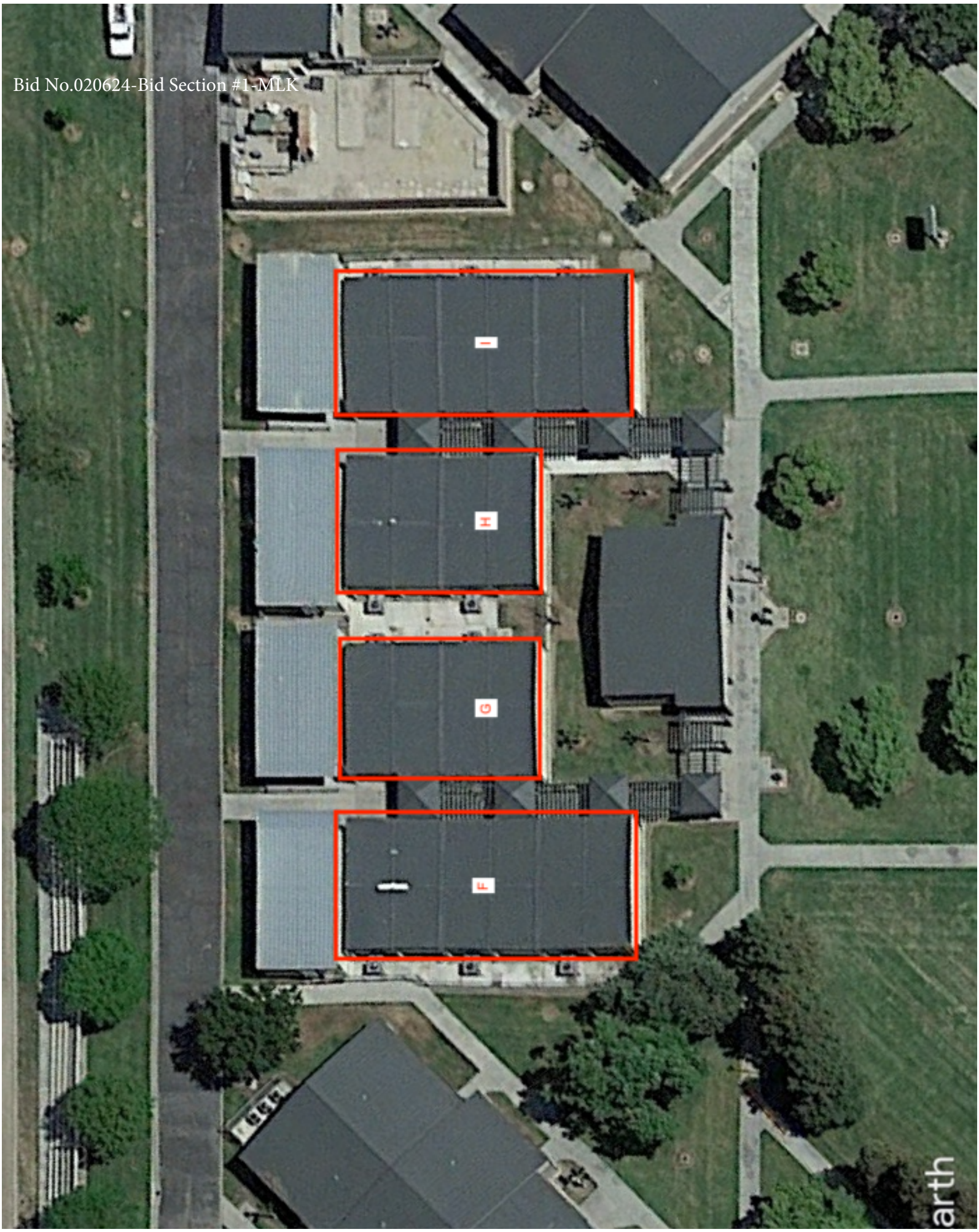
Bid No.020624-Bid Section #1-MLK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SECTION 01110

SUMMARY OF WORK

PART 1 — GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes removal and disposal of the existing roofing systems, coping, insulation, flashings, and all construction related debris. Installation of a new standing seam metal roofing system as specified with all applicable details for a complete watertight warrantied roofing assembly per the manufacturers instructions.

B. Materials specified in section 01 64 00 Owner Furnished Contractor Installed (O.F.C.I.) will be the responsibility of the contractor to receive, store, protect, and maintain in good condition throughout the course of the project.

C. Related Work Specified Elsewhere:

1. Section 01 - Owner Furnished Contractor Installed
2. Section 01 - Submittals
3. Section 06 - Rough Carpentry
4. Section 07 - Insulation Board
5. Section 07 - Standing Seam Metal Roofing
6. Section 07: Sheet Metal Flashing and Trim

1.3 WORK COVERED BY CONTRACT DOCUMENTS

A. Project Identification: Martin Luther King Elementary School Re-Roofing Project

B. Project Locations: Martin Luther King Elementary School 601 Lilly St. Madera, CA 93638

C. Owner: Madera Unified School District 1205 S. Madera Ave. Madera, CA 93638

D. General scope of work but not limited to;

1. <u>Roof Areas F, G, H, & I:</u>
2. Includes removal and disposal of existing roofing system(s), insulation board, gutters, flashings, copings, etc. for a complete prepared roof surface.
3. Includes one hundred (100) square feet of decking replacement included in the base bid price. A per square foot price will be inserted into the bid form for anything needed and approved by the district over 100 square feet. Before and after photos of all dryrot replacement must be submitted with billing as justification, payment will not be made without proper documentation.
4. Install one layer of R-Mer Seal self adhering underlayment over the entire roof area.
5. Install one layer of 1/4” dens deck prime insulation board with 6 screws and plates per 4’x8’ sheet.

6. Install new 24 gauge galvanized sheet metal gutter and downspouts at all existing locations. Install downspout screens at all downspout locations.

7. Install a new R-Mer Span standing seam metal panel roofing system per all manufacturers instructions and details.

8. Install new pre-finished expansion joint flashings per approved garland details at all locations.

1.4 WORK COMPLETED BY THE DISTRICT

A. No work will be completed by the district.

1.5 TYPE OF CONTRACT

A. Work will be completed under a single prime contract.

B. Owner Supplied Contractor Installed (O.F.C.I.). Materials will be clearly noted at the back of each specification section as to what is being supplied by the owner. All O.F.C.I. materials are to be installed as part of this contract by the contractor. All other materials needed to complete this scope of work and are not specifically listed in the owner supplied materials section will be the responsibility of the contractor to supply and install.

1.6 USE OF PREMISES

A. General: Contractor will have limited use of premises for construction operations.

B. Use of site: Limit use of premises to work areas required. Do not disturb portions of the project site beyond areas in which the work is indicated.

C. The building interior is off limits to the contractor. All access shall be from the exterior.

D. The point of exterior access must be approved by the owner.

E. Entrances: Keep all entrances serving the building clear and available to the owner, owner's employees, and emergency vehicles.

F. Use of existing building: Maintain existing building in a weather tight condition throughout the construction period. Repair damage caused by construction operations. Protect building and occupants during construction.

G. Vehicle Parking: Contractor parking is available on site and will need to be approved by the owner.

H. Assume full responsibility for protection and safekeeping of materials stored on premises. Coordinate the location of materials and equipment to be stored on premises. Provide barricades, barriers, and enclosures as required to ensure safety.

1.7 OWNERS OCCUPANCY REQUIREMENTS

A. The owner will occupy the building during the entire construction phase. Cooperate with the owner during construction operations to minimize owner conflicts and facilitate owner usage. Perform the work as to not interfere with owners operations.

B. A minimum of 72 hours notice is needed for all activities that will affect the owners operations.

1.8 WORK RESTRICTIONS

A. On site work hours: Work shall generally be performed from the hours of 7:00 am – 5:00 pm Monday through Friday except as otherwise indicated or approved by the owner.

B. Weekend hours, early morning hours, utility shut down, and noisy activity requires owner's authorization a minimum of 72 hours in advance.

1.9 UNIT PRICES

A. The following unit prices will be used to add or deduct from the total contract amount.

1. Replacement dry rot or damaged roof decking.

10. SCHEDULE OF ALTERNATES

A. None

1.11 PROJECT CONDITIONS

A. Proceed with roofing work only when existing and forecasted weather conditions will permit a unit of work to be installed in accordance with manufacturer's recommendations and warranty requirements.

B. Do not apply roofing insulation or membrane to damp deck surface.

C. Do not expose materials subject to water or solar damage in quantities greater than can be weatherproofed during same day.

1.12 SEQUENCING AND SCHEDULING

A. Sequence installation of roofing with related units of work specified in other sections to ensure that roof assemblies, including roof accessories, flashing, trim and joint sealers, are protected against damage from effects of weather, corrosion and adjacent construction activity.

B. Complete all roofing field assembly work each day. Phased construction will not be accepted. Phased construction refers to the application of the roof insulation board, ply sheet membrane, and cap sheet membrane installed in the same day.

C. Due to the cure time needed for the roofing system prior to the acrylic coating scheduling of work past the completion date of **August 9, 2024** will need to be reviewed and agreed upon by all parties. Work can only be completed during weekends or off hours past the project completion date unless otherwise reviewed and approved by the district. All coating work and 100% project completion shall be no later than 9/30/2024. Including punch list and final inspection. All days after 9/30/24 will have liquidated damages applied. specifically approved by the Owner.

1.13 PROJECT TIMELINE

A. Project Start: June 7, 2024

B. Project Completion: August 9, 2024

END OF SECTION 01 11 00 – SUMMARY OF WORK

SECTION 01 30 00
SUBMITTALS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

A. Contract General Conditions.

B. See also contract general conditions for additional requirements especially those regarding requests for ALTERNATIVES OR EQUALS and for SUBSTITUTIONS.

1.02 SUMMARY

A. This Section specifies administrative and procedural requirements for submittals required for performance of the Work, including:

1. Contractor's construction schedule
2. Submittal schedule
3. Shop Drawings
4. Product Data
5. Samples.

B. Administrative Submittals: Refer to other Division-1 Sections and other Contract Documents for requirements for administrative submittals. Such submittals include, but are not limited to:

1. Permits
2. Applications for payment
3. Performance and payment bonds
4. Insurance certificates
5. List of Subcontractors.

1.03 SUBMITTAL PROCEDURES

A. Coordination: Coordinate preparation and processing of submittals with performance of construction activities. Transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay.
   1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals and related activities that require sequential activity.
   2. Coordinate transmittal of different types of submittals for related elements of the Work so processing will not be delayed by the need to review submittals concurrently for coordination.
      a. The Architect shall return without action any submittals requiring coordination with other submittals until related submittals are coordinated.
   3. Processing: Allow sufficient review time so that installation will not be delayed as a result of the time required to process submittals, including time for resubmittals.
      a. See General Conditions and Supplementary General Conditions for additional requirements.
      b. If an intermediate submittal is necessary, process the same as the initial submittal.
      c. No extension of Contract Time will be authorized because of failure to transmit submittals to the Architect sufficiently in advance of the Work to

permit processing.

B. Submittal Preparation: Place a permanent label or title block on each submittal for identification. Indicate the name of the entity that prepared each submittal on the label or title block.

1. Provide a space approximately 4" x 5" on the label or beside the title block on Shop Drawings to record the Contractor's review and approval markings and the action taken.
2. Include the following information on the label for processing and recording action taken:
   a. Project name
   b. Date
   c. Name and address of Architect
   d. Name and address of Contractor
   e. Name and address of subcontractor
   f. Name and address of supplier
   g. Name of manufacturer
   h. Number and title of appropriate Specification Section
   i. Drawing number and detail references, as appropriate.

C. Submittal Transmittal: Package each submittal appropriately for transmittal and handling. Transmit each submittal from Contractor to Architect using a transmittal form. Submittals received from sources other than the Contractor will be returned without action.

On the transmittal Record relevant information and requests for data. On the form, or separate sheet, record deviations from Contract Document requirements, including minor variations and limitations. Include Contractor's certification that information complies with Contract Document requirements.

1.05 SHOP DRAWINGS

A. Submit newly prepared information, drawn to accurate scale. Highlight, encircle, or otherwise indicate deviations from the Contract Documents. Do not reproduce Contract Documents or copy standard information as the basis of Shop Drawings. Standard information prepared without specific reference to the Project is not considered Shop Drawings.

B. Shop Drawings include fabrication and installation drawings, setting diagrams, schedules, patterns, templates and similar drawings. Include the following information:

Dimensions
Identification of products and materials included
Compliance with specified standards
Notation of coordination requirements
Notation of dimensions established by field measurement.

C. Sheet Size: Except for templates, patterns and similar full- size Drawings, submit Shop Drawings on sheets at least 8-1/2" x 11" but no larger than 30" x 42".

D. Submittals: Submit one correctable translucent reproducible print and six (6) blue- or black-line print for the Architect's review; the reproducible and one print will be returned.

Do not use Shop Drawings without an appropriate final stamp indicating action taken in connection with construction.

1.06 PRODUCT DATA

A. Collect Product Data into a single submittal for each element of construction or system. Product Data includes printed information such as manufacturer's installation instructions, catalog cuts, standard color charts, roughing-in diagrams and templates, standard wiring diagrams and performance curves. Where Product Data must be specially prepared because standard printed data is not suitable for use, submit as "Shop Drawings."

1. Mark each copy to show applicable choices and options. Where printed Product Data includes information on several products, some of which are not required, mark copies to indicate the applicable information. Include the following information:

   Manufacturer's printed recommendations,
   Compliance with recognized trade association standards,
   Compliance with recognized testing agency standards,
   Application of testing agency labels and seals,
   Notation of dimensions verified by field measurement,
   Notation of coordination requirements.

2. Do not submit Product Data until compliance with requirements of the Contract Documents has been confirmed.

B. Submittals: Submit a minimum of six (6) copies of each required submittal as well as additional copies as required by the Architect, (the actual number of submittals and distribution required shall be determined by the Trustees Representative at the Preconstruction Conference). The Architect will return two sets marked with action taken and corrections or modifications required.

C. Distribution: Furnish copies of final submittal to installers, subcontractors, suppliers, manufacturers, fabricators, and others required for performance of construction activities.

1. Do not proceed with installation until an applicable copy of Product Data applicable is in the installer's possession.

2. Do not permit use of unmarked copies of Product Data in connection with construction.

1.07 SAMPLES

A. Submit full-size, fully fabricated Samples cured and finished as specified and physically identical with the material or product proposed. Samples include partial sections of manufactured or fabricated components, cuts or containers of materials, color range sets, and swatches showing color, texture and pattern.

1. Mount, display, or package Samples in the manner specified to facilitate review of qualities indicated. Prepare Samples to include the following:

   Generic description of the Sample
   Sample source
   Product name or name of manufacturer
   Compliance with recognized standards
   Availability and delivery time.

2. Submit Samples for review of kind, color, pattern, and texture, for a final check of these characteristics with other elements, and for a comparison of these

characteristics between the final submittal and the actual component as delivered and installed.

B. Preliminary submittals: Where Samples are for selection of color, pattern, texture or similar characteristics from a range of standard choices, submit a full set of choices for the material or product.

Preliminary submittals will be reviewed and returned with the Architect's mark indicating selection and other action.

C. Submittals: Except for Samples illustrating assembly details, workmanship, fabrication techniques, connections, operation and similar characteristics, submit 3 sets; one will be returned marked with the action taken.

Maintain sets of Samples, as returned, at the Project site, for quality comparisons throughout the course of construction.

D. Distribution of Samples: Prepare and distribute additional sets to subcontractors, manufacturers, fabricators, suppliers, installers, and others as required for performance of the Work.

Field Samples specified in individual Sections are special types of Samples. Field Samples are full-size examples erected on site to illustrate finishes, coatings, or finish materials and to establish the standard by which the Work will be judged.

1.08 ARCHITECTS ACTION

A. Except for submittals for record, information or similar purposes, where action and return is required or requested, the Architect will review each submittal, mark to indicate action taken, and return promptly.

Compliance with specified characteristics is the Contractor's responsibility.

B. Action Stamp: The Architect will stamp each submittal with a uniform, self-explanatory action stamp. The stamp will be appropriately marked, as follows, to indicate the action taken:

1. Final Unrestricted Release: Where submittals are marked "Approved," that part of the Work covered by the submittal may proceed provided it complies with requirements of the Contract Documents; final acceptance will depend upon that compliance.
2. Final-But-Restricted Release: When submittals are marked "Approved as Noted," that part of the Work covered by the submittal may proceed provided it complies with notations or corrections on the submittal and requirements of the Contract Documents; final acceptance will depend on that compliance.
3. Returned for Resubmittal: When submittal is marked "Not Approved, Revise and Resubmit," do not proceed with that part of the Work covered by the submittal, including purchasing, fabrication, delivery, or other activity. Revise or prepare a new submittal in accordance with the notations; resubmit without delay. Repeat if necessary to obtain a different action mark.
   a. Do not permit submittals marked "Not Approved, Revise and Resubmit" to be used at the Project site, or elsewhere where Work is in progress.

   b. Note: Any work performed prior to receiving a FULLY APPROVED

submittal shall be done at the contractors own risk and is subject to being replaced if any of the submittal requirements are not met.

PART 2 – PRODUCTS NOT USED

PART 3 – EXECUTION NOT USED

END OF SECTION 01300

SECTION 01 64 00

OWNER FURNISHED CONTRACTOR INSTALLED
(O.F.C.I)

PART 1 - GENERAL

1. SUMMARY

A. DESCRIPTION: The Owner shall procure and provide certain products for installation as shown and specified per Contract Documents.

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 as O.F.C.I. materials.

2. Note that this project includes the installation of owner-supplied materials as noted in this specification section only. All materials not specifically listed below will be the responsibility of the contractor to provide and install.

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.

PART 2 - PRODUCTS

1. PRODUCTS

A. ROOFING MATERIAL FURNISHED BY OWNER (O.F.C.I.): District supplied material. Related specification sections include;

1. Section 07 - Asphalt Shingles
2. Section 07 - Standing Seam Metal Roofing
3. Section 07 - Sheet Metal Flashing and Trim

B. MATERIAL LIST

1. The Owner will only supply the quantity listed in the owner supplied materials section of this specification below. All additional materials and accessories will be the full responsibility of the contractor to provide and install per the specification and project requirements.

2. Any and all material or accessories required for the installation of the roof system in excess of the district provided material must be supplied and installed 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.

3. All required flashings as required per each specification section for plumbing, electrical, gas, etc. will be the Contractors responsibility to provide and install as well as to be included in the bid cost.

4. All materials not specifically included in the owner supplied materials section will be the responsibility of the contractor to provide and install in compliance with the respective specification section.

5. Freight charges of owner supplied materials will be the responsibility of the Owner.

6. Contractor must coordinate and take delivery of materials, count all materials and ensure it matches the list below, unload and properly locate materials at the job site, and properly protect, cover and store at job site.

7. Contractor must be able to provide certification in writing from roof system manufacturer that the contractor is approved to install the specified roof system and provide all warranty requirements of each respective specification section.

8. Materials specially provided by the owner

14000.00	R-Mer Span Roof Panel 18'', 24 gauge, Standard Color
70.00	R-Mer Span Self Adhering Underlayment 200 sq ft per roll
380.00	Head Closure with Neoprene 18" steel
50.00	24 gauge Flat Stock 4' x 10' Sheet, Premium Color
1.00	Skid Charge, per 50 sheets of flat stock
5.00	1/8" SS Rivets - Colored to match, per 250
1.00	Butyl Tape 1/8" x 1/2" x 45 FT (16 rolls per case)
55.00	Edge Stiffener, 10' length
1.00	Shop Drawings (101-250- Sq) Includes Roof Drawings (Req. for Warranty)
35.00	Clips - 2 Hole Galvanized (Standard), 100 per box
7.00	Clips - Gable - 16 Gauge, 25 per box
11.00	Eave, Valley Closure (Foam Only); 1 1/2" x 7/16" 50 LF per roll
8.00	Rake Closure (Foam w. adhesive); 1 1/16" x 5/8" 50 LF per roll
2.00	Tripolymer Sealant (Clear, 24 tubes per case)
2.00	Touch-Up Paint - 2 oz. Can
1.00	Hand Crimping Tool
28.00	Concealor Clip Fastener #14-BDP1 X 1.5", 250 per box
38.00	Off Set Cleat 10'
0.00	Valley Closure 10'
1.00	Electric Seamer Rental Weekly + Freight FOB Atlanta GA
1.00	Pan End Tool

PART 3 - EXECUTION

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 the site, in accordance with construction schedule.
2. Bill of Materials: Deliver supplier's documentation to Contractor.
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.

2. CONTRACTOR'S RESPONSIBILITIES

A. SUBMITTALS: Review shop drawings, product data and samples and submit to Architect and/ or Owner 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 the site, including un-crating, protection, and storage.
3. Inspection: Promptly inspect products jointly with Owner; record shortages, damaged or defective items. Shortages and/or damage must be noted at the time of delivery by the contractor no claims may be made after the fact.
4. Storage: Protect products from damage or exposure to elements per the manufactures requirements.

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.
3. Install all O.F.C.I. products per the specifications and manufacturer instructions.
4. All products not supplied by the owner are the responsibility of the contractor to supply and install per manufacturers instructions.

END OF SECTION

SECTION 06 10 00
ROUGH CARPENTRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification sections, apply to work of this section.

B. Related work specified elsewhere:

1. Division 01: Summary of Work

2. Division 07: Standing Seam Metal Roofing

3. Division 07: Sheet Metal Flashing and Trim

1.2 SUMMARY:

A. This portion of the specification sets forth the general requirements, including the quality and type of materials required for the installation of all pressure treated and non pressure treated lumber used for wood curbs, nailing strips, miscellaneous blocking material, unexposed fillers, fascia, edging strips, deck replacement, etc

1.3 STORAGE:

A. All material specified herein shall be stored (after delivery to the site) so that it will be fully protected from damage and weather, and shall be stacked to prevent damage. All lumber shall be fully protected to maintain the original required moisture content as specified in item titled "Moisture Content".

1.4 OTHER REQUIREMENTS:

A. Dimensions indicated on the drawings are nominal dimensions (except where details show actual sizes) and shall be subject to the standard reductions required for surfacing or tolerances permitted by the grading rules. Unless otherwise indicated on drawings, all material shall be S4S (surfaced four sides).

1.5 PROTECTION:

A. All finished work shall be adequately protected against damage from any source.

1.6 COORDINATION:

A. Carpenters shall coordinate their work with that of the other trades so that progress continues without interruption.

PART 2 - PRODUCTS

2.1 WOOD - FRAMING AND CURBS:

A. GRADING RULES, GRADES, AND SPECIES

1. Lumber: Southern Pine, yellow pine, Douglas fir, spruce, ponderosa pine, larch or Hemlock and shall meet the following minimum grade requirement of construction standard (75% #1 and 25% #2); free from warping and visible decay. Lumber shall be graded according to the standard grading rules of the Southern Pine Inspection Bureau, the West Coast Lumber Inspection Bureau, or the Western Wood Products Association.

B. MOISTURE CONTENT

1. All lumber shall be air-dried or kiln-dried before treatment, so that the moisture content is not more than 19%. After treatment, it shall be kiln-dried at temperatures not exceeding 160 degrees F. (71 degrees C) so that the moisture content is not more than 19% at time of shipment

C. DECAY-RESISTANT TREATMENT:

1. Lumber in contact with roofing or acting as fascias, and all other exterior lumber, shall be pressure-treated with a waterborne preservative in accordance with AWPA Specification P5. Creosote and oil-borne preservatives are not acceptable.

2. Treating processes, material conditions, plant equipment, and other pertinent requirements shall conform to AWPA Specifications C1 and C2 for specific kind of lumber and type of preservative to be used. Retention shall be as required for intended use.

3. All treated lumber shall bear the mark of a code recognized third party agency such as the AWPA.

D. PLYWOOD:

Grade: CDX or Cyme exterior Grade. Description: 5/8" thick

E. WOOD SIDING:

1. T 111 or approved equal.

2.2 MECHANICAL FASTENERS:

A. WOOD TO STEEL:

1. Acceptable Manufacturers:
   a. Roofgrip screw with Climaseal coating; plastic disc - Buildex Div. of ITW, Itasca, IL.
   b. Dekfast screw with Sentri coating: plastic disc – Construction Fasteners, Inc., Wyomissing, PA.
   c. Fabco Fastening Systems, West Newton, PA: Insul-Fixx screw with Fabcote coating; plastic plate, Plate-Fixx screw with Fabcote coat; plastic disc.
   d. Kwik-Deck screw with Oxyseal coating; plastic disc - Atlas Bolt & Screw Div., Trans Union Fastener Corp., Ashland, OH.

e. Olympic #12-11 Standard Steel Deck Screw or #14-10 Heavy Duty All Purpose Screw with CR-10 coating; three inch diameter plastic - Olympic Manufacturing Group, Inc., Agawam, MA.
f. Glasfast (plastic disc) - Owens-Corning Fiberglas Corp., Toledo, OH.
g. Perma Fastener screw with permaseal coating; plastic plate - International Permalite, Inc., Oak Brook, IL.

2. Screw Length: Sufficient to engage steel, wood deck 1 inch.

B. WOOD TO WOOD:

1. Type: Galvanized, common, annular ring nail. Length: Sufficient to penetrate underlay blocking 1-1/4 inches.

2. Acceptable Manufacturers:

a. Hillwood Manufacturing Co., Cleveland, OH.
b. Independent Nail, Inc., Bridgewater, MA.
c. W.H. Maze Co., Peru, IL.
d. National Nail Corp., Grand Rapids, MI.

C. WOOD TO MASONRY:

1. Acceptable Manufacturers:

a. Tapcon 1/4" diameter, Phillips pan head anchor - Buildex Div. of ITW, Itasca, IL.
b. Confas - Construction Fasteners, Inc., Wyomissing, PA.
c. Con-fixx - Fabco Fastening Systems, West Newton, PA.
d. #14-10 Heavy Duty all Purpose Screw – Olympic Manufacturing Group, Inc., Agawam, MA.
e. Tru-Fast fastener (stainless steel) - The Tru-Fast Corp., Bryan, OH.

2. Length: Sufficient to provide 1-1/2 inch embedment.

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D. WOOD TO HOLLOW MASONRY:

1. Acceptable Manufacturers:

a. Sleeve Anchor by Hilti Fastening Systems, Tulsa, OK.
b. Rawly Hollow Masonry Anchor by the Rawlplug Co., Inc., New Rochelle, NY.

2. Length: As recommended by manufacturer

PART 3 - EXECUTION

3.1 CARPENTRY:

A. At roof edge to receive metal fascia, around all roof top penetration perimeters, and under any flashing component that is to have a roof flange mechanically fastened to roofing substrate; mechanically attach wood blocking. Blocking thickness: Equal to common 1 x 4”, 1 x 6” 2x4”, 2x6”, 2x8”, 2x10”, 2x12”.

B. Fasteners shall be installed in two rows staggered. Spacing in any one row shall not exceed 24 inches. Within eight feet of outside corners, spacing shall not exceed twelve inches in any one row.

C. Where required, offset blocking layers twelve inches, weave corners.

D. When preservative treated wood is cut, the cut end shall be treated in accordance with AWPA Specification M4.

E. Lumber shall be accurately cut to the work requirements and shall be well fastened.

F. Bolted fastenings shall have washers of adequate size under both heads and nuts. Nails shall be of correct size and quantity for proper fastening. Oversized nails that will result in splitting shall not be used. All fasteners shall be galvanized per ASTM A 153.

END OF SECTION

SECTION 07 22 00

ROOF DECK AND INSULATION

PART 1 – GENERAL

1. RELATED DOCUMENTS

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

2. SUMMARY

A. Section includes roof insulation over the properly prepared deck substrate.

B. Related Sections:
1. Section 01 - Summary of Work
2. Section 01 - Owner Furnished Contractor Installed
3. Section 01 - Submittals
4. Section 06 - Rough Carpentry
5. Section 07 - Standing Seam Metal Roofing
6. Section 07 - Sheet Metal Flashing and Trim

3. REFERENCES

A. American Society for Testing and materials (ASTM):
1. ASTM A167 Standard Specification for Stainless and Heat-Resisting Chromium Nickel Steel Plate, Sheet and Strip.
2. ASTM A653 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvanized) by the Hot-Dip Process.
3. ASTM B29 Standard Specification for Refined Lead.
4. ASTM B32 Standard Specification for Solder Metal.
5. ASTM C165 Standard Test Method for Measuring Compressive Properties of Thermal Insulation.
6. ASTM C208 Standard Specification for Cellulosic Fiber Insulation Board.
7. ASTM C209 Standard Test Method for Cellulosic Fiber Insulating Board.
8. ASTM C272 Standard Test Method for Water Absorption of Core Materials for Structural Sandwich Constructions.
9. ASTM C1396 Standard Specification for Gypsum Wallboard.
10. ASTM C518 Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
11. ASTM C578 Standard Specification for Perlite Thermal Insulation Board.
12. ASTM C728 Standard Test Methods for Fire Test of Roof Coverings.
13. ASTM C1289 Standard Specification for Faced Rigid Polyisocyanurate Thermal Insulation.
14. ASTM D5 Standard Test Method for Penetration of Bituminous Materials.
15. ASTM D36 Standard Test Method for Softening Point of Bitumen (Ring and Ball Apparatus).
16. ASTM D312 Standard Specification for Asphalt Used in Roofing.
17. ASTM D412 Standard Test Methods for Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers-Tension.

18. ASTM D1621 Standard Test Method for Compressive Properties of Rigid Cellular Plastics.
19. ASTM D1622 Standard Test Method for Apparent Density of Rigid Cellular Plastics.
20. ASTM D2126 Standard Test Method for Response off Rigid Cellular Plastics to Thermal Humid Aging.
21. ASTM D2178 Standard Specification for Asphalt Glass Felts used in Roofing and Waterproofing.
22. ASTM D4601 Standard Specification for Asphalt-Coated Glass Fiber Base Sheet Used in Roofing.
23. ASTM D5147 Standard Sampling and Testing Modified Bituminous Sheet Material.

B. Cast Iron Soil Pipe Institute, Washington, D.C. (CISPI)

C. Factory Mutual Research (FM):
1. Roof Assembly Classifications.

D. National Roofing Contractors Association (NRCA):
1. Roofing and Waterproofing Manual.

E. Underwriters Laboratories, Inc. (UL):
1. Fire Hazard Classifications.

F. Warnock Hersey (WH):
1. Fire Hazard Classifications.

G. Sheet Metal and Air Conditioning Contractors National Association (SMACNA)

H. Steel Deck Institute, St. Louis, Missouri (SDI)

I. Southern Pine Inspection Bureau, Pensacola, Florida (SPIB)

J. Insulation Board, Polyisocyanurate (FS HH-I-1972)

K. Insulation Board, Thermal (Fiberboard) (FS LLL-1-535B)

1.4. SUBMITTALS

A. Product Data: Provide manufacturer's specification data sheets for each product in accordance with Division 01 Section Submittal Procedures. 013000.

B. Provide approval letters from insulation manufacturer for use of their insulation within this particular roofing system type.

C. Provide a sample of each insulation type.

D. Shop Drawings
1. Submit manufacturer's shop drawings indicating complete installation details of tapered insulation system, tapered insulation crickets, including identification of each insulation block, sequence of installation, layout, drain locations, roof slopes, thicknesses, crickets and saddles.
2. Shop drawing shall include: Outline of roof, location of drains, a complete board layout of tapered insulation components, thickness and the average "R" value for the completed insulation system.

E. Certification

1. Submit roof manufacturer's certification that insulation fasteners furnished are acceptable to roof manufacturer.
2. Submit roof manufacturer's certification that insulation furnished is acceptable to roofing manufacturer as a component of roofing system and is eligible for roof manufacturer's system warranty.

1.5. QUALITY ASSURANCE

A. Fire Classification, ASTM E-108.

B. Manufacturer's Certificate: Certify that roof system furnished is approved by Factory Mutual, Underwriters Laboratories, Warnock Hersey or approved third party testing facility in accordance with ASTM E108, Class A for external fire and meets local or nationally recognized building codes.

C. Manufacturer's Certificate: Certify that the roof system is adhered properly to meet or exceed the requirements of FM 1-90.

D. Pre-installation meeting: Refer to Division 07 roofing specifications for pre-installation meeting requirements.

1.6. DELIVERY, STORAGE AND HANDLING

A. Deliver products to site with seals and labels intact, in manufacturer's original containers, dry and undamaged.

B. Store all insulation materials in a manner to protect them from the wind, sun and moisture damage prior to and during installation. Any insulation that has been exposed to any moisture shall be removed from the project site.

C. Keep materials enclosed in a watertight, ventilated enclosure (i.e. tarpaulins).

D. Store materials off the ground. Any warped, broken or wet insulation boards shall be removed from the site.

PART 2 – PRODUCTS

2.1. PRODUCTS, GENERAL

A. Refer to Division 01 Section "Common Product Requirements."

B. Basis of Design: Materials, manufacturer's product designations, and/or manufacturer's names specified herein shall be regarded as the minimum standard of quality required for work of this Section. Comply with all manufacturer and contractor/fabricator quality and performance criteria specified in Part 1.

C. Substitutions: Products proposed as equal to the products specified in this Section shall be submitted in accordance with Bidding Requirements and Division 01 provisions.
1. Proposals shall be accompanied by a copy of the manufacturer's standard specification section. That specification section shall be signed and sealed by a professional engineer licensed in the state in which the installation is to take place. Substitution requests containing specifications without licensed engineer certification shall be rejected for non-conformance.

2. Include a list of three (3) projects of similar type and extent, located within a one hundred mile radius from the location of the project. In addition, the three projects must be at least five (5) years old and be available for inspection by the Architect, Owner or Owner's Representative.
3. Equivalency of performance criteria, warranty terms, submittal procedures, and contractual terms will constitute the basis of acceptance.
4. The Owner's decision regarding substitutions will be considered final. Unauthorized substitutions will be rejected.

2.2. INSULATION MATERIALS

A. Thermal Insulation Properties and Approved Insulation Boards.
   1. Rigid Polyisocyanurate Roof Insulation; ASTM C1289:
      a. Qualities: Rigid, closed cell polyisocyanurate foam core bonded to heavy duty glass fiber mat facers.
      b. Thickness: **N/A**
      c. R-Value: **N/A**
      d. Attachment: Mechanically attached per roofing manufactures ASCE 7-16 Wind Uplift requirements.
      e. Compliances: UL, WH or FM listed under Roofing Systems Federal Specification HH-I-1972, Class 1.
      f. Acceptable Products:
         1) ENRGY-3; Johns Manville
         2) H-Shield; Hunter
         3) EnergyGuard; GAF
         4) Approved Equivalent

   2. Tapered Polyisocyanurate Roof Insulation; ASTM C1289:
      a. Qualities: Factory Tapered, closed cell polyisocyanurate foam core bonded to heavy duty glass fiber mat facers.
      b. Thickness: **N/A**
      c. Average R-Value: **N/A**
      d. Tapered Slope: **N/A**
      e. Attachment: Mechanically or adhesive attached per roofing manufactures ASCE 7-16 Wind Uplift requirements.
      f. Compliances: UL, WH or FM listed under Roofing Systems Federal Specification HH-I-1972, Class 1
      g. Acceptable Products:
         1) ENRGY 3; Johns Manville
         2) EnergyGuard; GAF
         3) H-Shield; Hunter
         4) Approved Equivalent

   3. High Density Six Side Primed Fiberboard Roof insulation; ASTM C208
      a. Qualities: Rigid, composed of interlocking fibers factory blended treated with asphalt on six sides.
      b. Board Size: **N/A**
      c. Thickness: **N/A**
      d. Attachment: Attached per roofing manufactures ASCE 7-16 Wind Uplift requirements.
      e. Compliances: UL, WH, FM listed under Roofing Systems. Federal Specification LLL-I-535-B.

f. Acceptable Manufacturers:
   1) Blue Ridge; Celotex
   2) Temple Inland
   3) GAF Building Materials Corporation
   4) Georgia-Pacific
   5) Approved Equivalent

4. Dens-Deck Prime Roof Board
   a. Qualities: Nonstructural glass mat faced, noncombustible, water-resistant treated gypsum core panel.
   b. Board Size: Four feet by Eight feet (4'x8').
   c. Thickness: **1/4"**
   d. R-Value: **.28**
   e. Attachment: Mechanically attached per roofing manufacturers ASCE 7-16 wind uplift requirements.
   f. Compliances: UL, WH or FM listed under Roofing Systems.

2.3. RELATED MATERIALS

A. Fiber Cant and Tapered Edge Strips: Performed rigid insulation units of sizes/shapes indicated, matching insulation board or of perlite or organic fiberboard, as per the approved manufacturer.
   1. Acceptable Manufacturers:
      a. The Garland Company, Inc.
      b. Celotex
      c. Johns Manville
      d. GAF
      e. Approved Equivalent

B. Protection Board: Pre-molded semi-rigid asphalt composition board one half (1/2) inch.

C. Roof Board Joint Tape: Six (6) inches wide glass fiber mat with adhesive compatible with insulation board facers.

D. Asphalt: ASTM D312, Type III Steep Asphalt.

E. Roof Deck Insulation Adhesive: Insul-Lock HR - Dual-component, high rise foam adhesive with 45% rapidly renewable material content as recommended by insulation manufacturer and approved by FM indicated ratings.
   1. Tensile Strength (ASTM D412)……250 psi
   2. Density (ASTM D1875)……..8.5 lbs./gal.
   3. Viscosity (ASTM D2556)……22,000 to 60,000 cP.
   4. 2 `Peel Strength (ASTM D903)…..17 lb/in.
   5. 3 `Flexibility (ASTM D816)……Pass @ -70°F

F. Fasteners: Corrosion resistant screw fastener as recommended by roof membrane manufacturer.
   1. Factory Mutual Tested and Approved with three (3) inches coated disc for I-90 rating, length required to penetrate metal deck one inch.
   2. Screws: Concealor #14-13 DP1 as specified per ASCE 7 calculations.

PART 3 – EXECUTION

1. EXECUTION, GENERAL

A. Comply with requirements of Division 01 Section “Common Execution Requirements.”

2. INSPECTOR OF SURFACES

A. Roofing contractor shall be responsible for preparing an adequate substrate to receive insulation.
   1. Verify that work which penetrates roof deck has been completed.
   2. Verify that wood nailers are properly and securely installed.
   3. Examine surfaces for defects, rough spots, ridges, depressions, foreign material, moisture, and unevenness.
   4. Do not proceed until defects are corrected.
   5. Do not apply insulation until substrate is sufficiently dry.
   6. Broom clean substrate immediately prior to application.
   7. Use additional insulation to fill depressions and low spots that would otherwise cause ponding water.
   8. Verify that temporary roof has been completed.

3. INSTALLATION

A. Comply with built-up roofing manufacturer's written instructions, as submitted and reviewed by Architect during the submittal process, for installing roof insulation.

B. Install one lapped rosin sheet course and mechanically fasten to substrate according to built-up roofing manufacturer's written instructions and as called for in these specifications and on the drawings.

C. Insulation Cant Strips: Install and secure preformed 45-degree insulation cant strips at junctures of built-up roofing with vertical surfaces or angle changes greater than 45 degrees.

D. Install tapered insulation under area of roofing to conform to slopes indicated. Install insulation with long joints of insulation in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4 inch with insulation.

   1. Cut and fit insulation within 1/4 inch of nailers, projections, and penetrations.

E. Install insulation under area of roofing to achieve required thickness. Where overall insulation thickness is 2.7 inches or greater, install two or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of 6 inches in each direction.

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

G. Mechanically Fastened and Adhered Insulation: Install first layer of insulation to deck using mechanical fasteners specifically designed and sized for fastening specified board-type roof insulation to deck type.

1. Fasten first layer of insulation to resist uplift pressure at corners, perimeter, and field of the roof.

    a. Field: 16 screws per 4 foot by 8 foot panel (2 square feet per screw).
    b. Perimeter: 24 screws per 4 foot by 8 foot panel (1.33 square feet per screw).
    c. Corners: 32 screws per 4 foot by 8 foot panel (1 square foot per screw).

2. Set each subsequent layer of insulation in insulation adhesive adhered per the roofing system manufactures recommendations.

H. Install cover boards over insulation with long joints in continuous straight lines with end joints staggered between rows. Offset joints of insulation below a minimum of 6 inches in each direction. Loosely butt cover boards together and fasten to roof deck. Tape joints if required by roofing manufacturer.

I. Apply insulation adhesive to underside and immediately bond cover board to substrate.

J. Approved insulation board shall be fully attached to the deck with an approved mechanical fastening system. As a minimum, the amount of fasteners shall be in accordance with manufacturer's recommendation ASCE 7-16. Otherwise, a minimum of one fastener per two square feet shall be installed.

K. Filler pieces of insulation require at least two fasteners per piece if size of insulation is less than four square feet.

L. Spacing pattern of fasteners shall be as per manufacturer's recommendations to meet the ASCE 7-16 requirements. Placement of any fastener from edge of insulation board shall be a minimum of three inches, and a maximum of six (6) inches.

M. Minimum penetration into deck shall be as recommended by the fastener manufacturer. There is a one (1) inch minimum for metal, wood and structural concrete decks where not specified by the manufacturer. For gypsum and cement-wood fiber decks, penetration shall be determined from pull-out test results with a minimum penetration of one and one-half (1 ½) inches.

N. Gypsum and cementitious wood fiber decks: Where the roof deck is visible from the building interior, the contractor shall ensure no penetration of fasteners through underside of the deck. Any holes or spalling caused by fastener installation shall be repaired by the roofing contractor. Where the new roof system thickness exceeds an amount so that a minimum of 1 ½ of penetration cannot be achieved with an Olympic TB Fastener, or approved equivalent, then (and only then) toggle bolts may be used to secure installation to the deck.

O. Tape joints of insulation as per manufacturer's requirements.

P. Attachment with Insulation Adhesive Approved by Factory Mutual (FM).

Q. Ensure all surfaces are clean, dry, free of dirt, debris, oils, loose ore embedded gravel, unadhered coatings, deteriorated membrane and other contaminants that may inhibit adhesion.

R. Apply insulation adhesive directly to the substrate using a ribbon pattern with one quarter to one half (1/4-1/2) inch wide beads 12 inches o.c., using either the manual applicator or an automatic applicator, at a rate of one (1) gallon per one hundred (150) square feet per cartridge.

S. Immediately place insulation boards into wet adhesive. Do not slide boards into place. Do not allow the adhesive to skin over before installing insulation boards.

T. Briefly step each board into place to ensure contact with the adhesive. Substrates with irregular surfaces may prevent the insulation board from making positive contact with the adhesive. Relief cuts or temporary weights may be required to ensure proper contact.

U. All boards shall be cut and fitted where the roof deck intersects a vertical surface. The boards shall be cut to fit a minimum of one quarter (1/4) inch away from the vertical surface.

V. Tape joints of insulation as per manufacturer's requirements.

4. CLEANING

A. Remove debris and cartons from roof deck. Leave insulation clean and dry, ready to receive roofing membrane.

5. CONSTRUCTION WASTE MANAGEMENT

A. Remove and properly dispose of waste products generated during installation. Comply with requirements of authorities having jurisdiction.

END OF SECTION

SECTION 07 41 00
METAL ROOF PANELS

1.GENERAL

1.1. RELATED DOCUMENTS

A. Drawings and general provisions of the contract, including the conditions of the contract and Division 1 specification sections apply to this section.

1.2. SECTION INCLUDES

A. Work described in this section includes pre formed standing seam metal roofing system over self adhering underlayment over 1/4" dens dek prime mechanically attached to the roof deck.

B. Includes gutters, downspouts, fascia metal, all associated flashings and closures installed over the panel manufactures self-adhering underlayment and the specified roof deck insulation system.

1.3. RELATED SECTIONS

A. Section 01 - Owner Supplied Materials

B. Section 01 - Summary of Work

C. Section 06 - Rough Carpentry

D. Section 07 - Sheet Metal Flashing and Trim

1.4. REFERENCES

A. ASTM A 653/A 653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galv.) by the Hot-Dip Process.

B. ASTM A 792/A 792M - Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.

C. ASTM A 875 - Standard Specification for Steel Sheet, Zinc-5 % Aluminum Alloy-Coated by the Hot-Dip Process

D. ASTM B 101 - Standard Specification for Lead-Coated Copper Sheet and Strip for Building Construction.

E. ASTM B 209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.

F. ASTM D 1056 - Standard Specification for Flexible Cellular Materials - Sponge or Expanded Rubber.

G. ASTM D 2178 - Standard Specification for Asphalt Glass Felt Used in Roofing and Waterproofing.

H. ASTM D 3575 - Standard Test Methods for Flexible Cellular Materials made from Olefin Polymers.

I. ASTM E 84 - Standard Test for Surface Burning Characteristics of Building Materials.

J. ASTM E 283 - Standard Test Method for Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.

K. ASTM E 331 - Standard Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.

L. ASTM E 1592 - Standard Test Method for Structural Performance of Sheet Metal Roof and Siding Systems by Uniform Static Air Pressure Difference.

M. ASTM E 1646 - Standard Test Method for Water Penetration of Exterior Metal Roof Panel Systems by Uniform Static Air Pressure Difference.

N. ASTM E 1680 - Standard Test Method for Rate of Air Leakage Through Exterior Metal Roof Panel Systems.

O. ASTM E 2140 - Standard Test Method for Water Penetration of Metal Roof Panel Systems by Static Water Pressure Head.

P. AAMA 501.1 - Standard Test Method for Water Penetration of Windows, Curtain Walls and Doors Using Dynamic Pressure.

Q. ASCE 7 - Minimum Design Loads for Buildings and Other Structures.

R. FM 4470 Approval Standard for Class 1 Panel Roofs.

S. FM 4471 - Class 1 Panel Roof; Factory Mutual Research Corporation.

T. UL 263 - Fire Tests of Building Constructions and Materials.

U. UL 580 - Standard for Tests for Uplift Resistance of Roof Assemblies.

V. UL 790 - Standard Test Methods for Fire Tests of Roof Coverings.

W. UL 1897 - Uplift Test for Roof Covering Systems.

X. ICC-ES AC166 - Test Procedure for Wind Driven Rain Resistance of Metal Roof Coverings.

Y. SMACNA - Architectural Sheet Metal Manual.

Z. National Coil Coating Association (NCCA)

AA. NRCA - The NRCA Roofing and Waterproofing Manual.

1.5. DESIGN / PERFORMANCE REQUIREMENTS

A. Standing Seam Roofing System: R-Mer Span
   1. Thermal Expansion and Contraction:
      a. Completed metal roofing and flashing system shall be capable of withstanding expansion and contraction of components caused by changes in temperature without buckling, producing excess stress on structure, anchors or fasteners, or reducing performance ability.
      b. Design temperature differential shall be not less than 200 degrees F.
      c. Interface between panel and clip shall provide for unlimited thermal movement in each direction along the longitudinal direction.
      d. Location of metal roofing rigid connector shall be at roof ridge unless otherwise approved by the Project Architect. Metal ridge connector may require design as per job conditions by specified manufacturer.

2. Uniform Wind Load Capacity:
    a. Installed roof system shall withstand negative (uplift) design wind loading pressures complying with the following criteria.
        1. Design Code: ASCE 7-16, Method 2 for Components and Cladding.
        2. <u>All items below (3 - 11,c must be sent with the submittals for the project)</u>
        3. Safety Factor: 2.00 after any load reduction or material stress increase.
        4. Building with an Importance Factor of __.
        5. Wind Speed: ___ mph.
        6. Ultimate Pullout Value: __ pounds per each of the two fasteners holding the panel anchor to the roof decking or framing system.
        7. Exposure Category: ___.
        8. Design Roof Height: ___ feet.
        9. Minimum Building Width: ___ feet.
        10. Roof Pitch: __ inches per foot.
        11. Roof Area Design Uplift Pressure:
            a. Zone 1 - Field of roof __ psf.
            b. Zone 2 - Eaves, ridges, hips, and rakes __ psf.
            c. Zone 3 - Corners __ psf.
    b. ASTM E 1592: Capacity shall be determined using pleated airbag method in accordance with ASTM E 1592, testing of sheet metal roof panels. Allowable safe working loads shall be determined by dividing the ultimate test load by the safety factor specified above.
    c. Underwriters' Laboratories, Inc., (UL), wind uplift resistance classification: Roof assembly shall be classified as Class 1-90, as defined by UL 580
3. Uniform Positive Load Capacity.
    a. Installed roof system shall be capable of resisting the following positive uniform roof loads: Roof Live Load of 20 psf; Roof Snow Load of _N/A_ psf.
    b. Dead Load: Loading of the roof structure, due to tear off of existing, and/or installation of new roofing materials shall not exceed the present loading due to weight of the existing roofing system.
    c. Installed roof system shall carry positive uniform design loads with a maximum system deflection of L/180 as measured at the rib (web) of the panel.
4. Underwriters' Laboratories, Inc., (UL):
    a. Underwriters' Laboratories, Inc., (UL) fire resistance P ratings for roof assemblies: If applicable, panel system shall be approved for use in an appropriate Construction Assembly, as defined by UL 263.
    b. Underwriters' Laboratories, Inc., (UL) Class A fire rating per UL 790.
5. ASTM E 283: Static pressure air infiltration (doors, windows, curtain walls):
    a. Pressure Leakage Rate
        1. 1.57 PSF 0.0007 cfm/sq.ft.
        2. 6.24 PSF 0.0002 cfm/sq.ft.
        3. 20.0 PSF 0.0036 cfm/sq.ft.
6. ASTM E 331: Static pressure water infiltration (doors, windows, curtain walls):
    a. Pressure Result:
        1. 5 Gal. /Hr. per S.F. and Static No Leakage
        2. Pressure of 20.0 Psf. for 15 minutes
7. ASTM E 1680: Static pressure air infiltration (roof panels):
    a. Pressure Leakage Rate:
        1. 1.57 PSF 0.0012 cfm/sq.ft.
        2. 6.24 PSF 0.0001 cfm/sq.ft.
        3. 20.0 PSF 0.0011 cfm/sq.ft.
8. ASTM E 1646: Static pressure water infiltration (roof panels):
    a. Pressure Result:
        1. 5 Gal. /Hr. per S.F. and Static No Leakage

2. Pressure of 20.0 Psf for 15 minutes

9. Capacities for gauge, span or loading other than those tested may be determined by interpolation of test results within the range of test data. Extrapolations for conditions outside test range are not acceptable.
10. Water penetration (dynamic pressure): No water penetration, other than condensation, when exposed to dynamic rain and 70 mph wind velocities for not less than five minutes duration, when tested in accord with principles of AAMA 501.1.
11. Wind and wind driven rain resistance: No water penetration or panel movement when exposed to 110 mph wind velocities when tested in accordance with TAS 100.
12. Installed roof system assembly shall show that it can resist the calculated roof pressure in accordance with the test results of TAS 125.
13. Water penetration in low slope applications: No water penetration or panel movement when subject to 6 inch head of water for 6 hours when tested in accordance with the ASTM E 2140 and when subject to 6 inch head of water for 7 days when tested in accordance with the TAS 114 appendix G.
14. Submit third party validation of environmental claims, prepared UL Environment, for all metal roof panels containing recycled content and/or bio based content.

1.6. SUBMITTALS

A. Submit under provisions of Section 01300.

B. Product Data: Submit product data, test reports, and certifications in accordance with quality assurance and performance requirements specified herein.

C. Design Loads: Submit manufacturer's minimum design load calculations according to ASCE 7-16, Method 2 for Components and Cladding. In no case shall the design loads be taken to be less than those specified herein.

D. Shop Drawings: Prepared specifically for this project by the panel manufactures engineering department; showing dimensions of metal roofing and accessories, fastening details and connections and interface with other products.

E. LEED Submittals: Provide documentation of how the requirements of Credit will be met:
1. List of proposed materials with recycled content. Indicate post-consumer recycled content and pre-consumer recycled content for each product having recycled content.
2. Product data and certification letter indicating percentages by weight of post-consumer and pre-consumer recycled content for products having recycled content.

F. Selection Samples: For each finish product specified, two complete sets of samples representing manufacturer's full range of available colors and textures.

G. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and textures.

H. Manufacturer's Certificates: Certify products meet or exceed specified requirements.

I. Inspection Certification: Submit a letter signed by an officer of the manufacturer certifying that the manufacture will provide weekly project inspections throughout the course of construction.

J. Any material submitted as equal to the specified material must be accompanied by a report signed and sealed by a professional engineer licensed in the state in which the installation is to take place. This report shall show that the submitted equal meets the Design and Performance criteria in this specification. Substitution requests submitted without licensed engineer approval will be rejected for non-conformance.

K. Closeout Submittals:
   1. Provide manufacturer's maintenance instructions that include recommendations for periodic checking and maintenance of installed roof system.
   2. Provide executed copy of manufacturer's warranty.
   3. Provide all manufacturers inspection reports.

1.7. QUALITY ASSURANCE

A. Manufacturer Qualifications: Manufacturer shall have in place a documented, standardized quality control program such as ISO-9001 approval.

B. The Manufacturer's Field Representative to conduct required inspections of work in progress 2 days per week as described herein and shall furnish written documentation of all such inspections on a weekly basis.

C. Alternate Manufacturers: The following manufacturer criteria must be submitted, alternate systems will not be considered for approval unless each of these items has been submitted for review at least 10 business days prior to bid opening:

D. Submit each item listed in article 1.6 (E through O) for evaluation of the proposed system.

E. Tests shall have been made for identical systems within the ranges of specified performance criteria.

F. Empirical calculations for roof performance shall only be acceptable for positive loads.

G. A list of a minimum of five (5) jobs where the proposed alternate material was used under similar conditions. The reference list shall include date of project, size of project, project address, and telephone number of architect/owner contact.

H. A financial statement demonstrating a minimum of a 3:1 ratio of assets to liabilities.

I. A written statement from the manufacturer stating that they will provide the building owner with a site inspection 2 days per week by an experienced, full time employee of the company.

J. A written statement from a corporate officer of the manufacturing company stating that he or she has reviewed the specifications and confirms that the proposed system meets or exceeds all performance requirements listed as well as meets the panel size, gauge, weight, clip design, sealant design, uplift pressures and height of the vertical seam

K. A copy of manufacturer's 30 year warranty. Warranty must include coverage for all trim, flashing, and penetrations associated with this roof.

L. Proof that the manufacturer has been in business for a minimum number of years equal to the warranty period required for this project.

M. Installer Qualifications: Certified and approved installer of the sheet metal roofing manufacturer.

N. Source Limitations: Obtain all components of roof system from a single manufacturer, including roll goods materials if required. Secondary products that are required shall be recommended and approved in writing by the roofing system Manufacturer.

O. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
   1. Finish areas designated by Architect.
   2. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.
   3. Refinish mock-up area as required to produce acceptable work.

1.8. 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.

1.9. DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.

B. Unload / Load panels using a proper boom or crane with the proper lifting equipment and using multiple attachment points to avoid bending or twisting the panels.

C. Store materials protected from exposure to harmful environmental conditions and at temperature and humidity conditions recommended by the manufacturer.
   1. Store materials above ground, on skids.
   2. Protect material with waterproof covering and allow sufficient ventilation to prevent condensation buildup or moisture entrapment on the materials.
   3. Store products to prevent twisting, bending, abrasion, and denting.

1.10. 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.

1.11. WARRANTY

A. Warranty:
   1. Manufacturers 30 year NDL (No Dollar Limit), warranty including coverage for all trim, flashings, gutters, and penetrations associated with the roof area.
   2. Provide installers 3 year warranty covering roofing system installation and water-tightness.
   3. Provide warranty from a single manufacturer for all standing seam metal roof areas, low slope roof areas, wall panels, soffit panels, coping systems, etc. and transitions between the product types.

2.PRODUCTS

2.1. MANUFACTURERS

A. Acceptable Manufacturer: Garland Company, Inc. (The), which is located at: 3800 E. 91st St.; Cleveland, OH 44105; Toll Free Tel: 800-321-9336; Tel: 216-641-7500; Fax: 216-641-0633; Web:www.garlandco.com

B. Local Contact: Rich Jones (559) 647-1196

C. Substitutions will not be permitted, district standard.

D. 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 a minimum of ten (10) days prior to the bid date for review.
   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 contractors request for manufacturer substitution.

2.2. STANDING SEAM METAL ROOFING, FASCIA & TRIM

A. Fascia, Trim, Gutters, Downspouts: R-Mer Flat Sheet by The Garland Company, Inc.

1. Material: 24 gauge pre-finished flat sheet.

B. Standing Seam Metal Roofing: R-Mer Span by The Garland Company, Inc.
   1. Width of Standing T-Seam Panel: 1 inch T-seam.
      a. 18 inches panel width.
   2. Standing Seam: 2-3/8 inch tall mechanically seamed with factory installed hot melt sealant in-seam cap. Panel/Cap is configured with a total of 4 layers of metal surrounding anchor clip.
   3. Panel Profile: Provided with minimum 1-1/2 inches wide elevated mesa's every 2 inches on center continuous throughout panel.
      a. Slope: Solid Decking with self adhesive underlayment; down to 1/4:12.
   4. Panel material:
      a. Galvanized steel 24 gauge, G90, smooth as per ASTM A 653.
   5. Flashing and flat stock material: Fabricate in profiles indicated on drawings of same material, thickness, and finish as roof system, unless indicated otherwise.
   6. Coated Finish:
      a. Exposed surfaces for coated panels:
         1. Two coat coil applied, baked-on full-strength (70% resin) fluorocarbon coating system (polyvinylidene fluoride, PVF2), applied by manufacturer's approved applicator.
      b. Unexposed surfaces for coated panels shall be baked-on polyester coating with .20 to .30 dry film thickness (TDF).
      c. Anchor Clips:
         1. Concealed Standard Anchor Clips: Clips 16 gauge galvanized steel, 1 piece clip with projecting legs for additional panel alignment and provision for unlimited thermal movement in each direction along the longitudinal dimension.
      d. Fasteners:
         1. Concealed fasteners: Corrosion resistant steel fasteners (zinc plated, stainless steel or equal) designed to meet structural loading requirements.
         2. Steel: Concealor #14-13 DP1 as specified per ASCE 7-16 calculations.
         3. Exposed fasteners: Series 410 stainless steel fasteners or 1/8 inch diameter stainless steel waterproof rivets. All exposed fasteners shall be factory painted to match the color of the standing seam panels.
      e. Closures: Factory precut closed cell foam meeting ASTM D 1056 or ASTM D 3575, enclosed in metal channel matching panels when used at hip, ridge, rake, and jamb.
      f. Provide all miscellaneous accessories for complete installation.

2.3. STANDING SEAM METAL ROOFING ACCESSORIES

A. Underlayment:
   1. R-Mer Seal by The Garland Company, Inc.
      a. Underlayment shall be applied over the entire roof and fascia area.
      b. Underlayment shall be one layer of R-mer Seal self adhesive underlayment. Seams shall be lapped in accordance with manufactures instructions.

B. Insulation:
   1. Type: ASTM C 1289 Polyisocyanurate Roof Board Insulation
      a. R Value: N/A
      b. Minimum Thickness N/A
      c. Manufacturers:
         1. Atlas Roofing Corp
         2. GAF Materials Corp

3. Hunter Panels, LLC

C. Barrier Boards:
1. Type: Dens Dek Prime
a. Minimum Thickness: 1/4”
b. Manufacturer:
1. Georgia Pacific

D. Bearing Plates:
1. N/A

E. Sealant:
1. Concealed Applications: Non-Curing Butyl Sealant - Schnee-Morehead, Inc. SM5430 Acryl-R, or equal.
2. Exposed Applications: UV Resistant Tripolymer Sealant - Geocel Corporation, 2300 Tripolymer Sealant, or equal.

2.4. METAL ROOFING ACCESSORIES

A. R-Mer SS Sheet Stock: High gloss, factory painted
1. Material and Thickness:
a. 24 gauge steel
2. Color
a. Standard Color

2.5. METAL ROOFING PANELS

A. Standard Selection:
1. Material & Thickness:
a. 24 gauge steel
2. Color
a. Standard Color

3.EXECUTION

3.1. EXAMINATION

A. Examine surfaces to receive metal roofing. Notify the Architect in writing of any defective conditions encountered. Starting of the work shall constitute acceptance of such conditions.

B. Structural Deck Substrate:
1. Inspect roof deck to verify deck is clean and smooth, free of depressions, waves, or projections, and properly sloped.
2. Verify deck is dry and joints are solidly supported and fastened.
3. Verify wood nailers are installed and correctly located. Do not use pressure-treated wood containing salt-based preservatives or materials corrosive to steel.

C. Structural Framing Substrate:
1. Verify primary and secondary framing members are installed and fastened, properly aligned and sloped.
2. Verify framing members meet the clip spacing criteria as noted in this specification for proper fastening of the panel system.
3. Verify damaged shop coatings are repaired with touch up paint.

D. Verify roof openings, curbs, pipes, sleeves, ducts, or vents through roof are solidly set, reglets are in place, and nailing strips located.

E. Correct defective conditions before beginning work.

3.2. INSTALLATION

A. Install in conformance with the NRCA Roofing and Waterproofing Manual and Manufacturers installation requirements.

B. Form panel shape as indicated on drawings, accurate in size, square, and free from distortion or defects.

C. Install underlayment and eave protection sheet underlayment as recommended by the Manufacturer.

D. Coordinate with installation of rigid board insulation as specified in Section 072200.

E. Install all panels continuous from ridge to eave. Transverse seams are not permitted.

F. Directly over the completed roof substrate, install one (1) piece panel anchor clips. Anchor clips will be fastened into the structural roof decking based on the following spacing pattern:

G. Clip spacing must be 2' for Zone 1 (field)

H. Clip spacing must be 2' for Zone 2 (eave, [ridge, hip,] and rake).

I. Clip spacing must be 2' for Zone 3 (corners)

J. Clip spacing for Zones 2 & 3 must extend 10' feet onto the roof area.

K. Installation of Roof Panels: Roof panels can be installed by starting from either end and working towards the opposite end. Due to the symmetrical design of the specified panels system, it is also acceptable to start from the middle of the roof and work toward each end.

L. A stainless steel pop rivet shall be secured through the anchor reveal of the panel leg and extend into the arm of the panel clip located at the ridge of the system. Provide at each arm of the clip along the ridge. The panel is then anchored at both sides of the clip.

M. Capture all drilling debris during this operation with a rag or cloth placed on the panels at the drilling operation.

N. Panels are not securely attached to the roof until fixed to the anchor clip. To avoid damage and injury, all panels shall be fixed to the anchor clip immediately as they are installed.

O. Panel lengths that exceed maximum shipping lengths shall be field rolled on equipment owned by the panel manufacturer. Seam sealant must be factory applied.

P. Exposed fasteners, screws and/or roof mastic are unacceptable and will be rejected. System configuration only allows for exposed fasteners at panel overlap, if required, and at trim details in accordance with the Manufacturer's requirements.

Q. Where not otherwise indicated conform to SMACNA details including flashings and trim.

R. Install sealants where indicated to clean dry surfaces only without skips or voids..

S. Install metal edge treatment in accordance with the manufacturer's instructions and the approved shop drawings.

T. Install metal roofing accessories in accordance with the manufacturer's instructions and the approved shop drawings.

3.3. PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Substantial Completion.

3.4. CONSTRUCTION WASTE MANAGEMENT

A. Remove and properly dispose of waste products generated during roofing procedures. Comply with requirements of authorities having jurisdiction

3.5. FINAL INSPECTION

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

B. Inspect roofing work and flashing of roof penetrations, walls, curbs and other equipment. List all items requiring correction or completion and furnish copy of list to each party in attendance.

C. Repair or replace deteriorated or defective work found at time above inspection as required to a produce an installation which is free of damage and deterioration at time of Substantial Completion and according to warranty requirements.

D. Notify the Contractor, Architect, & Owner upon completion of corrections.

E. Following the final inspection, provide written notice of acceptance of the installation from the roofing system manufacturer.

F. Immediately correct roof leakage during construction. If the Contractor does not respond within twenty four (24) hours, the Owner will exercise rights to correct the Work under the terms of the Conditions of the Contract.

3.6. DEMONSTRATION AND TRAINING

A. At a time and date agreed to by the Owner, instruct the Owner's facility manager, or other representative designated by the Owner, on the following procedures:

B. Roof troubleshooting procedures.

C. Notification procedures for reporting leaks or other apparent roofing problems.

D. Roofing maintenance.

E. The Owner's obligations for maintaining the roofing warranty in effect and force.

F. The Manufacturer's obligations for maintaining the roofing warranty in effect and force.

END OF SECTION

SECTION 07 62 00

SHEET METAL FLASHING AND TRIM

1.GENERAL

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.

2. SUMMARY

A. Section Includes:

1. Manufactured through-wall flashing with counter flashing.
2. Formed low-slope roof sheet metal fabrications.
3. Formed wall, coping, and soffit sheet metal fabrications.
4. Formed equipment support flashing
5. Surface mounted counter flashing
6. Manufactured reglets and counter flashing
7. Formed gutter and downspouts

B. Related Requirements:

1. Division 06 "Rough Carpentry" for wood nailers, curbs, and blocking.
2. Division 07 “Membrane Roofing” for materials and installation of sheet metal flashing and trim integral with roofing.
3. Division 07 “Metal Roofing” for materials and installation of sheet metal flashing and trim integral with roofing.
4. Division 07 "Roof Accessories" for set-on-type curbs, equipment supports, roof hatches, vents, and other manufactured roof accessory units.

3. COORDINATION

A. Coordinate sheet metal flashing and trim layout and seams with sizes and locations of penetrations to be flashed, and joints and seams in adjacent materials.

B. Coordinate sheet metal flashing and trim installation with adjoining roofing and wall materials, joints, and seams to provide leak proof, secure, and noncorrosive installation.

4. PREINSTALLATION MEETINGS

A. Pre Installation Conference: Conduct conference at Project site.

1. Review construction schedule. Verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
2. Review special roof details, roof drainage, roof-penetration flashing, equipment curbs, and condition of other construction that affect sheet metal flashing and trim.
3. Review requirements for insurance and certificates if applicable.
4. Review sheet metal flashing observation and repair procedures after flashing installation.

5. SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each manufactured product and accessory.

B. Shop Drawings: For sheet metal flashing and trim.

1. Include plans, elevations, sections, and attachment details.
2. Detail fabrication and installation layouts, expansion-joint locations, and keyed details. Distinguish between shop- and field-assembled work.
3. Include identification of material, thickness, weight, and finish for each item and location in Project.
4. Include details for forming, including profiles, shapes, seams, and dimensions.
5. Include details for joining, supporting, and securing, including layout and spacing of fasteners, cleats, clips, and other attachments. Include pattern of seams.
6. Include details of termination points and assemblies.
7. Include details of expansion joints and expansion-joint covers, including showing direction of expansion and contraction from fixed points.
8. Include details of roof-penetration flashing.
9. Include details of edge conditions, including eaves, ridges, valleys, rakes, crickets, and counter flashings as applicable.
10. Include details of special conditions.
11. Include details of connections to adjoining work.
12. Detail formed flashing and trim at scale of not less than 3 inches per 12 inches

C. Samples for Initial Selection: For each type of sheet metal and accessory indicated with factory-applied finishes.

D. Samples for Verification: For each type of exposed finish.

1. Sheet Metal Flashing: 12 inches (300 mm) long by actual width of unit, including finished seam and in required profile. Include fasteners, cleats, clips, closures, and other attachments.
2. Trim, Metal Closures, Expansion Joints, Joint Intersections, and Miscellaneous Fabrications: 12 inches (300 mm) long and in required profile. Include fasteners and other exposed accessories.

6. INFORMATIONAL SUBMITTALS

A. Qualification Data: For fabricator.

B. Product Certificates: For each type of coping and roof edge flashing that is SPRI ES-1 tested.

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

D. Sample Warranty: For special warranty.

7. CLOSEOUT SUBMITTALS

A. Maintenance Data: For sheet metal flashing and trim, and its accessories, to include in maintenance manuals.

8. QUALITY ASSURANCE

A. Fabricator Qualifications: Employs skilled workers who custom fabricate sheet metal flashing and trim similar to that required for this Project and whose products have a record of successful in-service performance.

1. For copings and roof edge flashings that are SPRI ES-1 tested**,** shop shall be listed as able to fabricate required details as tested and approved.

9. DELIVERY, STORAGE, AND HANDLING

A. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage. Store sheet metal flashing and trim materials away from uncured concrete and masonry.

B. Protect strippable protective covering on sheet metal flashing and trim from exposure to sunlight and high humidity, except to extent necessary for period of sheet metal flashing and trim installation.

10. WARRANTY

A. Special Warranty on Finishes: Manufacturer agrees to repair finish or replace sheet metal flashing and trim that shows evidence of deterioration of factory-applied finishes within specified warranty period.

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

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

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

2.PRODUCTS

1. PERFORMANCE REQUIREMENTS

A. General: Sheet metal flashing and trim assemblies shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight.

B. Sheet Metal Standard for Flashing and Trim: Comply with NRCA's "The NRCA Roofing Manual" and SMACNA's "Architectural Sheet Metal Manual" requirements for dimensions and profiles shown unless more stringent requirements are indicated.

C. Sheet Metal Standard for Copper: Comply with CDA's "Copper in Architecture Handbook." Conform to dimensions and profiles shown unless more stringent requirements are indicated.

D. SPRI Wind Design Standard: Manufacture and install roof edge flashings tested according to SPRI ES-1 and capable of resisting the following design pressure:

1. Design Pressure: As indicated on Drawings**.**

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

1. Temperature Change: 120 deg F (67 deg C)**,** ambient; 180 deg F (100 deg C)**,** material surfaces**.**

2. SHEET METALS

A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying strippable, temporary protective film before shipping.

B. Metallic-Coated Steel Sheet: Provide zinc-coated (galvanized) steel sheet according to ASTM A 653/A 653M, G90 (Z275) coating designation; prepainted by coil-coating process to comply with ASTM A 755/A 755M.

1. Surface: Smooth, flat and with manufacturer's standard clear acrylic coating on both sides**.**
2. Exposed Coil-Coated Finish:
   a. Two-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

3. Color: Match Architect's sample
4. Concealed Finish: Pretreat with manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with minimum total dry film thickness of 0.5 mil (0.013 mm).

3. UNDERLAYMENT MATERIALS

A. Self-Adhering, High-Temperature Sheet: Minimum 45 mils thick, consisting of a slip-resistant polyethylene- or polypropylene-film top surface laminated to a layer of butyl- or SBS-modified asphalt adhesive, with release-paper backing; specifically designed to withstand high metal temperatures beneath metal roofing. Provide primer according to written recommendations of underlayment manufacturer.

1. The Garland Company Inc., 3800 E. 91st Street Cleveland OH 44105; R-Mer Seal self-adhering underlayment.
2. Thermal Stability: ASTM D 1970; stable after testing at 240 deg F or higher.
3. Low-Temperature Flexibility: ASTM D 1970; passes after testing at minus 20 deg F or lower.

B. Slip Sheet: Rosin-sized building paper, 3 lb/100 sq. ft. minimum.

4. MISCELLANEOUS MATERIALS

A. General: Provide materials and types of fasteners, solder, protective coatings, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and as recommended by manufacturer of primary sheet metal unless otherwise indicated.

B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal or manufactured item.

1. General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.

    a. Exposed Fasteners: Heads matching color of sheet metal using plastic caps or factory-applied coating. Provide metal-backed EPDM or PVC sealing washers under heads of exposed fasteners bearing on weather side of metal.
    b. Blind Fasteners: High-strength aluminum or stainless-steel rivets suitable for metal being fastened.
    c. Spikes and Ferrules: Same material as gutter; with spike with ferrule matching internal gutter width.

2. Fasteners for Zinc-Tin Alloy-Coated Stainless-Steel Sheet: Series 300 stainless steel.

C. Solder:

1. For Zinc-Coated (Galvanized) Steel: ASTM B 32, Grade Sn50, 50 percent tin and 50 percent lead or Grade Sn60, 60 percent tin and 40 percent lead with maximum lead content of 0.2 percent**.**

D. Sealant Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch wide and 1/8 inch thick.

E. Elastomeric Sealant: ASTM C 920, elastomeric polyurethane polymer sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.

F. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type expansion joints with limited movement.

G. Bituminous Coating: Cold-applied asphalt emulsion according to ASTM D 1187.

H. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required for application.

5. FABRICATION, GENERAL

A. General: Custom fabricate sheet metal flashing and trim to comply with details shown and recommendations in cited sheet metal standard that apply to design, dimensions, geometry, metal thickness, and other characteristics of item required. Fabricate sheet metal flashing and trim in shop to greatest extent possible.

1. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.
2. Obtain field measurements for accurate fit before shop fabrication.
3. Form sheet metal flashing and trim to fit substrates without excessive oil canning, buckling, and tool marks; true to line, levels, and slopes; and with exposed edges folded back to form hems.
4. Conceal fasteners and expansion provisions where possible. Do not use exposed fasteners on faces exposed to view.

B. Fabrication Tolerances: Fabricate sheet metal flashing and trim that is capable of installation to a tolerance of 1/4 inch in 20 feet on slope and location lines indicated on Drawings and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

C. Expansion Provisions: Form metal for thermal expansion of exposed flashing and trim.

1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with butyl sealant concealed within joints.
2. Use lapped expansion joints only where indicated on Drawings.

D. Sealant Joints: Where movable, nonexpansion-type joints are required, form metal to provide for proper installation of elastomeric sealant according to cited sheet metal standard.

E. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.

F. Seams: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with elastomeric sealant unless otherwise recommended by sealant manufacturer for intended use.

G. Do not use graphite pencils to mark metal surfaces.

6. ROOF-DRAINAGE SHEET METAL FABRICATIONS

A. Hanging Gutters: Fabricate to cross section required, complete with end pieces, outlet tubes, and other accessories as required. Fabricate in minimum 96-inch- long sections. Furnish flat-stock gutter brackets and flat-stock gutter spacers and straps fabricated from same metal as gutters, of size recommended by cited sheet metal standard but with thickness not less than dimension indicated on Drawings. Fabricate expansion joints, expansion-joint covers, gutter bead reinforcing bars, and gutter accessories from same metal as gutters. Shop fabricate interior and exterior corners.

1. Gutter Profile: Style B according to cited sheet metal standard.
2. Expansion Joints: Butt type with cover plate**.**
3. Accessories: Continuous, removable leaf screen with sheet metal frame and hardware cloth screen at each downspout location.
4. Gutters with Girth up to 15 Inches: Fabricate from the following materials:
   a. Galvanized Steel: 22 gauge thickness.

B. Downspouts: Fabricate downspouts per plans and details or per size per CA plumbing code. Fabricate from the following materials unless otherwise shown on drawings.
1. Galvanized Steel: 22 gauge thickness.

C. Conductor Heads: Fabricate conductor heads with flanged back and stiffened top edge and of dimensions and shape required, complete with outlet tubes, exterior flange trim, and built-in overflows. Fabricate from the following materials:

1. Galvanized Steel: 22 gauge thickness.

7. WALL SHEET METAL FABRICATIONS

A. Through-Wall Flashing: Fabricate continuous flashings in minimum 96-inch- long, but not exceeding 12-foot long, sections, under copings, and at shelf angles. Fabricate discontinuous lintel, sill, and similar flashings to extend 6 inches beyond each side of wall openings; and form with 2-inch high, end dams. Fabricate from the following materials:

1. Galvanized Steel: 22 gauge thickness.

B. Opening Flashings in Frame Construction: Fabricate head, sill, jamb, and similar flashings to extend **4 inches** beyond wall openings. Form head and sill flashing with 2-inch high, end dams. Fabricate from the following materials:

1. Galvanized Steel: 22 gauge thickness.

C. Wall Expansion-Joint Cover: Fabricate from the following materials:

1. Galvanized Steel: 22 gauge thickness.

8. MISCELLANEOUS SHEET METAL FABRICATIONS

A. Gutters: Fabricate from the following materials:

1. Pre-Finished Steel: 22 gauge thickness.

B. Downspouts: Fabricate from the following materials:

1. Steel: Schedule 40

C. Edge Metal / Gravel Stop: Fabricate from the following materials:

1. Pre-Finished Steel: 24 gauge thickness.

D. Cleat Flashing: Fabricate from the following materials:

1. Galvanized Steel: 22 gauge thickness.

E. Curb Covers / Pans: Fabricate from the following materials:

1. Galvanized Steel: 22 gauge thickness.

F. Scuppers: Fabricate from the following materials:

1. Galvanized Steel: 22 gauge thickness.

G. Equipment Support Flashing: Fabricate from the following materials:

1. Galvanized Steel: 22 gauge thickness.

H. Overhead-Piping Safety Pans: Fabricate from the following materials:

1. Galvanized Steel: 22 gauge thickness.

3.EXECUTION

1. EXAMINATION

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

1. Verify compliance with requirements for installation tolerances of substrates.
2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
3. Verify that air- or water-resistant barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.

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

2. UNDERLAYMENT INSTALLATION

A. Self-Adhering Sheet Underlayment: Install self-adhering sheet underlayment, wrinkle free. Prime substrate if recommended by underlayment manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation; use primer for installing underlayment at low temperatures. Apply in shingle fashion to shed water, with end laps of not less than 6 inches staggered 24 inches between courses. Overlap side edges not less than 3-1/2 inches. Roll laps and edges with roller. Cover underlayment within 14 days.

B. Apply slip sheet, wrinkle free, directly on substrate before installing sheet metal flashing and trim.

3. INSTALLATION, GENERAL

A. General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, solder, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.

1. Install sheet metal flashing and trim true to line, levels, and slopes. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.
2. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
3. Space cleats not more than 12 inches apart. Attach each cleat with at least two fasteners. Bend tabs over fasteners.
4. Install exposed sheet metal flashing and trim with limited oil canning, and free of buckling and tool marks.
5. Torch cutting of sheet metal flashing and trim is not permitted.
6. Do not use graphite pencils to mark metal surfaces.

B. Metal Protection: Where dissimilar metals contact each other, or where metal contacts pressure-treated wood or other corrosive substrates, protect against galvanic action or corrosion by painting contact surfaces with bituminous coating or by other permanent separation as recommended by sheet metal manufacturer or cited sheet metal standard.

1. Coat concealed side of stainless-steel sheet metal flashing and trim with bituminous coating where flashing and trim contact wood, ferrous metal, or cementitious construction.
2. Underlayment: Where installing sheet metal flashing and trim directly on cementitious or wood substrates, install underlayment and cover with slip sheet.

C. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at maximum of **10 feet** with no joints within 24 inches of corner or intersection.

1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with sealant concealed within joints.

2. Use lapped expansion joints only where indicated on Drawings.

D. Fasteners: Use fastener sizes that penetrate wood blocking or sheathing not less than 1-1/4 inches for nails and not less than 3/4 inch for wood screws.

E. Conceal fasteners and expansion provisions where possible in exposed work and locate to minimize possibility of leakage. Cover and seal fasteners and anchors as required for a tight installation.

F. Seal joints as required for watertight construction.

1. Use sealant-filled joints unless otherwise indicated. Embed hooked flanges of joint members not less than 1 inch into sealant. Form joints to completely conceal sealant. When ambient temperature at time of installation is between 40 and 70 deg F, set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures. Do not install sealant-type joints at temperatures below 40 deg F.
2. Prepare joints and apply sealants to comply with requirements in Section 079200 "Joint Sealants."

G. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pre-tin edges of sheets with solder to width of 1-1/2 inches; however, reduce pre-tinning where pre-tinned surface would show in completed Work.

1. Do not solder metallic-coated steel sheet.
2. Do not pre-tin zinc-tin alloy-coated stainless steel**.**
3. Do not use torches for soldering.
4. Heat surfaces to receive solder, and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.
5. Stainless-Steel Soldering: Tin edges of uncoated sheets, using solder for stainless steel and acid flux. Promptly remove acid flux residue from metal after tinning and soldering. Comply with solder manufacturer's recommended methods for cleaning and neutralization.
6. Copper Soldering: Tin edges of uncoated sheets, using solder for copper.
7. Copper-Clad Stainless-Steel Soldering: Tin edges of uncoated sheets, using solder for copper-clad stainless steel.

H. Rivets: Rivet joints in zinc where necessary for strength.

4. ROOF-DRAINAGE SYSTEM INSTALLATION

A. General: Install sheet metal roof-drainage items to produce complete roof-drainage system according to cited sheet metal standard unless otherwise indicated. Coordinate installation of roof perimeter flashing with installation of roof-drainage system.

B. Hanging Gutters: Join sections with riveted and soldered joints or joints sealed with sealant as shown and specified on drawings or summary/scope of work. Provide for thermal expansion. Attach gutters at eave or fascia to firmly anchor them in position. Provide end closures and seal watertight with sealant. Slope to downspouts.

1. Fasten gutter spacers to front and back of gutter.

2. Anchor and loosely lock back edge of gutter to continuous cleat**,** eave or apron flashing**.**
3. Anchor back of gutter that extends onto roof deck with cleats spaced not more than 24 inches apart.
4. Anchor gutter with gutter brackets and straps spaced not more than 24 inches apart to roof deck, unless otherwise indicated, and loosely lock to front gutter bead.
5. Anchor gutter with spikes and ferrules spaced not more than 24 inches apart.
6. Install gutter with expansion joints at locations indicated, but not exceeding, 50 feet apart. Install expansion-joint caps.
7. Install continuous gutter screens on gutters with noncorrosive fasteners, removable for cleaning gutters.

C. Conductor Heads: Anchor securely to wall, with elevation of conductor head rim at minimum of 1 inch below gutter discharge.

D. Expansion-Joint Covers: Install expansion-joint covers at locations and of configuration indicated. Lap joints minimum of 4 inches in direction of water flow.

5. ROOF FLASHING INSTALLATION

A. General: Install sheet metal flashing and trim to comply with performance requirements**,** sheet metal manufacturer's written installation instructions, and cited sheet metal standard. Provide concealed fasteners where possible, and set units true to line, levels, and slopes. Install work with laps, joints, and seams that are permanently watertight and weather resistant.

B. Roof Edge Flashing: Anchor to resist uplift and outward forces according to recommendations in FM Global Property Loss Prevention Data Sheet 1-49 for FM Approvals' listing for required windstorm classification.

C. Copings: Anchor to resist uplift and outward forces according to recommendations in cited sheet metal standard unless otherwise indicated.

1. Interlock exterior bottom edge of coping with continuous cleat anchored to substrate at 24-inch centers.
2. Anchor interior leg of coping with washers and screw fasteners through slotted holes at 24-inch centers.

D. Copings: Anchor to resist uplift and outward forces according to recommendations in FM Global Property Loss Prevention Data Sheet 1-49 for specified FM Approvals' listing for required windstorm classification.

E. Pipe or Post Counterflashing: Install counterflashing umbrella with close-fitting collar with top edge flared for elastomeric sealant, extending minimum of 4 inches over base flashing. Install stainless-steel draw band and tighten.

F. Counterflashing: Coordinate installation of counterflashing with installation of base flashing. Insert counterflashing in reglets or receivers and fit tightly to base flashing. Extend counterflashing 4 inches over base flashing. Lap counterflashing joints minimum of 4 inches. Secure in waterproof manner by means of interlocking folded seam or blind rivets and sealant, anchor and washer at 36-inch centers unless otherwise indicated.

G. Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof. Seal with elastomeric sealant and clamp flashing to pipes that penetrate roof.

6. WALL FLASHING INSTALLATION

A. General: Install sheet metal wall flashing to intercept and exclude penetrating moisture according to cited sheet metal standard unless otherwise indicated. Coordinate installation of wall flashing with installation of wall-opening components such as windows, doors, and louvers.

B. Through-Wall Flashing: Installation of through-wall flashing is specified in Section 042000 "Unit Masonry."Section092400 "Cement Plastering."

C. Opening Flashings in Frame Construction: Install continuous head, sill, jamb, and similar flashings to extend 4 inches beyond wall openings.

7. MISCELLANEOUS FLASHING INSTALLATION

A. Equipment Support Flashing: Coordinate installation of equipment support flashing with installation of roofing and equipment. Weld or seal flashing with elastomeric sealant to equipment support member.

B. Overhead-Piping Safety Pans: Suspend pans from structure above, independent of other overhead items such as equipment, piping, and conduit, unless otherwise indicated on Drawings. Pipe and install drain line to plumbing waste or drainage system.

8. ERECTION TOLERANCES

A. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerance of 1/4 inch in 20 feet on slope and location lines indicated on Drawings and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

B. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerances specified in MCA's "Guide Specification for Residential Metal Roofing."

9. CLEANING AND PROTECTION

A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.

B. Clean and neutralize flux materials. Clean off excess solder.

C. Clean off excess sealants.

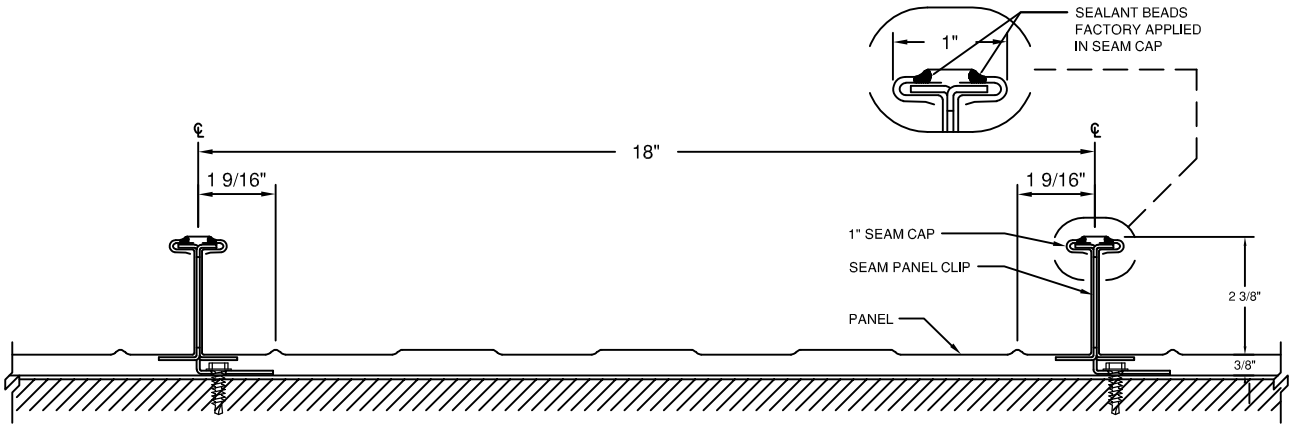
D. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions. On completion of sheet metal flashing and trim installation, remove unused materials and clean finished surfaces as recommended by sheet metal flashing and trim

manufacturer. Maintain sheet metal flashing and trim in clean condition during construction.

E. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 07 62 00

Bid No.020624-Bid Section #1-MLK



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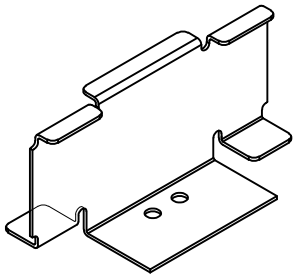
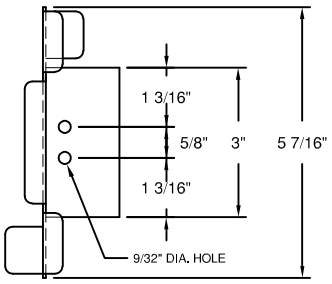
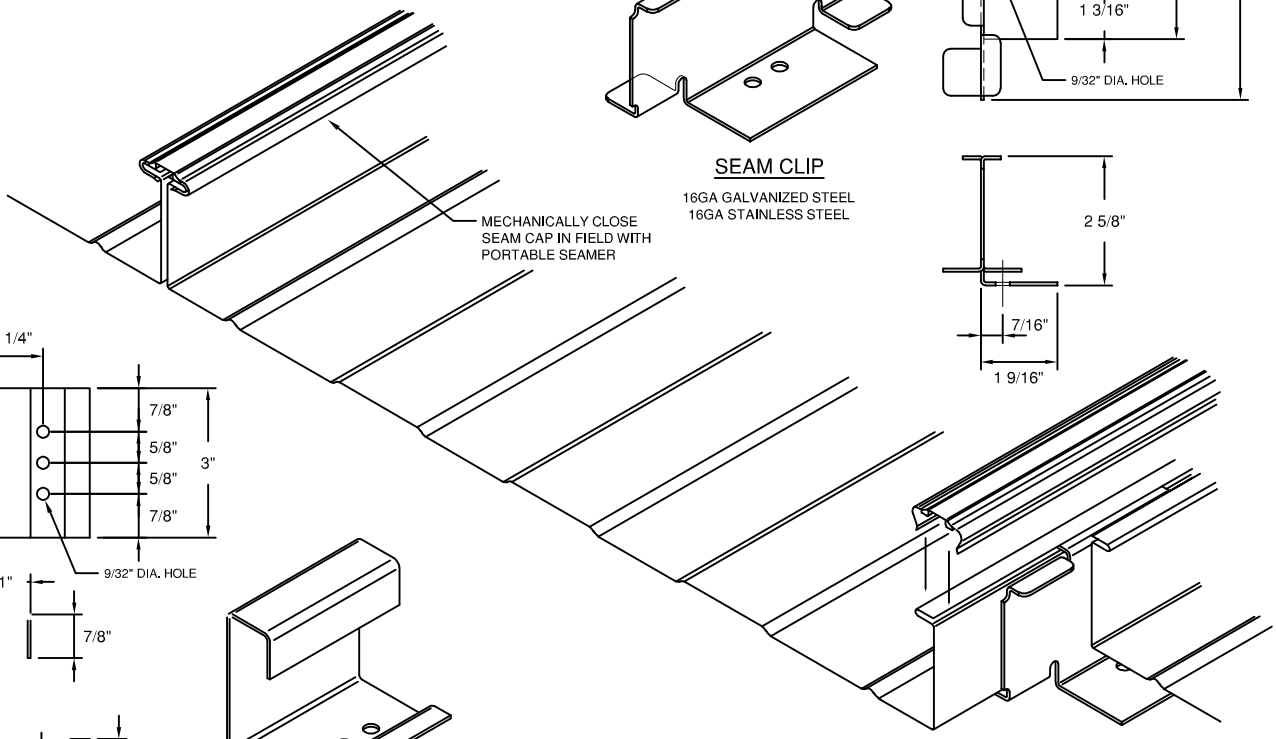
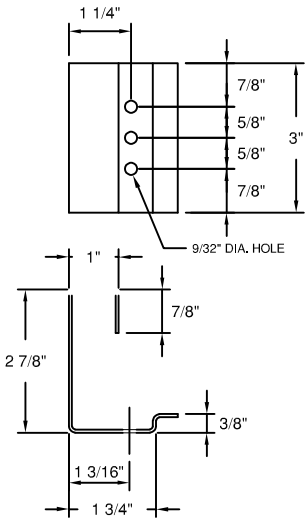


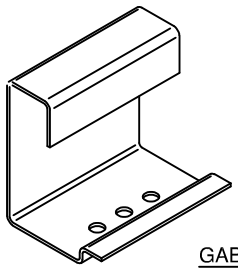
SEAM CLIP

16GA GALVANIZED STEEL
16GA STAINLESS STEEL









GABLE CLIP

16GA GALVANIZED STEEL
16GA STAINLESS STEEL

DRAWINGS ON 8½"x11 TITLE BLOCKS ARE NOT TO SCALE.

18" PANEL 2 HOLE CLIP

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PROJECT:	
CUSTOMER:	
ARCHITECT:	
REPRESENTATIVE:	
DATE:	SHT: OF

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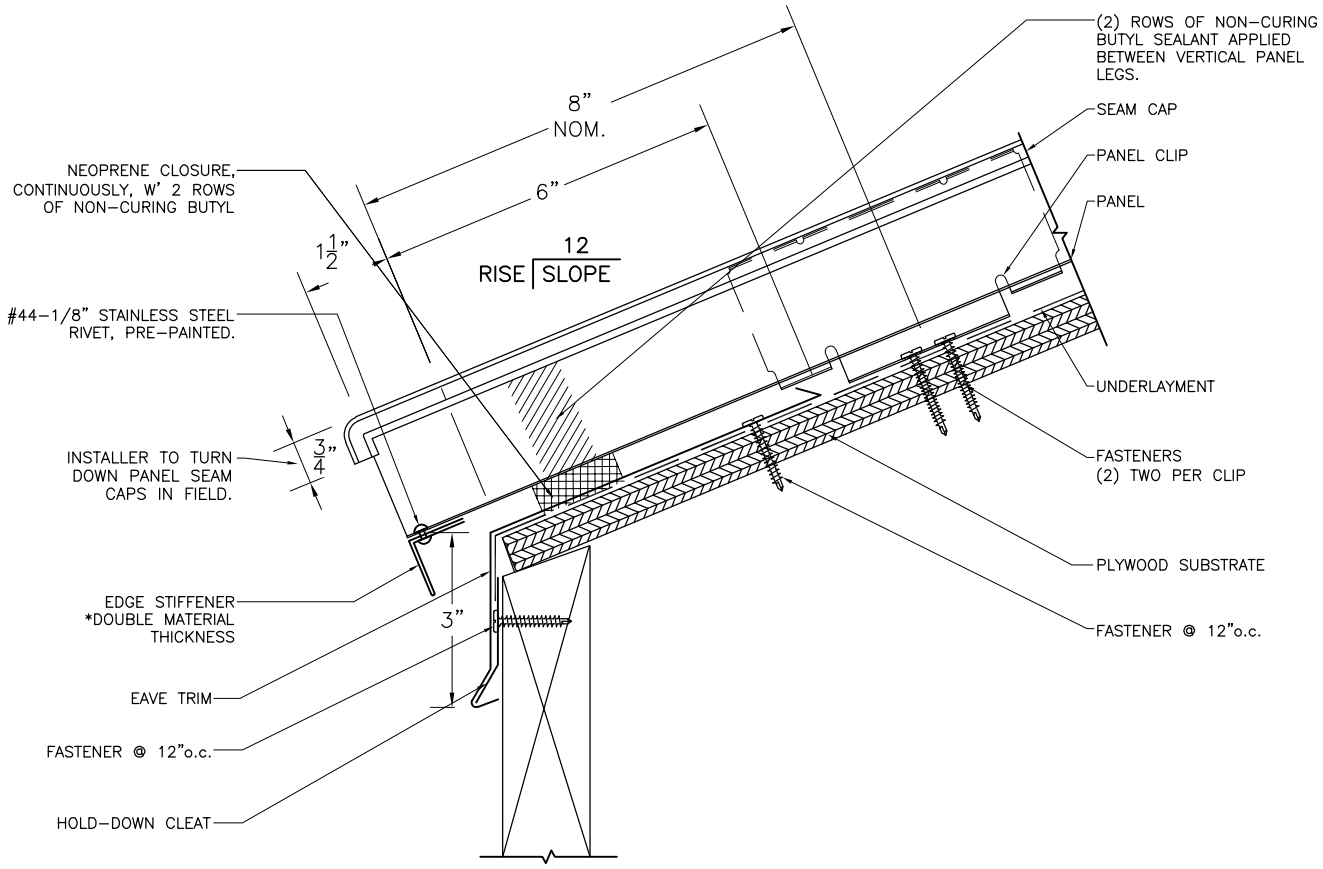

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EXPANDING EAVE DETAIL

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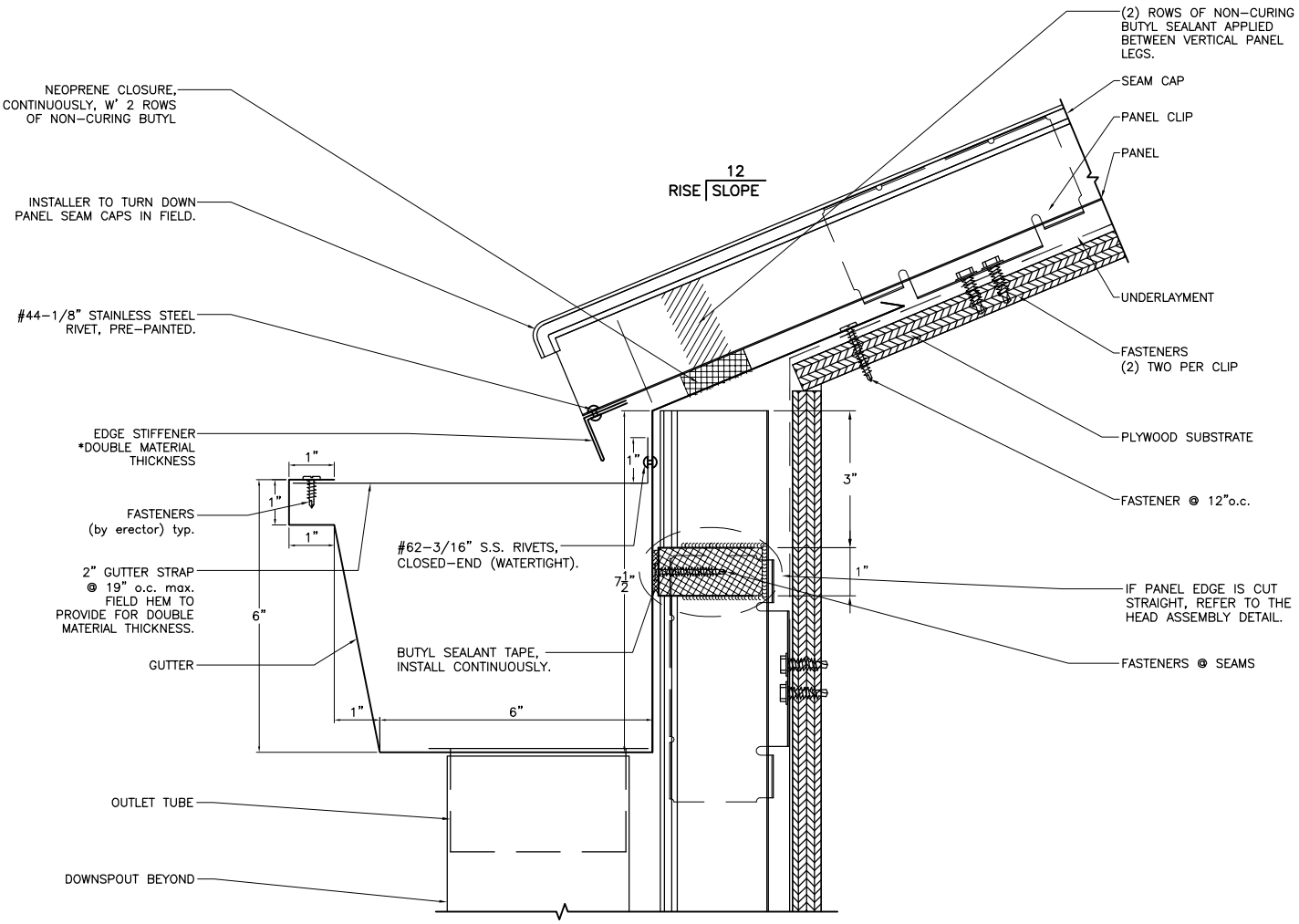

DRAWINGS ON 8½"x11 TITLE BLOCKS ARE NOT TO SCALE.

EXPANDING EAVE AT FLANGED GUTTER AND WALL PANEL DETAIL

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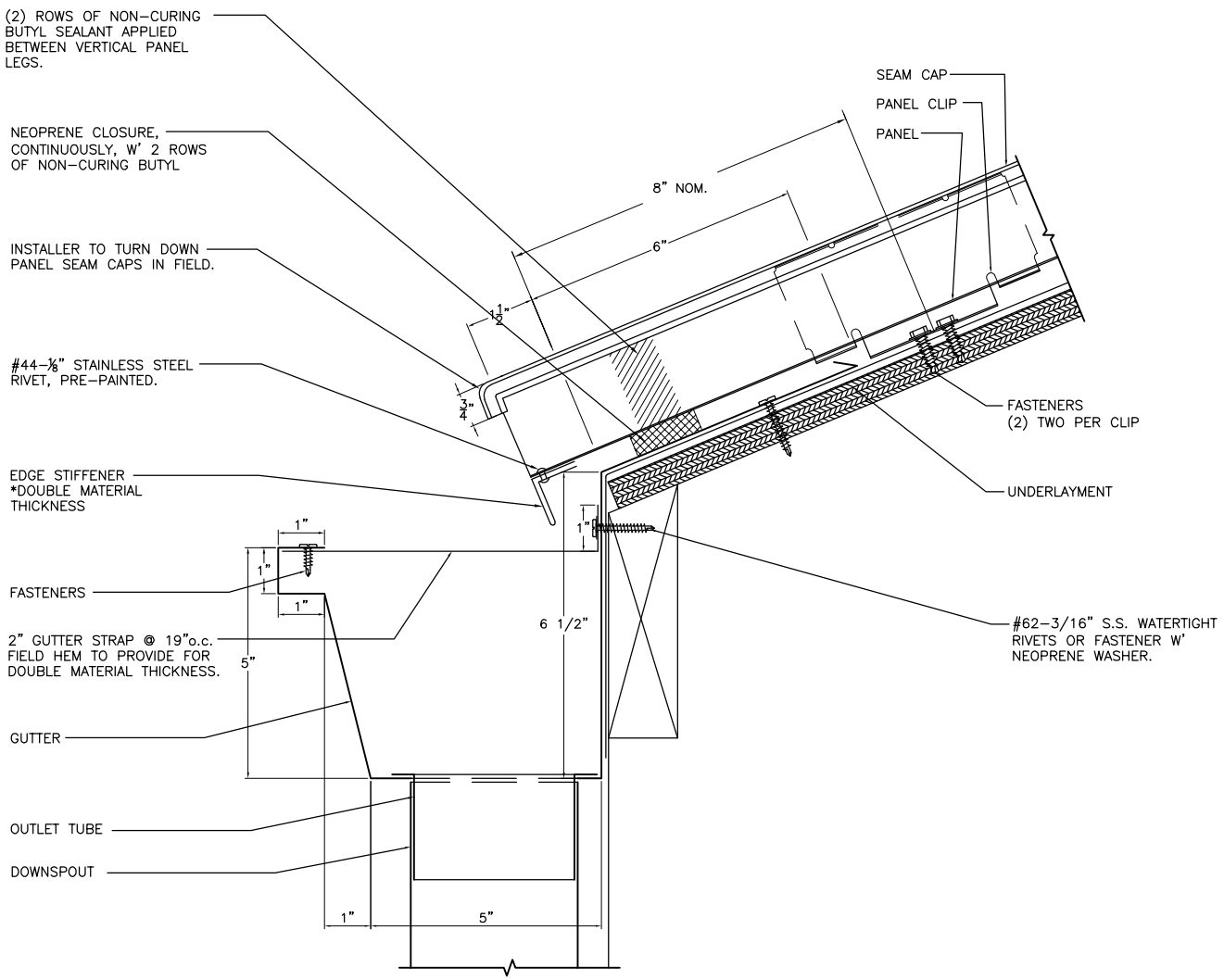

DRAWINGS ON 8½"x11 TITLE BLOCKS ARE NOT TO SCALE.

EXPANDING EAVE AT FLANGED GUTTER DETAIL

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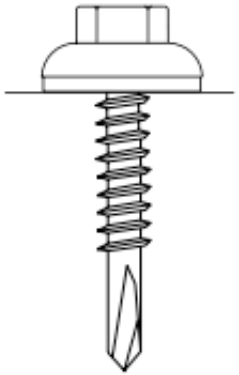
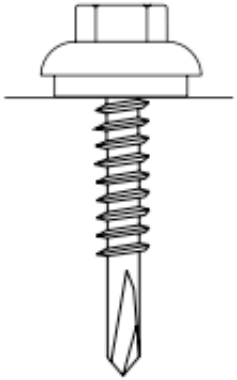
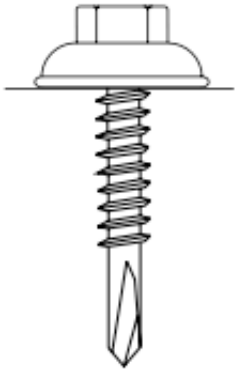
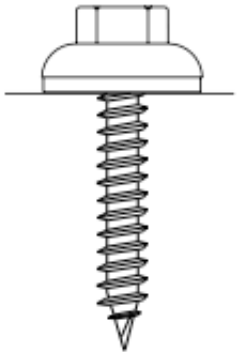
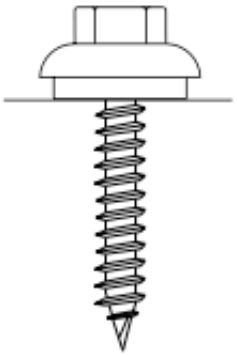
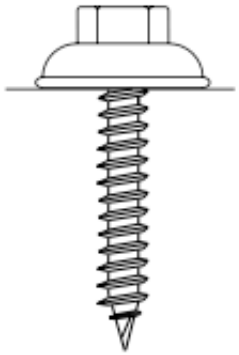
CUSTOMER:	
ARCHITECT:	
REPRESENTATIVE:	
DATE:	SHT: OF

	CORRECT Sealing material slightly visible at edge of metal washer. Assembly is watertight.	**TOO LOOSE** Sealing material is not visible; not enough compression to seal properly.	**TOO TIGHT** Metal washer deformed; sealing material pressed beyond washer edge.
SELF DRILLER			
WOODSCREW			

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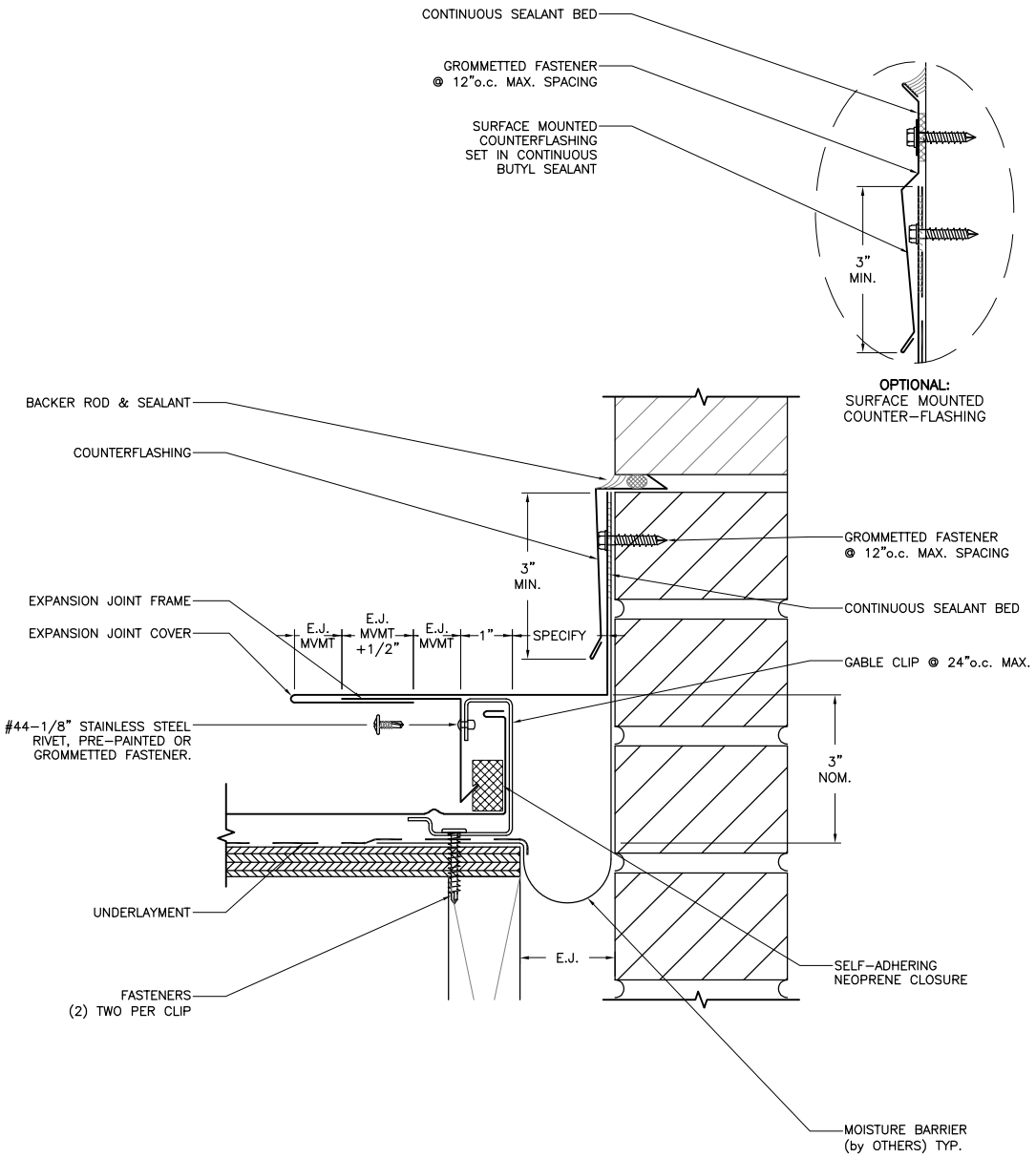

DRAWINGS ON 8½"x11 TITLE BLOCKS ARE NOT TO SCALE.

JAMB AT EXPANSION JOINT DETAIL

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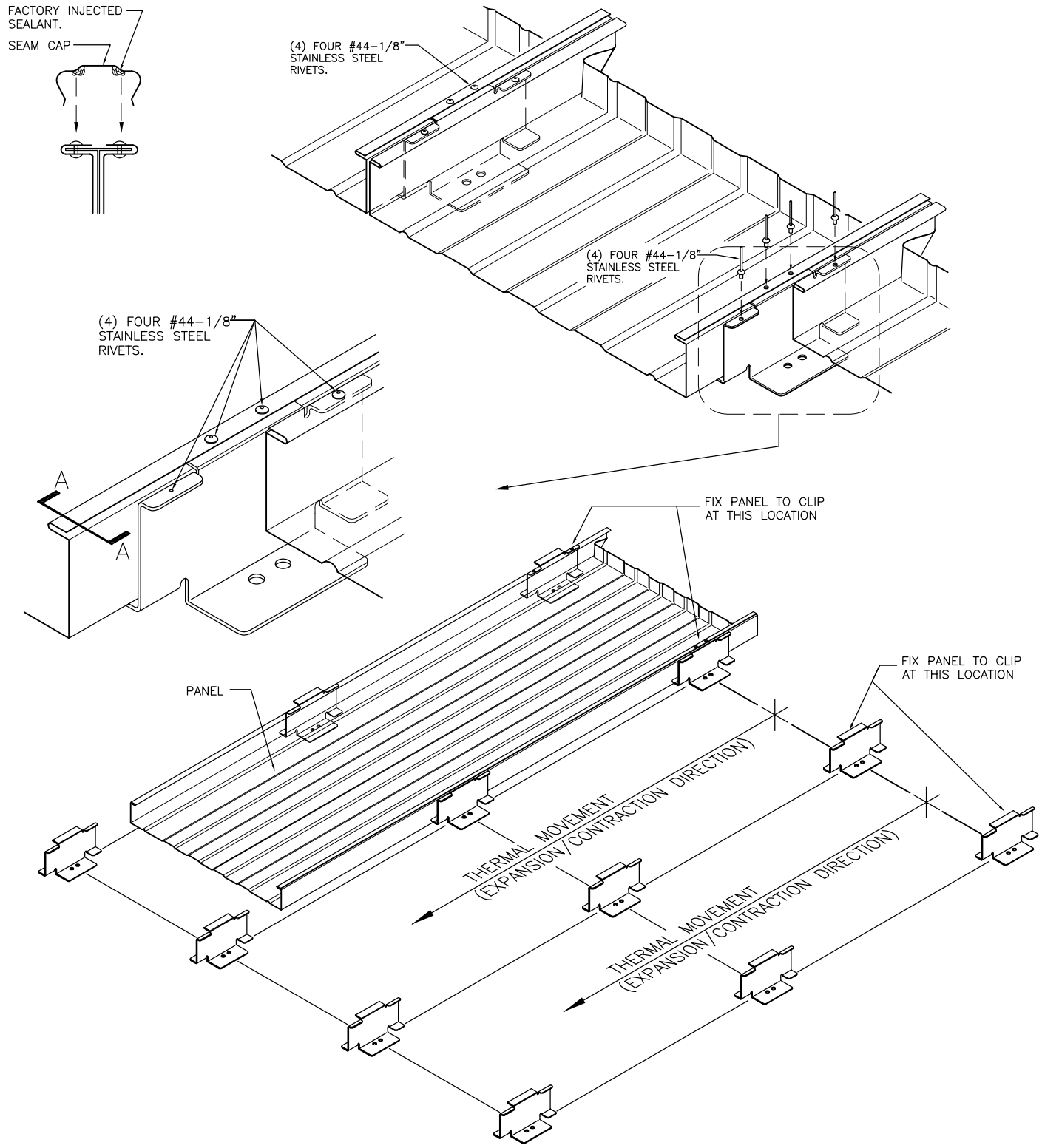
FILENAME:

R-MER SPAN

Bid No.020624-Bid Section #1-MLK



DRAWINGS ON 8½"x11 TITLE BLOCKS ARE NOT TO SCALE.

PANEL CLIP DETAIL (4 RIVETS)

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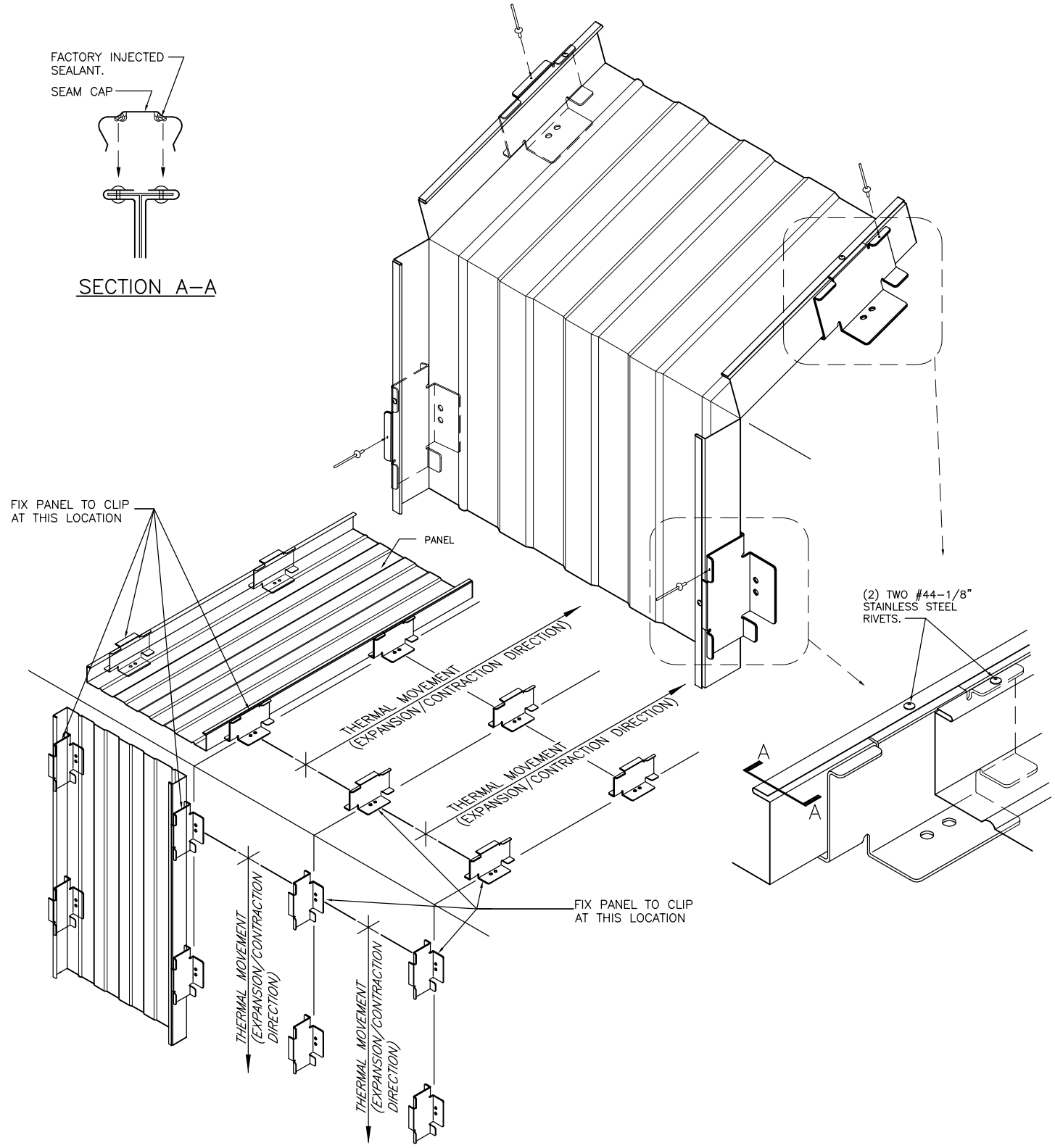
REPRESENTATIVE:	
DATE:	SHT: OF

FILENAME:

R-MER SPAN

Bid No.020624-Bid Section #-MLK



DRAWINGS ON 8½"x11 TITLE BLOCKS ARE NOT TO SCALE.

KNEE PANEL CLIP DETAIL

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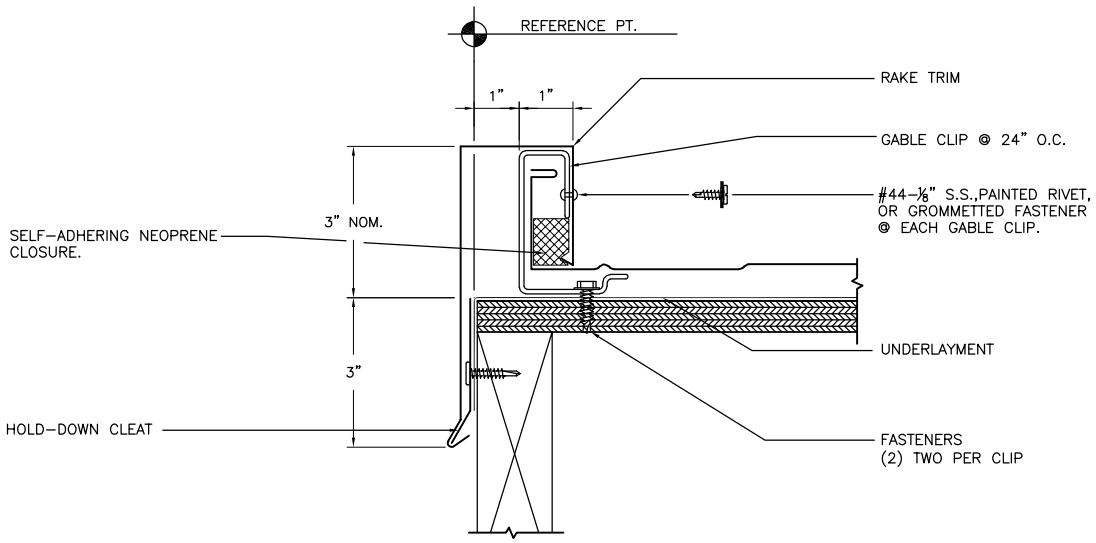

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RAKE DETAIL

GARLAND since 1895

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CUSTOMER:	
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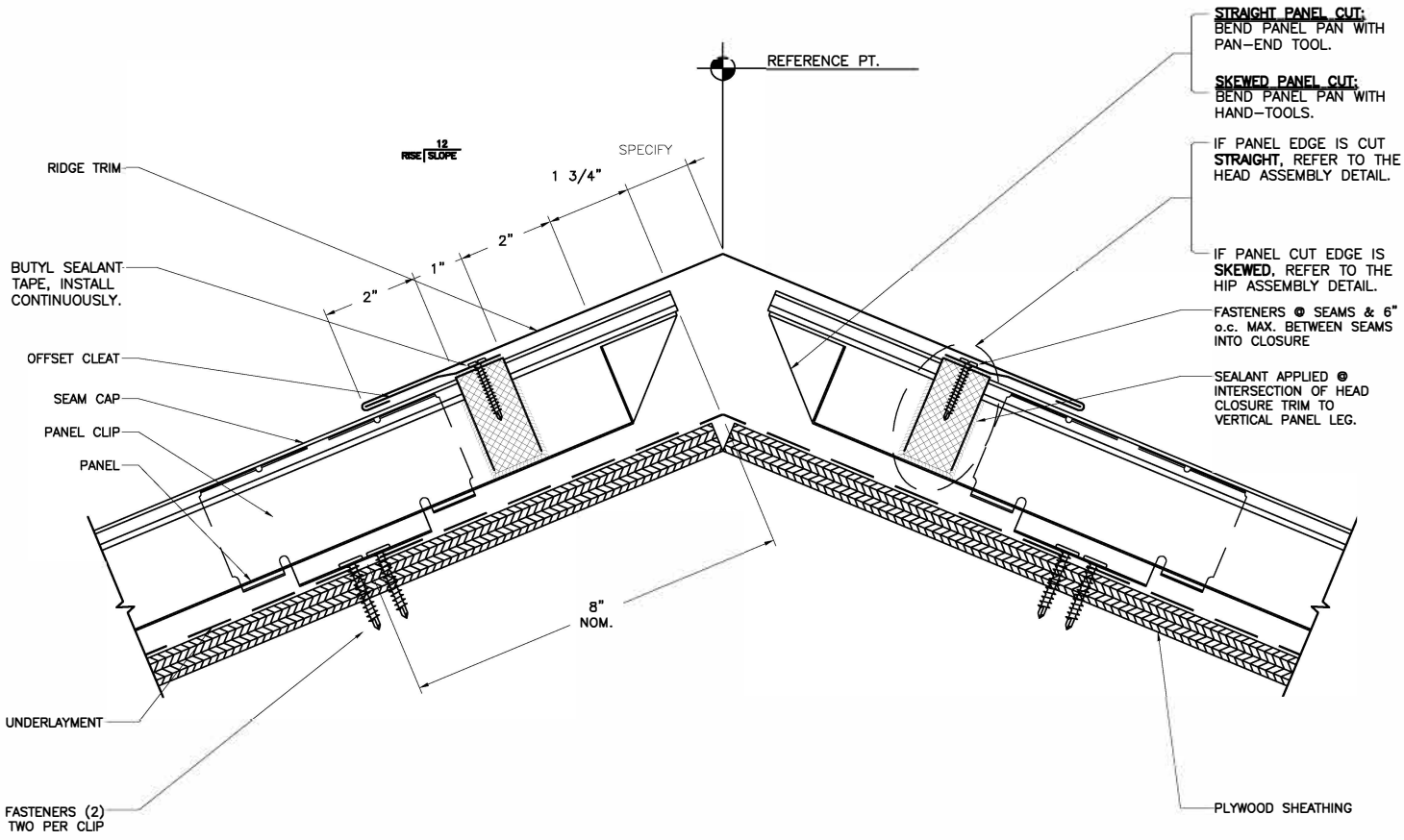
R-MER SPAN



DRAWINGS ON 8½"x11 TITLE BLOCKS ARE NOT TO SCALE.

RIDGE DETAIL

since 1895

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CUSTOMER:	
ARCHITECT:	
REPRESENTATIVE:	
DATE:	SHT: OF

Bid No.020624-Bid Section #1-
Millview

SECTION 01110

SUMMARY OF WORK

PART 1 — GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes removal and disposal of the existing roofing systems, coping, insulation, flashings, and all construction related debris. Installation of a new modified bituminous & composition shingle roofing system as specified with all applicable details for a complete watertight warrantied roofing assembly per the manufacturers instructions.

B. Materials specified in section 01 64 00 Owner Furnished Contractor Installed (O.F.C.I.) will be the responsibility of the contractor to receive, store, protect, and maintain in good condition throughout the course of the project.

C. Related Work Specified Elsewhere:

1. Section 01 - Owner Furnished Contractor Installed
2. Section 01 - Submittals
3. Section 06 - Rough Carpentry
4. Section 07 - Insulation Board
5. Section 07 - Asphalt Shingles
6. Section 07: Modified Built-up Roofing
7. Section 07: Sheet Metal Flashing and Trim

1.3 WORK COVERED BY CONTRACT DOCUMENTS

A. Project Identification: Millview Elementary School Re-Roofing Project

B. Project Locations: Millview Elementary School 1609 Clinton St. Madera, CA 93638

C. Owner: Madera Unified School District 1205 S. Madera Ave. Madera, CA 93638

D. General scope of work but not limited to;

1. <u>Roof Areas B,C,D, E, F, G, L, & M:</u>
2. All roofing work associated with removal and replacement of the existing HVAC systems per the design by Trane. All patch work shall be with in kind materials.
3. <u>Low Slope Roof Areas as noted on the Site Plan:</u>
4. Includes removal and disposal of existing roofing system(s), insulation board, gutters, flashings, copings, etc. for a complete prepared roof surface.
5. Includes two hundred (200) square feet of decking replacement included in the base bid price. A per square foot price will be inserted into the bid form for anything needed and approved by the district

over 200 square feet. Before and after photos of all dryrot replacement must be submitted with billing as justification, payment will not be made without proper documentation.

6. Install one layer of rosin sheathing over the entire roof deck.

7. Install one layer of 1/2" wood fiber 6 side primed insulation board with 16 screws and plates per 4'x8' sheet.

8. Install 4lb lead flashings with factory lead top counter-flashing. All electrical penetrations are to have a lead bonnet banded and caulked.

9. Install one layer of Stressbase 80 ply sheet in specified adhesive, trim all T joints.

10. Install one layer of Stressply Plus FR Mineral cap sheet in specified adhesive, trim all T joints.

11. Install new 24 gauge galvanized sheet metal 1/4" low rise gravel stop with 22 gauge cleat. Minimum size 4"x4".

12. Install new 24 gauge galvanized gutter and downspouts at all existing locations.

13. Properly prepare, prime, and paint gravel stop, gutter, and downspouts to match the existing campus trim color.

14. Install Garla-Flex mastic at all gravel stop locations.

15. Install Garla-Block Primer at all roof areas at a rate of 1/2 gallon per square.

16. Apply Pyramic base coat to the entire roof / base flashing surface, pipe penetrations, vents, etc.at a rate of 1.5 gallons per 100 sq ft and back roll the entire application.

17. Apply Pyramic top coat to the entire roof / base flashing surface, pipe penetrations, vents, etc.in a cross hatch pattern to the base coat at a rate of 1.5 gallons per 100 sq ft and back roll the entire application. Ensure complete coverage, additional coats may be needed for complete uniform coverage.

18. Install Pyramic base / top coat to the wall support curb pans, lead flashings, and lead counter flashing, and new Tuff Stuff sealant.

19. Allow all mastic and roof work to properly cure prior to the application of the roof coating. Approximately 30 days. All mastic work is to have granules applied when it is installed.

20. <u>Steep Slope Roof Areas as noted on Site Plan</u>

21. Includes removal and disposal of existing roofing system(s), insulation board, gutters, flashings, copings, etc. for a complete prepared roof surface.

22. Includes two hundred (200) square feet of decking replacement included in the base bid price. A per square foot price will be inserted into the bid form for anything needed and approved by the district over 200 square feet. Before and after photos of all dryrot replacement must be submitted with billing as justification, payment will not be made without proper documentation.

23. Install one layer of R-Mer Seal self adhering underlayment over the entire roof surface.

24. Install 24 gauge galvanized edge metal and strip in with one layer of R-Mer Seal self adhering underlayment.

25. Install new 24 gauge galvanized sheet metal gutter and downspouts at all existing locations. Install downspout screens at all downspout locations.

26. Properly prepare, prime, and paint all edge metal, gutters and downspouts.

27. Install all new 4lb lead flashings at pipe penetrations. Install a factory lead cap counter flashing at all penetrations except those connected. Install at all connected penetrations a 4lb lead collar counter flashing, band, flare the top out, seal with Tuff Stuff sealant.

28. Install new roof vents & roof jacks at all locations, do not re-use sheet metal vents.

29. Install a new composition shingle roofing system per all manufacturers instructions.

30. Install a continuous ridge vent at all buildings as noted on the site plan.

31. HVAC units - Install new 24 gauge galvanized sheet metal saddle, step flashing, apron flashing and side skins.

1.4 WORK COMPLETED BY THE DISTRICT

A. No work will be completed by the district.

1.5 TYPE OF CONTRACT

A. Work will be completed under a single prime contract.

B. Owner Supplied Contractor Installed (O.F.C.I.). Materials will be clearly noted at the back of each specification section as to what is being supplied by the owner. All O.F.C.I. materials are to be installed as part of this contract by the contractor. All other materials needed to complete this scope of work and are not specifically listed in the owner supplied materials section will be the responsibility of the contractor to supply and install.

1.6 USE OF PREMISES

A. General: Contractor will have limited use of premises for construction operations.

B. Use of site: Limit use of premises to work areas required. Do not disturb portions of the project site beyond areas in which the work is indicated.

C. The building interior is off limits to the contractor. All access shall be from the exterior.

D. The point of exterior access must be approved by the owner.

E. Entrances: Keep all entrances serving the building clear and available to the owner, owner's employees, and emergency vehicles.

F. Use of existing building: Maintain existing building in a weather tight condition throughout the construction period. Repair damage caused by construction operations. Protect building and occupants during construction.

G. Vehicle Parking: Contractor parking is available on site and will need to be approved by the owner.

H. Assume full responsibility for protection and safekeeping of materials stored on premises. Coordinate the location of materials and equipment to be stored on premises. Provide barricades, barriers, and enclosures as required to ensure safety.

1.7 OWNERS OCCUPANCY REQUIREMENTS

A. The owner will occupy the building during the entire construction phase. Cooperate with the owner during construction operations to minimize owner conflicts and facilitate owner usage. Perform the work as to not interfere with owners operations.

B. A minimum of 72 hours notice is needed for all activities that will affect the owners operations.

1.8 WORK RESTRICTIONS

A. On site work hours: Work shall generally be performed from the hours of 7:00 am – 5:00 pm Monday through Friday except as otherwise indicated or approved by the owner.

B. Weekend hours, early morning hours, utility shut down, and noisy activity requires owner's authorization a minimum of 72 hours in advance.

1.9 UNIT PRICES

A. The following unit prices will be used to add or deduct from the total contract amount.

1. Replacement dry rot or damaged roof decking.

10. SCHEDULE OF ALTERNATES

A. None

1.11 PROJECT CONDITIONS

A. Proceed with roofing work only when existing and forecasted weather conditions will permit a unit of work to be installed in accordance with manufacturer's recommendations and warranty requirements.

B. Do not apply roofing insulation or membrane to damp deck surface.

C. Do not expose materials subject to water or solar damage in quantities greater than can be weatherproofed during same day.

1.12 SEQUENCING AND SCHEDULING

A. Sequence installation of roofing with related units of work specified in other sections to ensure that roof assemblies, including roof accessories, flashing, trim and joint sealers, are protected against damage from effects of weather, corrosion and adjacent construction activity.

B. Complete all roofing field assembly work each day. Phased construction will not be accepted. Phased construction refers to the application of the roof insulation board, ply sheet membrane, and cap sheet membrane installed in the same day.

C. Due to the cure time needed for the roofing system prior to the acrylic coating scheduling of work past the completion date of **August 9, 2024** will need to be reviewed and agreed upon by all parties. Work can only be completed during weekends or off hours past the project completion date unless otherwise reviewed and approved by the district. All coating work and 100% project completion shall be no later than 9/30/2024. Including punch list and final inspection. All days after 9/30/24 will have liquidated damages applied. specifically approved by the Owner.

1.13 PROJECT TIMELINE

A. Project Start: June 7, 2024

B. Project Completion: August 9, 2024

END OF SECTION 01 11 00 – SUMMARY OF WORK

SECTION 01 30 00
SUBMITTALS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

A. Contract General Conditions.

B. See also contract general conditions for additional requirements especially those regarding requests for ALTERNATIVES OR EQUALS and for SUBSTITUTIONS.

1.02 SUMMARY

A. This Section specifies administrative and procedural requirements for submittals required for performance of the Work, including:

1. Contractor's construction schedule
2. Submittal schedule
3. Shop Drawings
4. Product Data
5. Samples.

B. Administrative Submittals: Refer to other Division-1 Sections and other Contract Documents for requirements for administrative submittals. Such submittals include, but are not limited to:

1. Permits
2. Applications for payment
3. Performance and payment bonds
4. Insurance certificates
5. List of Subcontractors.

1.03 SUBMITTAL PROCEDURES

A. Coordination: Coordinate preparation and processing of submittals with performance of construction activities. Transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay.
   1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals and related activities that require sequential activity.
   2. Coordinate transmittal of different types of submittals for related elements of the Work so processing will not be delayed by the need to review submittals concurrently for coordination.
      a. The Architect shall return without action any submittals requiring coordination with other submittals until related submittals are coordinated.
   3. Processing: Allow sufficient review time so that installation will not be delayed as a result of the time required to process submittals, including time for resubmittals.
      a. See General Conditions and Supplementary General Conditions for additional requirements.
      b. If an intermediate submittal is necessary, process the same as the initial submittal.
      c. No extension of Contract Time will be authorized because of failure to transmit submittals to the Architect sufficiently in advance of the Work to

permit processing.

B. Submittal Preparation: Place a permanent label or title block on each submittal for identification. Indicate the name of the entity that prepared each submittal on the label or title block.

1. Provide a space approximately 4” x 5” on the label or beside the title block on Shop Drawings to record the Contractor’s review and approval markings and the action taken.
2. Include the following information on the label for processing and recording action taken:
   a. Project name
   b. Date
   c. Name and address of Architect
   d. Name and address of Contractor
   e. Name and address of subcontractor
   f. Name and address of supplier
   g. Name of manufacturer
   h. Number and title of appropriate Specification Section
   i. Drawing number and detail references, as appropriate.

C. Submittal Transmittal: Package each submittal appropriately for transmittal and handling. Transmit each submittal from Contractor to Architect using a transmittal form. Submittals received from sources other than the Contractor will be returned without action.

On the transmittal Record relevant information and requests for data. On the form, or separate sheet, record deviations from Contract Document requirements, including minor variations and limitations. Include Contractor’s certification that information complies with Contract Document requirements.

1.05 SHOP DRAWINGS

A. Submit newly prepared information, drawn to accurate scale. Highlight, encircle, or otherwise indicate deviations from the Contract Documents. Do not reproduce Contract Documents or copy standard information as the basis of Shop Drawings. Standard information prepared without specific reference to the Project is not considered Shop Drawings.

B. Shop Drawings include fabrication and installation drawings, setting diagrams, schedules, patterns, templates and similar drawings. Include the following information:

Dimensions
Identification of products and materials included
Compliance with specified standards
Notation of coordination requirements
Notation of dimensions established by field measurement.

C. Sheet Size: Except for templates, patterns and similar full- size Drawings, submit Shop Drawings on sheets at least 8-1/2” x 11” but no larger than 30” x 42”.

D. Submittals: Submit one correctable translucent reproducible print and six (6) blue- or black-line print for the Architect’s review; the reproducible and one print will be returned.

Do not use Shop Drawings without an appropriate final stamp indicating action taken in connection with construction.

1.06 PRODUCT DATA

A. Collect Product Data into a single submittal for each element of construction or system. Product Data includes printed information such as manufacturer's installation instructions, catalog cuts, standard color charts, roughing-in diagrams and templates, standard wiring diagrams and performance curves. Where Product Data must be specially prepared because standard printed data is not suitable for use, submit as "Shop Drawings."

1. Mark each copy to show applicable choices and options. Where printed Product Data includes information on several products, some of which are not required, mark copies to indicate the applicable information. Include the following information:
   Manufacturer's printed recommendations,
   Compliance with recognized trade association standards,
   Compliance with recognized testing agency standards,
   Application of testing agency labels and seals,
   Notation of dimensions verified by field measurement,
   Notation of coordination requirements.
2. Do not submit Product Data until compliance with requirements of the Contract Documents has been confirmed.

B. Submittals: Submit a minimum of six (6) copies of each required submittal as well as additional copies as required by the Architect, (the actual number of submittals and distribution required shall be determined by the Trustees Representative at the Preconstruction Conference). The Architect will return two sets marked with action taken and corrections or modifications required.

C. Distribution: Furnish copies of final submittal to installers, subcontractors, suppliers, manufacturers, fabricators, and others required for performance of construction activities.

1. Do not proceed with installation until an applicable copy of Product Data applicable is in the installer's possession.

2. Do not permit use of unmarked copies of Product Data in connection with construction.

1.07 SAMPLES

A. Submit full-size, fully fabricated Samples cured and finished as specified and physically identical with the material or product proposed. Samples include partial sections of manufactured or fabricated components, cuts or containers of materials, color range sets, and swatches showing color, texture and pattern.

1. Mount, display, or package Samples in the manner specified to facilitate review of qualities indicated. Prepare Samples to include the following:
   Generic description of the Sample
   Sample source
   Product name or name of manufacturer
   Compliance with recognized standards
   Availability and delivery time.

2. Submit Samples for review of kind, color, pattern, and texture, for a final check of these characteristics with other elements, and for a comparison of these

characteristics between the final submittal and the actual component as delivered and installed.

B. Preliminary submittals: Where Samples are for selection of color, pattern, texture or similar characteristics from a range of standard choices, submit a full set of choices for the material or product.

Preliminary submittals will be reviewed and returned with the Architect's mark indicating selection and other action.

C. Submittals: Except for Samples illustrating assembly details, workmanship, fabrication techniques, connections, operation and similar characteristics, submit 3 sets; one will be returned marked with the action taken.

Maintain sets of Samples, as returned, at the Project site, for quality comparisons throughout the course of construction.

D. Distribution of Samples: Prepare and distribute additional sets to subcontractors, manufacturers, fabricators, suppliers, installers, and others as required for performance of the Work.

Field Samples specified in individual Sections are special types of Samples. Field Samples are full-size examples erected on site to illustrate finishes, coatings, or finish materials and to establish the standard by which the Work will be judged.

1.08 ARCHITECTS ACTION

A. Except for submittals for record, information or similar purposes, where action and return is required or requested, the Architect will review each submittal, mark to indicate action taken, and return promptly.

Compliance with specified characteristics is the Contractor's responsibility.

B. Action Stamp: The Architect will stamp each submittal with a uniform, self-explanatory action stamp. The stamp will be appropriately marked, as follows, to indicate the action taken:

1. Final Unrestricted Release: Where submittals are marked "Approved," that part of the Work covered by the submittal may proceed provided it complies with requirements of the Contract Documents; final acceptance will depend upon that compliance.
2. Final-But-Restricted Release: When submittals are marked "Approved as Noted," that part of the Work covered by the submittal may proceed provided it complies with notations or corrections on the submittal and requirements of the Contract Documents; final acceptance will depend on that compliance.
3. Returned for Resubmittal: When submittal is marked "Not Approved, Revise and Resubmit," do not proceed with that part of the Work covered by the submittal, including purchasing, fabrication, delivery, or other activity. Revise or prepare a new submittal in accordance with the notations; resubmit without delay. Repeat if necessary to obtain a different action mark.
   a. Do not permit submittals marked "Not Approved, Revise and Resubmit" to be used at the Project site, or elsewhere where Work is in progress.

   b. Note: Any work performed prior to receiving a FULLY APPROVED

submittal shall be done at the contractors own risk and is subject to being replaced if any of the submittal requirements are not met.

PART 2 – PRODUCTS NOT USED

PART 3 – EXECUTION NOT USED

END OF SECTION 01300

SECTION 01 64 00

OWNER FURNISHED CONTRACTOR INSTALLED
(O.F.C.I)

PART 1 - GENERAL

1. SUMMARY

A. DESCRIPTION: The Owner shall procure and provide certain products for installation as shown and specified per Contract Documents.

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 as O.F.C.I. materials.

2. Note that this project includes the installation of owner-supplied materials as noted in this specification section only. All materials not specifically listed below will be the responsibility of the contractor to provide and install.

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.

PART 2 - PRODUCTS

1. PRODUCTS

A. ROOFING MATERIAL FURNISHED BY OWNER (O.F.C.I.): District supplied material. Related specification sections include;

1. Section 07 - Asphalt Shingles
2. Section 07 - Modified Bitumen Roofing
3. Section 07 - Sheet Metal Flashing and Trim

B. MATERIAL LIST

1. The Owner will only supply the quantity listed in the owner supplied materials section of this specification below. All additional materials and accessories will be the full responsibility of the contractor to provide and install per the specification and project requirements.

2. Any and all material or accessories required for the installation of the roof system in excess of the district provided material must be supplied and installed 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.

3. All required flashings as required per each specification section for plumbing, electrical, gas, etc. will be the Contractors responsibility to provide and install as well as to be included in the bid cost.

4. All materials not specifically included in the owner supplied materials section will be the responsibility of the contractor to provide and install in compliance with the respective specification section.

5. Freight charges of owner supplied materials will be the responsibility of the Owner.

6. Contractor must coordinate and take delivery of materials, count all materials and ensure it matches the list below, unload and properly locate materials at the job site, and properly protect, cover and store at job site.

7. Contractor must be able to provide certification in writing from roof system manufacturer that the contractor is approved to install the specified roof system and provide all warranty requirements of each respective specification section.

8. Materials specially provided by the owner:

125.00	Stressply Plus FR Mineral, 75 sq ft per rl
65.00	Stressbase 80 Plus, 150 sq ft per rl
75.00	Green Lock Membrane Adhesive, 5 gallon pail
10.00	Green Lock Flashing Adhesive, 3.5 gallon pail
2.00	Garmesh 6" x 150'
1.00	Garla-Prime VOC, 5 gallon pail
5.00	Flashing Bond Mastic, 5 gallon pail
4.00	Pyramic Plus Lo Acrylic Coating, 55 gallon drum
8.00	Garla-Block Primer, 5 gallon pail
30.00	Tuff Stuff Urethane Caulking 10.1 oz tube (White)
50.00	Garla Flex Rubberized Mastic 10.1 oz tube
100.00	R-Mer Seal Self Adhering Underlayment 200 sq ft per roll

PART 3 - EXECUTION

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 the site, in accordance with construction schedule.
2. Bill of Materials: Deliver supplier's documentation to Contractor.
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.

2. CONTRACTOR'S RESPONSIBILITIES

A. SUBMITTALS: Review shop drawings, product data and samples and submit to Architect and/ or Owner 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 the site, including un-crating, protection, and storage.
3. Inspection: Promptly inspect products jointly with Owner; record shortages, damaged or defective items. Shortages and/or damage must be noted at the time of delivery by the contractor no claims may be made after the fact.
4. Storage: Protect products from damage or exposure to elements per the manufactures requirements.

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.
3. Install all O.F.C.I. products per the specifications and manufacturer instructions.
4. All products not supplied by the owner are the responsibility of the contractor to supply and install per manufacturers instructions.

END OF SECTION

SECTION 06 10 00
ROUGH CARPENTRY

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division-1 Specification sections, apply to work of this section.

B. Related work specified elsewhere:

1. Division 01: Summary of Work

2. Division 07: Modified Bitumen Roofing

3. Division 07: Sheet Metal Flashing and Trim

1.2 SUMMARY:

A. This portion of the specification sets forth the general requirements, including the quality and type of materials required for the installation of all pressure treated and non pressure treated lumber used for wood curbs, nailing strips, miscellaneous blocking material, unexposed fillers, fascia, edging strips, deck replacement, etc

1.3 STORAGE:

A. All material specified herein shall be stored (after delivery to the site) so that it will be fully protected from damage and weather, and shall be stacked to prevent damage. All lumber shall be fully protected to maintain the original required moisture content as specified in item titled "Moisture Content".

1.4 OTHER REQUIREMENTS:

A. Dimensions indicated on the drawings are nominal dimensions (except where details show actual sizes) and shall be subject to the standard reductions required for surfacing or tolerances permitted by the grading rules. Unless otherwise indicated on drawings, all material shall be S4S (surfaced four sides).

1.5 PROTECTION:

A. All finished work shall be adequately protected against damage from any source.

1.6 COORDINATION:

A. Carpenters shall coordinate their work with that of the other trades so that progress continues without interruption.

PART 2 - PRODUCTS

2.1 WOOD - FRAMING AND CURBS:

A. GRADING RULES, GRADES, AND SPECIES

1. Lumber: Southern Pine, yellow pine, Douglas fir, spruce, ponderosa pine, larch or Hemlock and shall meet the following minimum grade requirement of construction standard (75% #1 and 25% #2); free from warping and visible decay. Lumber shall be graded according to the standard grading rules of the Southern Pine Inspection Bureau, the West Coast Lumber Inspection Bureau, or the Western Wood Products Association.

B. MOISTURE CONTENT

1. All lumber shall be air-dried or kiln-dried before treatment, so that the moisture content is not more than 19%. After treatment, it shall be kiln-dried at temperatures not exceeding 160 degrees F. (71 degrees C) so that the moisture content is not more than 19% at time of shipment

C. DECAY-RESISTANT TREATMENT:

1. Lumber in contact with roofing or acting as fascias, and all other exterior lumber, shall be pressure-treated with a waterborne preservative in accordance with AWPA Specification P5. Creosote and oil-borne preservatives are not acceptable.

2. Treating processes, material conditions, plant equipment, and other pertinent requirements shall conform to AWPA Specifications C1 and C2 for specific kind of lumber and type of preservative to be used. Retention shall be as required for intended use.

3. All treated lumber shall bear the mark of a code recognized third party agency such as the AWPA.

D. PLYWOOD:

Grade: CDX or Cyme exterior Grade. Description: 5/8" thick

E. WOOD SIDING:

1. T 111 or approved equal.

2.2 MECHANICAL FASTENERS:

A. WOOD TO STEEL:

1. Acceptable Manufacturers:
   a. Roofgrip screw with Climaseal coating; plastic disc - Buildex Div. of ITW, Itasca, IL.
   b. Dekfast screw with Sentri coating: plastic disc – Construction Fasteners, Inc., Wyomissing, PA.
   c. Fabco Fastening Systems, West Newton, PA: Insul-Fixx screw with Fabcote coating; plastic plate, Plate-Fixx screw with Fabcote coat; plastic disc.
   d. Kwik-Deck screw with Oxyseal coating; plastic disc - Atlas Bolt & Screw Div., Trans Union Fastener Corp., Ashland, OH.

e. Olympic #12-11 Standard Steel Deck Screw or #14-10 Heavy Duty All Purpose Screw with CR-10 coating; three inch diameter plastic - Olympic Manufacturing Group, Inc., Agawam, MA.
f. Glasfast (plastic disc) - Owens-Corning Fiberglas Corp., Toledo, OH.
g. Perma Fastener screw with permaseal coating; plastic plate - International Permalite, Inc., Oak Brook, IL.

2. Screw Length: Sufficient to engage steel, wood deck 1 inch.

B. WOOD TO WOOD:

1. Type: Galvanized, common, annular ring nail. Length: Sufficient to penetrate underlay blocking 1-1/4 inches.

2. Acceptable Manufacturers:

a. Hillwood Manufacturing Co., Cleveland, OH.
b. Independent Nail, Inc., Bridgewater, MA.
c. W.H. Maze Co., Peru, IL.
d. National Nail Corp., Grand Rapids, MI.

C. WOOD TO MASONRY:

1. Acceptable Manufacturers:

a. Tapcon 1/4" diameter, Phillips pan head anchor - Buildex Div. of ITW, Itasca, IL.
b. Confas - Construction Fasteners, Inc., Wyomissing, PA.
c. Con-fixx - Fabco Fastening Systems, West Newton, PA.
d. #14-10 Heavy Duty all Purpose Screw – Olympic Manufacturing Group, Inc., Agawam, MA.
e. Tru-Fast fastener (stainless steel) - The Tru-Fast Corp., Bryan, OH.

2. Length: Sufficient to provide 1-1/2 inch embedment.

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D. WOOD TO HOLLOW MASONRY:

1. Acceptable Manufacturers:

a. Sleeve Anchor by Hilti Fastening Systems, Tulsa, OK.
b. Rawly Hollow Masonry Anchor by the Rawlplug Co., Inc., New Rochelle, NY.

2. Length: As recommended by manufacturer

PART 3 - EXECUTION

3.1 CARPENTRY:

A. At roof edge to receive metal fascia, around all roof top penetration perimeters, and under any flashing component that is to have a roof flange mechanically fastened to roofing substrate; mechanically attach wood blocking. Blocking thickness: Equal to common 1 x 4”, 1 x 6” 2x4”, 2x6”, 2x8”, 2x10”, 2x12”.

B. Fasteners shall be installed in two rows staggered. Spacing in any one row shall not exceed 24 inches. Within eight feet of outside corners, spacing shall not exceed twelve inches in any one row.

C. Where required, offset blocking layers twelve inches, weave corners.

D. When preservative treated wood is cut, the cut end shall be treated in accordance with AWPA Specification M4.

E. Lumber shall be accurately cut to the work requirements and shall be well fastened.

F. Bolted fastenings shall have washers of adequate size under both heads and nuts. Nails shall be of correct size and quantity for proper fastening. Oversized nails that will result in splitting shall not be used. All fasteners shall be galvanized per ASTM A 153.

END OF SECTION

SECTION 07 22 00

ROOF DECK AND INSULATION

PART 1 – GENERAL

1. RELATED DOCUMENTS

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

2. SUMMARY

A. Section includes roof insulation over the properly prepared deck substrate.

B. Related Sections:
1. Section 01 - Summary of Work
2. Section 01 - Owner Furnished Contractor Installed
3. Section 01 - Submittals
4. Section 06 - Rough Carpentry
5. Section 07 - Modified Bitumen Roofing
6. Section 07 - Sheet Metal Flashing and Trim

3. REFERENCES

A. American Society for Testing and materials (ASTM):
1. ASTM A167 Standard Specification for Stainless and Heat-Resisting Chromium Nickel Steel Plate, Sheet and Strip.
2. ASTM A653 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvanized) by the Hot-Dip Process.
3. ASTM B29 Standard Specification for Refined Lead.
4. ASTM B32 Standard Specification for Solder Metal.
5. ASTM C165 Standard Test Method for Measuring Compressive Properties of Thermal Insulation.
6. ASTM C208 Standard Specification for Cellulosic Fiber Insulation Board.
7. ASTM C209 Standard Test Method for Cellulosic Fiber Insulating Board.
8. ASTM C272 Standard Test Method for Water Absorption of Core Materials for Structural Sandwich Constructions.
9. ASTM C1396 Standard Specification for Gypsum Wallboard.
10. ASTM C518 Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Heat Flow Meter Apparatus.
11. ASTM C578 Standard Specification for Perlite Thermal Insulation Board.
12. ASTM C728 Standard Test Methods for Fire Test of Roof Coverings.
13. ASTM C1289 Standard Specification for Faced Rigid Polyisocyanurate Thermal Insulation.
14. ASTM D5 Standard Test Method for Penetration of Bituminous Materials.
15. ASTM D36 Standard Test Method for Softening Point of Bitumen (Ring and Ball Apparatus).
16. ASTM D312 Standard Specification for Asphalt Used in Roofing.
17. ASTM D412 Standard Test Methods for Vulcanized Rubber and Thermoplastic Rubbers and Thermoplastic Elastomers-Tension.

18. ASTM D1621 Standard Test Method for Compressive Properties of Rigid Cellular Plastics.
19. ASTM D1622 Standard Test Method for Apparent Density of Rigid Cellular Plastics.
20. ASTM D2126 Standard Test Method for Response off Rigid Cellular Plastics to Thermal Humid Aging.
21. ASTM D2178 Standard Specification for Asphalt Glass Felts used in Roofing and Waterproofing.
22. ASTM D4601 Standard Specification for Asphalt-Coated Glass Fiber Base Sheet Used in Roofing.
23. ASTM D5147 Standard Sampling and Testing Modified Bituminous Sheet Material.

B. Cast Iron Soil Pipe Institute, Washington, D.C. (CISPI)

C. Factory Mutual Research (FM):
1. Roof Assembly Classifications.

D. National Roofing Contractors Association (NRCA):
1. Roofing and Waterproofing Manual.

E. Underwriters Laboratories, Inc. (UL):
1. Fire Hazard Classifications.

F. Warnock Hersey (WH):
1. Fire Hazard Classifications.

G. Sheet Metal and Air Conditioning Contractors National Association (SMACNA)

H. Steel Deck Institute, St. Louis, Missouri (SDI)

I. Southern Pine Inspection Bureau, Pensacola, Florida (SPIB)

J. Insulation Board, Polyisocyanurate (FS HH-I-1972)

K. Insulation Board, Thermal (Fiberboard) (FS LLL-1-535B)

1.4. SUBMITTALS

A. Product Data: Provide manufacturer's specification data sheets for each product in accordance with Division 01 Section Submittal Procedures. 013000.

B. Provide approval letters from insulation manufacturer for use of their insulation within this particular roofing system type.

C. Provide a sample of each insulation type.

D. Shop Drawings
1. Submit manufacturer's shop drawings indicating complete installation details of tapered insulation system, tapered insulation crickets, including identification of each insulation block, sequence of installation, layout, drain locations, roof slopes, thicknesses, crickets and saddles.
2. Shop drawing shall include: Outline of roof, location of drains, a complete board layout of tapered insulation components, thickness and the average "R" value for the completed insulation system.

E. Certification

1. Submit roof manufacturer's certification that insulation fasteners furnished are acceptable to roof manufacturer.
2. Submit roof manufacturer's certification that insulation furnished is acceptable to roofing manufacturer as a component of roofing system and is eligible for roof manufacturer's system warranty.

1.5. QUALITY ASSURANCE

A. Fire Classification, ASTM E-108.

B. Manufacturer's Certificate: Certify that roof system furnished is approved by Factory Mutual, Underwriters Laboratories, Warnock Hersey or approved third party testing facility in accordance with ASTM E108, Class A for external fire and meets local or nationally recognized building codes.

C. Manufacturer's Certificate: Certify that the roof system is adhered properly to meet or exceed the requirements of FM 1-90.

D. Pre-installation meeting: Refer to Division 07 roofing specifications for pre-installation meeting requirements.

1.6. DELIVERY, STORAGE AND HANDLING

A. Deliver products to site with seals and labels intact, in manufacturer's original containers, dry and undamaged.

B. Store all insulation materials in a manner to protect them from the wind, sun and moisture damage prior to and during installation. Any insulation that has been exposed to any moisture shall be removed from the project site.

C. Keep materials enclosed in a watertight, ventilated enclosure (i.e. tarpaulins).

D. Store materials off the ground. Any warped, broken or wet insulation boards shall be removed from the site.

PART 2 – PRODUCTS

2.1. PRODUCTS, GENERAL

A. Refer to Division 01 Section "Common Product Requirements."

B. Basis of Design: Materials, manufacturer's product designations, and/or manufacturer's names specified herein shall be regarded as the minimum standard of quality required for work of this Section. Comply with all manufacturer and contractor/fabricator quality and performance criteria specified in Part 1.

C. Substitutions: Products proposed as equal to the products specified in this Section shall be submitted in accordance with Bidding Requirements and Division 01 provisions.
1. Proposals shall be accompanied by a copy of the manufacturer's standard specification section. That specification section shall be signed and sealed by a professional engineer licensed in the state in which the installation is to take place. Substitution requests containing specifications without licensed engineer certification shall be rejected for non-conformance.

2. Include a list of three (3) projects of similar type and extent, located within a one hundred mile radius from the location of the project. In addition, the three projects must be at least five (5) years old and be available for inspection by the Architect, Owner or Owner's Representative.
3. Equivalency of performance criteria, warranty terms, submittal procedures, and contractual terms will constitute the basis of acceptance.
4. The Owner's decision regarding substitutions will be considered final. Unauthorized substitutions will be rejected.

2.2. INSULATION MATERIALS

A. Thermal Insulation Properties and Approved Insulation Boards.
1. Rigid Polyisocyanurate Roof Insulation; ASTM C1289:
   a. Qualities: Rigid, closed cell polyisocyanurate foam core bonded to heavy duty glass fiber mat facers.
   b. Thickness: **N/A**
   c. R-Value: **N/A**
   d. Attachment: Mechanically attached per roofing manufactures ASCE 7-16 Wind Uplift requirements.
   e. Compliances: UL, WH or FM listed under Roofing Systems Federal Specification HH-I-1972, Class 1.
   f. Acceptable Products:
      1) ENRGY-3; Johns Manville
      2) H-Shield; Hunter
      3) EnergyGuard; GAF
      4) Approved Equivalent

2. Tapered Polyisocyanurate Roof Insulation; ASTM C1289:
   a. Qualities: Factory Tapered, closed cell polyisocyanurate foam core bonded to heavy duty glass fiber mat facers.
   b. Thickness: **N/A**
   c. Average R-Value: **N/A**
   d. Tapered Slope: **N/A**
   e. Attachment: Mechanically or adhesive attached per roofing manufactures ASCE 7-16 Wind Uplift requirements.
   f. Compliances: UL, WH or FM listed under Roofing Systems Federal Specification HH-I-1972, Class 1
   g. Acceptable Products:
      1) ENRGY 3; Johns Manville
      2) EnergyGuard; GAF
      3) H-Shield; Hunter
      4) Approved Equivalent

3. High Density Six Side Primed Fiberboard Roof insulation; ASTM C208
   a. Qualities: Rigid, composed of interlocking fibers factory blended treated with asphalt on six sides.
   b. Board Size: **Four feet by eight feet (4' x 8')**
   c. Thickness: **1/2"**
   d. Attachment: Attached per roofing manufactures ASCE 7-16 Wind Uplift requirements.
   e. Compliances: UL, WH, FM listed under Roofing Systems. Federal Specification LLL-I-535-B.

f. Acceptable Manufacturers:
   1) Blue Ridge; Celotex
   2) Temple Inland
   3) GAF Building Materials Corporation
   4) Georgia-Pacific
   5) Approved Equivalent

4. Dens-Deck Prime Roof Board
   a. Qualities: Nonstructural glass mat faced, noncombustible, water-resistant treated gypsum core panel.
   b. Board Size: Four feet by Eight feet (4'x8').
   c. Thickness: **N/A**
   d. R-Value: **N/A**
   e. Attachment: Mechanically attached per roofing manufacturers ASCE 7-16 wind uplift requirements.
   f. Compliances: UL, WH or FM listed under Roofing Systems.

2.3. RELATED MATERIALS

A. Fiber Cant and Tapered Edge Strips: Performed rigid insulation units of sizes/shapes indicated, matching insulation board or of perlite or organic fiberboard, as per the approved manufacturer.
   1. Acceptable Manufacturers:
      a. The Garland Company, Inc.
      b. Celotex
      c. Johns Manville
      d. GAF
      e. Approved Equivalent

B. Protection Board: Pre-molded semi-rigid asphalt composition board one half (1/2) inch.

C. Roof Board Joint Tape: Six (6) inches wide glass fiber mat with adhesive compatible with insulation board facers.

D. Asphalt: ASTM D312, Type III Steep Asphalt.

E. Roof Deck Insulation Adhesive: Insul-Lock HR - Dual-component, high rise foam adhesive with 45% rapidly renewable material content as recommended by insulation manufacturer and approved by FM indicated ratings.
   1. Tensile Strength (ASTM D412)……250 psi
   2. Density (ASTM D1875)……..8.5 lbs./gal.
   3. Viscosity (ASTM D2556)……22,000 to 60,000 cP.
   4. 2 `Peel Strength (ASTM D903)…..17 lb/in.
   5. 3 `Flexibility (ASTM D816)……Pass @ -70°F

F. Fasteners: Corrosion resistant screw fastener as recommended by roof membrane manufacturer.
   1. Factory Mutual Tested and Approved with three (3) inches coated disc for I-90 rating, length required to penetrate metal deck one inch.
   2. Screws: Concealor #14-13 DP1 as specified per ASCE 7 calculations.

PART 3 – EXECUTION

1. EXECUTION, GENERAL

A. Comply with requirements of Division 01 Section “Common Execution Requirements.”

2. INSPECTOR OF SURFACES

A. Roofing contractor shall be responsible for preparing an adequate substrate to receive insulation.
   1. Verify that work which penetrates roof deck has been completed.
   2. Verify that wood nailers are properly and securely installed.
   3. Examine surfaces for defects, rough spots, ridges, depressions, foreign material, moisture, and unevenness.
   4. Do not proceed until defects are corrected.
   5. Do not apply insulation until substrate is sufficiently dry.
   6. Broom clean substrate immediately prior to application.
   7. Use additional insulation to fill depressions and low spots that would otherwise cause ponding water.
   8. Verify that temporary roof has been completed.

3. INSTALLATION

A. Comply with built-up roofing manufacturer's written instructions, as submitted and reviewed by Architect during the submittal process, for installing roof insulation.

B. Install one lapped rosin sheet course and mechanically fasten to substrate according to built-up roofing manufacturer's written instructions and as called for in these specifications and on the drawings.

C. Insulation Cant Strips: Install and secure preformed 45-degree insulation cant strips at junctures of built-up roofing with vertical surfaces or angle changes greater than 45 degrees.

D. Install tapered insulation under area of roofing to conform to slopes indicated. Install insulation with long joints of insulation in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4 inch with insulation.

   1. Cut and fit insulation within 1/4 inch of nailers, projections, and penetrations.

E. Install insulation under area of roofing to achieve required thickness. Where overall insulation thickness is 2.7 inches or greater, install two or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of 6 inches in each direction.

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

G. Mechanically Fastened and Adhered Insulation: Install first layer of insulation to deck using mechanical fasteners specifically designed and sized for fastening specified board-type roof insulation to deck type.

1. Fasten first layer of insulation to resist uplift pressure at corners, perimeter, and field of the roof.
    a. Field: 16 screws per 4 foot by 8 foot panel (2 square feet per screw).
    b. Perimeter: 24 screws per 4 foot by 8 foot panel (1.33 square feet per screw).
    c. Corners: 32 screws per 4 foot by 8 foot panel (1 square foot per screw).

2. Set each subsequent layer of insulation in insulation adhesive adhered per the roofing system manufactures recommendations.

H. Install cover boards over insulation with long joints in continuous straight lines with end joints staggered between rows. Offset joints of insulation below a minimum of 6 inches in each direction. Loosely butt cover boards together and fasten to roof deck. Tape joints if required by roofing manufacturer.

I. Apply insulation adhesive to underside and immediately bond cover board to substrate.

J. Approved insulation board shall be fully attached to the deck with an approved mechanical fastening system. As a minimum, the amount of fasteners shall be in accordance with manufacturer's recommendation ASCE 7-16. Otherwise, a minimum of one fastener per two square feet shall be installed.

K. Filler pieces of insulation require at least two fasteners per piece if size of insulation is less than four square feet.

L. Spacing pattern of fasteners shall be as per manufacturer's recommendations to meet the ASCE 7-16 requirements. Placement of any fastener from edge of insulation board shall be a minimum of three inches, and a maximum of six (6) inches.

M. Minimum penetration into deck shall be as recommended by the fastener manufacturer. There is a one (1) inch minimum for metal, wood and structural concrete decks where not specified by the manufacturer. For gypsum and cement-wood fiber decks, penetration shall be determined from pull-out test results with a minimum penetration of one and one-half (1 ½) inches.

N. Gypsum and cementitious wood fiber decks: Where the roof deck is visible from the building interior, the contractor shall ensure no penetration of fasteners through underside of the deck. Any holes or spalling caused by fastener installation shall be repaired by the roofing contractor. Where the new roof system thickness exceeds an amount so that a minimum of 1 ½ of penetration cannot be achieved with an Olympic TB Fastener, or approved equivalent, then (and only then) toggle bolts may be used to secure installation to the deck.

O. Tape joints of insulation as per manufacturer's requirements.

P. Attachment with Insulation Adhesive Approved by Factory Mutual (FM).

Q. Ensure all surfaces are clean, dry, free of dirt, debris, oils, loose ore embedded gravel, unadhered coatings, deteriorated membrane and other contaminants that may inhibit adhesion.

R. Apply insulation adhesive directly to the substrate using a ribbon pattern with one quarter to one half (1/4-1/2) inch wide beads 12 inches o.c., using either the manual applicator or an automatic applicator, at a rate of one (1) gallon per one hundred (150) square feet per cartridge.

S. Immediately place insulation boards into wet adhesive. Do not slide boards into place. Do not allow the adhesive to skin over before installing insulation boards.

T. Briefly step each board into place to ensure contact with the adhesive. Substrates with irregular surfaces may prevent the insulation board from making positive contact with the adhesive. Relief cuts or temporary weights may be required to ensure proper contact.

U. All boards shall be cut and fitted where the roof deck intersects a vertical surface. The boards shall be cut to fit a minimum of one quarter (1/4) inch away from the vertical surface.

V. Tape joints of insulation as per manufacturer's requirements.

4. CLEANING

A. Remove debris and cartons from roof deck. Leave insulation clean and dry, ready to receive roofing membrane.

5. CONSTRUCTION WASTE MANAGEMENT

A. Remove and properly dispose of waste products generated during installation. Comply with requirements of authorities having jurisdiction.

END OF SECTION

SECTION 07 31 13
ASPHALT SHINGLES

1.GENERAL

1.1. SECTION INCLUDES

A. Includes all labor, materials, and equipment to install a composition shingle roofing system over the properly prepared substrate.

B. Includes removal and disposal of existing roofing system(s), insulation boards, gutters, flashings, sheet metal items, copings, etc. for a complete prepared roof surface to receive the new roofing system.

C. See section 01110 Summary of Work for a detailed scope of work.

1.2. RELATED SECTIONS

A. Section 01 - Summary of Work

B. Section 06 - Rough Carpentry

C. Section 07 - Modified Bitumen Roofing

D. Section 07 - Sheet Metal Flashing & Trim

E. Section 09 - Painting

1.3. REFERENCES

A. ASTM International (ASTM):
1. ASTM C209 - Standard Test Methods for Cellulosic Fiber Insulating Board.
2. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board.
3. ASTM D226 - Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing.
4. ASTM D1621 - Standard Test Method for Compressive Properties of Rigid Cellular Plastics.
5. ASTM D1970 - Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection.
6. ASTM D2126 - Standard Test Method for Response of Rigid Cellular Plastics to Thermal and Humid Aging.
7. ASTM D3018 - Standard Specification for Class A Asphalt Shingles Surfaced with Mineral Granules.
8. ASTM D3161 - Standard Test Method for Wind-Resistance of Asphalt Shingles (Fan-Induced Method).
9. ASTM D3462 - Standard Specification for Asphalt Shingles Made from Glass Felt and Surfaced with Mineral Granules.
10. ASTM D4586 - Standard Specification for Asphalt Roof Cement, Asbestos- Free.
11. ASTM D4601 - Standard Specification for Asphalt-Coated Glass Fiber Base Sheet Used in Roofing.
12. ASTM D4869 - Standard Specification for Asphalt-Saturated Organic Felt Underlayment Used in Steep Slope Roofing.
13. ASTM D6757 - Standard Specification for Underlayment Felt Containing Inorganic

Fibers Used in Steep-Slope Roofing.
14. ASTM D7158 - Standard Test Method for Wind Resistance of Asphalt Shingles (Uplift Force/Uplift Resistance Method).
15. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
16. ASTM E96 - Standard Test Methods for Water Vapor Transmission of Materials.
17. ASTM E108 - Standard Test Methods for Fire Tests of Roof Coverings.

B. Florida Building Code (FBC).
1. FL14807 - Underlayments.
2. FL14809 - Asphalt Shingles.
3. FL 23186 - Underlayments.

C. ICC Evaluation Service (ICC-ES).
1. ICC Approval - ESR-1561: Roofing Felt and Underlayment.
2. ICC Approval - ESR-3150: Asphalt Shingles.
3. ICC-ES AC188: Acceptance Criteria for Roof Underlayments.

D. Intertek Testing Services (ITS).
1. Fire Resistance Directory, Current Edition.
2. Code Compliance Research Report - CCRR-1082: Roofing Felt and Underlayment.

E. Underwriters Laboratory (UL):
1. UL 790 - Standard Test Methods for Fire Tests of Roof Coverings.
2. UL 2218 - Impact Resistance of Prepared Roof Covering Materials.

1.4. SUBMITTALS

A. Submit under provisions of Section 01 - Administrative Requirements.

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. Samples for Selection: For the following products, of sizes indicated: For each product specified, two complete sets of color samples representing manufacturer's full range of available colors and patterns.
1. Asphalt Shingles: Full size.
2. Asphalt Starter Shingles: Full size.
3. Polymer Modified Fiberglass Hip and Ridge Shingles: Full size.
4. Polymer Modified Self-Adhering Fiberglass Reinforced Underlayment: 12 inches (305 mm) square.
5. Nails Used for Fastening Shingles: 5 of each nail type and size.

D. Samples for Verification: For the following products, of sizes indicated: For each product specified, two samples representing actual product, color, and patterns.
1. Asphalt Shingles: Full size.
2. Asphalt Starter Shingles: Full size.
3. Polymer Modified Fiberglass Hip and Ridge Shingles: Full size.
4. Polymer Modified Self-Adhering Fiberglass Reinforced Underlayment: 12 inches (305 mm) square.
5. Nail Used for Fastening Shingles: 5 of each nail type and size.

1.5. QUALITY ASSURANCE

A. Primary Roofing Materials Manufacturer Requirements:
   1. Manufacturer specified asphalt shingles for a minimum of ten years.
   2. Manufacturer shall be an associate member in good standing of either the National Roofing Contractors Association (NRCA), Western States Roofing Contractors Association (WSRCA), or the Midwest Roofing Contractors Association (MRCA).

B. Installer Qualifications: Approved by the manufacturer to install the specified products and provide the specified warranties.

C. Fire-Resistance Characteristics: Where indicated, provide asphalt shingles and related roofing materials identical to those of assemblies tested for fire resistance per test method below by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify products with appropriate markings of applicable testing agency.

D. Exterior Fire-Test Exposure: Class A; ASTM E108 or UL 790, for application and roof slopes indicated.

E. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
   1. Finish areas designated by Architect.
   2. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.
   3. Refinish mock-up area as required to produce acceptable work.

1.6. DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.7. 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.

1.8. PROJECT MEETINGS

A. Pre-Construction Meeting:
   1. Prior to the start of the roofing project, the Owner will hold a job-site meeting and roof tour to review the scope of work.
   2. Authorized representatives of the Owner, the Roofing Contractor (Project Superintendent), the asphalt shingle manufacturer, other Subcontractors whose work complements, penetrates, or is mounted on the roof or will use the roof as a work platform, will be in attendance.
   3. The agenda for the meeting shall include:
      a. A review of the submittals.
      b. Distribution of approved submittals.
      c. A walkover inspection of the roof.
      d. Establishment of a schedule for the work.
      e. Selection of staging and storage locations.

B. Final Inspection: Following the completion of the work, a final inspection shall be scheduled by Owner's Representative. Any uncompleted work shall be noted on a punch list. Final payment shall be made only after punch list is completed.

1.9. WARRANTY

A. Standard Warranty: Shingles subjected to terms and conditions of the standard Manufacturer's Limited Warranty. Wind warranty coverage is subject to the shingles being sealed.
   1. Warranty Length: 50 years.
   2. Limited Term Resistance to Wind: 130 mph (209 kph).

B. Provide a three (3) year workmanship warranty.

C. Upon project completion and acceptance by Owner, the Roofing Contractor shall promptly provide executed copies of the specified warranties.

D. Furnish a list containing the names and contact telephone numbers of the Roofing Contractor's Service Manager, Superintendent, and Project Manager and the Roofing Contractor's current mailing address.

2.PRODUCTS

2.1. MANUFACTURERS

A. Acceptable Manufacturer: Malarkey Roofing Products, which is located at: 3131 N. Columbia Blvd. P. O. Box 17217; Portland, OR 97217; Toll Free Tel: 800-545-1191; Tel: 503-283-1191; Fax: 503-289-7644; Email: request info (jkouba@malarkeyroofing.com); Web: https://malarkeyroofing.com

B. Substitutions: Not permitted.

2.2. SHINGLES

A. High Profile Laminate Shingles:
   1. Legacy (272) as manufactured by Malarkey Roofing Products.
      a. Malarkey Legacy shingles hold a Class A Fire Rating.
      b. As manufactured, Legacy meets the requirements of:
         1. ASTM D7158 Class H, ASTM D3462, ASTM D3161 Class F, ASTM D3018 Type I, ASTM E108 Class A, UL 2218 Class 4 Impact Resistance, ICC-ES AC438, and CSA A123.5.
         2. ICC Approval: ESR-3150.
         3. FBC Approval: No. 14809.
         4. Listed with UL and Intertek/WHI.
      c. Performance:
         1. Limited Material Warranty: 50 years.
         2. Limited Wind Warranty: 15 years. 110 mph (177 kph).
         3. Enhanced Wind Warranty Available: 130 mph (209 kph).
         4. Legacy Silverwood is listed with CRRC and compliant with CEC Title 24, Part 6 Cool Roof Requirements.
         5. NEX polymer mix includes recycled rubber and plastics.
         6. SEBS polymer modified asphalt laminate adhesive.
         7. SEBS asphalt seal-down adhesive.
         8. 3M Smog-Reducing Granules.
         9. Enlarged nailing area of The Zone.

B. Color: Color shall be selected from the manufacturer's standard colors.

2.3. UNDERLAYMENT

A. R-Mer Seal, Self-Adhering Underlayment by The Garland Company:
   1. Product: R-Mer Seal by The Garland Company.
   2. Substitutions not permitted.
   3. As manufactured, meets requirements of ASTM D1970.
   4. Self-adhering sheet shall be nominal 45 mils (1.14 mm) thick.
   5. Self-adhering sheet shall be 36 inches (0.91 meter) in width.
   6. One (1) roll covers two (2) squares of roof.

2.4. RELATED PRODUCTS

A. Endura Vent Eave and Ridge Vents, below deck ventilation system.

B. NEX Polymer Modified 8 inches (203 mm) High-Profile Hip and Ridge: Malarkey No. 222 EZ-Ridge Scotchgard.

C. Full-Width Perforated Starter Shingle: Malarkey Smart Start No. 210.

D. Plastic Roof Cement conforming to ASTM D4586.

E. Fasteners: Hot Dip Galvanized nails with minimum 3/8 inch (9.5 mm) head.

F. Dormer Vents: Construction Metals Inc. low profile stamped dormer, Simpson LPSD20.

2.5. SHEET METAL FLASHING & TRIM

A. Sheet Metal Flashing and Trim: Comply with requirements in Division 7 Section "Sheet Metal Flashing and Trim."

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 item.

   1. Step Flashings: 24 gauge minimum. Fabricate with a headlap of 2 inches (50 mm) and a minimum extension of 5 inches (125 mm) over the underlying asphalt shingle and up the vertical surface.
   2. Cricket Flashings: 24 gauge minimum. Fabricate with concealed flange extending a minimum 24 inches (600 mm) beneath upslope asphalt shingles and 6 inches (150 mm) above the roof plane.
   3. Open Valley Flashings: 24 gauge minimum. Fabricate in lengths not exceeding [10 feet (3 m)] with 1-inch- (25-mm-) high inverted-V profile at center of valley and equal flange widths of 10 inches (250 mm).
   4. Drip Edges: 24 gauge minimum. 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 (9.6-mm) drip at lower edge.
   5. Vent Pipe Flashings: ASTM B 749, Type L51121, at least 1/16 inch (1.6 mm) thick. Provide 4lb lead sleeve sized to slip over the pipe and install the factory lead counter flashing cap.

3.EXECUTION

3.1. DELIVERY, STORAGE, AND HANDLING

A. New and dry roof materials delivered to the job site in containers unopened and undamaged. Manufacturer's products stamped with labels, names, and run codes of manufacture and testing laboratory.

B. Store underlayment materials on ends only. Discard rolls which may have been flattened, creased, or otherwise damaged. Place materials on pallets or wood sleepers. Do not stack palletized materials.

C. Cover underlayment rolls with weatherproof materials secured to prevent materials from becoming exposed to moisture. Use breathable tarps.

D. Disperse materials stored on the roof surface to avoid concentrated loading. Set larger concentrations over structural members.

3.2. ENVIRONMENTAL REQUIREMENTS

A. Application of roofing materials shall not be performed when weather conditions interfere with good roofing practices.

3.3. UNDERLAYMENT AND EDGING

A. Apply specified underlayment as follows:
   1. Apply a single layer of polymer modified underlayment laid parallel to eaves, lapping to the 4 inch (102 mm) ply line, and 6 inches (152 mm) on ends, end laps staggered 6 feet (1829 mm) from course to course.

B. Valleys: Only those valley installations listed in the manufacturer's installation instructions shall be permitted.
   1. Regardless of valley method used, begin application by centering a full-width valley liner of self-adhering underlayment to the roof deck in all valleys.
   2. The field underlayment is then woven through the valley over the layer of self-adhering underlayment or lapped 6 inches (152 mm) on each side. If fastening the field underlayment, be aware no fasteners are allowed within 6 inches (152 mm) of the valley centerline.

C. Pipe Flashing: Apply ASTM D1970 underlayment around the pipe, sealing it to the field underlayment prior to installing the metal pipe flashing. Install and secure the metal jack so the bottom flange laps over onto the shingles. Side and top flanges shall have shingles lapping onto the flange. Shingles that lap onto flanges shall be sealed to the metal with asphalt roof cement conforming to ASTM D4586.

D. Perimeter Flashing: Use non-corrosive, 24-gauge sheet metal drip edge flashing. Install prior to underlayment on eave edges of roof and then along rake edges over the ends of installed underlayment. Install drip edge with flanges large enough (recommend 4-inch (102 mm) flanges) to completely cover roof edges. Secure with galvanized (or compatible) roofing nails, centered on the top flange at 8 to 10 inches (203 to 254 mm) O.C. or according to local code requirements.

3.4. METAL FLASHING INSTALLATION

A. General: Install metal flashings and other sheet metal to comply with requirements in Division 7 Section "Sheet Metal Flashing and Trim."

B. Install metal flashings according to recommendations in ARMA's "Residential Asphalt Roofing Manual" and asphalt shingle recommendations in NRCA's "The NRCA Roofing and Waterproofing Manual."

C. Apron Flashings: Extend lower flange over and beyond each side of downslope asphalt shingles and up the vertical surface.

D. Step Flashings: Install with a head lap of 2 inches and extend over the underlying asphalt shingle and up the vertical surface. Fasten to roof deck only.

E. Cricket Flashings: Install against the roof-penetrating element extending concealed flange beneath upslope asphalt shingles and beyond each side.

F. Open Valley Flashings: Install centrally in valleys, lapping ends at least 8 inches in direction to shed water. Fasten upper end of each length to roof deck beneath overlap.

G. Secure hemmed flange edges into metal cleats spaced 2 inches apart and fastened to roof deck.

H. Rake Drip Edges: Install rake drip edge flashings over underlayment and fasten to roof deck.

I. Eave Drip Edges: Install eave drip edge flashings below underlayment and fasten to roof sheathing.

J. Pipe Flashings: Form flashing around pipe penetrations and asphalt shingles. Fasten and seal to asphalt shingles as recommended by manufacturer.

3.5. APPLICATION OF SHINGLES

A. Laminate Shingle Application; 8 inches (203 mm) Offset - Diagonal Pattern:
   1. Starter courses: Use Malarkey starter shingles or 3-tab shingles with the tabs cut off; apply to eave and rake edges of roof.
   2. Cut 6 inches (152 mm) off the length of the starter strip and apply at a lower corner of roof. The starter course shall overhang the edge metal 1/4 to 3/4 inch (6 mm to 19 mm). Fasten with four (4) nails, 1-1/2 inches to 3 inches (38 to 76 mm) up from the eave with one fastener 1 inch (25 mm) from each end and the remaining two evenly spaced on the same line as the end fasteners.
   3. Continue starter course across the roof with a full-length shingles, butting them loosely together to avoid buckling.
   4. First course: Start with a full shingle applied directly over the starter course at the same lower corner of the roof, and secure with fasteners.
   5. Second course: Cut 8 inches (203 mm) off one end of a full shingle and apply the remaining piece over the underlying, first course shingle. Align the bottom edge along a line level with the "sawtooth" overlay in the preceding course, exposing the first course 5-5/8 inches (143 mm). Secure with fasteners.
   6. Succeeding Courses: Courses three through five are begun with partial shingles, each progressively 8 inches (203 mm) shorter, establishing the overall diagonal pattern or stair-step effect. (Pieces cut from shingles along one rake edge can be used to finish off courses on the opposite rake.)
   7. Apply a full shingle adjacent to each of the first five courses to extend the pattern. Butt the shingles loosely together to prevent buckling.
   8. Courses six through ten repeat the process beginning with a full shingle and repeating the 1-to-5 course cycle on up the roof.
   9. Strike a chalk line every six courses or so to ensure straight courses. Shingles may be laid from either lower corner of the roof. Start at the rake edge and follow layout and cutting instructions as required for proper application. Installation of shingles with a 4 inch (102 mm) offset is also acceptable. Offsets must be no less than 4 inches (102 mm).

B. Valley Installation:
   1. Valley Underlayment: Center a full-width strip of self-adhering underlayment (or equivalent conforming to ASTM D1970) in the valley and apply it directly to the roof deck. Ensure this valley liner is tight to the deck without bridging in the center of the valley. Lace the field underlayment into and through the valley from both sides or overlap the valley liner a minimum of 6 inches (152 mm) on each side. When fastening, none should be placed closer than 6 inches (152 mm) from the valley centerline.
   2. Open metal valleys: Install minimum 24 inches (610 mm) wide, 26-gauge, metal valley flashing over the valley liner, and secure with fasteners no more than 1 inch (25 mm) from the outside edges at a spacing of 10 inches (254 mm) to 12 inches (305 mm) on center. For additional sealing, a continuous, 6-inch (152 mm) wide stripping ply of self-adhering Arctic Seal may be applied over the fasteners. Overlaps in the metal should be a minimum of 4 inches (102 mm) and embedded in a continuous bead of sealant. Do not fasten the metal laps. Lay a first course of shingles along the eave of one roof area and over the valley, making sure the end of the last shingle meets or goes beyond the centerline of the metal valley. Complete the installation of shingles on that roof section. After all shingles have been installed in the valley, snap a chalk line 2 inches (51 mm) from the center of the metal valley, and trim shingles to the chalk line, matching the centerline angle. Crop the tops of each shingle course at a 1 inch (25 mm), 45 degree cut. Embed the ends of the cut valley shingles in a continuous 3 inch (76 mm) wide bead of mastic. Install shingles on the adjoining roof as described above.
   3. "Bleeder," "Point," or "California-cut" valleys are not acceptable.

3.6. FASTENERS

A. Laminate Nailing Pattern: Nails must be placed within the nailing zone, 1 inch (25 mm) in from each end of the shingle and the remaining nails evenly spaced on the same line as the end nails. Fasteners shall be seated flush to the shingle surface and not overdriven to cut into shingles. When fastening, butt shingles loosely together to prevent buckling.
   1. Fasteners per shingle: Four (4).
   2. Fasteners per shingle/high wind areas: Six (6), including starter shingles.
   3. Steep slope fastening (roof decks, greater than 21:12): Six (6), including starter shingles, and hand-sealing underneath.

3.7. OWNER SUPPLIED MATERIALS

A. The Owner will only supply the quantity listed in the owner supplied materials section of this specification below. All additional materials and accessories will be the full responsibility of the contractor to provide and install per the specification and project requirements.

B. Any material or accessories required for the installation of the roof system in excess of the Owner provided material must be supplied by the Contractor and added into the bid cost proposal. 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 fabricate flashing metal from the Owner provided flat stock is contractor's responsibility and to be added into the bid cost proposal.

C. All required flashings as required per each specification section for plumbing, electrical, gas, etc. will be the Contractors responsibility to provide and install as well as to be included in the bid cost.

D. All materials not specifically included in the owner supplied materials section will be the

responsibility of the contractor to provide and install in compliance with section 073113.

E. Freight charges of owner supplied materials will be the responsibility of the Owner.

F. Contractor must coordinate and take delivery of materials, count all materials and ensure it matches the list below, unload and properly locate materials at the job site, and properly protect, cover and store at jobsite.

G. Contractor must be able to provide certification in writing from roof system manufacturer that the contractor is approved to install the specified roof system and provide all warranty requirements of section 073113.

1. Materials specifically provided by the Owner:

   a. See Section 016400 Owner Supplied Materials

END OF SECTION

SECTION 07 55 00
MODIFIED BITUMINOUS MEMBRANE ROOFING

1.GENERAL

1.1. SECTION INCLUDES

A. Includes all labor, materials, and equipment to install a modified bitumen roof system over the properly prepared substrate.

B. Includes a new cold applied 2-ply asphalt roofing system with all accessories as needed for a complete warrantable roofing system.

1.2. RELATED SECTIONS

A. Section 01 - Summary of Work

B. Section 01 - Owner Furnished Contractor Installed

C. Section 01 - Submittals

D. Section 06 - Rough Carpentry

E. Section 07 - Insulation Board

F. Section 07 - Asphalt Shingles

G. Section 07 - Sheet Metal Flashing and Trim

1.3. REFERENCES

A. ASTM D 41 - Standard Specification for Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing.

B. ASTM D 312 - Standard Specification for Asphalt used in Roofing.

C. ASTM D 451 - Standard Test Method for Sieve Analysis of Granular Mineral Surfacing for Asphalt Roofing Products.

D. ASTM D 1970 - Specification for Sheet Materials, Self-Adhering Polymer Modified Bituminous, Used as Steep Roofing Underlayment for Ice Dam Protection.

E. ASTM D 1079 Standard Terminology Relating to Roofing, Waterproofing and Bituminous Materials.

F. ASTM D 1863 Standard Specification for Mineral Aggregate Used as a Protective Coating for Roofing.

G. ASTM D 2178 Standard Specification for Asphalt Glass Felt Used in Roofing and Waterproofing.

H. ASTM D 2822 Standard Specification for Asphalt Roof Cement.

I. ASTM D 4601 Standard Specification for Asphalt Coated Glass Fiber Base Sheet Used in Roofing.

J. ASTM D 5147 Standard Test Method for Sampling and Testing Modified Bituminous Sheet Materials.

K. ASTM D 6162 Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using a Combination of Polyester and Glass Fiber Reinforcements.

L. ASTM D 6163 Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Glass Fiber Reinforcements.

M. ASTM D 6164 - Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Polyester Reinforcements.

N. ASTM E 108 - Standard Test Methods for Fire Test of Roof Coverings

O. Factory Mutual Research (FM): Roof Assembly Classifications.

P. National Roofing Contractors Association (NRCA): Roofing and Waterproofing Manual.

Q. Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA) - Architectural Sheet Metal Manual.

R. Underwriters Laboratories, Inc. (UL): Fire Hazard Classifications.

S. Warnock Hersey (WH): Fire Hazard Classifications.

T. ANSI-SPRI ES-1 Wind Design Standard for Edge Systems used with Low Slope Roofing Systems.

U. ASCE 7, Minimum Design Loads for Buildings and Other Structures

V. UL - Fire Resistance Directory.

W. FM Approvals - Roof Coverings and/or RoofNav assembly database.

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: Submit calculations from manufacturers engineering department prior to the start of the project. All items below must be addressed per ASCE 7-16 and approved as part of the submittal package specific to the geographical location of this project.

   1. Uniform Wind Uplift Load Capacity
      a. Installed roof system shall withstand negative (uplift) design wind loading pressures complying with the following criteria.
         1. Design Code: ASCE 7-16, Method 2 for Components and Cladding.
         2. Importance Category:

a. III
3. Importance Factor of:
a. 1.0
4. Wind Speed: 120 mph
5. Ultimate Pullout Value: 540 pounds per each of the fastener
6. Exposure Category:
a. C.
7. Design Roof Height: 20 feet.
8. Minimum Building Width: 30 feet.
9. Roof Pitch: 1/4 :12.
10. Roof Area Design Uplift Pressure:
a. Zone 1 - Field of roof 20 psf
b. Zone 2 - Eaves, ridges, hips and rakes 33.6 psf
c. Zone 3 - Corners 33.6 psf

2. Snow Load: N/A psf.
3. Live Load: 20 psf, or not to exceed original building design.
4. Dead Load:
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.

E. LEED: Roof system shall meet the reflectivity and emissivity criteria to qualify for one point under the LEED credit category, Credit 7.2, Landscape & Exterior Design to Reduce Heat Island - Roof.

F. Roof System membranes containing recycled or bio-based materials shall be third party certified through UL Environment.

G. Roof system shall have been tested in compliance with the following codes and test requirements: Submit all supporting data as noted below prior to the start of the project.
1. Miami-Dade County:
a. Torch and Mop Membrane Systems Over
1. Steel Decks N.O.A.
b. Roofing Underlayments
1. Garland Underlayments N.O.A.
c. Roofing Cements and Coatings
1. Garland Coatings and Mastics N.O.A.
2. Cool Roof Rating Council:
a. CRRC Directory: CRRC 0700-0028
3. Underwriters Laboratories:
a. Certification: 11040005 / 11040025
4. Warnock Hersey
a. ITS Directory of Listed Products
5. FM Approvals:
a. RoofNav Website

1.5. SUBMITTALS

A. Submit under provisions of Section 01300.

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 instructions.

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. Design Pressure Calculations: Submit design pressure calculations for the roof area in accordance with ASCE 7-16 and local 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 who has provided roof system attachment analysis for not less than 5 consecutive years.

E. Recycled or Bio-Based Materials: Provide third party certification through UL Environment of roof System membranes containing recycled or bio based materials

F. Verification Samples: For each modified bituminous membrane ply product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns.

G. Provide written certification from the roofing system manufacturer certifying the applicator is currently authorized to install the specified roof system and ability to provide the specified warranty.

H. Sample Warranty: Provide an unexecuted copy of the warranty specified for this project clearly stating the terms required of the owner, contractor, and manufacturer.

I. Manufacturer's Certificates: Provide to certify products meet or exceed specified requirements.

J. Inspection Certification: Submit a letter signed by an officer of the manufacturer certifying that the manufacture will provide weekly project inspections throughout the course of construction.

K. Test Reports: Submit test reports, prepared by an independent testing agency, for all modified bituminous sheet roofing, indicating compliance with ASTM D5147.

L. Manufacturer's Fire Compliance Certificate: Certify that the roof system furnished is approved by Factory Mutual (FM), Underwriters Laboratories (UL), Warnock Hersey (WH) or approved third party testing facility in accordance with ASTM E108, Class A for external fire and meets local or nationally recognized building codes.

M. 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: Company specializing in manufacturing products specified with documented ISO 9001 certification and minimum of twelve years of documented experience and must not have been in Chapter 11 bankruptcy during the last five years.

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 MEETINGS

A. Convene minimum two weeks prior to commencing Work of this section.

B. Review installation procedures and coordination required with related Work.

C. Inspect and make notes of job conditions prior to installation:
1. Record minutes of the conference and provide copies to all parties present.
2. Identify all outstanding issues in writing designating the responsible party for follow-up action and the timetable for completion.
3. Installation of roofing system shall not begin until all outstanding issues are resolved to the satisfaction of the Owner and Architect.

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 except store KEE-Stone FB 60 rolls flat 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. COORDINATION

A. Coordinate Work with installing associated metal flashings as work of this section proceeds.

1.10. 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.

1.11. WARRANTY

A. Upon completion of the work, provide the Manufacturer's written and signed NDL 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. 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:
      a. 3 years from date of acceptance.

2.PRODUCTS

2.1. MANUFACTURERS

A. Acceptable Manufacturer: The Garland Company, Inc.; 3800 E. 91st St., Cleveland, OH 44105. Local Representative: Richard Jones Phone: (559) 647-1196. rjones@garlandind.com Web Site: www.garlandco.com.

B. Requests for substitutions will not be considered for this project. District Standard.

2.2. COLD APPLIED 2-PLY ROOF SYSTEM

A. Insulation Base Layers:

   1. Polyisocyanurate roof board insulation. Install in multiple layers staggering all seams per manufactures details. Install with mechanical fasteners per ASCE 7-16 wind uplift calculations.

   2. R- Value: N/A, minimum thickness N/A

B. Insulation Top Layer:
   1. One layer of six side primed ½" woodfiber insulation board installed over one layer of rosin sheathing paper. Install per ASCE 7-16 wind uplift requirements.

C. Base (Ply) Sheet: One ply bonded to the prepared substrate with Interply Adhesive:
   1. StressBase 80:

D. Modified Cap (Ply) Sheet: One ply bonded to the prepared substrate with Interply Adhesive:
   1. StressPly Plus FR Mineral:

E. Interply Adhesive:
   1. Green-Lock Plus:

F. Flashing Base Ply: One ply bonded to the prepared substrate with Flashing Ply Adhesive:
   1. StressBase 80:

G. Flashing Cap (Ply) Sheet: One ply bonded to the prepared substrate with Flashing Ply Adhesive:

1. StressPly Plus FR Mineral:

H. Flashing Ply Adhesive:
   1. Green-Lock Flashing Adhesive:

I. Surfacing:
   1. Pyramic Plus Lo Acrylic Coating

2.3. ACCESSORIES:

A. Roof Insulation Base Layer(s): Provide roof insulation as specified in accordance with Section 072200. (Base layer is to be mechanically attached per ASCE 7-16)

B. Tapered Insulation System / Crickets: Per the final approved plan set slope to drain minimum 1/2" per foot.

C. Roof Insulation Top Layer: Provide one layer of ½" six side primed Blue Ridge Structodek High Density Fiberboard Roof Insulation. ASTM C 208, Type II.

D. Vapor Retarder: Red Rosin Paper; Install layer rosin sheet shingled uniformly to achieve one ply over the entire prepared substrate. Shingle in direction of slope of roof to shed water on each area of roof.
   1. Red Rosin Paper by WR Meadows
      a. Weight – 12 lb./roll
      b. Size – 500 square feet p/roll
      c. 36" wide by 167' long

E. Nails and Fasteners: Non-ferrous metal or galvanized steel, except that hard copper nails shall be used with copper; aluminum or stainless steel nails shall be used with aluminum; and stainless steel nails shall be used with stainless steel, Fasteners shall be self-clinching type of penetrating type as recommended by the deck manufacturer. Fasten nails and fasteners flush-driven through flat metal discs not less than 1 inch (25 mm) diameter. Omit metal discs when one-piece composite nails or fasteners with heads not less than 1 inch (25 mm) diameter are used.

F. Walkway Pads - As recommended and furnished by the membrane manufacturer set in approved adhesive to control foot traffic on roof top surface and provide a durable system compliant non-slip walkway.
   1. TrafGuard Roof Walkway Pads by Viking Products Group
      a. ½" x 3' x 4'
      b. In absence of a clear defined walkway plan in the project documents install walk way pads in a path from all roof access points to and around all HVAC and serviceable mechanical equipment, to and around roof hatches, and as designated by the owner.

G. Urethane Sealant Hybrid - Tuff-Stuff MS: 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: 450%
   3. Hardness, Shore A ASTM C 920: 35
   4. Adhesion-in-Peel, ASTM C 92: 30 pli

H. Sealant - Green-Lock Structural Adhesive: Single component, 100% solids structural adhesive as furnished and recommended by the membrane manufacturer.
   1. Elongation, ASTM D 412: 300%

2. Hardness, Shore A, ASTM C 920: 50
3. Shear Strength, ASTM D 1002: 300 psi

I. Butyl Tape: 100% solids, asbestos free and compressive tape designed to seal as recommended and furnished by the membrane manufacturer.

J. Glass Fiber Cant - Glass Cant: Continuous triangular cross Section made of inorganic fibrous glass used as a cant strip as recommended and furnished by the membrane manufacturer.

K. Roof Deck Insulation Adhesive: Insul-Lock HR - Dual-component, high rise foam adhesive with 45% rapidly renewable material content as recommended by roofing manufacturer and approved by FM indicated ratings.
1. Tensile Strength (ASTM D412)……250 psi
2. Density (ASTM D1875)……..8.5 lbs./gal.
3. Viscosity (ASTM D2556)……22,000 to 60,000 cP.
4. 2 `Peel Strength (ASTM D903)…..17 lb/in.
5. 3 `Flexibility (ASTM D816)……Pass @ -70°F

2.4. EDGE TREATMENT AND ROOF PENETRATION FLASHINGS

A. Pre-Manufactured Edge Metal Finishes:
1. Exposed and unexposed surfaces for mill finish flashing, fascia, and coping cap, as shipped from the mill
2. Exposed surfaces for coated panels:
a. Steel Finishes: fluorocarbon finish. Epoxy primer baked both sides, .2-.25 mils thickness as approved by finish coat manufacturer.
Weathering finish as referred by National Coil Coaters Association (NCCA).
Provided with the following properties.
1. Pencil Hardness: ASTM D3363, HB-H / NCCA II-2.
2. Bend: ASTM D-4145, O-T / NCCA II-19
3. Cross-Hatch Adhesion: ASTM D3359, no loss of adhesion
4. Gloss (60 deg. angle): ASTM D523, 25+/-5%
5. Reverse Bend: ASTM D2794, no cracking or loss of adhesion
6. Nominal Thickness: ASTM D1005

B. 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.

C. 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.

D. Pitch pans, Rain Collar 24 gauge stainless or 20oz (567gram) copper. All joints should be welded/soldered watertight. See details for design.

E. Drain Flashings should be 4lb (1.8kg) sheet lead formed and rolled.

F. Plumbing stacks should be 4lb (1.8kg) sheet lead formed and rolled. <u>All plumbing stacks are to have the factory lead caps / counter flashing installed</u>. Caulking and banding will not be acceptable on open top pipe penetrations. On field fabricated flashings where a lead cap can’t be applied a lead umbrella flashing is to be installed. Caulking and banding will be required with the specified sealant.

G. 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 deg. F 8.5 lb/gal typical

H. Fabricated Flashings: Fabricated flashings and trim are specified in Section 07620.
   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.

I. Manufactured Roof Specialties: Shop fabricated copings, fascia, gravel stops, control joints, expansion joints, joint covers and related flashings and trim are specified in Section 07710.
   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.

3.EXECUTION

3.1. EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. Inspect and approve the deck condition, slopes and fastener backing if applicable, parapet walls, expansion joints, roof drains, stack vents, vent outlets, nailers and surfaces and elements.

C. Verify that work penetrating the roof deck, or which may otherwise affect the roofing, has been properly completed.

D. If substrate preparation and other conditions are the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2. PREPARATION

A. General: Clean surfaces thoroughly prior to installation.
   1. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
   2. Fill substrate surface voids that are greater than 1/4 inch wide with an acceptable fill material.
   3. Roof surface to receive roofing system shall be smooth, clean, free from loose gravel, dirt and debris, dry and structurally sound.
   4. Wherever necessary, all surfaces to receive roofing materials shall be power broom and vacuumed to remove debris and loose matter prior to starting work.
   5. Do not apply roofing during inclement weather. Do not apply roofing membrane to damp, frozen, dirty, or dusty surfaces.
   6. Fasteners and plates for fastening components mechanically to the substrate shall provide a minimum pull-out capacity of 300 lbs. (136 k) per fastener. Base or ply sheets attached with cap nails require a minimum pullout capacity of 40 lb. per nail.
   7. Prime decks where required, in accordance with requirements and recommendations of the primer and deck manufacturer.
   8. Dimensional wood deck shall be minimum 1 inch (25 mm) thick, knotholes and cracks larger than 1/4 inch shall be covered with sheet metal. All boards shall be appropriately nailed and have adequate end bearing to the centers of beams/rafters.

Lumber shall be kiln dried.

9. Plywood shall be a minimum 15/32 inch (11.9 mm) thick and conform to the standards and installation requirements of the American Plywood Association (APA).
10. In all retrofit roof applications, it is required that deck be inspected for defects. Any defects are to be corrected per the deck manufacturer's recommendations and standards of the APA/Engineered Wood Association prior to new roof application.
11. Light metal wall ties or other structural metal exposed on top of the wood deck shall be covered with one ply of a heavy roofing sheet, such as HPR Glasbase Base Sheet, extending 2 inches to 6 inches (51 mm to 152 mm) beyond the metal in all directions. Nail in place before applying the base ply.

3.3. 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. General: Avoid installation of modified bitumen membranes at temperatures lower than 40-45 degrees 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.

C. 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

D. 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.

3.4. INSULATION INSTALLATION

A. Comply with built-up roofing manufacturer's written instructions, as submitted and reviewed by Architect during the submittal process, for installing roof insulation.

B. (Wood Decks Only) Install one lapped rosin sheet course and mechanically fasten to substrate according to built-up roofing manufacturer's written instructions and as called for in these specifications and on the drawings.

C. Insulation Cant Strips: Install and secure preformed 45-degree insulation cant strips at junctures of built-up roofing with vertical surfaces or angle changes greater than 45 degrees.

D. Install tapered insulation under area of roofing to conform to slopes indicated.

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

1. Cut and fit insulation within 1/4 inch of nailers, projections, and penetrations.

F. Install insulation under area of roofing to achieve required thickness. Where overall insulation thickness is 2.7 inches or greater, install two or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of 6 inches in each direction.

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

H. Mechanically Fastened and Adhered Insulation: Install first layer of insulation to deck using mechanical fasteners specifically designed and sized for fastening specified board-type roof insulation to deck type.

1. Fasten first layer of insulation to resist uplift pressure at corners, perimeter, and field of roof.

a. Field: 16 screws per 4 foot by 8 foot panel (2 square feet per screw).
b. Perimeter: 24 screws per 4 foot by 8 foot panel (1.33 square feet per screw).
c. Corners: 32 screws per 4 foot by 8 foot panel (1 square foot per screw).

2. Set each subsequent layer of insulation in Insuloc Insulation Adhesive by The Garland Company.

I. Install cover boards over insulation with long joints in continuous straight lines with end joints staggered between rows. Offset joints of insulation below a minimum of 6 inches in each direction. Loosely butt cover boards together and adhere to base layer insulation. Tape joints if required by roofing manufacturer.

1. Apply insulation adhesive to underside and immediately bond cover board to substrate.

3.5. INSTALLATION COLD APPLIED ROOF SYSTEM

1. Base Ply: Cut base ply sheets into 18 foot lengths and allow plies to relax before installing. Install base sheet in Interply Adhesive: applied at the rate required by the manufacturer. Shingle base sheets uniformly to achieve one ply throughout over the prepared substrate. Shingle in proper direction to shed water on each large area of roofing.
2. Lap ply sheet ends 8 inches. Stagger end laps 12 inches minimum.
3. Solidly bond to the substrate and adjacent ply with specified cold adhesive at the rate of 2 to 2-1/2 gallons per 100 square feet.
4. Roll must push a puddle of adhesive in front of it with adhesive slightly visible at all side laps. Use care to eliminate air entrapment under the membrane.
5. Install subsequent rolls of modified across the roof as above with a minimum of 4 inch side laps and 8 inch staggered end laps. Lay modified membrane in the same direction as the underlayers but the laps shall not coincide with the laps of the base layers.

6. Extend plies 2 inches beyond top edges of cants at wall and projection bases.
7. Install base flashing ply to all perimeter and projection details.
8. Allow the one ply of base sheet to cure at least 30 minutes before installing the modified membrane. However, the modified membrane must be installed the same day as the base plies.

B. Modified Cap Ply(s): Cut cap ply sheets into 18 foot lengths and allow plies to relax before installing. Install in interplay adhesive applied at the rate required by the manufacturer. Shingle sheets uniformly over the prepared substrate to achieve the number of plys specified. Shingle in proper direction to shed water on each large area of roofing.
1. Lap ply sheet ends 8 inches. Stagger end laps 12 inches minimum.
2. Solidly bond to the base layers with specified cold adhesive at the rate of 2 to 2-1/2 gallons per 100 square feet.
3. Roll must push a puddle of adhesive in front of it with adhesive slightly visible at all side laps. Care should be taken to eliminate air entrapment under the membrane.
4. Install subsequent rolls of modified across the roof as above with a minimum of 4 inch side laps and 8 inch staggered end laps. Lay modified membrane in the same direction as the underlayers but the laps shall not coincide with the laps of the base layers.
5. Allow cold adhesive to set for 5 to 10 minutes before installing the top layer of modified membrane.
6. Extend membrane 2 inches beyond top edge of all cants in full moppings of the cold adhesive as shown on the Drawings.

C. Fibrous Cant Strips: Provide non-combustible perlite or glass fiber cant strips at all wall/curb detail treatments where angle changes are greater than 45 degrees. Cant may be set in approved cold adhesives, hot asphalt or mechanically attached with approved plates and fasteners.

D. Wood Blocking, Nailers and Cant Strips: Provide wood blocking, nailers and cant strips as specified in Section 06114.
1. Provide nailers at all roof perimeters and penetrations for fastening membrane flashings and sheet metal components.
2. Wood nailers should match the height of any insulation, providing a smooth and even transition between flashing and insulation areas.
3. Nailer lengths should be spaced with a minimum 1/8 inch gap for expansion and contraction between each length or change of direction.
4. Nailers and flashings should be fastened in accordance with Factory Mutual "Loss Prevention Data Sheet 1- 49, Perimeter Flashing" and be designed to be capable of resisting a minimum force of 200 lbs/lineal foot in any direction.

E. Metal Work: Provide metal flashings, counter flashings, parapet coping caps and thru-wall flashings as specified in Section 07620 or Section 07710. Install in accordance with the SMACNA "Architectural Sheet Metal Manual" or the NRCA Roofing Waterproofing manual.

F. Termination Bar: Provide a metal termination bar or approved top edge securement at the terminus of all flashing sheets at walls and curbs. Fasten the bar a minimum of 8 inches (203 mm) o/c to achieve constant compression. Install Tuff Stuff Urethane sealant at the top edge as required.

G. Flashing Base Ply: Install flashing sheets by the same application method used for the base ply.
1. Seal curb, wall and parapet flashings with an application of mastic and mesh on a daily basis. Do not permit conditions to exist that will allow moisture to enter behind, around or under the roof or flashing membrane.
2. Prepare all walls, penetrations, expansion joints and where shown on the Drawings to

be flashed with required primer at the rate of 100 square feet per gallon. Allow primer to dry tack free.

3. Adhere to the underlying base ply with specified flashing ply adhesive unless otherwise specified. Nail off at a minimum of 8 inches (203 mm) o.c. from the finished roof at all vertical surfaces.
4. Solidly adhere the entire flashing ply to the substrate. Secure the tops of all flashings that are not run up and over curb through termination bar fastened at 6 inches (152 mm) O.C. and sealed at top.
5. Seal all vertical laps of flashing ply with a three-course application of trowel-grade mastic and fiberglass mesh.
6. Coordinate counter flashing, cap flashings, expansion joints and similar work with modified bitumen roofing work as specified.
7. Coordinate roof accessories, miscellaneous sheet metal accessory items, including piping vents and other devices with the roofing system work.
8. Secure the top edge of the flashing sheet using a termination bar only when the wall surface above is waterproofed, or nailed 4 inches on center and covered with an acceptable counter flashing.

H. Flashing Cap Ply:

1. Seal curb, wall and parapet flashings with an application of mastic and mesh on a daily basis. Do not permit conditions to exist that will allow moisture to enter behind, around or under the roof or flashing membrane.
2. Prepare all walls, penetrations, expansion joints and where shown on the Drawings to be flashed with required primer at the rate of 100 square feet per gallon. Allow primer to dry tack free.
3. Adhere to the underlying base flashing ply with specified flashing ply adhesive unless otherwise specified. Nail off at a minimum of 8 inches (203 mm) o.c. from the finished roof at all vertical surfaces.
4. Coordinate counter flashing, cap flashings, expansion joints and similar work with modified bitumen roofing work as specified.
5. Coordinate roof accessories, miscellaneous sheet metal accessory items with the roofing system work.
6. All stripping shall be installed prior to flashing cap sheet installation.
7. Heat and scrape granules when welding or adhering at cut areas and seams to granular surfaces at all flashings.
8. Secure the top edge of the flashing sheet using a termination bar only when the wall surface above is waterproofed, or nailed 4 inches on center and covered with an acceptable counter flashing.
9. Three course all vertical laps and the top edge of the base flashing sheet with Flashing Bond Mastic & Garmesh Webbing. Install white roofing granules into the fresh mastic.

I. Roof Walkways: Provide walkways in areas indicated on the drawings / plans or at a minimum;

a. Install walk way pads in a path from all roof access points to and around all HVAC and serviceable mechanical equipment, to and around roof hatches, and as designated by the owner.

3.6. INSTALLATION OF SURFACING

A. Prior to installation of surface coating, obtain approval from manufacturer as to work completed. On average, at least 30 days are required prior to final surfacing.

1. Reflective Coating:

a. Allow all cold applied mastics and coating to properly dry and cure before coating application.

b. Install primer coat at a rate of 1/2 gallon per 100 square feet.
c. Paint all exposed roofing with manufacturer's base coat acrylic coating installed at a rate of one and a half (1.5) gallons per square, back roll entire installation required.
d. Paint all exposed roofing with manufacturer's Energy Star top coat acrylic coating installed at a rate of one and a half (1.5) gallon per square, complete coverage for a clean neat appearance is required. Additional coats may be required to achieve complete coverage and proper mil thickness. Coating to be applied in a cross hatch pattern to the base coat.

3.7. 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. Metal Edge:
1. Inspect the nailers to assure proper attachment and configuration.
2. Run one ply over the edge. Assure coverage of all wood nailers. Fasten plies with ring shank nails at 8 inches (203 mm) o.c.
3. Install continuous cleat and fasten at 6 inches (152 mm) o.c.
4. Install new metal edge hooked to continuous cleat and set in bed of roof cement. Fasten flange to wood nailers every 3 inches (76 mm) o.c. staggered.
5. Prime metal edge at a rate of 100 square feet per gallon and allow to dry.
6. Strip in flange with base flashing ply covering entire flange in bitumen with 6 inches (152 mm) on to the field of roof. Assure ply laps do not coincide with metal laps.
7. Install a second ply of modified flashing ply in bitumen over the base flashing ply, 9 inches (228 mm) on to the field of the roof. Seal outside edge with rubberized cement.

C. Roof Edge With Gutter:
1. Inspect the nailer to assure proper attachment and configuration. Increase slope at metal edge by additional degree of slope in first board.
2. Run one ply over the edge. Assure coverage of all wood nailers. Fasten plies with ring shank nails at 8 inches (203 mm) o.c.
3. Install gutter and strapping.
4. Install continuous cleat and fasten at 6 inches (152 mm) o.c.
5. Install new metal edge hooked to continuous cleat and set in bed of roof cement. Fasten flange to wood nailer every 3 inches (76 mm) o.c. staggered.
6. Prime metal edge at a rate of 100 square feet per gallon and allow to dry.
7. Strip in flange with base flashing ply covering entire flange in bitumen with 6 inches (152 mm) onto the field of the roof. Assure ply laps do not coincide with metal laps.
8. Install a second ply of modified flashing ply in bitumen over the base flashing ply, 9 inches (228 mm) on to the field of the roof.

D. Scupper Through Wall (Overflow):
1. Inspect the nailer to assure proper attachment and configuration.
2. Run one ply over nailer up the overflow, into the scupper hole and up flashing as in typical wall flashing detail. Assure coverage of all wood nailers.
3. Install scupper box in a 1/4 inch (6 mm) bed of mastic. Assure all box seams are soldered and have a minimum 4 inch (101 mm) flange. Make sure all corners are closed and soldered. Prime scupper at a rate of 100 square feet per gallon and allow to dry.
4. Fasten flange of scupper box every 3 inches (76 mm) o.c. staggered.

5. Strip in flange scupper box with base flashing ply covering entire area with 6 inch (152 mm) overlap on to the field of the roof and wall flashing.
6. Install a second ply of modified flashing ply in bitumen over the base flashing ply, 9 inches (228 mm) on to the field of the roof. Apply a three-course application of mastic and mesh at all seams.

E. Coping Cap:
1. Minimum flashing height is 8 inches (203 mm) above finished roof height. Maximum flashing height is 24 inches (609 mm). Prime vertical wall at a rate of 100 square feet per gallon and allow to dry.
2. Set cant in bitumen. Run all field plies over cant a minimum of 2 inches (50 mm).
3. Attach tapered board to top of wall.
4. Install base flashing ply covering entire wall and wrapped over top of wall and down face with 6 inches (152 mm) on to field of roof and set in cold asphalt. Nail membrane at 8 inches (203 mm) o.c.
5. Install a second ply of modified flashing ply in bitumen over the base flashing ply, 9 inches (228 mm) on to the field of the roof. Apply a three-course application of mastic and mesh at all seams and install white roofing granules in fresh mastic.
6. Install continuous cleat and fasten at 6 inches (152 mm) o.c. to outside wall.
7. Install new metal coping cap hooked to continuous cleat.
8. Fasten inside cap 24 inches (609 mm) o.c. with approved fasteners and neoprene washers through slotted holes, which allow for expansion and contraction.

F. Surface Mounted Counterflashing:
1. Minimum flashing height is 8 inches (203 mm) above finished roof height. Maximum flashing height is 24 inches (609 mm). Prime vertical wall at a rate of 100 square feet per gallon and allow to dry.
2. Set cant in bitumen. Run all field plies over cant a minimum of 2 inches (50 mm).
3. Install base flashing ply covering wall set in bitumen with 6 inches (152 mm) on to field of the roof.
4. Install a second ply of modified flashing ply in bitumen over the base flashing ply, 9 inches (228 mm) on to the field of the roof. Apply a three-course application of mastic and mesh at all vertical seams and install white roofing granules in fresh mastic.
5. Apply butyl tape to wall behind flashing. Secure termination bar through flashing, butyl tape and into wall. Alternatively use caulk to replace the butyl tape.
6. Secure counterflashing set on butyl tape above flashing at 8 inches (203 mm) o.c. and caulk top of counterflashing.

G. Equipment Support:
1. Minimum curb height is 8 inches (203 mm) above finished roof height. Prime vertical at a rate of 100 square feet per gallon and allow to dry.
2. Set cant in bitumen. Run all field plies over cant a minimum of 2 inches (50 mm).
3. Install base flashing ply covering curb set in bitumen with 6 inches (152 mm) on to field of the roof.
4. Install a second ply of modified flashing ply in bitumen over the base flashing ply, 9 inches (228 mm) on to the field of the roof. Attach top of membrane to top of curb and nail at 8 inches (203 mm) o.c. Apply a three-course application of mastic and mesh at all vertical seams and install white roofing granules in fresh roofing mastic.
5. Install pre-manufactured cover. Fasten sides at 24 inches (609 mm) o.c. with fasteners and neoprene washers. Furnish all joint cover laps with butyl tape between metal covers.
6. Set equipment on neoprene pad and fasten as required by equipment manufacturer.

H. Curb Detail/Air Handling Station:
1. Minimum curb height is 8 inches (203 mm) above finished roof height. Prime vertical

at a rate of 100 square feet per gallon and allow to dry.
2. Set cant in bitumen. Run all field plies over cant a minimum of 2 inches (50 mm).
3. Install base flashing ply covering curb set in bitumen with 6 inches (152 mm) on to field of the roof.
4. Install a second ply of modified flashing ply in bitumen over the base flashing ply, 9 inches (228 mm) on to the field of the roof. Apply a three-course application of mastic and mesh at all vertical seams and install white roofing granules into fresh mastic.
5. Install pre-manufactured counterflashing with fasteners and neoprene washers or per manufacturer's recommendations.
6. Set equipment on neoprene pad and fasten as required by equipment manufacturer.

I. Skylight:
1. Minimum curb height is 8 inches (203 mm) above finished roof height. Prime vertical at a rate of 100 square feet per gallon and allow to dry.
2. Set cant in bitumen. Run all field plies over cant a minimum of 2 inches (50 mm).
3. Install base flashing ply covering curb set in bitumen with 6 inches (152 mm) on to field of the roof.
4. Install a second ply of modified flashing ply in bitumen over the base flashing ply, 9 inches (228 mm) on to the field of the roof. Attach top of membrane to top of wood nailer and apply a three-course application of mastic and mesh. Allow to cure and install white roofing granules in fresh mastic.
5. Install pre-manufactured lens and fasten flashing sides at 8 inches (203 mm) o.c. with fasteners and neoprene washers.

J. Exhaust Fan:
1. Minimum curb height is 8 inches (203 mm) above finished roof height. Prime vertical at a rate of 100 square feet per gallon and allow to dry.
2. Set cant in bitumen. Run all plies over cant a minimum of 2 inches (50 mm).
3. Install base flashing ply covering curb with 6 inches (152 mm) on to field of the roof.
4. Install a second ply of modified flashing ply installed over the base flashing ply, 9 inches (228 mm) on to field of the roof. Attach top of membrane to top of wood curb and nail at 8 inches (203 mm) o.c. Apply a three-course application of mastic and mesh at all vertical seams and install white roofing granules into fresh mastic.
5. Install metal exhaust fan over the wood nailers and flashing to act as counterflashing. Fasten per manufacturer's recommendation.

K. Roof Drain:
1. Plug drain to prevent debris from entering plumbing.
2. Taper insulation to drain minimum of 24 inches (609 mm) from center of drain.
3. Install two base flashing plies (40 inch square minimum) in bitumen.
4. Set lead/copper flashing (30 inch square minimum) in 1/4 inch (6 mm) bed of mastic. Run lead/copper into drain a minimum of 2 inches (50 mm). Prime lead/copper at a rate of 100 square feet per gallon and allow to dry.
5. Run roof system plies over drain. Cut out plies inside drain bowl.
6. Install modified membrane (48 inch square minimum) in bitumen.
7. Install clamping ring and assure that all plies are under the clamping ring.
8. Remove drain plug and install strainer.

L. Plumbing Stack:
1. Minimum stack height is 12 inches (609 mm).
2. Run roof system over the entire surface of the roof. Seal the base of the stack with elastomeric sealant.
3. Prime flange of new sleeve. Install properly sized sleeves set in 1/4 inch (6 mm) bed

of roof cement.
4. Install base flashing ply in bitumen.
5. Install membrane in bitumen.
6. Caulk the intersection of the membrane with elastomeric sealant.
7. Install a factory lead counter flashing cap over the top of the pipe. Caulking and banding or rolling the lead inside the pipe will not be accepted.

M. Heat Stack:
1. Minimum stack height is 12 inches (609 mm).
2. Run roof system over the entire surface of the roof. Seal the base of the stack with elastomeric sealant.
3. Prime flange of new sleeve. Install properly sized sleeves set in 1/4 inch (6 mm) bed of roof cement.
4. Install base flashing ply in bitumen.
5. Install modified membrane in bitumen.
6. Caulk the intersection of the membrane with elastomeric sealant.
7. Install new collar over cape. Weld collar or install stainless steel draw brand.

3.8. 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.

3.9. 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.

3.10. FIELD QUALITY CONTROL

A. Inspection: Provide manufacturer's field observations at start-up and two (2) days per week through project completion. Provide a final inspection upon completion of the Work.
1. Warranty shall be issued upon manufacturer's acceptance of the installation.
2. Field observations shall be performed by a representative employed full-time by the manufacturer and whose primary job description is to assist, inspect and approve membrane installations for the manufacturer.
3. Provide observation reports from the representative indicating procedures followed, weather conditions and any discrepancies found during inspection.
4. Provide a final report from the representative, certifying that the roofing system has been satisfactorily installed according to the project specifications, approved details and good general roofing practice.

3.11. SCHEDULES

A. Base (Ply) Sheet:
   1. StressBase 80: 80 mil SBS (Styrene-Butadiene-Styrene) rubber modified roofing base sheet reinforced with a fiberglass scrim, performance requirements according to ASTM D 5147.
      a. Tensile Strength, ASTM D 5147
         1. 2 in/min. @ 0 +/- 3.6 deg. F MD 100 lbf/in XD 100 lbf/in
         2. 50mm/min. @ -17.78 +/- 2 deg. C MD 17.5 kN/m XD 17.5 kN/m
      b. Tear Strength, ASTM D 5147
         1. 2 in/min. @ 73.4 +/- 3.6 deg. F MD 110 lbf XD 100 lbf
         2. 50mm/min. @ 23 +/- 2 deg. C MD 489 N XD 444 N
      c. Elongation at Maximum Tensile, ASTM D 5147
         1. 2 in/min. @ 0 +/- 3.6 deg. F MD 4 % XD 4 %
         2. 50mm/min@ -17.78 +/- 2 deg. C MD 4 % XD 4 %
      d. Low Temperature Flexibility, ASTM D 5147, Passes -40 deg. F (-40 deg. C)

B. Modified (Cap) Sheet:
   1. StressPly Plus FR Mineral: 155 mil SBS (Styrene-Butadiene-Styrene) mineral surfaced, 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 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 500 lbf XD 500 lbf
         2. 50 mm/min. @ 23 +/- 2 deg. C MD 2224 N XD 2224 N
      c. Elongation at Maximum Tensile, ASTM D 5147
         1. 2 in/min. @ 73.4 +/- 3.6 deg. F MD 8% XD 8%
         2. 50 mm/min. @ 23 +/- 2 deg. C MD 8% XD 8%
      d. Low Temperature Flexibility, ASTM D 5147, Passes -30 deg. F (-34 deg. C)

C. Interply Adhesive:
   1. Green-Lock Plus Membrane Adhesive: Cold applied solvent free membrane adhesive: zero V.O.C. compliant performance requirements:
      a. Non-Volatile Content ASTM D 4586 100%
      b. Density ASTM D 1475 12.3 lbs./gal. (1.47 g/cm3)
      c. Viscosity Brookfield Spindle T-E at 5 rpm 124,000 cPs.
      d. Flash Point ASTM D 93 400 deg. F min. (232 deg. C)
      e. Slope: up to 3:12

D. Flashing Base Ply:
   1. StressBase 80: 80 mil SBS (Styrene-Butadiene-Styrene) rubber modified roofing base sheet reinforced with a fiberglass scrim, performance requirements according to ASTM D 5147.
      a. Tensile Strength, ASTM D 5147
         1. 2 in/min. @ 0 +/- 3.6 deg. F MD 100 lbf/in XD 100 lbf/in
         2. 50 mm/min. @ -17.78 +/- 2 deg. C MD 17.5 kN/m XD 17.5 kN/m
      b. Tear Strength, ASTM D 5147
         1. 2 in/min. @ 73.4 +/- 3.6 deg. F MD 110 lbf XD 100 lbf
         2. 50 mm/min. @ 23 +/- 2 deg. C MD 489 N XD 444 N
      c. Elongation at Maximum Tensile, ASTM D 5147
         1. 2 in/min. @ 0 +/- 3.6 deg. F MD 4 % XD 4 %
         2. 50 mm/min. @ -17.78 +/- 2 deg. C MD 4 % XD 4 %
      d. Low Temperature Flexibility, ASTM D 5147

1. Passes -40 deg. F (-40 deg. C)

E. Flashing Ply Adhesive:
   1. Green-Lock Plus Flashing Adhesive: Cold applied solvent free flashing adhesive: zero V.O.C.
      a. Non-Volatile Content ASTM D 4586 100%
      b. Density ASTM D 1475 11.8 lbs./gal. (1.17 g/cm3)
      c. Viscosity Brookfield 400,000 cPs.
      d. Flash Point ASTM D 93 400 deg. F min. (232 deg. C)

F. Flashing (Cap) Sheet:
   1. StressPly Plus FR Mineral: 155 mil SBS (Styrene-Butadiene-Styrene) mineral surfaced, 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 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 500 lbf XD 500 lbf
         2. 50 mm/min. @ 23 +/- 2 deg. C MD 2224 N XD 2224 N
      c. Elongation at Maximum Tensile, ASTM D 5147
         1. 2 in/min. @ 73.4 +/- 3.6 deg. F MD 8% XD 8%
         2. 50 mm/min. @ 23 +/- 2 deg. C MD 8% XD 8%
      d. Low Temperature Flexibility, ASTM D 5147, Passes -30 deg. F (-34 deg. C)

G. Surface Primer:

   1. Acrylic Primer:

      a. Garla-Block: Water-Based Acrylic Primer.

         1. Solids by weight 21%

         2. Application Temperature 50-95 degrees

H. Surface Coating:
   1. White Elastomeric Roof Coating:
      a. Pyramic Plus Lo Acrylic Roof Coating: White, Water-Based, Acrylic-Urethane, Non Toxic, Fire Retardant Roof Coating.
         1. Non Volatile 63%
         2. Density 11.7lb. / gal
         3. VOC >50 gal./l
         4. Reflectance 0.83
         5. Emittance 0.90
         6. SRI 104

3.12. OWNER SUPPLIED MATERIALS

A. The Owner will only supply the quantity listed in the owner supplied materials section of this specification below. All additional materials and accessories will be the full responsibility of the contractor to provide and install per the specification and project requirements.

B. Any material or accessories required for the installation of the roof system in excess of the Owner provided material must be supplied by the Contractor and added into the bid cost proposal. 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 fabricate flashing metal from the Owner provided flat stock is contractor's responsibility and to be added into the bid cost proposal.

C. All required flashings as required per each specification section for plumbing, electrical, gas, etc. will be the Contractors responsibility to provide and install as well as to be included in the bid cost.

D. All materials not specifically included in the owner supplied materials section will be the responsibility of the contractor to provide and install in compliance with section 075500.

E. Freight charges of owner supplied materials will be the responsibility of the Owner.

F. Contractor must coordinate and take delivery of materials, count all materials and ensure it matches the list below, unload and properly locate materials at the job site, and properly protect, cover and store at jobsite.

G. Contractor must be able to provide certification in writing from roof system manufacturer that the contractor is approved to install the specified roof system and provide all warranty requirements of section 07550.

1. Materials specifically provided by the Owner:

    a. See Specification Section 016400 OFCI

END OF SECTION

SECTION 07 62 00

SHEET METAL FLASHING AND TRIM

1.GENERAL

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.

2. SUMMARY

A. Section Includes:

1. Manufactured through-wall flashing with counter flashing.
2. Formed low-slope roof sheet metal fabrications.
3. Formed wall, coping, and soffit sheet metal fabrications.
4. Formed equipment support flashing
5. Surface mounted counter flashing
6. Manufactured reglets and counter flashing
7. Formed gutter and downspouts

B. Related Requirements:

1. Division 06 "Rough Carpentry" for wood nailers, curbs, and blocking.
2. Division 07 “Membrane Roofing” for materials and installation of sheet metal flashing and trim integral with roofing.
3. Division 07 “Metal Roofing” for materials and installation of sheet metal flashing and trim integral with roofing.
4. Division 07 "Roof Accessories" for set-on-type curbs, equipment supports, roof hatches, vents, and other manufactured roof accessory units.

3. COORDINATION

A. Coordinate sheet metal flashing and trim layout and seams with sizes and locations of penetrations to be flashed, and joints and seams in adjacent materials.

B. Coordinate sheet metal flashing and trim installation with adjoining roofing and wall materials, joints, and seams to provide leak proof, secure, and noncorrosive installation.

4. PREINSTALLATION MEETINGS

A. Pre Installation Conference: Conduct conference at Project site.

1. Review construction schedule. Verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
2. Review special roof details, roof drainage, roof-penetration flashing, equipment curbs, and condition of other construction that affect sheet metal flashing and trim.
3. Review requirements for insurance and certificates if applicable.
4. Review sheet metal flashing observation and repair procedures after flashing installation.

5. SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each manufactured product and accessory.

B. Shop Drawings: For sheet metal flashing and trim.

1. Include plans, elevations, sections, and attachment details.
2. Detail fabrication and installation layouts, expansion-joint locations, and keyed details. Distinguish between shop- and field-assembled work.
3. Include identification of material, thickness, weight, and finish for each item and location in Project.
4. Include details for forming, including profiles, shapes, seams, and dimensions.
5. Include details for joining, supporting, and securing, including layout and spacing of fasteners, cleats, clips, and other attachments. Include pattern of seams.
6. Include details of termination points and assemblies.
7. Include details of expansion joints and expansion-joint covers, including showing direction of expansion and contraction from fixed points.
8. Include details of roof-penetration flashing.
9. Include details of edge conditions, including eaves, ridges, valleys, rakes, crickets, and counter flashings as applicable.
10. Include details of special conditions.
11. Include details of connections to adjoining work.
12. Detail formed flashing and trim at scale of not less than 3 inches per 12 inches

C. Samples for Initial Selection: For each type of sheet metal and accessory indicated with factory-applied finishes.

D. Samples for Verification: For each type of exposed finish.

1. Sheet Metal Flashing: 12 inches (300 mm) long by actual width of unit, including finished seam and in required profile. Include fasteners, cleats, clips, closures, and other attachments.
2. Trim, Metal Closures, Expansion Joints, Joint Intersections, and Miscellaneous Fabrications: 12 inches (300 mm) long and in required profile. Include fasteners and other exposed accessories.

6. INFORMATIONAL SUBMITTALS

A. Qualification Data: For fabricator.

B. Product Certificates: For each type of coping and roof edge flashing that is SPRI ES-1 tested.

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

D. Sample Warranty: For special warranty.

7. CLOSEOUT SUBMITTALS

A. Maintenance Data: For sheet metal flashing and trim, and its accessories, to include in maintenance manuals.

8. QUALITY ASSURANCE

A. Fabricator Qualifications: Employs skilled workers who custom fabricate sheet metal flashing and trim similar to that required for this Project and whose products have a record of successful in-service performance.

1. For copings and roof edge flashings that are SPRI ES-1 tested**,** shop shall be listed as able to fabricate required details as tested and approved.

9. DELIVERY, STORAGE, AND HANDLING

A. Do not store sheet metal flashing and trim materials in contact with other materials that might cause staining, denting, or other surface damage. Store sheet metal flashing and trim materials away from uncured concrete and masonry.

B. Protect strippable protective covering on sheet metal flashing and trim from exposure to sunlight and high humidity, except to extent necessary for period of sheet metal flashing and trim installation.

10. WARRANTY

A. Special Warranty on Finishes: Manufacturer agrees to repair finish or replace sheet metal flashing and trim that shows evidence of deterioration of factory-applied finishes within specified warranty period.

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

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

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

2.PRODUCTS

1. PERFORMANCE REQUIREMENTS

A. General: Sheet metal flashing and trim assemblies shall withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, installation, or other defects in construction. Completed sheet metal flashing and trim shall not rattle, leak, or loosen, and shall remain watertight.

B. Sheet Metal Standard for Flashing and Trim: Comply with NRCA's "The NRCA Roofing Manual" and SMACNA's "Architectural Sheet Metal Manual" requirements for dimensions and profiles shown unless more stringent requirements are indicated.

C. Sheet Metal Standard for Copper: Comply with CDA's "Copper in Architecture Handbook." Conform to dimensions and profiles shown unless more stringent requirements are indicated.

D. SPRI Wind Design Standard: Manufacture and install roof edge flashings tested according to SPRI ES-1 and capable of resisting the following design pressure:

1. Design Pressure: As indicated on Drawings**.**

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

1. Temperature Change: 120 deg F (67 deg C)**,** ambient; 180 deg F (100 deg C)**,** material surfaces**.**

2. SHEET METALS

A. General: Protect mechanical and other finishes on exposed surfaces from damage by applying strippable, temporary protective film before shipping.

B. Metallic-Coated Steel Sheet: Provide zinc-coated (galvanized) steel sheet according to ASTM A 653/A 653M, G90 (Z275) coating designation; prepainted by coil-coating process to comply with ASTM A 755/A 755M.

1. Surface: Smooth, flat and with manufacturer's standard clear acrylic coating on both sides**.**
2. Exposed Coil-Coated Finish:
   a. Two-Coat Fluoropolymer: AAMA 621. Fluoropolymer finish containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

3. Color: Match Architect's sample
4. Concealed Finish: Pretreat with manufacturer's standard white or light-colored acrylic or polyester backer finish, consisting of prime coat and wash coat with minimum total dry film thickness of 0.5 mil (0.013 mm).

3. UNDERLAYMENT MATERIALS

A. Self-Adhering, High-Temperature Sheet: Minimum 45 mils thick, consisting of a slip-resistant polyethylene- or polypropylene-film top surface laminated to a layer of butyl- or SBS-modified asphalt adhesive, with release-paper backing; specifically designed to withstand high metal temperatures beneath metal roofing. Provide primer according to written recommendations of underlayment manufacturer.

1. The Garland Company Inc., 3800 E. 91st Street Cleveland OH 44105; R-Mer Seal self-adhering underlayment.
2. Thermal Stability: ASTM D 1970; stable after testing at 240 deg F or higher.
3. Low-Temperature Flexibility: ASTM D 1970; passes after testing at minus 20 deg F or lower.

B. Slip Sheet: Rosin-sized building paper, 3 lb/100 sq. ft. minimum.

4. MISCELLANEOUS MATERIALS

A. General: Provide materials and types of fasteners, solder, protective coatings, sealants, and other miscellaneous items as required for complete sheet metal flashing and trim installation and as recommended by manufacturer of primary sheet metal unless otherwise indicated.

B. Fasteners: Wood screws, annular threaded nails, self-tapping screws, self-locking rivets and bolts, and other suitable fasteners designed to withstand design loads and recommended by manufacturer of primary sheet metal or manufactured item.

1. General: Blind fasteners or self-drilling screws, gasketed, with hex-washer head.

    a. Exposed Fasteners: Heads matching color of sheet metal using plastic caps or factory-applied coating. Provide metal-backed EPDM or PVC sealing washers under heads of exposed fasteners bearing on weather side of metal.
    b. Blind Fasteners: High-strength aluminum or stainless-steel rivets suitable for metal being fastened.
    c. Spikes and Ferrules: Same material as gutter; with spike with ferrule matching internal gutter width.

2. Fasteners for Zinc-Tin Alloy-Coated Stainless-Steel Sheet: Series 300 stainless steel.

C. Solder:

1. For Zinc-Coated (Galvanized) Steel: ASTM B 32, Grade Sn50, 50 percent tin and 50 percent lead or Grade Sn60, 60 percent tin and 40 percent lead with maximum lead content of 0.2 percent**.**

D. Sealant Tape: Pressure-sensitive, 100 percent solids, polyisobutylene compound sealant tape with release-paper backing. Provide permanently elastic, nonsag, nontoxic, nonstaining tape 1/2 inch wide and 1/8 inch thick.

E. Elastomeric Sealant: ASTM C 920, elastomeric polyurethane polymer sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.

F. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type expansion joints with limited movement.

G. Bituminous Coating: Cold-applied asphalt emulsion according to ASTM D 1187.

H. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required for application.

5. FABRICATION, GENERAL

A. General: Custom fabricate sheet metal flashing and trim to comply with details shown and recommendations in cited sheet metal standard that apply to design, dimensions, geometry, metal thickness, and other characteristics of item required. Fabricate sheet metal flashing and trim in shop to greatest extent possible.

1. Fabricate sheet metal flashing and trim in thickness or weight needed to comply with performance requirements, but not less than that specified for each application and metal.
2. Obtain field measurements for accurate fit before shop fabrication.
3. Form sheet metal flashing and trim to fit substrates without excessive oil canning, buckling, and tool marks; true to line, levels, and slopes; and with exposed edges folded back to form hems.
4. Conceal fasteners and expansion provisions where possible. Do not use exposed fasteners on faces exposed to view.

B. Fabrication Tolerances: Fabricate sheet metal flashing and trim that is capable of installation to a tolerance of 1/4 inch in 20 feet on slope and location lines indicated on Drawings and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

C. Expansion Provisions: Form metal for thermal expansion of exposed flashing and trim.

1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with butyl sealant concealed within joints.
2. Use lapped expansion joints only where indicated on Drawings.

D. Sealant Joints: Where movable, nonexpansion-type joints are required, form metal to provide for proper installation of elastomeric sealant according to cited sheet metal standard.

E. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, noncorrosive metal.

F. Seams: Fabricate nonmoving seams with flat-lock seams. Form seams and seal with elastomeric sealant unless otherwise recommended by sealant manufacturer for intended use.

G. Do not use graphite pencils to mark metal surfaces.

6. ROOF-DRAINAGE SHEET METAL FABRICATIONS

A. Hanging Gutters: Fabricate to cross section required, complete with end pieces, outlet tubes, and other accessories as required. Fabricate in minimum 96-inch- long sections. Furnish flat-stock gutter brackets and flat-stock gutter spacers and straps fabricated from same metal as gutters, of size recommended by cited sheet metal standard but with thickness not less than dimension indicated on Drawings. Fabricate expansion joints, expansion-joint covers, gutter bead reinforcing bars, and gutter accessories from same metal as gutters. Shop fabricate interior and exterior corners.

1. Gutter Profile: Style B according to cited sheet metal standard.
2. Expansion Joints: Butt type with cover plate**.**
3. Accessories: Continuous, removable leaf screen with sheet metal frame and hardware cloth screen at each downspout location.
4. Gutters with Girth up to 15 Inches: Fabricate from the following materials:
   a. Galvanized Steel: 22 gauge thickness.

B. Downspouts: Fabricate downspouts per plans and details or per size per CA plumbing code. Fabricate from the following materials unless otherwise shown on drawings.
1. Galvanized Steel: 22 gauge thickness.

C. Conductor Heads: Fabricate conductor heads with flanged back and stiffened top edge and of dimensions and shape required, complete with outlet tubes, exterior flange trim, and built-in overflows. Fabricate from the following materials:

1. Galvanized Steel: 22 gauge thickness.

7. WALL SHEET METAL FABRICATIONS

A. Through-Wall Flashing: Fabricate continuous flashings in minimum 96-inch- long, but not exceeding 12-foot long, sections, under copings, and at shelf angles. Fabricate discontinuous lintel, sill, and similar flashings to extend 6 inches beyond each side of wall openings; and form with 2-inch high, end dams. Fabricate from the following materials:

1. Galvanized Steel: 22 gauge thickness.

B. Opening Flashings in Frame Construction: Fabricate head, sill, jamb, and similar flashings to extend **4 inches** beyond wall openings. Form head and sill flashing with 2-inch high, end dams. Fabricate from the following materials:

1. Galvanized Steel: 22 gauge thickness.

C. Wall Expansion-Joint Cover: Fabricate from the following materials:

1. Galvanized Steel: 22 gauge thickness.

8. MISCELLANEOUS SHEET METAL FABRICATIONS

A. Gutters: Fabricate from the following materials:

1. Pre-Finished Steel: 22 gauge thickness.

B. Downspouts: Fabricate from the following materials:

1. Steel: Schedule 40

C. Edge Metal / Gravel Stop: Fabricate from the following materials:

1. Pre-Finished Steel: 24 gauge thickness.

D. Cleat Flashing: Fabricate from the following materials:

1. Galvanized Steel: 22 gauge thickness.

E. Curb Covers / Pans: Fabricate from the following materials:

1. Galvanized Steel: 22 gauge thickness.

F. Scuppers: Fabricate from the following materials:

1. Galvanized Steel: 22 gauge thickness.

G. Equipment Support Flashing: Fabricate from the following materials:

1. Galvanized Steel: 22 gauge thickness.

H. Overhead-Piping Safety Pans: Fabricate from the following materials:

1. Galvanized Steel: 22 gauge thickness.

3.EXECUTION

1. EXAMINATION

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

1. Verify compliance with requirements for installation tolerances of substrates.
2. Verify that substrate is sound, dry, smooth, clean, sloped for drainage, and securely anchored.
3. Verify that air- or water-resistant barriers have been installed over sheathing or backing substrate to prevent air infiltration or water penetration.

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

2. UNDERLAYMENT INSTALLATION

A. Self-Adhering Sheet Underlayment: Install self-adhering sheet underlayment, wrinkle free. Prime substrate if recommended by underlayment manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation; use primer for installing underlayment at low temperatures. Apply in shingle fashion to shed water, with end laps of not less than 6 inches staggered 24 inches between courses. Overlap side edges not less than 3-1/2 inches. Roll laps and edges with roller. Cover underlayment within 14 days.

B. Apply slip sheet, wrinkle free, directly on substrate before installing sheet metal flashing and trim.

3. INSTALLATION, GENERAL

A. General: Anchor sheet metal flashing and trim and other components of the Work securely in place, with provisions for thermal and structural movement. Use fasteners, solder, protective coatings, separators, sealants, and other miscellaneous items as required to complete sheet metal flashing and trim system.

1. Install sheet metal flashing and trim true to line, levels, and slopes. Provide uniform, neat seams with minimum exposure of solder, welds, and sealant.
2. Install sheet metal flashing and trim to fit substrates and to result in watertight performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.
3. Space cleats not more than 12 inches apart. Attach each cleat with at least two fasteners. Bend tabs over fasteners.
4. Install exposed sheet metal flashing and trim with limited oil canning, and free of buckling and tool marks.
5. Torch cutting of sheet metal flashing and trim is not permitted.
6. Do not use graphite pencils to mark metal surfaces.

B. Metal Protection: Where dissimilar metals contact each other, or where metal contacts pressure-treated wood or other corrosive substrates, protect against galvanic action or corrosion by painting contact surfaces with bituminous coating or by other permanent separation as recommended by sheet metal manufacturer or cited sheet metal standard.

1. Coat concealed side of stainless-steel sheet metal flashing and trim with bituminous coating where flashing and trim contact wood, ferrous metal, or cementitious construction.
2. Underlayment: Where installing sheet metal flashing and trim directly on cementitious or wood substrates, install underlayment and cover with slip sheet.

C. Expansion Provisions: Provide for thermal expansion of exposed flashing and trim. Space movement joints at maximum of **10 feet** with no joints within 24 inches of corner or intersection.

1. Form expansion joints of intermeshing hooked flanges, not less than 1 inch deep, filled with sealant concealed within joints.

2. Use lapped expansion joints only where indicated on Drawings.

D. Fasteners: Use fastener sizes that penetrate wood blocking or sheathing not less than 1-1/4 inches for nails and not less than 3/4 inch for wood screws.

E. Conceal fasteners and expansion provisions where possible in exposed work and locate to minimize possibility of leakage. Cover and seal fasteners and anchors as required for a tight installation.

F. Seal joints as required for watertight construction.

1. Use sealant-filled joints unless otherwise indicated. Embed hooked flanges of joint members not less than 1 inch into sealant. Form joints to completely conceal sealant. When ambient temperature at time of installation is between 40 and 70 deg F, set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures. Do not install sealant-type joints at temperatures below 40 deg F.
2. Prepare joints and apply sealants to comply with requirements in Section 079200 "Joint Sealants."

G. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pre-tin edges of sheets with solder to width of 1-1/2 inches; however, reduce pre-tinning where pre-tinned surface would show in completed Work.

1. Do not solder metallic-coated steel sheet.
2. Do not pre-tin zinc-tin alloy-coated stainless steel**.**
3. Do not use torches for soldering.
4. Heat surfaces to receive solder, and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.
5. Stainless-Steel Soldering: Tin edges of uncoated sheets, using solder for stainless steel and acid flux. Promptly remove acid flux residue from metal after tinning and soldering. Comply with solder manufacturer's recommended methods for cleaning and neutralization.
6. Copper Soldering: Tin edges of uncoated sheets, using solder for copper.
7. Copper-Clad Stainless-Steel Soldering: Tin edges of uncoated sheets, using solder for copper-clad stainless steel.

H. Rivets: Rivet joints in zinc where necessary for strength.

4. ROOF-DRAINAGE SYSTEM INSTALLATION

A. General: Install sheet metal roof-drainage items to produce complete roof-drainage system according to cited sheet metal standard unless otherwise indicated. Coordinate installation of roof perimeter flashing with installation of roof-drainage system.

B. Hanging Gutters: Join sections with riveted and soldered joints or joints sealed with sealant as shown and specified on drawings or summary/scope of work. Provide for thermal expansion. Attach gutters at eave or fascia to firmly anchor them in position. Provide end closures and seal watertight with sealant. Slope to downspouts.

1. Fasten gutter spacers to front and back of gutter.

2. Anchor and loosely lock back edge of gutter to continuous cleat, eave or apron flashing.
3. Anchor back of gutter that extends onto roof deck with cleats spaced not more than 24 inches apart.
4. Anchor gutter with gutter brackets and straps spaced not more than 24 inches apart to roof deck, unless otherwise indicated, and loosely lock to front gutter bead.
5. Anchor gutter with spikes and ferrules spaced not more than 24 inches apart.
6. Install gutter with expansion joints at locations indicated, but not exceeding, 50 feet apart. Install expansion-joint caps.
7. Install continuous gutter screens on gutters with noncorrosive fasteners, removable for cleaning gutters.

C. Conductor Heads: Anchor securely to wall, with elevation of conductor head rim at minimum of 1 inch below gutter discharge.

D. Expansion-Joint Covers: Install expansion-joint covers at locations and of configuration indicated. Lap joints minimum of 4 inches in direction of water flow.

5. ROOF FLASHING INSTALLATION

A. General: Install sheet metal flashing and trim to comply with performance requirements, sheet metal manufacturer's written installation instructions, and cited sheet metal standard. Provide concealed fasteners where possible, and set units true to line, levels, and slopes. Install work with laps, joints, and seams that are permanently watertight and weather resistant.

B. Roof Edge Flashing: Anchor to resist uplift and outward forces according to recommendations in FM Global Property Loss Prevention Data Sheet 1-49 for FM Approvals' listing for required windstorm classification.

C. Copings: Anchor to resist uplift and outward forces according to recommendations in cited sheet metal standard unless otherwise indicated.

1. Interlock exterior bottom edge of coping with continuous cleat anchored to substrate at 24-inch centers.
2. Anchor interior leg of coping with washers and screw fasteners through slotted holes at 24-inch centers.

D. Copings: Anchor to resist uplift and outward forces according to recommendations in FM Global Property Loss Prevention Data Sheet 1-49 for specified FM Approvals' listing for required windstorm classification.

E. Pipe or Post Counterflashing: Install counterflashing umbrella with close-fitting collar with top edge flared for elastomeric sealant, extending minimum of 4 inches over base flashing. Install stainless-steel draw band and tighten.

F. Counterflashing: Coordinate installation of counterflashing with installation of base flashing. Insert counterflashing in reglets or receivers and fit tightly to base flashing. Extend counterflashing 4 inches over base flashing. Lap counterflashing joints minimum of 4 inches. Secure in waterproof manner by means of interlocking folded seam or blind rivets and sealant, anchor and washer at 36-inch centers unless otherwise indicated.

G. Roof-Penetration Flashing: Coordinate installation of roof-penetration flashing with installation of roofing and other items penetrating roof. Seal with elastomeric sealant and clamp flashing to pipes that penetrate roof.

6. WALL FLASHING INSTALLATION

A. General: Install sheet metal wall flashing to intercept and exclude penetrating moisture according to cited sheet metal standard unless otherwise indicated. Coordinate installation of wall flashing with installation of wall-opening components such as windows, doors, and louvers.

B. Through-Wall Flashing: Installation of through-wall flashing is specified in Section 042000 "Unit Masonry."Section092400 "Cement Plastering."

C. Opening Flashings in Frame Construction: Install continuous head, sill, jamb, and similar flashings to extend 4 inches beyond wall openings.

7. MISCELLANEOUS FLASHING INSTALLATION

A. Equipment Support Flashing: Coordinate installation of equipment support flashing with installation of roofing and equipment. Weld or seal flashing with elastomeric sealant to equipment support member.

B. Overhead-Piping Safety Pans: Suspend pans from structure above, independent of other overhead items such as equipment, piping, and conduit, unless otherwise indicated on Drawings. Pipe and install drain line to plumbing waste or drainage system.

8. ERECTION TOLERANCES

A. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerance of 1/4 inch in 20 feet on slope and location lines indicated on Drawings and within 1/8-inch offset of adjoining faces and of alignment of matching profiles.

B. Installation Tolerances: Shim and align sheet metal flashing and trim within installed tolerances specified in MCA's "Guide Specification for Residential Metal Roofing."

9. CLEANING AND PROTECTION

A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.

B. Clean and neutralize flux materials. Clean off excess solder.

C. Clean off excess sealants.

D. Remove temporary protective coverings and strippable films as sheet metal flashing and trim are installed unless otherwise indicated in manufacturer's written installation instructions. On completion of sheet metal flashing and trim installation, remove unused materials and clean finished surfaces as recommended by sheet metal flashing and trim

manufacturer. Maintain sheet metal flashing and trim in clean condition during construction.

E. Replace sheet metal flashing and trim that have been damaged or that have deteriorated beyond successful repair by finish touchup or similar minor repair procedures.

END OF SECTION 07 62 00

Leon Environmental Services

4545 N. Brawley Ave., Suite 104, Fresno, CA 93722
Phone: 559.274.9200 Fax: 559.274.9240 Email: LeonEnviro@comcast.net

September 08, 2023

Domingo Mora
Madera Unified School District
1902 Howard Rd.
Madera, CA 93637

Re: Asbestos Bulk Samples
Millview Elementary School
1609 Clinton St.
Madera, CA
Job No. B192-23

Dear Domingo:

Attached are the asbestos sampling results for the above referenced building. This report includes conclusions, recommendations and bulk analysis results. If you have any questions or need additional information, please do not hesitate to call.

Thank you for using Leon Environmental Services. We look forward to working with you in the future.

Respectfully,

Tommy Leon
Certified Asbestos Consultant
Certification No. 05-3882

Sampling Site: Millview Elementary, 1609 Clinton St, Madera, CA B192-23

ASBESTOS ANALYSIS RESULTS

A total of **31** samples of suspect materials were collected by a state certified asbestos inspector from **Millview Elementary School** at **1609 Clinton St, Madera, CA**. The sample collection areas were determined by the information given to the inspector by **Domingo Mora** about the impending remodel/renovation that is planned for these buildings. McCall and Spero Environmental, Inc., a NVLAP accredited laboratory performed a total of **34** analyses from the **31** samples collected. The chain of custody from Leon Environmental Services and the report from McCall and Spero contain a full list of all samples taken from this site.

Sample	Location	Material	% Of ACM	Friable
Roof A				
01	Roof	Light Grey Asphalt Shingle	ND	
02	Roof	Tar Paper	ND	
Roof B				
03	Roof – Top Layer	Light Grey Asphalt Shingle	ND	
04	Roof – Bottom Layer	Green Asphalt Shingle	ND	
05	Roof – Bottom Layer	Tar Paper	ND	
06	Roof Patch	Dark Grey Asphalt Shingle	ND	
07	Roof – Vent	White Sealant	ND	
Roof C				
08	Roof	Roof Core	ND	
09	AC Unit	Black Roof Mastic	ND	
Roof F				
10	Roof	Grey Asphalt Shingle	ND	
11	Roof	Tar Paper	ND	
12	AC Unit	Black Roof Mastic	ND	
13	AC Unit	Sealant		

Sampling Site: Millview Elementary, 1609 Clinton St, Madera, CA B192-23

Roof I				
14	Roof	Light Grey Rolled Roofing	ND	
15	Roof	Tar Paper	ND	
16	AC Duct	Black Roof Mastic	3%	No
Roof J1				
17	Roof	Roof Core	ND	
		Insulation	ND	
Roof J2				
18	Roof	Roof Core	ND	
		Insulation	ND	
Roof K				
19	Roof	Light Grey Rolled Roofing	ND	
20	Roof	Tar Paper	ND	
21	Roof Vent	Black Roof Mastic	ND	
Roof L				
22	Roof – Top Layer	Light Grey Asphalt Shingle	ND	
23	Roof – Top Layer	Tar Paper	ND	
24	Roof – Bottom Layer	Roof Material	ND	
25	Roof – Bottom Layer	Tar Paper	ND	
26	AC Unit	Black Roof Mastic	3%	No
27	AC Duct	White Sealant	ND	
Roof M				
28	Roof	Roof Core	ND	
		Insulation	ND	

Sampling Site: Millview Elementary, 1609 Clinton St, Madera, CA B192-23

29	Roof Jack	Grey/Black Roof Mastic	2%	No
30	AC Unit	Clear Sealant	ND	
31	AC Unit	White Sealant	ND	

COMMENTS AND RECOMMENDATIONS

Non-Friable Asbestos

The Black Roof Mastic (samples 16, 26) on roof I and roof L is positive for asbestos at 3%.
The Grey/Black Roof Mastic (samples 29) on roof M is positive for asbestos at 2%.

These materials are considered a ***non-hazardous non-friable ACM***. It is required that a licensed asbestos abatement contractor remove these materials prior to renovation and or demolition of this structure.

CONCLUSIONS AND REGULATIONS

Based on our survey, sampling and subsequent laboratory analysis and regulatory guidelines affecting this site, the types of ACM identified on this page require removal (in most cases) prior to demolition and/or renovation procedures to comply with local, state and federal agencies. The US EPA NESHAP (40 CFR Part 61 – November 20, 1990) requires materials containing greater than one percent asbestos be removed prior to renovation or demolition. If those materials are friable or likely to become friable due to the forces expected to act upon them during renovation or demolition, they become a regulated asbestos containing material (RACM) and require a 10-day notification to the local Air Pollution Control District prior to abatement.

Non-friable and non-regulated ACM, in most cases, may be disposed of as a Non-Hazardous waste in a landfill that accepts Asbestos Containing Materials. All friable waste containing more than 1% asbestos (RACM) must be manifested as hazardous waste for disposal purposes.

CAL OSHA--------Construction Industry--------8CCR, 1529

Cal/OSHA worker health and safety regulations apply during any disturbance of ACM by a person while in the employ of another. This is true regardless of friability or quantity disturbed. If there is greater than 100 square feet of ACM which will be affected by the demolition, a California Licensed Contractor who is registered with Cal/OSHA for asbestos is required. The regulations regarding asbestos are found in Title 8 CCR Section 1529, and also include formal notification requirements to Cal/OSHA at least 24 hours prior to removal. It is required that removal be conducted with the material kept in a wetted state to contain dust and hazardous emissions.

Sampling Site: Millview Elementary, 1609 Clinton St, Madera, CA B192-23

The construction industry standard covers employees engaged in demolition and construction, and the following related activities likely to involve asbestos exposure: removal, encapsulation, alteration, repair, maintenance, insulation, spill emergency cleanup, transportation, disposal and storage of ACM.

Demolition contractors typically require that a building owner/operator accept responsibility for removal of all ACM found during the building inspection prior to start of demolition activities.

LIMITATIONS OF LIABILITY

Conclusions and recommendations presented in this report are qualitative judgments based on the prevailing regulations and accepted industry standards at the time of the report issuance. Leon Environmental Services provides no other guarantees, either expressed or implied. All quantities of materials listed herein are estimates for sampling purposes only, and should be verified by Owner representative or an abatement contractor prior to asbestos abatement.

The nature of demolition and asbestos abatement is such that materials can be uncovered which previously were unknown to exist. Therefore, Leon Environmental Services cannot be responsible for materials not previously detected due to lack of accessibility or concealment, although every effort was made during the inspection to detect all suspect materials. If any materials other than those included herein are discovered during renovation or demolition, it must be assumed that the materials are asbestos containing, and should be treated accordingly until further testing and analysis is performed.

The data interpretations and recommendations are based solely on information available to Leon Environmental Services at the time of our inspection. The customer recognizes that site conditions or accessibility may vary, from those encountered at the time of our inspection and sample collection. Varying conditions or access could result in additional information that would lead us to revise conclusions and recommendations. Leon Environmental Services will not be responsible for the interpretation or use by others of information contained within this report.

Thomas Leon DATE:
Certified Asbestos Consultant
Certification No. 05-3882

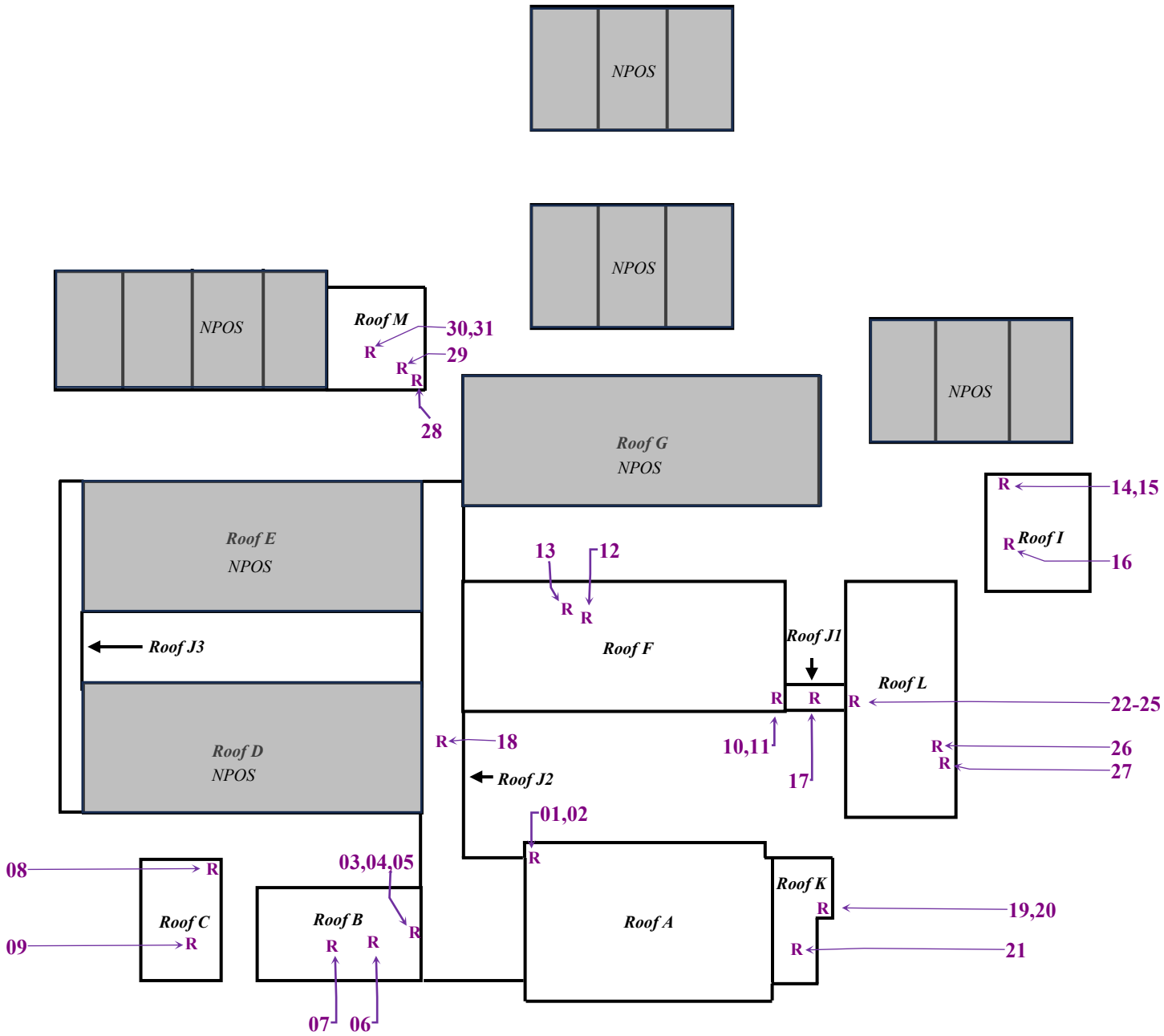
*Abbreviation Key:

Asbestos Containing Material — ACM (equal to or greater than 0.1% by weight)
No Asbestos Detected--N.A.D or N.D.
Homogeneous—H
Not Sampled--NS

Leon Environmental Services

Richard "Danny" Leon CAC Certification No. 04-3708
Tommy Leon CAC Certification No. 05-3882

Job B192-23 / Sample Location Diagram
Millview Elementary School – Roofs / 1609 Clinton St, Madera, CA
Domingo Mora / Madera Unified School District
Drawing not to Scale



NPOS = Not Part of Survey

Y = Exterior Samples
X = Interior Samples
R = Roof Samples

4545 N. Brawley Ave., Suite 104, Fresno, CA 93722
Phone: 559.274.9200 Fax: 559.274.9240 Email: LeonEnviro@comcast.net

McCall and Spero Environmental, Inc.
Specialists in Microanalysis

1831 Williamson Court • Suite 100 • Louisville, KY 40223
Phone (502) 244-7135 • FAX (502) 244-7136
E-mail: customerservice@mselabs.com • Website: www.mselabs.com

Date: September 8, 2023

Attention: Tommy Leon
Leon Environmental Services

Subject: Analysis of bulk samples for asbestos mineral fibers by Polarized Light Microscopy (PLM) with Dispersion Staining (EPA/600/R-93/116)

RE: MSE-P963LEO.1
Domingo Mora, Madera Unified School District - Millview Elementary School, Roofs: 1609 Clinton St; Madera, CA Project
LEO# B192-23

Dear Mr. Leon:

McCall & Spero Environmental, Inc. has completed the analysis of the bulk samples we received from your offices on September 8, 2023. These samples represent the bulk samples from the Domingo Mora, Madera Unified School District - Millview Elementary School, Roofs: 1609 Clinton St; Madera, CA Project.

The PLM bulk analysis was performed according to the "Method of the Determination of Asbestos in Bulk Building Materials", R. L. Perkins and B. W. Harvey (EPA/600/R-93/116).

The results for the thirty-four (34) samples are summarized in the following report. Please note that for samples consisting of two or more distinct components, each component is analyzed and reported individually (EPA 40 CFR Part 61 [FRL-4821-71]).

Thank you for consulting McCall & Spero Environmental, Inc. Should you have any questions concerning these results, please contact our office.

Sincerely,

Kevin R. Bean, B.A.
PLM Laboratory Director

NVLAP®
TESTING
NVLAP LAB CODE 101895-0

SUMMARY OF PLM BULK ANALYSIS RESULTS

Project Name: Domingo Mora, Madera Unified School District - Millview Elementary School, Roofs: 1609 Clinton St; Madera, CA Project
McCall & Spero Environmental Project No. MSE-P963LEO.1

MSE # P963LEO.1	SAMPLE # DESCRIPTION	ASBESTOS TYPE & %	OTHER FIBROUS MATERIAL & %	% NON-FIBROUS MATERIAL	COLOR
001	01 Asphalt Shingle	ND	Cellulose / 10% Glass / 10%	80%	Gray
002	02 Tar Paper	ND	Cellulose / 10% Synthetics / 10%	80%	Black
003	03 Asphalt Shingle	ND	Cellulose / 10% Synthetics / 10%	80%	Gray
004	04 Asphalt Shingle	ND	Cellulose / 10% Glass / 10%	80%	Green
005	05 Tar Paper	ND	Cellulose / 10% Glass / 20%	80%	Black
006	06 Asphalt Shingle	ND	Cellulose / 10% Synthetics / 10%	80%	Gray
007	07 Sealant	ND	Cellulose / 5%	95%	White
008	08 Roof Core	ND	Cellulose / 20% Glass / 20%	80%	Black
009	09 Roof Mastic	ND	Cellulose / 5%	95%	Black
010	10 Asphalt Shingle	ND	Cellulose / 10% Synthetics / 10%	80%	Gray
011	11 Tar Paper	ND	Cellulose / 10% Glass / 20%	80%	Black
012	12 Roof Mastic	ND	Cellulose / 5%	95%	Black
013	13 Sealant	ND	Cellulose / 5%	95%	Tan
014	14 Rolled Roofing	ND	Cellulose / 10% Glass / 10%	80%	Gray/Black

SUMMARY OF PLM BULK ANALYSIS RESULTS

MSE # P963LEO.1	SAMPLE # DESCRIPTION	ASBESTOS TYPE & %	OTHER FIBROUS MATERIAL & %	% NON-FIBROUS MATERIAL	COLOR
015	15 Tar Paper	ND	Cellulose / 10% Synthetics / 10%	80%	Black
016	16 Roof Mastic	CH / 3%	Cellulose / 5%	92%	Black
017 (A)	17 (A) Roof Core	ND	Cellulose / 10% Glass / 10%	80%	Black
017 (B)	17 (B) Insulation	ND	Cellulose / 10% Glass / 70%	20%	Brown
018 (A)	18 (A) Roof Core	ND	Cellulose / 10% Glass / 10%	80%	Black
018 (B)	18 (B) Insulation	ND	Cellulose / 10% Glass / 70%	20%	Brown
019	19 Rolled Roofing	ND	Cellulose / 10% Glass / 10%	80%	Gray
020	20 Tar Paper	ND	Cellulose / 10% Synthetics / 10%	80%	Black
021	21 Roof Mastic	ND	Cellulose / 5%	95%	Black
022	22 Asphalt Shingle	ND	Cellulose / 10% Glass / 10%	80%	Gray
023	23 Tar Paper	ND	Cellulose / 10% Synthetics / 10%	80%	Black
024	24 Rolled Roofing	ND	Cellulose / 10% Glass / 10%	80%	Black
025	25 Tar Paper	ND	Cellulose / 10% Synthetics / 10%	80%	Black
026	26 Roof Mastic	CH / 3%	Cellulose / 5%	92%	Black
027	27 Sealant	ND	Cellulose / 5%	95%	Gray

SUMMARY OF PLM BULK ANALYSIS RESULTS

MSE # P963LEO.1	SAMPLE # DESCRIPTION	ASBESTOS TYPE & %	OTHER FIBROUS MATERIAL & %	% NON-FIBROUS MATERIAL	COLOR
028 (A)	28 (A) Roof Core	ND	Cellulose / 10% Glass / 10%	80%	Black
028 (B)	28 (B) Insulation	ND	Cellulose / 10% Glass / 70%	20%	Brown
029	29 Roof Mastic	CH / 2%	Cellulose / 5%	93%	Black
030	30 Sealant	ND	Cellulose / 5%	95%	Clear
031	31 Sealant	ND	Cellulose / 5%	95%	White

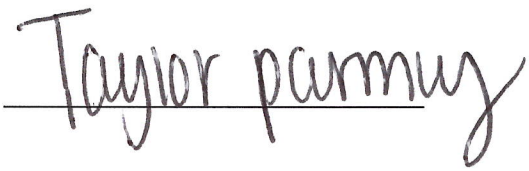
NOTES:

ND = None Detected CH = Chrysotile A = Amosite AC = Actinolite
CR = Crocidolite AN = Anthophyllite TR = Tremolite

For samples consisting of separate components, each component is analyzed and reported separately.

Results apply only to items tested. Quantification is accurate to within ± 10%. Results from this report must not be reproduced, except in full, with the approval of McCall & Spero Environmental, Inc. This report must not be used to claim product endorsement by NVLAP or any agency of the U.S. Government.

** EPA recommends that bulk materials found negative for asbestos or less than one percent asbestos by polarized light microscopy that fall into one of five dominantly nonfriable categories be reanalyzed by an additional method, such as transmission electron microscopy. (EPA Notice of Advisory, FR Vol. 59, No. 146 & Test Method EPA 600/ R-93/ 116).

Analyst: Taylor B. Parmly 

McCall & Spero Environmental, Inc.

Leon Environmental Services

4545 N. Brawley Ave., Suite 104, Fresno, CA 93722 Phone: 559.274.9200 Fax: 559.274.9240 Email: LeonEnviro@comcast.net

Customer: Domingo Mora | Company: Madera Unified School District

Date: September 5, 2023 | Job No.: B192-23

Analysis: (PLM) | Turn Around: Rush | Same Day | Next Day | (2-3 Day) | 4-5 days

Inspection Site : Millview Elementary School - Roofs, 1609 Clinton St, Madera, CA

Sample No	Location	Material			Quantity
		Color	Type	Friable	
	Roof A				
01	Roof	Light Grey	Asphalt Shingle		
02	Roof		Tar Paper		
	Roof B				
03	Roof - Top Layer	Light Grey	Asphalt Shingle		
04	Roof - Bottom Layer	Green	Asphalt Shingle		
05	Roof - Bottom Layer		Tar Paper		
06	Roof Patch	Dark Grey	Asphalt Shingle		
07	Roof - Vent	White	Sealant		
	Roof C				
08	Roof		Roof Core		
09	AC Unit	Black	Roof Mastic		
	Roof F				
10	Roof	Grey	Asphalt Shingle		
11	Roof		Tar Paper		
12	AC Unit	Black	Roof Mastic		
13	AC Duct		Sealant		

Relinquished By: [signature] Date: 9-5-23

Received By: TBP Date: 916123

Leon Environmental Services

4545 N. Brawley Ave., Suite 104, Fresno, CA 93722 Phone: 559.274.9200 Fax: 559.274.9240 Email: LeonEnviro@comcast.net

Customer: Domingo Mora **Company** Madera Unified School District

Date: September 5, 2023 **Job No.** B192-23

Analysis (PLM) **Turn Around:** Rush Same Day Next Day (2-3 Day) 4-5 days

Inspection Site : Millview Elementary School - Roofs, 1609 Clinton St, Madera, CA

Sample No	Location	Material			Quantity
		Color	Type	Friable	
	Roof I				
14	Roof	Light Grey	Rolled Roofing		
15	Roof		Tar Paper		
16	AC Duct	Black	Roof Mastic		
	Roof J1				
17	Roof		Roof Core		
	Roof		Insulation		
	Roof J2				
18	Roof		Roof Core		
	Roof		Insulation		
	Roof K				
19	Roof	Light Grey	Rolled Roofing		
20	Roof		Tar Paper		
21	Roof Vent	Black	Roof Mastic		
	Roof L				
22	Roof - Top Layer	Light Grey	Asphalt Shingle		

Relinquished By N. Gin Date 9-5-23

Received By TBP Date 916123

Leon Environmental Services

4545 N. Brawley Ave., Suite 104, Fresno, CA 93722 Phone: 559.274.9200 Fax: 559.274.9240 Email: LeonEnviro@comcast.net

Customer: Domingo Mora | Company: Madera Unified School District

Date: September 5, 2023 | Job No.: B192-23

Analysis: (PLM) | Turn Around: Rush | Same Day | Next Day | (2-3 Day) | 4-5 days

Inspection Site : Millview Elementary School - Roofs, 1609 Clinton St, Madera, CA

Sample No	Location	Material			Quantity
		Color	Type	Friable	
23	Roof - Top Layer		Tar Paper		
24	Roof - Bottom Layer	Light Grey	Roofing Material		
25	Roof - Bottom Layer		Tar Paper		
26	AC Unit	Black	Roof Mastic		
27	AC Duct	White	Sealant		
	Roof M				
28	Roof		Roof Core		
	Roof		Insulation		
29	Roof Jack	Grey/ Black	Roof Mastic		
30	AC Unit	Clear	Sealant		
31	AC Unit	White	Sealant		

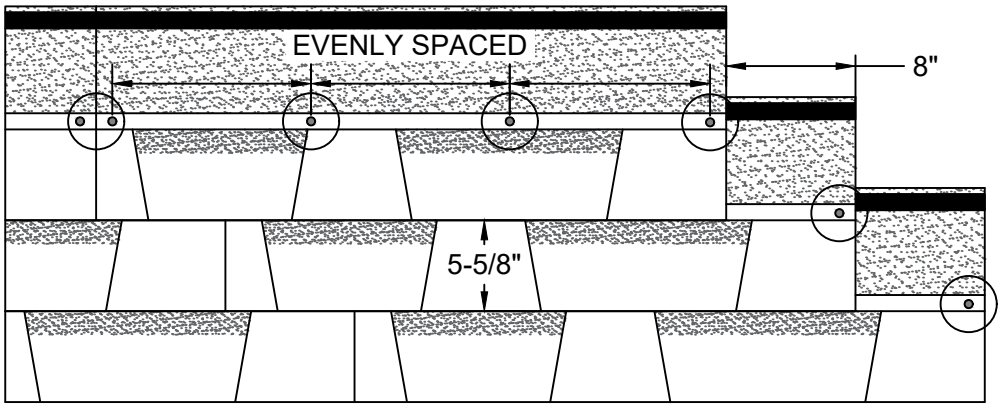
Relinquished By: N. Sig | Date: 9-5-23

Received By: TBP | Date: 916123

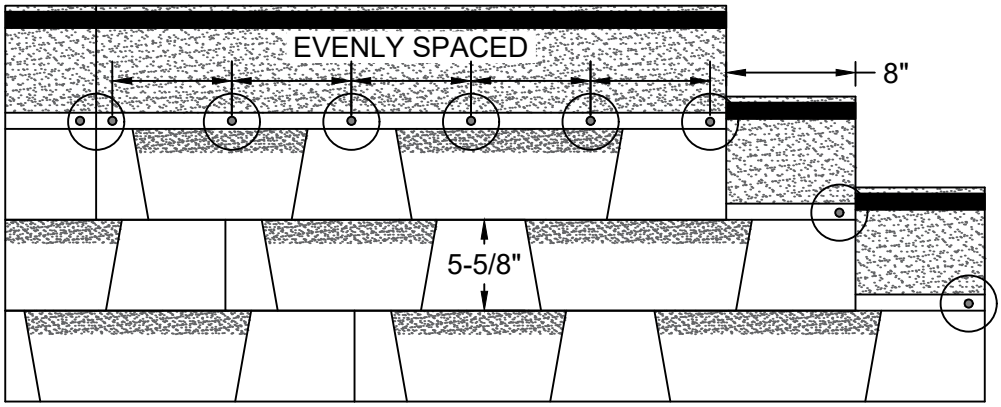
Bid No..020624-Bid Section #1-Millview

LAMINATE NAILING PATTERNS

4 NAIL

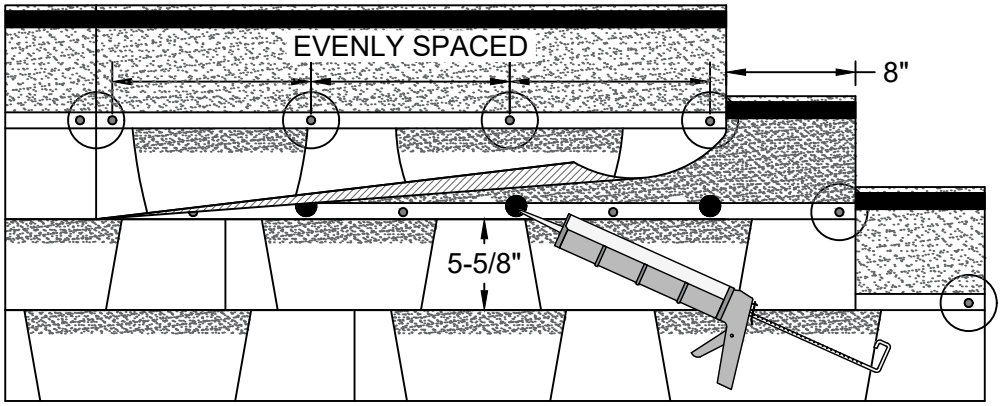


6 NAIL



-IN BOTH PATTERNS, FASTENERS SHOULD BE PLACED IN THE NAILING AREA AND END FASTENERS SET APPROX. 1" FROM EACH EDGE OF THE SHINGLE. THE REMAINING FASTENERS SHOULD BE EVENLY SPACED ON THE SAME LINE AS THE END FASTENERS.

HAND-SEALING LAMINATE SHINGLES

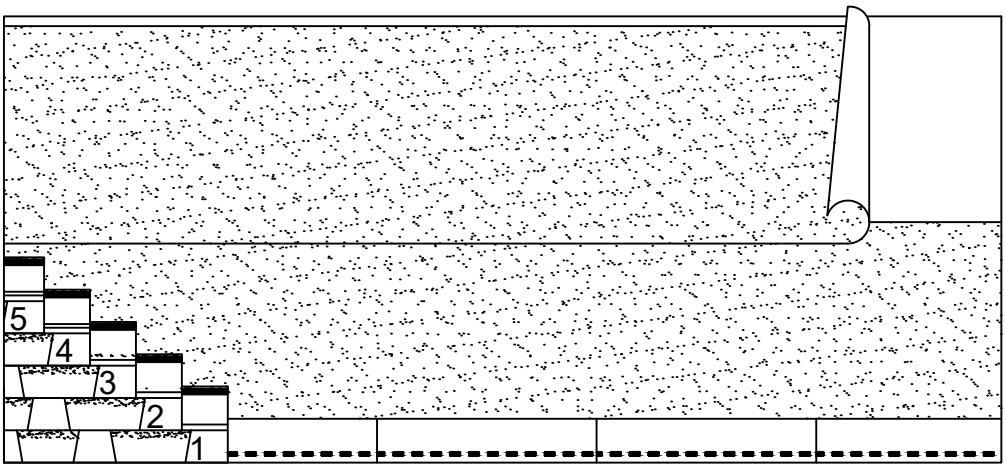


STEEP SLOPE 6

Malarkey Roofing Products® Defining Excellence.™	PROJECT NAME:	DATE:
		SCALE: NOT TO SCALE
		PROJECT NO:
	ADDRESS:	DRAWING NO. :
Rev. 8/20	OWNER:	SUBMITTAL NO. :

Bid No.020624-Bid
Section #1-Millview

LAMINATE LAYOUT PATTERN

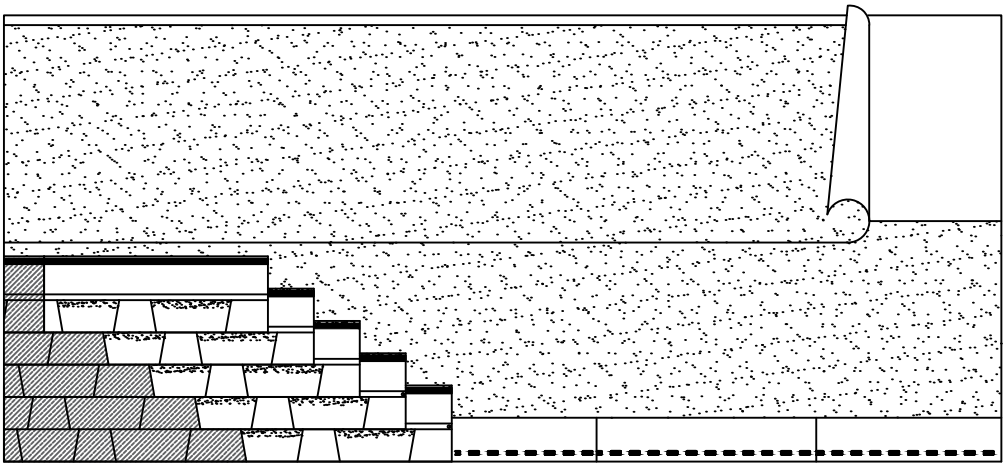


STEP 1

COURSES 1-5

1: FULL LENGTH
2-5: EACH PROGRESSIVELY 8" SHORTER (MIN 4")

*LOOSELY BUTT FACTORY EDGE TO FACTORY EDGE WHEN INSTALLING THE STAIRSTEP METHOD.

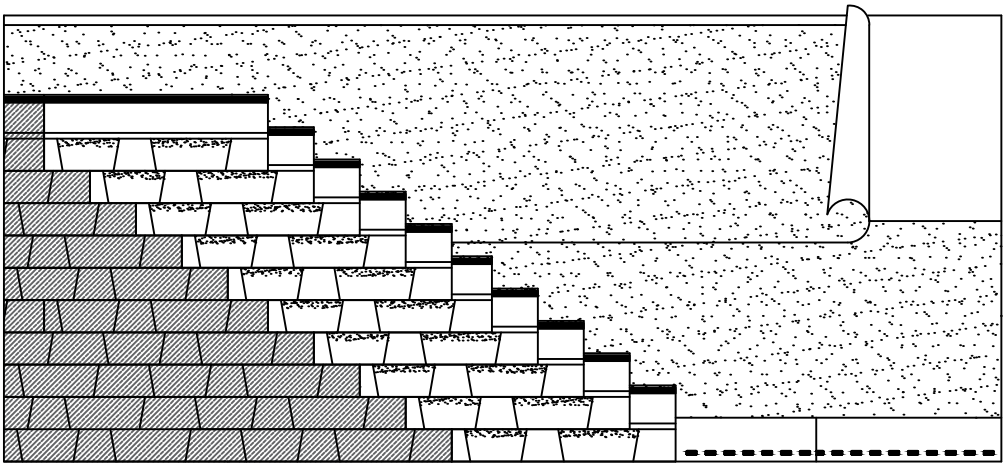


STEP 2

COURSES 1-5

*APPLY A FULL SHINGLE ADJACENT TO EACH OF THE FIRST FIVE COURSES TO EXTEND THE PATTERN.

*LOOSELY BUTT FACTORY EDGE TO FACTORY EDGE WHEN INSTALLING THE STAIRSTEP METHOD.



STEP 3

REMAINING COURSES

*REPEAT THE PROCESS AT COURSE 6 BEGINNING WITH A FULL SHINGLE AND CONTINUE SUCCEEDING COURSES ON UP THE ROOF.

*LOOSELY BUTT FACTORY EDGE TO FACTORY EDGE WHEN INSTALLING THE STAIRSTEP METHOD.

STEEP SLOPE 9

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Rev. 8/20

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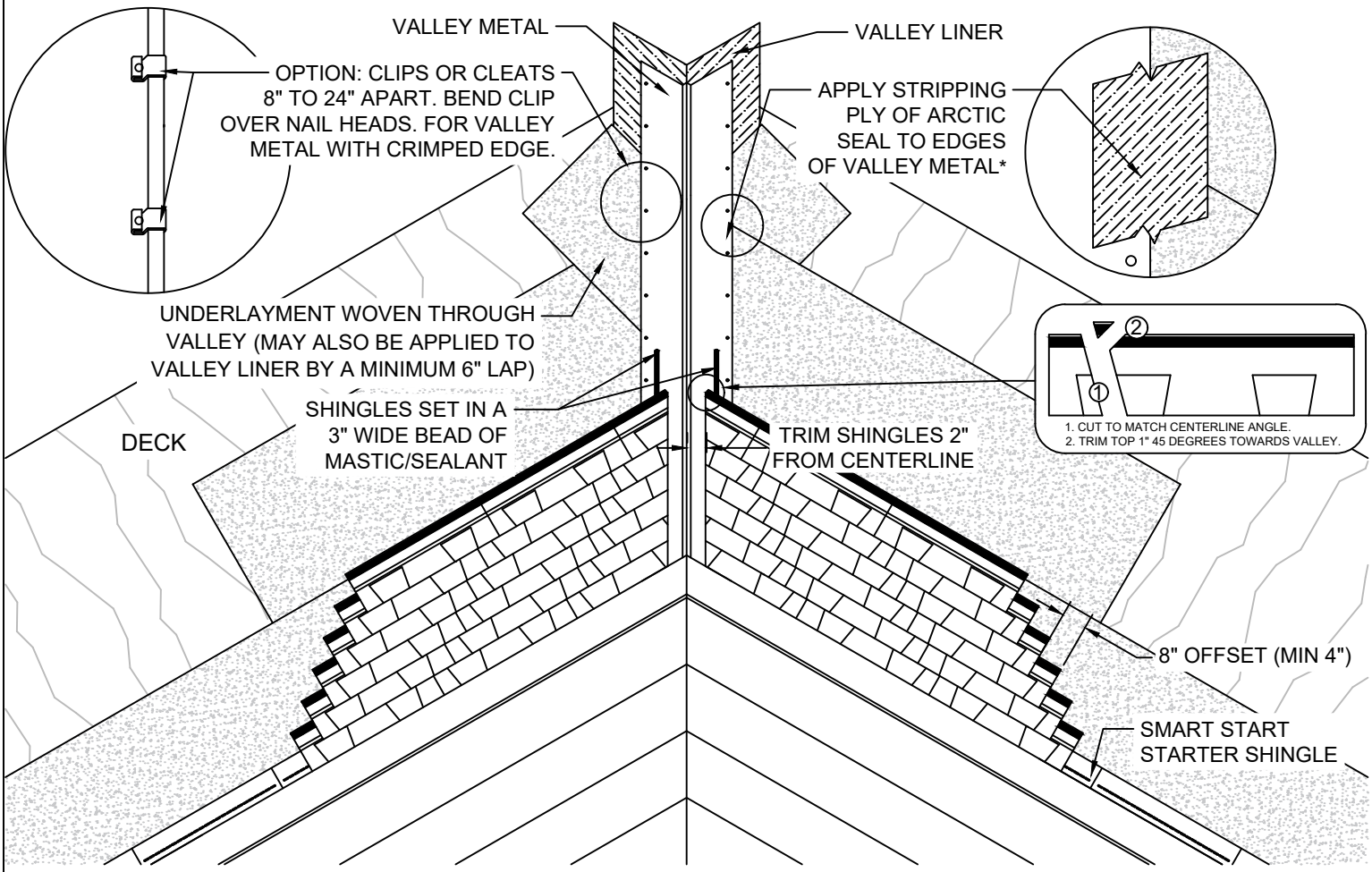
Bid No.020624-Bid
Section #1-Millview

LAMINATE METAL "W" VALLEY



NOTES:
- VALLEY METAL FLASHING USED WITH MALARKEY SHINGLES MUST BE MINIMUM 24" WIDE AND 26 GAUGE.
- SECURE VALLEY METAL WITH FASTENERS NO MORE THAN 1" FROM THE OUTSIDE EDGES AND SPACED 10"-12" ON CENTER.
- SET OVERLAPPING ENDS OF VALLEY METAL IN A UNIFORM LAYER OF SEALANT WITH A MINIMUM 4" LAP. DO NOT FASTEN THE LAP.
- NAIL SHINGLES NO CLOSER THAN 6" FROM VALLEY CENTERLINE.
*A CONTINUOUS, MINIMUM 6"-WIDE STRIP OF ARCTIC SEAL SHALL BE APPLIED TO BOTH EDGES OF THE VALLEY METAL FOR ADDITIONAL SEALING ON PROJECTS WITH MALARKEY NDL AND EMERALD PREMIUM WARRANTIES.

STEEP SLOPE 15

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		SCALE: NOT TO SCALE
		PROJECT NO:
	ADDRESS:	DRAWING NO. :
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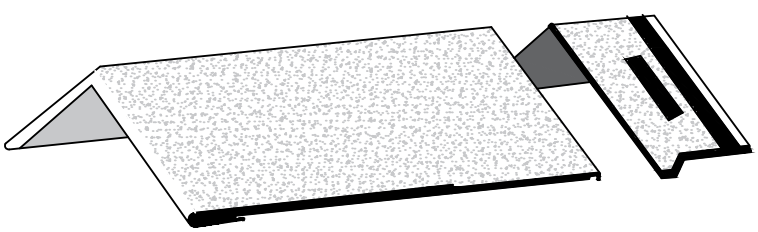
Bid No.020624-Bid
Section #1-Millview

EZ-RIDGE HIP AND RIDGE SHINGLES LAMINATE SHINGLE ROOF

EZ-RIDGE INSTALLATION - REMOVE RIDGE SHINGLES FROM CARTON AND PLACE ON ROOF RIDGE IN POSITION OVER INSTALLED FIELD SHINGLES. OVERLAP ALL RIDGES TO THE CUTOUT (ALWAYS MAINTAINING EXPOSURE OF HIP OR RIDGE AT 8 1/4"). PUSH DOWN ON CENTER OF SHINGLE AND NAIL TO FIT EXACT PITCH OF ROOF. THE ENTIRE SHINGLE SHOULD BE ALIGNED WITH THE UNDERLYING CUTOUT. BEGIN AT THE BOTTOM OF THE HIP OR AT THE RIDGE OPPOSITE THE DIRECTION OF PREVAILING WINDS. COMPLETE HIPS BEFORE RIDGES.

-TO ENSURE IMMEDIATE SEALING, MALARKEY RECOMMENDS EACH RIDGE SHINGLE BE SEALED DOWN UNDERNEATH WITH A QUARTER-SIZED SPOT OF SHINGLE TAB ADHESIVE ON EACH SIDE.

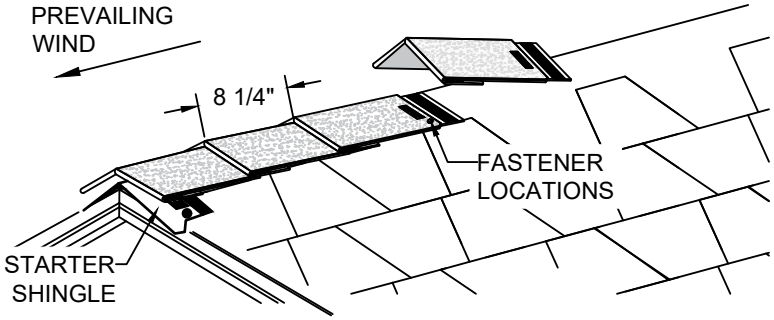
NOTE: AVOID EXCESSIVE USE OF ADHESIVE AS IT MAY CAUSE BLISTERING.



TO CREATE AN EZ-RIDGE STARTER, CUT OFF THE 8 ¼" EXPOSURE PORTION* OF AN EZ-RIDGE SHINGLE, AND USE THE 3 ¼" REMAINDER (WITH SEAL-DOWN STRIP) AS THE STARTER.

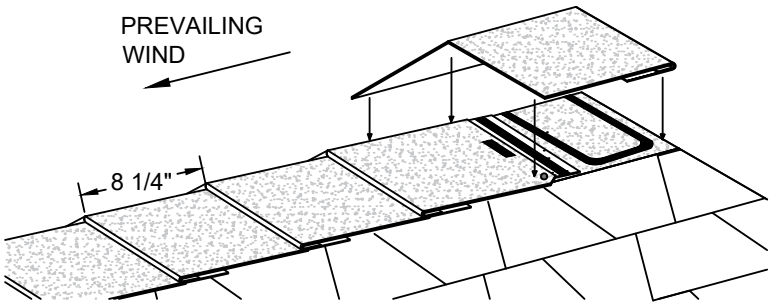
PLACE THE STARTER FLUSH TO THE RAKE AT THE PEAK, AND POSITION SO SEAL-DOWN STRIP IS NEAREST THE ROOF EDGE. FASTEN WITH TWO NAILS, ONE ON EACH SIDE, ¾" BEHIND THE CUTOUT AND ½" UP FROM THE EDGE.

*SAVE THE EXPOSURE PORTION FOR USE AS THE LAST SHINGLE ON THE OPPOSITE END OF THE RIDGE.



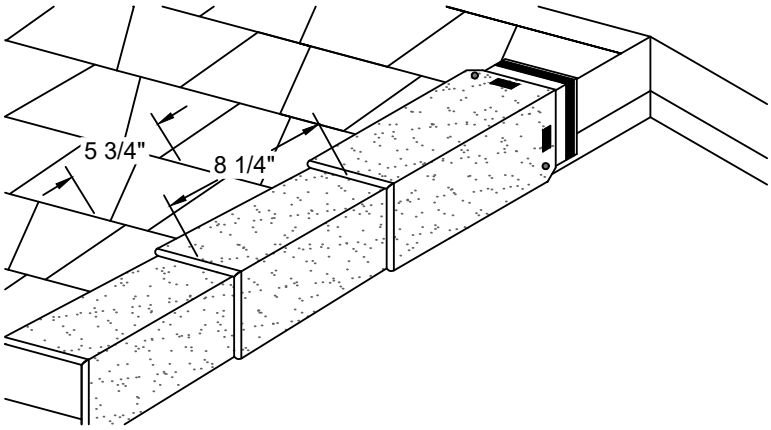
FIRST EZ-RIDGE SHINGLE COMPLETELY OVERLAPS STARTER. POSITION EACH EZ-RIDGE SHINGLE TO FOLLOW WITH AN 8 ¼" EXPOSURE BEFORE FASTENING.

SHINGLE FASTENING: INSTALL ONE NAIL ON EACH SIDE OF THE EZ-RIDGE SHINGLES, ¾" BEHIND THE CUTOUT, AND ½" UP FROM THE EDGE. USE ⅜" HEADED, NON CORROSIVE ROOFING NAILS, LONG ENOUGH TO PENETRATE ALL LAYERS AND FASTEN THE SHINGLE SECURELY TO THE ROOF DECK.



FOR THE LAST SHINGLE OF THE RUN, REMOVE THE CUTOUT END OF THE RIDGE SHINGLE AND TRIM TO FIT, MAINTAINING THE 8 ¼" EXPOSURE. SET THE SHINGLE IN MASTIC.

THE LAST SHINGLE OF THE RUN CAN ALSO BE FLIPPED AROUND TO PRESERVE THE HIGH-PROFILE APPEARANCE AT THE RAKE EDGE OF THE ROOF.



RAKE EDGE INSTALLATION: EZ-RIDGE SHINGLES CAN ALSO BE INSTALLED ON RAKE EDGES. INSTALL RAKE EDGE SHINGLES BEFORE RIDGE SHINGLES.

FOLLOW EZ-RIDGE INSTALLATION INSTRUCTIONS WITH THESE EXCEPTIONS: ALWAYS START AT THE LOW END OF THE ROOF, AND POSITION THE HIGH PROFILE, FINISHED END OF THE SHINGLES IN THE LOWEST POSITION.

INSTALLATION WITH EXPOSED NAILS MAY AFFECT THE AESTHETIC APPEAL OF EZ-RIDGE SHINGLES.

STEEP SLOPE 22B

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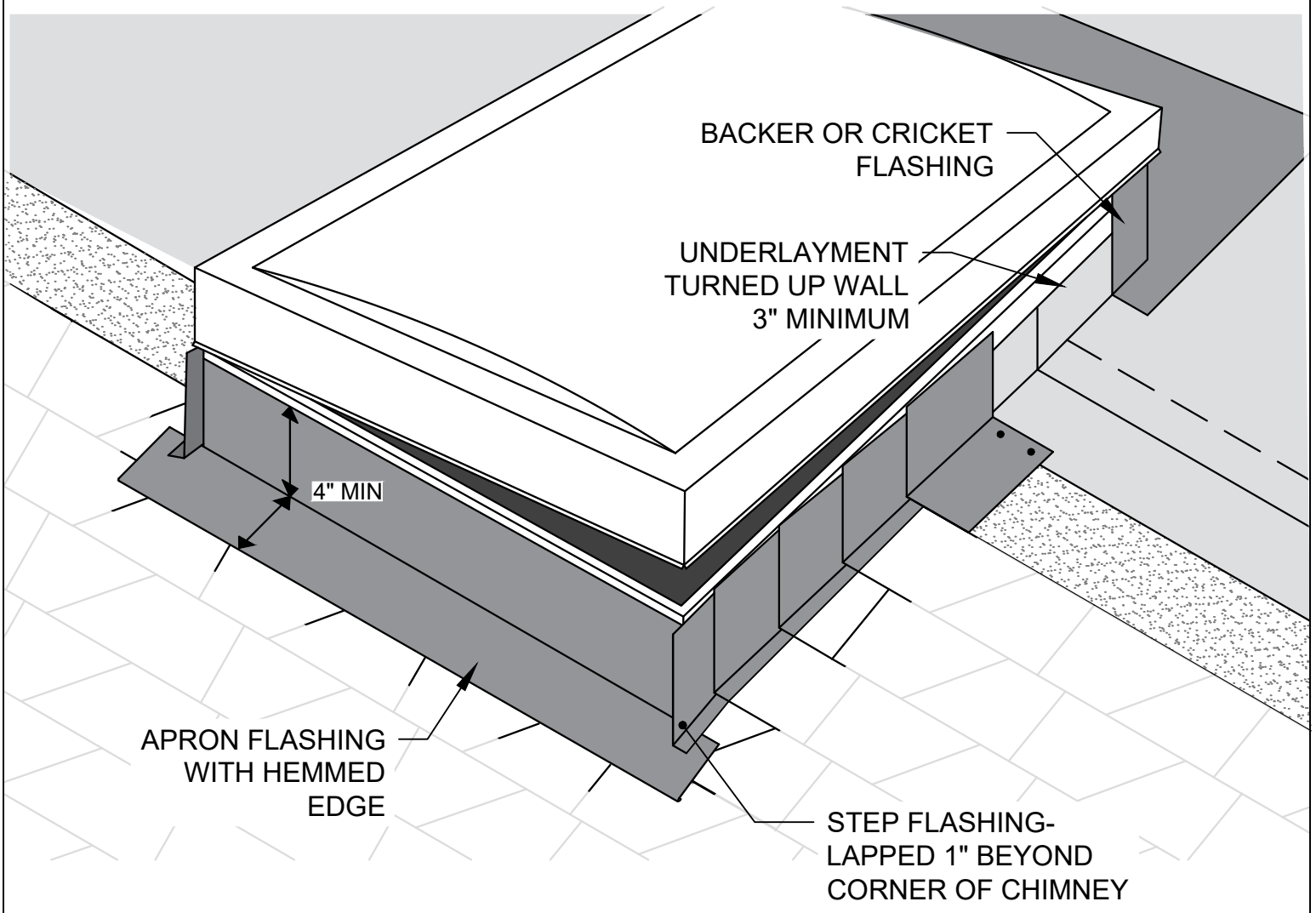
SKYLIGHT FLASHING



NOTES:
-ALL FLASHING TO BE MINIMUM 26 GAUGE.
-STEP FLASHING TO BE INTEGRATED WITH EACH COURSE OF SHINGLES.
-MAINTAIN A 1/4" - 3/4" GAP BETWEEN THE SHINGLES AND VERTICAL BEND OF METAL STEP FLASHINGS.
-WHEN CLOSED, THE SKYLIGHT SASH SHOULD COUNTER-FLASH THE APRON AND STEP FLASHINGS.

STEEP SLOPE 29

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		SCALE: NOT TO SCALE
		PROJECT NO:
	ADDRESS:	DRAWING NO. :
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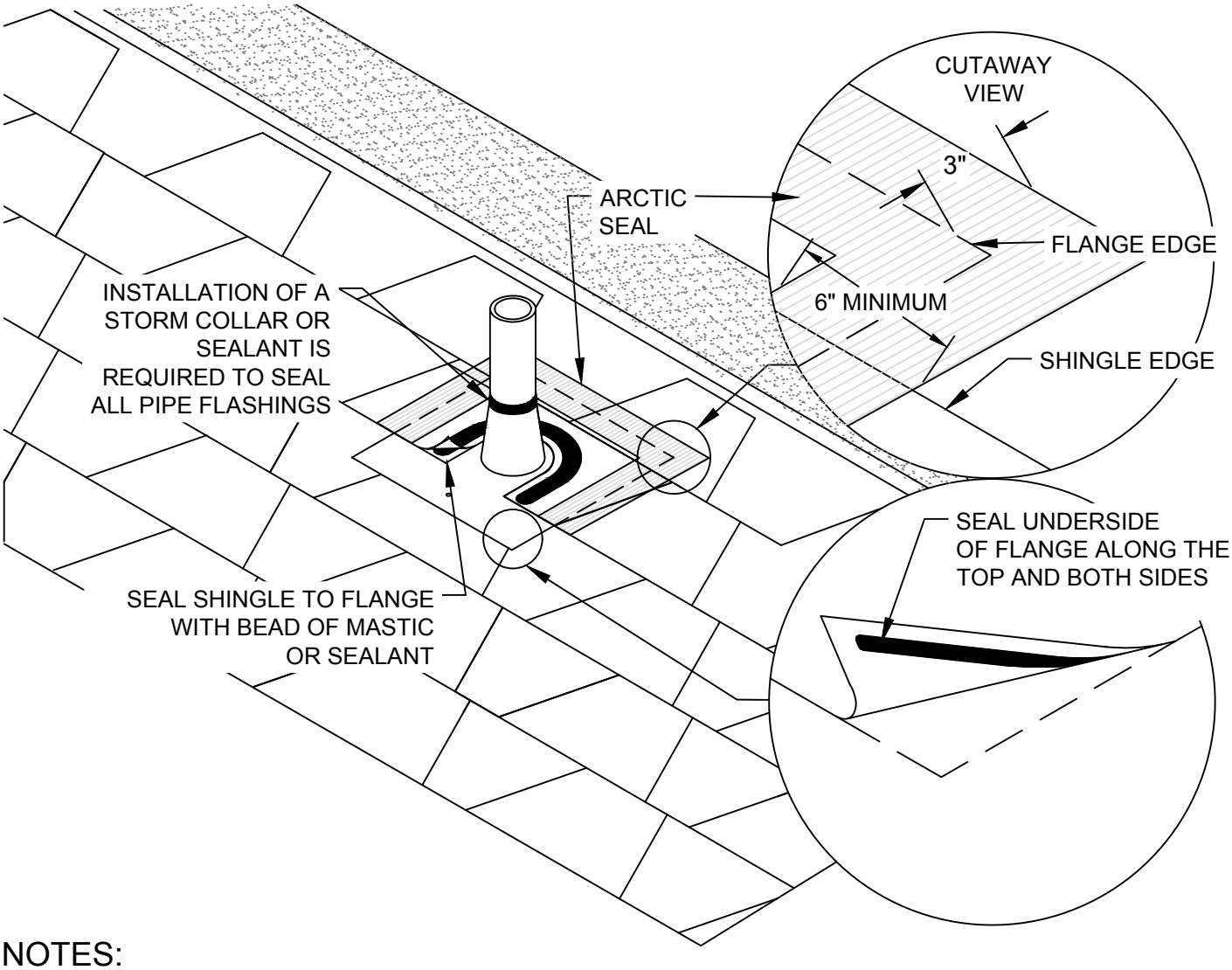
Bid No.020624-Bid Section #1-Millview

PIPE FLASHING
LAMINATE SHINGLE ROOF



NOTES:

-FOR ADDITIONAL PROTECTION ON SLOPES 2" - 4" MALARKEY RECOMMENDS THE UNEXPOSED FLANGES OF ALL VENT AND PIPE FLASHINGS BE STRIPPED-OFF (MINIMUM 6" WIDE) WITH ARCTIC SEAL SELF-ADHERING UNDERLAYMENT COVERING ALL FASTENERS USED TO SECURE THE FLASHINGS AND TYING ONTO THE FIELD UNDERLAYMENT A MINIMUM OF 3".

-SHINGLES ON TOP OF THE STRIPPING OF ARCTIC SEAL SHOULD BE SEALED DOWN WITH A BEAD OF MASTIC/SEALANT (UNEXPOSED/UNDER THE SHINGLES).

STEEP SLOPE 18B

Malarkey Roofing Products® Defining Excellence.™	PROJECT NAME:	DATE:
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		PROJECT NO:
	ADDRESS:	DRAWING NO. :
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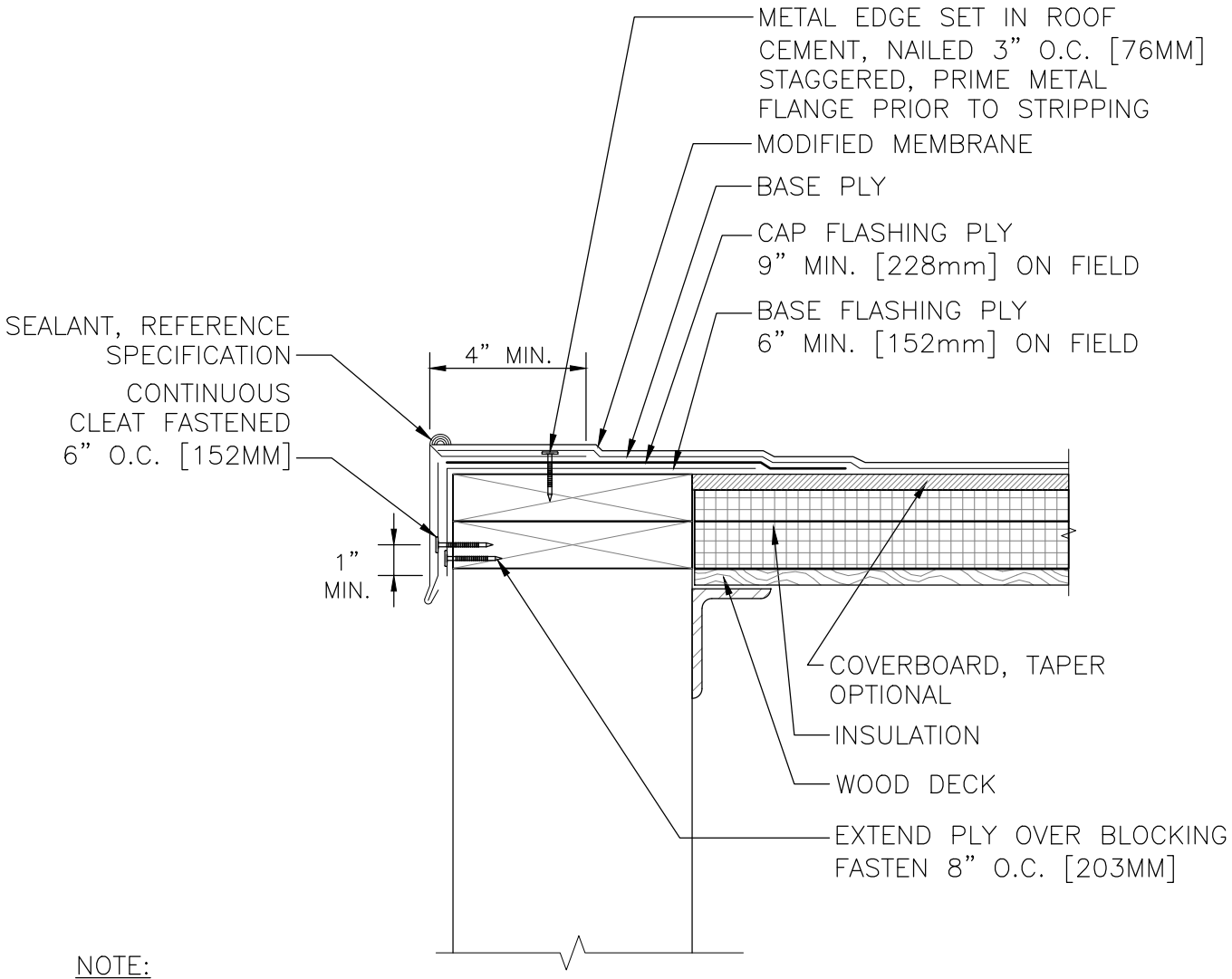


NOTE:
REFERENCE SPECIFICATION FOR SURFACING, MEMBRANE ADHESIVE TYPE, AND INSULATION/COVER BOARD TYPE AND ATTACHMENT METHOD.

DRAWINGS ON 8$\frac{1}{2}$"x11 TITLE BLOCKS ARE NOT TO SCALE.

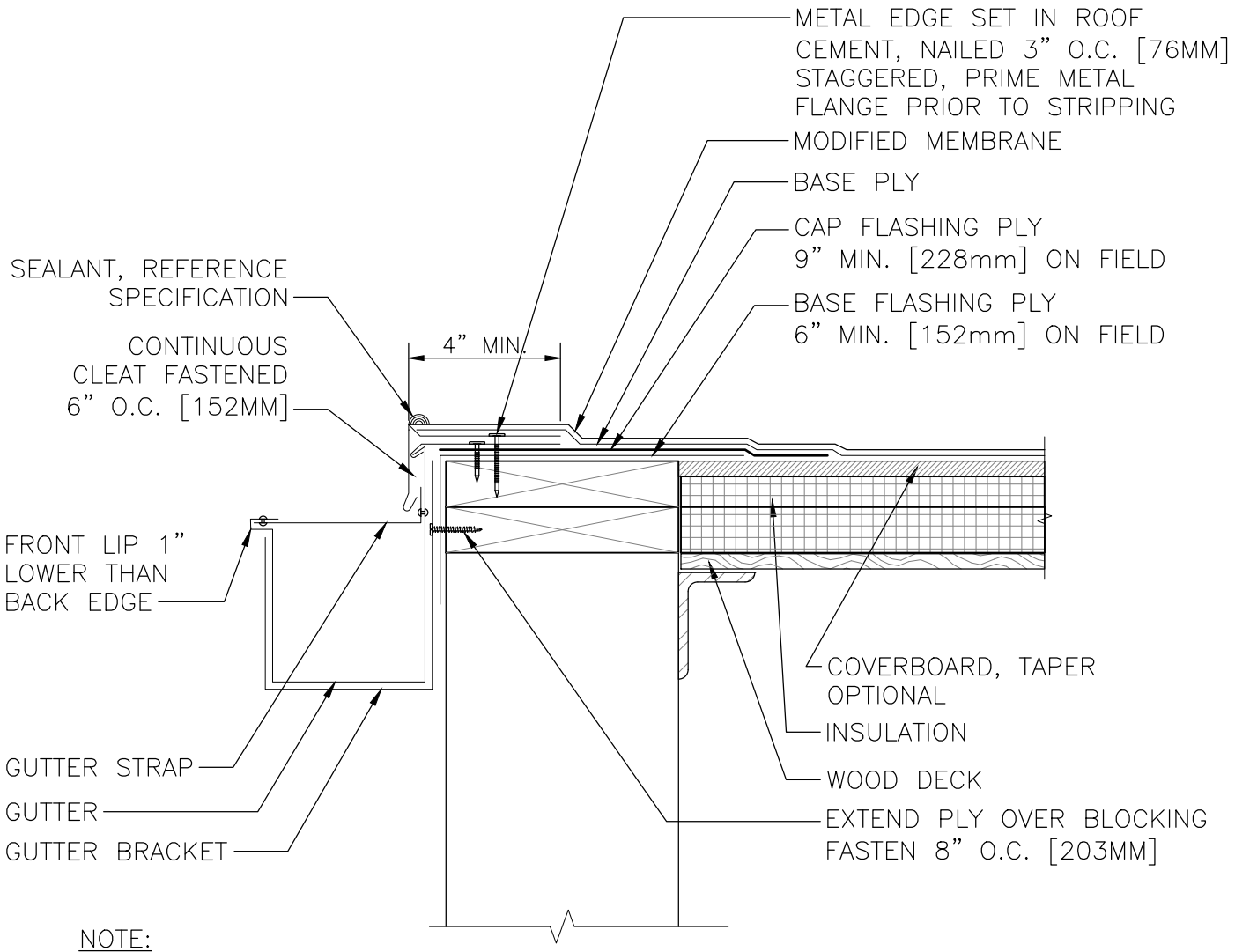
METAL EDGE - DRIP EDGE (ALTERNATE)

GARLAND since 1895

THE GARLAND COMPANY, INC.
GARLAND CANADA, INC.
THE GARLAND COMPANY UK, LTD

PROJECT:	
CUSTOMER:	
ARCHITECT:	
REPRESENTATIVE:	
DATE:	SHT: OF

Bid No.020624-Bid Section
#1-Millview



NOTE:
REFERENCE SPECIFICATION FOR SURFACING, MEMBRANE ADHESIVE TYPE, AND INSULATION/COVER BOARD TYPE AND ATTACHMENT METHOD.

DRAWINGS ON 8½"x11 TITLE BLOCKS ARE NOT TO SCALE.

METAL EDGE - DRIP EDGE WITH GUTTER (ALTERNATE)

GARLAND
since 1895

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THE GARLAND COMPANY UK, LTD

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REPRESENTATIVE:	
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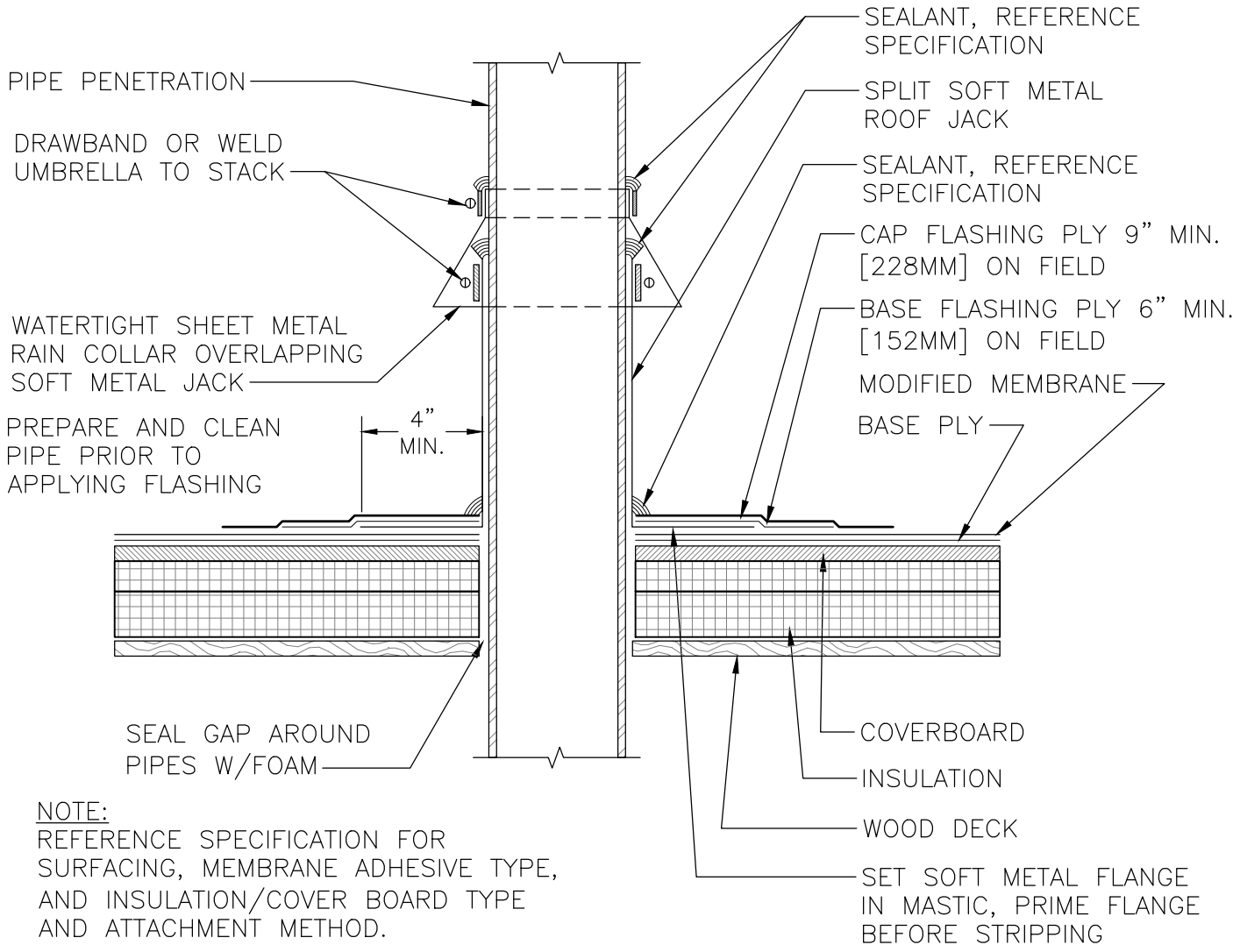
Bid No.020624-Bid Section #1-Millview



NOTE:
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DRAWINGS ON $8\frac{1}{2}$"x11 TITLE BLOCKS ARE NOT TO SCALE.

PIPE/TUBE PENETRATION - SPLIT JACK w/COLLAR

GARLAND
since 1895

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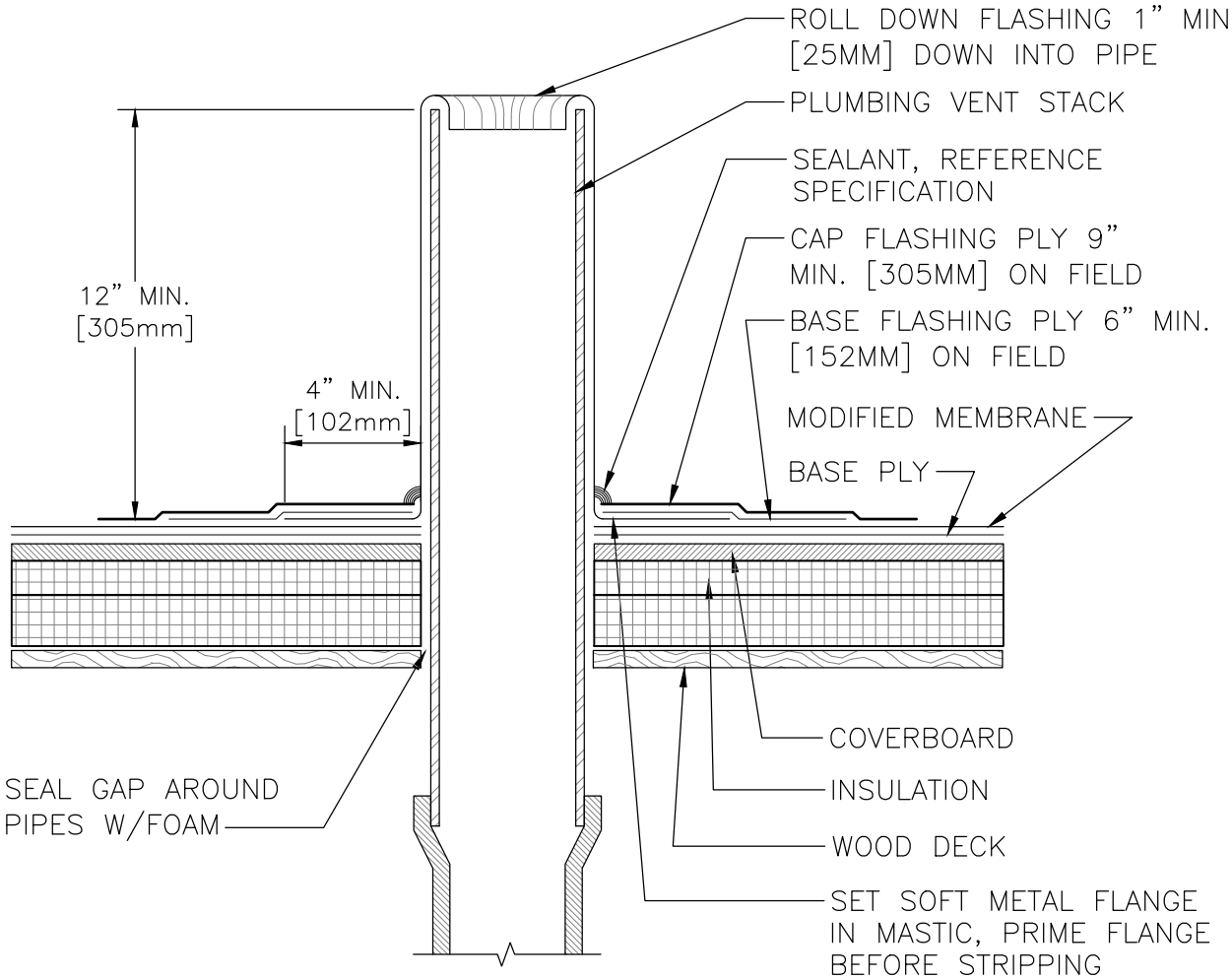
Millview



NOTE:
REFERENCE SPECIFICATION FOR SURFACING, MEMBRANE ADHESIVE TYPE, AND INSULATION/COVER BOARD TYPE AND ATTACHMENT METHOD.

DRAWINGS ON 8½"x11 TITLE BLOCKS ARE NOT TO SCALE.

PLUMBING STACK

since 1895

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THE GARLAND COMPANY UK, LTD

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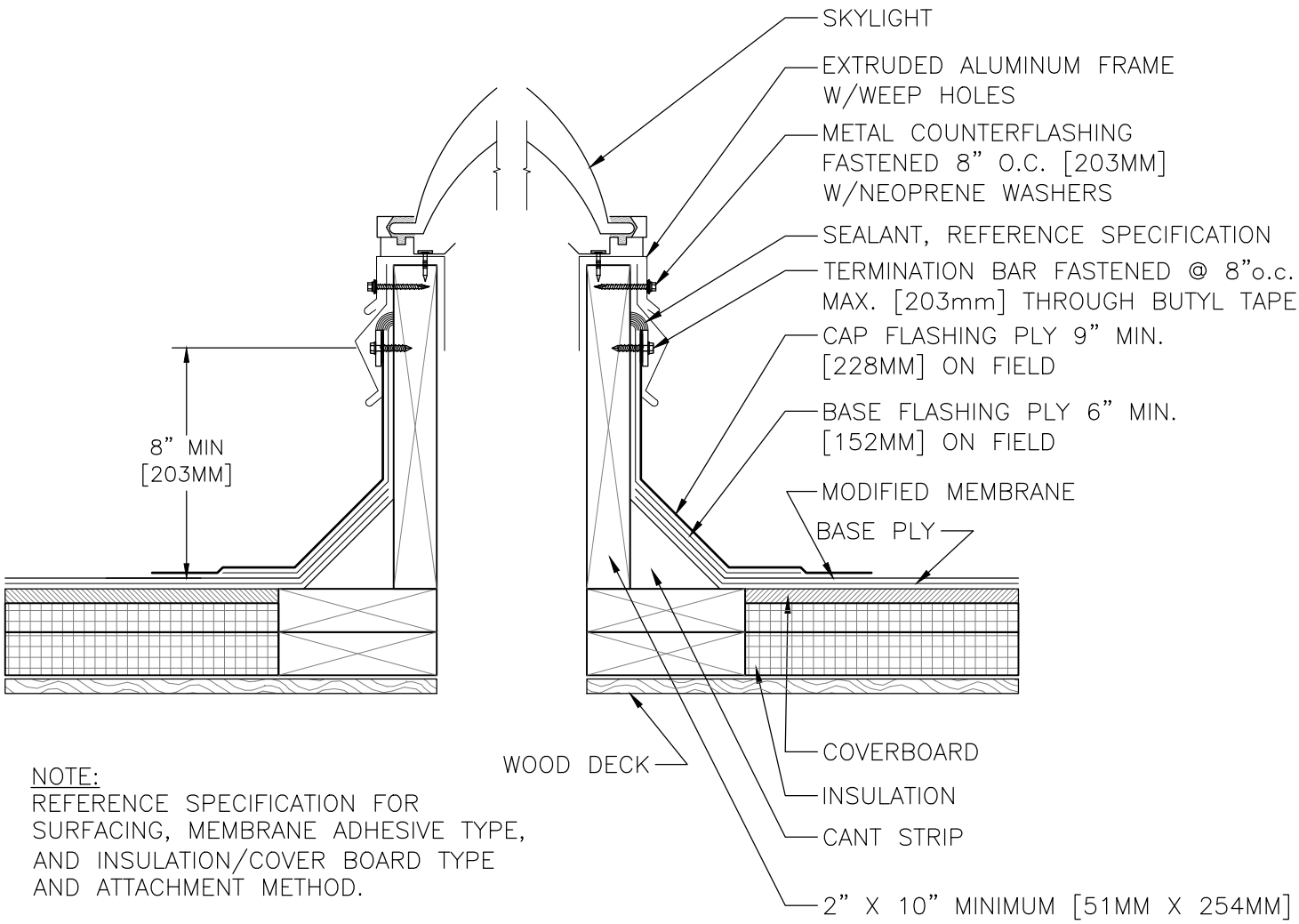
Bid No.020624-Bid Section #1-
Millview



NOTE:
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DRAWINGS ON 8$\frac{1}{2}$"x11 TITLE BLOCKS ARE NOT TO SCALE.

SKYLIGHT

GARLAND
since 1895

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THE GARLAND COMPANY UK, LTD

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REPRESENTATIVE:	
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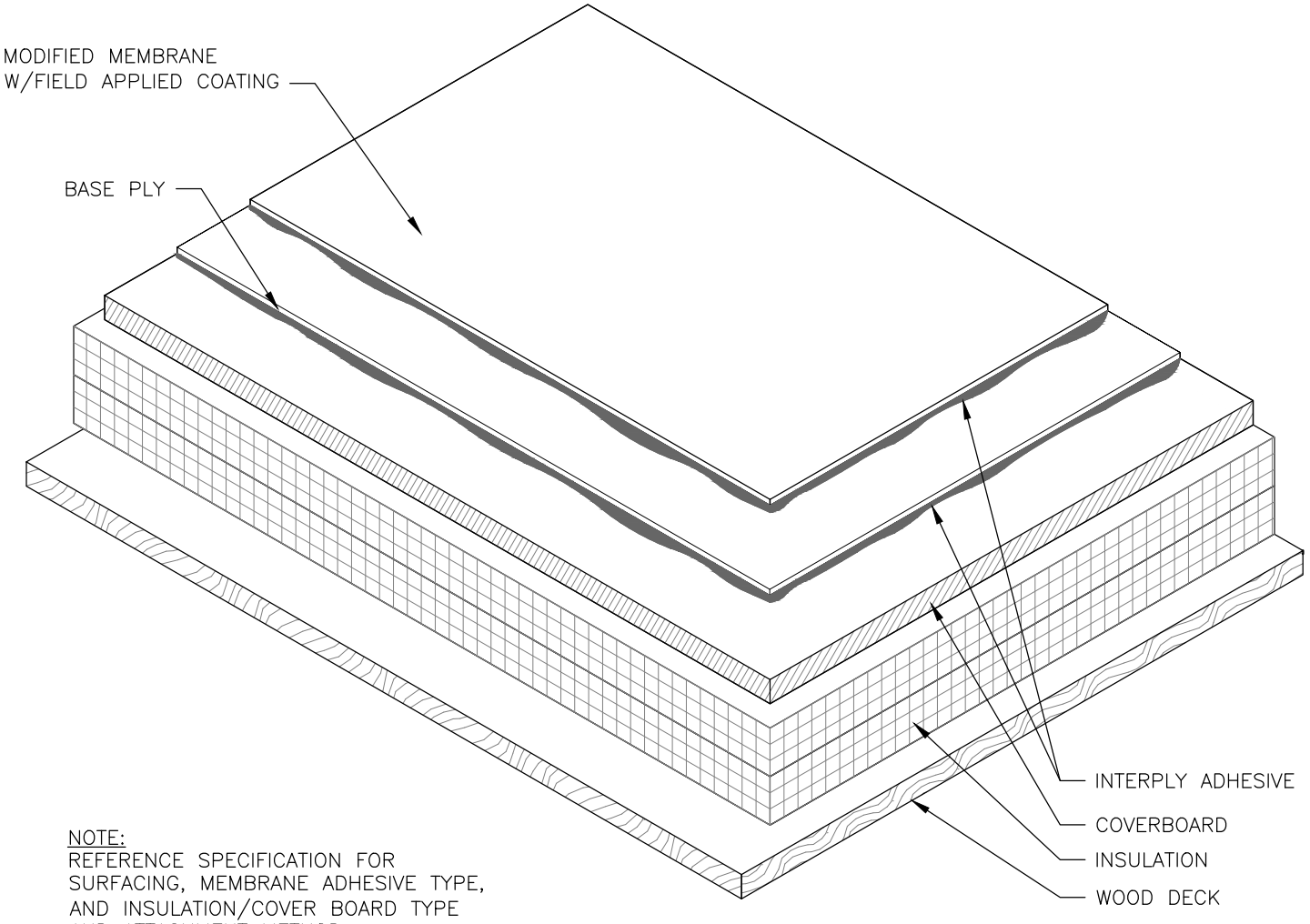

NOTE:
REFERENCE SPECIFICATION FOR SURFACING, MEMBRANE ADHESIVE TYPE, AND INSULATION/COVER BOARD TYPE AND ATTACHMENT METHOD.

DRAWINGS ON 8½"x11 TITLE BLOCKS ARE NOT TO SCALE.

TYPICAL ROOF SYSTEM - COATED SURFACE

since 1895

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THE GARLAND COMPANY UK, LTD

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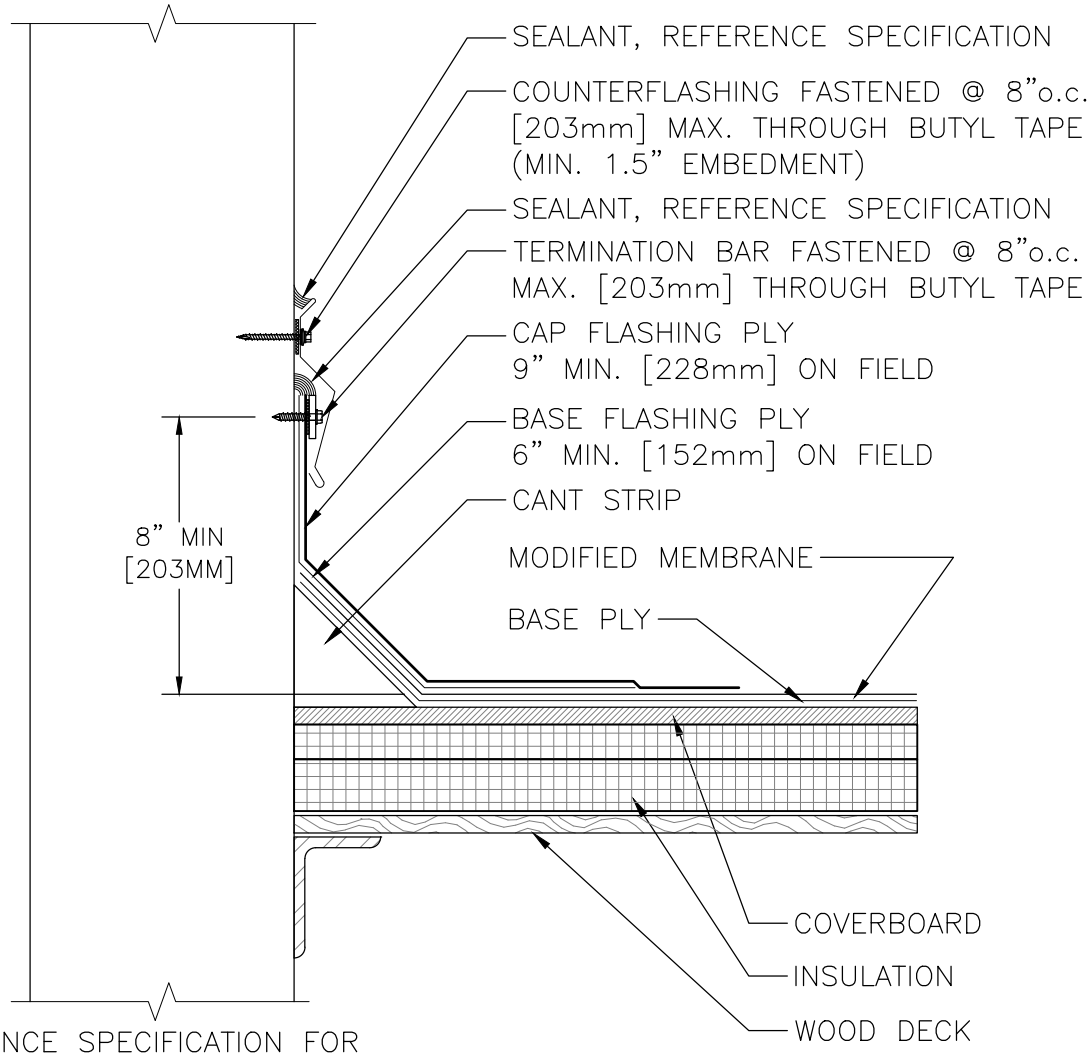
Bid No.020624-Bid Section #1-Millview



NOTE:
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DRAWINGS ON 8$\frac{1}{2}$"x11 TITLE BLOCKS ARE NOT TO SCALE.

WALL FLASHING - SURFACE MOUNTED COUNTERFLASHING

GARLAND since 1895

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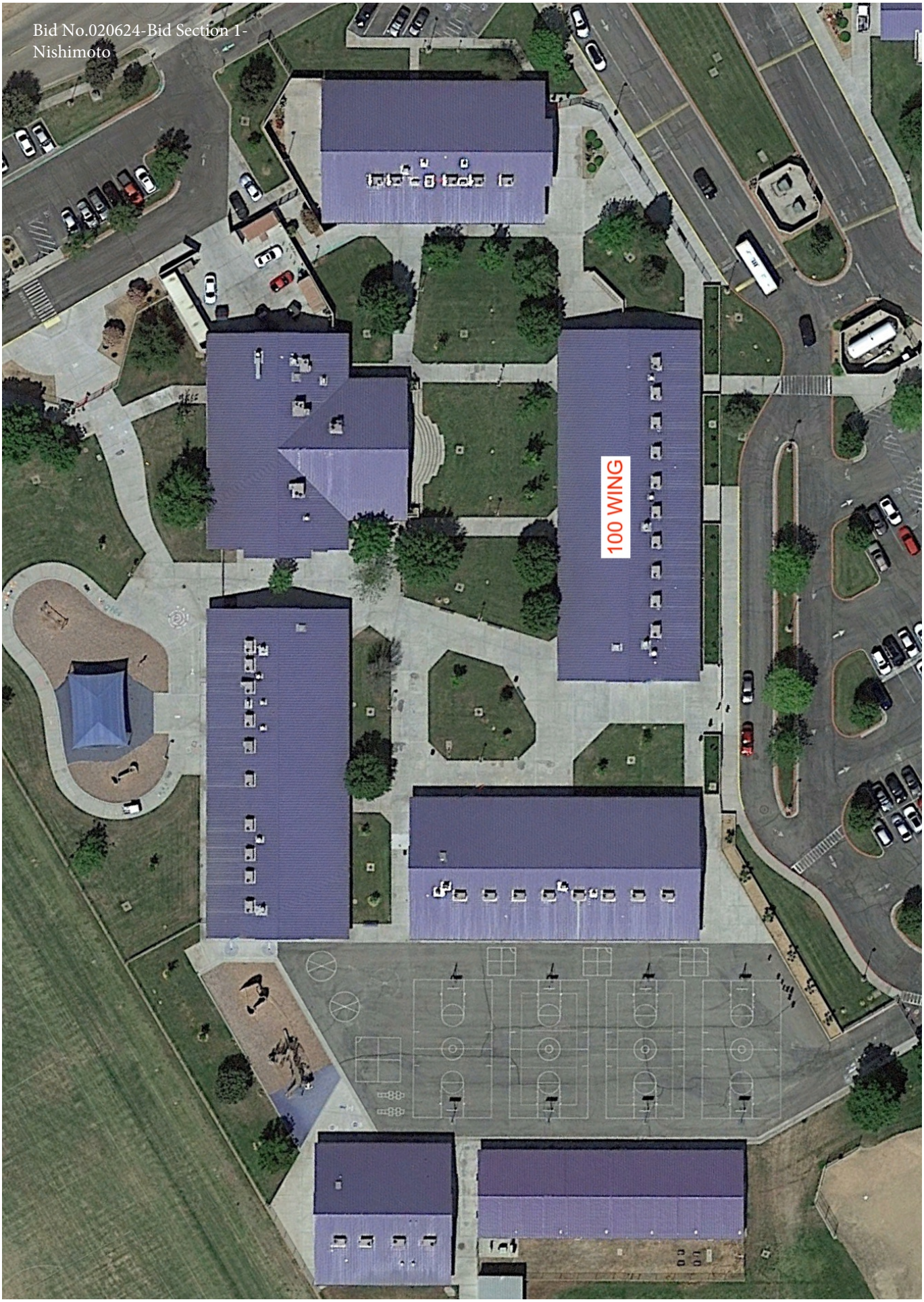
Bid No.020624-Bid Section 1-
Nishimoto



SECTION 01110

SUMMARY OF WORK

PART 1 — GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section includes removal and disposal of the existing roofing systems, coping, insulation, flashings, and all construction related debris. Installation of a new standing seam metal roofing system as specified with all applicable details for a complete watertight warrantied roofing assembly per the manufacturers instructions.

B. Related Work Specified Elsewhere:

1. Section 01 - Submittals

2. Section 07 - Standing Seam Metal Roofing

3. Section 07: Sheet Metal Flashing and Trim

1.3 WORK COVERED BY CONTRACT DOCUMENTS

A. Project Identification: Nishimoto Elementary School Roof Repair Project

B. Project Locations: Nishimoto Elementary School 26460 Martin Street Madera, CA 93638

C. Owner: Madera Unified School District 1205 S. Madera Ave. Madera, CA 93638

D. General scope of work but not limited to;

1. Roof Areas 1100 Wing, 1200 Wing, 1300 Wing, 1500 Wing, Office, & Cafeteria:

2. Includes removal and disposal of existing fasteners and sealants at all roof penetrations including roof curbs, pipe penetrations, roof hatch, and vent flashings.

3. Clean all existing metal flashings with a solvent based cleaner and allow to properly dry.

4. Install new Garland Butyl Tape at all locations.

5. Install new Garland Butyl Caulk sealant at all locations where tape can not be used

6. Install a new rubber grommeted fastener at all existing locations and as needed to create firm contact of all metal flashings.

7. Install new decktite pipe boots at all locations.

8. All materials needed for this project are to be part of the contractors bid and will not be owner supplied.

1.4 WORK COMPLETED BY THE DISTRICT

A. No work will be completed by the district.

1.5 TYPE OF CONTRACT

A. Work will be completed under a single prime contract.

1.6 USE OF PREMISES

A. General: Contractor will have limited use of premises for construction operations.

B. Use of site: Limit use of premises to work areas required. Do not disturb portions of the project site beyond areas in which the work is indicated.

C. The building interior is off limits to the contractor. All access shall be from the exterior.

D. The point of exterior access must be approved by the owner.

E. Entrances: Keep all entrances serving the building clear and available to the owner, owner's employees, and emergency vehicles.

F. Use of existing building: Maintain existing building in a weather tight condition throughout the construction period. Repair damage caused by construction operations. Protect building and occupants during construction.

G. Vehicle Parking: Contractor parking is available on site and will need to be approved by the owner.

H. Assume full responsibility for protection and safekeeping of materials stored on premises. Coordinate the location of materials and equipment to be stored on premises. Provide barricades, barriers, and enclosures as required to ensure safety.

1.7 OWNERS OCCUPANCY REQUIREMENTS

A. The owner will occupy the building during the entire construction phase. Cooperate with the owner during construction operations to minimize owner conflicts and facilitate owner usage. Perform the work as to not interfere with owners operations.

B. A minimum of 72 hours notice is needed for all activities that will affect the owners operations.

1.8 WORK RESTRICTIONS

A. On site work hours: Work shall generally be performed from the hours of 7:00 am – 5:00 pm Monday through Friday except as otherwise indicated or approved by the owner.

B. Weekend hours, early morning hours, utility shut down, and noisy activity requires owner's authorization a minimum of 72 hours in advance.

1.9 UNIT PRICES

A. The following unit prices will be used to add or deduct from the total contract amount.

1. Replacement dry rot or damaged roof decking.

10. SCHEDULE OF ALTERNATES

A. None

1.11 PROJECT CONDITIONS

A. Proceed with roofing work only when existing and forecasted weather conditions will permit a unit of work to be installed in accordance with manufacturer's recommendations and warranty requirements.

B. Do not apply roofing insulation or membrane to damp deck surface.

C. Do not expose materials subject to water or solar damage in quantities greater than can be weatherproofed during same day.

1.12 SEQUENCING AND SCHEDULING

A. Sequence installation of roofing with related units of work specified in other sections to ensure that roof assemblies, including roof accessories, flashing, trim and joint sealers, are protected against damage from effects of weather, corrosion and adjacent construction activity.

B. Complete all roofing field assembly work each day. Phased construction will not be accepted. Phased construction refers to the application of the roof insulation board, ply sheet membrane, and cap sheet membrane installed in the same day.

1.13 PROJECT TIMELINE

A. Project Start: June 7, 2024

B. Project Completion: August 9, 2024

END OF SECTION 01 11 00 – SUMMARY OF WORK

SECTION 01 30 00
SUBMITTALS

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

A. Contract General Conditions.

B. See also contract general conditions for additional requirements especially those regarding requests for ALTERNATIVES OR EQUALS and for SUBSTITUTIONS.

1.02 SUMMARY

A. This Section specifies administrative and procedural requirements for submittals required for performance of the Work, including:

1. Contractor's construction schedule
2. Submittal schedule
3. Shop Drawings
4. Product Data
5. Samples.

B. Administrative Submittals: Refer to other Division-1 Sections and other Contract Documents for requirements for administrative submittals. Such submittals include, but are not limited to:

1. Permits
2. Applications for payment
3. Performance and payment bonds
4. Insurance certificates
5. List of Subcontractors.

1.03 SUBMITTAL PROCEDURES

A. Coordination: Coordinate preparation and processing of submittals with performance of construction activities. Transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay.
   1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals and related activities that require sequential activity.
   2. Coordinate transmittal of different types of submittals for related elements of the Work so processing will not be delayed by the need to review submittals concurrently for coordination.
      a. The Architect shall return without action any submittals requiring coordination with other submittals until related submittals are coordinated.
   3. Processing: Allow sufficient review time so that installation will not be delayed as a result of the time required to process submittals, including time for resubmittals.
      a. See General Conditions and Supplementary General Conditions for additional requirements.
      b. If an intermediate submittal is necessary, process the same as the initial submittal.
      c. No extension of Contract Time will be authorized because of failure to transmit submittals to the Architect sufficiently in advance of the Work to

permit processing.

B. Submittal Preparation: Place a permanent label or title block on each submittal for identification. Indicate the name of the entity that prepared each submittal on the label or title block.

1. Provide a space approximately 4” x 5” on the label or beside the title block on Shop Drawings to record the Contractor’s review and approval markings and the action taken.
2. Include the following information on the label for processing and recording action taken:
   a. Project name
   b. Date
   c. Name and address of Architect
   d. Name and address of Contractor
   e. Name and address of subcontractor
   f. Name and address of supplier
   g. Name of manufacturer
   h. Number and title of appropriate Specification Section
   i. Drawing number and detail references, as appropriate.

C. Submittal Transmittal: Package each submittal appropriately for transmittal and handling. Transmit each submittal from Contractor to Architect using a transmittal form. Submittals received from sources other than the Contractor will be returned without action.

On the transmittal Record relevant information and requests for data. On the form, or separate sheet, record deviations from Contract Document requirements, including minor variations and limitations. Include Contractor’s certification that information complies with Contract Document requirements.

1.05 SHOP DRAWINGS

A. Submit newly prepared information, drawn to accurate scale. Highlight, encircle, or otherwise indicate deviations from the Contract Documents. Do not reproduce Contract Documents or copy standard information as the basis of Shop Drawings. Standard information prepared without specific reference to the Project is not considered Shop Drawings.

B. Shop Drawings include fabrication and installation drawings, setting diagrams, schedules, patterns, templates and similar drawings. Include the following information:

Dimensions
Identification of products and materials included
Compliance with specified standards
Notation of coordination requirements
Notation of dimensions established by field measurement.

C. Sheet Size: Except for templates, patterns and similar full- size Drawings, submit Shop Drawings on sheets at least 8-1/2” x 11” but no larger than 30” x 42”.

D. Submittals: Submit one correctable translucent reproducible print and six (6) blue- or black-line print for the Architect’s review; the reproducible and one print will be returned.

Do not use Shop Drawings without an appropriate final stamp indicating action taken in connection with construction.

1.06 PRODUCT DATA

A. Collect Product Data into a single submittal for each element of construction or system. Product Data includes printed information such as manufacturer's installation instructions, catalog cuts, standard color charts, roughing-in diagrams and templates, standard wiring diagrams and performance curves. Where Product Data must be specially prepared because standard printed data is not suitable for use, submit as "Shop Drawings."

1. Mark each copy to show applicable choices and options. Where printed Product Data includes information on several products, some of which are not required, mark copies to indicate the applicable information. Include the following information:
   Manufacturer's printed recommendations,
   Compliance with recognized trade association standards,
   Compliance with recognized testing agency standards,
   Application of testing agency labels and seals,
   Notation of dimensions verified by field measurement,
   Notation of coordination requirements.
2. Do not submit Product Data until compliance with requirements of the Contract Documents has been confirmed.

B. Submittals: Submit a minimum of six (6) copies of each required submittal as well as additional copies as required by the Architect, (the actual number of submittals and distribution required shall be determined by the Trustees Representative at the Preconstruction Conference). The Architect will return two sets marked with action taken and corrections or modifications required.

C. Distribution: Furnish copies of final submittal to installers, subcontractors, suppliers, manufacturers, fabricators, and others required for performance of construction activities.

1. Do not proceed with installation until an applicable copy of Product Data applicable is in the installer's possession.

2. Do not permit use of unmarked copies of Product Data in connection with construction.

1.07 SAMPLES

A. Submit full-size, fully fabricated Samples cured and finished as specified and physically identical with the material or product proposed. Samples include partial sections of manufactured or fabricated components, cuts or containers of materials, color range sets, and swatches showing color, texture and pattern.

1. Mount, display, or package Samples in the manner specified to facilitate review of qualities indicated. Prepare Samples to include the following:
   Generic description of the Sample
   Sample source
   Product name or name of manufacturer
   Compliance with recognized standards
   Availability and delivery time.

2. Submit Samples for review of kind, color, pattern, and texture, for a final check of these characteristics with other elements, and for a comparison of these

characteristics between the final submittal and the actual component as delivered and installed.

B. Preliminary submittals: Where Samples are for selection of color, pattern, texture or similar characteristics from a range of standard choices, submit a full set of choices for the material or product.

Preliminary submittals will be reviewed and returned with the Architect's mark indicating selection and other action.

C. Submittals: Except for Samples illustrating assembly details, workmanship, fabrication techniques, connections, operation and similar characteristics, submit 3 sets; one will be returned marked with the action taken.

Maintain sets of Samples, as returned, at the Project site, for quality comparisons throughout the course of construction.

D. Distribution of Samples: Prepare and distribute additional sets to subcontractors, manufacturers, fabricators, suppliers, installers, and others as required for performance of the Work.

Field Samples specified in individual Sections are special types of Samples. Field Samples are full-size examples erected on site to illustrate finishes, coatings, or finish materials and to establish the standard by which the Work will be judged.

1.08 ARCHITECTS ACTION

A. Except for submittals for record, information or similar purposes, where action and return is required or requested, the Architect will review each submittal, mark to indicate action taken, and return promptly.

Compliance with specified characteristics is the Contractor's responsibility.

B. Action Stamp: The Architect will stamp each submittal with a uniform, self-explanatory action stamp. The stamp will be appropriately marked, as follows, to indicate the action taken:

1. Final Unrestricted Release: Where submittals are marked "Approved," that part of the Work covered by the submittal may proceed provided it complies with requirements of the Contract Documents; final acceptance will depend upon that compliance.
2. Final-But-Restricted Release: When submittals are marked "Approved as Noted," that part of the Work covered by the submittal may proceed provided it complies with notations or corrections on the submittal and requirements of the Contract Documents; final acceptance will depend on that compliance.
3. Returned for Resubmittal: When submittal is marked "Not Approved, Revise and Resubmit," do not proceed with that part of the Work covered by the submittal, including purchasing, fabrication, delivery, or other activity. Revise or prepare a new submittal in accordance with the notations; resubmit without delay. Repeat if necessary to obtain a different action mark.
   a. Do not permit submittals marked "Not Approved, Revise and Resubmit" to be used at the Project site, or elsewhere where Work is in progress.

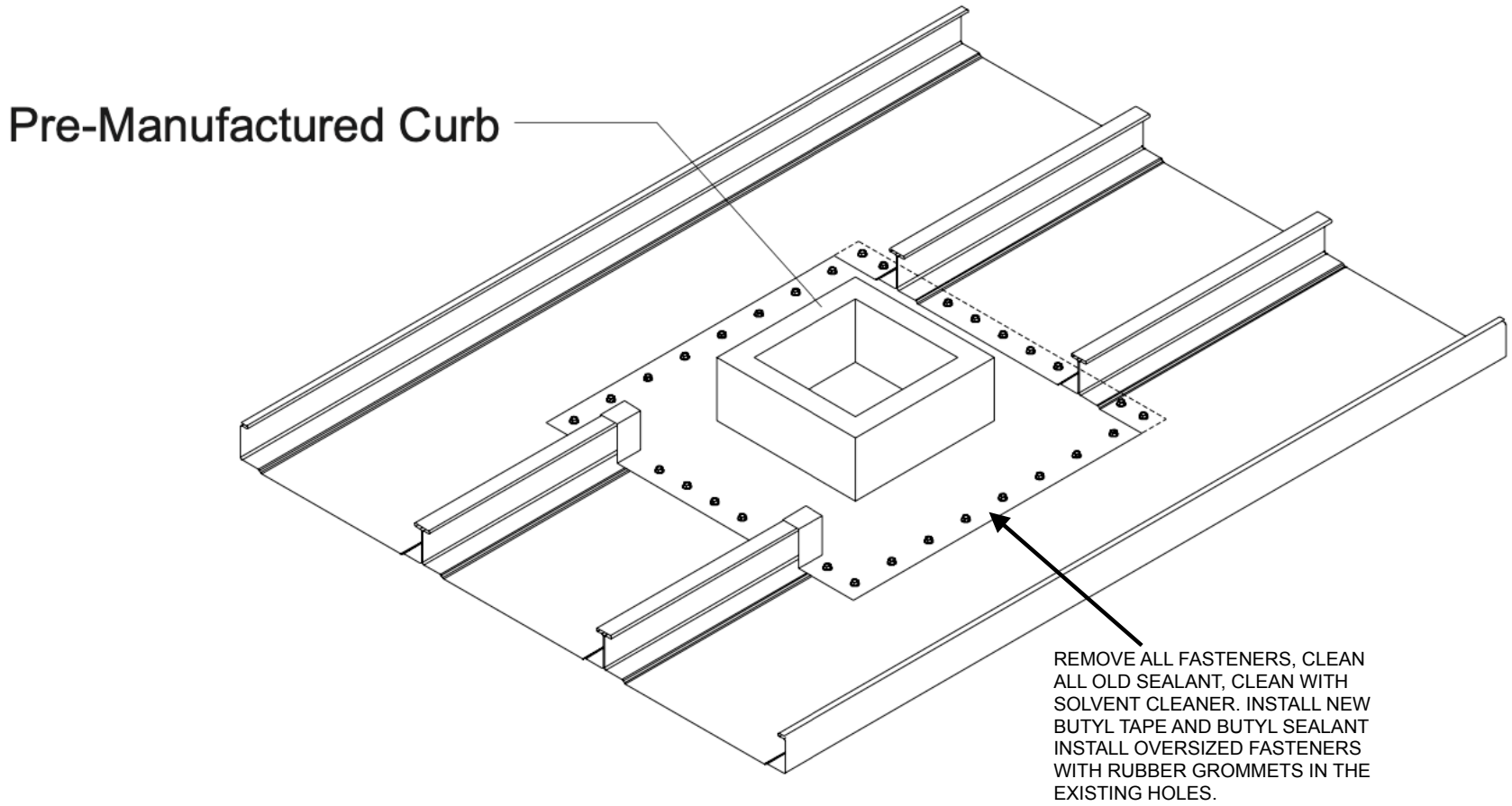
   b. Note: Any work performed prior to receiving a FULLY APPROVED

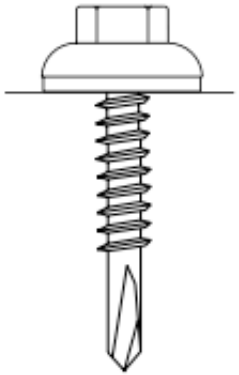
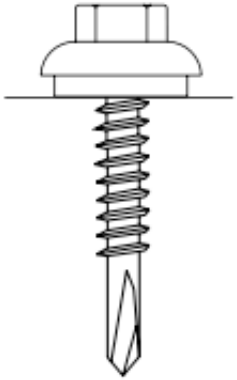
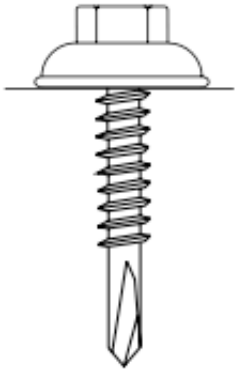
submittal shall be done at the contractors own risk and is subject to being replaced if any of the submittal requirements are not met.

PART 2 – PRODUCTS NOT USED

PART 3 – EXECUTION NOT USED

END OF SECTION 01300


Pre-Manufactured Curb
REMOVE ALL FASTENERS, CLEAN ALL OLD SEALANT, CLEAN WITH SOLVENT CLEANER. INSTALL NEW BUTYL TAPE AND BUTYL SEALANT INSTALL OVERSIZED FASTENERS WITH RUBBER GROMMETS IN THE EXISTING HOLES.

	CORRECT Sealing material slightly visible at edge of metal washer. Assembly is watertight.	**TOO LOOSE** Sealing material is not visible; not enough compression to seal properly.	**TOO TIGHT** Metal washer deformed; sealing material pressed beyond washer edge.
SELF DRILLER			
WOODSCREW