

PROJECT SPECIFICATIONS

ROOFING PROJECTS AT VARIOUS CAMPUSES

AT MATILIJA JUNIOR HIGH SCHOOL

(PROJ#-1608)

703 EL PASEO ROAD, OJAI, CA 93023

AT MEINERS OAKS ELEMENTARY SCHOOL

(PROJ#-1110)

400 S LOMITA AVE, OJAI, CA 93023

AT MIRA MONTE ELEMENTARY SCHOOL

(PROJ#-1205)

1216 LOMA DR, OJAI, CA 93023

AT NORDHOFF HIGH SCHOOL

(PROJ#-1713)

1401 MARICOPA HWY, OJAI, CA 93023

AT TOPA TOPA ELEMENTARY SCHOOL

(PROJ#-1507)

916 MOUNTAIN VIEW AVE, OJAI, CA 93023

OJAI UNIFIED SCHOOL DISTRICT

414 E OJAI AVE, OJAI, CA 93023

Prepared By

RNT Architects
285 N Ventura Ave #102
Ventura, Ca 93001

January 10, 2019

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NOT USED

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NOT USED

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NOT USED

SECTION 011000 - SUMMARY OF WORK

PART 1 - GENERAL

1.1 SUMMARY OF THE WORK:

A. The Work under this Contract necessary for and incidental to the execution and completion of all Work indicated and inferred in the Contract Documents for the roofing replacements at the locations indicated in the summary of work below. **All roofing finished surfaces shall be California Code of Regulations (CCR) Title 24 compliant.**

B. Drawings and Specifications dated January 10, 2019, were prepared by:

ROESLING NAKAMURA TERADA ARCHITECTS, INC.
285 N Ventura Ave #102, Ventura, CA 93001

C. Summary of Work:

1. Matilija Junior High School (PROJ#-1608) 703 El Paseo Rd, Ojai, CA 93023
 - a. Restore Building C Roof – Built-up Roofing
 - b. Replace Building D Roof – Asphalt Shingles over Aqua Shield Underlayment
 - c. Restore Building F Roof – Built-up Roofing
2. Meiners Oaks Elementary School (PROJ#-1110) 400 S Lomita Ave, Ojai, CA 93023
 - a. Replace Building J Roof - SBS
 - b. Restore Building K3 Roof – Standing Seam Metal
3. Mira Monte Elementary School (PROJ#-1205) 1216 Loma Dr, Ojai, CA 93023
 - a. Replace Building D Roof - SBS
 - b. Replace Building E Roof - SBS
 - c. Restore Building J Roof – Standing Seam Metal
 - d. Replace Building Q Roof - SBS
4. Nordhoff High School (PROJ#-1713) 1401 Maricopa Hwy, Ojai, CA 93023
 - a. Replace Building F Roof - SBS
 - b. Replace Building G Roof - SBS
 - c. Replace Building H Roof - SBS
 - d. Replace Building I Roof - SBS
 - e. Replace Building J Roof - SBS
 - f. Restore Building Q Roof – Standing Seam Metal
5. Topa Topa Elementary School (PROJ#-1507) 916 Mountain View Ave, Ojai, CA 93023
 - a. Restore Building G Roof – Built-up Roofing

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6. Topa Topa Elementary School (PROJ#-1507) 916 Mountain View Ave, Ojai, CA 93023
 - a. Restore Building G Roof – Built-up Roofing

1.1 OCCUPATIONAL SAFETY AND HEALTH ACT REQUIREMENTS:

- A. During the entire construction period, it shall be the responsibility of the Contractor to maintain conditions at the Project site so as to meet in all respects the requirements of the Federal Occupational Safety and Health Administration (OSHA) and the California Occupational Safety and Health Administration (CAL-OSHA). These provisions shall cover the Contractor's employees and all other persons working upon or visiting the site. To this end, the Contractor shall inform himself and his representatives of Federal OSHA and California OSHA standards.
- B. Bid Documents are available online at the Ojai Unified School District's Website (<http://www.ojaiusd.org/Departments/Maintenance/Construction-Projects>)

1.2 COORDINATION REQUIREMENTS:

- A. It is the Contractor's responsibility to coordinate the Work so as to minimize conflicts and optimize efficiency.
- B. Coordinate scheduling, submittals, and Work of the various Sections of Specifications to assure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.

1.3 BUILDING SYSTEM COORDINATION:

- A. Notify Architect if conditions are uncovered which would prevent the completed construction from conforming to the requirements of the Work.
- B. Materials/Systems: As specified. Verify compatibility with District-wide standard systems.
- C. "NIC" construction is indicated and specified herein as an aid to the Contractor in scheduling the amount of time and materials necessary for the completion of the Contract.

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1.4 DISTRICT OCCUPANCY:

- A. The District will occupy the campus during the entire period of construction for certain administrative operations during the summer months. Cooperate with the District in all construction operations including the following to minimize conflict and to facilitate District usage.
- B. If and when it should be necessary for the Contractor to impact the day-to-day operations of District's functions in order to pursue the Work, the Contractor shall furnish at least 14 days notice to the District and coordinate the means and timing to avoid, minimize, or circumvent such impacts. The District reserves the right to assess and anticipate such impacts and the right to stop or postpone the Work until a mutually satisfactory time and means can be agreed upon. The Contractor shall include costs for delays caused by normal school operations and scheduled special events.

1.5 CONTRACTOR'S USE OF THE PREMISES:

- A. The Contractor shall limit his use of the premises for construction activities and for storage, to allow for District occupancy.
- B. The Contractor shall be responsible for the following:
 - 1. Coordinate the use of the premises under the direction of the District.
 - 2. Assume full responsibility for the protection and safekeeping of products under this Contract which are stored at the site.
 - 3. Move stored products that are under the Contractor's control, which interfere with operations of the District.
 - 4. Obtain and pay for the use of additional storage or construction areas needed for operations.

1.6 COORDINATION OTHER DISTRICT CONTRACTORS:

- A. The District may have separate contractors or vendors working on the site at the time of this project. The Contractor shall coordinate work activities to not interfere with other District work.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION (Not Applicable)

End of Section

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SECTION **012100** - ALLOWANCES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Allowances which the Contractor shall provide for designated construction activities in the Work and in his bid.
- B. Related Documents
 - 1. Section 012600: Modification procedures
 - 2. Section 012200: Unit Prices

1.2 DESCRIPTION OF REQUIREMENTS

- A. Definitions and Explanations: Certain requirements of the construction related to each allowance are indicated and specified. The allowance has been established instead of additional requirements for that construction, and further requirements thereof will be issued by Change Order.
- B. Contingency Allowance: Contingency allowance shall be used only as directed for District's purposes, and only by change orders which designate amounts to be charged to contingency allowance. Contractor's related costs are not included in the Contract sum (other than allowance itself) for construction so ordered to be charged to contingency allowance. The change orders will include costs and reasonable overhead/profit margins. At time of project closeout, unused amounts remaining in contingency allowance shall be credited to the District by change order.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 SCHEDULE OF ALLOWANCES

- A. **Allowance No. 1:** The Contractor shall include in the bid an allowance listed below for each specific project location for miscellaneous unforeseen conditions, including, but not limited to the replacement of existing plywood roof sheathing, wet insulation, and unsatisfactory framing:
 - 1. Matilija Junior High School (PROJ#-1608) Allowance: \$10,000
 - 2. Meiners Oaks Elementary School (PROJ#-1110) Allowance: \$10,000
 - 3. Mira Monte Elementary School (PROJ#-1205) Allowance: \$10,000
 - 4. Nordhoff High School (PROJ#-1712) Allowance: \$20,000
 - 5. Summit Elementary School (PROJ#-1308) Allowance: \$10,000

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6. Topa Topa Elementary School (PROJ#-1507) Allowance: \$10,000

End of Section

SECTION 012200 - UNIT PRICES

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for unit prices.
- B. Related Requirements:
 - 1. Section 012100 "Allowances" for procedures for using unit prices to adjust quantity allowances.

1.2 DEFINITIONS

- A. Unit price is an amount incorporated into the Agreement, applicable during the duration of the Work as a price per unit of measurement for materials, equipment, or services, or a portion of the Work, added to or deducted from the Contract Sum by appropriate modification, if the scope of Work or estimated quantities of Work required by the Contract Documents are increased or decreased.

1.3 PROCEDURES

- A. Unit prices include all necessary material, plus cost for delivery, installation, insurance, applicable taxes, overhead, and profit.
- B. Measurement and Payment: See individual Specification Sections for work that requires establishment of unit prices. Methods of measurement and payment for unit prices are specified in those Sections.
- C. Owner reserves the right to reject Contractor's measurement of work-in-place that involves use of established unit prices and to have this work measured, at Owner's expense, by an independent surveyor acceptable to Contractor.
- D. List of Unit Prices: A schedule of unit prices is included in Part 3. Specification Sections referenced in the schedule contain requirements for materials described under each unit price.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 SCHEDULE OF UNIT PRICES

A. **Unit Price No. 1** - Replace Sheathing:

1. Description: Removal of unsatisfactory plywood roof sheathing and replacement with sound sheathing according to Section 061600 "Sheathing."
2. Unit of Measurement: Square Foot.
3. Quantity Allowance: Coordinate unit price with allowance adjustment requirements in Section 012100 "Allowances."

B. **Unit Price No. 2** - Replace Framing:

1. Description: Removal of unsatisfactory dimensional wood roof framing and replacement with sound framing according to Section 061000 "Rough Carpentry."
2. Unit of Measurement: Board Foot.
3. Quantity Allowance: Coordinate unit price with allowance adjustment requirements in Section 012100 "Allowances."

C. **Unit Price No. 3** - Replace Wet Insulation:

1. Description: Removal of unsatisfactory wet insulation with dry insulation according to Section 070150.19 "Preparation for Reroofing."
2. Unit of Measurement: Square Foot.
3. Quantity Allowance: Allowance for removal of existing wet insulation, and replacement with new insulation, is specified under Section 012100 "Allowances."

END OF SECTION 012200

SECTION 012500 - PRODUCT OPTIONS AND SUBSTITUTIONS

1 GENERAL

1.1 SUMMARY

- A. Section Includes: Procedures for submittal of requests for substitution for materials.

1.2 GENERAL REQUIREMENTS

- A. Whenever in the specifications products are by reference standard, any product meeting the standards referenced may be used. Products or manufacturers which the specifying agency has previously investigated and found in compliance with the reference standards are listed for the Contractor's information only and are not meant to restrict use to these products only. Submit information on such products in accordance with Section 013300.
- B. Whenever in the specifications any material, article or process is indicated or specified by trade, patent or proprietary name or name of manufacturer such specification for material, article or process, unless marked "no substitution", shall be deemed to be followed by the words "or approved equal in accordance with Section 012500."
- C. Where more than one proprietary name is specified, the Contractor may provide any one of the materials or equipment specified that is most expensive. Use only one brand, kind of make of material or equipment for each specific purpose throughout the Work notwithstanding that similar materials or equipment of two or more manufacturers or producers may be specified for the same purpose.
- D. Submit a written request for proposed substitutions to the Architect not later than 10 days after date of "Notice to Proceed". Submit proposed substitutions relating to a particular subcontract or trade at one time on the Contractor's letterhead, listing proposed items for indicated or specified items, and stating amounts for all variations in costs. If the Architect accepts any proposed substitution, such acceptance will be set forth in a Change Order. No substitution will be considered after this 10 day period. Each request must specify the total variation in the product, materials, costs, etc.
1. No substitution will be considered during bidding period.
- E. Drawings have been detailed in compliance with the ICC Evaluation Report for material specified. If a proposed substitute material is accepted by the Architect, the Contractor will assume the responsibility for construction modifications and additional costs required by reason of this acceptance.
- F. Where materials or items of manufacturer are specified in groups and are made or furnished by one manufacturer, no substitution will be considered that is not made or furnished similarly by one manufacturer. Where the Contractor proposes to use a system of equipment other than that specified or detailed on the Drawings the substitution shall be proposed as a complete system.

1.3 REQUIREMENTS FOR SUBMITTING SUBSTITUTIONS:

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- A. Submit written request for each proposed substitution on form shown at the end of this Section. Provide data substantiating request as well as a "Certificate of Suitability" certifying that the proposed substitution is equal or better in all respects to that specified and that it will, in all respects perform the function for which it is intended. Include with request all required samples. Submit 7 copies of all written requests and data for proposed substitutions. If the proposed substitution requires that portion of the work be redesigned or removed in order to accommodate the substituted item, submit design and engineering calculations prepared by a design professional licensed in the State of California.
- B. Submit complete information to the Architect so that proper evaluation can be made. The burden of proof of equality of the substituted item shall be on the Contractor. Acceptance of such substitutions is entirely at the discretion of the Architect and the District. All materials or items of manufacturer, which the Contractor proposes to substitute for those specified, must be accepted by the Architect before they may be ordered. In reviewing the supporting data submitted for substitutions, the Architect will use for purposes of comparison all the characteristics of the specified material or equipment as they appear in the manufacturer's published data even though all the characteristics may not have been particularly mentioned in the Specifications. If more than two (2) submissions of supporting data are required, the cost of reviewing the additional supporting data shall be borne by the Contractor, and the District will deduct the costs from the Contract price.
- C. The Architect will issue to the Contractor a list setting forth those items for which substitutions are accepted. No substitution will be accepted for any materials or item of manufacture called for in the Contract Documents which is not of equal quality and utility and which does not possess equal design or color characteristics to those of the specified material or item. No acceptance is valid if all differences have not been fully identified at time of request.
- D. If, in the opinion of the Architect or the District, the proposed substitution is not equal or better in every respect to that so indicated or specified, or was not submitted for acceptance in the manner outlined above, the Contractor shall furnish the specified materials at no additional cost to the District.
- E. It shall be the responsibility of the Contractor, in proposing a substitution for any item herein specified, to inform all other trades, vendors, and subcontractors of effects said substitution will have upon their construction activities or products. Failure to so notify shall require that the Contractor make all payments arising from alterations in specified materials or methods necessary to complete the Work in an approved and acceptable manner. If any substitution is approved and later determined not be an equal due to failure of Contractor to identify differences, the original specified item shall be installed.
- F. Any substitution approved, that affects any other part of the work and creates cost impact, shall be paid for by the Contractor.

2 PRODUCTS (Not Applicable)

3 EXECUTION (Not Applicable)

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SUBSTITUTION REQUEST FORM

Re: _____
Project Name

Project Manual Section Number

Item

To: _____
Architect

From: _____
General Contractor

We hereby submit for your consideration the following product comparisons of the specified item and the proposed substitution:

A.	Comparison:	Specified Item	Substitution
1.	Product Name/Model	_____	_____
2.	Manufacturer	_____	_____
	Address	_____	_____
	Phone Number	_____	_____
3.	Product Cost	_____	_____
	Installation/Labor Cost	_____	_____
4.	Delivery Time	_____	_____
	Installation Time	_____	_____
5.	Product Characteristics	_____	_____
		_____	_____
		_____	_____
		_____	_____
		_____	_____
6.	Dimensions	_____	_____

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Effects _____

7. Guarantee/Warranty _____

8. ICC No. _____

9. UL Rating _____

B. Substantiating Data:

Attach manufacturer's literature for both specified item and substitution.

C. Samples:

Provide samples for both specified item and substitution, if applicable.

D. Similar Projects:

1. _____
Name Date

Address _____

2. _____
Name Date

Address _____

E. Maintenance Service/Parts:

_____ Name

_____ Address

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F. What Effect does this substitution have on applicable code requirements?

G. Change Data:

Attach complete information for changes to be made to drawings and project manual.

* * * * *

* Certification of equal performance and assumption of liability for equal performance.

* The Contractor shall agree to pay for costs involved in changing the building design; including engineering, drafting and detail cost caused by the proposed substitution.

Submitted by:

Signature	Name
Title	

Firm	Date
------	------

Address

City	State	Zip	Telephone
------	-------	-----	-----------

Remarks:

Signature must be by persons having authority to legally bind his firm to the above terms. Failure to provide legally binding signature will result in retraction of approval.

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For Use by District's Representative:

_____ Accepted _____ Not Accepted

District's Consultant:

By: _____

Date: _____

_____ Accepted _____ Not Accepted

School District:

By: _____

Date: _____

* * * * *

SECTION 012600 - MODIFICATION PROCEDURES

1 GENERAL

1.1 SUMMARY:

- A. Section Includes: Procedures for processing Change Orders.

1.2 CHANGE INITIATION PROCEDURES:

- A. The Contractor may initiate a change by submittal of a request to the Architect describing the proposed change with a statement of the reasons for the change and the effect on the Contract Sum and the Contract Time with full documentation.
- B. The Architect may issue a Price Modification Request (PMR), signed by the District, instructing the Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order. The directive will describe changes in the Work, and will designate method of determining changes in Contract Sum and/or Contract Time.
- C. The Architect may issue Supplemental Instructions for minor changes that will not affect Contract Sum or Contract Time. The Contractor shall sign and return the original copy of the form to the Architect.

1.3 CONTRACTOR'S PROPOSALS AND DOCUMENTATION:

- A. In response to each PMR issued by the Architect, submit an itemized quotation detailing all changes in Contract Sum and Contract Time. Upon request, the Contractor shall provide additional data, including the following, to support the quotation.
 - 1. Quantities of products, labor, and equipment.
 - 2. Taxes, insurance, and bonds.
 - 3. Overhead and profit.
 - 4. Justification for change in Contract Time.
 - 5. Credit for deletions from the Contract, similarly documented.
 - 6. Quotation shall include all components necessary, whether or not specifically described, to complete the work, such as, but is not limited to, cutting, patching and painting, additional power supply required for equipment, etc. By failing to provide quotation for component(s) of the work without prior notification to the District that additional quotation(s) to be furnished at a later date, the Contractor waives all claims for extra costs for such component(s) required to complete the work.

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- B. If additional costs necessitated by a Construction Change Directive are indicated to be paid on a time and materials basis, provide additional data, including the following, after completing the Change.
 - 1. Date and number of Change Authorization.
 - 2. Dates and times work was performed and by whom.
 - 3. Time records and wage rates paid.
 - 4. Invoices and receipts for products, equipment, and subcontracts.

1.4 EXECUTION OF CHANGE ORDERS:

- A. The Architect will issue Change Orders on AIA Form G701 for signatures of parties as provided in the Conditions of the Contract.
- B. On fixed price Change Orders, changes in Contract Sum and Contract Time will be based on the PMR and the Contractor's quotation as accepted by the District.
- C. On time and material Change Orders, changes in Contract Sum and Contract Time will be determined by the District and Architect from the Contractor's data.

1.5 CORRELATION OF CONTRACTOR SUBMITTALS:

- A. Promptly revise the Schedule of Values, and Application for Payment forms to record each authorized Change Order as a separate line item and adjust the Contract Sum as shown on the Change Order.
- B. Promptly revise Progress Schedules to reflect changes in Contract Time, revise subschedules to adjust times for other items of Work affected by the change and resubmit.
- C. Promptly enter changes on the Project Record Documents.

2 PRODUCTS (Not Applicable)

3 EXECUTION (Not Applicable)

END OF SECTION

SECTION 013100 - PROJECT MEETINGS

PART 1 GENERAL

1.1 SUMMARY:

A. Section Includes: Requirements for preconstruction meeting, progress meetings, preinstallation conferences, specially called meetings, and post-construction meeting.

1.2 CONTRACTOR'S RESPONSIBILITIES:

A. Prepare agenda for progress meeting and for preinstallation conferences, notify participants, and make physical arrangements for all meetings.

1.3 PRECONSTRUCTION MEETING:

A. After issuance of notice to proceed, a preconstruction meeting will be held at a time and location designated by the District.

B. Attendance: The meeting shall be chaired by the Architect and attended by the District's Inspector, District Representative, and his professional consultants as needed, the Contractor and his superintendent, all major subcontractors as requested to be present and other persons designated by the District.

C. Agenda: The agenda for the meeting shall include the following items as a minimum.

1. Discussion of the construction schedule including critical construction sequencing.
2. Designation of persons authorized to represent and sign documents for the District, Architect and Contractor, with examples of official signature of each.
3. Procedures and forms for processing submittals, field decisions, proposal requests, change orders, applications for payment, revised construction schedules, and establishment of proper lines of communication.
4. Procedures for maintaining record documents.
5. Contractor's use of premises including location of office, construction and storage areas, parking areas and routes for construction traffic.
6. Procedures for resolving interruptions of construction activities to accommodate the District's use of the site.
7. Temporary barricades, utilities, sanitary facilities, signs and other temporary facilities required.
8. Normal working hours and extended hours.

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9. Security procedures.
10. Housekeeping procedures.
11. Communication procedures between parties.
12. List names, addresses and telephone numbers of those persons authorized to act for the Contractor in emergencies.
13. Construction permit requirements, procedures and posting.
14. Testing laboratory or agency and testing procedures.
15. Establish schedule for progress meetings.
16. Other administrative items as appropriate.
17. Long lead items.

D. Architect will record and distribute minutes within five (5) days after the meeting.

1.4 PROGRESS MEETINGS:

A. Progress meetings shall be held at the dates and times scheduled at the preconstruction meeting unless changes are agreed to by all parties and appropriate notification of such changes has been given.

B. Attendance: The meeting shall be attended by the Architect, the Contractor's superintendent and project manager, the District's representatives, and the District's Inspector of Record. When requested by the District, the Architect or the Contractor, subcontractors, and the Architect's consultants shall also attend.

C. Agenda: The agenda for these meetings shall include, but not be limited to, the following items:

1. Review progress of construction since the previous meeting.
2. Discuss user's activities that will impact construction activities.
3. Discuss field observations, problems and conflicts.
4. Identify problems which impede planned progress and develop corrective measures as required to regain the projected schedule. Revise the construction schedule if necessary.
5. Plan progress during the next construction period.
6. Coordinate the progress of subcontractors.
7. Review changes proposed by the District for their effect on the construction schedule and completion time.

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8. Review Price Modification Requests (PMRs).
9. Review Pay Requests.
10. Review As-Built Documents.
11. Long lead items.

D. Architect will record and distribute minutes within two (2) days after the meeting.

1.5 PREINSTALLATION CONFERENCES:

A. Before beginning construction activities that require coordination with any other construction activity or process, a preinstallation conference will be held at a time designated by the Contractor.

B. Attendance: The meeting shall be attended by the District's Inspector, Testing Agency when required by the District's Inspector, the Contractor's superintendent, and the installers and manufacturer's representatives involved in or affected by the installation. Advise the Architect of scheduled conference dates and times.

C. Agenda: The conference shall:

1. Assure a clear understanding of the Drawings and Specifications.
2. Resolve possible conflicts and compatibility problems.
3. Establish coordination between all parties involved.
4. Assure a clear understanding of the shop drawing, manufacturer's installation recommendations and Contract Documents.
5. Establish acceptable requirements for substrates.

D. Contractor to record and distribute minutes.

1.6 SPECIAL MEETINGS:

A. Upon appropriate notice to other parties, special meetings may be called by the District, Architect or Contractor, at times agreed to by all parties involved.

1.7 POST-CONSTRUCTION CONFERENCE:

- A. A post-construction conference shall be held before final inspection of the Work to discuss and resolve all unsettled matters. Bonds and insurance to remain in force, and the other documents required to be submitted by the Contractor will be reviewed and all deficiencies determined. Schedules and procedures for the final inspection process and for the correction of defects and deficiencies shall be discussed and agreed.

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- B. Attendance: The meeting shall be attended by the Architect, the Contractor's superintendent and project manager, the District representatives, and the District's Inspector of Record. When requested by the District, the Architect or the Contractor, subcontractors and the Architect's consultants shall also attend.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

End of Section

SECTION 013110 - SCHEDULES AND REPORTS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes: Preparation and submission of progress schedule, periodical progress reports, submittal schedule, schedule of values, and periodic payment submittals.

B. Related Sections

1. General Conditions: Contract completion time.

1.2 CONSTRUCTION SCHEDULE

A. Immediately upon being awarded the Contract and before request for first partial payment, the Contractor shall prepare and submit to the District a construction progress schedule. Requests for partial payment will not be processed until progress schedule has been submitted and reviewed by the District and the Architect.

B. Prepare the construction progress schedule using computer generated network analysis system.

1. The graphic display shall be a standard network or arrow diagram capable of illustrating the required data. The graphic display system used shall be readily legible with a clear, consistent method for continuations and detail referencing. The critical path shall be clearly delineated on the display. When milestone dates are included in the Contract they shall be clearly indicated on the display.
2. Data shall be presented as a separate printout on paper or, where feasible, may be printed on the same sheet as the graphic display. Data shall be organized in a logical coherent display capable of periodic updating.
3. Data shall include verbal activity descriptions with a numerical ordering system cross referenced to the graphic display. Additionally, costs (broken down into separate materials and labor costs), duration, early start date, early finish date, late start date, late finish date, and float shall be detailed for each activity. A running total of the percent completion based on completed activity costs versus total contract cost shall be indicated. A system for indicating schedules versus actual activity dates and durations shall be provided.
4. The schedule shall be of sufficient detail to facilitate the Contractor's control of the job and to allow the District, District's Inspector and Architect, to readily follow progress for portions of the work.
5. The contractor shall also incorporate into the construction schedule a submittal sequence showing the dates for all the submittal of all required shop drawings, product data, samples, mock-ups, and long lead items.

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6. The contractor shall include concurrent work activities of other contractors working at the same area under separate Contract with the District. The schedule shall include proper interface and sequencing of such activities so work of both contracts can be completed within their required Contract Completion Time.
7. A schedule fragment is to be generated for any PMR for which a time extension is requested.

C. The Construction schedule shall be continuously updated and, redrawn and submitted simultaneously with the application for progress payments. Each revised schedule shall indicate the Work actually accomplished during the previous period and the schedule for completion of the remaining Work. Requests for monthly partial payment will not be processed until updated progress schedule has been submitted and approved.

D. A copy of the most recent updated Construction Schedule shall be posted in the Contractor's job office, and copies of out-of-date schedules shall be kept at the job office for perusal by the Architect and the District.

E. The Contractor is required to submit a recovery schedule at any time when the monthly update reflects more than ten (10) days of negative float time. This recovery schedule replaces the project schedule until the original milestones are recovered, or until it expires and a new recovery schedule is required.

1.3 SCHEDULE OF VALUES

A. Immediately upon being awarded the Contract, and before first request for partial payment, prepare and submit to the District and the Architect, a Schedule of Values allocated to the various portions of the Work.

B. Submit a subschedule for each separate phase of Work specified in Section 011000 "Summary of Work" at a minimum with the schedule shown by building and categories in excess of \$25,000.

C. The schedule shall list the installed value of the component parts of the Work in sufficient detail to serve as a basis for computing values for progress payments during construction. Follow the table of contents of this Project Manual as the format for listing component items. Also, list any items in excess of \$25,000. For each major line item, list subvalues of major products or operations under the item, where applicable.

D. No overhead and profit is to be loaded onto the costs of individual items.

E. For items on which progress payments will be requested for stored materials, break down the value into (1) the cost of the materials, delivered and unloaded, with taxes paid, and (2) the total installed value. It is within the District's prerogative to pay for uninstalled materials on a case by case basis.

F. Submit a subschedule for each separate phase of Work specified in Section 011000 "Summary of Work" at a minimum plus any items of work exceeding \$25,000.

G. The sum of all values listed in the schedule shall equal the total Contract sum.

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1.4 PERIODIC ESTIMATE FOR PARTIAL PAYMENT

- A. Submit seven (3) original copies of each periodic pay request to the District's Inspector and Architect within the time limits set out in clause entitle "Payments - Periodic" of the General Conditions. Prepare the application on forms supplied by the District. Complete every entry provided for on the form including signature by authorized officer. Incomplete and or inaccurate applications will be returned without action. Entries shall match current data shown on the schedule of values and progress schedule. Listing shall include amounts of change orders issued prior to last day of the period of construction covered by the application. Pay request shall be notarized.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

End of Section

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SECTION 013300 - SUBMITTALS

PART 1 - GENERAL

1.1 SUMMARY :

- A. Description of Requirements: The types of submittal requirements specified in this Section include: Shop Drawings, product data, samples, catalog data, equipment and material lists, elementary diagrams, wiring diagrams, installation instructions, maintenance manuals and instructions, operation brochures and miscellaneous work-related submittals. Individual submittal requirements are specified in applicable sections for each unit of work. Refer to other Sections of the Specifications and other Contract Documents of this project of administrative submittals.
- B. Related Documents:
 - 1. Section 013110: Schedules and reports
 - 2. Section 012500: Product Options and Substitutions
 - 3. Section 017700: Closeout Procedures

1.2 DEFINITIONS: Work related submittals of this Section are categorized for convenience as follows:

- A. Shop Drawings: These include specially prepared technical data for this project, including drawings, diagrams, performance curves, data sheets, schedules, templates, reports, calculations, instructions, measurements and similar information not in standard printed form for general application to a range of similar projects.
- B. Product Data: These include standard printed information on materials, products and systems; not specially prepared for this project, other than the designation of selections from among available choices printed therein.
- C. Samples: These include both fabricated and unfabricated physical examples of materials, products and units of work; both as complete units and as smaller portions of units of work; either for limited visual inspection or (where indicated) for more detailed testing and analysis.
- D. Mock-Ups: These are a special form of samples, which are too large or otherwise inconvenient for handling in specified manner for transmittal of sample submittals.
- E. Long Lead Items: These include windows and doors, acoustical paneling and lighting fixtures. Submittals for each of these items shall be submitted to Architect within 10 days after Award of Contract, or Notice to Proceed, whichever is sooner.
- F. Miscellaneous Submittals: Related directly to the work (nonadministrative) include warranties, maintenance agreements, workmanship bonds, project photographs, survey data and reports,

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physical work records, quality testing and certifying reports, copies of industry standards, record drawings, field measurement data, operating and maintenance materials, overrun stock and similar information, devices and materials applicable to the work and not processed as Shop Drawings, product data or samples.

- G. As used herein, the term "manufactured" applies to standard units usually mass-produced; and "fabricated" means items specifically assembled or made out of selected materials to meet individual design requirements.

1.3 GENERAL SUBMITTAL PROCEDURES:

- A. Submit shop drawings, product data, and samples in accordance with the submittal schedule specified in Section 013100. Extension of Contract time will not be granted because of the Contractor's failure to make timely and complete submittals. If submittal of shop drawings does not generally adhere to the submittal schedule, the turn around time shall be appropriately adjusted. Do not purchase materials or equipment or begin construction activities covered by the required submittals until submittals have been reviewed and returned.
- B. Transmittal: Accompany each submittal with a dated, signed and sequence numbered transmittal. Include information required by this form including project identification, name and address of Contractor and of subcontractor or supplier, a list of items included in the submittal, and identification of drawing numbers, specification section and paragraph numbers to which the submittal pertains, and space for Contractor's review and approval stamp. The form must certify that the items submitted conform in every particular way to the item specified, including finish, assembly, materials, etc. Items without certification shall be submitted as a substitution accompanied by a substitution request form.
- C. Coordination: Submittals shall include a typewritten list showing each item and manufacturer for approval by the Contractor and review by the Architect and shall be submitted concurrently with all equipment which forms a system or subsystem that must be reviewed simultaneously because of coordination requirements. These submittals shall be corrected by the Contractor to "as-built" conditions prior to the completion of the Project and turned over to the District.
- D. Check of Returned Submittals: Check the submittals returned for correction and ascertain if the corrections result in extra cost above that included under the Contract Documents, and give written notice within five (5) days if, in Contractor's opinion, such extra cost results from corrections. By failing to so notify or by starting any Work covered by a submittal, Contractor waives all claims for extra costs resulting from required corrections.
- E. Submittal Size and Identification: The size of submittal shall be suitable for intended purpose. Minimum size 8-1/2" x 11" drawn to an indicated scale and dimensioned in English (not metric) measurements. Callouts clear and legible. Each submittal shall indicate:
 - 1. Name and originating company or firm.
 - 2. Contractor's name.
 - 3. Subcontractor's and supplier's name.

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4. Preparation and revision dates.
5. Street sequence number.
6. Project title.
7. Description of each enclosure.
8. Specification reference.
9. Reference to any prior actions on the submission.
10. Full identification of materials called out.
11. Statements of reason for any proposed change, proposed adjustment in price and contract time when shop drawings show variations from Contract requirements.
12. Contractor's review and approval stamp for compliance with Contract Documents.
13. Highlight any deviation from plans and specifications.

1.4 SHOP DRAWINGS AND PRODUCT DATA :

- A. Shop Drawings: The term "Shop Drawings" as used herein includes fabrication and installation, layout, and setting drawings; wiring and control diagrams; and other drawings, diagrams, schedules and data specially prepared for the Work by the Contractor, or a subcontractor, sub-subcontractor, manufacturer, supplier, or distributor to illustrate some portion of the Work.
1. Check and verify all field measurements and submit for review, with such promptness as to cause no delay to the Work or that of any other contractor or subcontractor, all shop or setting drawings and schedules required for the construction activities of the various trades. Shop Drawings shall be prepared at the Contractor's expense and shall be sent to the Architect, carriage prepaid. No draw or payments will be made based on submittals and their reviews.
 2. Drawings shall show all information required by the applicable technical section and shall be in sufficient detail as may be required to show that fabricated materials, equipment or systems, and the positions thereof conform to the Contract Documents. Any deviations from Contract requirements must be noted in writing, with justification.
 3. Shop Drawings shall establish the actual detail of fabricated items, indicate proper relation of adjoining construction, amplify design details of mechanical and electrical equipment in proper relation to physical spaces in the structure, and incorporate minor changes of design or construction to suit actual conditions. Changes shall be noted to direct designer's attention to them. Shop Drawings shall be drawn to scale and shall be completely

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dimensioned. Copies of Contract Documents or xerox portions of Contract Documents shall not be used as Shop Drawings and shall be rejected.

- B. Product Data: The term "product data" as used herein includes manufacturer's standard drawings, certificates of conformance to each and every detail of the specified item, substantiating calculations, schedules, performance charts, instructions, brochures, diagrams, and other data furnished by the Contractor to illustrate materials or equipment for some portion of the Work.
 - 1. The data shall include all information required by the applicable technical section and shall be in sufficient detail to show that manufactured materials and equipment conform to the Contract Documents.
 - 2. Catalog Cuts: Clearly mark each copy to indicate the product or model as well as optional sizes, finishes or other features proposed for use. Delete inapplicable data or clearly marked "NOT APPLICABLE". Identify any inconsistent details to those specified.
 - 3. Submittal Preparation: Bind product data with sturdy, labeled covers with an index listing the contents. Loose unbound submittals will be returned without review. Submit three (3) copies of all product data.
- 1.5 SAMPLES: Unless otherwise specified, samples to be standard commercial samples designed to show all qualities specified.
- A. Furnish for review samples of the various materials, together with the finish thereon, as specified for and intended to be used on or in the Work. Samples shall be sent to the office of the Architect, carriage prepaid.
 - B. Submit samples to the Architect for distribution and review before purchasing, fabricating, applying, or installing such materials and finishes. The Architect will review and take action on samples within 20 working days of the Contractor's submittal. All actions by the Architect will be in writing.
 - C. Submit three (3) copies of samples, other than field samples. A standard transmittal copy, attached at end of this section, shall accompany the sample per Paragraph 1.3E, and shall list all items being transmitted, designating their particular usage and location in the Work and shall be identified as to manufacturer, trade name, style, model. One approved sample will be returned to the Contractor.
 - D. Approval of a sample shall not be taken in itself to change or modify any contract requirement. Materials, finishes, and workmanship in the completed building shall be equal in every respect to that of the approved sample.
 - E. Unless otherwise specified, samples shall be 8" by 10" in size and shall be limited in thickness to a minimum consistent with sample analysis. In lieu thereof, the actual full size item may be submitted.

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- F. Samples of value may be returned to the Contractor for use in the Work after review, analysis, comparison or testing as may be required by the Architect, provided that the location is recorded and the samples bear temporary identification as samples.
 - G. Field samples shall be prepared at the site by the Contractor as specified in the various sections of these Specifications. Affected finished construction shall not be commenced until the Architect has given written approval of the field samples.
- 1.6 MAINTENANCE AND OPERATING MANUALS: To be submitted for applicable products.
- 1.7 INSTALLATION INSTRUCTIONS:
- A. Installation instructions shall incorporate all information necessary to properly install materials and equipment. For equipment, include proper sizing and rough-in location of all utility or service connections, fusing or circuit breaker sizing, exhaust requirements, foundation requirements, vibration isolators and requirements for leveling, anchoring, adjusting, lubrication and similar preparation. Submit when products and materials are delivered to the site.
- 1.8 NON-REQUESTED SUBMITTALS:
- A. Submittals not required by the individual sections of the technical provisions or Architect, which are submitted, will be returned with no comment.
- 1.9 ARCHITECT'S ACTION:
- A. The Architect will review the submittals and will affix the Architect's initials or signature as follows:
 - 1. Submittals stamped "NO EXCEPTION TAKEN", require no further action and fabrication or construction may proceed. The Architect will return to the Contractor, the stamped transparency of Shop Drawings and two (2) stamped copies of brochures, schedules, materials lists, and other product data, except where required otherwise.
 - 2. Submittals stamped "MAKE CORRECTIONS NOTED", require no further action and fabrication or construction may proceed contingent upon all corrections being made as noted. Quantities returned will be as specified above for submittals stamped "NO EXCEPTION TAKEN".
 - 3. Submittals stamped "REJECTED" or "REVISE AND RESUBMIT", require the Contractor to resubmit them with reasonable promptness and no fabrication or construction may begin. The Architect will return to the Contractor; one (1) stamped transparency and one (1) marked copy of shop drawings and one (1) marked copy and three (3) unmarked copies, all stamped, of brochures, schedules, materials lists, and other product data.
 - B. Resubmittals: If first or subsequent submittal is stamped "REJECTED" or "REVISE AND RESUBMIT", corrective action shall be taken and resubmittal procedure shall be same as for first submittal. The Contractor shall direct specific attention in writing on resubmitted Shop Drawing to revisions other than the correction requested by the Architect on previous submittals.

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- C. Distribution Copies: In addition to prints required for his own use, the Contractor shall be responsible for obtaining required prints for, and for distribution to, the District's Inspector (two (2) copies), and all applicable subcontractors.
- D. The Architect will check and take action on such drawings and schedules only for conformance with the design concept of the Work and compliance with information given in the contract documents. When so directed by the Architect, the Contractor shall make corrections required.
 - 1. The Architect will review the Shop Drawings as originally submitted as well as the first resubmittal thereof at his own cost.
 - 2. If additional resubmittals beyond the first resubmittal are made or required for failure to address previous comments or when resubmittal is incomplete, the Contractor will be back charged by the District on behalf of the Architect, at an hourly rate of \$100 for additional time spent by the Architect of this additional process.
 - 3. For items submitted that marginally meet the specifications but should be rejected and were not submitted for consideration as an approved equal, the Contractor will be back-charged by the District on behalf of the architect at an hourly rate of \$100 for additional time spent by the Architect for this additional process.
 - 4. Substitutions will not be considered when they are indicated or implied on shop drawings, or product data submittals without a separate written request for the specific substitution, or when acceptance will require revision of the Contract Documents. Refer to Section 012500.
- E. The shop drawings, product data and supporting data shall be prepared by the Contractor or his suppliers and subcontractors, but shall be submitted as the instruments of the Contractor.
- F. **The Contractor shall check the drawings of his suppliers and subcontractors as well as its own drawings before submitting them.** In particular, the Contractor shall ascertain that the drawings meet all requirements of the Contract Drawings and Specifications and conform to the structural and space conditions. If such shop drawings show variations from Contract Documents, whether because of standard shop practice or other reasons, the Contractor shall clearly describe such variations including other changes required to correlate the construction in his letter of transmittal.
- G. Shop Drawings when submitted to the Architect for review shall be accompanied by a written statement signed by the Contractor, that the Shop Drawings have been checked by its Quality Control organization and found to be in accordance with the Contract Drawings and Specifications and that proper provision has been made to accommodate abutting construction. This statement may be in the form of an approval stamp bearing the Contractor's signature.
- H. Substantiating calculations, when specified, shall be prepared and signed by a registered Civil or Structural Engineer licensed in the State of California, employed by the Contractor.

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- I. The Architect's review of Shop Drawings will be general only and shall not relieve the Contractor from responsibility for errors of any sort, for deviations from Drawings or Specifications, or for conflict with the construction activities of others that may result from such deviations. Architect's review of a separate item does not indicate a review of an assembly in which the item functions.

1.10 CONTRACTOR RESPONSIBILITIES:

- A. Contractor shall thoroughly check all Shop Drawings, product data, and manufacturer's literature and all other submittals prior to submission for Architect's review.
- B. Contractor shall determine and verify field measurements, field construction criteria, catalog numbers and similar data and shall be responsible for conformance with specifications.
- C. Contractor shall notify Architect in writing, at time of submission, of any deviations in submittals from requirements of the Contract Documents.
- D. Contractor shall notify Architect of any discrepancies or conflicts in the Contract Documents immediately. Architect shall decide which item(s) is correct.
- E. Contractor will maintain a complete file of all project correspondence, meeting notes, submittals and deliver to District at conclusion of the project.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 GENERAL REQUIREMENTS: All submittals and resubmittals shall be accompanied by a transmittal letter per Paragraph 1.3B.

- A. Numbering: Serial number of submittal for the particular item, starting with No. 1 for initial submittal. Resubmittals shall be identified with initial submittal number followed by a lower case alphabetical letter continuing sequentially for each resubmittal for that particular item or submittal.
- B. Identification and Status: Submittals shall contain Contractor's stamp, initialed or signed, certifying to thorough checking of submittal, verification of products, field measurements, field construction criteria, and coordination of information within the submittal with requirements of the work and of Contract Documents.

3.1 QUANTITY:

- A. Shop drawings required by the technical provisions or called for by the Architect (including catalog data, brochures, etc.) shall be submitted as directed by the Architect. The number of copies and submittal address will be determined and announced at the pre-construction

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conference. Unless otherwise specified or directed, the following minimum quantities are required within thirty (30) days after award of Contract:

1. Documents: Six (6) prints or copies (two (2) copies for the District, two (2) copies for the General Contractor, one (1) copy for the Architect and one (1) copy for the Consultant).
2. Samples: Three (3) of each item (one each for District, Architect and General Contractor).
3. Manuals: Three (3) bound copies.
4. Blueline: Two (2) prints or copies and one (1) reproducible. Contractor shall make distribution copies from reproducible for the District's Inspector per paragraph 1.10C.

3.2 SUBMISSION PROCESS:

- A. Transmittal: Separate cover letters shall be prepared and transmitted with shop drawings for each related submission. This is required due to checking by various disciplines. Refer to Paragraph 1.3B.
- B. Stamp of Approval: Shop drawings shall have the Contractor's stamp of approval on each drawing signed and dated as evidence of the Contractor's check and coordination of the items submitted. Catalog cuts and brochures shall have items proposed for use marked for ready identification by reviewing personnel. Shop drawings that do not have the Contractor's stamp of approval, signature and date will be rejected.
- C. General: Distribution will be made as follows:
 1. When "No Exception Taken" or "Make Corrections Noted": Two (2) copies of brochures shall be retained by the Architect. Remaining copies to Contractor. "Make Corrections Noted" drawings need not be resubmitted.
 2. When "Rejected": Two (2) copies retained by the Architect. Remaining copies to the Contractor. Rejected items shall be resubmitted within 10 days of receipt by the Contractor of the rejection.
- D. Contractor: All submittals shall be thoroughly checked and approved by the Contractor prior to forwarding to the Architect for review. Stamp documents or otherwise indicate Contractor's approval and confirm approval in transmittal letter.
- E. Architect: Will review submittals upon receipt and take appropriate action and return to the Contractor. The Architect will stamp documents indicating limits of reviewing process if any.
- F. Rejected Submittals: Rejected submittals will be stamped "Rejected" and returned to the Contractor for action. Rejections, resubmittals and final approvals of shop drawings, materials, etc., will not be acceptable as a cause for delay under the contract COMPLETION TIME.
- G. Variation from Contract requirements proposed by the Contractor on the Shop Drawings which are acceptable to the Architect, will be authorized by change order.

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- H. Resubmittals: Rejected submittals submitted for the Contractor's approval and Architect's re-review shall be clearly marked "Rejected" or "Revise and Resubmit" with explanatory statement indicating steps taken to remedy the rejection. See paragraph "GENERAL REQUIREMENTS" above.

3.3 CLOSEOUT SUBMITTALS: Refer to Section 017700.

End of Section

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SECTION 013516 - ALTERATION PROJECT PROCEDURES

PART 1 GENERAL

1.1 SUMMARY:

- A. Section Includes: Cutting into existing construction to provide for the installation, performance, or inspection of other work and subsequent fitting and patching required to restore surfaces to their original condition.

1.2 PROJECT CONDITIONS:

- A. Existing Conditions: Protect existing finishes, landscaping, equipment and adjacent work which is scheduled to remain or reuse, from damage.

1.3 QUALITY ASSURANCE:

- A. Requirements for Structural Work: Do not cut, drill or penetrate and patch structural work in any manner that would result in a reduction of load carrying capacity or of load deflection ratio, without written authorization from the Architect.
- B. Operational and Safety Limitations: Do not alter or demolish operational elements or safety related components in a manner that would result in a reduction of their capacity to perform in the manner intended, including energy performance, or that would result in increased maintenance, or decreased operational life or decreased safety.
- C. Visual Requirements: Do not cut and patch work in a manner that would result in substantial visual evidence of such work. Remove and replace work judged by the Architect to be cut and patched in a visually unsatisfactory manner.

1.4 SEQUENCING/SCHEDULING:

- A. Before commencing any alteration or demolition work, submit for review and approval of the District, a schedule showing the commencement, the order and the completion dates for the various parts of the work.

1.5 SUBMITTALS:

- A. Procedural Proposal for Alteration and Demolition: Where prior approval of alteration and demolition is required, submit proposed procedures for this work well in advance of the time work will be performed, minimum of two weeks and request approval to proceed. Include the following information, as applicable, in the submittal:
 - 1. Describe nature of the work and how it is to be performed. Describe anticipated results of the work in terms of changes to existing work, including structural, operational and visual changes as well as other significant elements.

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2. List products to be used and firms that will perform work.
3. Give dates when work is expected to be performed per Paragraphs 1.3 and 1.4.
4. List utilities that will be disturbed or otherwise be affected by work, including those that will be relocated and those that will be out of service temporarily. Indicate how long utility service will be disrupted, per Paragraphs 1.3 and 1.4.
5. Approval by the Architect to proceed with alteration work does not waive the Architect's right to later require complete removal and replacement of work found to be altered in an unsatisfactory manner.

PART 2 PRODUCTS

2.1 MATERIALS:

- A. General: Except as otherwise indicated, or as directed by the Architect, use materials for cutting and patching that are identical to existing materials. If identical materials are not available, or cannot be used, use materials that match existing adjacent surfaces to the fullest extent possible with regard to visual effect. Use materials for cutting and patching that will result in equal or better performance characteristics.
- B. Products for Patching and Extending Work:
 1. New Materials: As specified in product Sections; match existing products and work for patching and extending work.
 2. Salvage sufficient quantities of cut or removed material to replace damaged work in existing construction when material is not readily obtainable on current market.
 3. Replacement Materials: Provide same products or types of construction as that in existing structure, as needed to patch, extend or match existing work. Contract Documents do not define products or standards or workmanship present in existing construction. Determine products by inspection and any necessary testing, and workmanship by use of the existing as a sample of comparison.

PART 3 EXECUTION

3.1 EXAMINATION:

- A. Before alteration, examine the surfaces to be altered, as-built drawings, and the conditions under which the work is to be performed. If unsafe or otherwise unsatisfactory conditions are encountered, notify the Architect and the District for approval of corrective action to be taken before proceeding with the work. Beginning of alteration Work means acceptance of existing conditions.

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- B. Before the start of alteration work, meet at the project site with all parties involved in such work, including mechanical and electrical trades. Review areas of potential interference and conflict between the various trades. Coordinate layout of the work and resolve potential conflicts before proceeding with the work.
- C. Verify that demolition is complete, and areas are ready for installation of new Work.
- D. Field Measurements: Verify dimensions before proceeding with the Work. Obtain field measurements for work required to be accurately fitted to other construction. Be responsible for the accuracy of such measurements and precise fitting and assembly of finished work.

3.2 PREPARATION:

- A. Temporary Support: To prevent failure provide temporary support of work to be cut.
- B. Protection: Protect other work during cutting and patching to prevent damage. Provide protection from adverse weather conditions for that part of the project that may be exposed during cutting and patching operations.
 - 1. Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas. Maintain all required exit routes of travel at all times.
- C. Take precautions not to cut existing pipe, conduit or duct serving the building, or buildings but scheduled to be relocated until provisions have been made to bypass them.
- D. Cut, move, or remove items as necessary for access to alteration work. Replace and restore at completion.
- E. Remove unsuitable material not marked for salvage, such as rotted wood and corroded metals. Replace materials as specified for finished Work.
- F. Remove debris and abandoned items from area and from concealed spaces.
- G. Prepare surface and/or removed surface finishes to provide for proper installation of new work and finishes.
- H. Make such explorations and probes as are necessary. Ascertain any required protective measures before proceeding with demolition and removal. Give particular attention to shoring and bracing requirements so as to prevent any damage to existing construction.
- I. Provide, erect and maintain barriers, erosion control, warning signs and other items as required for proper protection of the public, occupants of adjacent buildings, workmen engaged in demolition operations, and adjacent construction.
- J. Provide adequate fire protection in accordance with Ventura County Fire Department requirements.

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- K. Do not close or obstruct walkways, passageways or stairways. Do not store or place materials in passageways, stairs or other means of egress. Conduct operations with minimum traffic interference.

3.3 PERFORMANCE:

- A. General: Keep dust, debris, noise to levels acceptable to the District. Employ skilled workmen to perform alteration work. Except as otherwise indicated or as approved by the Architect, proceed with such work at the earliest feasible time and complete work without delay. Coordinate work at alterations to expedite completion, sequentially and to accommodate District occupancy.
 - 1. Demolition, removal and alteration work shall be as indicated and/or required to accommodate the new work. Do such work required with due care, including shoring, bracing, etc. Be responsible for any damage which may be caused by such work to any part or parts of existing site or items designated for reuse. Perform patching, restoration and new work in accordance with applicable technical sections of the Specifications.
 - 2. Materials or items designated to be reinstalled shall be as shown on the Drawings. Remove such items with care, under the supervision of the trade responsible for reinstallation; protect and store until required. Replace material or items damaged in its removal with similar new material.
 - 3. Execute the work in a careful and orderly manner, with the least possible disturbance to the public and to the occupants of the adjacent buildings.
 - 4. Where alternations occur, or new and old work join, cut, remove, patch, repair, or refinish the adjacent surfaces or so much thereof as is required by the involved conditions, and leave in as good a condition as existed prior to the commencing of the work. Alteration work shall be performed by the various respective trades which normally perform the particular items or work.
 - 5. Finish new and adjacent existing surfaces as specified for new work. Clean existing surfaces of dirt, grease, loose paint, etc.
- B. Cutting: Cut the work using methods that are least likely to damage work to be retained or adjoining work. Where possible review proposed procedures with the original installer; comply with original installer's recommendations.
- C. Patching: Patch with seams which are durable and as invisible as possible. Comply with specified tolerances for the work.
 - 1. Where feasible, inspect and test patched areas to demonstrate integrity of work.
 - 2. Restore exposed finishes of patched areas and where necessary extend finish restoration into retained adjoining work in a manner which will eliminate evidence of patching and refinishing.

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D. Transitions:

1. Where new Work abuts or aligns with existing, perform a smooth and even transition. Patch Work to match existing adjacent Work in texture and appearance.
2. When finished surfaces are cut so that a smooth transition with new work is not possible, terminate existing surface along a straight line at a natural line of division and provide jointing materials appropriate to the finished surface.

E. Adjustments:

1. Where a change of plane of 1/4 inch or more occurs, submit recommendations for providing a smooth transition for District's or Architect's review

F. Finishes:

1. Finish surfaces as specified elsewhere in this Specification.
2. Finish patches to produce uniform finish and texture over entire area. When finish cannot be matched, refinish entire surface to nearest intersections.

3.4 CLEANING

- A. Remove debris as the Work progresses. Maintain the premises in a neat and clean condition.
- B. At completion of work of each trade, clean area and make surfaces ready for work or successive trades.
- C. Thoroughly clean areas and spaces where work is performed or used as access to work. Remove completely paint, mortar, oils and items of similar nature. Thoroughly clean piping, conduit and similar features before painting or other finishing is applied. Restore damaged pipe covering to its original condition.
- D. At completion of alterations work in each area, provide final cleaning of new and existing finishes and equipments and return area to a condition suitable for use by the District.

End of Section

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SECTION 014200 - REFERENCES

PART 1 - GENERAL

1.1 DEFINITIONS

- A. General: Basic Contract definitions are included in the Conditions of the Contract.
- B. "Approved": When used to convey Architect's action on Contractor's submittals, applications, and requests, "approved" is limited to Architect's duties and responsibilities as stated in the Conditions of the Contract.
- C. "Directed": A command or instruction by Architect. Other terms including "requested," "authorized," "selected," "required," and "permitted" have the same meaning as "directed."
- D. "Indicated": Requirements expressed by graphic representations or in written form on Drawings, in Specifications, and in other Contract Documents. Other terms including "shown," "noted," "scheduled," and "specified" have the same meaning as "indicated."
- E. "Regulations": Laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, and rules, conventions, and agreements within the construction industry that control performance of the Work.
- F. "Furnish": Supply and deliver to Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
- G. "Install": Unload, temporarily store, unpack, assemble, erect, place, anchor, apply, work to dimension, finish, cure, protect, clean, and similar operations at Project site.
- H. "Provide": Furnish and install, complete and ready for the intended use.
- I. "Project Site": Space available for performing construction activities. The extent of Project site is shown on Drawings and may or may not be identical with the description of the land on which Project is to be built.

1.2 INDUSTRY STANDARDS

- A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.
- B. Publication Dates: Comply with standards in effect as of date of the Contract Documents unless otherwise indicated.

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- C. Copies of Standards: Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.
1. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.

1.3 ABBREVIATIONS AND ACRONYMS

- A. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated in Gale's "Encyclopedia of Associations: National Organizations of the U.S." or in Columbia Books' "National Trade & Professional Associations of the United States."
- B. Industry Organizations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list.
1. AABC - Associated Air Balance Council; www.aabc.com.
 2. AAMA - American Architectural Manufacturers Association; www.aamanet.org.
 3. AAPFCO - Association of American Plant Food Control Officials; www.aapfco.org.
 4. AASHTO - American Association of State Highway and Transportation Officials; www.transportation.org.
 5. AATCC - American Association of Textile Chemists and Colorists; www.aatcc.org.
 6. ABMA - American Bearing Manufacturers Association; www.americanbearings.org.
 7. ABMA - American Boiler Manufacturers Association; www.abma.com.
 8. ACI - American Concrete Institute; (Formerly: ACI International); www.concrete.org
 9. ACPA - American Concrete Pipe Association; www.concrete-pipe.org.
 10. AEIC - Association of Edison Illuminating Companies, Inc. (The); www.aeic.org.
 11. AF&PA - American Forest & Paper Association; www.afandpa.org.
 12. AGA - American Gas Association; www.aga.org.
 13. AHAM - Association of Home Appliance Manufacturers; www.aham.org.
 14. AHRI - Air-Conditioning, Heating, and Refrigeration Institute (The); www.ahrinet.org.
 15. AI - Asphalt Institute; www.asphaltinstitute.org.
 16. AIA - American Institute of Architects (The); www.aia.org.
 17. AISC - American Institute of Steel Construction; www.aisc.org.
 18. AISI - American Iron and Steel Institute; www.steel.org.
 19. AITC - American Institute of Timber Construction; www.aitc-glulam.org.
 20. AMCA - Air Movement and Control Association International, Inc.; www.amca.org.
 21. ANSI - American National Standards Institute; www.ansi.org.
 22. AOSA - Association of Official Seed Analysts, Inc.; www.aosaseed.com.
 23. APA - APA - The Engineered Wood Association; www.apawood.org.
 24. APA - Architectural Precast Association; www.archprecast.org.
 25. API - American Petroleum Institute; www.api.org.
 26. ARI - Air-Conditioning & Refrigeration Institute; (See AHRI).
 27. ARI - American Refrigeration Institute; (See AHRI).
 28. ARMA - Asphalt Roofing Manufacturers Association; www.asphaltroofing.org.
 29. ASCE - American Society of Civil Engineers; www.asce.org.
 30. ASCE/SEI - American Society of Civil Engineers/Structural Engineering Institute; (See ASCE).

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31. ASHRAE - American Society of Heating, Refrigerating and Air-Conditioning Engineers; www.ashrae.org.
32. ASME - ASME International; (American Society of Mechanical Engineers); www.asme.org.
33. ASSE - American Society of Safety Engineers (The); www.asse.org.
34. ASSE - American Society of Sanitary Engineering; www.asse-plumbing.org.
35. ASTM - ASTM International; www.astm.org.
36. ATIS - Alliance for Telecommunications Industry Solutions; www.atis.org.
37. AWEA - American Wind Energy Association; www.awea.org.
38. AWI - Architectural Woodwork Institute; www.awinet.org.
39. AWMAC - Architectural Woodwork Manufacturers Association of Canada; www.awmac.com.
40. AWPA - American Wood Protection Association; www.awpa.com.
41. AWS - American Welding Society; www.aws.org.
42. AWWA - American Water Works Association; www.awwa.org.
43. BHMA - Builders Hardware Manufacturers Association; www.buildershardware.com.
44. BIA - Brick Industry Association (The); www.gobrick.com.
45. BICSI - BICSI, Inc.; www.bicsi.org.
46. BIFMA - BIFMA International; (Business and Institutional Furniture Manufacturer's Association); www.bifma.org.
47. BISSC - Baking Industry Sanitation Standards Committee; www.bissc.org.
48. BWF - Badminton World Federation; (Formerly: International Badminton Federation); www.bissc.org.
49. CDA - Copper Development Association; www.copper.org.
50. CE - Conformance Europeenne; <http://ec.europa.eu/growth/single-market/ce-marking/>
51. CEA - Canadian Electricity Association; www.electricity.ca.
52. CEA - Consumer Electronics Association; www.ce.org.
53. CFFA - Chemical Fabrics and Film Association, Inc.; www.chemicalfabricsandfilm.com.
54. CFSEI - Cold-Formed Steel Engineers Institute; www.cfsei.org.
55. CGA - Compressed Gas Association; www.cganet.com.
56. CIMA - Cellulose Insulation Manufacturers Association; www.cellulose.org.
57. CISCA - Ceilings & Interior Systems Construction Association; www.cisca.org.
58. CISPI - Cast Iron Soil Pipe Institute; www.cispi.org.
59. CLFMI - Chain Link Fence Manufacturers Institute; www.chainlinkinfo.org.
60. CPA - Composite Panel Association; www.pbmdf.com.
61. CRI - Carpet and Rug Institute (The); www.carpet-rug.org.
62. CRRC - Cool Roof Rating Council; www.coolroofs.org.
63. CRSI - Concrete Reinforcing Steel Institute; www.crsi.org.
64. CSA - Canadian Standards Association; www.csa.ca.
65. CSA - CSA International; (Formerly: IAS - International Approval Services); www.csa-international.org.
66. CSI - Construction Specifications Institute (The); www.csinet.org.
67. CSSB - Cedar Shake & Shingle Bureau; www.cedarbureau.org.
68. CTI - Cooling Technology Institute; (Formerly: Cooling Tower Institute); www.cti.org.
69. CWC - Composite Wood Council; (See CPA).
70. DASMA - Door and Access Systems Manufacturers Association; www.dasma.com.
71. DHI - Door and Hardware Institute; www.dhi.org.
72. ECA - Electronic Components Association; (See ECIA).
73. ECAMA - Electronic Components Assemblies & Materials Association; (See ECIA).
74. ECIA - Electronic Components Industry Association; www.eciaonline.org.

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75. EIA - Electronic Industries Alliance; (See TIA).
76. EIMA - EIFS Industry Members Association; www.eima.com.
77. EJMA - Expansion Joint Manufacturers Association, Inc.; www.ejma.org.
78. ESD - ESD Association; (Electrostatic Discharge Association); www.esda.org.
79. ESTA - Entertainment Services and Technology Association; (See PLASA).
80. ETL - Intertek (See Intertek); www.intertek.com.
81. EVO - Efficiency Valuation Organization; www.evo-world.org.
82. FCI - Fluid Controls Institute; www.fluidcontrolsintstitute.org.
83. FIBA - Federation Internationale de Basketball; (The International Basketball Federation); www.fiba.com.
84. FIVB - Federation Internationale de Volleyball; (The International Volleyball Federation); www.fivb.org.
85. FM Approvals - FM Approvals LLC; www.fmglobal.com.
86. FM Global - FM Global; (Formerly: FMG - FM Global); www.fmglobal.com.
87. FRSA - Florida Roofing, Sheet Metal & Air Conditioning Contractors Association, Inc.; www.floridarooft.com.
88. FSA - Fluid Sealing Association; www.fluidsealing.com.
89. FSC - Forest Stewardship Council U.S.; www.fscus.org.
90. GA - Gypsum Association; www.gypsum.org.
91. GANA - Glass Association of North America; www.glasswebsite.com.
92. GS - Green Seal; www.greenseal.org.
93. HI - Hydraulic Institute; www.pumps.org.
94. HI/GAMA - Hydronics Institute/Gas Appliance Manufacturers Association; (See AHRI).
95. HMMA - Hollow Metal Manufacturers Association; (See NAAMM).
96. HPVA - Hardwood Plywood & Veneer Association; www.hpva.org.
97. HPW - H. P. White Laboratory, Inc.; www.hpwhite.com.
98. IAPSC - International Association of Professional Security Consultants; www.iapsc.org.
99. IAS - International Accreditation Service; www.iasonline.org.
100. IAS - International Approval Services; (See CSA).
101. ICBO - International Conference of Building Officials; (See ICC).
102. ICC - International Code Council; www.iccsafe.org.
103. ICEA - Insulated Cable Engineers Association, Inc.; www.icea.net.
104. ICPA - International Cast Polymer Alliance; www.icpa-hq.org.
105. ICRI - International Concrete Repair Institute, Inc.; www.icri.org.
106. IEC - International Electrotechnical Commission; www.iec.ch.
107. IEEE - Institute of Electrical and Electronics Engineers, Inc. (The); www.ieee.org.
108. IES - Illuminating Engineering Society; (Formerly: Illuminating Engineering Society of North America); www.ies.org.
109. IESNA - Illuminating Engineering Society of North America; (See IES).
110. IEST - Institute of Environmental Sciences and Technology; www.iest.org.
111. IGMA - Insulating Glass Manufacturers Alliance; www.igmaonline.org.
112. IGSHPA - International Ground Source Heat Pump Association; www.igshpa.okstate.edu.
113. ILI - Indiana Limestone Institute of America, Inc.; www.iliai.com.
114. Intertek - Intertek Group; (Formerly: ETL SEMCO; Intertek Testing Service NA); www.intertek.com.
115. ISA - International Society of Automation (The); (Formerly: Instrumentation, Systems, and Automation Society); www.isa.org.
116. ISAS - Instrumentation, Systems, and Automation Society (The); (See ISA).

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117. ISFA - International Surface Fabricators Association; (Formerly: International Solid Surface Fabricators Association); www.isfanow.org.
118. ISO - International Organization for Standardization; www.iso.org.
119. ISSFA - International Solid Surface Fabricators Association; (See ISFA).
120. ITU - International Telecommunication Union; www.itu.int/home.
121. KCMA - Kitchen Cabinet Manufacturers Association; www.kcma.org.
122. LMA - Laminating Materials Association; (See CPA).
123. LPI - Lightning Protection Institute; www.lightning.org.
124. MBMA - Metal Building Manufacturers Association; www.mbma.com.
125. MCA - Metal Construction Association; www.metalconstruction.org.
126. MFMA - Maple Flooring Manufacturers Association, Inc.; www.maplefloor.org.
127. MFMA - Metal Framing Manufacturers Association, Inc.; www.metalframingmfg.org.
128. MHIA - Material Handling Industry of America; www.mhia.org.
129. MIA - Marble Institute of America; www.marble-institute.com.
130. MMPA - Moulding & Millwork Producers Association; www.wmmpa.com.
131. MPI - Master Painters Institute; www.paintinfo.com.
132. MSS - Manufacturers Standardization Society of The Valve and Fittings Industry Inc.; www.mss-hq.org.
133. NAAMM - National Association of Architectural Metal Manufacturers; www.naamm.org.
134. NACE - NACE International; (National Association of Corrosion Engineers International); www.nace.org.
135. NADCA - National Air Duct Cleaners Association; www.nadca.com.
136. NAIMA - North American Insulation Manufacturers Association; www.naima.org.
137. NBGQA - National Building Granite Quarries Association, Inc.; www.nbgqa.com.
138. NBI - New Buildings Institute; www.newbuildings.org.
139. NCAA - National Collegiate Athletic Association (The); www.ncaa.org.
140. NCMA - National Concrete Masonry Association; www.ncma.org.
141. NEBB - National Environmental Balancing Bureau; www.nebb.org.
142. NECA - National Electrical Contractors Association; www.necanet.org.
143. NeLMA - Northeastern Lumber Manufacturers Association; www.nelma.org.
144. NEMA - National Electrical Manufacturers Association; www.nema.org.
145. NETA - InterNational Electrical Testing Association; www.netaworld.org.
146. NFHS - National Federation of State High School Associations; www.nfhs.org.
147. NFPA - National Fire Protection Association; www.nfpa.org.
148. NFPA - NFPA International; (See NFPA).
149. NFRC - National Fenestration Rating Council; www.nfrc.org.
150. NHLA - National Hardwood Lumber Association; www.nhla.com.
151. NLGA - National Lumber Grades Authority; www.nlga.org.
152. NOFMA - National Oak Flooring Manufacturers Association; (See NWFA).
153. NOMMA - National Ornamental & Miscellaneous Metals Association; www.nomma.org.
154. NRCA - National Roofing Contractors Association; www.nrca.net.
155. NRMCA - National Ready Mixed Concrete Association; www.nrmca.org.
156. NSF - NSF International; www.nsf.org.
157. NSPE - National Society of Professional Engineers; www.nspe.org.
158. NSSGA - National Stone, Sand & Gravel Association; www.nssga.org.
159. NTMA - National Terrazzo & Mosaic Association, Inc. (The); www.ntma.com.
160. NWFA - National Wood Flooring Association; www.nwfa.org.
161. PCI - Precast/Prestressed Concrete Institute; www.pci.org.
162. PDI - Plumbing & Drainage Institute; www.pdionline.org.

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163. PLASA - PLASA; (Formerly: ESTA - Entertainment Services and Technology Association); <http://www.plasa.org>.
164. RCSC - Research Council on Structural Connections; www.boltcouncil.org.
165. RFCI - Resilient Floor Covering Institute; www.rfci.com.
166. RIS - Redwood Inspection Service; www.redwoodinspection.com.
167. SAE - SAE International; www.sae.org.
168. SCTE - Society of Cable Telecommunications Engineers; www.scte.org.
169. SDI - Steel Deck Institute; www.sdi.org.
170. SDI - Steel Door Institute; www.steeldoor.org.
171. SEFA - Scientific Equipment and Furniture Association (The); www.sefalabs.com.
172. SEI/ASCE - Structural Engineering Institute/American Society of Civil Engineers; (See ASCE).
173. SIA - Security Industry Association; www.siaonline.org.
174. SJI - Steel Joist Institute; www.steeljoist.org.
175. SMA - Screen Manufacturers Association; www.smainfo.org.
176. SMACNA - Sheet Metal and Air Conditioning Contractors' National Association; www.smacna.org.
177. SMPTE - Society of Motion Picture and Television Engineers; www.smpte.org.
178. SPFA - Spray Polyurethane Foam Alliance; www.sprayfoam.org.
179. SPIB - Southern Pine Inspection Bureau; www.spib.org.
180. SPRI - Single Ply Roofing Industry; www.spri.org.
181. SRCC - Solar Rating & Certification Corporation; www.solar-rating.org.
182. SSINA - Specialty Steel Industry of North America; www.ssina.com.
183. SSPC - SSPC: The Society for Protective Coatings; www.sspc.org.
184. STI - Steel Tank Institute; www.steeltank.com.
185. SWI - Steel Window Institute; www.steelwindows.com.
186. SWPA - Submersible Wastewater Pump Association; www.swpa.org.
187. TCA - Tilt-Up Concrete Association; www.tilt-up.org.
188. TCNA - Tile Council of North America, Inc.; www.tileusa.com.
189. TEMA - Tubular Exchanger Manufacturers Association, Inc.; www.tema.org.
190. TIA - Telecommunications Industry Association (The); (Formerly: TIA/EIA - Telecommunications Industry Association/Electronic Industries Alliance); www.tiaonline.org.
191. TIA/EIA - Telecommunications Industry Association/Electronic Industries Alliance; (See TIA).
192. TMS - The Masonry Society; www.masonrysociety.org.
193. TPI - Truss Plate Institute; www.tpinst.org.
194. TPI - Turfgrass Producers International; www.turfgrassod.org.
195. TRI - Tile Roofing Institute; www.tilerroofing.org.
196. UL - Underwriters Laboratories Inc.; <http://www.ul.com>.
197. UNI - Uni-Bell PVC Pipe Association; www.uni-bell.org.
198. USAV - USA Volleyball; www.usavolleyball.org.
199. USGBC - U.S. Green Building Council; www.usgbc.org.
200. USITT - United States Institute for Theatre Technology, Inc.; www.usitt.org.
201. WASTEC - Waste Equipment Technology Association; www.wastec.org.
202. WCLIB - West Coast Lumber Inspection Bureau; www.wclib.org.
203. WCMA - Window Covering Manufacturers Association; www.wcmanet.org.
204. WDMA - Window & Door Manufacturers Association; www.wdma.com.
205. WI - Woodwork Institute; www.wicnet.org.
206. WSRCA - Western States Roofing Contractors Association; www.wsrca.com.

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207. WWPA - Western Wood Products Association; www.wwpa.org.

C. Code Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. This information is believed to be accurate as of the date of the Contract Documents.

1. DIN - Deutsches Institut fur Normung e.V.; www.din.de.
2. IAPMO - International Association of Plumbing and Mechanical Officials; www.iapmo.org.
3. ICC - International Code Council; www.iccsafe.org.
4. ICC-ES - ICC Evaluation Service, LLC; www.icc-es.org.

D. Federal Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. Information is subject to change and is up to date as of the date of the Contract Documents.

1. COE - Army Corps of Engineers; www.usace.army.mil.
2. CPSC - Consumer Product Safety Commission; www.cpsc.gov.
3. DOC - Department of Commerce; National Institute of Standards and Technology; www.nist.gov.
4. DOD - Department of Defense; www.quicksearch.dla.mil.
5. DOE - Department of Energy; www.energy.gov.
6. EPA - Environmental Protection Agency; www.epa.gov.
7. FAA - Federal Aviation Administration; www.faa.gov.
8. FG - Federal Government Publications; www.gpo.gov/fdsys.
9. GSA - General Services Administration; www.gsa.gov.
10. HUD - Department of Housing and Urban Development; www.hud.gov.
11. LBL - Lawrence Berkeley National Laboratory; Environmental Energy Technologies Division; www.eetd.lbl.gov.
12. OSHA - Occupational Safety & Health Administration; www.osha.gov.
13. SD - Department of State; www.state.gov.
14. TRB - Transportation Research Board; National Cooperative Highway Research Program; The National Academies; www.trb.org.
15. USDA - Department of Agriculture; Agriculture Research Service; U.S. Salinity Laboratory; www.ars.usda.gov.
16. USDA - Department of Agriculture; Rural Utilities Service; www.usda.gov.
17. USDOJ - Department of Justice; Office of Justice Programs; National Institute of Justice; www.ojp.usdoj.gov.
18. USP - U.S. Pharmacopeial Convention; www.usp.org.
19. USPS - United States Postal Service; www.usps.com.

E. Standards and Regulations: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the standards and regulations in the following list. This information is subject to change and is believed to be accurate as of the date of the Contract Documents.

1. CFR - Code of Federal Regulations; Available from Government Printing Office; www.gpo.gov/fdsys.
2. DOD - Department of Defense; Military Specifications and Standards; Available from DLA Document Services; www.quicksearch.dla.mil.

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3. DSCC - Defense Supply Center Columbus; (See FS).
4. FED-STD - Federal Standard; (See FS).
5. FS - Federal Specification; Available from DLA Document Services;
www.quicksearch.dla.mil.
 - a. Available from Defense Standardization Program; www.dsp.dla.mil.
 - b. Available from General Services Administration; www.gsa.gov.
 - c. Available from National Institute of Building Sciences/Whole Building Design Guide; www.wbdg.org/ccb.
6. MILSPEC - Military Specification and Standards; (See DOD).
7. USAB - United States Access Board; www.access-board.gov.
8. USATBCB - U.S. Architectural & Transportation Barriers Compliance Board; (See USAB).

F. State Government Agencies: Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities in the following list. This information is subject to change and is believed to be accurate as of the date of the Contract Documents.

1. CBHF; State of California; Department of Consumer Affairs; Bureau of Electronic and Appliance Repair, Home Furnishings and Thermal Insulation; www.bearhfti.ca.gov.
2. CCR; California Code of Regulations; Office of Administrative Law; California Title 24 Energy Code; www.calregs.com.
3. CDHS; California Department of Health Services; (See CDPH).
4. CDPH; California Department of Public Health; Indoor Air Quality Program; www.cal-iaq.org.
5. CPUC; California Public Utilities Commission; www.cpuc.ca.gov.
6. SCAQMD; South Coast Air Quality Management District; www.aqmd.gov.
7. TFS; Texas A&M Forest Service; Sustainable Forestry and Economic Development; www.txforestsERVICE.tamu.edu.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 014200

SECTION 015000 - CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

1 GENERAL

1.1 SUMMARY

- A. Section Includes: Temporary construction facilities and controls as required for proper performance of the Contract. Locate temporary facilities where directed and maintain in a safe and sanitary condition at all times until completion of the Contract.

1.2 REGULATORY REQUIREMENTS

- A. Comply with governing regulations and utility company regulations and recommendations.
- B. Comply with pollution and environmental protection regulations for use of water and energy, for discharge of wastes and storm drainage from Project Site, and for control of dust, air pollution and noise.
- C. Temporary construction shall conform to requirements of State, County, and local authorities and underwriters which pertain to operation, health, safety, and fire hazard. Furnish and install items necessary for conformance with such requirements, whether or not called for under the separate divisions of these specifications.

1.3 CONSTRUCTION FENCE AND STORAGE:

- A. Contractor will be responsible for all security controls on the project. Provide temporary fencing to secure Contractor's storage areas, trash bins and equipment.

2 PRODUCTS (Not Applicable)

3 EXECUTION

3.1 GENERAL REQUIREMENTS

- A. Provide all facilities and controls, of substantial construction, as required to serve intended purpose during full life of construction or for full extent of need during construction, and as approved by the Architect. Maintenance, operation, and control of all new or temporary electrical facilities put into operation before final acceptance of project shall be complete responsibility of Contractor until final acceptance.

3.2 TEMPORARY SANITARY FACILITIES

- A. Provide temporary sanitary conveniences for the use of employees and persons engaged on the Work, including subcontractors and their employees, as required by law, ordinances, or

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regulations of public authorities having jurisdiction. Use of permanent toilet facilities in the Work under construction will not be permitted.

- B. Maintain sanitary facilities in a clean and sanitary condition during the entire course of the Work. The facilities shall be removed, complete with contents upon completion of the project.

3.3 TEMPORARY ELECTRIC FACILITIES

- A. Provide and maintain during the progress of the Work all electrical lighting and power requirements to facilitate the Work of all trades and services connected with the Work. Provide adequate lighting levels to permit workmen to properly perform their construction activities and for detection of flaws in finishes. Provide extensions, lamps and outlets for requirements for single phase service.
- B. The District shall pay for the cost of electricity.
- C. Provide adequate artificial lighting for all areas of work when natural light is not adequate for work, and provide foot-candles of lighting as specified within the Specifications. In no case shall lighting be below thirty (30) foot-candles.
- D. Remove temporary wiring and equipment when no longer needed and dispose of equipment and wiring.

3.4 TEMPORARY WATER

- A. Make arrangements with School District for use of all water required for construction purposes. The District shall pay for the cost of water used. Furnish and install piping or hose to carry water for every point where needed on the project. Use only potable water.

3.5 CONSTRUCTION EQUIPMENT

- A. Erect, equip, and maintain construction equipment in strict accordance with applicable statutes, laws, ordinances, rules and regulations of authority having jurisdiction.
- B. Provide, maintain and remove upon completion of the Work all temporary rigging, scaffolding, hoisting equipment, rubbish chutes, ramps, stairs, runways, platforms, ladders, railings, and other temporary construction as required for all construction activities hereunder.
- C. Protect all existing pavements and plantings from damage due to trash bins, equipment and other temporary. Any damaged pavement or plantings shall be replaced at the Contractor's expense.

3.6 STORAGE

- A. Confine operations of the Contractor, including storage of salvage and, recycled materials, to areas approved. Contractor shall be liable for damage caused by him during such use of property of the District or other parties. Contractor shall save the District, its officers and

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agents, and the Architect and his employees free and harmless from liability of any nature or kind arising from any use, trespass, or damage occasioned by his operations on premises of third persons.

- B. Locate storage and motor vehicle parking area as directed by the District's Representative.
- 3.7 TEMPORARY JOB OFFICE: Not Required.
- 3.8 TEMPORARY TELEPHONE SERVICE
 - A. Use by Contractor of cellular phone is acceptable.
- 3.9 PORTABLE FIRE EXTINGUISHERS: Not Required.
- 3.10 SHORING, ANCHORING AND BRACING
 - A. Provide temporary shoring, anchoring and bracing required by the nature of the work in order to make all parts absolutely rigid and stable. The Contractor shall be responsible for any damage resulting from failure to provide either through lack of proper judgement or from any other cause.
 - B. REMOVAL AT COMPLETION
 - A. Upon completion of the Work, or prior thereto, when so directed by the Architect, remove all temporary facilities, structures and installation from the District's property. Coordinate the return of temporary fencing. Similarly, return exterior areas utilized for temporary facilities to substantially their original state, or when indicated on the Drawings, complete the areas as indicated or noted. Properly disinfect sanitary facilities and remove evidence from the site.

End of Section

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SECTION 016400 - OWNER FURNISHED PRODUCTS

1 GENERAL

1.1 SUMMARY

- A. DESCRIPTION: The Owner shall procure and provide certain products for installation as shown and specified per Contract Documents for projects listed below:
1. Matilija Junior High School (PROJ#2018-1608)
 2. Meiners Oaks Elementary School (PROJ#2018-1110)
 3. Mira Monte Elementary School (PROJ#2018-1205)
 4. Nordhoff High School (PROJ#2018-1712)
 5. San Antonio Elementary School (PROJ#2019-1308)
 6. Topa Topa Elementary School (PROJ#2018-1507)
- B. RELATED WORK SPECIFIED ELSEWHERE:
1. General: Products furnished and paid for by the Owner are described in the following technical sections and /or in the Drawings.
 2. DISTRICT SUPPLIED MATERIAL
Note that this project includes the installation of owner-supplied material; the District has acquired roofing material through the CMAS (California Multiple Award Schedules) program.

1.2 DEFINITIONS

- A. GENERAL: The following are used to identify products as noted on the Drawings.
- B. OWNER FURNISHED CONTRACTOR INSTALLED (O.F.C.I.): Products or equipment furnished by the Owner for installation under this contract.
- C. OWNER FURNISHED OWNER INSTALLED (O.F.O.I.): Products or equipment to be provided and installed by the Owner, but requiring surfacing, backing, utility connections or other preparation under this contract, for proper installation.
- D. NOT IN CONTRACT (N.I.C.): Products or equipment to be provided and installed by Owner, not requiring surfacing, backing, utility connections or other preparation under this contract.

2 PRODUCTS

2.1 PRODUCTS

- A. ROOFING MATERIAL FURNISHED BY OWNER (O.F.C.I.): District supplied material through the CMAS (California Multiple Award Schedules) program. Related specification sections include;

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1. Section 071326 Self-Adhering Sheet Waterproofing
2. Section 075216 - Styrene-Butadiene-Styrene (SBS) Modified Bituminous Membrane Roofing
3. Section 075630.1 Liquid Applied Roofing (Built-up Roofing)
4. Section 075630.2 Liquid Applied Roofing (Metal Roofing)

B. MATERIAL LIST

Listed in the Tables below is a list of district provided material. Any material or accessories required for the installation of the roof system in excess of the district provided material must be supplied by the Contractor. It is up to the Contractor to determine the precise amount of material required for the completion of this project; and to provide excess material, as required. The cost to handle and break flashing metal from the District provided flat stock is contractor's responsibility.

**TABLE 1. ROOFING MATERIAL OWNER FURNISHED CONTRACTOR INSTALLED (O.F.C.I)
MATILJA JUNIOR HIGH SCHOOL (PROJ#2018-1608 BUILDINGS C, D, F)**

Material	Product Name	Product Code	Quantity Supplied by District	Coverage
Primer	SA Primer	7630-5	5	See Data Sheet and Spec
Coating	White-Star	7840-5-U	30	See Data Sheet and Spec
Base Sheet	HPR SA FR Base	4114	34	See Data Sheet and Spec
Cap Sheet	Stressply SA FR Mineral	4125	50	See Data Sheet and Spec
Underlayment	HPR Aquashield	4131	8	See Data Sheet and Spec

**TABLE 2. ROOFING MATERIAL OWNER FURNISHED CONTRACTOR INSTALLED (O.F.C.I)
MEINERS OAKS ELEMENTARY SCHOOL (PROJ#2018-1110) BUILDINGS J, K3**

Material	Product Name	Product Code	Quantity Supplied by District	Coverage
Coating	White-Star	7840-5-U	18	See Data Sheet and Spec
Primer	SA Primer	7630-5	3	See Data Sheet and Spec
Base Sheet	HPR SA FR Base	4114	20	See Data Sheet

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				and Spec
Cap Sheet	Stressply SA FR Mineral	4125	30	See Data Sheet and Spec
Primer	RustGo Primer	1524-5UN	1	See Data Sheet and Spec
Metal Coating	White-Knight Plus WC	4125	7	See Data Sheet and Spec

TABLE 3. ROOFING MATERIAL OWNER FURNISHED CONTRACTOR INSTALLED (O.F.C.I)
MIRA MONTE ELEMENTARY SCHOOL (PROJ#2018-1205) BUILDINGS D, E, Q, J

Material	Product Name	Product Code	Quantity Supplied by District	Coverage
Primer	RustGo Primer	1524-5UN	2	See Data Sheet and Spec
Metal Coating	White-Knight Plus WC	7838-5-U	10	See Data Sheet and Spec
Coating	White-Star	7840-5-U	83	See Data Sheet and Spec
Primer	SA Primer	7630-5	28	See Data Sheet and Spec
Base Sheet	HPR SA FR Base	4114	92	See Data Sheet and Spec
Cap Sheet	Stressply SA FR Mineral	4125	137	See Data Sheet and Spec

TABLE 4. ROOFING MATERIAL OWNER FURNISHED CONTRACTOR INSTALLED (O.F.C.I)
NORDHOFF HIGH SCHOOL (PROJ#2018-1712) BUILDINGS F, G, H, I, J

Material	Product Name	Product Code	Quantity Supplied by District	Coverage
Coating	White-Star	7840-5-U	163	See Data Sheet and Spec
Primer	SA Primer	7630-5	45	See Data Sheet and Spec
Base Sheet	HPR SA FR Base	4114	181	See Data Sheet and Spec
Cap Sheet	Stressply SA FR Mineral	4125	271	See Data Sheet and Spec
Primer	RustGo Primer	1524-5UN	4	See Data Sheet and Spec

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Metal Coating	White-Knight Plus WC	7838-5-U	20	See Data Sheet and Spec
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TABLE 5. ROOFING MATERIAL OWNER FURNISHED CONTRACTOR INSTALLED (O.F.C.I)
SAN ANTONIO ELEMENTARY SCHOOL (PROJ# 2019-1308) BUILDINGS A, B, C

Material	Product Name	Product Code	Quantity Supplied by District	Coverage
Underlayment	HPR Aquashield	4131	80	See Data Sheet and Spec

TABLE 6. ROOFING MATERIAL OWNER FURNISHED CONTRACTOR INSTALLED (O.F.C.I)
TOPA TOPA ELEMENTARY SCHOOL (PROJ# 2018-1507) BUILDING G

Material	Product Name	Product Code	Quantity Supplied by District	Coverage
Coating	White-Star	7840-5-U	30	See Data Sheet and Spec
Primer	SA Primer	7630-5	10	See Data Sheet and Spec
Base Sheet	HPR SA FR Base	4114	34	See Data Sheet and Spec
Cap Sheet	Stressply SA FR Mineral	4125	50	See Data Sheet and Spec

3 EXECUTION

3.1 OWNER'S RESPONSIBILITIES

- A. SUBMITTALS: Arrange for and deliver necessary shop drawings, product data and samples to Contractor.
- B. DELIVERY:
 - 1. General: Arrange and pay for product delivery to site, in accordance with construction schedule.
 - 2. Bill of Materials: Deliver supplier's documentation to Contractor.

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3. Inspection: Inspect jointly with Contractor.
 4. Claims: Submit for transportation damage and replacement of otherwise damaged, defective, or missing items.
- C. GUARANTEES: Arrange for manufacturer's warranties, bonds, service, inspections, as required.

3.2 CONTRACTOR'S RESPONSIBILITIES

- A. SUBMITTALS: Review shop drawings, product data and samples and submit to Architect with notification of any discrepancies or problems anticipated in use of product.
- B. DELIVERY:
1. General: Designate delivery date for each product in Progress Schedule.
 2. Receiving: Receive and unload products at site. Handle products at site, including uncrating and storage.
 3. Inspection: Promptly inspect products jointly with Owner; record shortages, damaged or defective items.
 4. Storage: Protect products from damage or exposure to elements.
- C. INSTALLATION:
1. General: Assemble, install, connect, adjust and finish products, as stipulated in the respective section of Specifications.
 2. Repair and Replacement: Items damaged during handling and installation.

END OF SECTION

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SECTION 017400 - CLEANING

1 GENERAL

Conditions of the Contract and Division 1, as indicated, apply to this Section.

1.1 SUMMARY

- A. Section Includes: Cleanup during construction and final cleaning of the shelter and site before acceptance by the District as specified herein and in other sections when specified.

2 PRODUCTS

2.1 MATERIALS

- A. Use cleaning materials which will not create hazards to health or property and which will not damage materials. Use cleaning materials and methods recommended by the manufacturer of the surface material to be cleaned. Use cleaning materials only on surfaces recommended by the cleaning material manufacturer.

3 EXECUTION

3.1 CLEANUP DURING CONSTRUCTION

- A. It is required that the entire site be kept in a neat and orderly condition, and the District's Inspector or the Architect may, at any time during construction, order a general cleanup of the site as a part of the Work.
- B. Sort and collect recyclable materials and store such materials at designated locations. Remove to recycling center promptly. Do not accumulate materials such that they create environmental or fire hazard. Dispose of waste, trash, and debris in a safe, acceptable manner, in accordance with applicable laws and ordinances and as prescribed by authorities having jurisdiction. Bury no such waste material and debris on the site. Burning of trash and debris on the site will not be permitted.
- C. Location of legal disposal area for trash and debris and length of haul is the Contractor's responsibility.

3.2 FINAL CLEANING

- A. Before final inspection by the Architect and after all construction activity is essentially complete, thoroughly clean all surfaces, utilizing professional building cleaners. Items to be cleaned include, but are not limited to; windows, doors, trim, exposed nonferrous metal surfaces, light fixtures and plates, and all finish surfaces throughout the construction. Vacuum clean and

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remove all spots, smears, dust, debris, hand prints and defacements of every sort, including those of vandals. Follow the recommendations of the manufacturer of the materials and items to be cleaned for all cleaning.

3.3 FINAL SITE CLEANING

- A. Before final inspection, thoroughly clean the entire site and put it into a neat, acceptable condition. Remove from the entire site all construction waste and unused materials, dunnage, loose rock and stones, excess earth, roots, weeds, and all debris of any description resulting from the Work. Hose down and scrub where necessary all new concrete and asphalt pavement and walks dirtied as a result of the work. Thoroughly remove all paint droppings from concrete walks and other pavements.

End of Section

SECTION 017700 – CLOSEOUT PROCEDURES

1 GENERAL

Conditions of the Contract and Division 1, as indicated, apply to this Section.

1.1 SUMMARY:

- A. Section Includes: Activities and procedures for closing out the Contract and assisting in District's final inspection.
- B. Related Documents:
 - 1. Section 01500: Construction facilities and temporary controls
 - 2. Section 01710: Cleaning

1.2 REQUIREMENTS PREPARATORY TO FINAL INSPECTION: The required submittals shall be made before final payment.

- A. Remove temporary facilities from the site.
- B. Thoroughly clean the new construction and site, as directed by District's Inspector and Architect.
- C. Properly mount all operating instructions for equipment and post as specified in their respective sections.
- D. Job Record specifications and prints shall be completed, signed, and submitted to the Architect as specified herein.
- E. Submit to the Architect, the material and equipment maintenance instructions, as specified in the body of the Specifications.
- F. Submit to the Architect, all guarantees and warranties as specified in the General Conditions.
- G. When requested, submit certificates indicating payment of all debts and Claims arising from the Work.
- H. Deliver all tools which are a permanent part of equipment installed in the Work to the District's Inspector of Record.

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- I. Deliver all keys, construction and permanent, properly identified, to the District's Inspector of Record.
- J. Deliver spare parts and extra materials as specified within each individual technical Section Division 1 through 16. Destination as directed by District's Inspector of Record.
- K. General Contractor is to first prepare a detailed and documented "Punch List" of all aspects of the project and distribute to all sub-contractors for response and completion of work called for in the Punch List. A computerized program is recommended for computer sort of each sub-contractors work. Architect and sub-consultants shall review General Contractor's punch list and make modifications. General Contractor shall distribute such information to sub-contractors.

1.3 FINAL INSPECTION:

- A. After General Contractor has prepared "Punch List" and Sub-Contractor have completed Punch List work as called for all requirements preparatory to the final inspection have been completed as herein specified, notify the Architect and District's Inspector to perform the final inspection as required by Clause entitled "Final Inspection and Acceptance" of the General Conditions.

1.4 RECORD SPECIFICATIONS AND PRINTS:

- A. Maintain a set of Record Specifications and Prints as required by Clause entitled "Job Record Specifications and Prints" of the General Conditions. Deliver to District or Architect as directed.

1.5 OPERATION AND MAINTENANCE DATA SUBMITTAL:

- A. Submit to the District for approval, five (5) copies of complete operation and maintenance data as specified herein and in other sections of these specifications. Submit data a minimum of 30 days before completion of the Contract. The Contract will not be considered complete until this data has been reviewed by the District.
- B. Assemble all data required herein, except that to be mounted in frames, in three-ring loose-leaf binders, complete with index, index dividers, and permanently attached exterior label on cover.
- C. Data Required:
 - 1. Manufacturer's Manuals: Submit complete installation, operation, maintenance and service manuals, and printed instructions and parts lists for all materials and equipment where such printed matter is regularly available from the manufacturer. This includes, but is not limited to such service manuals as may be sold by the

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manufacturer covering the operation and maintenance of his items, and complete replacement parts lists sufficiently detailed for parts replacement ordering to manufacturer. Bound publications need not be assembled in binders. Manuals shall be in durable plastic binders approximately 8-1/2" x 11" in size and identifying on, or readable through, the front cover stating general nature of manual. Manual shall be typewritten with index at front. Manual shall furnish all emergency data regarding product or equipment, complete instructions regarding operations and maintenance, complete nomenclature of all replaceable parts, part numbers, and name and address of nearest vendor or part.

2. Project files as maintained for the District.

1.6 MANUFACTURERS' WARRANTIES:

- A. Deliver all manufacturers' warranties required by the Contract Documents, with District named as the beneficiary. In addition, for all equipment, or components thereof, bearing a manufacturers' warranty that extends for a longer time period than the Contractor's warranty, secure and deliver the manufacturers' warranties in the same manner.
- B. Form of Warranty: Submit written warranties, except manufacturers' standard printed warranties, on the Contractor's, subcontractor's, material suppliers', or manufacturer's own letterhead, addressed to the District. Submit all warranties in duplicate, and in the form shown on the following page, modified as approved to suit the conditions pertaining to the warranty.
- C. Submission of Warranties: Collect and assemble all written warranties into a bound booklet form, and deliver them to the Architect for final review and approval.

1.7 GUARANTEES:

- A. Description: Guarantees from Subcontractors shall not limit Contractor's warranties and guarantees to District. Whenever possible, the Contractor shall cause warranties of Subcontractors to be made directly with the District. If such warranties are made to Contractor, Contractor shall assign such warranties to the District prior to final payment.
- B. Form of Guarantee: Submit a written guarantee, typed on Contractor's letter head and in the form contained at the end of this Section, when required by a Specification Section.
- C. Submittal Requirements:
 - 1. Assemble guarantees, bonds, and services and maintenance contracts executed by each Subcontractor.

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2. Number of original signed copies required: Two (2) each.
3. Table of Contents: Neatly typed and in orderly sequence. Provide complete information for each item as follows:
 - a. Product or Work item.
 - b. Firm name, address, telephone number, and name of principal.
 - c. Scope.
 - d. Date of beginning of guarantees, bond, or service and maintenance contract.
 - e. Duration of guarantee, bond, or service and maintenance contract.
 - f. Provide information for the District.
 - (1) Correct procedure in case of failure.
 - (2) Circumstances which might affect the validity of guarantee or bond.
 - g. Contractor's name, address, telephone number; and name of responsible principal.

D. Form of Submittals:

1. Prepare in duplicate packets.
2. Format: Size 8-1/2" x 11" sheets punched for 3-ring binder. Fold larger sheets to fit into binders.
3. Cover: Identify each packet with type or printed title "Guarantees and Bonds".
List:
 - a. Title of Project
 - b. Name of Contractor
4. Binders: Commercial quality, 3-ring with durable and easily cleaned plastic covers.

E. Time of Submittals:

1. Prior to Final Completion.
2. For Work activities, other than those Work activities accepted, provide updated submittal prior to final Completion, listing the date of Final Completion as the start of the Guarantee to Repair Period.

F. Submittals Required:

1. Submit guarantees, bonds, and service and maintenance contracts specified in the individual technical Sections.

2 PRODUCTS (Not Applicable)

3 EXECUTION

3.1 GUARANTEES:

- A. Contractor shall guarantee all workmanship and materials for two (2) years, or as listed in individual Specification Sections, whichever is longer. The guarantee period shall be based on the date of completion of the work, as called out herein. After acceptance of the building, if during the guarantee period any defects or faulty materials are found, he shall immediately upon notification by the Architect, and/or District at his own expense, replace and repair them, together with any damage to finish, fixtures, equipment or furnishings due to defective work.

3.2 DELIVERY OF FINAL DATA: Final payment will not be authorized until the Contractor deliver the following:.

- A. Furnishes the Architect breakdown of final costs of job as adjusted by changes.
- B. Furnishes the District service manuals, operating instructions and guarantees as specified in Part 1 of this Section.
- C. Furnishes District with completed job record drawings and specifications of all trades provided in the Contract Documents. During the progress of the work, keep an accurate record, on a set of prints specifically designated for that purpose, of all deviations from the original plans and the location of all mechanical, plumbing and electrical work as actually installed. The furnishing of these record drawings to the Architect shall be dated and signed by the Contractor and appropriate subcontractor. Record drawings shall include all change orders and addenda.
 - 1. In closing out the project, the Contractor, through the District's Inspector, shall insure that the Architect is furnished with the completed "Job Record Prints" and Specifications.
 - 2. "Record" information concerning the locations and invert elevations of underground utility lines, junction boxes, bends, clean-outs, stub-outs, tie-ins, valves, etc., is of prime importance and shall be accurately located and clearly marked on record drawings.
 - 3. Changes listed in the addenda, change orders shall be furnished to the Architect on the job record prints and the Specifications marked with red ink.
 - 4. Changes made on "Job Record Prints" and Specifications shall be marked with a large asterisk (*) and a reference note stating which item in which addendum or

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change order (including date) initiated in the change. This note shall be shown adjacent to the change and shall be flagged accordingly. For example:

- See Change Order # 2, Item #4 6-30-99
- See Addendum #2, Item #4, 6-30-99

5. Changes in the Specification shall be marked with a large asterisk (*) and a reference note stating which item in which addendum or change order (including date) initiated in the change. This note shall be shown in the right margin viz: Add. #2, Item #4, 6-30-99
6. At each item in the addenda and change orders a reference note shall be made as to which sheet and/or which detail in the "Job Record Prints" and Specifications are affected and/or which section, page, and item in the specifications are affected, viz: "SHEET S-2, DETAIL B" or "SECTION #07600-1, ITEM 1.3 (c).

3.3 CORRECTION OF DEFECTIVE WORK: The Architect will issue instructions about necessary corrections of defective work appearing either during construction or after acceptance but prior to expiration of guarantee. Execution of such corrective measures shall be subject to Architect's approval.

- A. A sum amounting to 1.5 times the value of the incomplete or unsatisfactory work shall be withheld and shall become payable only after such work has been satisfactorily completed.
- B. The Architect's charges in connection with such corrective measures, including redesign, supervision and/or inspection, shall be backcharged by the District on behalf of the Architect. Provisions of this paragraph supplement the General Conditions, superseding other requirements in the Contract.

3.4 APPROVALS: Approval of the work in part or as a whole by the Architect shall not relieve the Contractor of responsibility for faulty materials or workmanship. Such approvals may be withdrawn at any time that subsequent examination reveals that apparently satisfactory work is, in fact, defective or otherwise fails to conform to all requirements of the Drawings and Specifications. Such work from which approval has been withdrawn shall be replaced and re-executed in accordance with the Contract at no expense to the District.

- A. After Contractor has completed work on his punchlist, a pre-final inspection will be made by the Architect upon written notification from the Contractor that all work under this Contract is complete. A list will be made of work determined to be unacceptable. Such work shall be corrected promptly and will be reinspected for final acceptance upon written notification by the Contractor. At the discretion of the Architect, final inspection and acceptance of certain items of work may be deferred if conditions beyond the control of the Contractor prevent conclusive determination that the conditions of the Contract have been fulfilled.

3.5 SUBSTANTIAL COMPLETION: The Architect will issue a Certificate of Substantial Completion when he is satisfied after each major sub-phase that is substantially complete. However, a punch list will be issued by the Architect, after pre-final inspection, together with the certificate of substantial completion, listing items to be satisfactorily and fully completed or corrected. The guarantee period for such punch list items shall not begin until the incomplete or unsatisfactory work has been concluded to the satisfaction of the Architect and thus certified.

- A. The failure to include any items on such list shall not alter the responsibility of the Contractor to complete all work in accordance with the Contract Documents.
- B. Should such unsatisfactory work not be adjusted within a reasonable time period, a sum equal to the cost to correct such inadequacies by others, as necessary, shall be withheld from the final payment.

3.6 MAINTENANCE AND OPERATION TRAINING:

- A. The Contractor shall hold training classes at times and dates, set by the District, to fully inform the end user on the proper care, repair, operation, and maintenance on all aspects of the new construction.

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(To be typed on Letterhead of Contractor responsible for Work to be guaranteed.)

GUARANTEE FOR

(Work)

We hereby guarantee that the _____ Work

performed for the construction of

_____ has been performed in accordance with the Drawings and Specifications and that the Work as installed will fulfill the requirements of the Guarantee included in the Specifications. We agree to repair or replace any or all of our Work, together with any adjacent Work which may be displaced by so doing, that may prove to be defective in its workmanship or materials within a period of _____ (____) year(s) from date of acceptance of the above named project by the San Dieguito Union High School District, without any expense whatsoever to the said District, ordinary wear and tear and unusual abuse or neglect excepted.

In the event of our failure to comply with the above mentioned conditions within thirty days after being notified in writing by the District, we collectively or separately do hereby authorize the District to proceed to have said defects repaired and made good at our expense and we will honor and pay the costs and charges therefrom upon demand.

Date: _____ Signed: _____
(Subcontractor)

(Supplier)

Date: _____ Signed: _____
(Contractor)

Local Representative to be contacted for services:

Name: _____ Phone No. _____

Address: _____

(Sample Form)

SECTION 061000 - ROUGH CARPENTRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Framing with dimension lumber.
 - 2. Rooftop equipment bases and support curbs.
 - 3. Wood furring, grounds, nailers, and blocking.
 - 4. Wood framing for drainage crickets.
 - 5. Plywood sheathing.

1.3 SUBMITTALS

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Wood treatment data as follows, including chemical treatment manufacturer's instructions for handling, storing, installing, and finishing treated materials:
 - 1. For each type of preservative-treated wood product, include certification by treating plant stating type of preservative solution and pressure process used, net amount of preservative retained, and compliance with applicable standards.
 - 2. For waterborne-treated products, include statement that moisture content of treated materials was reduced to levels indicated before shipment to Project site.
- C. Material test reports from a qualified independent testing agency indicating and interpreting test results relative to compliance of fire-retardant-treated wood products with requirements indicated.
- D. Warranty of chemical treatment manufacturer for each type of treatment.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Keep materials under cover and dry. Protect from weather and contact with damp or wet surfaces. Stack lumber, plywood, and other panels. Provide for air circulation within and around stacks and under temporary coverings.

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1. For lumber and plywood pressure treated with waterborne chemicals, place spacers between each bundle to provide air circulation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. Wood-Preservative-Treated Materials:
 - a. Baxter: J. H. Baxter Co.
 - b. Chemical Specialties, Inc.
 - c. Continental Wood Preservers, Inc.
 - d. Hickson Corp.
 - e. Hoover Treated Wood Products, Inc.
 - f. Osmose Wood Preserving, Inc.
Or approved equal.

2.2 LUMBER, GENERAL

- A. Lumber Standards: Comply with DOC PS 20, "American Softwood Lumber Standard," and with applicable grading rules of inspection agencies certified by ALSC's Board of Review.
- B. Inspection Agencies: Inspection agencies, and the abbreviations used to reference them, include the following:
 1. RIS - Redwood Inspection Service.
 2. WCLIB - West Coast Lumber Inspection Bureau.
 3. WWPA - Western Wood Products Association.
- C. Grade Stamps: Provide lumber with each piece factory marked with grade stamp of inspection agency evidencing compliance with grading rule requirements and identifying grading agency, grade, species, moisture content at time of surfacing, and mill.
 1. For exposed lumber, furnish pieces with grade stamps applied to ends or back of each piece, or omit grade stamps and provide grade-compliance certificates issued by inspection agency.
- D. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.
 1. Provide dressed lumber, S4S, unless otherwise indicated.

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2. Provide dry lumber with 19 percent maximum moisture content at time of dressing for 2-inch nominal thickness or less, unless otherwise indicated.

2.3 WOOD-PRESERVATIVE-TREATED MATERIALS

- A. General: Where lumber or plywood is indicated as preservative treated or is specified to be treated, comply with applicable requirements of AWPA C2 (lumber) and AWPA C9 (plywood). Mark each treated item with the Quality Mark Requirements of an inspection agency approved by ALSC's Board of Review.
- B. Pressure treat above ground items with waterborne preservatives to a minimum retention of 0.25 lb/cu. ft.. After treatment, kiln-dry lumber and plywood to a maximum moisture content of 19 and 15 percent, respectively. Treat indicated items and the following:
 1. Wood cants, wood member under parapet cap, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
 2. Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.
 3. Wood floor plates installed over concrete slabs directly in contact with earth.
- C. Complete fabrication of treated items before treatment, where possible. If cut after treatment, apply field treatment complying with AWPA M4 to cut surfaces. Inspect each piece of lumber or plywood after drying and discard damaged or defective pieces.

2.4 DIMENSION LUMBER

- A. General: Provide dimension lumber of grades indicated according to the ALSC National Grading Rule (NGR) provisions of the inspection agency indicated.
- B. Other Framing Not Listed Above: Provide the following grades and species:
 1. Grade: No. 1.
 2. Species: Douglas Fir Larch; WCLIB or WWPA.
- C. Exposed Framing: Provide material hand-selected from lumber of species and grade indicated below for uniformity of appearance and freedom from characteristics that would impair finish appearance.
 1. Species and Grade: As indicated above for load-bearing construction of same type.

2.5 TIMBERS

- A. For timbers of 5-inch nominal size and thicker, provide material complying with the following requirements:
 1. Species and Grade: Douglas fir-larch, Select Structural per WCLIB or WWPA rules.
 2. Additional Restriction: Free of heart centers.

2.6 MISCELLANEOUS LUMBER

- A. General: Provide lumber for support or attachment of other construction, including rooftop equipment curbs and support bases, cant strips, bucks, nailers, blocking, furring, grounds, strip-ping, and similar members.
- B. Moisture Content: 19 percent maximum for lumber items not specified to receive wood preservative treatment.
- C. Grade: For dimension lumber sizes, provide No. 2 grade per WCLIB or WWPA of Douglas Fir Larch.

2.7 WOOD-BASED STRUCTURAL-USE PANELS, GENERAL

- A. Structural-Use Panel Standard: Provide plywood panels complying with DOC PS 1, "U.S. Product Standard for Construction and Industrial Plywood."
- B. Trademark: Factory mark structural-use panels with APA trademark evidencing compliance with grade requirements.

2.8 PLYWOOD

- A. General: Where existing roof sheathing requires replacement; provide roof sheathing to match original material thickness.
 - 1. Refer to Section 061600 "Sheathing."

2.9 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this Article for material and manufacture.
 - 1. Where rough carpentry is exposed to weather, in ground contact, or in area of high relative humidity, provide fasteners with a hot-dip zinc coating per ASTM A 153 or of Type 304 stainless steel.
- B. Nails, Wire, Brads, and Staples: FS FF-N-105.
- C. Power-Driven Fasteners: CABO NER-272.
- D. Wood Screws: ASME B18.6.1.
- E. Lag Bolts: ASME B18.2.1.
- F. Bolts: Steel bolts complying with ASTM A 307, Grade A; with ASTM A 563 hex nuts and, where indicated, flat washers.

PART 3 - EXECUTION

3.1 DSA COMPLIANCE FOR WORK OF REPAIR

- A. For all work performed where replacement of materials originally installed under a Division of the State Architect (DSA) approved set of construction documents is required, that work shall be performed in a manner that replaces the existing condition or as indicated in the originally approved documents. Roof sheathing replacement will be paid for by adjusting the Contract Sum according to unit prices include in the Contract Documents.

3.2 INSTALLATION, GENERAL

- A. Discard units of material with defects that impair quality of rough carpentry and that are too small to use with minimum number of joints or optimum joint arrangement.
- B. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted.
- C. Fit rough carpentry to other construction; scribe and cope as required for accurate fit. Correlate location of furring, nailers, blocking, grounds, and similar supports to allow attachment of other construction.
- D. Apply field treatment complying with AWPA M4 to cut surfaces of preservative-treated lumber and plywood.
- E. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
 - 1. CABO NER-272 for power-driven staples, P-nails, and allied fasteners.
 - 2. Published requirements of metal framing anchor manufacturer.
 - 3. "Table 2304.9.1 Nailing Schedule" of the California Building Code.
- F. Use common wire nails, unless otherwise indicated. Use finishing nails for finish work. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood; predrill as required.
- G. Use hot-dip galvanized nails where rough carpentry is exposed to weather, in ground contact, or in area of high relative humidity.
- H. Countersink nail heads on exposed carpentry work and fill holes with wood filler.

3.3 WOOD GROUNDS, NAILERS, BLOCKING, AND SLEEPERS

- A. Install wood grounds, nailers, blocking, and sleepers where shown and where required for screeding or attaching other work. Form to shapes shown and cut as required for true line and level of attached work. Coordinate locations with other work involved.

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- B. Attach to substrates to support applied loading. Recess bolts and nuts flush with surfaces, unless otherwise indicated. Build into masonry during installation of masonry work. Where possible, anchor to formwork before concrete placement.
- C. Install permanent grounds of dressed, preservative-treated, key-beveled lumber not less than 1-1/2 inches wide and of thickness required to bring face of ground to exact thickness of finish material. Remove temporary grounds when no longer required.

3.4 WOOD FURRING

- A. Install plumb and level with closure strips at edges and openings. Shim with wood as required for tolerance of finish work.

3.5 WOOD FRAMING, GENERAL

- A. Framing Standard: Comply with AFPA's "Manual for Wood Frame Construction," unless otherwise indicated.
- B. Do not splice structural members between supports.

3.6 INSTALLATION OF STRUCTURAL-USE PANELS

- A. Fastening Methods: Fasten panels as indicated below:
 - 1. Sheathing: Nail to wood framing. Where plywood replaces existing roof sheathing, match existing nail size and spacing.
 - a. Space panels 1/8 inch at edges and ends.

END OF SECTION

SECTION 061600 - SHEATHING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Roof sheathing for repair.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product.

PART 2 - PRODUCTS

2.1 ROOF SHEATHING

- A. Plywood Sheathing: CDX sheathing.

2.2 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.
 - 1. For roof sheathing, provide fasteners with hot-dip zinc coating complying with ASTM A 153 or of Type 304 stainless steel.

2.3 MISCELLANEOUS MATERIALS

- A. Adhesives for Field Gluing Panels to Wood Framing: Formulation complying with ASTM D 3498 that is approved for use with type of construction panel indicated by manufacturers of both adhesives and panels.

PART 3 - EXECUTION

3.1 DSA COMPLAINTS FOR WORK OF REPAIR

- A. For all work performed where replacement of materials originally installed under a Division of the State Architect (DSA) approved set of construction documents is required, that work shall be performed in a manner that replaces the existing condition or as indicated in the originally approved documents.

3.2 INSTALLATION, GENERAL

- A. Do not use materials with defects that impair quality of sheathing or pieces that are too small to use with minimum number of joints or optimum joint arrangement. Arrange joints so that pieces do not span between fewer than three support members.
- B. Cut panels at penetrations, edges, and other obstructions of work; fit tightly against abutting construction unless otherwise indicated.
- C. Securely attach to substrate by fastening as indicated, complying with the following:
 - 1. ICC-ES evaluation report for fastener.
- D. Coordinate [roof sheathing installation with flashing and joint-sealant installation so these materials are installed in sequence and manner that prevent exterior moisture from passing through completed assembly.
- E. Do not bridge building expansion joints; cut and space edges of panels to match spacing of structural support elements.

3.3 WOOD STRUCTURAL PANEL INSTALLATION

- A. General: Comply with applicable recommendations in APA Form No. E30, "Engineered Wood Construction Guide," for types of structural-use panels and applications indicated.
- B. Fastening Methods: Fasten panels as indicated below:
 - 1. Roof Sheathing:
 - a. As indicated in the Division of the State Architect approved drawings.
 - b. Space panels 1/8 inch (3 mm) apart at edges and ends.

END OF SECTION 061600

SECTION 070150.19 - PREPARATION FOR REROOFING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Full tear-off of entire roof system.
2. Removal of flashings and counterflashings, gutters, leader head, and sheet metal downspout.

1.2 ALLOWANCES

- A. Allowance for removal of existing wet insulation, and replacement with new insulation, is specified under Section 012100 "Allowances."
- B. Allowance for removal of existing deteriorated wood roof deck, and replacement with new wood deck, is specified under Section 012100 "Allowances."
- C. Allowance for removal of existing deteriorated wood nailers and curbs, and replacement with new wood, is specified under Section 012100 "Allowances."

1.3 UNIT PRICES

A. Work of this Section is affected by:

1. Unit Price for removal of existing wet insulation, and replacement with new insulation, is bid in accordance with under Section 012200 "Unit Prices."
2. Unit Price for removal of existing deteriorated wood roof deck, and replacement with new wood deck, is bid in accordance with under Section 012200 "Unit Prices."
3. Unit Price for removal of existing deteriorated wood nailers and curbs, and replacement with new wood, is bid in accordance with under Section 012200 "Unit Prices."

1.4 PREINSTALLATION MEETINGS

- A. Preliminary Roofing Conference: Before starting removal Work, conduct conference at Project site.

1.5 INFORMATIONAL SUBMITTALS

- A. Photographs: Show existing conditions of adjoining construction and site improvements, including exterior and interior finish surfaces, that might be misconstrued as having been damaged by reroofing operations.

1. Submit before Work begins.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: Approved by warrantor of existing roofing system to work on existing roofing.

1.7 FIELD CONDITIONS

- A. Existing Roofing System: Built-up roofing (BUR).
- B. Owner will not occupy portions of building immediately below reroofing area.
- C. Protect building to be reroofed, adjacent buildings, walkways, site improvements, exterior plantings, and landscaping from damage or soiling from reroofing operations.
- D. Maintain access to existing walkways, corridors, and other adjacent occupied or used facilities.
- E. Conditions existing at time of inspection for bidding will be maintained by Owner as far as practical.
 1. Construction Drawings and Project Manual for existing roofing system are provided for Contractor's convenience and information, but they are not a warranty of existing conditions. They are intended to supplement rather than serve in lieu of Contractor's own investigations. Contractor is responsible for conclusions derived from existing documents.
- F. Limit construction loads on existing roof areas to remain, and existing roof areas scheduled to be reroofed.
- G. Weather Limitations: Proceed with reroofing preparation only when existing and forecasted weather conditions permit Work to proceed without water entering existing roofing system or building.

PART 2 - PRODUCTS

2.1 AUXILIARY REROOFING MATERIALS

- A. General: Use auxiliary reroofing preparation materials recommended by roofing system manufacturer for intended use and compatible with components of new roofing system.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Shut off rooftop utilities and service piping before beginning the Work.

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- B. Disconnect and move aside equipment from curbs to facilitate reroofing work. Protect equipment in secure location during demolition and reroofing operations.
- C. Remove and dispose of existing pool heating system. Cap water piping below roof sheathing.
- D. Coordinate with Owner to shut down air-intake equipment in the vicinity of the Work.
 - 1. Cover air-intake louvers before proceeding with reroofing work that could affect indoor air quality or activate smoke detectors in the ductwork.
- E. During removal operations, have sufficient and suitable materials on-site to facilitate rapid installation of temporary protection in the event of unexpected rain.
- F. Maintain roof drains in functioning condition to ensure roof drainage at end of each workday.
 - 1. Prevent debris from entering or blocking roof drains and conductors.
 - a. Use roof-drain plugs specifically designed for this purpose.
 - b. Remove roof-drain plugs at end of each workday, when no work is taking place, or when rain is forecast.
 - 2. If roof drains are temporarily blocked or unserviceable due to roofing system removal or partial installation of new roofing system, provide alternative drainage method to remove water and eliminate ponding.
 - a. Do not permit water to enter into or under existing roofing system components that are to remain.

3.2 ROOF TEAR-OFF

- A. Notify Owner each day of extent of roof tear-off proposed for that day.
- B. Lower removed roofing materials to ground and onto lower roof levels, using dust-tight chutes or other acceptable means of removing materials from roof areas.
- C. Full Roof Tear-off: Remove existing roofing and other roofing system components down to the existing roof deck.
 - 1. Remove base flashings and counter flashings.
 - 2. Remove perimeter edge flashing and gravel stops.
 - 3. Remove copings.
 - 4. Remove expansion-joint covers.
 - 5. Remove flashings at pipes, curbs, mechanical equipment, and other penetrations.
 - 6. Remove roof drains.
 - 7. Remove deteriorated wood blocking, curbs, and nailers.
 - 8. Remove fasteners from deck.

3.3 DECK PREPARATION

- A. Inspect deck after tear-off of roofing system.
- B. If broken or loose fasteners that secure deck panels to one another or to structure are observed, or if deck appears or feels inadequately attached, immediately notify Architect.
- C. If deck surface is unsuitable for receiving new roofing or if structural integrity of deck is suspect, immediately notify Architect.
- D. Provide additional deck securement as directed by Architect.
- E. Replace plywood roof sheathing as directed by Architect according to Section 061600 "Sheathing."
 - 1. Roof sheathing replacement will be paid for by adjusting the Contract Sum according to unit prices included in the Contract Documents.

3.4 BASE FLASHING REMOVAL

- A. Remove existing base flashings.
 - 1. Clean substrates of contaminants, such as asphalt, sheet materials, dirt, and debris.
- B. Inspect wood blocking, curbs, and nailers for deterioration and damage.
 - 1. If wood blocking, curbs, or nailers have deteriorated, immediately notify Architect.
- C. When directed by Architect, replace wood blocking, curbs, and nailers to comply with Section 061000 "Rough Carpentry."

3.5 DISPOSAL OF DEMOLISHED MATERIALS

- A. All refused items become the property of the Contractor. Do not stockpile debris in the existing building, without the approval of the Architect. Remove debris as it accumulates from removal operations to a legal disposal area.
- B. Dispose of all hazardous materials to comply with all applicable regulations, laws, and ordinances concerning removal, handling and protection against exposure or environmental pollution.

END OF SECTION 070150.19

SECTION 071326 - SELF-ADHERING SHEET 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.
- B. Related Sections:
 - 1. Section 016400 – Owner Furnished Materials

1.2 SUMMARY

- A. Section Includes:
 - 1. Modified bituminous sheet waterproofing.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at **Project site**.
 - 1. Review waterproofing requirements including surface preparation, substrate condition and pretreatment, minimum curing period, forecasted weather conditions, special details and sheet flashings, installation procedures, testing and inspection procedures, and protection and repairs.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, and tested physical and performance properties of waterproofing.
 - 2. Include manufacturer's written instructions for evaluating, preparing, and treating substrate.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Field quality-control reports.
- C. Sample Warranties: For special warranties.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by waterproofing manufacturer.
- B. Store waterproofing rolls in their original packaging on pallets, inside, under cover, dry and protected from the elements. Avoid prolonged storage above 90 degrees Fahrenheit (32 degrees Centigrade).

1.7 FIELD CONDITIONS

- A. Environmental Limitations: Apply waterproofing within the range of ambient and substrate temperatures recommended in writing by waterproofing manufacturer. Do not apply waterproofing to a damp or wet substrate.
 - 1. Do not apply waterproofing in snow, rain, fog, or mist.
 - 2. Do not apply waterproofing when the ambient air temperature, roll temperature or substrate temperature is below 50 degrees Fahrenheit (10 degrees Centigrade) or above 100 degrees Fahrenheit (43 degrees Centigrade).
- B. Maintain adequate ventilation during preparation and application of waterproofing materials.

1.8 WARRANTY

- A. Manufacturer's Warranty: Manufacturer agrees to furnish replacement waterproofing material for waterproofing that does not comply with requirements or that fails to remain watertight within specified warranty period of 20 years.
- B. Installer's Special Warranty: Specified form, signed by Installer, covering Work of this Section, for warranty period of **two** years.
 - 1. Warranty includes removing and reinstalling protection board.

PART 2 - PRODUCTS

2.1 MODIFIED BITUMINOUS SHEET WATERPROOFING

- A. Modified Bituminous Sheet: Minimum 60-mil (1.5-mm) nominal thickness, fiberglass reinforced self-adhering sheet with release liner on adhesive side; formulated for application with primer or surface conditioner that complies with VOC limits of authorities having jurisdiction.
 - 1. The Garland Company, Inc. HPR Aqua Shield. Owner furnished and contractor installed.
 - a. Properties (Finished Membrane):
 - 1) Tensile Strength (ASTM D5147) 2 in/min. @73.4 ± 3.6°F MD 65 lbf/in
CMD 45 lbf/in 50mm/min @ 23± 3°C MD 49 kN/m CMD 8 kN/m

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- 2) Tear Strength (ASTM D5147) 2 in./min. @ 73.4 ± 3.6°F MD 105 lbf CMD 75 lbf 50mm/min @ 23± 3°C MD 467 N CMD 333 lbf
- 3) Elongation at Maximum Tensile (ASTM D5147) 2 in./min. @ 73.4 ± 3.6°F MD 3.5% CMD 3.5% 50mm/min @ 23± 3°C MD 3.5% CMD 3.5%

2.2 AUXILIARY MATERIALS

- A. Furnish auxiliary materials recommended by waterproofing manufacturer for intended use and compatible with sheet waterproofing.
- B. Mastic:
 1. Garland KEE-Loc Mastic or Equal

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of waterproofing.
 1. Verify that substrate is visibly dry and within the moisture limits recommended in writing by manufacturer. Test for capillary moisture by plastic sheet method according to ASTM D4263.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean, prepare, and treat substrates according to manufacturer's written instructions. Provide clean, dust-free, and dry substrates for waterproofing application.
- B. Mask off adjoining surfaces not receiving waterproofing to prevent spillage and overspray affecting other construction.
- C. Corners: Prepare, prime, and treat inside and outside corners according to ASTM D6135.
 1. Install membrane strips centered over vertical inside corners. Install 3/4-inch (19-mm) fillets of liquid membrane on horizontal inside corners and as follows:
 - a. At footing-to-wall intersections, extend liquid membrane in each direction from corner or install membrane strip centered over corner.
 - b. At plaza-deck-to-wall intersections, extend liquid membrane or sheet strips onto deck waterproofing and to finished height of sheet flashing.
- D. Prepare, treat, and seal vertical and horizontal surfaces at terminations and penetrations through waterproofing and at drains and protrusions according to ASTM D6135.

3.3 INSTALLATION OF MODIFIED BITUMINOUS SHEET WATERPROOFING

- A. Install modified bituminous sheets according to waterproofing manufacturer's written instructions and per recommendations in ASTM D6135.
- B. Apply primer to substrates at required rate and allow it to dry. Limit priming to areas that will be covered by sheet waterproofing in same day. Reprime areas exposed for more than 24 hours.
- C. Apply and firmly adhere sheets over area to receive waterproofing. Accurately align sheets and maintain uniform 3-inch- (64-mm-) minimum lap widths and 4-inch-minimum end laps in the field and 6-inch-minimum end laps at valleys. Overlap and seal seams, and stagger end laps to ensure watertight installation.
- D. Apply sheets from low to high points to ensure that laps shed water.
- E. Apply continuous sheets over already-installed sheet strips, bridging substrate cracks, construction, and contraction joints.
- F. Seal edges of sheet-waterproofing terminations with mastic.
- G. Repair tears, voids, and lapped seams in waterproofing not complying with requirements. Slit and flatten fishmouths and blisters. Patch with sheet waterproofing extending 6 inches (150 mm) beyond repaired areas in all directions.

3.4 FIELD QUALITY CONTROL

- A. Manufacturer's Field Provide site inspections at least three days per week by an onsite manufacturer representative directly employed by the manufacturer
- B. Waterproofing will be considered defective if it does not pass inspections.
- C. Manufacturer's Field Service Representative will prepare test and inspection reports.

3.5 PROTECTION, REPAIR, AND CLEANING

- A. Protect waterproofing from damage and wear during remainder of construction period.
- B. Correct deficiencies in or remove waterproofing that does not comply with requirements; repair substrates, reapply waterproofing, and repair sheet flashings.
- C. Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended in writing by manufacturer of affected construction.

END OF SECTION 071326

SECTION 072100 - THERMAL INSULATION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Glass-fiber blanket.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.1 GLASS-FIBER BLANKET

- A. Glass-Fiber Blanket, Kraft Faced: ASTM C 665, Type II (nonreflective faced), Class C (faced surface not rated for flame propagation).

2.2 ACCESSORIES

- A. Insulation for Miscellaneous Voids:
 - 1. Glass-Fiber Insulation: ASTM C 764, Type II, loose fill; with maximum flame-spread and smoke-developed indexes of 5, per ASTM E 84.
 - 2. Spray Polyurethane Foam Insulation: ASTM C 1029, Type II, closed cell, with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, per ASTM E 84.
- B. Insulation Anchors, Spindles, and Standoffs: As recommended by manufacturer.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Comply with insulation manufacturer's written instructions applicable to products and applications.
- B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain, or snow at any time.

- C. Extend insulation to envelop entire area to be insulated. Fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.
- D. Provide sizes to fit applications and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units unless multiple layers are otherwise shown or required to make up total thickness or to achieve R-value.

3.2 INSTALLATION OF INSULATION IN FRAMED CONSTRUCTION

- A. Blanket Insulation: Install in cavities formed by framing members according to the following requirements:
 - 1. Use insulation widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill the cavities, provide lengths that will produce a snug fit between ends.
 - 2. Place insulation in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
 - 3. Maintain 3-inch (76-mm) clearance of insulation around recessed lighting fixtures not rated for or protected from contact with insulation.
 - 4. Attics: Install eave ventilation troughs between roof framing members in insulated attic spaces at vented eaves.
 - 5. For wood-framed construction, install blankets according to ASTM C 1320 and as follows:
 - a. With faced blankets having stapling flanges, lap blanket flange over flange of adjacent blanket to maintain continuity of vapor retarder once finish material is installed over it.
- B. Miscellaneous Voids: Install insulation in miscellaneous voids and cavity spaces where required to prevent gaps in insulation using the following materials:
 - 1. Glass-Fiber Insulation: Compact to approximately 40 percent of normal maximum volume equaling a density of approximately 2.5 lb/cu. ft. (40 kg/cu. m).
 - 2. Spray Polyurethane Insulation: Apply according to manufacturer's written instructions.

END OF SECTION 072100

SECTION 073113 - ASPHALT SHINGLES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Asphalt shingles.
 - 2. Metal flashing and trim.
- B. Related Requirements:
 - 1. Section 071326 for Self-Adhering Sheet Waterproofing.

1.3 DEFINITION

- A. Roofing Terminology: See ASTM D1079 and glossary of NRCA's "The NRCA Roofing and Waterproofing Manual" for definitions of terms related to roofing work in this Section.

1.4 PREINSTALLATION MEETINGS

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

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples: For each exposed product and for each color and texture specified.
 - 1. Asphalt Shingles: Full size.
 - 2. Ridge and Hip Cap Shingles: Full size.
- C. Samples for Initial Selection: For each type of asphalt shingle indicated.
 - 1. Include similar Samples of accessories involving color selection.
- D. Samples for Verification: For the following products, of sizes indicated:

1. Asphalt Shingles: Full size.
2. Ridge and Hip Cap Shingles: Full size.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
- B. Product Test Reports: For each type of asphalt shingle and underlayment product indicated, for tests performed by a qualified testing agency.
- C. Sample Warranty: For manufacturer's warranty.

1.7 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For asphalt shingles to include in maintenance manuals.

1.8 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 1. Asphalt Shingles: 100 sq. ft. (9.3 sq. m) of each type, in unbroken bundles.

1.9 QUALITY ASSURANCE

- A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer.

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Store roofing materials in a dry, well-ventilated location protected from weather, sunlight, and moisture according to manufacturer's written instructions.
- B. Protect unused roofing materials from weather, sunlight, and moisture when left overnight or when roofing work is not in progress.
- C. Handle, store, and place roofing materials in a manner to prevent damage to roof deck or structural supporting members.

1.11 FIELD CONDITIONS

- A. Environmental Limitations: Install self-adhering sheet underlayment within the range of ambient and substrate temperatures recommended in writing by manufacturer.

1.12 WARRANTY

- A. Manufacturer's Warranty: Manufacturer agrees to repair or replace asphalt shingles that fail within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Manufacturing defects.
 - 2. Material Warranty Period: 25 years from date of Substantial Completion, prorated, with first 10 years nonprorated.
 - 3. Wind-Speed Warranty Period: Asphalt shingles will resist blow-off or damage caused by wind speeds of up to 110 mph (49 m/s) for 15 years from date of Substantial Completion.
- B. Roofing Installer's Warranty: On warranty form at end of this Section, signed by Installer, in which Installer agrees to repair or replace components of asphalt-shingle roofing that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Exterior Fire-Test Exposure: Provide asphalt shingles and related roofing materials identical to those of assemblies tested for Class A fire resistance according to ASTM E108 or UL 790 by Underwriters Laboratories or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify products with appropriate markings of applicable testing agency.

2.2 GLASS-FIBER-REINFORCED ASPHALT SHINGLES

- A. Laminated-Strip Asphalt Shingles: ASTM D3462/D3462M, laminated, multi-ply overlay construction, glass-fiber reinforced, mineral-granule surfaced, and self-sealing.
 - 1. GAF Timberline HD Reflector Series.
 - 2. Butt Edge: Straight cut.
 - 3. Strip Size: Manufacturer's standard.
 - 4. Impact Resistance: UL 2218, Class 4.
 - 5. Cool Roof: Roofing must be rated and labeled by the Cool Roof Rating Council (CRRC).
 - a. Minimum Solar Reflectance Index of 0.16
 - 1) Minimum aged solar reflectance of 0.20
 - 2) Minimum thermal emittance of 0.75.
 - 6. Color and Blends:
 - a. Matilija Junior High School: Hickory.
 - b. San Antonio Elementary School: Aged Chestnut.
- B. Hip and Ridge Shingles: Manufacturer's standard units to match asphalt shingles.

2.3 UNDERLAYMENT MATERIALS

- A. Self-Adhering Sheet Underlayment: Refer to Section 071326 Self-Adhering Sheet Waterproofing.

2.4 ACCESSORIES

- A. Asphalt Roofing Cement: ASTM D4586, Type II, asbestos free.
- B. Roofing Nails: As indicated.
 - 1. Where nails are in contact with metal flashing, use nails made from same metal as flashing.
- C. Synthetic-Underlayment Fasteners: As recommended in writing by synthetic-underlayment manufacturer for application indicated.

2.5 METAL FLASHING AND TRIM

- A. General: Comply with requirements in Section 076200 "Sheet Metal Flashing and Trim."
 - 1. Sheet Metal: 22 gage galvanized steel G-90 with three-coat fluorocarbon coating.
- B. Fabricate sheet metal flashing and trim to comply with recommendations in SMACNA's "Architectural Sheet Metal Manual" that apply to design, dimensions, metal, and other characteristics of the item.
 - 1. Drip Edges: Fabricate in lengths not exceeding 10 feet (3 m) with 2-inch (50-mm) roof-deck flange and 1-1/2-inch (38-mm) fascia flange with 3/8-inch (9.5-mm) drip at lower edge.
- C. Vent Pipe Flashings: Provide flashings as indicated in the drawings.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
 - 1. Examine roof sheathing to verify that sheathing joints are supported by framing and blocking or metal clips and that installation is within flatness tolerances.
 - 2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and completely anchored; and that provisions have been made for flashings and penetrations through asphalt shingles.
- B. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.

- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 UNDERLAYMENT INSTALLATION

- A. General: Comply with underlayment manufacturer's written installation instructions applicable to products and applications indicated unless more stringent requirements apply.
- B. Self-Adhering Sheet Underlayment: Install, wrinkle free, on roof deck. Comply with requirements of Section 071326. Install lapped in direction that sheds water. Lap sides not less than 3 inches (89 mm). Lap ends not less than 4 inches (150 mm) staggered 24 inches (600 mm) between courses. Roll laps with roller. Cover underlayment within seven days.

3.3 METAL FLASHING INSTALLATION

- A. General: Install metal flashings and other sheet metal to comply with requirements in Section 076200 "Sheet Metal Flashing and Trim."
 - 1. Install metal flashings according to recommendations in ARMA's "Residential Asphalt Roofing Manual" and NRCA's "NRCA Guidelines for Asphalt Shingle Roof Systems."
- B. Rake Drip Edges: Install rake drip-edge flashings over underlayment and fasten to roof deck.
- C. Eave Drip Edges: Install eave drip-edge flashings below underlayment and fasten to roof sheathing.
- D. Pipe Flashings: Form flashing around pipe penetrations and asphalt shingles. Fasten and seal to asphalt shingles as recommended by manufacturer.

3.4 ASPHALT-SHINGLE INSTALLATION

- A. General: Install asphalt shingles according to manufacturer's written instructions, recommendations in ARMA's "Residential Asphalt Roofing Manual," and recommendations in NRCA's "NRCA Guidelines for Asphalt Shingle Roof Systems."
- B. Install starter strip along lowest roof edge, consisting of an asphalt-shingle strip at least 8.5 inches (175 mm) wide with self-sealing strip face up at roof edge.
 - 1. Extend asphalt shingles 1/2 inch (13 mm) over fasciae at eaves and rakes.
 - 2. Install starter strip along rake edge.
- C. Install first and remaining courses of asphalt shingles stair-stepping diagonally across roof deck with manufacturer's recommended offset pattern at succeeding courses, maintaining uniform exposure.
- D. Install first and remaining courses of asphalt shingles stair-stepping diagonally across roof deck with manufacturer's recommended offset pattern at succeeding courses, maintaining uniform exposure.

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- E. Install asphalt shingles by single-strip column or racking method, maintaining uniform exposure. Install full-length first course followed by cut second course, repeating alternating pattern in succeeding courses.
- F. Fasten asphalt-shingle strips with a minimum of four roofing nails located according to manufacturer's written instructions.
- G. Hip and Ridge Shingles: Maintain same exposure of cap shingles as roofing shingle exposure. Lap cap shingles at ridges to shed water away from direction of prevailing winds. Fasten with roofing nails of sufficient length to penetrate sheathing.

3.5 ROOFING INSTALLER'S WARRANTY

- A. WHEREAS **<Insert name>** of **<Insert address>**, herein called the "Roofing Installer," has performed roofing and associated work ("the work") on the following project:
 - 1. Owner: **<Insert name of Owner>**.
 - 2. Address: **<Insert address>**.
 - 3. Building Name/Type: **<Insert information>**.
 - 4. Address: **<Insert address>**.
 - 5. Area of the Work: **<Insert information>**.
 - 6. Acceptance Date: **<Insert date>**.
 - 7. Warranty Period: **<Insert time>**.
 - 8. Expiration Date: **<Insert date>**.
- B. AND WHEREAS Roofing Installer has contracted (either directly with Owner or indirectly as a subcontractor) to warrant the work against leaks and faulty or defective materials and workmanship for designated Warranty Period,
- C. NOW THEREFORE Roofing Installer hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period he will, at his own cost and expense, make or cause to be made such repairs to or replacements of the work as are necessary to correct faulty and defective work and as are necessary to maintain the work in a watertight condition.
- D. This Warranty is made subject to the following terms and conditions:
 - 1. Specifically excluded from this Warranty are damages to the work and other parts of the building, and to building contents, caused by:
 - a. Lightning;
 - b. Peak gust wind speed exceeding **<Insert wind speed>** mph (m/sec);
 - c. Fire;
 - d. Failure of roofing system substrate, including cracking, settlement, excessive deflection, deterioration, and decomposition;
 - e. Faulty construction of parapet walls, copings, chimneys, skylights, vents, equipment supports, and other edge conditions and penetrations of the work;
 - f. Vapor condensation on bottom of roofing; and

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- g. Activity on roofing by others, including construction contractors, maintenance personnel, other persons, and animals, whether authorized or unauthorized by Owner.
2. When the work has been damaged by any of foregoing causes, Warranty shall be null and void until such damage has been repaired by Roofing Installer and until cost and expense thereof have been paid by Owner or by another responsible party so designated.
3. Roofing Installer is responsible for damage to the work covered by this Warranty but is not liable for consequential damages to building or building contents resulting from leaks or faults or defects of the work.
4. During Warranty Period, if Owner allows alteration of the work by anyone other than Roofing Installer, including cutting, patching, and maintenance in connection with penetrations, attachment of other work, and positioning of anything on roof, this Warranty shall become null and void on date of the alterations, but only to the extent the alterations affect the work covered by this Warranty. If Owner engages Roofing Installer to perform the alterations, Warranty shall not become null and void unless Roofing Installer, before starting the alterations, notified Owner in writing, showing reasonable cause for claim, that the alterations would likely damage or deteriorate the work, thereby reasonably justifying a limitation or termination of this Warranty.
5. During Warranty Period, if original use of roof is changed and it becomes used for, but was not originally specified for, a use or service more severe than originally specified, this Warranty shall become null and void on date of the change, but only to the extent the change affects the work covered by this Warranty.
6. Owner shall promptly notify Roofing Installer of observed, known, or suspected leaks, defects, or deterioration and shall afford reasonable opportunity for Roofing Installer to inspect the work and to examine evidence of such leaks, defects, or deterioration.
7. This Warranty is recognized to be the only warranty of Roofing Installer on the work and shall not operate to restrict or cut off Owner from other remedies and resources lawfully available to Owner in cases of roofing failure. Specifically, this Warranty shall not operate to relieve Roofing Installer of responsibility for performance of the work according to requirements of the Contract Documents, regardless of whether Contract was a contract directly with Owner or a subcontract with Owner's General Contractor.

E. IN WITNESS THEREOF, this instrument has been duly executed this **<Insert day>** day of **<Insert month>**, **<Insert year>**.

1. Authorized Signature: **<Insert signature>**.
2. Name: **<Insert name>**.
3. Title: **<Insert title>**.

END OF SECTION 073113

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SECTION 075216 - STYRENE-BUTADIENE-STYRENE (SBS) MODIFIED BITUMINOUS
MEMBRANE ROOFING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Modified bituminous sheet waterproofing and accessories.
2. Edge treatment and flashings.

1.2 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Convene minimum two weeks prior to commencing the Work of this section.
2. Review installation procedures and coordination required with related work.
3. Refer to Section 070150.19 Preparation for Reroofing for documentation of existing conditions and identification and repair of substandard conditions.
4. Record minutes of the conference and provide copies to all parties present.

1.3 REFERENCES

- A. ASTM 312 – Standard specification for Asphalt used in Roofing.
- B. ASTM D 451 - Standard Test Method for Sieve Analysis of Granular Mineral Surfacing for Asphalt Roofing Products.
- C. ASTM D 1079 Standard Terminology Relating to Roofing, Waterproofing and Bituminous Materials.
- D. ASTM D 1227 Standard Specification for Emulsified Asphalt Used as a Protective Coating for Roofing.
- E. ASTM D 1863 Standard Specification for Mineral Aggregate Used as a Protective Coating for Roofing.
- F. ASTM D 2178 Standard Specification for Asphalt Glass Felt Used in Roofing and Waterproofing.
- G. ASTM D 2822 Standard Specification for Asphalt Roof Cement.
- H. ASTM D 4601 Standard Specification for Asphalt Coated Glass Fiber Base Sheet Used in Roofing.

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- I. ASTM D 5147 Standard Test Method for Sampling and Testing Modified Bituminous Sheet Materials.
 - J. ASTM D 6162 Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using a Combination of Polyester and Glass Fiber Reinforcements.
 - K. ASTM D 6163 Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Glass Fiber Reinforcements.
 - L. ASTM D 6164 - Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Polyester Reinforcements.
 - M. ASTM E 108 - Standard Test Methods for Fire Test of Roof Coverings
 - N. Factory Mutual Research (FM): Roof Assembly Classifications.
 - O. National Roofing Contractors Association (NRCA): Roofing and Waterproofing Manual.
 - P. Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA) - Architectural Sheet Metal Manual.
 - Q. Underwriters Laboratories, Inc. (UL): Fire Hazard Classifications.
 - R. Warnock Hersey (WH): Fire Hazard Classifications.
 - S. ANSI-SPRI ES-1 Wind Design Standard for Edge Systems used with Low Slope Roofing Systems.
 - T. ASCE 7, Minimum Design Loads for Buildings and Other Structures
 - U. UL - Fire Resistance Directory.
 - V. FM Approvals - Roof Coverings and/or RoofNav assembly database.
 - W. Miami-Dade Building Code Compliance - N.O.A. (Notice of Acceptance).
 - X. California Title 24 Energy Efficient Standards.
- 1.4 DESIGN / PERFORMANCE REQUIREMENTS
- A. Perform work in accordance with all federal, state and local codes.
 - B. Exterior Fire Test Exposure: Roof system shall achieve a UL, FM or WH Class rating for roof slopes indicated on the Drawings as follows:
 - 1. Factory Mutual Class A Rating.
 - 2. Underwriters Laboratory Class A Rating.
 - 3. Warnock Hersey Class A Rating.
 - C. Design Requirements:

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1. 1. Uniform Wind Uplift Load Capacity
 - a. a. Installed roof system shall withstand negative (uplift) design wind loading pressures complying with the following criteria.
 - 1) Design Code: ASCE 7, Method 2 for Components and Cladding.
 - 2) Importance Category:
 - a) III.
 - 3) Importance Factor of:
 - a) 1.0
 - 4) Wind Speed: 115 mph
 - 5) Ultimate Pullout Value: 410 pounds per each of the fastener
 - 6) Exposure Category:
 - a) C.
 - 7) Design Roof Height: 25 feet.
 - 8) Minimum Building Width: 100 feet.
 - 9) Roof Pitch: 1:12.
 - 10) Roof Area Design Uplift Pressure:
 - a) Zone 1 - Field of roof 19.3 psf
 - b) Zone 2 - Eaves, ridges, hips and rakes 32.3 psf
 - c) Zone 3 - Corners 48.6 psf
2. Live Load: 20 psf, or not to exceed original building design.
3. Dead Load:
 - a. a. Installation of new roofing materials shall not exceed the dead load capacity of the existing roof structure.

D. Energy Star: Roof System shall comply with the initial and aged reflectivity required by the U.S. Federal Government's Energy Star program.

1. Initial SRI 75 minimum.

E. Roof system shall have been tested in compliance with the following codes and test requirements:

1. Miami-Dade County:
 - a. Self-Adhered Membrane Systems Over:
 - 1) Wood Decks N.O.A.
 - b. Roofing Underlayments
 - c. Roofing Cements and Coatings
2. Cool Roof Rating Council:
 - a. CRRC Directory CRRC 0700-0028
3. International Code Council Evaluation Service (ICC-ES):
 - a. Membrane Systems
4. Warnock Hersey
 - a. ITS Directory of Listed Products
5. FM Approvals:
 - a. RoofNav Website

1.5 ACTION SUBMITTALS

- A. Product Data: For each type of product.

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- B. Samples: For each exposed product and for each color and texture specified, representing actual product and color.

1.6 INFORMATIONAL SUBMITTALS

- A. Sample warranties.
- B. Design Pressure Calculations: Submit design pressure calculations for the roof area in accordance with ASCE 7 and California Building Code requirements. Include a roof system attachment analysis report, certifying the system's compliance with applicable wind load requirements before work begins. Report shall be signed and sealed by a professional engineer registered in the State of the Project and who has provided roof system attachment analysis for not less than 5 consecutive years.
- C. Manufacturer's Certificates: Provide to certify products meet or exceed specified requirements.
- D. Product Certification: Provide manufacturer's certification that materials are chemically and physically compatible with each other, and are suitable for inclusion within the total roof system specified herein.
- E. Test Reports: Submit test reports, prepared by an independent testing agency, for all modified bituminous sheet roofing, indicating compliance with ASTM D 5147.
- F. Manufacturer's Fire Compliance Certificate: Certify that the roof system furnished is approved by Underwriters Laboratories (UL), Warnock Hersey (WH) or approved third party testing facility in accordance with ASTM E108, Class A for fire and meets local or nationally recognized building codes.
- G. Closeout Submittals:
 - 1. Provide manufacturer's maintenance instructions that include recommendations for periodic inspection and maintenance of all completed roofing work.
 - 2. Provide product warranty executed by the manufacturer
 - 3. Assist Owner in preparation and submittal of roof installation acceptance certification as may be necessary in connection with fire and extended coverage insurance on roofing and associated work.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: An entity that employs installers and supervisors who are trained and approved by roofing manufacturer.
- B. Installer's Field Supervision: Maintain a full-time Supervisor/Foreman on job site during all phases of roofing work while roofing work is in progress.
- C. Perform work in accordance with NRCA Roofing and Waterproofing Manual.
- D. Product Certification: Provide manufacturer's certification that materials are manufactured in the United States and conform to requirements specified herein, are chemically and physically

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compatible with each other, and are suitable for inclusion within the total roof system specified herein.

- E. Source limitations: Obtain all components of roofing system from a single manufacturer. Secondary products that are required shall be recommended and approved in writing by the roofing system Manufacturer.

1.8 WARRANTY

- A. Upon completion of work, provide the Manufacturer's written and signed Edge-To-Edge NDL System Warranty, warranting that, if a leak develops in the roof during the term of this warranty, due either to defective material or defective workmanship by the installer, the manufacturer shall provide the Owner, at the Manufacturer's expense, with the labor and material necessary to return the defective area to a watertight condition including all Metal Components, flashings and trim.

- 1. Warranty Period: 30 years from date of acceptance.

- B. Installer is to guarantee all work against defects in materials and workmanship for a period indicated following final acceptance of the Work.

- 1. Warranty Period: 2 years from date of acceptance.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store products in manufacturer's unopened packaging with labels intact until ready for installation.
- B. Store all roofing materials in a dry place, on pallets or raised platforms, out of direct exposure to the elements until time of application. Store materials at least 4 inches above ground level and covered with "breathable" tarpaulins.
- C. Store materials in accordance with the instructions of the manufacturer prior to their application or installation. Store roll goods on end on a clean flat surface. No wet or damaged materials will be used in the application.
- D. Store at room temperature wherever possible, until immediately prior to installing the roll. Keep materials away from open flame or welding sparks.
- E. Avoid stockpiling of materials on roofs without first obtaining acceptance from the Architect/Engineer.
- F. Adhesive storage shall be between the range of above 40 degree F (4 degree C) and below 80 degree F (27 degree C). Area of storage shall be constructed for flammable storage.

1.10 PROJECT CONDITIONS

- A. Do not install products under environmental conditions outside Manufacturer's absolute limits.

PART 2 - PRODUCTS

2.1 MODIFIED BITUMINOUS SELF-ADHERED SHEET ROOFING AT MODIFIED BITUMINOUS CAP SHEET

- A. Modified Bituminous Sheet: Minimum 80-mil (1.5-mm) nominal thickness self-adhering sheet with release liner on adhesive side.

1. Products and Manufacturers:

- a. StressPly SA FR Mineral, The Garland Company. (Basis of Design) Owner furnished contractor installed.

- B. Base Ply: Minimum 80-mil (1.5-mm) nominal thickness self-adhering sheet with release liner on adhesive side.

1. HPR SA Base Sheet: 80 mil SBS (Styrene-Butadiene-Styrene) self-adhered base sheet with a woven fiberglass scrim reinforcement.

a. Tensile Strength, ASTM D 5147

- 1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 60 lbf/in XD 39 lbf/in
2) 50 mm/min. @ 23 +/- 2 deg. C 10.5 kN/m XD 6.8 kN/m

b. Tear Strength, ASTM D 5174

- 1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 100 lbf/in XD 95 lbf
2) 50 mm/min. @ 23 +/- 2 deg. C 445 N XD 422.70 lbf

c. Elongation at Maximum Tensile, ASTM D 5174

- 1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 4% XD 4% XD
2) 50 mm/min. @ 23 +/- 2 deg. C MD 4% XD.4% XD

- C. Thermoplastic/Modified Cap (Ply) Sheet: 80-mil (1.5-mm) nominal thickness self-adhering sheet with release liner on adhesive side.

1. StressPly SA FR Mineral: 140 mil SBS (Styrene-Butadiene-Styrene) mineral surfaced self-adhered, rubber modified roofing membrane reinforced with a fiberglass and polyester composite scrim. ASTM D 6162, Type III Grade G

a. Tensile Strength, ASTM D 5147

- 1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 310 lbf/in XD 310 lbf/in
2) 50 mm/min. @ 23 +/- 2 deg. C MD 2224 N XD 2224 N

b. Tear Strength, ASTM D 5174

- 1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 500 lbf/in XD 500 lbf
2) 50 mm/min. @ 23 +/- 2 deg. C 445 N XD 422.70 lbf

c. Elongation at Maximum Tensile, ASTM D 5174

- 1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 3.5% XD 3.5%
2) 50 mm/min. @ 23 +/- 2 deg. C MD 3.5% XD 3.5%

2. Physical Properties:

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- a. ASTM 5147 – Standard Test Method for Sampling and Testing Modified Bituminous Sheet Materials.
 - b. Hydrostatic-Head Resistance: **200 feet (60 m)** minimum; ASTM D 5385.
 - c. Finished Solar Reflective Index: Minimum SRI 75.
3. Sheet Strips: Self-adhering, rubberized-asphalt strips of same material and thickness as sheet waterproofing.
- D. Flashing Cap (Ply) Sheet:
1. StressPly SA FR mineral: 140 mil SBS (Styrene-Butadiene-Styrene) mineral surfaced self-adhered, rubber modified roofing membrane reinforced with a fiberglass and polyester composite scrim. ASTM D 6162, Type III Grade G
 - a. 2 in/min. @ 73.4 +/- 3.6 deg. F MD 310 lbf/in XD 310 lbf/in
 - b. 50 mm/min. @ 23 +/- 2 deg. C MD 54.25 kN/m XD 54.25 kN/m
 2. Tear Strength, ASTM D 5147
 - a. 2 in/min. @ 73.4 +/- 3.6 deg. F MD 500 lbf XD 500 lbf
 - b. 50 mm/min. @ 23 +/- 2 deg. C MD 2224 N
 3. Elongation at Maximum Tensile, ASTM D 5147
 - a. 2 in/min. @ 73.4 +/- 3.6 deg. F MD 3.5% XD 3.5%
 - b. 50 mm/min. @ 23 +/- 2 deg. C MD 3.5% XD 3.5%
 4. Low temperature Flexibility, ASTM D 5147, Passes, -15 deg. F (-26 deg. C)
- E. Surface coating: White elastomeric roof coating, Energy Star approved polyurea roof coating:
1. SRI 75 minimum.
 2. Non-volatile % (ASTM D 1644) 66 minimum.

2.2 AUXILIARY MATERIALS

- A. Furnish auxiliary materials recommended by proofing manufacturer for intended use and compatible with sheet proofing.
1. Furnish liquid-type auxiliary materials that comply with VOC limits of authorities having jurisdiction.
- B. Metal Termination Bars: Aluminum bars, approximately 1 by 1/8 inch (25 by 3 mm), predrilled at 9-inch (229-mm) centers.
- C. Quick Slope: modified acrylic cementitious material that adds slope and provides water dispersion.
- D. Glass Fiber Cant Strip: Continuous triangular cross section made of inorganig fibrous glass used as cant strip as recommended and furnished by the roofing manufacturer.
- E. Conduit Support Blocks: Dura-Block or as approved by roofing manufacturer.
- F. Penetrations and Three-course Flashings: Tuff-Flash liquid flashings or as approved by roofing manufacturer.

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- G. Edge metal, coping cap and gutter: Prefinished and provided by roofing manufacturer to maintain warranty. Refer to Section 071326 "Flashing and Sheet Metal".

PART 3 - EXECUTION

3.1 PREPARATION

- A. Refer to Section 070150.19 Preparation for Reroofing for documentation of requirements for removal of previous roofing and preparation of existing decks, parapets, curbs and blocking.
- B. Clean, prepare, and treat substrates according to manufacturer's written instructions. Provide clean, dust-free, and dry substrates for waterproofing application.
 - 1. Wherever necessary, all surfaces to received roofing materials shall be power broom and vacuumed to remove debris and loose matter immediately prior to starting work.
- C. Fill substrate surface voids that are greater than ¼ inch wide with an acceptable fill material.
- D. Mask off adjoining surfaces not receiving waterproofing to prevent spillage and overspray affecting other construction.
- E. Fasteners and plates for fastening components mechanically to the substrate shall provide a minimum pull-out capacity of 300 lbs per fastener. Plywood shall be a minimum of 15/32 inch thick and conform to the standards and installation requirements of the American Plywood Association (APA).

3.2 INSTALLATION - GENERAL

- A. Install modified bitumen membranes and flashings in accordance with manufacturer's instructions and with the recommendations provided by the National Roofing Contractors Association's Roofing & Waterproofing Manual, the Asphalt Roofing Manufacturers Association, and applicable codes.
- B. Avoid installation of modified bitumen membranes at temperatures lower than 40-45degrees F. When work at such temperatures unavoidable use the following precautions:
 - 1. Take extra care during cold weather installation and when ambient temperatures are affected by wind or humidity, to ensure adequate bonding is achieved between the surfaces to be joined. Use extra care at material seam welds and where adhesion of the applied product to the appropriately prepared substrate as the substrate can be affected by such temperature constraints as well.
 - 2. Unrolling of cold materials, under low ambient conditions must be avoided to prevent the likelihood of unnecessary stress cracking. Rolls must be at least 40 degrees F at the time of application. If the membrane roll becomes stiff or difficult to install, it must be replaced with roll from a heated storage area.
 - 3. Commence installation of the roofing system at the lowest point of the roof (or roof area), working up the slope toward the highest point. Lap sheets shingle fashion so as to constantly shed water

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4. All slopes greater than 2:12 require back-nailing to prevent slippage of the ply sheets. Use ring or spiral-shank 1 inch cap nails, or screws and plates at a rate of 1 fastener per ply (including the membrane) at each insulation stop. Place insulation stops at 16 ft o.c. for slopes less than 3:12 and 4 feet o.c. for slopes greater than 3:12. On non-insulated systems, nail each ply directly into the deck at the rate specified above. When slope exceeds 2:12, install all plies parallel to the slope (strapping) to facilitate backnailing. Install 4 additional fasteners at the upper edge of the membrane when strapping the plies.

3.3 MODIFIED BITUMINOUS SHEET-WATERPROOFING APPLICATION

- A. Install modified bituminous sheets according to waterproofing manufacturer's written instructions and per recommendations in ASTM D 6135.
- B. Fastened Base Sheet: Install base sheet screwed to the substrate with the appropriate fastener and fastening pattern determined from wind uplift calculation.
 1. Do not leave installed Base Sheet exposed to the weather; cover with mineral cap sheet the same day.
- C. Apply and firmly adhere sheets over area to receive waterproofing. Accurately align sheets and maintain uniform 4- (64-mm-) minimum side lap and 8 inch minimum end lap set in roofing cement widths. Overlap and seal seams, and stagger end laps to ensure watertight installation. Offset side laps from underlying membranes a minimum of 18 inches. Cut end laps at opposing diagonal corners to minimize "T"-seams and apply a bead of roofing manufacturer approved sealant compatible with roofing.
- D. Horizontal Application: Apply sheets from low to high points of decks to ensure that laps shed water. Fold membrane back halfway lengthwise to remove the split release film. Press membrane securely into place and repeat with the opposite half of the membrane. Use a heavy, weighted roller over entire surface working outwards to eliminate voids.
- E. Apply continuous sheets over already-installed sheet strips, bridging substrate cracks, construction, and contraction joints.
- F. Seal edges of sheet-waterproofing terminations with manufacturer approved sealant.
- G. Install sheet-waterproofing and auxiliary materials to tie into adjacent waterproofing.
- H. Repair tears, voids, and lapped seams in waterproofing not complying with requirements. Slit and flatten fishmouths and blisters. Patch with sheet waterproofing extending 6 inches (150 mm) beyond repaired areas in all directions.

3.4 SURFACE COATING:

- A. Apply in compliance with roofing manufacturer's written instructions.
- B. Apply three gallons per roofing square in a cross hatched two-coat application.

3.5 EDGE TREATMENT AND ROOF PENETRATION FLASHING

- A. Fibrous Cant Strips: Provide non-combustible cant strips at all wall/curb detail treatments where angle changes are greater than 45 degrees/ Cant may be set in approved cold adhesives in accordance with the roofing manufacturer's recommendations.
- B. Wood Blocking and Nailers: Provide wood blocking nailers as specified in Section 06100 "Rough Carpentry".
- C. Metal Work: Provide metal flashings, counter flashings, parapet coping caps and thru-wall flashings as specified in Section 076200 "Sheet Metal Flashings and Trim".
- D. Termination Bar: Provide metal termination bar or approved top edge securement at the terminus of all flashing sheets at walls and curbs. Fasten bar a minimum of 8 inches on center to achieve constant compression. Provide manufacturer approved sealant at the top edge as shown.
- E. Flashing Base Ply: At all vertical and other flashing details, install Base Sheet and Cap sheet over already installed field plies. Prepare substrate as recommended by the roofing manufacturer and extend end onto field as indicated.
- F. Surface Coatings: Apply roof coatings in strict conformance with the manufacturer's written instructions.

3.6 PROTECTION, REPAIR, AND CLEANING

- A. Do not permit foot or vehicular traffic on unprotected membrane. Special permission shall be obtained from the manufacturer before any traffic shall be permitted over new roofing.
- B. Protect installed insulation drainage panels from damage due to UV light, harmful weather exposures, physical abuse, and other causes. Provide temporary coverings where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.
- C. Correct deficiencies in or remove waterproofing that does not comply with requirements; repair substrates, reapply waterproofing, and repair sheet flashings.
- D. Remove asphalt markings from finished surfaces.
- E. Clean spillage and soiling from adjacent construction using cleaning agents and procedures recommended in writing by manufacturer of affected construction.
- F. Repair and repaint underside of exposed sheathing where roofing installation causes visible damage.

3.7 FIELD QUALITY CONTROL

- A. Inspection: Provide manufacturer's field observations at start-up and daily. Provide a final inspection upon completion of the Work.

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1. Warranty shall be issued upon manufacturer's acceptance of the installation.
- B. Field observations shall be performed by a Manufacturer's Representative employed full-time by the manufacturer and whose primary job description is to assist, inspect and approve membrane installations for the manufacturer.
- C. Provide observation reports from the Manufacturer's Representative indicating procedures followed, weather conditions and any discrepancies found during inspection.
- D. Provide a final report from the Manufacturer's Representative, certifying that the roofing system has been satisfactorily installed according to the project specifications, approved details and good general roofing practice.

END OF SECTION 071326

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SECTION **075630.1** – FLUID APPLIED BUILT UP ROOFING RESTORATION

PART 1 - GENERAL

1.1 SUMMARY:

- A. Section Includes:
 - 1. Built-Up Smooth or Mineral Modified Surface Roof Restoration
 - 2. Accessories

1.2 Related Sections:

- A. Section 016400 – Owner Furnished Materials
- B. Section 061000 - Rough Carpentry: Roof blocking installation requirements.
- C. Section 076200 - Flashing and Sheet Metal: Metal cap flashing and expansion joints.
- D. Section 076200 - Flashing and Sheet Metal: Weather protection for base flashings.
- E. Section 077100 - Roof Specialties: Counter flashing gravel stops, and fascia, scuppers, gutters and downspouts.

1.3 REFERENCES

- A. ASTM C 92 - Standard Test Methods for Sieve Analysis and Water Content of Refractory Materials
- B. ASTM C 920 - Standard Specification for Elastomeric Joint Sealants.
- C. ASTM D 75 - Standard Practice for Sampling Aggregates.
- D. ASTM D 93 – Standard Test Methods for Flash Point by Pensky-Martens Closed Cup Tester.
- E. ASTM D 412 – Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-Tension.
- F. ASTM D 624 – Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers.
- G. ASTM D 1863 – Standard Specification for Mineral Aggregate Used on Built-Up Roofs.
- H. ASTM D 3960 – Standard Practice for Determining Volatile Organic Compound (VOC) Content of Paints and Related Coatings.
- I. ASTM D 5147 – Standard Test Methods for Sampling and Testing Modified Bituminous Sheet Material.

1.4 SYSTEM DESCRIPTION

- A. Built-up or Mineral Modified Surface Restoration: Renovation work includes:
 - 1. For Gravel surfaced systems topcoat entire roof surface and resurface entire roof surface with gravel while it is wet.

1.5 SUBMITTALS

- A. Submit under provisions of Section 013300.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.

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3. Installation methods.
 - C. Shop Drawings: Submit shop drawings including installation details of roofing, flashing, fastening, insulation and vapor barrier, including notation of roof slopes and fastening patterns of insulation and base modified bitumen membrane, prior to job start.
 - D. Warranty Samples: Provide sample copy of specified manufacturer's warranty. Provide sample copy of contractor warranty.
 - E. Manufacturer's Certificates: Certify products meet or exceed specified requirements.
 - F. Closeout Submittals: Provide manufacturer's maintenance instructions that include recommendations for periodic inspection and maintenance of all completed roofing work. Provide product warranty executed by the manufacturer. Assist Owner in preparation and submittal of roof installation acceptance certification as may be necessary in connection with fire and extended coverage insurance on roofing and associated work.
- 1.6 QUALITY ASSURANCE
- A. Perform Work in accordance with NRCA Roofing and Waterproofing Manual.
 - B. Manufacturer Qualifications: Manufacturer: Company specializing in manufacturing products specified in this section with documented ISO 9001 certification and minimum twelve years and experience.
 - C. Installer Qualifications: Company specializing in performing Work of this section with minimum five years documented experience and a certified Pre-Approved Garland Contractor.
 - D. Installer's Field Supervision: Maintain a full-time Supervisor/Foreman on job site during all phases of roofing work while roofing work is in progress.
 - E. Product Certification: Provide manufacturer's certification that materials are manufactured in the United States and conform to requirements specified herein, are chemically and physically compatible with each other, and are suitable for inclusion within the total roof system specified herein.
 - F. Source Limitations: Obtain all components of roof system from a single manufacturer. Secondary products that are required shall be recommended and approved in writing by the roofing system Manufacturer. Upon request of the Architect or Owner, submit Manufacturer's written approval of secondary components in list form, signed by an authorized agent of the Manufacturer.
- 1.7 PRE-INSTALLATION CONFERENCE
- A. Convene a pre-roofing conference approximately two weeks before scheduled commencement of roofing system installation and associated work.
 - B. Require attendance of installers of deck or substrate construction to receive roofing, installers of rooftop units and other work in and around roofing which must precede or follow roofing work including mechanical work, Architect, Owner, roofing system manufacturer's representative.
 - C. Objectives include:
 1. Review foreseeable methods and procedures related to roofing work, including set up and mobilization areas for stored material and work area.
 2. Tour representative areas of roofing substrates, inspect and discuss condition of substrate, roof drains, curbs, penetrations and other preparatory work.
 3. Review structural loading limitations of deck and inspect deck for loss of flatness and for required attachment.

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4. Review roofing system requirements, Drawings, Specifications and other Contract Documents.
5. Review and finalize schedule related to roofing work and verify availability of materials, installer's personnel, equipment and facilities needed to make progress and avoid delays.
6. Review required inspection, testing, certifying procedures.
7. Review weather and forecasted weather conditions and procedures for coping with unfavorable conditions, including possibility of temporary roofing.
8. Record conference including decisions and agreements reached. Furnish a copy of records to each party attending.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store products in manufacturer's unopened packaging with labels intact until ready for installation.
- B. Store all roofing materials in a dry place, on pallets or raised platforms, out of direct exposure to the elements until time of application. Store materials at least 4 inches above ground level and covered with "breathable" tarpaulins.
- C. Stored in accordance with the instructions of the manufacturer prior to their application or installation. Store roll goods on end on a clean flat surface. No wet or damaged materials will be used in the application.
- D. Store at room temperature wherever possible, until immediately prior to installing the roll. During winter, store materials in a heated location with a 50 degree F (10 degree C) minimum temperature, removed only as needed for immediate use. Keep materials away from open flame or welding sparks.
- E. Avoid stockpiling of materials on roofs without first obtaining acceptance from the Architect/Engineer.
- F. Adhesive storage shall be between the range of above 50 degree F (10 degree C) and below 80 degree F (27 degree C). Area of storage shall be constructed for flammable storage.

1.9 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.
- B. Weather Condition Limitations: Do not apply roofing system during inclement weather or when a 40 percent chance of precipitation or greater is expected.
- C. Proceed with roofing work only when existing and forecasted weather conditions will permit unit of work to be installed in accordance with manufacturer's recommendations and warranty requirements.
- D. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed during same day.
- E. When applying materials with spray equipment, take precautions to prevent over spray and/or solvents from damaging or defacing surrounding walls, building surfaces, vehicles or other property. Care should be taken to do the following:
 1. Close air intakes into the building.
 2. Have a dry chemical fire extinguisher available at the jobsite.
 3. Post and enforce "No Smoking" signs.
 4. Post and enforce "No Parking" signs where applicable.

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- F. Avoid inhaling spray mist; take precautions to ensure adequate ventilation.
- G. Protect completed roof sections from foot traffic for a period of at least 48 hours at 75 degrees F (24 degrees C) and 50 percent relative humidity or until fully cured.
- H. Take precautions to ensure that materials do not freeze.
- I. Minimum temperature for application is 40 degrees F (4 degrees C) and rising for solvent based materials and 50 degrees F (10 degrees C) and rising for water based.

1.10 WARRANTY

- A. Upon completion of the work, provide the Manufacturer's written and signed limited labor and materials Warranty, warranting that, if a leak develops in the roof during the term of this warranty, due either to defective material or defective workmanship by the installing contractor, the manufacturer shall provide the Owner, at the Manufacturer's expense, with the labor and material necessary to return the defective area to a watertight condition.
 - 1. Warranty Period:
 - a. 5 plus 5 (10 years): 5 years from date of acceptance plus 5 additional years after required inspection by Garland.
- B. Installer is to guarantee all work against defects in materials and workmanship for a period indicated following final acceptance of the Work.
 - 1. Warranty Period:
 - a. 2 years from date of acceptance.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis of Design: Garland Company, Inc. (The); 3800 E. 91st St., Cleveland, OH 44105. ASD. Toll Free: 800-321-9336. Phone: 216-641-7500. Fax: 216-641-0633. Web Site: www.garlandco.com
- B. Requests for substitutions will be considered in accordance with provisions of Section 01600.
- C. The Products specified are intended and the Standard of Quality for the products required for this project. If other products are proposed the bidder must disclose in the bid the manufacturer and the products that they intend to use on the Project. If no manufacturer and products are listed, the bid may be accepted only with the use of products specified.
 - 1. Bidder will not be allowed to change materials after the bid opening date.
 - 2. If alternate products are included in the bid, the products must be equal to or exceed the products specified. Supporting technical data shall be submitted to the Architect/ Owner for approval prior to acceptance.
 - 3. In making a request for substitution, the Bidder/Roofing Contractor represents that it has:
 - a. Personally investigated the proposed product or method, and determined that it is equal or superior in all respects to that specified.
 - b. Will provide the same guarantee for substitution as for the product and method specified.
 - c. Will coordinate installation of accepted substitution in work, making such changes as may be required for work to be completed in all respects.
 - d. Will waive all claims for additional cost related to substitution, which

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- e. consequently become apparent.
 - e. Cost data is complete and includes all related cost under his/her contract or other contracts, which may be affected by the substitution.
 - f. Will reimburse the Owner for all redesign cost by the Architect for accommodation of the substitution.
4. Architect/ Owner reserves the right to be the final authority on the acceptance or rejection of any or all bids, proposed alternate roofing systems or materials that has met ALL specified requirement criteria.
 5. Failure to submit substitution package, or any portion thereof requested, will result in immediate disqualification and consideration for that particular contractor's request for manufacturer substitution.
- 2.2 ROOF RESTORATION SYSTEM FOR BUILT-UP OR MINERAL MODIFIED SURFACE ROOFS
- A. White-Star:
 1. Primer: Garla-Block Primer (field), Garla Prime (Metal)
 2. Coating: White-Star.
 3. Flashing: HPR Torch Base, Stressply IV Plus Mineral.
 4. Reinforcement: White-Star base coat on all seams, penetrations and end laps
 5. Surfacing: Gravel ASTM D 1863.
- 2.3 ACCESSORIES
- A. Urethane Sealant - Tuff-Stuff: One part, non-sag sealant as approved and furnished by the membrane manufacturer for moving joints.
 1. Tensile Strength, ASTM D 412: 250 psi
 2. Elongation, ASTM D 412: 950%
 3. Hardness, Shore A ASTM C 920: 35
 4. Adhesion-in-Peel, ASTM C 92: 30 pli
 - B. DuraBlock conduit supports
- 2.4 EDGE TREATMENT AND ROOF PENETRATION FLASHINGS
- A. Flashing Boot - Rubbertite Flashing Boot: Neoprene pipe boot for sealing single or multiple pipe penetrations adhered in approved adhesives as recommended and furnished by the membrane manufacturer.
 - B. Vents and Breathers: Heavy gauge aluminum and fully insulated vent that allows moisture and air to escape but not enter the roof system as recommended and furnished by the membrane manufacturer.
 - C. Pitch pans, Rain Collar 24 gauge stainless or 20oz (567gram) copper. All joints should be welded/soldered watertight. See details for design.
 - D. Drain Flashings should be 4lb (1.8kg) sheet lead formed and rolled.
 - E. Plumbing stacks should be commercial innovations ZincJak zinc jacks formed and rolled.

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- F. Liquid Flashing - Tuff-Flash: An asphaltic-polyurethane, low odor, liquid flashing material designed for specialized details unable to be waterproofed with typical modified membrane flashings.
 - 1. Tensile Strength, ASTM D 412: 400 psi
 - 2. Elongation, ASTM D 412: 300%
 - 3. Density @77 degrees F 8.5 lb/gal typical
- G. Fabricated Flashings: Fabricated flashings and trim are specified in Section 076200.
- H. Fabricated flashings and trim shall conform to the detail requirements of SMACNA "Architectural Sheet Metal Manual" and/or the CDA Copper Development Association "Copper in Architecture - Handbook" as applicable.
- I. Manufactured Roof Specialties: Manufactured copings, fascia, gravel stops, control joints, expansion joints, joint covers and related flashings and trim are specified in Section 077100.
 - 1. Manufactured roof specialties shall conform to the detail requirements of SMACNA "Architectural Sheet Metal Manual" and/or the NRCA "Roofing and Waterproofing Manual" as applicable.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. Verify that work penetrating the roof deck, or which may otherwise affect the roofing, has been properly completed.
- C. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 ROOF PREPARATION AND REPAIR

- A. General:
 - 1. Remove existing roof flashings from curbs and parapet walls down to the surface of the roof. Remove existing flashings at roof drains and roof penetrations. Remove perimeter edge
 - 2. Remove all wet, deteriorated, blistered or delaminated roofing membrane or insulation and fill in any low spots occurring as a result of removal work to create a smooth, even surface for application of new roof membranes.
 - 3. Install new wood nailers as necessary to accommodate insulation/recovery board or new nailing patterns.
 - 4. When mechanically attached, the fastening pattern for the insulation/recovery board shall be as recommended by the specific product manufacturer.
 - 5. Re-roofing over coal tar pitch requires a mechanically attached recovery board or insulation and a base sheet prior to the application of roofing system.
 - 6. Existing roof surfaces shall be primed as necessary and allowed to dry prior to installing the roofing system.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

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- C. Repair all defects such as deteriorated roof decks; replace saturated insulation board, replace loose or brittle membrane or membrane flashings. Verify that existing conditions meet the following requirements:
 - 1. Existing membrane is either fully adhered or that the membranes mechanical fasteners are secured and functional.
 - 2. Application of roofing materials over a brittle roof membrane is not recommended.
- D. Remove all loose dirt, gravel and foreign debris from the roof surface. Do not damage roof membrane in cleaning process.
- E. Clean and seal all parapet walls, gutters and coping caps, and repair any damaged metal where necessary. Seal watertight all fasteners, pipes, drains, vents, joints and penetrations where water could enter the building envelope with Tuff-Flash liquid flashing
- F. Clean the entire roof surface by removing all dirt, algae, paint, oil, talc, rust or foreign substance. Use a 10 percent solution of TSP (tri-sodium phosphate), Simple Green and warm water. Pressure wash entire roof surface and scrub heavily soiled areas with a brush. Rinse with fresh water to remove all TSP solution. Allow roof to dry thoroughly before continuing.
- G. Repair existing roof membrane as necessary to provide a sound substrate for the liquid membrane. All surface defects (cracks, blisters, tears) must be repaired with similar materials.
- H. Pre-Treatment of Known Growth - General Surfaces: Once areas of moss, mold, algae and other fungal growths or vegetation have been removed and surfaces have also been thoroughly cleaned, apply a biocide wash at a maximum spread rate of 0.2 gallons/square (0.08 liters/m), to guard against subsequent infection. Allow to dry onto absorbent surfaces before continuing with the application. On non-absorbent surfaces, allow to react before thoroughly rinsing to remove all traces of the solution.
- I. Prime entire roof surface with Garla-Block primer at ½ gallon per 100 square feet of roofing area.

3.3 INSTALLATION

- A. General Installation Requirements:
 - 1. Install in accordance with manufacturer's instructions. Apply to minimum coating thickness required by the manufacturer.
 - 2. Cooperate with manufacturer, inspection and test agencies engaged or required to perform services in connection with installing the roof system.
 - 3. Insurance/Code Compliance: Where required by code, install and test the roofing system to comply with governing regulation and specified insurance requirements.
 - 4. Protect work from spillage of roofing materials and prevent materials from entering or clogging drains and conductors. Replace or restore work damaged by installation of the roofing system.
 - 5. All primers must be top coated within 24 hours of application. Re-prime If more time passes after priming.
 - 6. Keep roofing materials dry during application. Phased construction can be allowed as long as no, more than 7 days pass between coats excluding primers.
 - 7. Coordinate counter flashing, cap flashings, expansion joints and similar work with work specified in other Sections under Related Work.
 - 8. Coordinate roof accessories and miscellaneous sheet metal accessory items, including piping vents and other devices with work specified in other Sections under Related Work.
- B. Built Up Roof Restoration: Renovation work includes:

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1. Surface preparation: Remove all loose roofing gravel, dirt and foreign debris from the roof surface.
2. Flashing:
 - a. Fascia Edges: Cut back edges, prime, cover with membrane and coat.
 - b. Parapets and Vertical Surfaces: Prepare parapet walls and vertical surfaces where indicated on the Drawings, with asphalt primer. Allow primer to dry tack free. Apply flashing plies as follows:
 - (1) With torch applied membrane using modified membrane as the flashing and nailed 8 inches O.C. at all vertical surfaces.
 - (2) Solidly adhere flashing membrane to substrate and nail using termination bar.
 - (3) Seal all vertical laps of flashing membrane with a three-course application of KEE-Loc Mastic and Garmesh fiberglass mesh
 - (4) Seal junction of flashing membrane and roof with a three-course application of KEE-Loc and mesh.
 - c. Metal Flashings: Repair/Replace metal flashings, pitch pockets, etc.
3. Primer: Prime entire roof surface at 1/2 gallon per 100 SF.
4. Coating: Apply Coating to entire roof surface.
 - a. Apply White-Star base coat at 2.0 gallons per 100 SF at a minimum of 8" over all seams, end laps, penetrations and flashings
 - b. Apply White-Star top coat at 2.0 gallons per 100 SF over entire roofing area
5. Surfacing: For gravel surfaced systems topcoat entire roof surface and resurface entire roof surface with gravel while it is wet.

3.4 INSTALLATION EDGE TREATMENT AND ROOF PENETRATION FLASHING

- A. Fabricated Flashings: Fabricated flashings and trim are provided as specified in Section 07620.
 1. Fabricated flashings and trim shall conform to the detail requirements of SMACNA "Architectural Sheet Metal Manual" and/or the Copper Development Association "Copper in Architecture - Handbook" as applicable.
- B. Manufactured Roof Specialties: Manufactured copings, fascia, gravel stops, control joints, expansion joints, joint covers and related flashings and trim are provided as specified in Section 077100.
 1. Manufactured roof specialties shall conform to the detail requirements of SMACNA "Architectural Sheet Metal Manual" and/or the National Roofing Contractor's Association "Roofing and Waterproofing Manual" as applicable.
- C. Perimeter Edge:
 1. Cut and remove roofing membrane over metal gravel stop flange at 4" from metal edge. Completely abrade metal and apply Garla-Prime asphalt primer at a rate of 100 square feet per gallon and allow to fully cure. Membrane must be primed where the new torch-applied membrane will be adhered to the existing system.
 2. Replace all damaged metal with continuous cleat and set in bed of Garla-Flex mastic. Fasten flange to deck at 3" on center. Install edge metal to match existing
 3. Install one ply HPR torch-base at a minimum 8" from perimeter edge
 4. Install one ply Stressply IV Plus torch-applied membrane at 12" minimum from perimeter edge. Seal outside edge with Green-Lock structural adhesive
- D. Liquid Flashing:

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1. Mask target area on roof membrane with tape.
2. Clean all non-porous areas with isopropyl alcohol.
3. Apply 32 wet mil base coat of liquid flashing over masked area.
4. Embed polyester reinforcement fabric into the base coat of the liquid flashing.
5. Apply 48-64 wet mil top coat of the liquid flashing material over the fabric extending 2 inches (51 mm) past the scrim in all directions.
6. Apply minerals immediately or allow the liquid flashing material to cure 15-30 days and then install reflective coating.

3.5 CLEANING

- A. Clean-up and remove daily from the site all wrappings, empty containers, paper, loose particles and other debris resulting from these operations.
- B. Remove asphalt markings from finished surfaces.
- C. Repair or replace defaced or disfigured finishes caused by Work of this section.

3.6 PROTECTION

- A. Provide traffic ways, erect barriers, fences, guards, rails, enclosures, chutes and the like to protect personnel, roofs and structures, vehicles and utilities.
- B. Protect exposed surfaces of finished walls with tarps to prevent damage.
- C. Plywood for traffic ways required for material movement over existing roofs shall be not less than 5/8 inch (16 mm) thick.
- D. In addition to the plywood listed above, an underlayment of minimum 1/2 inch (13 mm) recover board is required on new roofing.
- E. Special permission shall be obtained from the Manufacturer before any traffic shall be permitted over new roofing.

3.7 FIELD QUALITY CONTROL

- A. Require attendance of roofing materials manufacturers' representatives at site during installation of the roofing system daily.
- B. Perform field inspection and testing as required under provisions of Section 014100.
- C. Correct defects or irregularities discovered during field inspection.

3.8 FINAL INSPECTION

- A. At completion of roofing installation and associated work, meet with Contractor, Architect, installer, installer of associated work, roofing system manufacturer's representative and others directly concerned with performance of roofing system.

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- B. Walk roof surface areas, inspect perimeter building edges as well as flashing of roof penetrations, walls, curbs and other equipment. Identify all items requiring correction or completion and furnish copy of list to each party in attendance.
- C. If core cuts verify the presence of damp or wet materials, the installer shall be required to replace the damaged areas at his own expense.
- D. Repair or replace deteriorated or defective work found at time above inspection as required to produce an installation that is free of damage and deterioration at time of Substantial Completion and according to warranty requirements.
- E. Architect upon completion of corrections.
- F. Following the final inspection, provide written notice of acceptance of the installation from the roofing system manufacturer.

3.9 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

3.10 SCHEDULES

A. Flashing Base (Ply) Sheet:

- 1. HPR Torch Base: 110 mil SBS (Styrene-Butadiene-Styrene) rubber modified roofing base sheet reinforced with a fiberglass scrim. Designed for torch applications with a burn-off backer that indicates when the material is hot enough to be installed.
 - a. Tensile Strength, ASTM D 5147
 - (1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 210 lbf/in XD 210 lbf/in
 - (2) 50 mm/min. @ 23 +/- 2 deg. C MD 36.75 kN/m XD 36.75 kN/m
 - b. Tear Strength, ASTM D 5147
 - (1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 300 lbf XD 300 lbf
 - (2) 50 mm/min. @ 23 +/- 2 deg. C MD 1,334 N XD 1,334 N
 - c. Elongation at Maximum Tensile, ASTM D 5147
 - (1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 6% XD 6%
 - (2) 50 mm/min. @ 23 +/- 2 deg. C MD 6% XD 6%
 - d. Low Temperature Flexibility, ASTM D5147, Passes -30 deg. F (-34.4 deg. C)

B. Flashing Modified Cap (Ply) Sheet:

- 1. StressPly IV Plus: 180 mil SBS (Styrene-Butadiene-Styrene) rubber modified roofing membrane reinforced with a fiberglass and polyester composite scrim. This membrane is designed for torch applications and has a burn-off backer that indicates when the material is hot enough to be installed.
 - a. Tensile Strength, ASTM D 5147
 - (1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 310 lbf/in XD 310 lbf/in
 - (2) 50 mm/min. @ 23 +/- 2 deg. C MD 54.25 kN/m XD 54.25 kN/m
 - b. Tear Strength, ASTM D 5147
 - (1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 510 lbf XD 510 lbf
 - (2) 50 mm/min. @ 23 +/- 2 deg. C MD 2269 N XD 2269 N
 - c. Elongation at Maximum Tensile, ASTM D 5147
 - (1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 9% XD 8%

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- (2) 50 mm/min. @ 23 +/- 2 deg. C MD 9% XD 8%
- d. Low Temperature Flexibility, ASTM D 5147, Passes -40 deg. F (-40 deg. C)
- C. Primers:
 - 1. Garla-Block Primer: copolymer sealant that prevent staining and degradation of surface coatings when installed over smooth or granulated asphalt, coal tar modified bitumen, or smooth asphalt BUR membranes.
 - a. Non-Volatile Solids % by Weight, ASTM 3960: 28-32 %
 - b. Non-Volatile Solids % by Volume, ASTM 3960: 25-28 %
 - c. pH: 8-10
 - d. Wet Film Thickness @ 1 gal./100 sq. ft.: 16 mils (microns 406.4)
 - e. Flash Point PMCC: None
 - f. Drying Time, Touch @ 70 degrees F (21.1 degrees C) /50% R.H.: 1-2 hrs.
 - g. Viscosity @ 77 degrees F (25 degrees C) Brookfield RVT, #4 Spindle; 20 rpm, ASTM 2196: 3000-5000 cPs
 - h. VOC: 30 g/l max
- D. Coatings:
 - 1. Coating: White-Star: single-component, aliphatic, polyurea, liquid adhesive. White-Star combined with white marble roofing aggregate, or white reflective roofing minerals meets California's Title 24 Energy Efficiency Standards.
 - a. Tensile Strength, ASTM D 412: 2300-2600 psi
 - b. Tear Resistance, ASTM D 624: 230-280 lbs./in.
 - c. Elongation, ASTM D 412: 250-300%
 - d. Density @ 77 degrees F (25 degrees C), ASTM D 2939: 10.14 lbs./gal (.984 g/cm³)
 - e. Flash Point, ASTM D 93: 120 degrees F (48 degrees C) min.
 - f. Non-Volatile, ASTM D 75: Typical 89%
 - g. Viscosity @ 77 degrees F (25 degrees C); 20 rpm, ASTM D 2196) Brookfield RVT, #4 Spindle: 3500-5000 cP
 - h. Wet Film Thickness: New Flood Coat @ 2 gal.: 32 mils
- E. Surfacing:
 - 1. Surfacing: Gravel ASTM D 1863:
 - a. White Pea gravel.

End of Section

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SECTION 075630.2 – FLUID APPLIED METAL ROOFING RESTORATION

PART 1 - GENERAL

1.1 SUMMARY:

- A. Section Includes:
 - 1. Metal Surface Roof Restoration
 - 2. Accessories

1.2 Related Sections:

- A. Section 016400 – Owner Furnished Materials
- B. Section 061000 - Rough Carpentry: Roof blocking installation requirements.
- C. Section 076200 - Flashing and Sheet Metal: Metal cap flashing and expansion joints.
- D. Section 076200 - Flashing and Sheet Metal: Weather protection for base flashings.
- E. Section 077100 - Roof Specialties: Counter flashing gravel stops, and fascia, scuppers, gutters and downspouts.

1.3 REFERENCES

- A. ASTM C 920 - Standard Specification for Elastomeric Joint Sealants.
- B. ASTM D 75 - Standard Practice for Sampling Aggregates.
- C. ASTM D 92 - Standard Test Method for Flash and Fire Points by Cleveland Open Cup Tester.
- D. ASTM D 93 - Standard Test Methods for Flash Point by Pensky-Martens Closed Cup Tester.
- E. ASTM D 412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers-Tension.
- F. ASTM D 562 - Standard Test Method for Consistency of Paints Measuring Krebs Unit (KU) Viscosity Using a Stormer-Type Viscometer.
- G. ASTM D 624 - Standard Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers
- H. ASTM D 816 - Standard Test Methods for Rubber Cements.
- I. ASTM D 1002 - Standard Test Method for Apparent Shear Strength of Single-Lap-Joint Adhesively Bonded Metal Specimens by Tension Loading (Metal-to-Metal).
- J. ASTM D 1370 - Standard Test Method for Contact Compatibility Between Asphaltic Materials (Oliensis Test).
- K. ASTM D 1475 - Standard Test Method For Density of Liquid Coatings, Inks, and Related Products.
- L. ASTM D 2196 - Standard Test Methods for Rheological Properties of Non-Newtonian Materials by Rotational (Brookfield type) Viscometer.
- M. ASTM D 2240 - Standard Test Method for Rubber Property-Durometer Hardness.
- N. ASTM D 2369 - Standard Test Method for Volatile Content of Coatings.
- O. ASTM D 2939 - Standard Test Methods for Emulsified Bitumens Used as Protective Coatings.
- P. ASTM D 3960 - Standard Practice for Determining Volatile Organic Compound (VOC) Content of Paints and Related Coatings.
- Q. ASTM D 4209 - Standard Practice for Determining Volatile and Nonvolatile Content of Cellulosics, Emulsions, Resin Solutions, Shellac, and Varnishes.
- R. ASTM D 4212 - Standard Test Method for Viscosity by Dip-Type Viscosity Cups.

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- S. ASTM D 4402 - Standard Test Method for Viscosity Determination of Asphalt at Elevated Temperatures Using a Rotational Viscometer.
- T. ASTM D 5040 - Standard Test Methods for Ash Content of Adhesives.
- U. ASTM D 5420 - Standard Test Method for Impact Resistance of Flat, Rigid Plastic Specimen by Means of a Striker Impacted by a Falling Weight (Gardner Impact).
- V. ASTM E 1980 - Standard Practice for Calculating Solar Reflectance Index of Horizontal and Low-Sloped Opaque Surfaces
- W. ASTM G 21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi.
- X. SRI - Solar Reflectance Index calculated according to ASTM E 1980.
- Y. South Coast AQMD Standards.
- Z. SMACNA Architectural Sheet Metal Manual.
- AA. ANSI/SPRI ES-1 - Testing and Certification Listing of Shop Fabricated Edge Metal
- BB. National Roofing Contractors Association (NRCA) - Roofing and Waterproofing Manual.

1.4 SYSTEM DESCRIPTION

- A. Metal Surface Roof Restoration: Renovation work includes:
 - 1. Surface preparation: Remove loose flaking rust, dust, dirt, debris, secure all gaped panels and replace all loose fasteners with next size larger. Remove all existing mastics. Pressure wash entire roof surface
 - 2. Metal Flashings: Repair/Replace metal flashings, pitch pockets, etc.
 - 3. Primer: Prime entire roof surface.

1.5 SUBMITTALS

- A. Submit under provisions of Section 013300.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation methods.
- C. Shop Drawings: Submit shop drawings including installation details of roofing, flashing, fastening, insulation and vapor barrier, including notation of roof slopes and fastening patterns of insulation and base modified bitumen membrane, prior to job start.
- D. Warranty Samples: Provide sample copy of specified manufacturer's warranty. Provide sample copy of contractor warranty.
- E. Manufacturer's Certificates: Certify products meet or exceed specified requirements.
- F. Closeout Submittals: Provide manufacturer's maintenance instructions that include recommendations for periodic inspection and maintenance of all completed roofing work. Provide product warranty executed by the manufacturer. Assist Owner in preparation and submittal of roof installation acceptance certification as may be necessary in connection with fire and extended coverage insurance on roofing and associated work.

1.6 QUALITY ASSURANCE

- A. Perform Work in accordance with NRCA Roofing and Waterproofing Manual.
- B. Manufacturer Qualifications: Manufacturer: Company specializing in manufacturing products specified in this section with documented ISO 9001 certification and minimum twelve years and experience.

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- C. Installer Qualifications: Company specializing in performing Work of this section with minimum five years documented experience and a certified Pre-Approved Garland Contractor.
- D. Installer's Field Supervision: Maintain a full-time Supervisor/Foreman on job site during all phases of roofing work while roofing work is in progress.
- E. Product Certification: Provide manufacturer's certification that materials are manufactured in the United States and conform to requirements specified herein, are chemically and physically compatible with each other, and are suitable for inclusion within the total roof system specified herein.
- F. Source Limitations: Obtain all components of roof system from a single manufacturer. Secondary products that are required shall be recommended and approved in writing by the roofing system Manufacturer. Upon request of the Architect or Owner, submit Manufacturer's written approval of secondary components in list form, signed by an authorized agent of the Manufacturer.

1.7 PRE-INSTALLATION CONFERENCE

- A. Convene a pre-roofing conference approximately two weeks before scheduled commencement of roofing system installation and associated work.
- B. Require attendance of installers of deck or substrate construction to receive roofing, installers of rooftop units and other work in and around roofing which must precede or follow roofing work including mechanical work, Architect, Owner, roofing system manufacturer's representative.
- C. Objectives include:
 - 1. Review foreseeable methods and procedures related to roofing work, including set up and mobilization areas for stored material and work area.
 - 2. Tour representative areas of roofing substrates, inspect and discuss condition of substrate, roof drains, curbs, penetrations and other preparatory work.
 - 3. Review structural loading limitations of deck and inspect deck for loss of flatness and for required attachment.
 - 4. Review roofing system requirements, Drawings, Specifications and other Contract Documents.
 - 5. Review and finalize schedule related to roofing work and verify availability of materials, installer's personnel, equipment and facilities needed to make progress and avoid delays.
 - 6. Review required inspection, testing, certifying procedures.
 - 7. Review weather and forecasted weather conditions and procedures for coping with unfavorable conditions, including possibility of temporary roofing.
 - 8. Record conference including decisions and agreements reached. Furnish a copy of records to each party attending.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store products in manufacturer's unopened packaging with labels intact until ready for installation.
- B. Store all roofing materials in a dry place, on pallets or raised platforms, out of direct exposure to the elements until time of application. Store materials at least 4 inches above ground level and covered with "breathable" tarpaulins.

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- C. Stored in accordance with the instructions of the manufacturer prior to their application or installation. Store roll goods on end on a clean flat surface. No wet or damaged materials will be used in the application.
- D. Store at room temperature wherever possible, until immediately prior to installing the roll. During winter, store materials in a heated location with a 50 degree F (10 degree C) minimum temperature, removed only as needed for immediate use. Keep materials away from open flame or welding sparks.
- E. Avoid stockpiling of materials on roofs without first obtaining acceptance from the Architect/Engineer.
- F. Adhesive storage shall be between the range of above 50 degree F (10 degree C) and below 80 degree F (27 degree C). Area of storage shall be constructed for flammable storage.

1.9 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.
- B. Weather Condition Limitations: Do not apply roofing system during inclement weather or when a 40 percent chance of precipitation or greater is expected.
- C. Proceed with roofing work only when existing and forecasted weather conditions will permit unit of work to be installed in accordance with manufacturer's recommendations and warranty requirements.
- D. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed during same day.
- E. When applying materials with spray equipment, take precautions to prevent over spray and/or solvents from damaging or defacing surrounding walls, building surfaces, vehicles or other property. Care should be taken to do the following:
 - 1. Close air intakes into the building.
 - 2. Have a dry chemical fire extinguisher available at the jobsite.
 - 3. Post and enforce "No Smoking" signs.
 - 4. Post and enforce "No Parking" signs where applicable.
- F. Avoid inhaling spray mist; take precautions to ensure adequate ventilation.
- G. Protect completed roof sections from foot traffic for a period of at least 48 hours at 75 degrees F (24 degrees C) and 50 percent relative humidity or until fully cured.
- H. Take precautions to ensure that materials do not freeze.
- I. Minimum temperature for application is 40 degrees F (4 degrees C) and rising for solvent based materials and 50 degrees F (10 degrees C) and rising for water based.

1.10 WARRANTY

- A. Upon completion of the work, provide the Manufacturer's written and signed limited labor and materials Warranty, warranting that, if a leak develops in the roof during the term of this warranty, due either to defective material or defective workmanship by the installing contractor, the manufacturer shall provide the Owner, at the Manufacturer's expense, with the labor and material necessary to return the defective area to a watertight condition.
 - 1. Warranty Period:
 - a. 5 plus 5 (10 years): 5 years from date of acceptance plus 5 additional years after required inspection by Garland.

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- B. Installer is to guarantee all work against defects in materials and workmanship for a period indicated following final acceptance of the Work.
 - 1. Warranty Period:
 - a. 2 years from date of acceptance.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis of Design: Garland Company, Inc. (The); 3800 E. 91st St., Cleveland, OH 44105. ASD. Toll Free: 800-321-9336. Phone: 216-641-7500. Fax: 216-641-0633. Web Site: www.garlandco.com
- B. Requests for substitutions will be considered in accordance with provisions of Section 01600.
- C. The Products specified are intended and the Standard of Quality for the products required for this project. If other products are proposed the bidder must disclose in the bid the manufacturer and the products that they intend to use on the Project. If no manufacturer and products are listed, the bid may be accepted only with the use of products specified.
 - 1. Bidder will not be allowed to change materials after the bid opening date.
 - 2. If alternate products are included in the bid, the products must be equal to or exceed the products specified. Supporting technical data shall be submitted to the Architect/ Owner for approval prior to acceptance.
 - 3. In making a request for substitution, the Bidder/Roofing Contractor represents that it has:
 - a. Personally investigated the proposed product or method, and determined that it is equal or superior in all respects to that specified.
 - b. Will provide the same guarantee for substitution as for the product and method specified.
 - c. Will coordinate installation of accepted substitution in work, making such changes as may be required for work to be completed in all respects.
 - d. Will waive all claims for additional cost related to substitution, which consequently become apparent.
 - e. Cost data is complete and includes all related cost under his/her contract or other contracts, which may be affected by the substitution.
 - f. Will reimburse the Owner for all redesign cost by the Architect for accommodation of the substitution.
 - 4. Architect/ Owner reserves the right to be the final authority on the acceptance or rejection of any or all bids, proposed alternate roofing systems or materials that has met ALL specified requirement criteria.
 - 5. Failure to submit substitution package, or any portion thereof requested, will result in immediate disqualification and consideration for that particular contractor's request for manufacturer substitution.

2.2 ROOF RESTORATION SYSTEM FOR BUILT-UP OR MINERAL MODIFIED SURFACE ROOFS

- A. Cold Applied White-Knight Plus WC:
 - 1. Primer: White-Knight Metal Primer

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2. Coating: White-Knight Plus WC:
3. Flashing: Repair as needed. Install flashing boot where needed. Coat all flashings at 2 gallons White-Knight Plus WC per 100 SF
4. Reinforcement: UniBond on all seams and apply base coat of White-Knight plus WC at 2 gallons per 100 SF
5. Surfacing: None

2.3 ACCESSORIES

- A. Urethane Sealant - Tuff-Stuff: One part, non-sag sealant as approved and furnished by the membrane manufacturer for moving joints.
 1. Tensile Strength, ASTM D 412: 250 psi
 2. Elongation, ASTM D 412: 950%
 3. Hardness, Shore A ASTM C 920: 35
 4. Adhesion-in-Peel, ASTM C 92: 30 pli
- B. DuraBlock conduit supports

2.4 EDGE TREATMENT AND ROOF PENETRATION FLASHINGS

- A. Flashing Boot - Rubbertite Flashing Boot: Neoprene pipe boot for sealing single or multiple pipe penetrations adhered in approved adhesives as recommended and furnished by the membrane manufacturer.
- B. Vents and Breathers: Heavy gauge aluminum and fully insulated vent that allows moisture and air to escape but not enter the roof system as recommended and furnished by the membrane manufacturer.
- C. Pitch pans, Rain Collar 24 gauge stainless or 20oz (567gram) copper. All joints should be welded/soldered watertight. See details for design.
- D. Drain Flashings should be 4lb (1.8kg) sheet lead formed and rolled.
- E. Plumbing stacks should be commercial innovations ZincJak zinc jacks formed and rolled.
- F. Liquid Flashing - Tuff-Flash: An asphaltic-polyurethane, low odor, liquid flashing material designed for specialized details unable to be waterproofed with typical modified membrane flashings.
 1. Tensile Strength, ASTM D 412: 400 psi
 2. Elongation, ASTM D 412: 300%
 3. Density @77 degrees F 8.5 lb/gal typical
- G. Fabricated Flashings: Fabricated flashings and trim are specified in Section 076200.
 1. Fabricated flashings and trim shall conform to the detail requirements of SMACNA "Architectural Sheet Metal Manual" and/or the CDA Copper Development Association "Copper in Architecture - Handbook" as applicable.
- H. Manufactured Roof Specialties: Manufactured copings, fascia, gravel stops, control joints, expansion joints, joint covers and related flashings and trim are specified in Section 077100.
 1. Manufactured roof specialties shall conform to the detail requirements of SMACNA "Architectural Sheet Metal Manual" and/or the NRCA "Roofing and Waterproofing Manual" as applicable.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. Verify that work penetrating the roof deck, or which may otherwise affect the roofing, has been properly completed.
- C. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 ROOF PREPARATION AND REPAIR

- A. General:
 - 1. Remove existing roof flashings from curbs and parapet walls down to the surface of the roof. Remove existing flashings at roof drains and roof penetrations. Remove perimeter edge
 - 2. Remove all wet, deteriorated, blistered or delaminated roofing membrane or insulation and fill in any low spots occurring as a result of removal work to create a smooth, even surface for application of new roof membranes.
 - 3. Install new wood nailers as necessary to accommodate insulation/recovery board or new nailing patterns.
 - 4. When mechanically attached, the fastening pattern for the insulation/recovery board shall be as recommended by the specific product manufacturer.
 - 5. Re-roofing over coal tar pitch requires a mechanically attached recovery board or insulation and a base sheet prior to the application of roofing system.
 - 6. Existing roof surfaces shall be primed as necessary and allowed to dry prior to installing the roofing system.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- C. Repair all defects such as deteriorated roof decks; replace saturated insulation board, replace loose or brittle membrane or membrane flashings. Verify that exiting conditions meet the following requirements:
 - 1. Existing membrane is either fully adhered or that the membranes mechanical fasteners are secured and functional.
 - 2. Application of roofing materials over a brittle roof membrane is not recommended.
- D. Remove all loose dirt, gravel and foreign debris from the roof surface. Do not damage roof membrane in cleaning process.
- E. Clean and seal all parapet walls, gutters and coping caps, and repair any damaged metal where necessary. Seal watertight all fasteners, pipes, drains, vents, joints and penetrations where water could enter the building envelope with Tuff-Flash liquid flashing
- F. Clean the entire roof surface by removing all dirt, algae, paint, oil, talc, rust or foreign substance. Use a 10 percent solution of TSP (tri-sodium phosphate), Simple Green and warm water. Pressure wash entire roof surface and scrub heavily soiled areas with a brush. Rinse with fresh water to remove all TSP solution. Allow roof to dry thoroughly before continuing.
- G. Repair existing roof membrane as necessary to provide a sound substrate for the liquid membrane. All surface defects (cracks, blisters, tears) must be repaired with similar materials.

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- H. Pre-Treatment of Known Growth - General Surfaces: Once areas of moss, mold, algae and other fungal growths or vegetation have been removed and surfaces have also been thoroughly cleaned, apply a biocide wash at a maximum spread rate of 0.2 gallons/square (0.08 liters/m), to guard against subsequent infection. Allow to dry onto absorbent surfaces before continuing with the application. On non-absorbent surfaces, allow to react before thoroughly rinsing to remove all traces of the solution.
- I. Power washing of metal roof surfaces to remove all loose rust or scale is mandatory before application. Use a high volume air broom or compressed air to remove residual dust rust perforations, etc. Deteriorated metal roof decks must be repaired or replaced prior to the application of the coating system.

3.3 INSTALLATION

- A. General Installation Requirements:
 - 1. Install in accordance with manufacturer's instructions. Apply to minimum coating thickness required by the manufacturer.
 - 2. Cooperate with manufacturer, inspection and test agencies engaged or required to perform services in connection with installing the roof system.
 - 3. Insurance/Code Compliance: Where required by code, install and test the roofing system to comply with governing regulation and specified insurance requirements.
 - 4. Protect work from spillage of roofing materials and prevent materials from entering or clogging drains and conductors. Replace or restore work damaged by installation of the roofing system.
 - 5. All primers must be top coated within 24 hours of application. Re-prime If more time passes after priming.
 - 6. Keep roofing materials dry during application. Phased construction can be allowed as long as no, more than 7 days pass between coats excluding primers.
 - 7. Coordinate counter flashing, cap flashings, expansion joints and similar work with work specified in other Sections under Related Work.
 - 8. Coordinate roof accessories and miscellaneous sheet metal accessory items, including piping vents and other devices with work specified in other Sections under Related Work.
- B. Metal Surface Roof Restoration: Renovation work includes:
 - 1. Surface Preparation: Remove loose flaking rust, dust, dirt, debris, secure all gaped panels and replace all loose fasteners with next size larger.
 - a. Remove rust by the most rigorous method suitable for the particular project and as approved by Garland.
 - b. Tighten all fasteners and verify that neoprene washers are in place.
 - c. Replace missing fasteners using oversize fasteners as necessary.
 - d. Seal all fastener heads by applying a heavy dab of Tuff-Stuff sealant to the tops and around of all fastener heads.
 - (1) White-Knight Plus WC
 - 2. Flashings: Repair/Replace metal flashings, pitch pockets, etc. Repair all voids in the metal panels by installing galvanized metal plate, butyl tape and rivets or fasteners with neoprene washers and then seal with appropriate reinforcement and coating
 - 3. Primer: White-Knight Metal Primer

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- a. Immediately after rust has been removed, prime surfaces with White-Knight Metal Primer/ Stallion Metal Primer at 1/2 gallon per 100 SF to prevent rust from reoccurring.
 - 4. Reinforcement: Base coat and treatment of field seams and around penetrations:
 - a. Application of White-Knight Plus Base Coat WC and UniBond reinforcement on field seams, flashings and around penetrations on roof and HVAC ducts
 - (1) Verify that the surface to be coated is properly prepared.
 - (2) Restore the surface to a suitable condition if roof surface becomes contaminated with dirt, dust or other materials that will interfere with adhesion of the coatings.
 - (3) Apply materials at specified dry film thickness.
 - (4) Use UniBond reinforcement on all seams, flashings and penetrations
 - (5) Apply White-Knight Plus WC Base Coat at minimum 8 inch wide stripes over all seams, flashings and around penetrations at 2.0 gallons per 100 SF.
 - (6) Allow to dry for a minimum of 24 hours before applying finish coats.
 - (7) On vertical surfaces to achieve proper application rate cut your application into two coats to avoid sagging and runs of coating.
 - 5. Coating:
 - a. Material: Apply in a uniform manner at 2.0 gallons per 100 SF over the entire roof surface and all HVAC ducts.
 - (1) White-Knight Plus WC
 - b. Use special attention to coating flashings and other critical areas to build adequate membrane thickness.
 - c. Use multiple coats on verticals to prevent sagging.
 - d. Apply to Garland's minimum membrane thickness over the entire roof surface.
- 3.4 INSTALLATION EDGE TREATMENT AND ROOF PENETRATION FLASHING
- A. Fabricated Flashings: Fabricated flashings and trim are provided as specified in Section 07620.
 - 1. Fabricated flashings and trim shall conform to the detail requirements of SMACNA "Architectural Sheet Metal Manual" and/or the Copper Development Association "Copper in Architecture - Handbook" as applicable.
 - B. Manufactured Roof Specialties: Manufactured copings, fascia, gravel stops, control joints, expansion joints, joint covers and related flashings and trim are provided as specified in Section 077100.
 - 1. Manufactured roof specialties shall conform to the detail requirements of SMACNA "Architectural Sheet Metal Manual" and/or the National Roofing Contractor's Association "Roofing and Waterproofing Manual" as applicable.
- 3.5 CLEANING
- A. Clean-up and remove daily from the site all wrappings, empty containers, paper, loose particles and other debris resulting from these operations.
 - B. Remove asphalt markings from finished surfaces.
 - C. Repair or replace defaced or disfigured finishes caused by Work of this section.

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3.6 PROTECTION

- A. Provide traffic ways, erect barriers, fences, guards, rails, enclosures, chutes and the like to protect personnel, roofs and structures, vehicles and utilities.
- B. Protect exposed surfaces of finished walls with tarps to prevent damage.
- C. Plywood for traffic ways required for material movement over existing roofs shall be not less than 5/8 inch (16 mm) thick.
- D. In addition to the plywood listed above, an underlayment of minimum 1/2 inch (13 mm) recover board is required on new roofing.
- E. Special permission shall be obtained from the Manufacturer before any traffic shall be permitted over new roofing.

3.7 FIELD QUALITY CONTROL

- A. Require attendance of roofing materials manufacturers' representatives at site during installation of the roofing system daily.
- B. Perform field inspection and testing as required under provisions of Section 014100.
- C. Correct defects or irregularities discovered during field inspection.

3.8 FINAL INSPECTION

- A. At completion of roofing installation and associated work, meet with Contractor, Architect, installer, installer of associated work, roofing system manufacturer's representative and others directly concerned with performance of roofing system.
- B. Walk roof surface areas, inspect perimeter building edges as well as flashing of roof penetrations, walls, curbs and other equipment. Identify all items requiring correction or completion and furnish copy of list to each party in attendance.
- C. If core cuts verify the presence of damp or wet materials, the installer shall be required to replace the damaged areas at his own expense.
- D. Repair or replace deteriorated or defective work found at time above inspection as required to produce an installation that is free of damage and deterioration at time of Substantial Completion and according to warranty requirements.
- E. Architect upon completion of corrections.
- F. Following the final inspection, provide written notice of acceptance of the installation from the roofing system manufacturer.

3.9 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

3.10 SCHEDULES

- A. Coatings:

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1. Coating: White-Knight Plus WC: highly reflective multi- purpose, single-component aliphatic urethane, liquid waterproofing membrane. VOC compliant and meets South Coast AQMD standards.
 - a. Tensile Strength: ASTM D 412, 2100 psi
 - b. Tear Resistance: ASTM D 624, 160 lbs./in
 - c. Elongation: ASTM D 412, 320%
 - d. Density @ 77 degrees F (25 degrees C, ASTM D 2939) 10.4 lb./gal (1.2 g/m³)
 - e. Flash Point: ASTM D 93, 110 degrees F min. (43 degrees C)
 - f. Non-Volatile: ASTM D 75, Typical 83%
 - g. Viscosity @ 77 degrees F (25 degrees C); Brookfield RVT, #4 Spindle 10 rpm 9200 cP
 - h. Wet Film Thickness @ 2 gal./100 sq. ft. (0.82 l/m²)
 - i. VOC: 50 g/l
 - j. Reflectance: 0.87
 - k. Emittance: 0.89
 - l. SRI: 110

- B. Flashings
 1. Flashings: White-Knight Plus WC: highly reflective multi- purpose, single-component aliphatic urethane, liquid waterproofing membrane. VOC compliant and meets South Coast AQMD standards.
 - a. Tensile Strength: ASTM D 412, 2100 psi
 - b. Tear Resistance: ASTM D 624, 160 lbs./in
 - c. Elongation: ASTM D 412, 320%
 - d. Density @ 77 degrees F (25 degrees C, ASTM D 2939) 10.4 lb./gal (1.2 g/m³)
 - e. Flash Point: ASTM D 93, 110 degrees F min. (43 degrees C)
 - f. Non-Volatile: ASTM D 75, Typical 83%
 - g. Viscosity @ 77 degrees F (25 degrees C); Brookfield RVT, #4 Spindle 10 rpm 9200 cP
 - h. Wet Film Thickness @ 2 gal./100 sq. ft. (0.82 l/m²)
 - i. VOC: 50 g/l
 - j. Reflectance: 0.87
 - k. Emittance: 0.89
 - l. SRI: 110

END OF SECTION

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SECTION **076200** - FLASHING AND SHEET METAL

PART 1 - GENERAL

1.1 SUMMARY:

- A. Section Includes: Sheet metal work including flashings, scuppers, counter flashings, and similar items.

1.2 REFERENCES

ASTM A 446-93 - Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, Structural (Physical) Quality

ASTM A 525-91b - Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process

ASTM B 32-93 - Solder Metal

ASTM C 1107-91a - Packaged Dry, Hydraulic-Cement Grout (Nonshrink)

ASTM D 41-85 - Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing

ASTM D 4586-93 - Asphalt Roof Cement, Asbestos-Free

NRCA – National Roofing Contractors Association “Roofing and Waterproofing Manual”

SMACNA - Architectural Sheet Metal Manual (Latest Edition)

1.3 SUBMITTALS

- A. Product Data: Submit manufacturer's product data, installation instructions and general recommendations for each standard factory fabricated product.
- B. Submittal procedures and quantities are specified in Section 013300.

1.1 QUALITY ASSURANCE

- A. Pre-application Conference: The sheet metal installer, as a part of the complete roofing system installation, shall participate in the pre-application conference as specified in Section 071326.

1.1 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Package and protect materials during shipment. Uncrate and inspect materials for damage, dampness, and wet-storage stains upon delivery to the job site. Remove from the site and replace damaged materials that cannot be restored to like-new condition.
- B. Storage: Store materials in dry, weather-tight, ventilated areas until immediately before installation.
- C. Handling: Handle sheet metal items to avoid damage to surfaces, edges, and ends.

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1.1 COORDINATING AND SCHEDULING

- A. Secure field measurements required for proper and adequate fabrication and installation of the work. Coordinate sheet metal work related to roofing work with the roofing installer.

PART 2 - PRODUCTS

2.1 GENERAL

- A. All materials to be provided in accordance with requirements of roofing manufacturer in order to maintain warranty requirements.

2.2 MATERIALS

- A. Galvanized Sheet Metal: ASTM A 653, coating designation G-90, in thickness of 22 gauge or 20 gauge, 36" to 48" by coil length, chemically treated, commercial or lock-forming quality.
- B. Aluminum: ASTM B 209, alloy 3105-H14
- C. Solder: ASTM B 32, 60-40 tin/lead solder with acid-chloride type flux, except use rosin flux over tinned surfaces.
- D. Fasteners: Same metal or a metal compatible with the items it contacts. Use stainless steel fasteners to fasten dissimilar materials. Provide compatible washers where required to protect surface of sheet metals and to provide a watertight connection.
 - 1. Nails: Use case-hardened concrete nails over concrete and roofing nails over wood, of required lengths. Where sheet metal is built in over roofing materials or other sheet metal, use nails with 1 inch tinned discs.
 - 2. Rivets: Tinned soft iron rivets to match color of surrounding flashing or sheet metal.
 - 3. Sheet Metal Screws: of proper size and material to suit conditions. Where wood nailers are provided, use galvanized or stainless steel wood screws as applicable.
 - 4. Plates: Coordinate size of plates and location with fastener manufacturer and roofing manufacturer. Material to be compatible with fastener and roofing.
- E. Metal Accessories: Provide sheet metal clips, straps, anchoring devices and similar accessory units as required for installation of work, matching or compatible with material being installed, noncorrosive.
- F. Reglet and Counter flashing Assemblies: Fabricate if not lighter than 22 gage galvanized steel sheet metal. Assemblies shall be as follows or equal approved in accordance with Section 012500.
 - 1. Fry Reglet Corp.; "Springlock Flashing System" surface mounted counter flashing.

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2. MM Systems Corporation; "Snap-Tite"
 3. Or equal.
- G. Non-Shrink Grout: Premixed, nonmetallic, non-corrosive, non-staining grouting compound containing silica sands, portland cement, shrinkage compensating agents and water reducing agents, meeting the requirements of ASTM C 1107. Acceptable products include, but are not limited to, the following:
1. Gifford Hill & Co., Inc.; "Supreme"
 2. Master Builders; "Masterflow 713"
 3. The Upco Company; "Upcon Nonshrink"
 4. Or equal.
- H. Liquid Flashing: An asphaltic-polyurethane, low odor, liquid flashing material designed for specialized details unable to be waterproofed with typical modified membrane flashings
1. Tuff-Flash:
 - a. Tensile Strength, ASTM D 412: 400 psi
 - b. Elongation, ASTM D 412: 300%
 - c. Density @77 deg. F 8.5 lb/gal typical
 2. Or equal.

2.3 FIELD FABRICATED EDGE METAL AND FINISHES

- A. Field Fabricated flashings and trim shall conform to the detail requirements of SMACNA "Architectural Sheet Metal Manual".
- B. Manufactured roof specialties shall conform to the detail requirements of SMACNA "Architectural Sheet Metal Manual" and/or the NRCA "Roofing and Waterproofing Manual" as applicable.
- C. Provide materials in accordance with requirements of roofing manufacturer in order to maintain warranty requirements.
1. Fascia Cover, Splice Plate, and cont. cleat:
 - a. Zinc-coated steel, ASTM A653, coating designation G-90, in thickness of 0.0299 nom./ 22 gauge, 36" to 48" by coil length, chemically treated, commercial or lock-forming quality.
 2. Coping Cap Cover and Splice Plate:
 - a. Zinc-coated steel, ASTM A653, coating designation G-90, in thickness of 0.0299 nom./ 22 gauge, 36" to 48" by coil length, chemically treated, commercial or lock-forming quality.
 3. Fascia Extruded Base Anchor and Components:
- D. Exposed surfaces for coated panels:
1. Steel finishes: Fluorocarbon finish.
 - a. Epoxy primer baked both sides, 0.2-0.25 mils thickness as approved by finish coating manufacturer

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- b. Weathering finish complying with National Coil Coaters Association (NCCA) recommendations:
 - (1) Pencil Hardness: ASTM D 3363, HB-H / NCCA II-2.
 - (2) Bend: ASTM D 4145, O-T / NCCA II-19.
 - (3) Cross-Hatch Adhesion: ASTM D 3359, no loss of adhesion.
 - (4) Gloss (60 deg. angle): ASTM D 523, 25+/-5%
 - (5) Reverse Bend: ASTM D 2794, no cracking or loss of adhesion.
 - (6) Nominal Thickness: ASTM D 1005
 - (a) Primer: 0.2 mils
 - (b) Topcoat: 0.7 mils minimum
 - (c) Clear coat

2.4 FABRICATION

- A. General: Shop-fabricate work to greatest extent possible. Fabricate sheet metal work in accordance with the SMACNA, unless otherwise indicated. Fabricate for waterproof and weather-resistant performance, with expansion provisions. Form exposed sheet metal work without excessive oil-canning, buckling and tool marks, true to line and levels, with exposed edges folded back to form hems.
- B. Seams: Fabricate nonmoving seams with flat-lock seams mechanically clinched and sealed watertight and provide sealant as recommended by roofing manufacturer. When edges to be seamed are on unfinished metal, form seams, and solder.
- C. Separations: Provide for separation of metal from noncompatible metal or corrosive substrates by coating concealed surfaces at locations of contact, with bituminous coating or other permanent separation as recommended by fabricator.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine surfaces against which sheet metal is to be placed to ensure that they are smooth, clean and free of defects.
- B. Check base flashings to ensure that they extend at least 9 inches above the toe of cant and are securely fastened to the structure.
- C. Do not start work until deficiencies have been corrected. Start of work of this section constitutes acceptance of the surfaces.

3.1 INSTALLATION

- A. Workmanship: Install sheet metal work in accordance with the SMACNA, unless otherwise indicated. Install sheet metal straight and true, with miters and joints accurately fitted, exposed

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work free of dents. Reinforce corners and make seams waterproof. Make provisions for expansion and contraction in sheet metal assemblies. Anchor work securely in place, conceal fasteners where possible.

1. Install flanges of sheet metal items on top of last roofing ply in full bed of asphaltic plastic cement 1/8 inch thick.
- B. Separations: Provide for separation of metal from noncompatible metal or corrosive substrates by coating concealed surfaces at locations of contact, with bituminous coating or other permanent separation as recommended by fabricator.
- C. Soldering Unfinished Sheet Metal: Pre-tin edges of unfinished sheet metal before soldering. Solder slowly with heavy, well-heated, properly tinned coppers, to heat the seam thoroughly and completely sweat the solder through the full width of the seam. Use ample solder which results in the seam showing not less than 1 inch of evenly flowed solder. Solder immediately after application of flux. Upon completion of soldering, neutralize acid and thoroughly clean surfaces.
- D. Corners at Finished Sheet Metal: Provide factory mitered and mechanically clinched and sealed watertight.
- E. Flashings for Modified Bitumen Roofing:
 1. Flashing at Equipment Supports: Fabricate cap flashing of 24 gage galvanized steel unless otherwise indicated. Turn bottom 1/2 inch of exposed edges outward at a 45 degree angle and hem on the underside. Install with joints between sections lapped 3 inches and sealed with sealant. Maintain bottom of flashing at least 1 inch above top of cant.
 1. Exhaust Pipe Vents: tuff flash as indicated.
- F. Reglets and Counter flashing Assemblies: Install reglets and counter flashings in accordance with the manufacturer's printed installation drawings and instructions and as indicated.
- G. Edge Metal: Fabricate edge metal of 22 gage galvanized steel unless otherwise indicated. Provide prefabricated mitered and soldered internal and external corners. Leave joints between sections open 1/4 inch and back with formed back-up plates lapping each section end a minimum of 3 inches. Seal laps with butyl sealer. Fold back exposed edges of edge metal 1/2 inch on the underside. Place edge metal on roofs after all roofing felts have been laid. Place in position on a 1/8 inch thick bed of black plastic cement the full width of the flange and nail not to exceed 12 inches on center.
- H. Edge Strips: Fabricate strips of galvanized steel of the same thickness as metal to be fastened. Secure edge strips in place as indicated.
- I. Scupper Linings: Unless otherwise indicated, line scuppers with 24 gage galvanized steel extending through the walls and projecting into conductor heads. Join scupper linings to wall and roof flanges with locked and soldered seams. Prime masonry or concrete surfaces to receive the scupper lining and coat with plastic cement. Set in non-shrink grout.

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- J. Miscellaneous Flashings and Metal Trim: Miscellaneous flashings, metal trim, and their related components are not necessarily individually described. Furnish miscellaneous items and trim not mentioned or described in accordance with the intent of the drawings and specifications and as required to complete the work.

End of Section

SECTION 077100 - ROOF SPECIALTIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Roof-edge drainage systems.

B. Preinstallation Conference: Conduct conference at Project site Participate in Roofing Pre-Installation Conference..

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

1.3 WARRANTY

A. Roofing-System Warranty: Roof specialties are included in warranty provisions in Section 071326 "Self-Adhering Sheet Roofing."

B. Special Warranty on Painted Finishes: Manufacturer agrees to repair finish or replace roof specialties that show evidence of deterioration of factory-applied finishes within specified warranty period.

1. Fluoropolymer Finish: Deterioration includes, but is not limited to, the following:
 - a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
 - b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
 - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

2. Finish Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. SPRI Wind Design Standard: Manufacture and install roof-edge specialties tested according to SPRI ES-1 and capable of resisting the following design pressures:

1. Design Pressure: As indicated in Section 071326 "Self-Adhering Sheet Roofing".

- B. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, hole elongation, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Provide clips that resist rotation and avoid shear stress as a result of thermal movements. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.

2.2 ROOF-EDGE DRAINAGE SYSTEMS

- A. Gutters: Manufactured in uniform section lengths not exceeding 12 feet (3.6 m) with matching corner units, ends, outlet tubes, and other accessories. Elevate back edge at least 1 inch (25 mm) above front edge. Furnish flat-stock gutter straps, gutter brackets, expansion joints, and expansion-joint covers fabricated from same metal as gutters.
 - 1. Zinc-Coated Steel: Nominal 0.034-inch (0.86-mm thickness).
 - 2. Gutter Profile: Style A according to SMACNA's "Architectural Sheet Metal Manual."
 - 3. Corners: Factory mitered and soldered. See SMACNA's "Architectural Sheet Metal Manual" for discussion of gutter brackets, straps, and spikes and ferrules for supporting gutters; see manufacturers' written instructions.
 - 4. Gutter Supports: Gutter brackets and Straps with finish matching the gutters.
 - 5. Gutter Accessories: Flat ends.
- B. Downspouts: Plain round complete with smooth-curve elbows, manufactured from the following exposed metal. Furnish with metal hangers, from same material as downspouts, and anchors.
 - 1. Zinc-Coated Steel: Nominal 0.034-inch (0.86-mm) thickness.
- C. Zinc-Coated Steel Finish: Three-coat fluoropolymer.
 - 1. Color: As selected by Architect from manufacturer's full range to match campus standard.

2.3 MATERIALS

- A. Zinc-Coated (Galvanized) Steel Sheet: ASTM A 653/A 653M, G90 (Z275) coating designation.

2.4 MISCELLANEOUS MATERIALS

- A. Fasteners: Manufacturer's recommended fasteners, suitable for application and designed to meet performance requirements. Furnish the following unless otherwise indicated:
 - 1. Exposed Penetrating Fasteners: Gasketed screws with hex washer heads matching color of sheet metal.
 - 2. Fasteners for Zinc-Coated (Galvanized) Steel Sheet: Series 300 stainless steel or hot-dip zinc-coated steel according to ASTM A 153 or ASTM F 2329.
- B. Elastomeric Sealant: ASTM C 920, elastomeric polyurethanepolymer sealant of type, grade, class, and use classifications required by roofing-specialty manufacturer for each application. Low or no solvent solids formula.

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- C. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type joints with limited movement.
- D. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required for application.

2.5 FINISHES

- A. Coil-Coated Galvanized-Steel Sheet Finishes:
 - 1. High-Performance Organic Finish: Prepare, pretreat, and apply coating to exposed metal surfaces to comply with ASTM A 755 and coating and resin manufacturers' written instructions.
 - a. Three-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat.

PART 3 - EXECUTION

3.1 UNDERLAYMENT INSTALLATION; as indicated.

3.2 INSTALLATION, GENERAL

- A. General: Install roof specialties according to manufacturer's written instructions. Anchor roof specialties securely in place, with provisions for thermal and structural movement. Use fasteners, solder, protective coatings, separators, underlayments, sealants, and other miscellaneous items as required to complete roof-specialty systems.
 - 1. Install roof specialties level, plumb, true to line and elevation; with limited oil-canning and without warping, jogs in alignment, buckling, or tool marks.
 - 2. Provide uniform, neat seams with minimum exposure of solder and sealant.
 - 3. Install roof specialties to fit substrates and to result in weathertight performance. Verify shapes and dimensions of surfaces to be covered before manufacture.
 - 4. Torch cutting of roof specialties is not permitted.
 - 5. Do not use graphite pencils to mark metal surfaces.
 - 6. No rotary saws.
- B. Metal Protection: Protect metals against galvanic action by separating dissimilar metals from contact with each other or with corrosive substrates by painting contact surfaces with bituminous coating or by other permanent separation as recommended by manufacturer.
 - 1. Bed flanges in thick coat of asphalt roofing cement where required by manufacturers of roof specialties for waterproof performance.
- C. Expansion Provisions: Allow for thermal expansion of exposed roof specialties.
 - 1. Space movement joints at a maximum of [12 feet (3.6 m) with no joints within 18 inches (450 mm) of corners or intersections unless otherwise indicated on Drawings.

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2. When ambient temperature at time of installation is between 40 and 70 deg F (4 and 21 deg C), set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures.
- D. Fastener Sizes: Use fasteners of sizes that penetrate wood blocking or sheathing not less than 1-1/4 inches (32 mm) for nails and not less than 3/4 inch (19 mm) for wood screws.
- E. Seal concealed joints with butyl sealant as required by roofing-specialty manufacturer.
- F. Seal joints as required for weathertight construction. Place sealant to be completely concealed in joint. Do not install sealants at temperatures below 40 deg F (4 deg C).
- G. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pre-tin edges of sheets to be soldered to a width of 1-1/2 inches (38 mm); however, reduce pre-tinning where pre-tinned surface would show in completed Work. Do not use torches for soldering. Heat surfaces to receive solder and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.

3.3 ROOF-EDGE DRAINAGE-SYSTEM INSTALLATION

- A. General: Install components to produce a complete roof-edge drainage system according to manufacturer's written instructions. Coordinate installation of roof perimeter flashing with installation of roof-edge drainage system.
- B. Gutters: Join and seal gutter lengths. Allow for thermal expansion. Attach gutters to firmly anchored gutter supports spaced not more than 24 inches (610 mm) apart. Attach ends with rivets and seal with sealant to make watertight. Slope to downspouts.
 1. Install gutter with expansion joints at locations indicated but not exceeding 50 feet (15.2 m)] apart. Install expansion-joint caps.
- C. Downspouts: Join sections with manufacturer's standard telescoping joints. Provide hangers with fasteners designed to hold downspouts securely to walls and 1 inch (25 mm) away from walls; locate fasteners at top and bottom and at approximately 60 inches (1500 mm) o.c.
 1. Provide elbows at base of downspouts at grade to direct water away from building.

3.4 CLEANING AND PROTECTION

- A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.
- B. Clean and neutralize flux materials. Clean off excess solder and sealants.
- C. Remove temporary protective coverings and strippable films as roof specialties are installed.

END OF SECTION 077100

SECTION 099113 - EXTERIOR PAINTING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes surface preparation and the application of paint systems on the following exterior substrates:
 - 1. Concrete - existing.
 - 2. Galvanized metal.
 - 3. Wood.
 - 4. Portland cement plaster (stucco) - existing.

1.2 DEFINITIONS

- A. MPI Gloss Level 1: Not more than five units at 60 degrees and 10 units at 85 degrees, according to ASTM D 523.
- B. MPI Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D 523.
- C. MPI Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D 523.
- D. MPI Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D 523.
- E. MPI Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D 523.
- F. MPI Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D 523.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product. Include preparation requirements and application instructions.
 - 1. Include printout of current "MPI Approved Products List" for each product category specified, with the proposed product highlighted.
- B. Sustainable Design Submittals:
 - 1. VOC levels to comply with limits defined by the California Air Resources Board.
- C. Samples: For each type of paint system and each color and gloss of topcoat.

1.4 REFERENCES

- A. MPI Architectural Painting Manual
- B. MPI Maintenance Repainting Manual

PART 2 - PRODUCTS

2.1 PAINT, GENERAL

- A. Comply with District standard paint manufacturer and Campus standard colors.
- B. MPI Standards: Products shall comply with MPI standards indicated and shall be listed in its "MPI Approved Products Lists."
- C. Material Compatibility:
 - 1. Materials for use within each paint system shall be compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
 - 2. For each coat in a paint system, products shall be recommended in writing by topcoat manufacturers for use in paint system and on substrate indicated.
- D. Colors: As selected by Architect from manufacturer's full range to match Campus standard colors.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and conditions, with Applicator present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Maximum Moisture Content of Substrates: When measured with an electronic moisture meter as follows:
 - 1. Concrete: 12 percent.
 - 2. Wood: 15 percent.
 - 3. Portland Cement Plaster: 12 percent.
- C. Verify suitability of substrates, including surface conditions and compatibility with existing finishes and primers.
- D. Proceed with coating application only after unsatisfactory conditions have been corrected.
 - 1. Application of coating indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Comply with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual" applicable to substrates and paint systems indicated.
- B. Remove hardware, covers, plates, and similar items already in place that are removable and 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.
 - 1. After completing painting operations, use workers skilled in the trades involved to reinstall items that were removed. Remove surface-applied protection.

3.3 APPLICATION

- A. Apply paints according to manufacturer's written instructions and recommendations in "MPI Manual."
- B. 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.

3.4 CLEANING AND PROTECTION

- A. 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.
- B. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.5 EXTERIOR PAINTING SCHEDULE

- A. Concrete Substrates, Nontraffic Surfaces, Existing Painted. Repair paint damaged during the course of construction as indicated in the MPI Maintenance Repainting Manual to match existing paint.
- B. Galvanized-Metal Substrates:
 - 1. Latex System MPI EXT 5.3H:
 - a. Prime Coat: Primer, galvanized, water based, MPI #134.
 - b. Intermediate Coat: Latex, exterior, matching topcoat.
 - c. Topcoat: Latex, exterior, semi-gloss (MPI Gloss Level 5), MPI #11.
- C. Wood Substrates: Exposed framing.

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1. Latex over Latex Primer System MPI EXT 6.2M:
 - a. Prime Coat: Primer, latex for exterior wood, MPI #6.
 - b. Intermediate Coat: Latex, exterior, matching topcoat.
 - c. Topcoat: Latex, exterior, low sheen (MPI Gloss Level 3-4), MPI #15.
- D. Wood Substrates: Wood trim.
 1. Latex over Latex Primer System MPI EXT 6.3L:
 - a. Prime Coat: Primer, latex for exterior wood, MPI #6.
 - b. Intermediate Coat: Latex, exterior, matching topcoat.
 - c. Topcoat: Latex, exterior, semi-gloss (MPI Gloss Level 5), MPI #11.
- E. Wood Substrates: Wood-based panel products.
 1. Latex over Latex Primer System MPI EXT 6.4K:
 - a. Prime Coat: Primer, latex for exterior wood, MPI #6.
 - b. Intermediate Coat: Latex, exterior, matching topcoat.
 - c. Topcoat: Latex, exterior, low sheen (MPI Gloss Level 3-4), MPI #15.
- F. Portland Cement Plaster Substrates, Existing Painted. Repair paint damaged during the course of construction as indicated in the MPI Maintenance Repainting Manual to match existing paint.

END OF SECTION 099113