shall be submitted for approval prior to final payment.

F. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

3.9 ACCEPTANCE

A. Prior to demobilization from the site, the Owner/project manager, Architect, and installer shall review the work. All defects noted noncompliance with the specifications or the recommendations of the thermoplastic manufacturer should be itemized in a punch list. These items must be corrected immediately by Contractor prior to demobilization to the satisfaction of the Owner/project manager and the thermoplastic manufacturer.

B. Notify Architect and Owner 48 hours in advance of the date and time of inspection.

END OF SECTION 07 54 19

SECTION 07 55 56

FLUID-APPLIED PROTECTED MEMBRANE WATERPROOFING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Provide a protected cold-fluid-applied polyurethane roofing/waterproofing system on structural concrete, plywood sheathing, cover board, metal or other substrates.

1. Work includes preparation of existing PVC membrane.
2. Removal of flashing membrane around internal drains to allow for direct liquid membrane application to drain bowl assembly. Membrane removal should extend at least 6” in all directions around drain assembly.
3. Install liquid membrane minimum 4” above existing sheet membrane termination, directly to prepared substrate.
4. Liquid membrane installation.
5. Drainage composite installation.
6. Expanded polystyrene insulation, loose laid.
7. Filter fabric.
8. Decorative stone covering.
9. Work includes bridging and sealing air leakage and water intrusion pathways and gaps including connections of the walls to the roof air barrier, and penetrations of the building envelope including piping, conduit, ducts and similar items.

B. Related Work: The following items are not included in this Section and are specified under the designated Sections:

1.3 PERFORMANCE REQUIREMENTS

A. Cold fluid applied polyurethane protected roofing/waterproofing system is intended to perform as a continuous barrier against liquid water and to flash or discharge to the exterior incidental water. Membrane system is intended to receive an overburden of insulation and ballast or concrete pavers and shall accommodate movements of building materials as required with accessory sealant materials at locations such as: changes in substrate, perimeter conditions and penetrations.

B. Installed roofing/waterproofing membrane system shall not permit the passage of water and will withstand the design pressures calculated in accordance with the most current revision of ASCE 7.

C. Manufacturer shall provide all primary roofing/waterproofing materials that are physically and chemically compatible when installed in accordance with manufacturers current application requirements.

1.4 SUBMITTALS

A. Submittals: Comply with project requirements for submittals as specified in Division 01.

B. Product Data: For each product.

C. Shop Drawings: Manufacturer's standard details and shop drawings for the specified system.

D. Manufacturer must provide a complete Cradle-To-Grave Life Cycle Analysis (LCA) and Environmental Product Declaration (EPD) according to ISO 14025:2006 for the roofing/waterproofing system.

E. Installer's Authorization: Installer shall provide written documentation from the manufacturer of their authorization to install the system, and eligibility to obtain the warranty specified in this section.

F. Manufacturer' Certification: Certification showing full time quality control of production facilities and that each batch of material is tested to ensure conformance with the manufacturer's published physical properties.

G. VOC Certification: Manufacturer's certification that all roofing/waterproofing system products meet current Volatile Organic Compound (VOC) regulations as established by the State in which they are being installed; and stating total VOC content, in grams per liter, for all system components (i.e. primers, adhesives, coatings, etc.).

1.5 QUALITY ASSURANCE

A. Manufacturer's Qualifications: Manufacturer shall demonstrate qualifications to supply materials of this section by certifying the following:

1. Membrane Manufacturer shall show evidence that the specified membrane has been manufactured by the same organization or direct affiliate for fifteen years.
2. Membrane Manufacturer shall have available an in-house technical staff to assist the contractor when necessary in the application of the products and site review of the assembly.

B. Installer's Qualifications: The Contractor shall demonstrate qualifications to perform the Work of this Section by submitting certification or license by the roofing/waterproofing membrane manufacturer as a trained and authorized applicator of the product the installer intends to use.

C. Source Limitations: All components listed in this section shall be provided by a single manufacturer or approved by the primary roofing/waterproofing manufacturer.

D. Materials Compatibility: All materials included in the roofing/waterproofing assembly, as well as associated materials adhered to/applied beneath the roofing/waterproofing membrane shall have been tested and verified to be compatible. Include written testing documentation and test reports if requested by Architect.

E. Final Inspection: Manufacturer's representative shall provide to the Architect a comprehensive site visit report after the completion of the roofing/waterproofing system

F. Applicable Regulations: Comply with local code and requirements of authorities having jurisdiction. Do not exceed VOC regulations as established by the State in which they are being

installed, including total VOC content, in grams per liter, for all system components (i.e. primers, adhesives, coatings, and similar items).

G. Roofing Terminology: Refer to ASTM D1079 and the glossary of the National Roofing Contractors Association (NRCA) Roofing and Waterproofing Manual for definitions of roofing terms related to this section.

1.6 PRE-INSTALLATION CONFERENCE

A. Prior to scheduled commencement of the roofing/waterproofing installation and associated work, conduct a meeting at the project site with the installer, architect/consultant, owner, manufacturer's representative and any other persons directly involved with the performance of the Work. The Installer shall record conference discussions and to include decisions and agreements reached (or disagreements) and furnish copies of recorded discussions to each attending party. The main purpose of this meeting is to review foreseeable methods and procedures related to the Work.

1.7 DELIVERY, STORAGE AND HANDLING

A. Deliver all roofing/waterproofing materials to the site in original containers, with factory seals intact.

B. Store all pail goods in their original undamaged containers in a clean, dry location within their specified temperature range.

C. Do not expose materials to moisture in any form before, during, or after delivery to the site. Reject delivery of materials that show evidence of contact with moisture.

D. Remove manufacturer supplied plastic covers from materials provided with such. Use "breathable" type covers such as canvas tarpaulins to allow venting and protection from weather and moisture. Cover and protect materials at the end of each workday. Do not remove any protective tarpaulins until immediately before the material will be installed.

E. Materials shall be stored above 55°F (12.6°C) a minimum of 24 hours prior to application

1.8 PROJECT CONDITIONS

A. Weather: Proceed with roofing/waterproofing only when existing and forecasted weather conditions permit. Membrane application can proceed when precipitation is imminent. Sikalastic RoofPro is capable of curing in immersion immediately after application. Visual marks in the form of pock marks may occur if uncured membrane is exposed to heavy rainfall but is not considered a limiting factor in the performance of the roofing membrane. Ambient/Substrate temperatures shall be above 41°F (5°C) when applying the roofing/waterproofing system.

B. All surfaces to receive the roofing/waterproofing membrane shall be free from visible water, dew, frost, snow and ice. Application of roofing/waterproofing membrane shall be conducted in well ventilated areas.

C. Roofing Membrane:

1. Roofing/waterproofing membrane is not intended to be exposed or in contact with a constant temperature below -22°F (-30°C) or in excess of 176°F (80°C). See technical data sheets for limitations, i.e., hot pipes and vents or direct steam venting.

2. Specified roofing/waterproofing membrane is non-flammable and VOC compliant. Consult container, packaging labels and Material Safety Data Sheets (MSDS) for specific safety information.
3. Specified roofing/waterproofing membrane is resistant to gasoline, paraffin, fuel oil, mineral spirits, and moderate solutions of acids and alkalis, acid rain and detergents. Some low molecular weight alcohols can soften. Any exposure to foreign materials or chemical discharges shall be presented to membrane manufacturer for evaluation to determine any impact on the waterproof membrane assembly performance prior to warranty issuance.

D. Contractor shall ensure adequate protection during installation of the roofing/waterproofing system.

E. Specified roofing/waterproofing membrane may be used as a temporary roofing/waterproofing barrier when applied at a wet film thickness of 15-20 mils to a properly prepared deck. When the specified roofing/waterproofing membrane is used as a temporary roofing/waterproofing barrier the roofing/waterproofing membrane does not need to be removed prior to installation of the finished roofing/waterproofing system. An approved Sikalastic RoofPro Primer will need to be applied to the approved deck prior to applying the temporary roofing/waterproofing barrier. Sika Reactivation Primer or Sika Concrete Primer Lo-VOC will be applied in between the existing temporary roofing/waterproofing barrier and finished roofing/waterproofing system after existing temporary barrier is clean, dry and sound.

1.9 WARRANTY

A. Warranty: Provide manufacturer's standard material and labor warranty for planter applications.

1. Warranty Length: 20 years.
2. Project shall be registered and approved by liquid membrane manufacturer prior to system installation.

PART 2 - PRODUCTS

2.1 MANUFACTURER

A. Basis-of-Design Manufacturer: Sika Corporation, 201 Polito Avenue, Lyndhurst NJ 07071. Toll Free 800-933-SIKA (7452), www.sikausa.com. No substitutions without prior written approval by the Design Professional.

2.2 ROOFING SYSTEM

A. Fluid-Applied Membrane System, 20 Year Warranty: Sikalastic RoofPro WP 20, Premium Reemat:

1. Base Layer: Sikalastic 644 Lo-VOC, 45 mils wet film thickness; 35 sf/gal coverage rate approx.
2. Top Layer 1: Sikalastic 644 Lo-VOC, 30 mils wet film thickness; 53 sf/gal coverage rate approx.

2.3 MEMBRANES AND COATINGS

A. Base and Topcoat with Reemat reinforcement shall be Sikalastic 644 Lo-VOC by Sika Corp, a single component, cold, fluid applied, moisture triggered, aliphatic, polyurethane top coat membrane.

B. Base coat and topcoat membranes shall be a one component, low VOC elastomeric polyurethane membrane that may be brush or roller applied. Membrane shall have the following physical properties and conforms to ASTM D7311-07: Standard Specification for Liquid Applied, Single Component, Moisture-Triggered, Aliphatic Polyurethanes used in Roofing.

C. Liquid Property Requirements:

1. VOC Content, ASTM D-2369-81: < 50 g/l
2. Volume Solids, ASTM D2697: 76% minimum.
3. Weight Solids: ASTM D1644: 83% minimum.
4. Sag Resistance, ASTM D4400: No sag at 700 micrometers (0.028 in. / 28 mil)

D. Film Physical Property Requirements:

1. Tensile Strength (Tension): ASTM D412: Minimum 1.86 MPa (270lb/in2)
2. Elongation: ASTM D412 : MIN 200%.
3. Accelerated Weathering FL/UV – 5000 Hours, ASTM G 154, No cracking or checking.
4. Water Vapor Transmission, Permeability / Permeance: ASTM E96: Maximum 8.5 gms/m2/ day (0.033 perm-inches).
5. Flexibility – Mandrel Bend, ASTM D522: Pass, no cracking or flaking.
6. Tear Resistance, ASTM D625: Minimum 5.8 kN/m (33 lbf/in)
7. Indentation Hardness, ASTM D2240: 82 Durometer Units (+/- 5 units)
8. Dynamic Puncture Resistance, ASTM D5635: Minimum 15 joules (357 ft.pounds)
9. Static Puncture Resistance, ASTM D5602: Minimum 20.7 kg. (45.5 lbs.)

2.4 MEMBRANE REINFORCEMENT - FIBERGLASS

A. Reinforcement for the roofing/waterproofing membrane system shall be Sika Reemat by Sika Corp, a conformable, random strand fiberglass mat specifically designed to provide greater impact resistance and greater resistance to excessive thermal and structural movement while maintaining elasticity and membrane film integrity.

B. Supplemental reinforcement of the roofing/waterproofing membrane system shall be Sika Flexitape Heavy by Sika Corp, a nylon mesh specifically designed for local reinforcement of the roofing/waterproofing membrane at structural cracks, expansion joints and transitions between dissimilar materials, OR Sika Joint Tape SA by Sika Corp., a self-adhering polymeric rubberized tape with woven polyester facer.

2.5 FILLET BEAD AND PENETRATION SEALANT

A. Sealant for fillet bead applications and membrane penetrations shall be Sikaflex 11FC by Sika Corp., a one-part polyurethane sealant suitable for fillet bead transition compound to be applied prior to the installation of the membrane system at changes in substrate direction, sealing reglet terminations, cracks in the substrate and penetrations of the roof /waterproofing system.

B. Exposed finish sealant shall be Sikaflex Hyflex 150 LM by Sika Corp., a one-part low modules hybrid sealant OR Sikasil WS-295. A one-part, low-modulus, weather sealing, silicone sealant suitable for finishing terminations at saw cuts and all UV exposed sealant terminations. SikaHyflex-150 LM is also suitable for fillet bead transition, changes in substrate direction, cracks in the substrate and penetrations of the roof before installation of the RoofPro membrane system

2.6 PRIMERS

A. Concrete, roof cover boards and sealing cementitious and gypsum-based substrates shall be primed with Sika Concrete Primer Lo-VOC by Sika Corp., a single component, rapid curing, high solids, moisture cured primer or Sikalastic Primer EP / Sikalastic Primer EP Rapid by Sika Corp., a two-component, cyclo-aliphatic, amine cured material.

B. Metal substrates shall be primed with Sikalastic® EP Primer/Sealer by Sika Corp., a two-component, cyclo-aliphatic, amine cured material with a high level of corrosion resistance for metal, bleed blocking on stable asphaltic surfaces, and chemically treated wood or the faster curing version Sikalastic® EP Primer Rapid by Sika Corp.

C. PVC membrane roofing primer shall be Sikalastic® EP Primer/Sealer by Sika Corp., a two-component, cyclo-aliphatic, amine cured material.

D. Membrane over-coating primer shall be Sika Reactivation Primer by Sika Corp., a single component polyurethane-based primer specifically designed for the reactivation of existing roof /waterproofing system applications prior to membrane over-coating OR Sikalastic Concrete Primer Lo-VOC, a single component, rapid curing, high solids, moisture cured primer

2.7 CONCRETE REPAIR AND PATCHING

A. Horizontal Cementitious repair mortar to repair bug holes, spalled areas, and other non-structural surface defects, or to slope decks shall be SikaQuick 1000 by Sika Corp., a two component, polymer-modified, Portland cement, fast-setting, trowel-grade mortar. Vertical & Overhead Cementitious repair mortar to repair bug holes, spalled areas and other non- structural surface defects shall be SikaQuick VOH.

B. Epoxy resin or urethane to fill uneven areas and birdbaths shall be Sikadur-22 Lo-Mod or Sikalastic-720.

2.8 MECHANICAL FASTENERS

A. Mechanical fasteners and plates for cover board/thermal barrier securement shall meet requirements of Factory Mutual and be of appropriate type and length for structural deck substrate.

B. #14 screw-type or drive spike fasteners for concrete decks shall achieve a minimum penetration depth of 1” into the concrete. Predrilling of the concrete deck is required.

C. All fasteners shall be installed with 3” diameter galvalume plates.

D. Fasteners and plates shall be by Sika Sarnafil.

2.9 GEO FOAM

A. Expanded polystyrene insulation shaped to provide the dimensionality as indicated on the project drawings. Geofoam shall comply with ASTM D6817 TYPE 46.

2.10 DRAINAGE MAT

A. Soil, sand or stone ballast over burden:

1. Sika Drainage Mat 420: impermeable high flow dimpled polypropylene drainage core heat-bonded to a layer of non-woven polypropylene filter fabric on the exposed top side and a polyethylene membrane protection film on the substrate facing bottom side.

2.11 FILTER FABRIC

A. Non-woven needle-punched polyester UV-stabilized mat, 3 oz./sq.yd., used between the extruded polystyrene insulation and stone ballast. Filter fabric shall be Sika 120 Fleece by Sika Corporation.

2.12 DECORATIVE STONE COVERING

A. Standard graded stone ballast, either smooth river bottom stone or coarse aggregate, cleaned of fines and debris, meeting the gradation requirements of ASTM D448, as follows: #3, #4, or #24

B. Large graded stone ballast, either smooth river bottom stone or coarse aggregate, cleaned of fines and debris, meeting the gradation requirements of ASTM D448, as follows: #1 or #2

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that surfaces and conditions are ready to accept the Work of this section. Notify Architect in writing of any discrepancies. Commencement of the Work in an area shall indicate Installer's acceptance of the substrate.

B. Surfaces shall be sound, dry, clean and free of oil, grease, dirt, excess mortar or other contaminants. Fill voids, gaps and spalled areas in substrate to provide an even plane. Strike masonry joints full flush.

3.2 SURFACE PREPARATION

A. Verify that the deck is clean and smooth, free of depressions, waves, or projections, and properly sloped to drains, valleys, eaves, scuppers or gutters. Verify that all roof openings or penetrations through the roof are secured back to solid blocking. Ensure all preparatory Work is complete prior to applying membrane.

B. All surfaces shall be blown clean using best methods to remove any remaining loose debris.

C. All cracks and voids greater than 0.040 inches shall be routed and caulked with a polyurethane sealant. Allow to cure per roof /waterproofing membrane manufacturer's technical data sheets prior to over-coating with the specified roof /waterproofing membrane system.

D. At all inside corners, gaps or voids at the juncture of the deck and penetrations apply a minimum 3/4 inch fillet bead of polyurethane sealant and allow to cure per roof /waterproofing membrane manufacturer's technical data sheets prior to installing the roof /waterproofing membrane system.

E. At all moving cracks, moving joints between dissimilar materials, and similar conditions, create a minimum 1 inch wide bond break utilizing bond breaker tape, centered over the crack or joint.

F. Membrane terminations shall be established prior to project start-up and documented in shop drawings. Terminations shall occur in raked-out mortar joints, saw cut terminations or under installed counter-flashing materials.

G. Use tape lines to achieve a straight edge detail. Remove tape while application is still wet for clean lines.

3.3 SUBSTRATE PREPARATION

A. Acceptable substrates include concrete, concrete block, solid wood/plywood sheathing, cover board/thermal barriers and metal.

B. Structural Concrete:

1. Acceptable concrete substrates are limited to poured in place concrete decks.
2. Minimum deck thickness for structural concrete is 4 inches (10.2 cm).
3. Concrete surface to be light broom finish or equivalent.
4. Curing agents shall be checked for compatibility with specified roofing/waterproofing materials. Most curing agents shall be completely removed from the substrate by grinding, scarifying, or other mechanical means.
5. Concrete and masonry surfaces shall be low-pressure (5,000 psi or less) power-washed in accordance with ICRI Guideline No. 03732: Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, and Polymer Overlays to remove all dirt, debris or surface contamination that would compromise bonding of the specified roofing/waterproofing membrane system. Remove oil or grease with solvents, or detergent and water. Rinse surface clean of remaining cleaning agents.
6. Do not apply on substrates with moisture content greater than 4% by weight, measured by Tramex Concrete Moisture Encounter meter.
7. Application to Damp (moisture content greater than 4%) Concrete: Sikalastic® GDC Primer can be applied to damp concrete as soon as surface water has dissipated after rainfall or other sources of water have ceased.
8. Application to Green Concrete: Sikalastic® GDC Primer can be applied to horizontal concrete surfaces 48 hours after concrete pour (or when concrete is walkable) and vertical surfaces 24 hours after forms are removed.
9. Minimum substrate compressive strength > 3000 psi. at the time Sikalastic® GDC Primer is applied

C. Existing Waterproofing Membrane:

1. Acceptable existing roofing/waterproofing membrane must be sound, well adhered and free of any trapped moisture. Verification that the membrane is free of trapped moisture must be established with a moisture scan and a copy of the moisture scan must be provided to the manufacturer.
2. Ensure that there is no trapped moister via an infrared scan.
3. Pressure wash the roof to remove all dust, dirt and debris from the surface.

4. Validate primer adhesion to Single-ply membranes to determine the level of surface preparation required.
5. Prepare and prime surface minimum 4” vertically past the existing membrane waterproofing flashing terminations.
6. Remove existing waterproofing membrane a minimum of 6” around the existing drain assembly in all directions. Fasten existing waterproofing membrane with appropriate fasteners and plates to secure existing waterproofing membrane prior to priming and liquid membrane installation.

D. Metal Surfaces:

1. Exposed drain bowls, pipes, and other metal surfaces shall be cleaned by power tool cleaning (SSPC SP-3) to remove corrosion deposits back to a clean, bright metal followed by a solvent wipe prior to application of the specified primer.

3.4 PRIMING

A. Concrete, Masonry, Cover Boards, and Wood:

1. Mix and apply specified primer for concrete/masonry/wood surfaces by brush or roller at the application rate shown on the technical data sheet. Porous, rough or absorbent surfaces will decrease coverage rates.
2. Allow to cure and dry in accordance with manufacturer’s technical data sheets.

B. Metal:

1. Apply specified primer for metal surfaces to clean and prepared drain bowls and other metal surfaces by brush or roller at the application rate shown on the technical data sheet to achieve an overall wet film thickness of 6-8 mils. High porosity and roughness of the substrate will decrease coverage rates.
2. Allow to cure and dry in accordance with manufacturer’s technical data sheets.

3.5 MEMBRANE REINFORCEMENT

A. Reinforcement of Cracks, Plywood and Cover Board Joints, and Base/Curb Flashing Transitions:

1. For all locations where the specified membrane system is to be applied directly to the substrate surface, provide reinforcement of cracks and joints prior to applying the specified membrane system
2. For all moving cracks and joints, create a minimum 1 inch wide bond break centered over the crack or joint by applying bond break tape centered over each crack or joint.
3. For all non-moving cracks and joints, rout and seal with Sikaflex polyurethane sealant.
4. For all horizontal-to-vertical transitions, provide a ¾” x ¾” Sikaflex polyurethane sealant cant.
5. Apply a minimum of a 3 inch wide strip of Sika Joint Tape SA directly, or alternatively Flexitape Heavy membrane reinforcement into a bed of liquid roofing/waterproofing membrane. Back roll reinforcement to fully embed reinforcement into the wet liquid polyurethane membrane. Add more liquid membrane as needed to fully embed the reinforcement.
6. Ensure reinforcement is not in tension during embedment.

3.6 COLD FLUID APPLIED MEMBRANE APPLICATION

A. Install roofing/waterproofing membrane system in accordance with current technical data sheets and in accordance with Part 2 Section 2.2.

B. Apply base embedment coat to horizontal deck and vertical wall surfaces by brush or with 1/2 inch – 3/4 inch nap roller to achieve a continuous and uniform minimum wet film thicknesses as specified in Part 2 section 2.2. For fleece applications, approximately 2/3 of the total resin shall be applied as the base embedment coat.

C. Immediately lay specified conformable reinforcement into the wet base embedment resin coat. Reemat reinforcement is typically precut before application; Fleece reinforcement is typically precut at flashings only before application.

D. Apply pressure to the membrane reinforcement with a roller as appropriate to fully embed and saturate the membrane reinforcement into liquid roofing/waterproofing material. Remove air pockets from under the membrane by rolling them out.

E. Apply additional liquid material as required to ensure the membrane reinforcement is fully embedded and has conformed to the substrate without tenting or visible pinholes.

F. Overlap sheets of Reemat membrane reinforcement a minimum of 2 inches in all directions. Overlap sheets of Fleece membrane reinforcement 3 inches at side laps and 6 inches at end laps.

G. Extend membrane reinforcement vertically at adjacent wall surfaces in accordance with project details and specifications.

H. When using fiberglass mat reinforcement, allow the base embedment coat to fully cure dry prior to the placement of top coat or other applications of the specified roofing/waterproofing material.

I. Apply topcoat by nap roller or brush to achieve a continuous and uniform minimum wet film thickness as specified in Part 2 Section 2.2.

J. Install all flashings in accordance with manufacturer’s construction details.

3.7 PARAPET AND WALL FLASHINGS

A. Clean, prepare and prime flashing substrate surfaces ready to receive membrane flashing applications.

B. All parapet, wall, and curb flashings shall be provided with a cant bead of Sika 11FC sealant cant with Flexitape or Sika SA Tape reinforcement prior to Sika Reemat Premium/Sika Fleece flashing application.

C. Terminate roofing/waterproofing membrane system at raked-out mortar joints, termination saw cut joint, or under installed counter-flashing materials. Seal all mortar joints and saw cut joints with Sikaflex polyurethane sealant.

D. Install metal counter flashings in accordance with details.

3.8 ROOF DRAINS

A. Clean, prepare and prime surfaces ready to receive membrane applications. Block drain bowl opening to avoid roofing/waterproofing material from entering the drainage system.

B. Remove strainer baskets and clamping rings from the drain bowl assembly. Temporarily replace the bolts back into assembly to avoid miss-alignment of connections after membrane applications are completed.

C. Extend the liquid roofing/ waterproofing material and membrane reinforcement directly into the throat of the prepared drain.

D. Remove drain blocks and allow the roofing/waterproofing system to fully cure dry prior to re-connecting the drain bowl assembly.

3.9 APPLICATION OF PENETRATION SEALANT

A. Seal reglet-based membrane terminations, heads of exposed mechanical fasteners, around penetrations, duct work, electrical and other apparatus extending through the roofing/waterproofing membrane with specified penetration sealant.

3.10 ROOF PROTECTION

A. Protect roofing/waterproofing Work from other trades until completion.

B. Stage materials in such a manner that avoids foot traffic over completed roof areas.

C. Provide temporary walkways and platforms to protect completed Work from traffic and point loading during the application process.

D. Provide temporary membrane tie-ins and water-stops at the end of each workday and remove prior to commencement of Work the following day.

3.11 PREFABRICATED COMPOSITE DRAINAGE AND PROTECTION MAT

A. Install the drainage mat when it can be followed immediately by the installation of the extruded polystyrene insulation and pavers/ballast.

B. Install the drainage mat on horizontal and vertical surfaces in accordance with the product data sheet. Lay out and position drainage mat, and allow to lay flat. Cut and closely fit drainage mat to perimeter and penetrations.

C. Overlap filter fabric from adjacent sheets/rolls, and bond all fabric overlaps with Sikaflex sealant. Install supplemental filter fabric as required to ensure filter fabric continuity at flashing locations.

3.12 INSTALLATION OF GEOFOAM INSULATION

A. Before the application of the insulation, any damage or deterioration to the composite drainage and protection mat shall be repaired.

B. Loose lay insulation and tightly butt together all insulation boards. The maximum acceptable joint width is 3/8 inch. Cut and closely fit insulation within ¾ inches to perimeter and penetrations.

C. Vertical insulation applications can be spot adhered to the drainage mat and to additional insulation layers, utilizing an acceptable adhesive.

D. Do not install damaged insulation boards.

3.13 FILTER FABRIC

A. Install filter fabric on horizontal and vertical surfaces over the extruded polystyrene insulation in accordance with the product data sheet.

B. Lay out and position filter fabric. Cut and closely fit filter fabric to perimeter and penetrations, extending the filter fabric vertically to the height of the overburden.

C. Overlap filter fabric to achieve 6 inch side and end laps. As required, bond all fabric overlaps with Sikaflex sealant to ensure filter fabric continuity prior to and during overburden installation.

3.14 STONE COVERING

A. Install stone ballast of the specified gradation at the prescribed application rate, in accordance with project documents. Ensure full and even coverage.

3.15 CLEAN-UP

A. Work areas are to be kept clean, clear and free of debris at all times.

B. Do not allow trash, waste, and/or debris to collect on the roof deck area. Trash, waste, and/or debris shall be removed from the roof on a daily basis.

C. All tools and unused materials shall be collected at the end of each workday and stored properly off of the finished roof surface and protected from exposure to the elements.

D. Dispose of or recycle all trash and excess material in a manner conforming to current EPA regulations and local laws.

E. Properly clean the finished roof surface after completion, and make sure the drains and gutters are not clogged.

F. Clean and restore all damaged surfaces to their original condition

END OF SECTION

SECTION 07 62 00 - ROOF RELATED SHEET METAL

PART I - GENERAL

1.1 RELATED DOCUMENTS

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

1.1 SECTION INCLUDES

A. It is the intent of this Section that the Work shall:
   1. Conform to all applicable building code requirements and of authorities having jurisdiction;
   2. Include all shop and field formed sheet metal work shown on drawings, specified or required, including, but not limited to:
      a. Metal counterflashing
      b. Expansion joint
      c. Gutters, Downspouts, Splash Blocks and Splash Pans

B. Related Sections:
   1. Section 07 72 00: Roof Accessories.
   2. All Sections of Work relating to or affecting the roofing system..

1.2 REFERENCES

A. ASTM International (ASTM)
   1. A525, Standard Specification for General Requirements for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process
   2. A526, Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, Commercial Quality
   3. A527, Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, Lock-Forming Quality
   4. A167, Standard Specification for Galvanized and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip
   5. B32, Standard Specification for Solder Metal
   6. C1107, Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink)

B. FM Global (FM)
   1. Loss Prevention Data Sheets: I-49, Perimeter Flashing

C. National Association of Architectural Metal Manufacturers (NAAMM)

D. National Roofing Contractors Association (NRCA)
   1. Roofing and Waterproofing Manual – Latest Edition

E. Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA)
   1. Architectural Sheet Metal Manual – Latest Edition

F. ANSI / SPRI ES-1: Fabricate and install sheet metal edge flashings and copings to comply with requirements of ANSI / SPRI ES-1 for 115 MPH wind speed zone and wind resistance loads.

1.3 SUBMITTALS

A. Product Data:
   1. Manufacturer’s specifications and other data needed to prove compliance with specified requirements.
   2. Manufacturer’s installation instructions.

B. Shop Drawings: Indicating sizes, configurations, details of attachment to related and adjacent work, materials, and finishes.

C. Samples:
   1. Full range of finish colors for Architect's selection.
   2. 12 inch long sample of each specified item with approved finish.
   3. Provide full size mockup of all shop built assemblies.

1.4 QUALITY ASSURANCE

A. Single Source Responsibility: Fabricator and installer of roof-related flashing and accessories shall be the same as the membrane roof installer.

B. Comply with governing codes and regulations of authorities having jurisdiction.

1.5 INSTALLATION CONFERENCE

A. Installation conference to be conducted on site.

1.6 DELIVERY, STORAGE AND HANDLING

A. Deliver, handle and store materials in accordance with manufacturer's instructions.

B. Handle and store materials and equipment in such a manner as to avoid damage.

C. No storage of materials shall be permitted on roof areas other than those materials that are to be installed the same day. Any exception must be in written form. Do not place materials or equipment in such a manner as to overload structure.

1.7 WARRANTIES

A. Manufacturer's Product Warranty:
   1. Manufacturer's standard 20 year Kynar 500 or Hylar 5000 Finish warranty signed by the manufacturer, with guarantee covering any failure of the fluoropolymer finish during the warranty period.
   2. Failure is defined to include, but not be limited to:
      a. Deterioration of finish, such as fading, discoloring, peeling, cracking, corroding, etc.
   3. Correction may include repair or replacement of failed product.

B. Roofing Contractor’s Warranty:
   1. Contractor shall warrant the sheet metal work and related work to be free from defects in workmanship and materials, and that the metal flashings will be and remain watertight, for a period of five (5) years from date of Substantial Completion.
   2. Defects shall include, but not be limited to:

a. Leaking water or bitumen within building or construction.
b. Becoming loose from substrate.
c. Loose or missing parts.
d. Finish failure as defined above.

PART 2 PRODUCTS

2.1 APPROVED MANUFACTURERS

A. Manufacturers named within specification are approved for use on the Project providing:
1. their products meet or exceed the specifications;
2. company has a minimum of **five (5) years** experience manufacturing products of the type specified;
3. products have been tested in conjunction with roofing membrane system as an assembly and as such has obtained the same approval and rating as the roofing membrane system; and
4. products are approved for use by the roofing membrane manufacturer.

B. Substitutions shall be in accordance with Division 1 requirements regarding substitutions.

2.2 SHEET METAL MATERIALS

A. General Requirements: Roofing sheet metal system shall have been tested in conjunction with roofing membrane system as an assembly and have the same approval and rating as the roofing membrane system.

B. Prefinished Galvanized Sheet Steel:
1. Commercial quality ASTM A527 G-90 hot-dip galvanized coating designation.
2. Thickness: Except as otherwise indicated, minimum **24 gauge**. SMACNA recommendations shall govern.
3. Finish: **Kynar 500 or Hylar 5000** in color as selected by Architect from manufacturer's full range of colors.

C. Sheet Lead:
1. Comply with FS QQ-L-201, Grade B
a. **Four (4) pound** minimum for use at roof drains and soil stacks.

D. Galvanized Steel: ASTM A527 with G-90 hot-dip galvanized coating designation. Minimum thickness **24 gauge**, except as otherwise noted.

E. Stainless Steel: ASTM A167, Type 302/304 Soft Temper, No. 2D finish. Minimum thickness **24 gauge**, except as otherwise noted.

2.3 FASTENERS

A. Same metal as flashing/sheet metal or other non-corrosive metal or as noted below.

B. Exposed fasteners shall be self-sealing and gasketed for weathertight installation. (ZAC type)

C. Match finish of exposed heads with material being fastened.

D. Mechanical Fasteners:
   1. Nails: Ring shank, minimum **1-1/2 inches** in length with **1/2 inch** diameter head.
   2. Washers: Steel washers with bonded rubber sealing gasket.
   3. Screws: Self-tapping/Self-piercing sheet metal type of galvanized steel or compatible with material being fastened, with integral EPDM washers.
   4. Rivets: Stainless steel and cadmium plated material, closed end type of sizes recommended by sheet metal manufacturer to suit application.

E. Clips:
   1. Continuous Cleat (coping/fascia): Minimum **22 gauge**, G-90 galvanized finish or galvanized steel. Match material of coping/fascia and provide one (1) gauge heavier.

2.4 RELATED MATERIALS

A. Solder: ASTM B32, alloy grade 58, 50 percent tin, 50 percent lead.

B. Flux:
   1. Phosphoric acid type, manufacturer's standard.
      a. For Use with Steel or Copper: Rosin flux
      b. For Use with Galvanized Steel: Acid-chloride type flux, except use rosin flux over tinned surfaces.

C. High-Temperature Sheet **40 mil** thick SBS modified bituminous product of self-adhering type with polyethylene-film surface conforming to "Lastobond Shield HT" manufactured by **Soprema, Inc.**, or approved equal.

D. Adhesives: Type recommended by flashing sheet manufacturer seaming and adhesive application of flashing sheet to ensure adhesion and watertightness.

E. Metal Accessories: Sheet metal clips, straps, anchoring devices, clamps and similar accessories required for the complete installation of work, matching or compatible with material being installed, non-corrosive, size and gauge recommended by installer to suit application and performance.

F. Sealant:
   1. Type A:
      a. Type: One-part, non-sag, moisture-curing polyurethane sealant.
      b. Approved Products/Manufacturers:
         1. "Chem-Calk 900" manufactured by **Bostik Construction Products Division**,
         2. "Vulkem 921" manufactured by **Mameco International, Inc.**,
         3. "Dynatrol I" manufactured by **Pecora Corporation**,
         4. "NP 1" manufactured by **Sonneborn Building Products**, or
         5. Approved equal.

   2. Type B:
      a. Type: One-part, neutral-curing, medium-modulus silicone sealant for sealing metal to metal surfaces, i.e. metal edge, cover plates, etc.
      b. Approved Products/Manufacturers:
         1. "Chem-Calk 1200" manufactured by **Bostik Construction Products Division**,
         2. "795 Silicone Building Sealant" manufactured by **Dow Corning Corporation**,

3. "895 Silicone" manufactured by **Pecora Corporation**,
4. "Omniseal" manufactured by **Sonneborn Building Products**,
5. "Spectrem 2" manufactured by **Tremco Incorporated**, or
6. Approved equal.

G. Liquid Applied Penetration Flashing System:
1. Polyurethane bituminous PMMA resin with polyester fleece reinforcement specifically formulated for liquid applied flashing or roof penetrations to be utilized at following locations:
   a. Flashing drains, penetrations, protrusions, electrical penetrations, low curb details, I-beams and other similar or unconventional conditions.
   b. Approved Product/Manufacturer:
      1. **Soprema Product**: Alsan Flashing; Polyfleece
      2. **Siplast Product**: ParaPro Flashing Resin; Pro Fleece
      3. **Elevate Product**: UltraFlash Liquid Flashing; UltraFlash Fabric

H. Termination Bar:
1. Material: Extruded aluminum bar with flat profile.
2. Size: **1/8 inch** thick by **one (1) inch** wide with factory punched **1/4 inch x 3/8 inch** oval holes spaced **six (6) inches** on center.
3. Approved Product/Manufacturer: "TB 125" manufactured by **TruFast Corp.**, or approved equal.

I. Pipe Hangers and Supports: Refer to Section 07 72 00, Roof Accessories.

J. Splash Blocks: Concrete type, of size and profiles indicated; minimum 3,000 psi compressive strength at 28 days, with minimum five (5) percent air entrainment. Use at locations where roof drainage dumps on ground.

K. Splash Pans: **22 gauge** galvanized steel of size and profiles indicated. Use at locations where roof drainage discharges over adjoining, lower roof level(s).

2.5 FABRICATION

A. Except as otherwise indicated, fabricate work in accordance with SMACNA Architectural Sheet Metal Manual and other recognized industry practices and reviewed shop drawings. Form all flashings, receivers and counterflashings in accordance with standards set forth in the NRCA roofing manual *and* SMACNA.

B. Comply with manufacturer's installation instructions and recommendations.

C. Unless noted otherwise, fabricate perimeter edge/fascia, scuppers, gutters, downspouts, copings, and trim from pre-finished galvanized sheet.

D. Shop fabricate work to greatest extent possible. Fabricate inside and outside corners for metal edges, counterflashing, and coping caps of equal length – minimum **2 foot** lengths

E. Fabricate items to size and dimensions as indicated on the drawings. Limit single-piece lengths to **ten (10) feet**.

F. Fabricate for waterproof and weather-resistant performance; with expansion provisions for running work sufficient to permanently prevent leakage, damage or deterioration of the work.

G. Integrate flashing in a manner consistent with detailing. Form work to fit substrates.

H. Make angle bends and folds for interlocking metal with full regard for expansion and contraction to avoid buckling or fullness in metal after installation.

I. Fabricate items with straight lines, sharp angles, smooth curves, and true levels. Avoid tool marks, buckling, and oil canning.

J. Fold back edges on concealed side of exposed edge to form hem.

K. Unless noted otherwise, lap joints minimum **one (1) inch**. Rivet and solder joints on parts that are to be permanently and rigidly assembled.

L. Seams:
1. Wherever possible, fabricate non-moving seams in sheet metal with flat-lock seams and end joints.
2. Pre-finished Galvanized Steel: Seal pre-finished metal seams with rivets and silicone sealant.
3. Metal Other than Aluminum: Tin edges to be seamed, form seams, and solder.

M. On **Kynar 500 or Hylar 5000** pre-finished metal, surface sand metal flanges prior to applying any primers. Prime all metal in contact with bituminous material.

N. Backpaint all concealed metal surfaces with bituminous paint where expected to be in contact with cementitious materials or dissimilar metals.

O. Expansion Provisions: Where lapped or bayonet type expansion provisions in work cannot be used or would not be sufficiently waterproof or weatherproof, form expansion joints of intermeshing hooked flanges, not less than **one (1) inch** deep filled with mastic sealant concealed within joints.

2.6 FABRICATED ITEMS

A. Metal Flashings: (Minimum ten (**10'**) foot lengths)
1. Through wall Receiver Tray: Minimum **24 gauge** stainless steel, through wall receivers shall not extend past the face of the exterior veneer more than **¾"**.
2. Counterflashing: Minimum **24 gauge** pre-finished galvanized metal.

B. Wind Clips: Minimum **24 gauge** to match material of counterflashing, **one (1) inch** wide by length to engage counterflashing a minimum of **1/2 inch**.

C. Metal Edge:
1. Minimum **24 gauge** pre-finished galvanized metal formed in maximum **ten (10) foot** lengths, with **six (6) inch** wide cover plates of same profile, **four (4) inch** flange, maximum **seven (7) inch** fascia, including a **3/4 inch** gravel stop. For fascias over (**7) inches** a **two (2) piece** fascia with separate cleat will be required.
2. Provide expansion slip joints at maximum **20 feet** on center.
3. Shop fabricates all interior and exterior corners. Fabricate exterior corners with **18 inch** minimum to **four (4) foot** maximum legs. Lap, rivet, and seal prior to delivery to jobsite.
4. Fabricate to sizes and dimensions as indicated on drawings with a minimum one **(1) inch** coverage past top of wall. Refer to SMACNA Fig. 2-5A.

5. Provide mock-up for Architect's approval prior to fabrication.

D. Continuous Cleats: Continuous strips, same material and profile, minimum one gauge heavier of item which cleats attach.

E. Vent Hoods, Sleeves, Penetration Flashings, and Accessories: Minimum **24 gauge** stainless steel, or as shown or directed otherwise.

F. Angle Termination Bar: **One (1) inch** x **one (1) inch 24 gauge** galvanized steel.

G. Roof Drain Flashing: Four (4) pound lead, minimum **36 inches** by **36 inches**.

H. Coping:
1. **24 gauge** pre-finished galvanized metal, with **six (6) inch** wide cover plates of same profile.
2. Fabricate as outlined in SMACNA; Refer to Figure 3-4 A.
3. Provide tapered substrate to slope to one (1) side, and cover with waterproof membrane.
4. Install with continuous cleat one (1) side and fasten other side.

I. Gutters, Downspouts and Collector Heads:
1. Gutters and Downspouts:
   a. **24 gauge** pre-finished galvanized metal formed in maximum ten (10) foot lengths, with six (6) inch wide cover plates.
   b. Minimum **five (5) inch** x **six (6) inch** box gutter (verify size meets rainfall data per SMACNA).
2. Gutter/Downspout Straps:
   a. Minimum **24 gauge** pre-finished (match color of gutter) galvanized metal. Hem both sides.
3. Gutter Supports:
   a. **24 gauge** pre-finished galvanized steel. Hemmed around **1/8 inch** galvanized bent steel bracket.
4. Gutter Screen:
   a. Galvanized steel **¼"** diamond wire screen enclosed in a pre-finished steel frame.
5. Collector Head:
   a. **24 gauge** pre-finished galvanized metal.
   b. As outlined in SMACNA;
   c. Refer to Figure 1-25F and Figure 1-28 with alternate Section A-A.
6. Base Metal:
   a. Steel conforming to:
      1. ASTM A924/A792 (Formerly ASTM A792) minimum yield 40,000 psi
      2. [For primers thicker than 0. 5 mil] Steel conforming to ASTM A65 3 (formerly ASTM A446), G-90 Galvanized, minimum yield 43,500 psi
      3. **24 gauge**.

J. Pipe Box Cover: **24 ga.** stainless steel.

K. Heat Exhaust Curbs and Hoods: **22 gauge** stainless steel.

L. Expansion Joint Cover: Minimum **24 ga**. galvanized metal (Provide pre-finished metal at perimeter edge end termination.)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify substrates are smooth and clean to extent required to perform sheet metal work.

B. Verify roof openings, curbs, pipes, sleeves, ducts or vents through roof are solidly set in place.

C. Verify that reglets, nailers, cants, and blocking to receive sheet metal are in place and free of concrete and soil.

D. Do not start work until conditions are satisfactory.

3.2 PREPARATION

A. Field measure site conditions prior to fabrication work.

B. Install starter and edge strips and cleats before starting installation.

3.3 INSTALLATION

A. Install sheet metal with lines, arises, and angles sharp and true, and plane surfaces free from objectionable wave, warp, or buckle. Exposed edges of sheet metal shall be folded back to form **1/4 inch** hem on concealed side from view. Finished work shall be free from water retention and leakage under all weather conditions. Pre-fabricated corners or transitions are required at changes in direction, elevation, or plane and at intersections. Locate field joints not less than **12 inches**, nor more than **three (3) feet** from actual corner. Laps shall be **one (1) inch**, riveted and soldered at following locations:
1. Pre-fabricated corners;
2. transitions;
3. changes in direction, elevation, and plane; and
4. at intersections.

B. Anchor units of work securely in place to prevent damage or distortion from wind or buckling. Provide for thermal expansion of metal units; conceal fasteners wherever possible; and set units true to line and level as indicated. Install work with laps, joints, and seams which are permanently watertight and weatherproof.

C. Install fabricated sheet metal items in accordance with manufacturer's installation instructions and recommendations and with SMACNA Architectural Sheet Metal Manual.

D. Separations: Provide for separation of metal from dissimilar metal or corrosive substrates by coating concealed surfaces with zinc chromate, bituminous coating, or other permanent separation at locations of contact as recommended by manufacturer or fabricator. Do not use materials which are incompatible with roofing system.

E. Continuous Cleat: At exposed edges of perimeter edge, fascias, cap flashings, and where required, attach continuous cleat at **six (6) inches** on center with appropriate fasteners.

F. Gravel Guard/Fascia:
1. Install with expansion joints **10 feet o.c.**, **1/2 inch** expansion leeway, with cover plate.
2. Set in asphalt mastic and fasten into nailer at **3 inches o.c.** staggered.
3. Buff sand **Kynar** surface of flange and prime.
4. Strip in flange with specified stripping plies set in hot bitumen extending **3 inches** from outer edge of flange to at least **3 inches** inward towards gravel stop. Provide finish stripping ply of modified bitumen base ply in hot bitumen extending **6 inches** from the outer edge of the flange and butt base of gravel stop.

G. Counterflashing:
1. Do not use surface mount counterflashing
2. Set in through wall with receiver and spring lock counterflashing, as detailed in drawings and to NRCA roofing manual, SMACNA standards.
3. Coordinate installation of through-wall flashing with the veneer contractor.
4. Seal through-wall in conjunction with substrate wall waterproofing.
5. Install wind clips **30 inches o.c.** at all counterflashing over **five (5) feet** in length.

H. Liquid Applied Penetration Flashing System: (Sanitary Vent Stacks)
1. Precut fleece for wrapping pipe, ensure the fleece extends **4"** up the pipe and the fingers extend a minimum of **2"** onto the field. The fingers of the fleece should be approximately **1-2" wide**. Ensure when wrapping the pipe, the fleece overlaps **1"**.
2. Precut fleece for field, ensure the fleece extends 8" from the pipe in all directions. Using two pieces of fleece with overlap of **2"** and cut out an opening for the pipe allowing a "snug" fit.
3. Dry fit all of the fleece for proper fit. Tape off **1"** past the fleece in the field and on the pipe for clean application. Label fleece pieces (1,2,3) and mark on tape to ensure proper order of placement.
4. Buff sand penetration to create a rough surface.
5. Stir liquid flashing to ensure no separation.
6. Apply liquid flashing to the penetration at a rate of 2 gallons per square, ensuring there is no drips, dry spots and that the coverage is uniform.
7. Apply fleece to wet liquid flashing using the brush to ensure fingers spread correctly and lay flat. Apply liquid flashing in fleece **1"** overlap to ensure fleece remains in place then apply liquid flashing to fleece on pipe and onto fingers. Apply in the direction of the fleece wrap to prevent voids, fish mouths, and/or creases in the fleece.
8. Apply liquid flashing to 1/2 of the field area at a rate of 2 gallons per square, look for similar coverage as the first application to the pipe and no dry spots.
9. Apply fleece into wet liquid flashing. Do not apply full coating on top just ensure it is set in place with light pressure.
10. Apply liquid flashing to the other 1/2 of the field area and in the area that will be overlapped by the second piece of field fleece.
11. Apply fleece into wet liquid flashing and coat the full field area with liquid flashing at a rate of 2 gallons per square. Ensure that the fleece is completely saturated and there are no voids or dry areas.
12. Remove tape around penetration and field and let dry 24 to 48 hours (curing time may vary with temperature and humidity)
13. Apply second coat of liquid flashing to pipe and field after first coat cures approximately **1-1/2"** past the previous application at a rate of 2 gallons per square.
14. Broadcast granules into liquid flashing until refusal. Wait for coat to dry and then brush off remaining granules.

I. Roof Drains:
1. After membrane installation, prime bottom of lead flashing sheet and set in uniform bed of plastic roof cement at specified locations.
2. Extend lead flashing into drain bowl or pipe a minimum of **two (2) inches** and over top of piping/bowl connection, if possible. Apply a continuous bead of specified Type A sealant, at intersection of pipe and drain bowl.
3. If drain bowl and pipe connection is contaminated with bituminous material, strip-in area with three (3) coursing of plastic roof cement and fabric.
4. Prime top of lead flashing sheet to receive strip-in membrane.

J. Gutters / Downspouts:
1. Install gutters as detailed.
2. Install downspouts plumb and level, attached to columns or wall with straps located at top and bottom of downspout and maximum **ten (10) feet** on center.
3. Install splash pad or block under discharge port of downspouts. Install splash pan over a protection (walkway) pad for downspouts located at roof level.
4. End Caps, Downspout Outlets, Gutter and Downspout Straps, Support Brackets and joint fasteners to be manufactured to suit profile and dimension of gutter and downspout.
5. Install all anchoring devices as outlined in SMACNA.
6. Expansion Joints: Lap or Butt type per SMACNA, locate every **50 linear feet**.

K. Expansion Joint:
1. Construct wood curbs as shown on drawings and as outlined in the NRCA and SMACNA Manuals.
2. Install underlayment, form envelope, and secure underlayment to curb. Fill envelope with compressible insulation.
3. Securely fasten expansion joint cover to curb with grommetted fasteners spaced **six (6) inches** on center.
4. Taper expansion joint down at the metal edge.

L. Coping:
1. Install wood nailers as shown on drawings.
2. Install metal cleats with appropriate fasteners spaced **six (6) inches** on center.
3. Install underlayment over the wood substrate. Lap ends minimum of **six (6) inches** and secure membrane in place. Seal laps with appropriate adhesive.
4. Install metal coping allowing **1/2 inch** spaces between segments. Lock coping onto cleat and install appropriate fasteners through the interior fascia spaced **24 inches** on center in enlarged holes.
5. Install cover plate centered over coping joint in continuous beads of specified Type B sealant, placed approximately **one (1) inch** from cover edges. Refer to SMACNA for alternate joints as required by length.
6. Install appropriate fastener through neoprene washer and cover plate between coping segments.
7. Accommodate building wall expansion joints by terminating coping joints and cleats either side of expansion joint. Do not run coping or cleats continuous across joints. Install coping cover plate to span across joint and lap coping on each side of joint a minimum of **four (4) inches**. Fasten cover plate on one (1) side of joint only. (Provide wall flashing membrane up and over parapet wall in accordance with manufacturer's detail.)

3.4 CLEANING AND PROTECTION

A. Remove flux and residual acid immediately by neutralizing with baking soda and washing with clean water. Leave work clean of stains.

B. Remove scraps and debris and leave work area clean.

C. Clean exposed metal surfaces, removing substances which might cause corrosion of metal or deterioration of finishes. Paint areas where finish is damaged on pre-finished metal by painting with a compatible paint in color to match undamaged finish.

D. Prime soldered area of phosphatized metal after cleaning to prevent rusting.

E. Paint metal flashings that have been soiled with bitumen with aluminized paint.

F. Clean other work damaged or soiled by Work of this Section.

G. Protect finished work from damage.

END OF SECTION 07 62 00

SECTION 07 65 00 FLEXIBLE FLASHING

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes requirements including but not limited to:
1. Flexible sheet flashing for windows, doors, parapets, and other openings and where indicated on Drawings.

B. Related Sections:
1. Section 07 62 00: Sheet Metal Flashing and Trim.
2. Section 07 92 00: Joint Sealants.
3. Section 08 11 13: Hollow Metal Doors & Frames

C. Reference Standards:
1. Part 1 California Building Standards Administrative Code, Title 24 C.C.R.
2. Part 2 California Building Standards Administrative Code, Title 24 C.C.R.
3. Part 3 California Electrical Code, Title 24 C.C.R.
4. Part 4 California Mechanical Code, Title 24 C.C.R.
5. Part 5 California Plumbing Code, Title 24 C.C.R.
6. Part 6 California Energy Code, Title 24 C.C.R.
7. Part 8 California Historical Code, Title 24 C.C.R.
8. Part 9 California Fire Code, Title 24 C.C.R.
9. Part 10 California Existing Building Code, Title 24 C.C.R.
10. Part 11 California Green Building Standards Code (CALGreen Code), Title 24 C.C.R.
11. Part 12 California Referenced Standards Code, Title 24 C.C.R.
12. NFPA 13-22 Standard for Installation of Sprinkler Systems (California Amended).
13. NFPA 14-19 Standard for the Installation of Standpipe and Hose System (California Amended).
14. NFPA 17-21 Standard for Dry Chemical Extinguishing Systems.
15. NFPA 20-19 Standard for the Installation of Stationary Pumps for Fire Protection.
16. NFPA 24-19 Standard for the Installation of Private Fire Service Mains and their Appurtenances (California Amended).
17. NFPA 72-22 National Fire Alarm and Signaling Code (California Amended).
18. NFPA 80-19 Standard for Fire Doors and Other Opening Protectives.
19. NFPA 253-19 Standard Method of Test for Critical Radiant Flux of Flooring Covering Systems Using a Radiant Heat Energy Source.
20. NFPA 2001-18 Standard on Clean Agent Fire Extinguishing Systems (California Amended).
21. Americans with Disabilities Act (ADA), Title II, and CBC (California Building Code) Section 11B.

1.3 SUBMITTALS

A. Concurrent Review Requirements: Submit submittals of this Section with doors and windows Sections.

B. Product Data: Include manufacturer’s written instructions for evaluating, preparing, and

treating substrate, technical data, and testing physical and performance properties of flexible sheet flashing.

C. Shop Drawings: Show locations and extent of flexible sheet flashing. Include details for substrate joints and cracks, sheet flashings, penetrations, inside and outside corners, tie-ins with adjoining waterproofing, and other termination conditions.

D. Samples - For the Following Products:
1. 12-by-12-inch square of flexible sheet flashing.

E. Installer Certificates: Signed by manufacturers certifying that installers comply with requirements.

F. Qualification Data: For installer.

G. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for flexible sheet flashing.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: A firm that is acceptable to flexible sheet flashing manufacturer for installation of flexible sheet flashing required for this Project.

B. Source Limitations: Obtain flexible sheet flashing materials through one (1) source from a single manufacturer.

C. Mockups:
1. Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution:
   a. Build mockup with doors and windows.

D. Pre-Installation Conference:
1. Conduct conference at Project site. Review methods and procedures related to flexible sheet flashing including, but not limited to the following:
   a. Review and finalize construction schedule and verify availability of materials, installer’s personnel, equipment, and facilities needed to make progress and avoid delays.
   b. Review and discuss the flashing to be coordinated with the finishing of doors and windows.
   c. Review, discuss, and coordinate the interrelationship of flexible flashing with other exterior wall components. Include provisions for sealants and fasteners.
   d. Review and discuss the sequence of work required to construct a watertight and weathertight exterior building envelope.
   e. Inspect and discuss the condition of substrate and other preparatory work performed by other trades.

1.5 WARRANTY

A. Special Warranty:
1. Manufacturer’s standard form in which manufacturer agrees to repair or replace components of flexible sheet flashing that fails in materials or workmanship within specified warranty period:
   a. Warranty period: Two (2) years.

B. Installer’s Warranty: One (1) year.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver liquid materials to Project site in original packages with seals unbroken, labeled with manufacturer's name, product brand name and type, date of manufacture, and directions for storing and mixing with other components.

B. Store liquid materials in their original undamaged packages in a clean, dry, protected location and within temperature range required by flexible sheet flashing manufacturer.

C. Remove and replace liquid materials that cannot be applied within their stated shelf life.

D. Store rolls according to manufacturer's written instructions.

E. Protect stored materials from direct sunlight.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Flexible Sheet Flashing:
   1. Subject to compliance with requirements, provide either the named product or an equal product by one of the other manufacturers specified:
      a. WR Grace (basis of design).
      b. FortiFlash by Fortifiber.
      c. FlexWrap and StraightFlash by DuPont.
      d. Or equal.

2.2 FLEXIBLE SHEET FLASHING

A. Product - Vycor Plus by WR Grace or Equal:
   1. Self-Adhered, cross-laminated high-density polyethylene (HDPE) sheet, backed by aggressive pressure-sensitive rubberized asphalt adhesive.
   2. Thickness: 25 mil minimum per ASTM D3767, Method A.
   3. Low temperature flexibility: Unaffected at minus 45 degrees F per ASTM D1970.
   4. Elongation, ultimate failure of rubberized asphalt: 200 percent minimum per ASTM D412.
   5. Cracked cycling 100 cycles: Unaffected at minus 25 degrees F per ASTM C836.
   6. Lap adhesion at minimum application temperature: 60 plf width per ASTM D1876 modified.
   7. Adhesion to concrete at minimum application temperature: 60 plf width per ASTM D903.
   8. Recommended exposure limit: 30 days.
   9. Perm-A-Barrier by Grace is not acceptable.

2.3 AUXILIARY MATERIALS

A. Mastic, Joint Sealant, Adhesives, and Tape:
   1. Liquid mastic and adhesives, and adhesive tapes recommended by flexible sheet flashing manufacturer:
      a. Caulking, sealants, and adhesives applied on the interior of the building envelope shall comply with South Coast Air Quality Management District (SCAQMD) Rule 1168.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with installer present, for compliance with requirements and other conditions affecting performance:
   1. Verify that concrete has cured and aged for minimum time period recommended by flexible sheet flashing manufacturer.
   2. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install flexible sheet flashing in accordance with the manufacturer's written instructions, AAMA Publication 2400, and the applicable code.

END OF SECTION 07 65 00

SECTION 07 81 23 INTUMESCENT FIREPROOFING

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes requirements including but not limited to:
   1. Mastic and intumescent fire resistive coatings.
   2. Accessories necessary for a complete installation.

1.3 SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings - Framing plans or schedules, or both, indicating the following:
   1. Extent of fireproofing for each construction and fire-resistance rating.
   2. Applicable fire-resistance design designations of a qualified testing and inspecting agency acceptable to authorities having jurisdiction.
   3. Minimum fireproofing thicknesses needed to achieve required fire-resistance rating of each structural component and assembly.
   4. Treatment of fireproofing after application.

C. Samples: For each exposed product and for each color and texture specified, in manufacturer's standard dimensions in size.

D. Qualification Data: For installer and testing agency.

E. Product Certificates: For each type of fireproofing.

F. Evaluation Reports: For fireproofing, from ICC-ES.

1.4 PERFORMANCE REQUIREMENTS

A. Assemblies: Provide fireproofing, including auxiliary materials, according to requirements of each fire resistance design and manufacturer's written instructions.

B. Fire Resistance Design:
   1. Indicated on Drawings, tested according to ASTM E119 or UL 263; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency:
      a. Steel members are to be considered unrestrained unless specifically noted otherwise.

C. Surface Burning Characteristics - Comply with ASTM E84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency:
   1. Flame spread index: 25 or less.
   2. Smoke developed index: 450 or less.

D. Asbestos: Provide products containing no detectable asbestos.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: A firm or individual certified, licensed, or otherwise qualified by fireproofing manufacturer as experienced and with sufficient trained staff to install manufacturer's products according to specified requirements.

B. Source Limitations: Obtain fireproofing for each fire-resistance design from single source.

C. Mockups:
1. Build mockups t**o** verify selections made under sample submittals and to demonstrate aesthetic effects and to set quality standards for materials and execution:
   a. Build mockup of each type of fireproofing and different substrate and each required finish.
   b. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
   c. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

D. Pre-Installation Conference:
1. Conduct conference at Project site:
   a. Review products, design ratings, restrained and unrestrained conditions, thicknesses, and other performance requirements.
   b. Review all metal materials, remove all corrosive materials, and provide primers and/or substrate material required by manufacturer.

PART 2 PRODUCTS

2.1 MASTIC AND INTUMESCENT FIRE-RESISTIVE COATINGS

A. Mastic and Intumescent Fire Resistive Coating, Interior Use:
1. Factory mixed formulation consisting of intumescent base coat and topcoat (if required), and complying with indicated fire resistance design:
   a. Manufacturers are subject to compliance with requirements; provide products by one of the following:
      1) Isolatek International, CAFCO SprayFilm WB 4 (basis of design).
      2) Albi Manufacturing; a division of StanChem, Inc.
      3) Carboline Company; a subsidiary of RPM International.
   b. Interior application: Designated for interior general purpose, conditioned interior space purpose use by a qualified testing agency acceptable to authorities having jurisdiction.
   c. Thickness: Required for fire-resistance design indicated, measured according to requirements of fire-resistance design.
   d. Hardness: Not less than 65 Type D durometer, according to ASTM D2240.
   e. Finish is as selected by Architect from manufacturer's standard finishes or spray-textured finish:
      1) Color and gloss: As indicated by manufacturer's designations, match Architect's sample or as selected by Architect from manufacturer's full range.

B. Mastic and Intumescent Fire Resistive Coating, Exterior Use:
1. Factory mixed formulation consisting of intumescent base coat and topcoat (if required) and complying with indicated fire resistance design:

a. Manufacturers are subject to compliance with requirements; provide products by one of the following:
   1) Isolatek International, CAFCO SprayFilm WB 4 System (basis of design).
   2) Albi Manufacturing; a division of StanChem, Inc.
   3) Carboline Company; a subsidiary of RPM International.
b. Exterior application: Designated for exterior use by a qualified testing agency acceptable to authorities having jurisdiction.
c. Thickness: Required for fire-resistance design indicated, measured according to requirements of fire-resistance design.
d. Hardness: Not less than 65 Type D durometer, according to ASTM D2240.
e. Finish is as selected by Architect from manufacturer's standard finishes or spray-textured finish:
   1) Color and gloss: As indicated by manufacturer's designations, match Architect's sample or as selected by Architect from manufacturer's full range.

2.2 AUXILIARY MATERIALS

A. Provide auxiliary materials that are compatible with fireproofing and substrates and are approved by UL or another testing and inspecting agency acceptable to authorities having jurisdiction for use in fire-resistance designs indicated.

B. Substrate Primers: Primers approved by fireproofing manufacturer and complying with required fire-resistance design by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.

C. Reinforcing Fabric: Glass or carbon fiber fabric of type, weight, and form required to comply with fire-resistance designs indicated; approved and provided by fireproofing manufacturer.

D. Reinforcing Mesh: Metallic mesh reinforcement of type, weight, and form required to comply with fire-resistance design indicated; approved and provided by fireproofing manufacturer. Include pins and attachment.

E. Topcoat: Suitable for application over applied fireproofing; of type recommended in writing by fireproofing manufacturer for each fire-resistance design.

PART 3 EXECUTION

3.1 FIELD CONDITIONS

A. Environmental Limitations: Do not apply fireproofing when ambient or substrate temperature is 50 degrees F (10 degrees C) or lower unless temporary protection and heat are provided to maintain temperature at or above this level for 24 hours before, during, and for 24 hours after product application.

B. Ventilation: Ventilate building spaces during and after application of fireproofing, providing complete air exchanges according to manufacturer's written instructions. Use natural means or, if they are inadequate, forced-air circulation until fireproofing dries thoroughly.

3.2 EXAMINATION

A. Examine substrates, areas, and conditions, with installer present, for compliance with requirements for substrates and other conditions affecting performance of the Work and according to each fire-resistance design:
   1. Verify that substrates are free of dirt, oil, grease, release agents, rolling compounds,

mill scale, loose scale, incompatible primers, paints, and encapsulate, or other foreign substances capable of impairing bond of fireproofing with substrates under conditions of normal use or fire exposure.

2. Verify that objects penetrating fireproofing, including clips, hangers, support sleeves, and similar items are securely attached to substrates.
3. Verify that substrates receiving fireproofing are not obstructed by ducts, piping, equipment, or other suspended construction that will interfere with fireproofing application.

B. Conduct tests according to fireproofing manufacturer's written instructions to verify that substrates are free of substances capable of interfering with bond.

C. Prepare written report, endorsed by installer, listing conditions detrimental to performance of the Work.

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

3.3 PREPARATION

A. Cover other work subject to damage from fallout or overspray of fireproofing materials during application.

B. Clean substrates of substances that could impair bond of fireproofing.

C. Prime substrates where included in fire-resistance design and where recommended in writing by fireproofing manufacturer unless compatible shop primer has been applied and is in satisfactory condition to receive fireproofing.

D. For applications visible on completion of Project, repair substrates to remove surface imperfections that could affect uniformity of texture and thickness in finished surface of fireproofing. Remove minor projections and fill voids that would telegraph through fire-resistive products after application.

3.4 APPLICATION

A. Construct fireproofing assemblies that are identical to fire-resistance design indicated and products as specified, tested, and substantiated by test reports; for thickness, primers, topcoats, finishing, and other materials and procedures affecting fireproofing work.

B. Comply with fireproofing manufacturer's written instructions for mixing materials, application procedures, and types of equipment used to mix, convey, and apply fireproofing; as applicable to particular conditions of installation and as required to achieve fire-resistance ratings indicated.

C. Coordinate application of fireproofing with other construction to minimize need to cut or remove fireproofing:

1. Do not begin applying fireproofing until clips, hangers, supports, sleeves, and other items penetrating fireproofing are in place.
2. Defer installing ducts, piping, and other items that would interfere with applying fireproofing until application of fireproofing is completed.

D. Install auxiliary materials as required, as detailed, and according to fire-resistance design and fireproofing manufacturer's written instructions for conditions of exposure and intended use. For auxiliary materials, use attachment and anchorage devices of type recommended

in writing by fireproofing manufacturer.

E. Spray apply fireproofing to maximum extent possible. After the spraying operation in each area, complete the coverage by trowel application or other placement method recommended in writing by fireproofing manufacturer.

F. Extend fireproofing in full thickness over entire area of each substrate to be protected.

G. Install body of fireproofing in a single course unless otherwise recommended in writing by fireproofing manufacturer.

H. Provide a uniform finish complying with description indicated for each type of fireproofing material and matching finish approved for required mockups.

I. Cure fireproofing according to fireproofing manufacturer's written instructions.

J. Do not install enclosing or concealing construction until after fireproofing has been applied, inspected, and tested and corrections have been made to deficient applications.

K. Finishes - Where indicated, apply fireproofing to produce the following finish:
1. Manufacturer's standard finishes: Finish according to manufacturer's written instructions for each finish selected.

3.5 FIELD QUALITY CONTROL

A. Special Inspections: Owner will engage a qualified special inspector to perform special inspections for tests and inspections as required by the CBC and DSA classified projects.

B. Perform the tests and inspections of completed Work in successive stages. Do not proceed with application of fireproofing for the next area until test results for previously completed applications of fireproofing show compliance with requirements. Tested values must equal or exceed values as specified and as indicated and required for approved fire-resistance design.

C. Fireproofing will be considered defective if it does not pass tests and inspections:
1. Remove and replace fireproofing that does not pass tests and inspections, and retest.
2. Apply additional fireproofing, per manufacturer's written instructions, where test results indicate insufficient thickness, and retest.

D. Prepare test and inspection reports.

3.6 CLEANING, PROTECTING, AND REPAIRING

A. Cleaning: Immediately after completing spraying operations in each containable area of Project, remove material overspray and fallout from surfaces of other construction and clean exposed surfaces to remove evidence of soiling.

B. Protect fireproofing, according to advice of manufacturer and installer, from damage resulting from construction operations or other causes, so fireproofing is without damage or deterioration at time of Substantial Completion.

C. As installation of other construction proceeds, inspect fireproofing and repair damaged areas and fireproofing removed due to Work of other trades.

D. Repair fireproofing damaged by other work before concealing it with other construction.

E. Repair fireproofing by reapplying it using same method as original installation or using manufacturer's recommended trowel-applied product.

END OF SECTION 07 81 23

SECTION 07 92 00 JOINT SEALANTS

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes requirements including but not limited to:
1. Control and expansion joints on exposed interior and exterior surfaces.
2. Perimeter joints between wall surfaces and frames of interior and exterior doors and openings.
3. Joints between plumbing fixtures and adjoining walls, floors, and counters.
4. Joints indicated or as necessary.
5. Accessories necessary for a complete installation.

B. Related Sections:
1. Section 03 30 00: Cast-In-Place Concrete
2. Section 05 50 00: Metal Fabrications.
3. Section 07 84 00: Firestopping.
4. Section 08 11 13: Hollow Metal Doors and Frames.
5. Section 08 14 16: Flush Wood Doors.
6. Section 08 80 00: Glazing.
7. Section 09 90 00: Painting and Coating.

1.3 SUBMITTALS

A. Product Data:
1. Technical data for each joint sealant product. Data to indicate elasticity and durability of each joint sealant product. Submit written certification from manufacturers of sealants attesting products are suitable for use indicated, verified through in-house testing laboratory:
   a. Written certification from manufacturers of joint sealants attesting that products comply with specification requirements and suitable for use indicated verified through manufacturers testing laboratory within the past 36 months or since most recent reformulation, whichever is most recent:
      1) Complete instructions for handling, storage, mixing, priming, installation, curing, and protection of each type of sealant.
      2) Manufacturer's letter, clearly indicating proposed lot numbers of each sealant supplied and expiration date sequence.
2. Recycled Content:
   a. Indicate recycled content; indicate percentage of pre-consumer and postconsumer recycled content per unit of product.
   b. Indicate relative dollar value of recycled content product to total dollar value of product included in Project.
   c. If recycled content product is part of an assembly, indicate the percentage of recycled content product in the assembly by weight.
   d. If recycled content product is part of an assembly, indicate relative dollar value of recycled content product to total dollar value of assembly.
3. Local/regional materials:
   a. Sourcing location(s): Indicate location of extraction, harvesting, and recovery;

indicate distance between extraction, harvesting, and recovery and the Project site.
b. Manufacturing location(s): Indicate location of manufacturing facility; indicate distance between manufacturing facility and the Project site.
c. Product value: Indicate dollar value of product containing local/regional materials; include materials cost only.
d. Product component(s) value: Where product components are sourced or manufactured in separate locations, provide location information for each component. Indicate the percentage by weight of each component per unit of product.

4. VOC data: Submit manufacturer's product data for sealants. Indicate VOC limits of the product. Submit MSDS highlighting VOC limits.
5. Submit environmental data in accordance with Table 1 of ASTM E2129 for products provided under work of this Section.

B. Samples:
1. Provide color samples from full manufacturer's full range for each type of sealant specified for Architect's review.

C. Certificates and Reports:
1. Product Certificates: Manufacturer's product certificate for each kind of joint sealant and accessory.
2. Sealant, Waterproofing, and Restoration Institute (SWRI) Validation Certificate: For each sealant specified to be validated by SWRI's Sealant Validation Program.
3. Product test reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, indicating that sealants comply with requirements.
4. Preconstruction compatibility and adhesion test reports:
a. From sealant manufacturer, indicating the following:
1) Materials forming joint substrates and sealant backings have been tested for compatibility and adhesion with sealants.
2) Interpretation of test results and written recommendations for primers and substrate preparation needed for adhesion.
5. Preconstruction field adhesion test reports: Indicate which sealants and joint preparation methods resulted in optimum adhesion to joint substrates based on testing specified.
6. Field adhesion test reports: For each sealant application tested.

1.4 QUALITY ASSURANCE

A. Installer Qualifications:
1. Firm having minimum five (5) years' documented experience and specializes in the installation of sealants:
a. Exposed sealant work (sealants used for air and weather seals external at perimeter, metal panel to panel joints) shall be performed by a single (i.e. one) firm specializing in the installation of sealants who has successfully produced work comparable to Project.
b. Concealed sealant work (sealants that are internal to skylights and providing an air seal) shall be the responsibility of the subcontractor providing erection of the respective system.

B. Source Limitations: Obtain each type of joint sealant from a single manufacturer.

C. Product Testing:
1. Test joint sealants using a qualified testing agency:
a. Testing agency qualifications: An independent testing agency qualified according to ASTM C1021 to conduct the testing indicated.
b. Test according to SWRI Sealant Validation Program for compliance with

requirements specified by reference to ASTM C920 for adhesion and cohesion under cyclic movement, adhesion in peel, and indentation hardness.

D. Environmental Requirements:
   1. Toxicity/IEQ:
      a. Comply with applicable regulations regarding toxic and hazardous materials:
         1) VOC content of interior sealants - sealants and sealant primers complying with limits for VOC content for SCAQMD when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
            a) Sealants: 250 g/L.
            b) Sealant primers for nonporous substrates: 250 g/L.
            c) Sealant primers for porous substrates: 775 g/L.
      b. Sealants containing aromatic solvents, fibrous talc, formaldehyde, halogenated solvents, mercury, lead, cadmium, chromium and their compounds, are not permitted.

1.5 WARRANTY

A. Written warranty, signed by installer agreeing to repair or replace elastomeric joint sealant work that has failed to provide a weathertight system within specified warranty period:
   1. **Warranty period: Five (5) years** from date of Substantial Completion.

B. Written warranties (weather seal and stain resistance), signed by sealant manufacturer agreeing to furnish joint sealants to repair or replace those that fail to provide airtight and watertight joints, or fail in adhesion, cohesion, abrasion resistance, stain resistance, weather resistance, durability, or appear to deteriorate in manner not specified in the manufacturer's data as an inherent quality of the material within specified warranty period:
   1. **Warranty period: Five (5) years** from date of Substantial Completion.

C. Warranties specified exclude deterioration or failure of sealants from:
   1. Movement of the structure caused by structural settlement or errors attributable to design or construction resulting in stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression.
   2. Disintegration of joint substrates from natural causes exceeding design specifications.
   3. Mechanical damage caused by individuals, tools, or outside agents.
   4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to site in original unopened containers or bundles with labels indicating manufacturer, product name and designation, color, expiration date, pot life, curing time, and mixing instructions for multicomponent materials.

B. Store and handle materials in compliance with manufacturer’s written instructions to prevent deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.

PART 2 PRODUCTS

2.1 MATERIALS

A. Compatibility: Provide joint sealants, backings, and related materials compatible with one another and with joint substrates under conditions of service and application, as stated by sealant manufacturer’s published data, and as substantiated by the manufacturer for each

application through testing.

B. Liquid Applied Sealants: Comply with ASTM C920 and requirements indicated for each liquid applied sealant specified, including those referencing ASTM C920 classifications for type, grade, class, and uses related to exposure and joint substrates.

C. Stain Test Response Characteristics: For sealants in contact with porous substrates, provide nonstaining products that have undergone testing according to ASTM C1248 and do not stain porous joint substrates.

D. Suitability for Contact with Food: Where sealants are indicated for joints that will come in repeated contact with food, provide products that comply with 21 CFR 177.2600.

E. Colors: For fully concealed joints, provide standard color of sealant that has the best overall performance characteristics for the application shown. For exposed joints, submit color samples to Architect for approval, from manufacturer's full line of standard colors.

F. Manufacturer's Representative: Use sealant produced by manufacturer who agrees to send a qualified technical representative to site upon request for the purpose of rendering advice concerning the recommended installation of manufacturer's materials.

G. Sealants: Self-leveling compounds for horizontal joints in pavements and non-sag compounds elsewhere except as shown or specified.

H. Silicone Sealant:
1. Comply with ASTM C920, Type M, Grade NS, Class 25; use NT, M, A and O:
    a. Use: Typical joints between masonry, metals, glass, and plastics (two-part silicone sealants).
    b. Properties:
        1) Performance: Non-stain, non-bleed, non-streaking to sealed and adjacent substrates. The minimum pli value after seven (7) day immersion shall not be less than 13 when tested in strict accordance with ASTM C794 Adhesion and Peel.
        2) Cure system and oil content: Neutral cure system specifically manufactured with controlled oil content to eliminate oil migration into sealed substrates and residue rundown over and onto adjacent substrates.
    c. Product and manufacturer: Dow Corning; 756 Silicone Building Sealant - HP with Additive.

I. Silicone Sealant:
1. ASTM C920, Type S, Grade NS, Class 50, for Use NT:
    a. Use: Typical joints between masonry, metals, glass, and plastics (single component sealants).
    b. Properties:
        1) Performance: Non-stain, non-bleed, non-streaking to sealed and adjacent substrates.
        2) Cure system and oil content: Neutral cure system specifically manufactured with controlled oil content to eliminate oil migration into sealed substrates and residue rundown over and onto adjacent substrates.
    c. Product and manufacturer:
        1) **BASF Building Systems**; Omniseal 50.
        2) **Dow Corning Corporation**; 756 SMS, 791, 795, 995 as applicable.
        3) **GE Advanced Materials**, Silicones; SilGlaze II SCS2800, SilPruf NB SCS9000, SilPruf SCS2000, or UltraPruf II SCS2900 as applicable.
        4) **Pecora Corporation**, as applicable.

5) **Sika Corporation**, Construction Products Division; SikaSil-C995.
6) **Tremco**, as applicable.
7) Comparable product.

J. Polyurethane Sealants:
1. ASTM C920, Type M, Grade NS, Class 25; use NT, M, A and O:
   a. Use: Typical Wall and floor joints (two-part polyurethane sealants). Use at concrete joints.
   b. Properties:
      1) Performance: Non-stain, non-bleed, non-streaking to sealed and adjacent substrates.
   c. Products and manufacturers:
      1) **BASF Building Systems**; Sonolastic NP-2.
      2) **Pecora Corporation**; Dynatred.
      3) **Sika Corporation**, Construction Products Division; Sikaflex 2c NS or Sikaflex 2c NS TG as applicable.
      4) **Tremco**, as applicable.
      5) Comparable product.

K. Two-Part Polyurethane Sealants:
1. ASTM C920, Type M, Grade NS, Class 50; use NT, M, A and O:
   a. Use: Typical Wall and floor joints (two-part polyurethane sealants).
   b. Properties:
      1) Performance: Non-stain, non-bleed, non-streaking to sealed and adjacent substrates. The minimum pli value after seven (7) day immersion shall not be less than 13 when tested in strict accordance with ASTM C794 Adhesion in Peel.
   c. Products and manufacturers:
      1) **BASF Construction Chemicals**; NP 2.
      2) **Pecora Corporation**, as applicable.
      3) **Schnee-Morehead**, Inc.; Permathane SM 7200.
      4) **Sika Corporation**, Inc.; Sikaflex - 2c NS TG.
      5) **Tremco**, as applicable.
      6) Comparable product.

L. Mildew Resistant Silicone Sealant:
1. ASTM C920, Type S, Grade NS, Class 25, Use NT, Substrate uses G, A, and O; and containing fungicide for mildew resistance; acid curing:
   a. Use: One-part mildew-resistant silicone, formulated with fungicide for sealing interior joints of nonporous substrates around ceramic tile, plumbing fixtures, and showers.
   b. Products - provide one of the following:
      1) **BASF Building Systems**; Omniplus.
      2) **Dow Corning**; 786 Mildew Resistant Silicone Sealant.
      3) **GE Silicones**; Sanitary SCS 1700.
      4) **Pecora Corporation**, as applicable.
      5) **Sika Corporation**, Inc., as applicable.
      6) **Tremco**, as applicable.
      7) Comparable product.

M. Latex Sealant:
1. Non-elastomeric, one-part, non-sag, paintable latex sealant that is recommended for exposed applications on the interior. Complying with ASTM C834, Type OP (opaque sealants):
   a. Products are subject to compliance with requirements; provide one of the following:
      1) **BASF**; Sonolastic Sonolac.

2) **Pecora Corporation**; AC-20 + Silicone.
3) **Sika Corporation**, Inc., as applicable.
4) **Tremco**, as applicable.
5) Comparable product.

N. Acoustical Joint Sealant:
1. Non-sag, paintable, non-staining latex sealant complying with ASTM C834. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E90:
   a. Products are subject to compliance with requirements; provide one of the following:
      1) **BASF**, as applicable.
      2) **Pecora Corporation**; AC-20 FTR or AIS-919.
      3) **Sika Corporation**, Inc., as applicable.
      4) **Tremco**, as applicable.
      5) **USG Corporation**; SHEETROCK Acoustical Sealant.
      6) Comparable product.

O. Sealant Backing:
1. Provide sealant backings that are non-staining, compatible with joint substrates, sealants, primers, and joint fillers, and approved for applications indicated by sealant manufacturer based on field experience and laboratory testing:
   a. Cylindrical sealant backings: Preformed, compressible, resilient, non-staining, non-waxing, non-extruding backings of flexible plastic foam complying with ASTM C1330, and of type indicated below. Select shape and density of cylindrical sealant backings in consultation with the manufacturer for proper performance in specific condition of use in each case.
   b. Type C - closed cell polyethylene foam material with surface skin, nonabsorbent to liquid water and gas, non-outgassing in unruptured state; provide one of the following:
      1) **BASF**, as applicable.
      2) **HBR Closed Cell Backer Rod**; Nomaco, Inc.
      3) **Pecora Corporation**, as applicable.
      4) **Sonolastic Closed-Cell Backer-Rod**; BASF Construction Chemicals.
      5) **Tremco**, as applicable.
      6) Comparable product.

P. Window Glazing:
1. Product Description: Ready to use glazing compound that may be used for face glazing wood or metal sash on existing windows. It is a knife-grade consistency allows for smooth, easy applications. Stick tightly to glass and sash and resists sagging, shrinking and cracking. Follow manufacturers suggested uses.
2. This product is NOT to be used on plastic windowpanes, porcelainized steel insulating panels or any insulated glass units with organic seals, stained or leaded glass. Any window pain over 48 inches in any direction.
3. Listed manufacturer:
   a. Dap 33 Glazing compound.
   b. Approved equal.

Q. Miscellaneous Materials:
1. Primer: Material recommended, as verified through compatibility and adhesion testing, by joint sealant manufacturer for the substrates indicated to be sealed.
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 joint substrates and adjacent nonporous surfaces in any way and formulated to promote optimum adhesion of sealants with joint substrates.

3. Masking tape: Non-staining, non-absorbent material compatible with joint sealants and that will not stain nor mar the finish of surface adjacent to joints to which it is applied.
4. Cork joint filler: Resilient and non-extruding, ASTM D1752, Type II.
5. Bond breaker tape: Polyethylene, TFE fluorocarbon, or plastic tape 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.

PART 3 EXECUTION

3.1 PROJECT CONDITIONS

A. Environmental Limitations:
   1. Do not proceed with installation of joint sealants under the following conditions:
      a. When ambient and substrate temperature conditions are outside limits permitted by joint sealant manufacturer or are below 40 degrees F (4.4 degrees C).
      b. When joint substrates are wet. Should joints or backing materials become wet, remove and replace backing material with new.

B. Joint Width Conditions: Do not proceed with installation of joint sealants where joint widths are less than those allowed by joint sealant manufacturer for applications indicated.

C. Joint Substrate Conditions: Do not proceed with installation of joint sealants until contaminants capable of interfering with adhesion are removed from joint substrates.

3.2 EXAMINATION

A. Examine joints indicated to receive joint sealants for compliance with requirements for joint configuration, installation tolerances, and conditions affecting sealant performance. Proceed with installation after unsatisfactory conditions have been corrected.

3.3 PREPARATION

A. Surface Cleaning of Joints:
   1. Clean out joints immediately before installing joint sealants to comply with the recommendations of joint sealant manufacturer and requirements:
      a. Remove foreign material from joint substrates interfering with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), existing joint sealants, oil, grease, water, surface dirt, and frost.
      b. Clean concrete, masonry, unglazed surfaces of 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 joint sealants. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil free compressed air.
      c. Remove laitance and form-release agents from concrete.
      d. Clean metal, glass, porcelain enamel, glazed surfaces of 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 joint sealants.

B. Joint Priming (Elastomeric Sealants Only): Prime joint substrates where recommended in writing by joint sealant manufacturer, based on prior testing and experience. Apply primer to comply with joint sealant manufacturer's written instructions. Confine primers to areas of joint sealant bond; do not allow spillage or migration onto adjoining surfaces.

C. Masking Tape: Use masking tape where required to prevent contact of sealant 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.

3.4 INSTALLATION

A. Silicone Glazing Sealants: Refer to Section 08 80 00: Glazing.

B. Comply with joint sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.

C. Installation Standard: Comply with recommendations in ASTM C1193 for use of joint sealants applicable to materials, applications, and conditions indicated.

D. Sealant Backings:
1. Install sealant backings to support sealants during application and at position necessary to produce 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 sealant backings. Trim for tight fit around obstructions or elements penetrating the joint.
    b. Do not stretch, twist, puncture, or tear sealant backings.
    c. Remove absorbent sealant backings that become wet before sealant application and replace with dry sealant backings.
    d. Install bond breaker tape behind sealants where backings are not used between sealants and back of joints.

E. Weeps and Vents: Install weeps and vents into joints at the same time sealants are being installed. Locate weeps and vents spaced recommended by sealant manufacturer and the window and curtain wall fabricator and erector. Do not install weeps and vents at outside building corners. Do not install vents at horizontal joints immediately below shelf angles, sills, and through wall flashings.

F. Sealants:
1. Install sealants by proven techniques resulting 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 same time sealant backings are installed:
    a. Apply sealants in depth in accordance with manufacturer's recommendations and recommended general proportions and limitations.
    b. Apply elastomeric sealants, in joints not subject to traffic or abrasion, to a depth equal to 50 percent of the joint width, but not less than 1/4 inch (6 mm) and not more than 1/2 inch (13 mm).
    c. Apply non-elastomeric sealants to a depth approximately equal to the joint width.

G. Tooling of Non-Sag Sealants:
1. Immediately after sealant application and before skinning or curing begins, tool sealants to form smooth, uniform, beads 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. Tool exposed surfaces of sealants to the profile shown, or if none is shown, tool slightly concave:
    a. Use masking tape to protect adjacent surfaces of recessed tooled joints.
    b. Provide a slight wash on horizontal joints where horizontal and vertical surfaces meet.

c. Against rough surfaces or in joints of uneven widths avoid the appearance of excess sealant or compound by locating the compound or sealant well back into joint wherever possible.

H. Installation of Preformed Silicone Sealant System:
1. Apply masking tape to each side of joint, outside of area to be covered by sealant system.
2. Apply silicone sealant to each side of joint to produce a bead of size complying with preformed silicone sealant system manufacturer's written instructions and covering a bonding area of not less than 3/8 inch (10 mm). Hold edge of sealant bead 1/4 inch (6 mm) inside masking tape.
3. Within 10 minutes of sealant application, press silicone extrusion into sealant to wet extrusion and substrate. Use a roller to apply consistent pressure and ensure uniform contact between sealant and both extrusion and substrate.
4. Complete installation of sealant system in horizontal joints before installing in vertical joints. Lap vertical joints over horizontal joints. At ends of joints, cut silicone extrusion with a razor knife.

I. Installation of Preformed Foam Sealants: Install each length of sealant immediately after removing protective wrapping. Do not pull or stretch material. Produce seal continuity at ends, turns, and intersections of joints. For applications at low ambient temperatures, apply heat to sealant in compliance with sealant manufacturer's written instructions.

J. Acoustical Sealant Installation: At sound rated assemblies and elsewhere as indicated, seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Comply with ASTM C919 and with manufacturer written recommendations.

3.5 FIELD QUALITY CONTROL

A. Field Adhesion Testing:
1. Field test exterior wall joint sealant adhesion to joint substrates:
   a. Extent of testing - test completed and cured sealant joints:
      1) Perform ten (10) tests for the first 1,000 feet (300 m) of joint length for each kind of sealant and joint substrate.
      2) Perform one (1) test for each 1,000 feet (300 m) of joint length thereafter or one (1) test per each floor per elevation.
2. Test method: Test joint sealants according to Method A, Field Applied Sealant Joint Hand Pull Tab, in Appendix X1 in ASTM C1193 or Method A, Tail Procedure, in ASTM C1521. For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.
3. Inspect tested joints and report on the following:
   a. Whether sealants filled joint cavities and are free of voids.
   b. Whether sealant dimensions and configurations comply with specified requirements.
   c. Whether sealants in joints connected to pulled out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. Compare these results to determine if adhesion passes sealant manufacturer field adhesion hand pull test criteria.
4. Record test results in a field adhesion test log. Include dates when sealants were installed, names of persons who installed sealants, test dates, test locations, whether joints were primed, adhesion results and percent elongations, sealant fill, sealant configuration, and sealant dimensions.
5. Repair sealants pulled from test area by applying new sealants following same

procedures used originally to seal joints. Ensure original sealant surfaces are clean and new sealant contacts original sealant.

B. Evaluation of Field Adhesion Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with indicated requirements will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.

3.6 SITE ENVIRONMENTAL PROCEDURES

A. Indoor Air Quality: Provide temporary ventilation during work. Coordinate interior application of sealants with interior finishes schedule.

3.7 CLEANING AND PROTECTION

A. Clean off excess sealants or sealants smears adjacent to joints as work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

B. Protect joint sealants during and after curing from contact with contaminating substances and from damage so sealants are without deterioration or damage at time of Substantial Completion. If, despite protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from the original work.

END OF SECTION 07 92 00

SECTION 08 11 13 HOLLOW METAL DOORS AND FRAMES

PART 1 GENERAL

1.1 RELATED DOCULENTS

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. Provide items shown on the Drawings and specified, including, but not limited to the following:
   1. Steel frames for doors.
   2. Thermally rated steel doors.

B. Related Sections:
   1. Section 07 92 00: Joint Sealants.
   2. Section 09 90 00: Painting and Coating.

C. Reference Standards:
   1. ASTM International (ASTM)
      a. A653 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
      b. A924 Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
      c. A1008 Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
      d. A1011 Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
      e. C1363 Standard Test Method for the Thermal Performance of Building Assemblies by Means of a Hot Box Apparatus.
      f. E283 Standard Test Method for Determining the rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
      g. E413 Standard Classification for Rating Sound Insulation.
   2. Hollow Metal Manufacturers Association (HMMA):
      a. HMMA 802 Manufacturing of Hollow Metal Doors and Frames.
      b. HMMA 810 Hollow Metal Doors.
      c. HMMA 830 Hardware Preparation and Locations for Hollow Metal Doors and Frames.
      d. HMMA 840 Installation and Storage of Hollow Metal Doors and Frames.
      e. HMMA 850 Fire Rated Hollow Metal Doors & Frames.
      f. HMMA 890 Technical Summary of Hollow Metal by HMMA.
   3. National Fire Protection Association (NFPA):
      a. 80 Fire Doors and Fire Windows.
      b. 252 Fire Tests of Door Assemblies.
   4. Steel Door Institute – Current Standards: Technical Data Series.
   5. Underwriters Laboratories Inc. (UL):
      a. Building Materials Directory.
      b. Listing and Labeling.
      c. 10B and 10C Fire Tests of Door Assemblies.
      d. 1784 Air Leakage Tests of Door Assemblies.

6. Intertek Testing, Services (Warnock Hersey, Inc. (WHI): Listing and Labeling.

1.3 SUBMITTALS

A. Product Data:
   1. Manufacturer's standard details and catalog data demonstrating compliance with specifications and referenced standards.
   2. Manufacturer's installation instructions.

B. Shop Drawings:
   1. Indicate complete schedule in detail for each steel door and frame using the same reference number for details and openings as those on the contract Drawings. If any door is not by the steel door manufacturer, only the door opening number should be shown along with the type of door (wood, plastic laminate faced, etc.):
      a. Show details of construction, installation, connections, anchors, hardware reinforcement, hardware preparation, louvers, and floor and threshold clearances.

C. Samples are required from non-Steel Door Institute members:
   1. 12-inch by 12-inch sample of a fire-rated and non-rated door, cut from corner of door, showing door construction.
   2. 12-inch by 12-inch sample of each type of door louver specified or required, showing louver construction.
   3. Six-inch (6”) long sample of a fire-rated, non-rated frame, and each type of glass stop specified or required, showing corner and construction.

D. Certificates: Manufacturer’s certification that oversized openings are in compliance with specifications.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: If other than a manufacturer listed under Paragraph 2.1 is proposed for use on the Project, it shall be a company specializing in the manufacturer of steel doors and frames of the type specified for this Project with a minimum of five (5) years’ experience.

B. All steel doors and frames shall be by a single manufacturer, shop drawings to be submitted with manufacturer’s insignia, which is being supplied.

C. Furnish steel doors and frames to meet current ANSI/Steel Door Standards.

D. ANSI A250.13 Testing and Rating of Sever Windstorm Resistant Components for Swing Door Assemblies.

E. ASTM E330, Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls and Doors by Uniform Static Air Pressure Difference.

F. Comply with ASTM E283 Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.

G. Regulatory Requirements:
   1. Fire-Rated Assemblies:
      a. Fire-rated door, panel, frame, and fire window construction shall conform to NFPA 252, or UL 10B, as applicable, and acceptable to the code of authorities having jurisdiction.

b. Fire-rated door construction:
   1) Notwithstanding any other requirements of this Section, provide gauge of metal, method of construction, hardware preparation, reinforcement, and placement, glass opening size, and other specifics required to obtain the specified or required label. The label shall contain the fire resistance rating (20-minute, 45-minute, 1-hour, 1-1/2-hour, 3-hour, etc.) and the designation (A, B, C, D, or E); doors with B Label shall be 1-1/2 hour.
   2) Fire-rated doors used in a stairway enclosure, shall be so constructed so that the maximum transmitted temperature shall not exceed 450 degrees F above ambient temperature at the end of 30 minutes of the Standard Fire Exposure Test and shall be so noted on the label.

c. Fire-rated openings:
   1) Conform to NFPA 80 for fire-rated class shown or required by code of authorities having jurisdiction:
      a) Units shall be identical to assemblies whose fire resistance characteristics have been determined in accordance with requirements specified above, and shall be labeled and listed by UL, WHI, or other inspection and testing agency acceptable to the code of authorities having jurisdiction.
      b) Fire-rated steel doors, panels, frames, and fire windows shall bear permanent labels attesting to fire resistance. At stairway enclosures, provide units listed for 450 degree F maximum temperature rise rating for 30 minutes of exposure.
      c) Oversized openings shall be constructed in accordance with all applicable requirements for labeled door construction.
      d) Fire rated door assemblies with gaps in excess of 1/8 inch between door and frame will not comply with NFPA 80.
      e) Locate label on hinge side of doors and frames so that when door is closed, label is not visible.
      f) Caution shall be taken to ensure that labels are not removed, damaged, or painted over.
      g) Glass panes shall not exceed sizes allowed whether indicated or not on the Drawings.

H. Wind Loads: Provide hollow metal and door hardware assemblies approved by DSA, including anchorage, capable of withstanding wind load design pressures that are calculated for this Project by a registered Architect or Engineer and is part of the construction documents per CBC.

I. Accessibility Requirements:
   1. Comply with applicable requirements:
      a. Americans with Disability Act of 1990, as amended: 2010 ADA Standards.
      b. 2022 California Building Code (CBC). CCR Title 24, Part 2, as adopted and amended by DSA.

1.5 WARRANTY

A. Warrant the work specified herein for one (1) year against becoming unserviceable or causing an objectionable appearance resulting from either defective or non-conforming materials and workmanship.

B. Defects shall include, but not be limited to:
   1. Use of incorrect materials in opening.
   2. Incorrect labeled components installed within opening.
   3. Noisy, rough, or difficult operation.
   4. Failure to meet specified quality assurance requirements.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store products in accordance with manufacturer's instructions, and as follows:
   1. In manufacturer's original, clearly labeled, undamaged containers or wrappers.
   2. Containers or wrappers shall list the name of the manufacturer and product.

B. Deliver materials to allow for minimum storage time at the Project site. Coordinate delivery with the scheduled time of installation.

C. Protect products from moisture, construction traffic, and damage:
   1. Store under cover in a clean, dry place, protected from weather and abuse.
   2. Store in a manner that will prevent rust or damage.
   3. Store doors in a vertical position, spaced with blocking to permit air circulation.
   4. Do not use non-vented plastic or canvas shelters.
   5. Should containers or wrappers become wet, remove immediately.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers listed below whose products meet or exceed the specifications are approved for use on the Project. Other manufacturers must comply with Manufacturer Qualifications, must manufacture equivalent products to those specified, and comply with requirements of Substitution Procedures regarding substitutions to be considered:
   1. CECO Door Products, Brentwood, TN; (615) 661-5030.
   2. Curries Company, Mason City, IA; (515) 423-1334.
   3. Pioneer Industries, Inc., Kewanee, IL; (309) 856-6000.
   4. Republic Builders Products Company, McKenzie, TN; (800) 733-3667.
   5. Steelcraft Mfg. Co., Cincinnati, OH; (513) 745-6400.
   6. Stiles Co.
   7. Approved equal.

2.2 MATERIALS, GENERAL

A. Steel requirements, all frames to be manufactured of commercial quality, stretcher leveled flatness, cold rolled steel per ASTM A1008 general requirements. Internal reinforcing may be manufactured of hot rolled pickled and oiled steel per ASTM A1011. Exterior frames and interior frames where shown on approved Drawings or required in damp, moist, humid, and wet areas, i.e., toilets, locker rooms, showers, etc., to be manufactured of commercial quality, stretcher leveled flatness, cold rolled steel and galvannealed to A-60 minimum coating weight standard per ASTM A653 and A924, with coating weight of not less than 0.60 ounce per square foot (0.30 ounce per square foot per side).

2.3 FRAME FABRICATION

A. Minimum Gauges:
   1. Interior openings:
      a. Less than four feet (4') width: 16 gauge.
      b. Four feet (4') in width and greater: 14 gauge.
   2. Exterior openings: 14 gauge

B. Design and Construction:
   1. Frames shall be custom made, welded units with integral trim of sizes and shapes shown on approved shop drawings. Hinge jambs that butt adjacent 100-degree walls

shall have at least four-inch (4") wide frame face to assure the door trim will not strike the wall prior to the door opening at least 100 degrees. Frame profile shall match wall thickness where practical, i.e., 4-3/4-inch at four-inch (4") CMU, 6-3/4-inch at six-inch (6") CMU, and 8-3/4-inch at eight-inch (8") CMU. At masonry wall openings, fabricate frames to suite masonry opening with two-inch (2") head member.

2. Frames shall be strong and rigid, neat in appearance, square, true, and free of defects, warp, and buckle. Molded members shall be clean cut, straight, and of uniform profile throughout their length.
3. Jamb depths, trim, profile, and backbends shall be as shown on approved shop drawings.
4. Corner joints, including face and inside corners, shall have contact edges closed tight, with trim faces mitered and continuously welded, and stops butted. The use of gussets shall not be permitted. Face of frame shall be ground smooth. Knockdown (KD) frames are not permitted.
5. Minimum depth of stops shall be 5/8 inch, except at fire windows where minimum depth of stops shall be 3/4 inch.
6. Frames for multiple openings shall have mullion and rail members that are closed tubular shapes having no visible seams or joints. Joints between faces of abutting members shall be securely welded and finished smooth. Mullions shall be key locked removable type. Keys shall be master keyed to Owner's Best system.
7. High frequency hinge reinforcement: Provide high frequency hinge reinforcements at door openings 48-inch and wider with mortise/butt type hinges only at top hinge location to deter against hinge reinforcement sag.
8. Continuous hinge reinforcement: Provide welded continuous 12-gage strap for continuous hinges specified in hardware sets in Division 08 Openings.
9. Provide countersunk flat or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated for removable stops; provide security head screws at exterior locations.
10. Provide A60 galvannealed coating at frames in restrooms and locker rooms with showers/Jacuzzi, clean areas such as kitchen rooms.
11. Hardware reinforcements:
    a. Frames shall be mortised, reinforced, drilled, and tapped at factory for fully template mortised hardware in accordance with approved hardware schedule and templates provided by Section 08 71 00: Door Hardware. Where surface-mounted hardware is to be applied, frames shall have reinforcing plates only.
    b. Minimum thickness of hardware reinforcing plates shall be as follows:
        1) Hinge and pivot reinforcements (1-1/4-inch x 10-inch minimum size): Seven (7) gauge.
        2) Strike reinforcements: 12-gauge stiffeners.
        3) Flush bolt reinforcements: 12-gauge.
        4) Closer reinforcements: 12-gauge.
        5) Reinforcements for surface-mounted hardware, hold-open arms, and surface panic devices: 12-gauge.
12. Floor anchors: Minimum 14-gauge, securely welded inside each jamb, with holes for floor anchorage.
13. Jamb anchors:
    a. Frames for installation in masonry walls shall be provided with adjustable jamb anchors of the T-strap type. Anchors shall be not less than 16-gauge steel. The number of anchors provided at each jamb shall be as follows:
        1) Frames up to seven-feet-six-inches (7'-6") in height: Three (3) anchors.
        2) Frames seven-feet-six-inches (7'-6") to eight feet (8') in height: Four (4) anchors.
        3) Frames over eight feet (8') in height: One (1) anchor for each two feet (2') or fraction thereof in height.
    b. Frames for installation in wood or metal stud partitions shall be provided with steel anchors of suitable approved design, not less than 16-gauge thickness, securely

welded inside each jamb as follows:
1) Frames up to seven feet six inches (7'-6") in height: Four (4) anchors.
2) Frames seven feet six inches (7'-6") to eight feet (8') in height: Five (5) anchors.
3) Frames over eight feet (8') in height: Four (4) anchors plus one (1) additional for each two feet (2') or fraction thereof over eight feet (8').

c. Frames to be anchored to previously placed concrete, masonry, or structural steel shall be provided with anchors of suitable design as shown on approved shop drawings.

14. Dust cover boxes: Shall be of not less than 26-gauge steel and shall be provided at all mortised hardware items. Eight-inch (8") CMU walls with face brick shall have dual offset jamb anchors.
15. Steel spreader: Shall be provided on all frames, temporarily attached to bottoms of both jambs for bracing during shipping and handling.
16. Loose glazing stops: Shall be of cold rolled steel, not less than 20 gauge, butted at corner joints and secured to the frame with countersunk cadmium or zinc-plated screws. Loose stops at exterior frames shall be placed on the interior side of the frames.
17. Unless otherwise noted on Drawings, ALL doors coat inside of frame profile with corrosion resistant coating to minimum thickness of 1/16 inch.

C. Frame Color: Field painted under Section 09 90 00: Painting and Coating to match face of door unless otherwise indicated on drawings.

2.4 DOOR FABRICATION

A. Minimum Gauges
1. Interior doors: 0.047 inch or 18 gauge (16 gauge for high frequency doors).Exterior doors: 0.059 inch or 16 gauge (14 gauge for windstorm rated doors).Design and Construction:
2. Types: Doors shall be custom fabricated, of types and sizes shown on approved shop drawings, and shall be seamless face construction with no visible seams or joints on vertical edges with fully welded seams free from blemishes and defects. Thickness shall be 1-3/4 inch, unless specifically noted or shown otherwise. Exterior doors: Provide doors with 22-gage steel z-channels placed at six inches (6") apart with foamed in place polyurethane core, with a thermal insulation calculated R factor of 11.01 per ASTM C518 Standards.
3. Fabrication:
   a. Doors shall be strong, rigid, and neat in appearance, free from warpage and buckle.
   b. Corner bends shall be true and straight and of minimum radius for gage of metal used.
   c. Provide stiffeners with polystyrene core spaced maximum six inches (6") on center and extending full height of door.
   d. Fill interior with noncombustible fiberglass insulation. Use mineral board filler as required for labeled doors.
   e. Faces shall be joined at vertical edges of door by a continuous weld extending full height of door. Welds shall be ground, filled, and dressed smooth to provide a smooth flush surface.
   f. Top and bottom edges of doors shall be closed with a continuous recessed steel channel not less than 16 gauge, extending full width of door and spot weld to both faces. Exterior doors shall have an additional flush closing channel at top and bottom edges. Openings shall be provided in the bottom closure channel at top and bottom edges. Openings shall be provided in the bottom closure of exterior doors to permit the escape of entrapped moisture.
   g. Continuous hinge reinforcement: Provide welded continuous 12-gage strap for

continuous hinges specified in hardware sets in Division 08: Openings.

h. Doors in wet or humid areas shall have a top cap and solid foam interior core to prevent internal moisture accumulation and galvannealed.

i. Edge profile shall be provided on both vertical edges of door as follows:
   1) Single-acting swing doors: Beveled 1/8 inch in two inches (2”).

j. Hardware reinforcements:
   1) Doors shall be mortised, reinforced, drilled, and tapped at factory for fully template hardware, in accordance with the approved hardware schedule and templates provided by Section 08 71 00: Door Hardware. Where surface-mounted hardware is to be applied, doors shall have reinforcing plates only.
   2) Minimum gauges for hardware reinforcing plates shall be as follows:
      a) Hinge and pivot reinforcements: Seven (7) gauge.
      b) Reinforcements for lock face, flush bolts, concealed holders, concealed or surface-mounted closers: 12 gauge.

4. Edge clearances:
   a. Between door and frame at head and jambs: 1/8 inch.
   b. At doorsills with no threshold: 5/8-inch to 3/4-inch above finished floor.
   c. At doorsills with threshold: As required to suit threshold.
   d. Between meeting edges of double doors: 1/8 inch.

B. Finish:
   1. Shop paint steel (whether galvanized or ungalvanized) stops and accessories as follows:
      a. Clean surfaces free of mill scale, rust, oil, grease, dirt, and other foreign matter.
      b. Chemically treat surfaces and apply one (1) coat of an approved baked-on rust-inhibitive primer paint to provide a minimum 0.5 mil dry film thickness.

   2. Field painted under Section 09 90 00: Painting and Coating.

C. Thermal Insulated Door: Total insulation R-Value of 44 measured in accordance with ASTM C1363, unless otherwise noted on Drawings.

PART 3 EXECUTION

3.1 COORDINATION

A. Coordinate the work of this Section.

B. Coordinate hardware installation with opening construction. Finish hardware is specified in Section 08 71 00: Door Hardware.

C. Coordinate doors, frames, and windows with glazing specified in Section 08 80 00: Glazing.

D. Coordinate doors and frames with painting specified in Section 09 90 00: Painting and Coating.

3.2 INSTALLATION

A. Separate dissimilar metals. Protect against galvanic action.

B. Frames:
   1. Anchorage and connections: Secure to adjacent construction. Where practical, interior door frames shall be flush with the pull side wall to minimize or eliminate the reveal and allow full 180-degree door swing.

2. Install frames in accordance with manufacturer’s instructions and install labeled frames in accordance with NFPA 80.
3. Frame spreader bars: Leave intact until frames are set perfectly square and plumb and anchors are securely attached.
4. Remove hardware, with the exception of prime-coated items, tag box, and reinstall after finish paint work is completed. Do not remove or paint over labels on labeled frames.

C. Doors:
1. Install hardware in accordance with hardware manufacturer's templates and instructions.
2. Install doors in accordance with manufacturer’s instructions and install labeled doors in accordance with NFPA 80.
3. Adjust operable parts for correct function.
4. Remove hardware, with the exception of prime-coated items, tag, box, and reinstall after finish paint Work is completed. Do not remove or paint over labels on labeled doors.

3.3 ADJUST AND CLEAN

A. Adjust doors for proper operation, free from binding or other defects.

B. Clean and restore soiled surfaces.

C. Remove scraps and debris, and leave site in clean condition.

END OF SECTION 08 11 13

SECTION 08 45 00 TRANSLUCENT WALL AND ROOF ASSEMBLIES

PART 1 – GENERAL

1.0 RELATED DOCUMENTS

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

1.1 SUMMARY

A. Section includes requirements for translucent wall and roof assemblies.

1.2 WORK INCLUDED

A. Engineer, manufacture, and installation of translucent wall and/or roof assemblies.
B. All anchors, brackets, hardware and all flashing up to but not penetrating adjoining work are also required as part of the system and shall be included.
C. Trained and factory authorized labor and supervision to complete the installation.

1.3 QUALITY ASSURANCE

A. Products shall be manufactured by a company continuously and regularly employed in the engineering and manufacturing of translucent wall and roof assemblies for a period of at least ten (10) years.
B. Product manufacturer shall be ISO-9001 accredited
C. Erection shall be by a factory-approved installer who has been in the business of erecting similar material for at least five (5) consecutive years and can show evidence of satisfactory completion of projects of similar size, scope, and type.
D. The manufacturer shall be responsible for the configuration and fabrication of the complete translucent system in accordance with this specification.

1.4 SUBMITTALS

A. Submit color samples of colors specified or the manufacturers standard range.
B. Submit Shop drawings indicating dimensions, tolerances, profiles, connections, drainage, flashing, color selections, and coordination with adjacent scope.
C. Manufacturer shall submit substantiating data, stating that the products to be furnished are in accordance with or exceed these specifications.
D. Manufacturer shall submit full warranty terms and conditions for verification of compliance with the requirements of this specification.
E. Include structural analysis data signed and sealed by a professional engineer licensed in the state of the project's location]
F. The manufacturer shall submit performance data based on the following standards:
    1. Self-Ignition Temperature (ASTM D 1929)
    2. Burning Extent (ASTM D 635)
    3. Smoke Density or Development (ASTM E 84, UL 723, or ASTM D 2843)
    4. Interior Flame Spread Index (ASTM E 84)
    5. ICC Evaluation Service Report (ICC-ESR)
    6. Roof Construction Class A (ASTM E 108 or UL 790)

7. Insulation U-factor (NFRC 100)
8. Solar Heat Gain Coefficient (SHGC) (NFRC 201)
9. Visible Transmittance (VT) (NFRC 202)
10. Condensation Resistance (NFRC 500)
11. Air Infiltration (ASTM E 283)
12. Water Penetration (ASTM E 331)
13. Load Bearing Ability (ASTM E 330)

1.5 MAINTENANCE DATA

A. The manufacturer shall provide recommended maintenance procedures, schedule of maintenance and materials required or recommended for maintenance.

1.6 WARRANTY

A. Submit manufacturer's written warranty agreeing to repair failures in materials and workmanship that lead to leaking into the building within ten (10) years from date of delivery.
B. Submit manufacturer's written warranty agreeing to repair or replace Fiberglass Sandwich Panels on the basis of:
   1. Structural Delamination for 10 years
   2. Color change exceeding 12 Units Delta E of Color Change per ASTM D 2244 for 5 years
   3. Development of Fiberbloom (exposure of glass gibers) for 25 years
C. Metal Finish Warranty:
   1. Anodize: Provide manufacturer's standard 5 year
D. Submit installer's written warranty agreeing to repair installation workmanship, defects and leaks within two year from date of delivery.

PART 2 – PRODUCTS

2.0 MANUFACTURER

A. Basis of design: The design and performance criteria of this job are based on
   a. [2.75" UniGrid ™]
   b. [2.75" GridSpan ™]
   2. As manufactured by Kingspan Light + Air, Inc.
      a. Phone: (800) 759-6985;
      b. Address: 28662 N Ballard Dr Lake Forest, IL 60045
      c. Website: https://www.kingspan.com/us/en
      d. Email: info@kingspanlightandair.us
B. Approved Manufacturers
   1. Other manufacturers may bid this project provided they submit evidence of compliance with all performance criteria specified.

2.1 TRANSLUCENT WALL AND ROOF ASSEMBLY DESCRIPTION AND PERFORMANCE

A. Description: Translucent glazing assemblies

1. A factory assembled double-glazed panel assembly incorporated into a complete aluminum frame system tested and warranted by the manufacturer as a single source system. Overall glazing assembly thickness shall be a minimum 2.75".
2. Glazing must be manufactured with a permanent integral ultra-violet protective layer.
3. Panel Configuration
    a. Grid pattern
        - In-line Shoji
    b. Nominal Grid Size

B. 12 inches by 24 inches (304 mm by 610 mm)

C. Flammability:
1. Exterior Sheet: Exterior Standard Ultimate Series
    a. Self-ignition temperature per ASTM D 1929: 860F
    b. Smoke Developed Index per ASTM E 84: 450
    c. Burning Rate per ASTM D 635: 1.1" (CC2)
2. Interior Sheet Interior Fire Rated Sheet FRCW
    a. Self-ignition temperature per ASTM D 1929: 912F
    b. Smoke Developed Index per ASTM E 84: 350
    c. Burning Rate per ASTM D 635: ZERO (CC1)
3. Currently Listed ICC-ES Report confirming compliance with IBC Chapter 26: ESR-2855 - ICC Evaluation Service, LLC (ICC-ES)
4. Class A Roof Construction Classification per ASTM E108 or UL 790]

D. Air, Water, Structural, and Impact
1. Air Permeability per ASTM E 283: <0.01 CFM/sf @ 1.57psf & 6.24psf
2. No water leakage per ASTM E 331: at 15 PSF
3. Proof wind loading per ASTM E 330: up to +/- 65 PSF

A. Energy Performance
1. Product must be currently listed and certified NFRC as required in Section R303.1.3 of the IECC; listed products receive an identifying CPD#
2. Basis of Design CPD#:
    a. KLA-M-6(UniGrid™ Fiberglass Wall, Non-TB)
    b. KLA-M-8(GridSpan™ Fiberglass Roof, Non-TB)
3. Exterior glazing color:
    a. Crystal, White
    4. Interior glazing color:
    5. a Crystal, White
6. NFRC Certified System Performance Values [**SELECT ONE ROW OF VALUES FROM THE NFRC CPD LINKED BELOW BASED ON THE SELECTED GLAZING COLORS AND SYSTEM CONFIGURATION – INPUT SELECTED VALUES BELOW**]
    a. UniGrid Fiberglass Wall, Non-TB: Directory Search Results (nfrc.org)
    b. GridSpan™ Fiberglass Roof, Non-TB: Directory Search Results (nfrc.org)
    c. U-factor per NFRC 100: _____
    d. Solar heat gain per NFRC 201: _____
    e. Visible Transmittance per NFRC 202: _____
    f. Condensation Resistance per NFRC 500: _____

7. Haze measurement minimum of 90% per ASTM D-1003.

B. FRP Sandwich Panel Durability
   1. Impact Strength per UL 972
      a. Class “A” Exterior Sheet - 245 ft-lbs - no penetration]
   2. Adhesive initial Adhesive Bond Strength:
      a. Shear Strength, ASTM D 1002: 563 psi.
      b. Tensile Strength, ASTM C 297: 557 psi minimum.
   3. Adhesive Aged per ASTM D 1037 Adhesive Bond Strength:
      a. Shear Strength, ASTM D 1002: 1212 psi.
      b. Tensile Strength, ASTM C 297: 914 psi minimum.
   4. Taber Abrasion Test per ASTM D 4060: 1000 cycles @ 500 grams = 32.5mg loss
   5. Color difference per ASTM D 2244: 12 ΔE units after 20 years

1.3 METAL FRAME STRUCTURE

A. Design criteria shall be per ASCE-7 requirements
B. Aluminum structural profiles shall be limited to a deflection of L/120 for vertical applications, L/60 for sloped] per IBC Table 1604.3.

1.4 METAL MATERIALS

A. Extruded aluminum shall be ANSI/ASTM B-221; 6063-T5/T6, 6005-T5 or 6061-T5/T6
B. Flashing: 5005 H34 Aluminum .040” thick
C. All fasteners for aluminum framing to be stainless steel or cadmium plated steel
D. All exposed Aluminum shall be
   1. Anodized finish as per performance requirement
      a. 215 Class I Clear Anodized]

PART 3 – EXECUTION

3.1 EXAMINATION

A. Installer shall examine area of installation to verify readiness of site conditions. Do not work until conditions are satisfactory.

3.2 INSTALLATION

A. Install components in strict accordance with manufacturer’s instructions on approved shop drawings.

END OF SECTION

SECTION 08 71 00 DOOR HARDWARE

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. This Section includes commercial door hardware for the following:
   1. Swinging doors.

B. Related Sections:
   1. Section 08 11 13: Hollow Metal Doors and Frames.

C. Reference Standards:
   1. Comply with the current version if not otherwise specified:
      a. California Building Code (CBC) 2022 ed.: Section 11B-404.
      b. ANSI A117.1 Accessible and Usable Buildings and Facilities.
      c. NFPA 70 National Electrical Code.
      d. NFPA 80 Fire Doors and Windows.
      e. NFPA 101 Life Safety Code.
      f. NFPA 105 Installation of Smoke Door Assemblies.
      g. State Building Codes, Local Amendments, if applicable.
   2. All hardware specified herein shall comply with the following industry standards:
      a. ANSI/BHMA Certified Product Standards A156 Series
      b. UL10C Positive Pressure Fire Tests of Door Assemblies

1.3 DEFINITIONS

A. Door hardware includes, but is not necessarily limited to, mechanical door hardware.

1.4 SUBMITTALS

A. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions, and finishes.

B. Door Hardware Schedule:
   1. Prepared by or under the supervision of supplier, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware:
      a. Format: Comply with scheduling sequence and vertical format in DHI's Sequence and Format for the Hardware Schedule.
      b. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same order as in the Door Hardware Sets in Part 4. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.
      c. Content - include the following information:
         1) Type, style, function, size, label, hand, and finish of each door hardware

item.
2) Manufacturer of each item.
3) Fastenings and other pertinent information.
4) Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
5) Explanation of abbreviations, symbols, and codes contained in schedule.
6) Mounting locations for door hardware.
7) Door and frame sizes and materials.
8) Warranty information for each product.

d. Submittal sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include product data, samples, shop drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.

C. Keying Schedule: After a keying meeting with the Owner has taken place, prepare a separate keying schedule detailing final instructions. Submit the keying schedule in electronic format. Include keying system explanation, door numbers, key set symbols, hardware set numbers, and special instructions. Owner must approve submitted keying schedule prior to the ordering of permanent cylinders/cores.

D. Product Test Reports: Indicating compliance with cycle testing requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified independent testing agency.

E. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Section 01 77 00: Closeout Procedures.

1.5 QUALITY ASSURANCE

A. Manufacturers Qualifications: Engage qualified manufacturers with a minimum five (5) years of documented experience in producing hardware and equipment similar to that indicated for this Project and that have a proven record of successful in-service performance.

B. Installer Qualifications: A minimum three (3) years' documented experience installing both standard and electrified door hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

C. Door Hardware Supplier Qualifications: Experienced commercial door hardware distributors with a minimum five (5) years' documented experience supplying both mechanical and electromechanical hardware installations comparable in material, design, and extent to that indicated for this Project. Supplier recognized as a factory direct distributor by the manufacturers of the primary materials with a warehousing facility in Project's vicinity. Supplier to have on staff a certified Architectural Hardware Consultant (AHC) available during the course of the Work to consult with Contractor, Architect, and Owner concerning both standard and electromechanical door hardware and keying.

D. Source Limitations:
1. Obtain each type and variety of door hardware specified in this section from a single source unless otherwise indicated:
a. Electrified modifications or enhancements made to a source manufacturer's product line by a secondary or third party source will not be accepted.

E. Each unit to bear third party permanent label demonstrating compliance with the referenced standards.

F. Keying Conference:
1. Conduct conference to comply with requirements in Division 01. Keying conference to incorporate the following criteria into the final keying schedule document:
   a. Function of building, purpose of each area, and degree of security required.
   b. Plans for existing and future key system expansion.
   c. Requirements for key control storage and software.
   d. Installation of permanent keys, cylinder cores, and software.
   e. Address and requirements for delivery of keys.

G. Pre-Submittal Conference:
1. Conduct coordination conference in compliance with requirements in Division 01 with attendance by representatives of supplier(s), installer(s), and Contractor(s) to review proper methods and the procedures for receiving, handling, and installing door hardware:
   a. Prior to installation of door hardware, conduct a Project specific training meeting to instruct the installing contractors' personnel on the proper installation and adjustment of their respective products. Product training to be attended by installers of door hardware (including electromechanical hardware) for aluminum, hollow metal, and wood doors. Training will include the use of installation manuals, hardware schedules, templates, and physical product samples as required.
   b. Inspect and discuss electrical roughing-in, power supply connections, and other preparatory work performed by other trades.
   c. Review sequence of operation narratives for each unique access controlled opening.
   d. Review and finalize construction schedule and verify availability of materials.
   e. Review the required inspecting, testing, commissioning, and demonstration procedures

H. At completion of installation, provide written documentation that components were applied to manufacturer's instructions and recommendations and according to approved schedule.

I. Regulatory Requirements:
1. Doors and doorways as part of an accessible route shall comply with CBC Sections 11B-404.
2. Locate latching hardware between 34 inches to 44 inches above the finished floor, per 2022 California Building Code, Section 11B-404.2.7:
   a. Panic hardware: Locate between 36 inches to 44 inches above the finished floor.
3. Handles, pull, latches, locks, other operable parts**:**
   a. Readily openable from egress side with one hand and without tight grasping, tight pinching, or twisting of the wrist to operate. 2022 California Building Code Section 11B-309.4.
   b. Force required to activate the operable parts: Five (5.0) pounds maximum, per 2022 California Building Code Section 11B-309.4.
4. Adjust doors to open with not more than five (5.0) pounds pressure to open at exterior doors and five (5.0) pounds at interior doors. As allowed per 2022 California Building Code Section 11B-404.2.9, local authority may increase the allowable pressure for fire doors to achieve positive latching, but not to exceed 15 pounds:
   a. Exception: Exterior doors’ pressure-to-open may be increased to 8.5 pounds if at a single location, and one (1) of a bank of eight (8) leafs or fraction of eight, and one (1) leaf of this bank is fitted with a low or high energy operator.
5. Low energy powered doors - comply with ANSI/BHMA A156.19; 2022 California Building Code Section 11B-404.2.9, Exception 2:
   a. Where powered door serves an occupancy of 150 or more, provide back-up battery

power or stand-by generator power, capable of supporting a minimum of 100 cycles.

b. Actuators, vertical bar type: Minimum two inches (2”) wide, 30 inches high, bottom located minimum five inches (5”) above floor or ground, top located minimum 35 inches above floor or ground. Displays International Symbol of Accessibility, per 2022 California Building Code Section 11B-703.7.
c. Actuators, plate type: Use two (2) at each side of the opening. Minimum four inches (4”) diameter or four inches (4”) square. Displays International Symbol of Accessibility, per 2022 California Building Code Section 11B-703.7. Locate centerline of lower plate between seven and eight inches (7” - 8”) above floor or ground, and upper plate between 30 inches and 44 inches above floor or ground.
d. Actuator location: Conspicuously located, clear, and level floor/ground space for forward or parallel approach.

6. Adjust door closer sweep periods so that from an open position of 90 degrees, the door will take at least five (5) seconds to move to a point 12 degrees from the latch, measured to the landing side of the door, per 2022 California Building Code Section 11B-404.2.8:
   a. Spring hinges: Adjust for 1.5 seconds minimum for 70 degrees to fully closed.
7. Smooth surfaces at bottom ten inches (10”) of push sides of doors, facilitating push-open with wheelchair footrests, per 2022 California Building Code Section 11B-404.2.10:
   a. Applied kickplates and armor plates: Bevel the left and right edges; free of sharp or abrasive edges.
   b. Tempered glass doors without stiles: Bottom rail may be less than ten inches (10”) if top leading edge is tapered 60 degrees minimum.
8. Door opening clear width no less than 32 inches, measured from face of frame stop, or edge of inactive leaf of pair of doors, to door face with door opened to 90 degrees. Hardware projection not a factor in clear width if located above 30 inches and below 80 inches, and the hardware projects no more than four inches (4”); 2022 California Building Code Section 11B-404.2.3:
   a. Exception: In alterations, a projection of 5/8-inch (15.9 mm) maximum into the required clear width shall be permitted for the latch side stop.
   b. Door closers and overhead stops: Not less than 78 inches above the finished floor or ground, per 2022 California Building Code 11B-307.4.
9. Thresholds**:**
   a. Floor or landing no more than 0.50 inch below the top of the threshold of the doorway, per 2022 California Building Code Section 11B-404.2.5.
   b. Vertical rise no more than 0.25 inch, change in level between 0.25 inch and 0.50 inch**:** Beveled to slope no greater than 1**:**2 (50 percent slope); 2022 California Building Code Section 11B-303.2 & ~.3.
10. Floor stops**:** Do not locate in path of travel. Locate no more than four inches (4”) from walls, per DSA Policy #99-08 (Access).
11. Pairs of doors with independently activated hardware both leafs**:** Limit swing of right-hand or right-hand-reverse leaf to 90 degrees to protect persons reading wall-mounted tactile signage, per 2022 California Building Code Section 11B-703.4.2.
12. Door and door hardware encroachment**:**
    a. When door is swung fully open into means-of-egress path, the door may not encroach/project more than seven inches (7”) into the required exit width, with the exception of door release hardware such as lockset levers or panic hardware. These hardware items must be located no less than 34 inches and no more than 48 inches above the floor/ground; 2022 California Building Code, Section 1005.7.1:
       1) In I-2 occupancies, latch release hardware is not permitted to project in the required exit width, regardless of its mounting height, per 2022 California Building Code, Section 1005.7.1 at Exception 1.

1.6 WARRANTY

A. General Warranty: Reference Division 01. Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

B. Warranty Period:
   1. Written warranty, executed by manufacturer(s), agreeing to repair or replace components of standard and electrified door hardware that fails in materials or workmanship within specified warranty period after final acceptance by the Owner. Failures include, but are not limited to, the following:
      a. Structural failures including excessive deflection, cracking, or breakage.
      b. Faulty operation of the hardware.
      c. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
      d. Electrical component defects and failures within the systems operation.

C. Standard Warranty Period: Two (2) years from date of Substantial Completion, unless otherwise indicated.

D. Special Warranty Periods:
   1. Locksets; Three (3) years.
   2. Extra heavy duty cylinder locks: Seven (7) years.
   3. Exit devices: Three (3) years mechanical, one (1) year electrical.
   4. Closures: Ten (10) years mechanical, One (1) year electrical.
   5. Hinges: One (1) year.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site. Do not store electronic access control hardware, software, or accessories at Project site without prior authorization.

B. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.

C. Deliver, as applicable, permanent keys, cylinders, cores, access control credentials, software, and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the Keying Conference.

PART 2 PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

A. General: Provide door hardware for each door to comply with requirements in Door Hardware Sets and each referenced section that products are to be supplied under.

B. Designations: Requirements for quantity, item, size, finish or color, grade, function, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Sets of Part 4. Products are identified by using door hardware designations, as follows.

C. Named Manufacturer's Products: Product designation and manufacturer are listed for each door hardware type required for the purpose of establishing requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule.

D. Substitutions: Requests for substitution and product approval for inclusive mechanical and electromechanical door hardware in compliance with the specifications must be submitted in writing and in accordance with the procedures and time frames outlined in Division 01, Substitution Procedures. Approval of requests is at the discretion of the Architect, Owner, and their designated consultants.

2.2 HANGING DEVICES

A. Hinges - ANSI/BHMA A156.1 certified butt hinges with number of hinge knuckles as specified in the Door Hardware Sets:
   1. Quantity - provide the following hinge quantity, unless otherwise indicated:
      a. Two (2) hinges: For doors with heights up to 60 inches.
      b. Three (3) hinges: For doors with heights 61 to 90 inches.
      c. Four (4) hinges: For doors with heights 91 to 120 inches.
      d. For doors with heights more than 120 inches, provide four (4) hinges, plus one (1) hinge for every 30 inches of door height greater than 120 inches.
   2. Hinge size - provide the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required:
      a. Widths up to three feet (3’0”): 4-1/2-inch standard or heavy weight as specified.
      b. Sizes from three-feet-one-inch (3’1”) to four feet (4’0”): Five-inch (5”) standard or heavy weight as specified.
   3. Hinge weight and base material - unless otherwise indicated, provide the following:
      a. Exterior doors: Heavy weight, non-ferrous, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate standard weight.
      b. Interior doors: Standard weight, steel, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate heavy weight.
   4. Hinge options - comply with the following where indicated in the Hardware Sets or on Drawings:
      a. Non-removable pins: Provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for the all out-swinging lockable doors.
      b. Drawings typically depict doors at 90 degrees, doors will actually swing to maximum allowable. Use wide-throw conventional or continuous hinges as needed up to eight inches (8”) in width to allow door to stand parallel to wall for true 180-degree opening. Advise architect if eight-inch (8”) width is insufficient.
   5. Acceptable Manufacturer:
      a. Schlage (basis of design).
      b. Manufacturer representative: Chris Clark Chris.clark@allegion.com (626) 390-0599.

2.3 CYLINDERS AND KEYING

A. General: Cylinder manufacturer to have minimum ten (10) years’ experience designing secured master key systems and have on record a published security keying system policy.

B. Source Limitations: Obtain each type of keyed cylinder and keys from the same source manufacturer as locksets and exit devices - Schlage, unless otherwise indicated.

C. Cylinders:
   1. Original manufacturer cylinders complying with the following:
      a. Mortise type: Threaded cylinders with rings and cams to suit hardware application.
      b. Rim type: Cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.
      c. Bored-lock type: Cylinders with tailpieces to suit locks.
      d. Mortise and rim cylinder collars to be solid and recessed to allow the cylinder face to be flush and be free spinning with matching finishes.

e. Keyway: Match facility standard.

D. Keying System:
1. Schlage Everest 29 Primus IC Core (keying by District):
a. Conduct specified Keying Conference to define and document keying system instructions and requirements.
b. Furnish factory cut, nickel-silver large bow permanently inscribed with a visual key control number as directed by District.
c. Existing system: Key locks to Owner's existing system.

E. Key Quantity:
1. Provide the following minimum number of keys:
a. Change keys per cylinder: Two (2).
b. Master keys (per master key level/group): Five (5).
c. Construction keys (where required): Ten (10).

F. Construction Keying: Provide construction master keyed cylinders.

G. Key Registration List (Bitting List):
1. Provide keying transcript list to District representative in the proper format for importing into key control software.
2. Provide transcript list in writing or electronic file as directed by the District.

2.4 MECHANICAL LOCKS AND LATCHING DEVICES

A. Locksets, Grade 1 (Heavy Duty):
1. ANSI/BHMA A156.13, Series 1000, Operational Grade 1 certified. Locksets are to be manufactured with a corrosion resistant steel case and be field-reversible for handing without disassembly of the lock body:
a. Acceptable manufacturers:
1) Schlage, mortise type.
2) Schlage L Series mortise indicators “N” escutcheons.
3) Outward opening doors will have Schlage LG13 Astragals.

2.5 LOCK AND LATCH STRIKES

A. Strikes:
1. Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:
a. Flat-lip strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
b. Extra-long-lip strikes: For locks used on frames with applied wood casing trim.
c. Aluminum-frame strike box: Provide manufacturer's special strike box fabricated for aluminum framing.
d. Double-lipped strikes: For locks at double acting doors. Furnish with retractable stop for rescue hardware applications.

B. Standards:
1. Comply with the following:
a. Strikes for mortise locks and latches: ANSI/BHMA A156.13.
b. Strikes for bored locks and latches: ANSI/BHMA A156.2.
c. Strikes for auxiliary deadlocks: ANSI/BHMA A156.36.
d. Dustproof strikes: ANSI/BHMA A156.16.

2.6 DOOR CLOSERS

A. All door closers specified herein shall meet or exceed the following criteria:
   1. General: Door closers to be from one manufacturer, matching in design and style, with the same type door preparations and templates regardless of application or spring size. Closers to be non-handed with full sized covers including installation and adjusting information on inside of cover.
   2. Standards: Closers to comply with UL 10C for Positive Pressure Fire Test and be UL listed for use of fire rated doors.
   3. Cycle testing: Provide closers which have surpassed 15 million cycles in a test witnessed and verified by UL.
   4. Size of units: Comply with manufacturer's written recommendations for sizing of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Where closers are indicated for doors required to be accessible to the physically handicapped, provide units complying with ANSI ICC/A117.1.
   5. Closer arms: Provide heavy duty, forged steel closer arms unless otherwise indicated in Hardware Sets.
   6. Closers shall not be installed on exterior or corridor side of doors; where possible install closers on door for optimum aesthetics.
   7. Closer accessories: Provide door closer accessories including custom templates, special mounting brackets, spacers, and drop plates as required for proper installation. Provide through-bolt and security type fasteners as specified in the hardware sets.

B. Door Closers, Surface Mounted (Commercial Duty):
   1. ANSI/BHMA 156.4, Grade 1 certified surface mounted, institutional grade door closers with complete spring power adjustment, sizes 1 thru 6; and fully operational adjustable according to door size, frequency of use, and opening force. Closers to be rack and pinion type, one piece cast iron or aluminum alloy body construction, with adjustable backcheck, closing sweep, and latch speed control valves. Provide non-handed units standard:
      a. Acceptable manufacturer (basis of design): L.C.N. (Grade 1 4040XP).

2.7 DOOR STOPS AND HOLDERS

A. General: Door stops and holders to be of type and design as specified below or in the Hardware Sets.

B. Door Stops and Bumpers:
   1. ANSI/BHMA A156.16, Grade 1 certified door stops and wall bumpers. Provide wall bumpers, either convex or concave types with anchorage as indicated, unless floor or other types of door stops are specified in Hardware Sets. Do not mount floor stops where they will impede traffic. Where floor or wall bumpers are not appropriate, provide overhead type stops and holders:
      a. Acceptable manufacturer (basis of design): Trimco (TC).

2.8 ARCHITECTURAL SEALS

A. General: Thresholds, weatherstripping, and gasket seals to be of type and design as specified below or in the Hardware Sets. Provide continuous weatherstrip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated. At exterior applications, provide non-corrosive fasteners and elsewhere where indicated.

B. Acceptable Manufacturer: Pemko Manufacturing (PE).

C. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.

D. On all exterior doors exposed to weather (no cover) provide Rain Guard full width of door.

2.9 FABRICATION

A. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to manufacturers recognized installation standards for application intended.

2.10 FINISHES

A. Standard: Designations used in the Hardware Sets and elsewhere indicate hardware finishes complying with ANSI/BHMA A156.18, including coordination with traditional U.S. finishes indicated by certain manufacturers for their products.

B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware.

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

PART 3 EXECUTION

3.1 COORDINATION

A. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing standard and electrified hardware. Check shop drawings of other work to confirm that adequate provisions are made for locating and installing hardware to comply with indicated requirements.

B. Door and Frame Preparation: Doors and corresponding frames are to be prepared, reinforced, and pre-wired (if applicable) to receive the installation of the specified electrified, monitoring, signaling, and access control system hardware without additional in-field modifications.

3.2 EXAMINATION

A. Examine scheduled openings, with installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.

B. Notify Architect of any discrepancies or conflicts between the door schedule, door types, Drawings, and scheduled hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.

3.3 PREPARATION

A. Hollow Metal Doors and Frames: Comply with ANSI/DHI A115 series.

3.4 INSTALLATION

A. Install each item of mechanical and electromechanical hardware and access control

equipment to comply with manufacturer's written instructions and according to specifications:

1. Installers are to be trained and certified by the manufacturer on the proper installation and adjustment of fire, life safety, and security products including hanging devices, locking devices, closing devices, and seals.

B. Mounting Heights:
   1. Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:
      a. Standard steel doors and frames: DHI's Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames.
      b. Provide blocking in drywall partitions where wall stops or other wall mounted hardware is located.

C. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Section 07 92 00: Joint Sealants.

D. Storage: Provide a secure lock up for hardware delivered to the Project but not yet installed. Control the handling and installation of hardware items so that the completion of the work will not be delayed by hardware losses before and after installation.

3.5 FIELD QUALITY CONTROL

A. Field Inspection: Supplier will perform a final inspection of installed door hardware and state in report whether work complies with or deviates from requirements, including whether door hardware is properly installed, operating, and adjusted.

3.6 ADJUSTING

A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

3.7 CLEANING AND PROTECTION

A. Protect all hardware stored on construction site in a covered and dry place. Protect exposed hardware installed on doors during the construction phase. Install any and all hardware at the latest possible time frame.

B. Clean adjacent surfaces soiled by door hardware installation.

C. Clean operating items as necessary to restore proper finish. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of Owner occupancy.

3.8 DEMONSTRATION

A. Instruct Owner's maintenance personnel to adjust, operate, and maintain mechanical and electromechanical door hardware.

3.9 MAINTENANCE SERVICE

A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and

removal and replacement of door hardware.

PART 4 SCHEDULE

4.1 DOOR HARDWARE SETS

A. The hardware sets represent the design intent and direction of the Owner and Architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware, and missing items should be brought to the attention of the Architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.

SpeXtra: 413214 (ALLEGION SPEC LISTING)

HARDWARE GROUP NO. 1

PROVIDE EACH SGL DOOR(S) WITH THE FOLLOWING:

QTY		DESCRIPTION	CATALOG NUMBER	FINISH	MFR
3	EA	HINGE	5BB1 4.5 X 4.5 NRP	652	IVE
1	EA	STOREROOM LOCK	L9080T 06N	626	SCH
1	EA	PRIMUS CORE	20-740	626	SCH
1	EA	SURFACE CLOSER	4040XP	689	LCN
1	EA	KICK PLATE	8400 10" X 2" LDW B-CS	630	IVE
1	EA	FLOOR STOP	FS436/FS438 AS REQ'D	626	IVE
1	EA	GASKETING	188SBK PSA	BK	ZER

END OF SECTION 08 71 00

SECTION 09 21 16 GYPSUM BOARD ASSEMBLIES

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes requirements including but not limited to:
   1. Gypsum Board.
   2. Accessories necessary for a complete installation.

B. Related Sections:
   1. Section 08 11 13: Hollow Metal Doors and Frames.
   2. Section 09 90 00: Painting and Coating.

1.3 PERFORMANCE REQUIREMENTS

A. Comply with manufacturer's load tables and the following design pressures and deflections:
   1. Stairs, Elevator Hoistways, and Vertical Shafts: 1/120 at 10 psf.
   2. Ground Floor Lobbies: 1/120 at 15 psf.
   3. Partitions Receiving Stone Cladding, Lath and Plaster, or Plaster Veneer: 1/360 at 15 psf.
   4. Partitions Receiving Monitors, Televisions, Heavy Audio/Visual Equipment: 1/360 at 15 psf.
   5. Typical Partitions: 1/240 at 5 psf.
   6. Other Partitions: 1/240 at 5 psf.
   7. Maximum Deflection:
      a. L/240 at 5 lbf per sq. ft.
      b. L/120 at 5 lbf per sq. ft.
      c. L/120 at 7.5 lbf per sq. ft.
      d. L/120 at 10 lbf per sq. ft.

B. Fire Resistance Rated Assemblies: For fire resistance rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E119 by an independent testing agency.

C. STC Rated Assemblies: For STC-rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E90 and classified according to ASTM E413 by an independent testing agency.

1.4 SUBMITTALS

A. Product Data: Submit For each type of drywall including calculations for loadings and stresses of exterior walls and specially fabricated framing based on manufacturer’s load tables.

B. Shop Drawings: Indicate locations, fabrication, and installation of control and expansion joints including plans, elevations, sections, details of components, and attachments to other

units of Work.

C. Samples:
1. Trim Accessories: Full size Sample in 12 inch (300 mm) long length for each trim accessory indicated.
2. Textured Finishes: 12 inches by 12 inches (300 mm by 300 mm) for each textured finish indicated and on same backing indicated for Work.

D. Calculations: Submit calculations verifying steel partition stud minimum base metal thickness and depth compliance with Code and ASTM C645 for height, load, and deflection.

E. Evaluation Reports: ICC-ES reports for dimpled steel studs and runners and firestop tracks.

1.5 QUALITY ASSURANCE

A. Regulatory Requirements:
1. 2022 California Building Code (CBC) (CCR Title 24, Part 2, as adopted and amended by DSA):
   a. CBC-7 – Chapter 7, Fire Resistant Materials and Construction
   b. CBC-19A – Chapter 19A, Concrete
   c. CBC – Chapter 25, Gypsum Board and Plaster.
2. Division of the State Architect, Interpretation of Regulations (DSA-IR):
   a. DSA-IR 25-3, Drywall Ceiling Suspension Conventional Construction-One Layer.
   b. DSA-IR 25-2.13, Metal Suspension Systems for Lay in Panel Ceilings.
3. Fire Resistance Rated Assemblies: For fire resistance rated assemblies, provide materials and construction identical to those tested in assembly indicated according to ASTM E119 by an independent testing agency.

B. Single Source Responsibility:
1. Framing Members: Obtain steel framing members from single manufacturer.
2. Panel Products: Obtain each type of gypsum board and other panel products from single manufacturer.
3. Finishing Materials: To the extent possible, obtain finishing materials from same manufacturer supplying gypsum board products. When not possible, obtain materials from manufacturer acceptable to gypsum board manufacturer.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in original packages, containers, or bundles bearing brand name and identification of manufacturer or supplier.

B. Store materials inside under cover and keep them dry and protected against weather, condensation, direct sunlight, construction traffic, and potential causes of damage. Stack panels flat and supported on risers on a flat platform to prevent sagging.

PART 2 PRODUCTS

2.1 MATERIALS

A. Manufacturers are subject to compliance with requirements; provide products by one of the following:
1. Steel Studs and Tracks:
   a. USG Corp. Basis of Design.

b. ClarkDietrich
c. CEMCO; California Expanded Metal Products Co.
d. Custom Stud.
e. MBA Building Supplies.
f. MRI Steel Framing, LLC.
g. Phillips Manufacturing Co.
h. SCAFCO Steel Stud Co.
i. Steel Network, Inc. (The).
j. Telling Industries.

2. Ceiling Grid:
   a. USG Corporation; Drywall Suspension System.

B. Framing Members:
   1. ASTM C754 for component sizes and conditions under specified maximum deflection and lateral loading conditions indicated:
      a. Steel Sheet Components: Comply with ASTM C645 requirements for metal.
      b. Protective Coating: ASTM A653/A653M, G60 (Z180), hot dip galvanized.

C. Steel Framing Components:
   1. ASTM C754 for conditions indicated; hot dip galvanize complying with ASTM A653 Z180:
      a. Steel Studs and Runners: ASTM C645, 0.0179 inch (0.45 mm) minimum base metal thickness; Depth indicated on Drawings.
      b. Dimpled Steel Studs and Runners: ASTM C645, equivalent to minimum base metal thickness indicated on Drawings for depth indicated on Drawings.
      c. Flat Strap and Backing Plate: Steel sheet for blocking and bracing in length and width indicated. Minimum Base Metal Thickness: 0.0179 inch (0.45 mm).
      d. Cold Rolled Channel Bridging: 0.0538 inch (1.37 mm) bare steel thickness, with minimum 1/2 inch (12.7 mm) wide flanges. Depth indicated on Drawings.
      e. Clip Angle: Not less than 1-1/2 inches by 1-1/2 inches (38.1 mm by 38.1 mm), 0.068 inch (1.73 mm) thick, galvanized steel.
      f. Hat Shaped, Rigid Furring Channels: ASTM C645; 0.0179 inch (0.45 mm) minimum base metal thickness; Depth indicated on Drawings.
      g. Resilient Furring Channels: 1/2 inch (12.7mm) deep, steel sheet members designed to reduce sound transmission. Configuration: Asymmetrical or hat shaped.
      h. Cold Rolled Furring Channels - 0.0538 inch (1.37mm) bare steel thickness, with minimum 1/2 inch (12.7mm) wide flanges:
         1) Depth: Indicated on Drawings.
         2) Furring Brackets: Adjustable, corrugated edge type of steel sheet with minimum bare steel thickness of 0.0312 inch (0.79 mm).
         3) Tie Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, 0.0625-inch (1.59mm) diameter wire, or double strand of 0.0475 inch (1.21mm) diameter wire.
      i. Z Shaped Furring: With slotted or nonslotted web, face flange of 1-1/4 inches (31.8 mm), wall attachment flange of 7/8 inch (22.2 mm), minimum bare metal thickness of 0.0179 inch (0.45 mm), and depth required to fit insulation thickness indicated.
      j. Auxiliary Framing Materials: Fasteners of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel members to substrates.
      k. Slip Type Head Joints - Where indicated, provide one of the following:
         1) Single Long Leg Runner System: ASTM C645 top runner with 2 inch (50.8 mm) deep flanges in thickness not less than indicated for studs, installed with studs friction fit into top runner and with continuous bridging, located within

12 inches (305 mm) of the top of studs to provide lateral bracing.

2) Double Runner System: ASTM C645 top runners, inside runner with 2 inch (50.8 mm) deep flanges in thickness not less than indicated for studs and fastened to studs, and outer runner sized to friction fit inside runner.
3) Deflection Track - Steel sheet top runner manufactured to prevent cracking of finishes applied to interior partition framing resulting from deflection of structure above; in thickness not less than indicated for studs and in width to accommodate depth of studs. Provide one of the following:
   a) Dietrich Metal Framing; SLP-TRK Slotted Deflection Track.
   b) Steel Network Inc. (The); VertiClip SLD or VertiTrack VTD Series.
   c) Superior Metal Trim; Superior Flex Track System (SFT).

l. Firestop Tracks:
1) Top runner manufactured to allow partition heads to expand and contract with movement of the structure while maintaining continuity of fire resistance rated assembly indicated; in thickness not less than indicated for studs and in width to accommodate depth of studs. Provide one of the following:
   a) Fire Trak Corp.; Fire Trak attached to studs with Fire Trak Slip Clip.
   b) Grace Construction Products; FlameSafe FlowTrak System.
   c) Metal-Lite, Inc.; The System.
   d) Steel Network Inc. (The); VertiClip SLD or VertiTrack VTD Series as applicable.

D. Ceiling Suspension Components:
1. Tie Wire: ASTM A641/A641M, Class 1 zinc coating, soft temper, 0.0625-inch (1.59 mm) diameter wire, or double strand of 0.0475-inch (1.21 mm) diameter wire.
2. Hanger Attachments to Concrete:
   a. Anchors: Postinstalled, chemical anchor or postinstalled, expansion anchor fabricated from corrosion resistant materials with holes or loops for attaching wire hangers and capable of sustaining, without failure, a load equal to 5 times that imposed by construction as determined by testing according to ASTM E488 by an independent testing agency.
   b. Powder Actuated Fasteners: Suitable for application indicated, fabricated from corrosion resistant materials with clips or other devices for attaching hangers of type indicated, and capable of sustaining, without failure, a load equal to 10 times that imposed by construction as determined by testing according to ASTM E1190 by an independent testing agency.
3. Wire Hangers: ASTM A641/A641M, Class 1 zinc coating, soft temper, 0.162-inch (4.12 mm) diameter.
4. Carrying Channels: Cold rolled, commercial steel sheet with base metal thickness of 0.0538 inch (1.37 mm) and minimum 1/2 inch (12.7 mm) wide flanges. Depth indicated on Drawings.
5. Furring Channels (Furring Members):
   a. Cold Rolled Channels: 0.0538 inch (1.37 mm) bare steel thickness, with minimum 1/2 inch (12.7 mm) wide flanges, 3/4 inch (19.1 mm) deep.
   b. Steel Studs: ASTM C645; minimum base metal thickness of 0.0312 inch (0.79 mm); Depth indicated on Drawings.
   c. Hat Shaped, Rigid Furring Channels: ASTM C645, 7/8 inch (22.2 mm) deep; Minimum base metal thickness of 0.0312 inch (0.79 mm).
6. Resilient Furring Channels: 1/2 inch (12.7 mm) deep members designed to reduce sound transmission. Configuration: Hat shaped.
7. Grid Suspension System for Ceilings: ASTM C645, direct hung system composed of main beams and cross furring members that interlock.

E. Gypsum Board:

1. ASTM C1396/C1396M, applicable to type of gypsum board indicated and whichever is more stringent:
   a. Core - Use Type X throughout:
      1) Thickness: 5/8 inch (15.9 mm).
      2) Long Edges: Tapered and featured (rounded or beveled) for prefilling.
   b. Ceiling Type - Manufactured for sag resistance:
      1) Thickness: 1/2 inch (13mm).
      2) Long Edges: Tapered.
   c. Moisture and Mold Resistant Type - Type X with moisture and mold resistant core and surfaces. Core:
      1) Thickness: 5/8 inch (15.9 mm).
      2) Long Edges: Tapered.

F. Impact Resistant Gypsum Board:
   1. ASTM C1396/C1396M gypsum board, tested according to ASTM C1629/C1629M:
      a. Core and Thickness: 5/8 inch (15.9 mm), Type X.
      b. Surface Abrasion: ASTM C1629/C1629M, meets or exceeds Level 1 requirements.
      c. Indentation: ASTM C1629/C1629M, meets or exceeds Level 1 requirements.
      d. Soft Body Impact: ASTM C1629/C1629M, meets or exceeds Level 1 requirements.
      e. Hard Body Impact: ASTM C1629/C1629M, meets or exceeds Level 1 requirements according to test in Annex A1.
      f. Long Edges: Tapered.
      g. Mold Resistance: ASTM D3273, score of 10 as rated according to ASTM D3274.

G. Acoustically Enhanced Gypsum Board:
   1. ASTM C1396/C1396M. Multilayer products constructed of two layers of gypsum boards sandwiching a viscoelastic sound-absorbing polymer core:
      a. Manufacturers are subject to compliance with requirements; provide products by one of the following:
         1) National Gypsum Company.
         2) Quiet Solution.
      b. Core: 1-3/8 inch (35 mm), regular type.
      c. Long Edges: Tapered.

H. Reinforced Gypsum Sheathing (Tile Backer Board):
   1. ASTM C1278/C1278M, standard edges. Cellulose fiber reinforced panels may be used in lieu of cementitious board:
      a. Core and Thickness: 1/2 inch (12.7 mm) or 5/8 inch (15.9 mm) to match conditions, Type X.
      b. Long Edge: Tapered.
      c. Mold Resistance: ASTM D3273, score of 10 as rated according to ASTM D3274.

I. Glass Mat Gypsum Sheathing Board:
   1. ASTM C1177/C1177M, with fiberglass mat laminated to both sides and with standard edges:
      a. Core: Type X
      b. Thickness: 5/8 inch (15.9 mm).
      c. Size: 48 inches by 96 inches (1219 mm by 2438 mm).
      d. Long Edges: Tapered.

J. Cementitious Backer Units:
   1. ASTM C1288 or ASTM C1325:
      a. Thickness: 1/2 inch (12.7 mm) and 5/8 inch (15.9 mm) to match conditions.
      b. Long Edges: Standard.

c. Mold Resistance: ASTM D3273, score of 10 as rated according to ASTM D3274.

K. Exterior Gypsum Board For Ceilings and Soffits:
1. Glass Mat Gypsum Sheathing Board: ASTM C1177/C1177M, with fiberglass mat laminated to both sides and with standard edges.
2. Core: 5/8 inch (15.9 mm), Type X.

L. Exterior Trim:
1. ASTM C1047, hot dip galvanized steel sheet, plastic, or rolled zinc:
   a. Shapes:
      1) Cornerbead.
      2) LC Bead: J shaped; exposed long flange receives joint compound.
      3) Expansion (Control) Joint: One piece, rolled zinc with V shaped slot and removable strip covering slot opening.

M. Interior Trim:
1. ASTM C1047; galvanized or aluminum coated steel sheet, rolled zinc, plastic, or paper faced galvanized steel sheet:
   a. Shapes:
      1) Cornerbead.
      2) Bullnose bead.
      3) LC Bead: J shaped; exposed long flange receives joint compound.
      4) L Bead: L shaped; exposed long flange receives joint compound.
      5) U Bead: J shaped; exposed short flange does not receive joint compound.
      6) Expansion (control) joint.

2. Manufacturers are subject to compliance with requirements; provide products by one of the following:
   a. Pittcon Industries.
   b. Fry Reglet Corp.
   c. Gordon, Inc.

N. Continuous Corner:
1. Extruded Aluminum; continuous integral fin for surface contact with gypsum board; 7/8 inch (22 mm) wide, tapered to edge; punched with holes staggered to accept screw fastening. Prime with corrosion resistant primer. Provide Pittcon Softforms (Basis of Design) or Schluter:
   a. Subject to compliance with requirements, provide basis of design or comparable by one of the following:
      1) Pittcon Industries.
      2) Fry Reglet Corporation.
      3) Schluter.

O. Joint Treatment - ASTM C475/C475M:
1. Joint Tape:
   a. Exterior Gypsum Soffit Board: USG Sheetrock Brand Paper Tape.
   b. Glass Mat Gypsum Sheathing Board Exterior Applications: USG Sheetrock Brand Paper Tape.
   c. Interior Gypsum Board: USG Sheetrock Brand Paper Tape.
   d. Cementitious Board: USG Durock Tape.
2. Joint Compound:
   a. Gypsum Board – Prefilling - At open joints, rounded or beveled panel edges, and damaged surface areas, use setting type taping compound: USG Sheetrock Brand Easy Sand Setting-Type Joint Compound:

1) Embedding and First Coat - For embedding tape and first coat on joints, fasteners, and trim flanges, use setting type taping compound: USG Sheetrock Brand All Purpose Joint Compound:
   a) Use setting type compound for installing paper faced metal trim accessories: USG Sheetrock Brand All Purpose Joint Compound.
2) Fill Coat: For second coat, use setting type, sandable topping compound: USG Sheetrock Brand Topping Joint Compound.
3) Finish Coat: For third coat, use setting type, sandable topping compound: USG Sheetrock Brand Topping Joint Compound.
4) Skim Coat: For final coat of Level 4 finish, use setting type, sandable topping compound: USG Sheetrock Brand Topping Joint Compound.

b. Cementitious Units: USG Sheetrock Brand Easy Sand Setting-Type Joint Compound.
c. Tile Backing Panels: USG Sheetrock Brand Easy Sand Setting-Type Joint Compound.
d. Water Resistant Gypsum Backing Board: Use setting type taping compound and setting-type, sandable topping compound: USG Sheetrock Brand Easy Sand Setting-Type Joint Compound.
e. Glass Mat Sheathing Board: USG Sheetrock Brand Easy Sand Setting-Type Joint Compound.

P. Auxiliary Gypsum Materials:
1. Comply with referenced installation standards and manufacturer's written recommendations:
   a. Steel Drill Screws: ASTM C1002, use screws complying with ASTM C954 for fastening panels to steel members from 0.033 to 0.112 inch (0.84 to 2.84 mm) thick.
   b. Sound Attenuation Blankets:
      1) ASTM C665, Type I (blankets without membrane facing) produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool, or rock wool:
         a) Fire Resistance Rated Assemblies: Comply with mineral-fiber requirements of assembly.
   c. Acoustical Sealant:
      1) Nonsag, paintable, nonstaining latex sealant complying with ASTM C834. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E90:
         a) USG Corporation; Sheetrock Brand Acoustical Sealant.

Q. Anchors, Clips, and Fasteners:
1. Steel shapes and clips: ASTM A36/A36M, zinc coated by hot dip process according to ASTM A123/A123M.
2. Expansion anchors: Fabricated from corrosion resistant materials, with allowable load or strength design capacities calculated according to ICC-ES AC193 and ACI 318 greater than or equal to the design load, as determined by testing per ASTM E488 conducted by a qualified testing agency.
3. Power actuated anchors: Fastener system of type suitable for application indicated, fabricated from corrosion resistant materials, with allowable load capacities calculated, greater than or equal to the design load, as determined by testing per ASTM E1190 conducted by a qualified testing agency.
4. Mechanical fasteners:
   a. ASTM C1513, corrosion resistant coated, self-drilling, self-tapping, steel drill screws:

1) Head type: Low profile head beneath sheathing.

5. Welding electrodes: Comply with AWS standards.

PART 3 EXECUTION

3.1 PROJECT CONDITIONS

A. Environmental Limitations:
1. Comply with ASTM C840 for gypsum board manufacturer's written instructions, whichever are more stringent:
a. Do not install paper faced gypsum panels until installation areas are enclosed and conditioned.

B. Room Temperatures: Maintain minimum 40 degrees F (4 degrees C). For adhesive attachment and finishing of gypsum board, maintain minimum 50 degrees F (10 degrees C) for 48 hours before application and continuously after until dry. Do not exceed 95 degrees F (35 degrees C) when using temporary heat sources.

C. Ventilation: Ventilate building spaces as required to dry joint treatment materials. Avoid drafts during hot, dry weather to prevent finishing materials from drying too rapidly.

D. Do not install panels that are wet, moisture damaged, and mold damaged:
1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

3.2 EXAMINATION

A. Examine areas and substrates including welded hollow metal frames, cast in anchors, and structural framing, for compliance with requirements and other conditions affecting performance. Proceed with installation after unsatisfactory conditions have been corrected.

3.3 PREPARATION

A. Suspended Assemblies: Coordinate installation of suspension systems with installation of overhead structure to ensure that inserts and other provisions for anchorages to building structure have been installed to receive hangers at spacing required to support the Work and that hangers will develop their full strength. Furnish concrete inserts and other devices indicated to other trades for installation in advance of time needed for coordination and construction.

3.4 INSTALLATION

A. Installation Standard: ASTM C754, except comply with framing sizes and spacing indicated.

B. Gypsum Board Assemblies: Comply with requirements in ASTM C840 applicable to framing installation.

C. Suspension System:
1. Isolate suspension systems from building structure where they abut or are penetrated by building structure to prevent transfer of loading imposed by structural movement:
a. Suspend hangers from building structure:

1) Install hangers plumb and free from contact with insulation or objects within ceiling plenum that are not part of supporting structural or suspension system. Splay hangers where required to miss obstructions and offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
2) Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with locations of hangers required to support standard suspension system members, install supplemental suspension members and hangers in the form of trapezes or equivalent devices:
    a) Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced installation standards.
3) Do not attach hangers to steel roof deck.
4) Do not attach hangers to permanent metal forms. Furnish cast in place hanger inserts that extend through forms.
5) Do not attach hangers to rolled in hanger tabs of composite steel floor deck.
6) Do not connect or suspend steel framing from ducts, pipes, or conduit.

b. Fire Resistance Rated Assemblies: Wire tie furring channels to supports.
c. Installation Tolerances: Install suspension systems that are level to within 1/8 inch in 12 feet (3 mm in 3.6 m) measured lengthwise on each member that will receive finishes and transversely between parallel members that will receive finishes.

D. Grid Suspension Systems: Attach perimeter wall track or angle where grid suspension systems meet vertical surfaces. Mechanically join main beam and cross furring members to each other and butt cut to fit into wall track.

E. Framing Assembly:
1. Where studs are installed directly against exterior masonry walls or dissimilar metals at exterior walls, install isolation strip between studs and exterior wall:
    a. Install studs so flanges within framing system point in same direction. Space studs in single layer application as indicated on drawings.
    b. Install tracks (runners) at floors and overhead supports. Extend framing full height to structural supports or substrates above suspended ceilings, except where partitions are indicated to terminate at suspended ceilings. Continue framing around ducts penetrating partitions above ceiling:
        1) Door Openings - Screw vertical studs at jambs to jamb anchor clips on door frames; install runner track section (for cripple studs) at head and secure to jamb studs:
            a) Install two studs at each jamb, unless otherwise indicated.
            b) Install cripple studs at head adjacent to each jamb stud, with minimum 1/2-inch (12.7mm) clearance from jamb stud to allow for installation of control joint in finished assembly.
            c) Extend jamb studs through suspended ceilings and attach to underside of overhead structure.
        2) Other Framed Openings: Frame openings other than door openings the same as required for door openings, unless otherwise indicated. Install framing below sills of openings to match framing required above door heads.
    c. Installation Tolerance: Install each framing member so fastening surfaces vary not more than 1/8 inch (3 mm) from the plane formed by faces of adjacent framing.

F. Sound Insulation: Install sound attenuation blankets before installing gypsum panels, unless blankets are readily installed after panels have been installed on one side.

G. Gypsum Panels:

1. Comply with ASTM C840. Examine panels before installation. Reject panels that are wet, moisture damaged, and mold damaged:
   a. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.
   b. Install panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch (1.5 mm) of open space between panels. Do not force into place.
   c. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.
   d. Form control and expansion joints with space between edges of adjoining gypsum panels.
   e. Cover both faces of support framing with gypsum panels in concealed spaces, except in chases braced internally:
      1) Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. (0.7 sq. m) in area.
      2) Fit gypsum panels around ducts, pipes, and conduits.
      3) Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4-inch to 3/8-inch (6.4 mm to 9.5 mm) wide joints to install sealant.
   f. Isolate perimeter of gypsum board applied to nonload bearing partitions at structural abutments, except floors. Provide 1/4 inch to 1/2 inch (6.4mm to 12.7mm) wide spaces at these locations, and trim edges with edge trim where edges of panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.
   g. Attachment to Steel Framing: Attach panels so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.

H. Gypsum Board:
   1. Install interior gypsum board where indicated on drawings.
      a. Single Layer Application:
         1) On ceilings, apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing, unless otherwise indicated.
         2) On partitions/walls, apply gypsum panels vertically (parallel to framing), unless otherwise indicated or required by fire resistance rated assembly, and minimize end joints. Stagger abutting end joints not less than one framing member in alternate courses of panels.
         3) Fastening Methods: Apply gypsum panels to supports with steel drill screws.
      b. Multilayer Application:
         1) On partitions/walls, apply gypsum board indicated for base layers and face layers vertically (parallel to framing) with joints of base layers located over stud or furring member and face-layer joints offset at least one stud or furring member with base-layer joints unless otherwise indicated or required by fire-resistance-rated assembly. Stagger joints on opposite sides of partitions.
         2) On Z shaped furring members, apply base layer vertically (parallel to framing) and face layer either vertically (parallel to framing) or horizontally (perpendicular to framing) with vertical joints offset at least one furring member. Locate edge joints of base layer over furring members.

3) Fastening Methods: Fasten base layers and face layers separately to supports with screws.

I. Cementitious Backer Units: ANSI A108.11; install where indicated with 1/4-inch (6.4 mm) gap where panels abut other construction or penetrations. Where tile backing panels abut other types of panels in same plane, shim surfaces to produce a uniform plane across panel surfaces.

J. Exterior Gypsum Board Soffits:
1. Apply panels perpendicular to supports, with end joints staggered and located over supports:
   a. Install with 1/4 inch (6.4 mm) open space where panels abut other construction or structural penetrations.
   b. Fasten with corrosion-resistant screws.

K. Trim Accessories:
1. For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Attach trim according to manufacturer's written instructions:
   a. Control Joints: Install control joints according to ASTM C840 and in specific locations approved by Architect for visual effect.
   b. Exterior Trim:
      1) Install in the following locations:
         a) Cornerbead: Use at outside corners.
         b) LC Bead: Use at exposed panel edges.
   c. Interior Trim - Install in the following locations:
      1) Cornerbead: Use at outside corners, unless otherwise indicated.
      2) Bullnose Bead: Use at outside corners.
      3) LC Bead: Use at exposed panel edges.
      4) L Bead: Use where indicated or necessary.
      5) U Bead: Use at exposed panel edges.

L. Gypsum Board Finishing:
1. Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces:
   a. Prefill open joints, rounded or beveled edges, and damaged surface areas.
   b. Apply joint tape over gypsum board joints, except those with trim having flanges not intended for tape.
   c. Gypsum Board Finish Levels - Finish panels to levels indicated below and according to ASTM C840:
      1) Level 1: Ceiling plenum areas, concealed areas, and where indicated.
      2) Level 2: Panels that are substrate for tile.
      3) Level 3: Surfaces be coated with drywall primer prior to final finishes. Heavy or medium texture finishes before final painting, or where heavy-grade wall coverings are to be applied as the final decoration. This level of finish is not recommended where smooth painted surfaces, or light to medium weight wall coverings as specified.
      4) Level 4: For surfaces receiving wall covering and flat paints.
      5) Level 5: For surfaces receiving gloss or semigloss paint and surfaces subjected to severe lighting. To be used in Kitchen areas and food service areas only.
   d. Glass Mat Gypsum Sheathing Board: Finish according to manufacturer's written instructions for use as exposed soffit board.

e. Glass Mat Faced Panels: Finish according to manufacturer's written instructions.

M. Installation Tolerances:
1. Suspension System: Install suspension systems that are level to within 1/8 inch in 12 feet (3 mm in 3.6 m) measured lengthwise on each member that will receive finishes and transversely between parallel members that will receive finishes.
2. Installation Tolerances, Suspension System: Install suspension systems level to within 1/8 inch in 12 feet (3 mm in 3.6 m) measured lengthwise on each member that will receive finishes and transversely between parallel members that will receive finishes.

3.5 PROTECTION

A. Protect installed products from damage from weather, condensation, direct sunlight, construction, and other causes during remainder of the construction period.

B. Remove and replace panels that are wet, moisture damaged, and mold damaged:
1. Indications that panels are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that panels are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

END OF SECTION 09 21 16

SECTION 09 24 00 CEMENT PLASTERING (PATCH AND REPAIR)

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes: Requirements including but not limited to:
   1. Exterior cement plaster repair.
   2. Metal lath and furring.
   3. Accessories necessary for a complete installation.

B. Related documents:
   1. Section 01 33 00: Submittal Procedures.
   2. Section 01 73 29: Cutting and Patching.
   3. Section 02 41 19: Selective Demolition.
   4. Section 07 92 00: Joint Sealants.
   5. Section 09 90 00: Painting and Coatings.

1.3 SUBMITTALS

A. Product Data: Submit technical data for product and accessory, including construction details and material descriptions.

B. Shop Drawings: Show locations and installation of control and expansion joints, including plans, elevations, sections, details of components, and attachments to other work.

1.4 QUALITY ASSURANCE

A. Regulatory Requirements:
   1. Building Code: Comply with applicable provisions of the 2022 California Building Code (CBC) (CCR Title 24, Part 2, as adopted and amended by DSA).
   2. Fire Resistance Ratings: Where indicated, provide cement plaster assemblies identical to those of assemblies tested for fire resistance according to ASTM E 119 by a qualified testing agency.

B. Preinstallation Conference: Conduct conference at site.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver cementitious materials in original packages, containers, or bundles, labeled with manufacturer's name, product brand name, and lot number.

B. Store materials inside under cover, and keep them dry and protected against damage from weather, moisture, direct sunlight, surface contamination, corrosion, construction traffic, and other causes.

1.6 PROJECT CONDITIONS

A. Comply with applicable requirements of ASTM C 926.

B. Environmental Requirements: Comply with requirements of referenced plaster application standards and recommendations of plaster manufacturer for environmental conditions before, during, and after plaster application.

C. Cold Weather Requirements: Provide heat and protection, temporary or permanent, as required to protect each coat of plaster from freezing for at least 24 hours after application. Distribute heat uniformly to prevent concentration of heat on plaster near heat sources; provide deflection or protective screens.

D. Warm Weather Requirements: Protect plaster against uneven and excessive evaporation and from strong flows of dry air, both natural and artificial. Apply and cure plaster as required by climatic and job conditions to prevent dry out during cure period. Provide suitable coverings, moist curing, barriers to deflect sunlight and wind, or combinations of these, as required.

E. Exterior Plasterwork:
1. Apply and cure plaster to prevent plaster drying out during curing period. Use procedures required by climatic conditions, including moist curing, providing coverings, and providing barriers to deflect sunlight and wind.
2. Apply plaster when ambient temperature is greater than 40 degrees F (4.4 degrees C).
3. Protect plaster coats from freezing for not less than 48 hours after set of plaster coat has occurred.

F. Protect contiguous work from soiling and moisture deterioration caused by plastering. Provide temporary covering and take precautions necessary to minimize spattering of plaster on adjacent work.

G. Factory Prepared Finishes: Comply with manufacturer's written recommendations for environmental conditions for applying finishes.

PART 2 PRODUCTS

2.1 MATERIALS

A. Manufacturers: Subject to compliance with requirements, provide products of one of the following:
1. Metal Lath and Accessories:
   a. Alabama Metal Industries (AMICO).
   b. CEMCO.
   c. ClarkDietrich Building Systems.
   d. Marino/WARE.
   e. Phillips Manufacturing.
2. Plastic Accessories:
   a. Alabama Metal Industries (AMICO).
   b. Phillips manufacturing.
   c. Plastic Components.
   d. Vinyl Corp.
3. Ready Mixed Finish Coat Plaster:
   a. California Stucco Product.
   b. El Rey Solutions.
   c. Omega Products International.

d. Quikrete.
e. Shamrock Stucco.

4. Acrylic Based Finish Coat:
   a. California Stucco Product.
   b. Dryvit Systems.
   c. El Rey Solutions.
   d. Finestone, BASF Corp.
   e. LaHabra, a brand of Parex USA, Inc.
   f. Omega Products International.
   g. Senergy, BASF Corp.
   h. Sto Corp.

B. Metal Lath:
   1. Expanded Metal Lath: ASTM C 847, cold rolled carbon steel sheet with ASTM A 653/A 653M, G60 (Z180), hot dip galvanized zinc coating.
      a. Diamond Mesh Lath: Self furring, 3.4 lb/sq. yd. (1.8 kg/sq. m).
      b. Comply with DSA IR 25-4 for the installation of Self-Furring Metal Lath.

C. Accessories: Comply with ASTM C 1063, and coordinate depth of trim and accessories with thicknesses and number of plaster coats required.
   1. Metal Accessories:
      a. Foundation Weep Screed: Fabricated from hot dip galvanized steel sheet, ASTM A 653/A 653M, G60 (Z180) zinc coating.
      b. Cornerite: Fabricated from metal lath with ASTM A 653/A 653M, G60 (Z180), hot dip galvanized-zinc coating.
      c. Outside Corner Reinforcement: Fabricated from metal lath with ASTM A 653/A 653M, G60 (Z180), hot dip galvanized zinc coating.
      d. Cornerbeads: Fabricated from zinc or zinc coated (galvanized) steel.
         1) Smallnose cornerbead with expanded flanges; use unless otherwise indicated.
         2) Smallnose cornerbead with expanded flanges reinforced by perforated stiffening rib; use on columns and for finishing unit masonry corners.
      e. Casing Beads: Fabricated from zinc or zinc coated (galvanized) steel; square edged style; with expanded flanges.
      f. Control Joints: Fabricated from zinc or zinc coated (galvanized) steel; one piece type, folded pair of unperforated screeds in M shaped configuration; with perforated flanges and removable protective tape on plaster face of control joint.
      g. Expansion Joints: Fabricated from zinc or zinc coated (galvanized) steel; folded pair of unperforated screeds in M shaped configuration; with expanded flanges.
      h. Two Piece Expansion Joints: Fabricated from zinc or zinc coated (galvanized) steel; formed to produce slip joint and square edged reveal adjustable from 1/4 to 5/8 inch (6 to 16 mm) wide; with perforated flanges.
   2. Plastic Accessories: Manufactured from high impact PVC.
      a. Cornerbeads: With perforated flanges.
         1) Smallnose cornerbead; use unless otherwise indicated.
         2) Bullnose cornerbead, radius 3/4 inch (19 mm) minimum; use at locations indicated on Drawings.
      b. Casing Beads: With perforated flanges in depth required to suit plaster bases indicated and flange length required to suit applications indicated.
         1) Square edge style; use unless otherwise indicated.
         2) Bullnose style, radius 3/4 inch (19 mm) minimum; use at locations indicated on Drawings.

3. Penetration Flashing.
   a. Tyvek flashing system. Straight flash for jambs and heads, FlexWrap for sills.
   b. Polymer Group, Inc.
   c. National Shelter Products, Inc

D. Miscellaneous Materials:
1. Water for Mixing and Finishing Plaster: Potable and free of substances capable of affecting plaster set or of damaging plaster, lath, or accessories.
2. Fiber for Base Coat: Alkaline resistant glass or polypropylene fibers, 1/2 inch (13 mm) long, free of contaminants, manufactured for use in cement plaster.
3. Bonding Compound: ASTM C 932.
4. Fasteners for Attaching Metal Lath to Substrates: ASTM C 1063.
5. Wire: ASTM A 641/A 641M, Class 1 zinc coating, soft temper, not less than 0.0475 inch 1.21 mm diameter unless otherwise indicated.
6. Sound Attenuation Blankets: ASTM C 665, Type I (blankets without membrane facing) produced by combining thermosetting resins with mineral fibers manufactured from glass, slag wool, or rock wool.
   a. Fire Resistance Rated Assemblies: Comply with mineral-fiber requirements of assembly.

E. Plaster Materials:
1. Portland Cement: ASTM C 150/C 150M, Type II.
   a. Color for Finish Coats: Integral color plaster shall match exterior paint color as indicated, provide sample/mock-up for approval by Architect.
2. Colorants for Job Mixed Finish Coats: Colorfast mineral pigments that produce finish plaster color selected by Architect.
3. Lime: ASTM C 206, Type S; or ASTM C 207, Type S.
4. Sand Aggregate: ASTM C 897.
   a. Color for Job Mixed Finish Coats: White**.**
5. Exposed Aggregates for Finish Coats: Match existing.
6. Ready Mixed Finish Coat Plaster: Mill mixed portland cement, aggregates, coloring agents, and proprietary ingredients.
   a. Color: Integral color plaster shall match exterior paint color as indicated, provide sample/mock-up for approval by Architect.
7. Acrylic Based Finish Coatings: Factory mixed acrylic emulsion coating systems formulated with colorfast mineral pigments and fine aggregates; for use over cement plaster base coats. Include manufacturer's recommended primers and sealing topcoats for acrylic based finishes.
   a. Color: Integral color plaster shall match exterior paint color as indicated, provide sample/mock-up for approval by Architect.

2.2 PLASTER MIXES

A. Comply with ASTM C 926 for applications indicated.
1. Fiber Content: Add fiber to base coat mixes after ingredients have mixed at least two minutes. Comply with fiber manufacturer's written instructions for fiber quantities in mixes, but do not exceed 1 lb of fiber/cu. yd. (0.6 kg of fiber/cu. m) of cementitious materials.

B. Base Coat Mixes for Use over Metal Lath: Scratch and brown coats for three coat plasterwork:
1. Portland Cement Mix:
   a. Scratch Coat: For cementitious material, mix 1 part portland cement and **3/4 to 1-1/2** parts lime. Use 2-1/2 to 4 parts aggregate per part of cementitious material.

b. Brown Coat: For cementitious material, mix 1 part portland cement and **3/4 to 1-1/2** parts lime. Use 3 to 5 parts aggregate per part of cementitious material, but not less than volume of aggregate used in scratch coat.

C. Job Mixed Finish Coat Mixes:
1. Portland Cement Mix: For cementitious materials, mix 1 part portland cement and **3/4 to 1-1/2** parts lime. Use 1-1/2 to 3 parts aggregate per part of cementitious material.

D. Factory Prepared Finish Coat Mixes: For ready mixed finish coat plasters or acrylic based finish coatings, comply with manufacturer's written instructions.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions for compliance with requirements for installation tolerances and other conditions affecting performance of the work. Proceed with installation after correcting unsatisfactory conditions.

3.2 PREPARATION

A. Remove plaster to nearest joint where possible. Saw cut joint for patch at location agreed upon with Architect prior to work.

B. Protect adjacent work from soiling, spattering, moisture deterioration, and other harmful effects caused by plastering.

C. Prepare smooth, solid substrates for plaster according to ASTM C 926.

3.3 INSTALLATION

A. Metal Lath: Install according to ASTM C 1063.
1. Partition Framing and Vertical Furring: Flat diamond mesh lath.
2. Horizontal Framing: Flat diamond mesh lath.

B. Accessories: Install according to ASTM C 1063 and at locations indicated on Drawings.
1. Reinforcement for External (Outside) Corners:
   a. Install cornerbead at exterior corner locations.
   b. Install cornerbead at interior corner locations.
2. Control Joints: Locate as approved by Architect for visual effect where not illustrated on drawings.
   a. As required to delineate plasterwork into areas (panels) of the following maximum sizes:
      1) Vertical Surfaces: 144 sq. ft. (13.4 sq. m).
      2) Horizontal and Other Nonvertical Surfaces: 100 sq. ft. (9.3 sq. m).
   b. At distances between control joints of not greater than 12 feet o.c.
   c. As required to delineate plasterwork into areas (panels) with length-to-width ratios of not greater than 2-1/2:1.
   d. Where control joints occur in surface of construction directly behind plaster.
   e. Where plasterwork areas change dimensions, to delineate rectangular shaped areas (panels) and to relieve the stress that occurs at the corner formed by the dimension change.
   f. Where plasterwork repair involves any of the above referenced conditions.

3.4 PLASTER APPLICATION

A. Comply with ASTM C 926.
   1. Do not deviate more than plus or minus 1/4 inch in 10 feet (6 mm in 3 m) from a true plane in finished plaster surfaces when measured by a 10-foot (3-m) straightedge placed on surface.
   2. Finish plaster flush with metal frames and other built-in metal items or accessories that act as a plaster ground unless otherwise indicated. Where casing bead does not terminate plaster at metal frame, cut base coat free from metal frame before plaster sets and groove finish coat at junctures with metal.
   3. Provide plaster surfaces ready to receive field applied finishes indicated.

B. Flat Surface Tolerances: Do not deviate more than plus or minus 1/8 inch in 10 feet (3 mm in 3 m) from a true plane in finished plaster surfaces, measured by a 10 foot (3m) straightedge placed at any location on surface.

C. Walls; Base Coat Mixes for Use over Metal Lath: For scratch and brown coats, for three coat plasterworks with 3/4 inch (19 mm) total thickness:
   1. Portland cement mixes.

D. Plaster Finish Coats: Apply to provide dash finish.

E. Acrylic Based Finish Coatings (Contractor Option to Plaster Finish Coat): Apply coating system, including primers, finish coats, and sealing topcoats, according to manufacturer's written instructions.

F. Concealed Exterior Plasterwork: Where plaster application is used as a base for adhered finishes, omit finish coat.

3.5 PLASTER REPAIRS

A. Repair or replace work to eliminate cracks, dents, blisters, buckles, crazing and check cracking, dry outs, efflorescence, sweat outs, and similar defects and where bond to substrate has failed.

B. Cut, patch, replace, repair, and point up plaster as necessary to accommodate other work. Repair cracks and indented surfaces. Point up finish plaster surfaces around items that are built into or penetrate plaster surfaces. Repair or replace work to eliminate blisters, buckles, check cracking, dry outs, efflorescence, excessive pinholes, and similar defects. Repair or replace work as necessary to comply with required visual effects.

3.6 TOLERANCES

A. Maximum Variation from True Lines and Levels: 1/8 inch in 10 feet (3mm in 3 m).

B. Maximum Variation from True Position: 1/8 inch (3mm).

3.7 CLEANING AND PROTECTION

A. Remove temporary protection and enclosure of work after plastering is complete. Promptly remove plaster from door frames, windows, and other surfaces not indicated to be plastered. Repair floors, walls, and other surfaces stained, marred, or otherwise damaged during plastering.

B. Remove unused materials, containers, equipment, and plaster debris.

C. Protect plaster and maintain conditions ensuring finished plaster is without damage or deterioration at time of Substantial Completion.

END OF SECTION 09 24 00

SECTION 09 90 00 PAINTING AND COATING

PART 1 GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes requirements including but not limited to:
   1. Surface preparation and field painting of exposed items and surfaces.
   2. Field preparation and painting of factory primed metal products and fabrications.
   3. Accessories necessary for a complete installation.

1.3 DEFINITIONS

A. Standard coating terms defined in ASTM D16 apply:
   1. Flat refers to a lusterless or matte finish with a gloss range below 15 when measured at an 85-degree meter.
   2. Eggshell refers to low sheen finish with a gloss range between 20 and 35 when measured at a 60-degree meter.
   3. Semigloss refers to medium sheen finish with a gloss range between 35 and 70 when measured at a 60-degree meter.
   4. Full gloss refers to high sheen finish with a gloss range more than 70 when measured at a 60-degree meter.

1.4 SUBMITTALS

A. Product Data:
   1. Submit technical data and information for block fillers, primers, paints, and coatings, including label analysis and instructions for handling, storing, and applying each coating material proposed for use:
      a. Indicate manufacturer's instructions for special surface preparation procedures, substrate conditions requiring special attention.
      b. Material List: Provide inclusive list of required coating materials. Indicate each material and cross reference specific coating, finish system, and application. Identify each material by manufacturer's catalog number, series, and general classification.
      c. Submit Zero VOC compliant products only.

B. Samples:
   1. Submit for each type of paint system and in each color and gloss of topcoat:
      a. Provide stepped samples, defining each separate coat, including block fillers and primers. Use representative colors when preparing samples for review. Resubmit until required sheen, color, and texture are achieved.
      b. Provide list of material and application for each coat of each sample. Label each sample as to location and application.
      c. Submit samples on following substrates for review of color and texture only:
         1) Concrete: Provide two 4-inch square samples for each color and finish.
         2) Concrete Masonry: Provide two 4" x 8" samples of masonry, with mortar joint in the center, for each finish and color.

3) Painted Wood: Provide two 12-inch square samples of each color and material on hardboard.
4) Ferrous and Nonferrous Metals: Provide two 4-inch square samples of flat metal and two 8 inch long samples of solid metal for each color and finish.

C. Product List: Submit list of including each paint system, color, and location of application. Use same product and location designations indicated in Finish Schedule.

1.5 QUALITY ASSURANCE

A. Regulatory Requirements:
1. Comply with Federal and local toxicity and air quality regulations and with Federal requirements on content of for heavy metals including but not limited to: lead and mercury. Do not use solvents in paint products that contribute to air pollution.
2. Performance and Durability:
a. ASTM D16 Standard Test Method for Load Testing Refractory Shapes at High Temperatures.
b. ASTM D2486 Standard Test Method for Scrub Resistance of Interior Wall Paint.
c. ASTM D2805 Standard Test Method for Hiding Power of Paints by Reflectometry.
d. ASTM D4828 Standard Test Method for Practical Washability of Organic Coatings.

B. Applicator Qualifications: A firm or individual having minimum 5 years documented experience in applying paints and coatings similar in material, design, and extent to those indicated.

C. Source Limitations: Obtain block fillers and primers for each coating system from the same manufacturer as the finish coats.

1.6 WARRANTY

A. Written warranty signed by the manufacturer and the installer in which the manufacture and installer agree to repair or replace paint and primers that fail within specified warranty period:
1. Failures include, but are not limited to, the following:
a. Flaking or delamination of paint with the substrate.
b. Rust, scale, similar imperfections due to improper surface preparation.
c. Thinning or watering of paint beyond that considered acceptable of paint manufacturer.
d. Failure to achieve dry film thickness (DFT) recommended by manufacturer for each coat in a paint system.
e. Deterioration or loss of color of paint beyond normal weathering.
2. Warranty Period: One year from date of Substantial Completion.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Store materials not in use in tightly covered containers in well ventilated areas with ambient temperatures continuously maintained at not less than 45 degrees F (7 degrees C):
1. Maintain containers in clean condition, free of foreign materials and residue.
2. Remove rags and waste from storage areas daily.

PART 2 PRODUCTS

2.1 MATERIALS

A. Basis of Design - **Vista Paint Corporation**:
   1. No Substitutes Allowed.
   2. Subject to compliance with requirements, provide first quality, 100% acrylic, commercial or industrial products of the specified manufacturer. Residential products are not permitted.
   3. Proprietary Names: Furnish product technical data, including per cent solids by weight and volume; VOC content limits and emissions data; and certificates of performance for comparable paint products of specified manufacturer. With exception to the paint used in the theater.

B. Material Compatibility: Provide each paint system including block fillers, primers, and finish coats, that are compatible with one another and with substrates indicated under conditions of service and application, demonstrated by manufacturer based on testing and field experience.

C. Material Quality: Provide manufacturer's best quality commercial paint 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. Residential quality paint products are not permitted.

D. Chemical Components of Interior Paints and Coatings:
   1. Provide products complying with limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24) and SCLAAQMD Rule1113:
      a. Aromatic Compounds: Paints and coatings shall not contain more than 1.0 percent by weight of total aromatic compounds (hydrocarbon compounds containing one or more benzene rings).
      b. Restricted Components: Paints and coatings shall not contain components restricted by the EPA and the SCLAAQMD.

E. Accessories: Materials not specifically indicated but required to achieve the finishes specified, of commercial quality.

F. Patching Materials: Latex filler compatible with paint systems.

G. Fastener Head Cover Materials: Latex filler.

H. Theater Black: Dulux Paints. No Exceptions or alternates.

2.2 SOURCE QUALITY CONTROL

A. Testing of Paint Materials:
   1. Owner reserves the right to invoke to engage the services of a qualified testing agency to sample paint materials:
      a. Contractor will be notified in advance and may be present when samples are taken. If paint materials have already been delivered to site, samples may be taken at the site. Samples will be identified, sealed, and certified by testing agency.
      b. Testing agency will perform tests for compliance with product requirements.
      c. Owner may direct Contractor to stop applying paints if test results show materials being used do not comply with product requirements. Contractor shall remove noncomplying paint materials from Project site, pay for testing, and repaint surfaces painted with rejected materials. Contractor will be required to remove rejected materials from previously painted surfaces if, on repainting with complying materials, the two paints are incompatible.

PART 3 EXECUTION

3.1 FIELD CONDITIONS

A. Apply waterborne paints when temperatures of surfaces to be painted and surrounding air are between 50 degrees F and 90 degrees F (10 degrees and 32 degrees C).

B. Do not thin or add water to waterbased paints, including waterbased alkyds.

C. Weather Conditions:
   1. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.
   2. Do not apply paint in snow, rain, fog, or mist; or when the relative humidity exceeds 85 percent; or at temperatures less than 5 degrees F (3 degrees C) above dew point; or to damp or wet surfaces.
   3. Minimum Application Temperatures for Water based Paints: Between 50 degrees F (10 degrees C) and 90 degrees F (32 degrees C).

D. Apply solvent thinned paints when temperatures of surfaces to be painted and surrounding air are between 45 degrees F. and 95 degrees F (7 degrees F and 35 degrees C):
   1. Minimum Application Temperature for Varnish Finishes: 65 degrees F (18 degrees C) for interior or exterior, unless required otherwise by manufacturer's instructions.
   2. Painting may continue during inclement weather if surfaces and areas to be painted are enclosed and heated within temperature limits specified by the manufacturer during application and drying periods.

E. Provide lighting level of 80-foot candles (860lx) measured midheight at substrate surface.

F. Labels: Do not paint over Underwriters Laboratories, Factory Mutual, other code required labels, or equipment name, identification, performance rating, or nomenclature plates.

3.2 EXTRA MATERIALS

A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents:
   1. Paint: 2 percent, but not less than 1 gallon (3.8 L) of each material and color applied.

3.3 EXAMINATION

A. Examine substrates and conditions for compliance with requirements for maximum moisture content and conditions affecting performance of the work.

B. Test substrates after repairing and cleaning substrates but prior to application of paint and coatings:
   1. Maximum moisture content of substrates, when measured with an electronic moisture meter as follows:
      a. Concrete: 12 percent.
      b. Fiber Cement Board: 12 percent.
      c. Masonry (Clay and CMUs): 12 percent.
      d. Wood: 15 percent.
      e. Gypsum Board: 12 percent.
      f. Plaster: 12 percent.

2. Test cementitious and plaster cement/stucco for alkalinity (pH).

C. Gypsum Board Substrates: Verify taped joints are tapes and finishing compound is sanded smooth.

D. Plaster Substrates: Verify plaster has fully cured. Verify existing plaster is in good condition and can receive new paint coating.

E. Spray Textured Ceiling Substrates: Verify surfaces are dry.

F. Verify suitability of substrates, including surface conditions and compatibility, with existing finishes and primers:
   1. Verify previously painted surfaces can be stripped to bare substrate, repaired if necessary, and prepared to receive new paint system consisting of primer and two top coats at a minimum:
      a. Note: Previously painted surfaces have failed to accept new paint systems. Determined cause of failure and take corrective measures to ensure each surface accepts new paint system. Failure of new paint system is not permitted.

G. Commence paint and coating application after correcting unsatisfactory conditions and surfaces are dry. Application of coating indicates applicator’s acceptance of surfaces and conditions.

3.4 PREPARATION

A. Coordination of Work:
   1. Review work in which primers are provided to ensure compatibility of the total system for various substrates. Notify Architect of anticipated problems when using materials specified over substrates primed by others:
      a. Preprimed Substrates: Inspect existing conditions in which primers are factory applied to ensure compatibility of the total system for each substrate. Notify Architect of anticipated problems when using the materials specified over factory primed or preprimed substrates.
      b. Existing Painted Surfaces: Inspect previously painted surfaces to ensure compatibility of the existing paints with new paint system for each substrate. Notify Architect of anticipated problems.
      c. Correct defects and clean surfaces affecting bond with paint system. Remove existing paints exhibiting loose surface defects showing signs of rust, scale, or delamination.
      d. Seal marks which may bleed through surface finishes.

B. Surface Preparation:
   1. Clean and prepare surfaces to be painted according to manufacturer's written instructions for each particular substrate condition and as specified. Provide barrier coats over incompatible primers or remove and reprime. If removal is impractical or impossible because of size or weight of item, provide surface applied protection before surface preparation and painting:
      a. Remove hardware and hardware accessories, plates, lighting fixtures, and similar items that are not to be painted. If removal is impractical or impossible because of size or weight of item, provide surface applied protection before surface preparation and painting. After completing painting operations in each space or area, reinstall items removed using workers skilled in the trades involved.
      b. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface applied protection if any.

c. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
d. Clean and prepare surfaces to receive paint according to manufacturer's written instructions for each substrate condition and as specified. Provide barrier coats over incompatible primers, existing paint or coating, or remove and reprime.
e. Correct defects and clean surfaces affecting bond with paint or coating system. Remove existing coatings exhibiting loose surface defects. Seal marks which may bleed through surface finishes.

C. Cleaning:
1. Before applying paint or surface treatments, clean substrates of substances that could impair bond of the various coatings. Remove oil and grease before cleaning. Schedule cleaning and painting so dust and contaminants from the cleaning process will not fall on wet, newly painted surfaces:
a. Remove incompatible primers, including factory applied primers, and reprime substrate with compatible primers or apply barrier coat as necessary to produce paint systems indicated.
b. Concrete Substrates: Remove release agents, curing compounds, efflorescence, and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces to be painted exceeds that permitted in manufacturer's written instructions.
c. Steel Substrates: Remove rust and loose mill scale. Clean using methods recommended in writing by paint manufacturer.
d. Galvanized Metal Substrates: Remove grease and oil residue from galvanized sheet metal fabricated from coil stock by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.
e. Aluminum Substrates: Remove surface oxidation.

D. Mildew and Mold Removal: Remove mildew and mold by high power washing (pressure range of 1500 to 4000 psi) with solution of trisodium phosphate and bleach. If substrate is too soft for high power washing, scrub substrate with solution. Rinse with clean water and allow surface to dry.

E. Protective Coverings: Provide protections for duration of the work, including covering furnishings and decorative items. Protect and mask adjacent finishes and components against damage, marking, overpainting, and injury. Clean and repair or replace damage caused by painting.

F. Renovated Surfaces:
1. Clean surface free of loose dirt and dust. Except at gypsum board surfaces, remove existing paint and coatings to bare substrate and prepare substrates to receive new paint system. Test substrate to verify it will bond with primer and receive new paint system without failure. If test fails, clean surface to base substrate and apply barrier coat. Retest to verify surface will accept new paint system:
a. Remove surface film preventing proper adhesion and bond.
b. Wash glossy paint with a solution of sal soda and rinse thoroughly.
c. Remove loose, blistered, and defective paint and varnish; smooth edges with sandpaper.
d. Clean corroded iron and steel surfaces.
e. Repair and blend into portland cement plaster.
f. Prime bare surfaces.
g. Tone varnished surfaces with stain bringing to uniform color.
h. If existing surfaces cannot be put in acceptable condition for finishing by customary cleaning, sanding, and puttying operations, notify Owner and do not proceed until correcting unsatisfactory conditions.

G. Cementitious Substrates:
   1. Prepare concrete surfaces to receive paint. Remove efflorescence, chalk, dust, dirt, grease, oils, release agents, mold, mildew, and existing paint. Roughen as necessary to remove glaze. If hardeners or sealers have been used to improve curing, use mechanical methods of surface preparation:
      a. Use abrasive blast cleaning methods if recommended by paint manufacturer.
      b. Do not paint surfaces if moisture content or alkalinity of surfaces exceeds that permitted in manufacturer's written instructions:
         1) Determine alkalinity and moisture content of surfaces by performing appropriate pH testing. If surfaces are sufficiently alkaline to cause the finish paint to blister and burn, correct condition prior to application of paint.
         2) Anhydrous Calcium Chloride Test: ASTM F1869. Proceed with installation after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. (1.36 kg of water/92.9 sq. m).
         3) Relative Humidity Test: Using in situ probes, ASTM F2170. Proceed with installation after substrates have obtained percent relative humidity level recommended by paint manufacturer.
         4) Perform additional moisture tests when recommended by manufacturer. Proceed with installation when moisture content complies with that permitted in manufacturer's written instructions.
         5) Remove stains caused by weathering of corroding metals with solution of sodium metasilicate after thoroughly wetting with water. Allow to thoroughly dry.
   2. Clean concrete floors to receive paint or coating with a 5 percent solution of muriatic acid or etching cleaner. Flush floors with clean water to remove acid; neutralize with ammonia, rinse, allow to dry; vacuum before painting.

H. Ferrous Metals:
   1. Clean ungalvanized ferrous metal surfaces that have not been shop coated; remove oil, grease, dirt, loose mill scale, and other foreign substances. Use solvent or mechanical cleaning methods that comply with SSPC recommendations:
      a. Blast steel surfaces clean as recommended by paint system manufacturer and according to SSPC SP6/NACE No. 3.
      b. Treat bare and sandblasted or pickled clean metal with a metal treatment wash coat before priming.
      c. Touch up bare areas and shop-applied prime coats that have been damaged. Wire brush, clean with solvents recommended by paint manufacturer, and touch up with same primer as the shop coat.

I. Galvanized Ferrous Metal Substrates: Clean galvanized surfaces with nonpetroleum based solvents leaving surface free of oil and surface contaminants. Remove pretreatment from galvanized sheet metal fabricated from coil stock by mechanical methods to produce clean, lightly etched surfaces that promote adhesion of subsequently applied paints.

J. Shop Primed Steel Substrates: Clean field welds, bolted connections, and areas where shop paint is abraded. Paint exposed areas with the same material as used for shop priming to comply with SSPC PA1 for touching up shop primed surfaces.

K. Aluminum Substrates: Clean surfaces to remove oil, grease, surface oxidation, and contaminants in accordance with SSPC SP1 Solvent Cleaning. Lightly abrade surface with a nonmetallic pad.

L. Masonry Substrates: Remove efflorescence and chalk. Do not paint surfaces if moisture content or alkalinity of surfaces or mortar joints exceeds that permitted in manufacturer's

written instructions.

M. Plaster/Stucco Substrates:
1. Remove contaminants, release agents, curing compounds, efflorescence, chalk, mold, mildew, and similar deterrents. Spot patch existing plaster to eliminate blisters, buckles, excessive crazing, and to check cracking, dryouts, efflorescence, sweat outs, and similar deflects the prevent plaster from bonding with paint or coatings. Sand or texture repair or patch to match adjacent finish and to remove trowel marks and arrises:
   a. Fill hairline cracks, small holes, and imperfections with latex patching plaster. Make smooth and flush with adjacent surfaces. Wash and neutralize high alkali surfaces.
   b. Deep Cracks: Clean out and fill deep cracks with latex patching plaster. Make smooth and flush with adjacent surfaces. Wash and neutralize high alkali surfaces.
   c. Do not paint surfaces if moisture content or alkalinity of surfaces exceeds that permitted in manufacturer's written instructions. Test for alkali using litmus paper.
   d. Allow patching and repair compounds to set and cure before painting.

N. Gypsum Board Surfaces: Fill minor defects with filler compound. Spot prime defects after repair.

O. Wood Substrates:
1. Scrape and clean small, dry, seasoned knots, and apply a thin coat of white shellac or recommended knot sealer before applying primer. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood filler. Sand smooth when dried.
2. Sand surfaces that will be exposed to view and dust off.
3. Prime, stain, or seal wood to be painted. Prime edges, ends, faces, undersides, and back sides of wood, including cabinets, counters, cases, and paneling.
4. Seal tops, bottoms, and cutouts of unprimed wood doors with a heavy coat of varnish or sealer immediately on delivery.
5. After priming, fill holes and imperfections in the finish surfaces with putty or plastic wood filler. Sand smooth when dried.

P. Pipe Covering and Insulation: Clean to remove loose, foreign, and objectionable material before applying sealing coat.

Q. Preparation of Substrates for Wallcovering:
1. Prime and seal substrate with release coat in accordance with wallcovering manufacturer's recommendations for substrate:
   a. Assure compatibility with product of wall covering manufacturer.
   b. Fill indentations in substrate and prime with opaque white primer before applying release coat.
   c. Apply release coat in accordance with manufacturer's recommendations.

R. Barrier Coat: Provide barrier coats over incompatible primers or remove and reprime. Notify Owner in writing of anticipated problems using specified finish coat material over previously coated substrates.

S. Material Preparation:
1. Mix and prepare paint materials according to manufacturer's written instructions:
   a. Maintain containers used in mixing and applying paint in a clean condition, free of foreign materials and residue.
   b. Stir material before application to produce a mixture of uniform density. Stir as

required during application. Do not stir surface film into material. If necessary, remove surface film and strain material before using.

c. Do not use thinners for water-based paints.

d. Tinting: Tint each undercoat a lighter shade to facilitate identification of each coat where multiple coats of the same material are applied. Tint undercoats to match the color of the finish coat but provide sufficient differences in shade of undercoats to distinguish each separate coat.

3.5 APPLICATION

A. Comply with manufacturer's written instructions and recommendations applicable to substrates and paint systems indicated:

1. The term *exposed surfaces* includes areas visible when permanent or built in fixtures, grilles, convector covers, covers for finned tube radiation, and similar components are in place. Extend coatings in these areas to maintain system integrity and provide desired protection.
2. Use applicators and techniques suited for paint and substrate indicated.
3. Provide finish coats compatible with primers.
4. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Before final installation, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
5. Paint exposed surfaces (top, bottom, sides, edges, underneath). If an item or a surface is not specifically mentioned, paint the item or surface the same as similar adjacent materials or surfaces:
   a. Field painting of exposed surfaces include bare and covered pipes and ducts (including color coding), hangers, exposed steel and iron supports, and surfaces of mechanical and electrical equipment that do not have a factory applied final finish.
   b. Areas visible when permanent or built in fixtures, grilles, convector covers, covers for finned tube radiation, and similar components are in place.
   c. Extend coatings in areas, as required, to maintain system integrity and provide desired protection.
6. Paint interior surfaces of ducts with a flat, nonspecular black paint where visible through registers or grilles.
7. Paint front and backsides of access panels, removable or hinged covers, and similar hinged items to match exposed surfaces.
8. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of a durable paint film. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
9. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of a durable paint film. Do not paint over labels of independent testing agencies or equipment name, identification, performance rating, or nomenclature plates.
10. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or surface imperfections. Cut in sharp lines and color breaks.
11. Finish exterior doors on tops, bottoms, and side edges the same as exterior faces.
12. Provide finish coats compatible with primers used.
13. Sand lightly between each succeeding enamel or varnish coat.

B. Items not to Receive Paint: Do not paint prefinished items, concealed surfaces, finished metal surfaces, operating parts, and labels.

C. Applicators:

1. Apply paints and coatings by brush, roller, spray, or applicators recommended by manufacturer:
   a. Brushes: Use brushes best suited for type of material applied. Use brush of appropriate size for surface or item being painted.
   b. Rollers: Use rollers of carpet, velvet back, or high-pile sheep's wool recommended by manufacturer for material and texture required.
   c. Spray Equipment: Use airless spray equipment with orifice size recommended by manufacturer for material and texture required.

D. Minimum Coating Thickness:
   1. Apply paint materials no thinner than manufacturer's recommended spreading rate to achieve dry film thickness indicated. Provide total dry film thickness of the entire system as recommended by manufacturer:
      a. Measure film thickness on magnetic surfaces by use of Elcometer thickness gauge and on nonmagnetic surfaces by pit gauge or Tooke Gauge.

E. Application:
   1. Apply first coat to surfaces that have been cleaned, pretreated, or prepared for painting as soon as practicable after preparation and before subsequent surface deterioration:
      a. The number of coats and film thickness required are the same regardless of application method. Do not apply succeeding coats until previous coat has cured as recommended by manufacturer.
      b. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished after removing rust and scale and priming or touching up surface sand if acceptable to topcoat manufacturers.
      c. If undercoats, stains, or conditions show through final coat of paint, apply additional coats until paint film is of uniform finish, color, and appearance. Give special attention to ensure edges, corners, crevices, welds, and exposed fasteners receive dry film thickness equivalent to that of flat surfaces.
      d. Allow sufficient time between successive coats to permit proper drying. Do not recoat surfaces until paint has dried and cured to where it feels firm and does not deform or feel sticky under moderate thumb pressure, and until application of another coat of paint does not cause undercoat to lift or lose adhesion.

F. Mechanical and Electrical Work:
   1. Painting of mechanical and electrical work is limited to items exposed in equipment rooms and occupied spaces:
      a. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.
      b. Prime and paint uninsulated and exposed pipes, conduit, boxes, insulated and exposed ducts, hangers, brackets, collars and supports, heat exchangers, tanks, ductwork, conduit, switchgear, and paintable insulation except where items are prefinished.
      c. Paint interior surfaces of air ducts, and convector and baseboard heating cabinets visible through grilles and louvers with one coat of flat black paint, to visible surfaces. Paint dampers exposed behind louvers, grilles, and convector and baseboard cabinets to match face panels.
      d. Paint both sides and edges of plywood backboards for electrical and telephone equipment before installing equipment.
      e. Color code equipment, piping, conduit, and exposed duct work in accordance with requirements indicated. Color band and identify with flow arrows, names, and numbering.
      f. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

g. Concealed Members: Wherever steel and metal parts to receive paint are built into and concealed by construction, paint as specified for exposed parts so finish painting is complete before members are concealed.

G. Fire Suppression, Plumbing, HVAC, Electrical, Communication, and Electronic Safety and Security Work:
1. Painting is limited to items exposed in equipment rooms and occupied spaces:
   a. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.
   b. Prime and paint uninsulated and exposed pipes, conduit, boxes, insulated and exposed ducts, hangers, brackets, collars and supports, heat exchangers, tanks, ductwork, conduit, switchgear, and paintable insulation except where items are prefinished.
   c. Paint interior surfaces of air ducts, and convector and baseboard heating cabinets visible through grilles and louvers with one coat of flat black paint, to visible surfaces. Paint dampers exposed behind louvers, grilles, and convector and baseboard cabinets to match face panels.
   d. Paint both sides and edges of plywood backboards for electrical and telephone equipment before installing equipment.
   e. Color code equipment, piping, conduit, and exposed duct work in accordance with requirements indicated. Color band and identify with flow arrows, names, and numbering.
   f. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

H. Block Fillers: Apply block fillers to concrete masonry block at rate to ensure complete coverage with pores filled.

I. Prime Coats: Before applying finish coats, apply prime coat, recommended by manufacturer, to material required to be painted or finished and that has not been prime coated by others. Recoat primed and sealed surfaces where evidence of suction spots or unsealed areas in first coat appears, to ensure a finish coat with no burn through or defects due to insufficient sealing.

J. Finish Coats:
1. Apply paints to produce surface films without cloudiness, spotting, holidays, laps, brush marks, roller tracking, runs, sags, ropiness, or other surface imperfections. Cut in sharp lines and color breaks. If undercoats or other conditions show through topcoat, apply additional coats until cured film has a uniform paint finish, color, and appearance without bleed through:
   a. Pigmented (Opaque) Finishes: Completely cover surfaces as necessary to provide a smooth, opaque surface of uniform finish, color, appearance, and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or surface imperfections is not acceptable.
   b. Transparent (Clear) Finishes: Use multiple coats to produce glass smooth surface film of even luster. Provide a finish free of laps, cloudiness, color irregularity, runs, brush marks, orange peel, nail holes, or other surface imperfections. Provide satin finish for final coats.

K. Completed Work: Match approved samples for color, texture, and coverage. Remove, refinish, or repaint work not complying with requirements.

L. Touch Up:
1. Touch up marred, scraped, and blemished areas of surfaces which were factory

primed or previously coated:

a. Prepare and touch up scratches, abrasions, and blemishes and remove foreign matter before proceeding with succeeding coats.
b. Touch up marred, scraped, and blemished areas of factory primed or previously coated surfaces.
c. Feather touch up coating overlapping minimum 2 inches onto adjacent unblemished areas producing smooth, uniform surface.
d. As soon after erection and installation as possible, touch up fasteners, welded surfaces and surroundings, field connections, and areas on which shop coat has been abraded or damaged with specified primer before corrosion and other damage occurs from exposure.

3.6 FIELD QUALITY CONTROL

A. Dry Film Thickness (DFT) Testing:
   1. Tests for dry film thickness may be determined by using a Tooke Scale and microgroover, an electronic scanner, or the Owner may engage the services of a qualified testing and inspecting agency to inspect and test paint for dry film thickness:
      a. Contractor shall touch up and restore painted surfaces damaged by testing.
      b. If test results show that dry film thickness of applied paint does not comply with paint manufacturer's written recommendations, Contractor shall pay for testing and apply additional coats as needed to provide dry film thickness that complies with paint manufacturer's written recommendations.

3.7 CLEANING AND PROTECTION

A. It is of the upmost important to the AISD that the sites remain in a safe, clean, and well-maintained condition. At the end of each day, leave the site ready to use by staff and students. Protect staff and students and the learning environment throughout the work.

B. Cleanup: At the end of each day, remove empty cans, rags, rubbish, and discarded paint materials from site. After completion of painting work, clean glass and paint spattered surfaces. Remove spattered paint by washing and scraping without scratching or damaging adjacent finished surfaces.

C. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

D. Provide *Wet Paint* signs to protect newly painted finishes. After completing painting operations, remove temporary protective wrappings provided by others to protect their work. After related work is complete, touch up and restore damaged or defaced painted surfaces. Comply with procedures specified in PDCA P1.

E. At completion of painting activities, touch up and restore damaged or defaced painted surfaces.

F. Waste Management: Legally dispose of unused paint and paint containers in accordance with manufacturer’s recommendations and environmental regulations.

PART 4 SCHEDULES

A. The following is a schedule of typical painted items and does not specifically include every

item that is to receive paint but should establish type and quality of finish for all items normally included in a complete paint job:

1. Finish all surfaces in accordance with the following schedule. Catalog names and numbers refer to products as manufactured by the **VISTA PAINT CORPORATION**, Fullerton, California.
2. Interior Schedule (Premium Plus)

B. Gypsum Board Surfaces (Drywall) Acrylic Flat Finish:
   1. First Coat: 1100 Hi-Build PVA Sealer
   2. Second Coat: 8100 Carefree Acrylic Flat Finish
   3. Third Coat: 8100 Carefree Acrylic Flat Finish

C. Gypsum Board Surfaces (Drywall) Acrylic Low Sheen Finish:
   1. First Coat: 1100 Hi-Build PVA Sealer
   2. Second Coat: 8200 Carefree Velvasheen Acrylic Low Sheen
   3. Third Coat: 8200 Carefree Velvasheen Acrylic Low Sheen

D. Gypsum Board Surfaces (Drywall) 100% Acrylic Eggshell Finish:
   1. First Coat: 1100 Hi-Build PVA Sealer
   2. Second Coat: 8300 Carefree 100% Acrylic Eggshell Finish
   3. Third Coat: 8300 Carefree 100% Acrylic Eggshell Finish

E. Gypsum Board Surfaces (Drywall) 100% Acrylic Semi-Gloss Finish:
   1. First Coat: 1100 Hi-Build PVA Sealer
   2. Second Coat: 8400 Carefree 100% Acrylic Semi-Gloss Finish
   3. Third Coat: 8400 Carefree 100% Acrylic Semi-Gloss Finish

F. Concrete, Plaster, Masonry – Acrylic Flat Finish:
   1. First Coat: 4600 Uniprime II Acrylic Epoxy Primer
   2. Second Coat: 8100 Carefree Acrylic Flat Finish
   3. Third Coat: 8100 Carefree Acrylic Flat Finish

G. Concrete, Plaster, Masonry – Acrylic Low Sheen Finish:
   1. First Coat: 4600 Uniprime II Acrylic Epoxy Primer
   2. Second Coat: 8200 Carefree Velvasheen Acrylic Low Sheen Finish
   3. Third Coat: 8200 Carefree Velvasheen Acrylic Low Sheen Finish

H. Concrete, Plaster, Masonry – 100% Acrylic Eggshell Finish:
   1. First Coat: 4600 Uniprime II Acrylic Epoxy Primer
   2. Second Coat: 8300 Carefree 100%Acrylic Eggshell Finish
   3. Third Coat: 8300 Carefree 100%Acrylic Eggshell Finish

I. Concrete, Plaster, Masonry – 100% Acrylic Semi-Gloss Finish:
   1. First Coat: 4600 Uniprime II Acrylic Epoxy Primer
   2. Second Coat: 8400 Carefree 100%Acrylic Semi-Gloss Finish
   3. Third Coat: 8400 Carefree 100%Acrylic Semi-Gloss Finish

J. Concrete Masonry Unit (CMU) Acrylic Flat Finish:
   1. First Coat: 018 100% Acrylic Block Filler
   2. Second Coat: 8100 Carefree Acrylic Flat Finish
   3. Third Coat: 8100 Carefree Acrylic Flat Finish

K. Concrete Masonry Unit (CMU) Acrylic Low Sheen Finish:
   1. First Coat: 018 100% Acrylic Block Filler

2. Second Coat: 8100 Carefree Velvasheen Acrylic Low Sheen Finish
3. Third Coat: 8100 Carefree Velvasheen Acrylic Low Sheen Finish

L. Concrete Masonry Unit (CMU) 100% Acrylic Eggshell Finish:
1. First Coat: 018 100% Acrylic Block Filler
2. Second Coat: 8300 Carefree 100% Acrylic Eggshell Finish
3. Third Coat: 8300 Carefree 100% Acrylic Eggshell Finish

M. Concrete Masonry Unit (CMU) 100% Acrylic Semi-Gloss Finish:
1. First Coat: 018 100% Acrylic Block Filler
2. Second Coat: 8400 Carefree 100% Acrylic Semi-Gloss Finish
3. Third Coat: 8400 Carefree 100% Acrylic Semi-Gloss Finish

N. Wood – 100% Acrylic Eggshell Finish:
1. First Coat: 8000 Carefree Prime-Zall Universal Primer
2. Second Coat: 8300 Carefree 100% Acrylic Eggshell Finish
3. Third Coat: 8300 Carefree 100% Acrylic Eggshell Finish

O. Wood – 100% Acrylic Semi-Gloss Finish:
1. First Coat: 8000 Carefree Prime-Zall Universal Primer
2. Second Coat: 8400 Carefree 100% Acrylic Semi-Gloss Finish
3. Third Coat: 8400 Carefree 100% Acrylic Semi-Gloss Finish

P. Metal: Ferrous – Satin Enamel Finish:
1. First Coat: 9600 Protec Alkyd Emulsion Metal Primer
2. Second Coat: 9700 Protec Alkyd Emulsion Satin Enamel
3. Third Coat: 9700 Protec Alkyd Emulsion Satin Enamel

Q. Metal: Ferrous – Semi-Gloss Enamel Finish:
1. First Coat: 9600 Protec Alkyd Emulsion Metal Primer
2. Second Coat: 9800 Protec Alkyd Emulsion Semi-Gloss Enamel
3. Third Coat: 9800 Protec Alkyd Emulsion Semi-Gloss Enamel

R. Metal: Ferrous – Gloss Enamel Finish:
1. First Coat: 9600 Protec Alkyd Emulsion Metal Primer
2. Second Coat: 9900 Protec Alkyd Emulsion Gloss Enamel
3. Third Coat: 9900 Protec Alkyd Emulsion Gloss Enamel

S. Metal: Non-Ferrous (Galvanized) Satin Enamel Finish:
1. Pretreatment: Jasco Prep & Prime Vinyl Wash Agent
2. First Coat: 4800 Metal Pro Acrylic Metal Primer
3. Second Coat: 9700 Protec Alkyd Emulsion Satin Enamel
4. Third Coat: 9700 Protec Alkyd Emulsion Satin Enamel

T. Metal: Non-Ferrous (Galvanized) Semi-Gloss Enamel Finish:
1. Pretreatment: Jasco Prep & Prime Vinyl Wash Agent
2. First Coat: 4800 Metal Pro Acrylic Metal Primer
3. Second Coat: 9800 Protec Alkyd Emulsion Semi-Gloss Enamel
4. Third Coat: 9800 Protec Alkyd Emulsion Semi-Gloss Enamel

U. Metal: Non-Ferrous (Galvanized) Gloss Enamel Finish:
1. Pretreatment: Jasco Prep & Prime Vinyl Wash Agent
2. First Coat: 4800 Metal Pro Acrylic Metal Primer
3. Second Coat: 9900 Protec Alkyd Emulsion Gloss Enamel

4. Third Coat: 9900 Protec Alkyd Emulsion Gloss Enamel

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