SECTION 01 11 00

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, gutters, downspouts, coping, insulation, flashings, and all construction related debris. Installation of the new roofing systems as specified with all applicable details for a complete watertight warrantied roofing assembly per the manufacturers instructions.

B. Related Work Specified Elsewhere:

1. Section 06 - Rough Carpentry
2. Section 07: KEE Membrane Roofing
3. Section 07: Sheet Metal Flashing and Trim

1.3 WORK COVERED BY CONTRACT DOCUMENTS

A. Project Identification: Central Unified School District Roofing Project 2026

B. Project Location: Harvest Elementary School 6514 W Gettysburg Ave, Fresno, Ca 93723

C. Owner: Central Unified School District 5652 W Gettysburg Ave, Fresno, CA 93722

D. General scope of work but not limited to;

E. **Harvest Elementary School Roof Project 2026**

1. Includes removal and disposal of existing roofing system(s), insulation board, gutters, downspouts, flashings, metal wall panels, wall vents, etc. for a complete prepared roof surface at the low slope roof section.
2. The coping cap will be removed and reinstalled once the full roof system is completed. Install Tuff Stuff Sealant at each internal butt plate or lap joint.
3. Replace all roof drains, drain rings, drain baskets, and drain pipes down to the elbow with new Zurn or equal drain assembly.

4. Modify existing HVAC curb, add blocking to square the curb, install a new 24 gauge galvanized sheetmetal pan.

5. Install one layer of rosin paper over the entire wood roof deck at the low slope roof sections.

6. Install one layer of ½" Woodfiber insulation board with screws and plates, 16 per 4'x 8' sheet.

7. Install one layer of Flexbase 80 in Greenlock Adhesive at all horizontal and vertical surfaces.

8. Install KEE Stone HP membrane adhered at all horizontal surfaces per manufactures details.

9. Install KEE Stone HP NF 60 mil membrane adhered at all vertical surfaces per manufacturers details.

10. Install new SolarBright boots at all pipe penetrations.

11. Install new 24 gauge galvanized sheet metal skirt flashing at all HVAC and roof curbs.

12. Install new PVC condensate lines from all HVAC units to the drains. Install new rubber blocking to properly support the new condensate line, maximum spacing 5' on center.

13. Install SolarBright walkway pad at all four sides of the HVAC units with a path to the roof hatch and under all support blocking.

14. If necessary, Include in the bid price a City of Porterville Re-Roof permit. The permit is to be pulled by the roofing contractor and all inspections are the responsibility of the roofing contractor.

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.

1. 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.

a. Unit-1 Replacement of dryrot wood roof decking, add a line items per square foot cost to proposal form.

1.10 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.

1.13 PROJECT TIME LINE

A. Advertisement 1: 04/09/2026

B. Advertisement 2: 04/16/2026

C. Pre Bid Meeting: 04/16/2026 at 9:00am

D. Bid Date: 04/23/2026 at 2:00pm

E. Project Completion Date: TBD

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 Division1 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 81/2" x 11" but no larger than 30" x 42".

D. Submittals: Submit one correctable translucent reproducible print and six (6) blue or blackline 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, roughingin 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 06 - Rough Carpentry

2. Section 07- KEE Membrane Roofing

3. 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. Below is the list of materials the owner will provide.

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 supplied in this section, 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.

HARVEST ELEMENTARY SCHOOL	
20.00	KEE-Lock Spatter Spray
58.00	KEE-Stone FB 60
62.00	KEE-Stone NF 60 Flashing
588.00	FlexBase Plus 80
165.00	Green-Lock Plus Flashing Adh
232.00	Green-Lock Plus Membrane Adh
3.00	KEE/PVC Walkway Roll 30' x 60'
42.00	KEE-Lock Flashing Adhesive
100.00	R-Mer Flat Stock 22G S

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 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 site, including uncrating and proper storage & security.
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. Section 01 - Summary of Work
2. Section 01 - Submittals
3. Section 06 - Rough Carpentry
4. Division 07: Modified KEE Membrane Roofing
5. 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 52 00
MODIFIED BITUMINOUS MEMBRANE ROOFING
Display hidden notes to specifier. (Don't know how? Click Here)

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PART 1 GENERAL

1.1 SECTION INCLUDES

A. Cold Applied 2-Ply Thermoplastic Hybrid Roof System (KEE-Stone HP and FB 60). (2.10)(3.4)

B. Accessories. (2.12)

C. Edge Treatment and Roof Penetration Flashings. (2.13)(3.9)

1.2 RELATED SECTIONS

A. Section 03 50 00 - Cement Deck Preparation.

B. Section 05 30 00 - Metal Decking.

C. Section 06 10 00 - Rough Carpentry.

D. Section 07 22 16 - Roof Board Insulation.

E. Section 07 62 00 - Sheet Metal Flashing and Trim.

F. Section 07 72 33 - Roof Hatches.

1.3 REFERENCES

A. ASTM C 920 - Standard Specification for Elastomeric Joint Sealants.

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

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

D. ASTM D 412 - Tensile Test on Rubber and Elastomers.

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

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

G. ASTM D 2824 Standard Specification for Aluminum-Pigmented Asphalt Roof Coating.

H. ASTM D 3019 - Standard Specification for Lap Cement Used with Asphalt Roll Roofing, Non-Fibered, and Fibered.

I. ASTM D 4586 Standard Specification for Asphalt Roof Cement, Asbestos-Free.

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

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

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

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

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

O. ASTM D 6754 - Standard Specification for Ketone Ethylene Ester (KEE) Sheet Roofing.

P. ASTM D 6757 - Standard Specification for Underlayment Felt Containing Inorganic Fibers Used in Steep-Slope Roofing.

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

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

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

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

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

V. Intertek/Warnock Hersey (WH): Fire Hazard Classifications.

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

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

Y. UL - Fire Resistance Directory.

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

AA. FBC - Florida Building Code.

BB. Miami-Dade Building Code Compliance - N.O.A. (Notice of Acceptance).

CC. California Title 24 Energy Efficient Standards.

1.4 DESIGN / PERFORMANCE REQUIREMENTS

A. Perform work in accordance with all federal, state and local codes.

B. Design Requirements:
   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, Method 2 for Components and Cladding.
         2) Importance Category:
            a) I.
            b) II.
            c) III.
            d) IV
         3) Importance Factor of:
            a) 0.77
            b) 1.0
            c) 1.15
            d) 2.0
         4) Wind Speed: ___ mph
         5) Exposure Category:
            a) B.
            b) C.
            c) D.
         6) Design Roof Height: ___ feet.
         7) Minimum Building Width: ___ feet.
         8) Roof Pitch: ___ :12.
         9) Roof Area Design Uplift Pressure:
            a) Zone 1' Interior Field of Roof ____psf -
            b) Zone 1 - Field of roof ___ psf
            c) Zone 2 - Eaves, ridges, hips and rakes ___ psf
            d) Zone 3 - Corners ___ psf
   2. Snow Load: ___ psf.
   3. Live Load: 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.

1.5 SUBMITTALS

A. Submit under provisions of Section 01 30 00.

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 retarder, 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 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.

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.
   3. Product 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. 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. 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.

H. 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. Manufacturer's Field Supervision: A representative of the roof system manufacturer must be present (insert days here) days per week during the roof system installation.

F. 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.

G. 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 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 HP and 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 Warranty, warranting that, if a leak develops in the roof during the term of this warranty, due to defective material or workmanship, 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, in accordance with the terms of the Manufacturer's warranty, warranty requirements and limitations.
   1. Warranty Period: XXX years from date of acceptance (in accordance with manufacturer's applicable warranty.

PART 2 PRODUCTS

2.1 MANUFACTURERS

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

B. Substitutions: Not permitted.

C. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00.

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 prior to acceptance.
   3. In making a request for substitution, the Bidder/Roofing Contractor represents that it has:
      a. Personally investigated the proposed product or method, and determined that it is equal or superior in all respects to that specified.
      b. Will provide the same guarantee for substitution as for the product and method specified.
      c. Will coordinate installation of accepted substitution in work, making such changes as may be required for work to be completed in all respects.
      d. Will waive all claims for additional cost related to substitution, which consequently become apparent.
      e. Cost data is complete and includes all related cost under his/her contract or other contracts, which may be affected by the substitution.
      f. Will reimburse the Owner for all redesign cost by the Architect for

accommodation of the substitution.

4. Architect/ Owner reserves the right to act as the final authority on the acceptance or rejection of any or all bids, proposed alternate roofing systems or materials that have met ALL specified requirement criteria.
5. Failure to submit substitution package, or any portion thereof requested, will result in immediate disqualification and consideration for that particular contractor's request for manufacturer substitution.

2.2 COLD APPLIED 2-PLY THERMOPLASTIC HYBRID ROOF SYSTEM - KEE-Stone HP or KEE-Stone FB 60

A. Nailable Base Sheet: One ply fastened to the deck per wind uplift calculations.
   1. VersiPly 40:

B. Base (Ply) Sheet: One ply bonded to the prepared substrate with Interply Adhesive:
   1. FlexBase Plus 80:

C. Thermoplastic Cap (Ply) Sheet: One ply bonded to the prepared substrate with Interply Adhesive (2):
   1. KEE-Stone FB 60:

D. Interply Adhesive: (1)
   1. Green-Lock Plus Membrane Adhesive.

E. Interply Adhesive: (2)
   1. KEE-Lock Foam Spatter applied

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

G. Flashing Cap (Ply) Sheet: One ply bonded to the prepared substrate with Flashing Ply Adhesive:
   1. KEE-Stone NF 60 Flashing.

H. Flashing Ply Adhesive (1):
   1. Green-Lock Plus Flashing Adhesive.

I. Flashing Ply Adhesive (2):
   1. KEE-Lock Flashing Adhesive:

J. Accessories:
   1. Pre-molded reinforced KEE-Stone accessories for detail applications.
   2. Unreinforced KEE Detail Roll.
   3. Utility Roll Membrane Reinforced KEE-Stone butt ends.

2.3 ACCESSORIES:

A. Roof Insulation Cover Board: Provide GP Gypsum DensDeck Prime, GP Gypsum DensDeck Storm-X Prime, USG Securock for proper adhesion of the self-adhered base sheet in accordance with Section 07 22 16.

B. Vapor Retarder: VaporSmart SA: SBS modified, self-adhering membrane with woven polypropylene film and split release film on backside. Install one layer of the self-adhering membrane to a properly prepared, primed (as required), clean and dry substrate in accordance with manufacturer's application instructions. Shingle in direction of slope or roof to shed water on each area of roof.
   1. Tensile Strength, ASTM D5147.
      a. MD 125 lbf./in (21.89 kN/m).

b. XD 90 lbf./in. (15.76 kN/m).
2. Tear Strength, ASTM D 4073.
a. MD 175 lbf. (778 N).
b. XD 120 lbf. (534 N).
3. Thickness, ASTM D5147.
a. 45 mils (1.14 mm).
4. Lap Adhesion, ASTM D1876.
a. 20 pli.
5. Water Permeance, ASTM E 96, Method B.
a. 0 perm (ng/Pa.s.m^2).
6. Air Permeability, ASTM E 2178.
a. < 0.025 L/s*m^2.

C. 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.

2.4 EDGE TREATMENT AND ROOF PENETRATION FLASHINGS

A. Pre-Manufactured Edge Metal: R-Mer Force Flash-less Snap-On Fascia Cover and Splice Plate.
1. Zinc-coated steel, ASTM A653, coating designation G-90, in thickness of 24-gauge, 22 gauge or 20 gauge, 36" to 48" by coil length, chemically treated, commercial or lock-forming quality
2. Aluminum, ASTM B209, alloy 3105-H14, in thickness of .032" nom. or .040" nom. or .050" nom. or .063" nom.

B. Pre-Manufactured Coping Cap: R-Mer Edge Coping Cap Cover and Splice Plate.
1. Zinc-coated steel, ASTM A653, coating designation G-90, in thickness of 24-gauge, 22 gauge or 20 gauge, 36" to 48" by coil length, chemically treated, commercial or lock-forming quality.
2. Aluminum, ASTM B209, alloy 3105-H14, in thickness of .040" nom. or .050" nom. or .063" nom.

C. Pre-Manufactured Edge Metal: R-Mer Force Flash-less Snap-On Fascia Extruded Base Anchor and Components.
1. Base Anchor: 6005A-T61 extruded aluminum.
2. Compression Seal for top of anchor: TPE thermoplastic elastomer.
3. Sealant for Flange: Green-Lock Sealant XL: Single-component high performance 100% solids, interior and exterior polyether joint sealant.

D. Pre-Manufactured Coping Cap: R-Mer Edge Coping Chairs.

E. Pre-Manufactured Edge Metal: R-Mer Drip Edge Fascia.
1. 24 and 22-gauge steel.
2. .040" and .050" aluminum.

F. 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.
   a) Primer: 0.2 mils.
   b) Topcoat: 0.7 mils min.
   c) Clear Coat 0.3 mils.
7) Color: Provide as specified. (Subject to minimum quantities)

G. 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.

H. 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.

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

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

K. Plumbing stacks should be 4lb (1.8kg) sheet lead formed and rolled.

L. Liquid Flashing - Tuff-Flash Plus LO: 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: 650 psi.
   2. Elongation, ASTM D 412: 325%
   3. Density @77 deg. F 8.3 lb/gal typical.

M. Fabricated Flashings: Fabricated flashings and trim are specified in Section 07 62 00 - Sheet Metal Flashing and Trim.
   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.

N. Manufactured Roof Specialties: Shop fabricated copings, fascia, gravel stops, control joints, expansion joints, joint covers and related flashings and trim are specified in Section 07 71 23.
   1. Manufactured roof specialties shall conform to the detail requirements of SMACNA "Architectural Sheet Metal Manual" and/or the NRCA "Roofing and Waterproofing Manual" as applicable.

PART 3 EXECUTION

3.1 EXAMINATION

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

B. 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.

B. Wood Deck:
   1. 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.
   2. 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).
   3. If no roof insulation is specified, provide a suitable dry sheathing paper, followed by an approved base sheet nailed appropriately for the specified roof system, with 1 inch (25 mm) diameter caps and annular nails unless otherwise required by the applicable Code or Approval agency.
   4. Insulation is to be mechanically attached in accordance with the insulation manufacturer's recommendations unless otherwise required by the applicable Code.
   5. 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.
   6. 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 INSTALLATION COLD APPLIED ROOF SYSTEM

A. 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.

1. Lap ply sheet ends 8 inches. Stagger end laps 12 inches minimum.
2. 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.
3. 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.
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. Extend plies 2 inches beyond top edges of cants at wall and projection bases.
6. Install base flashing ply to all perimeter and projection details.
7. 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. Thermoplastic Cap Ply: Allow plies to relax before installing. Install in interply adhesive applied at the rate required by the manufacturer. Shingle sheets uniformly over the prepared substrate to achieve the number of plies specified. Shingle in proper direction to shed water on each large area of roofing.

1. All field seams exceeding 10 feet in length shall be welded with an approved automatic welder.
2. All field seams must be clean and dry prior to initiating any field welding. Remove foreign materials from the seams (dirt, oils, etc.) with acetone or authorized alternative. Use CLEAN WHITE COTTON cloths and allow approximately five minutes for solvents to dissipate before initiating the automatic welder. Do not use denim or synthetic rags for cleaning.
3. Contaminated areas within a membrane seam will inhibit proper welding and will require a membrane patch or strip.
4. All welding shall be performed only by qualified personnel to ensure the quality and continuity of the weld. The lap or seam area of the membrane may be intermittently tack welded to hold the membrane in place.

5. The back interior edge of the membrane shall be welded first, with a thin, continuous weld to concentrate heat along the exterior edge of the lap during the final welding pass.
6. Follow local code requirements for electric supply, grounding and surge protection. The use of a dedicated, portable generator is highly recommended to ensure a consistent electrical supply, without fluctuations that can interfere with weld consistency.
7. Properly welded seams shall utilize a 1.5-inch-wide nozzle, to create a homogeneous weld, a minimum of 1.5 inches in width.

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 06 11 00.
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 07 62 00 or Section 07 71 23. 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. Provide suitable sealant at the top edge if 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. Coordinate counter flashing, cap flashings, expansion joints and similar work with modified bitumen roofing work as specified.
6. Coordinate roof accessories, miscellaneous sheet metal accessory items, including piping vents and other devices with the roofing system work.
7. Secure the top edge of the flashing sheet using a termination bar only when the wall surface above is waterproofed or nailed 4 inches o.c. 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 o.c. and covered with an acceptable counter flashing.
9. Seal all vertical laps of cap flashing ply with a three-course application of trowel-grade mastic and fiberglass mesh.

I. Roof Walkways: Provide walkways in areas indicated on the Drawings.

3.5 INSTALLATION EDGE TREATMENT AND ROOF PENETRATION FLASHING

A. Scupper Through Wall:
1. Inspect the nailer to ensure proper attachment and configuration.
2. Run one ply over nailer, into scupper hole and up flashing as in typical wall flashing detail. Assure coverage of all wood nailers.
3. Install a 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 of 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.

B. Scupper Through Wall (Overflow):
1. Inspect the nailer to ensure 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.

C. 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 allow to cure and aluminize.
   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.

D. Pre-manufactured Snap-On Coping Cap:
   1. Install miters first.
   2. Position base flashing of the Built-Up and/or Modified Roofing membrane over the wall edge covering nailers completely, fastening 8 inches o.c.. Install membrane and cap sheet with proper material and procedure according to manufacturer's recommendations.
   3. Install minimum 16-gauge, 16 inch long by specified width anchor chair at [Contact Garland Representative] feet on center.
   4. Install 6-inch-wide splice plate by centering over 16 inch long by specified width anchor chair. Apply two beads of sealant to either side of the splice plate's center. Approximately 2 inches from the coping cap joint. Install Coping Cap by hooking outside hem of coping on outside face of anchor chair. Press downward on inside edge of coping until "snap" occurs and hem is engaged on the entire chair.

E. Surface Mounted Counterflashing/Coping Cap:
   1. Minimum flashing height is 8 inches (203 mm) above finished roof height. 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 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 seams and allow to cure and aluminize.
   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. Fasten 8 inches (203 mm) o.c. and caulk top of counterflashing.
   7. Attach tapered board to top of wall (minimum slope 1/4 -12). Do not use organic fiberboard or perlite.
   8. Cover tapered board and all exposed wood with base flashing ply. Fasten inside and out at 8 inches (203 mm) o.c.
   9. Install continuous cleat and fasten at 6 inches (152 mm) o.c. to outside wall.
   10. Install new metal coping cap hooked to continuous cleat.
   11. Fasten inside of cap 24-inch (609 mm) o.c. with approved fasteners and neoprene washers.

F. 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 allow to cure and aluminize.
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.

G. 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 allow to cure and aluminize.
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.

H. 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 allow to cure and aluminize.
5. Install metal exhaust fan over the wood nailers and flashing to act as counterflashing. Fasten per manufacturer's recommendation.

I. 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. Run roof system plies over drain. Cut out plies inside drain bowl.
4. Set lead/copper flashing (30-inch square minimum) in 1/4-inch 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. Install base flashing ply (40-inch square minimum) in bitumen.
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.

J. Roof Drain Alternate:
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.

K. 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. Turn sleeve a minimum of 1 inch (25 mm) down inside of stack.

L. Scupper Through Wall:
1. Inspect the nailer to ensure proper attachment and configuration.
2. Run base ply over nailer, into scupper hole and up flashing as in typical wall flashing detail. Assure coverage of all wood nailers.
3. Install a 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 and allow to dry.
4. Fasten flange of scupper box every 3 inches (76 mm) o.c. staggered.
5. Strip in flange of 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. Then install thermoplastic cap field ply run over the base flashing ply in bitumen or foam adhesive.
7. Install a second ply of thermoplastic flashing cap ply heat welded over the thermoplastic cap ply, 9 inches (228 mm) on to the field of the roof.
8. Heat weld a cover strip over all seams.

M. Scupper Through Wall (Overflow):
1. Inspect the nailer to ensure proper attachment and configuration.
2. Run base 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 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. Then install thermoplastic cap field ply run over the base flashing ply in bitumen or foam adhesive.
7. Install a second ply of thermoplastic flashing cap ply heat welded over the thermoplastic cap ply, 9 inches (228 mm) on to the field of the roof.
8. Heat weld a cover strip over all seams.

N. 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 and allow to dry.
2. Set cant in bitumen. Run all base field plies over cant a minimum of 2 inches (50 mm).
3. Install base flashing ply covering entire wall and wrapped over top of wall and down face with 6 inches (152 mm) on to the base field ply and set in bitumen. Nail base flashing ply at 8 inches (203 mm) o.c. on the back side of the parapet wall.
4. Then install thermoplastic cap field ply run over the base flashing ply in bitumen or

foam adhesive.

5. Install a second ply of thermoplastic flashing cap ply heat welded over the thermoplastic cap field ply, 9 inches (228 mm) on to the field of the roof.
6. Heat weld a cover strip over all seams.
7. Install continuous cleat and fasten at 6 inches (152 mm) o.c. to outside wall.
8. Install new metal coping cap hooked to continuous cleat.
9. Fasten inside cap 24 inches (609 mm) o.c. with approved fasteners and neoprene washers through slotted holes, which allow for expansion and contraction.

O. Pre-manufactured Snap-On Coping Cap:

1. Install miters first.
2. Position base flashing ply over the wall edge covering nailers completely, fastening 8 inches on center. Install base ply and thermoplastic cap ply with proper material and procedure according to manufacturer's recommendations.
3. Install minimum 16-gauge, 16 inch long by specified width anchor chair at [Contact Garland Representative] feet on center.
4. Install 6-inch-wide splice plate by centering over 16 inch long by specified width anchor chair. Apply two beads of sealant to either side of the splice plate's center. Approximately 2 inches from the coping cap joint. Install Coping Cap by hooking outside hem of coping on outside face of anchor chair. Press downward on inside edge of coping until "snap" occurs and hem is engaged on the entire chair.

P. Surface Mounted Counterflashing/Coping Cap:

1. Minimum flashing height is 8 inches (203 mm) above finished roof height. Prime vertical wall and allow to dry.
2. Set cant in bitumen. Run all base 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 the base field ply and set in bitumen.
4. Then install thermoplastic cap field ply run over the base flashing ply in bitumen or foam adhesive.
5. Install the thermoplastic flashing ply in bitumen or foam over the base flashing ply, 9 inches (228 mm) on to the field of the roof.
6. 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.
7. Secure counterflashing set on butyl tape above flashing. Fasten 8 inches (203 mm) o.c. and caulk top of counterflashing.
8. Attach tapered board to top of wall (minimum slope 1/4 -12). Do not use organic fiberboard or perlite.
9. Cover tapered board and all exposed wood with base flashing ply. Fasten inside and out at 8 inches (203 mm) o.c.
10. Install continuous cleat and fasten at 6 inches (152 mm) o.c. to outside wall.
11. Install new metal coping cap hooked to continuous cleat.
12. Fasten inside of cap 24-inch (609 mm) o.c. with approved fasteners and neoprene washers.

Q. Equipment Support:

1. Minimum curb height is 8 inches (203 mm) above finished roof height. Prime vertical and allow to dry.
2. Set cant in bitumen. Run all base field plies over cant a minimum of 2 inches (50 mm).
3. Install base flashing ply covering the curb set in bitumen with 6 inches (152 mm) on to the base field ply and set in bitumen.
4. Then install thermoplastic cap field ply run over the base flashing ply in bitumen or foam adhesive.
5. Install the thermoplastic flashing ply in bitumen or foam over the base flashing ply, 9 inches (228 mm) on to the field of the roof.
6. 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.
7. Set equipment on neoprene pad and fasten as required by equipment manufacturer.

R. Curb Detail/Air Handling Station:
1. Minimum curb height is 8 inches (203 mm) above finished roof height. Prime vertical and allow to dry.
2. Set cant in bitumen. Run all base field plies over cant a minimum of 2 inches (50 mm).
3. Install base flashing ply covering the curb set in bitumen with 6 inches (152 mm) on to the base field ply and set in bitumen.
4. Then install thermoplastic cap field ply run over the base flashing ply in bitumen or foam adhesive.
5. Install the thermoplastic flashing ply in bitumen or foam over the base flashing ply, 9 inches (228 mm) on to the field of the roof.
6. Install pre-manufactured counterflashing with fasteners and neoprene washers or per manufacturer's recommendations.
7. Set equipment on neoprene pad and fasten as required by equipment manufacturer.

S. Exhaust Fan:
1. Minimum curb height is 8 inches (203 mm) above finished roof height. Prime vertical and allow to dry.
2. Set cant in bitumen. Run all base 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 the base field ply and set in bitumen.
4. Then install thermoplastic cap field ply run over the base flashing ply in bitumen or foam adhesive.
5. Install the thermoplastic flashing ply in bitumen or foam over the base flashing ply, 9 inches (228 mm) on to the field of the roof.
6. Install metal exhaust fan over the wood nailers and flashing to act as counterflashing. Fasten per manufacturer's recommendation.

T. Passive Vent/Air Intake:
1. Minimum curb height is 8 inches (203 mm) above finished roof height. Prime vertical and allow to dry.
2. Set cant in bitumen. Run all base 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 the base field ply and set in bitumen.
4. Then install thermoplastic cap field ply run over the base flashing ply in bitumen or foam adhesive.
5. Install the thermoplastic flashing ply in bitumen or foam over the base flashing ply, 9 inches (228 mm) on to the field of the roof.
6. Install passive vent/air intake over the wood nailers and flashing to act as counterflashing. Fasten per manufacturer's recommendations.

U. 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. Run roof system base plies over drain. Cut out plies inside drain bowl.
4. Set lead/copper flashing (30-inch square minimum) in 1/4-inch bed of mastic. Run lead/copper into drain a minimum of 2 inches (50 mm). Prime lead/copper and allow to dry.
5. Install base flashing ply (40-inch square minimum) in bitumen.
6. Install thermoplastic cap ply (48-inch square minimum) in bitumen or foam adhesive.
7. Install clamping ring and assure that all plies are under the clamping ring.
8. Remove drain plug and install strainer.

V. Plumbing Stack:

1. Minimum stack height is 12 inches (609 mm).
2. Run roof base ply 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 thermoplastic cap ply in bitumen or foam adhesive.
6. Caulk the intersection of the membrane with elastomeric sealant.
7. Turn sleeve a minimum of 1 inch (25 mm) down inside of stack.

3.6 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.

3.7 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.

3.8 FIELD QUALITY CONTROL

A. Inspection: Provide manufacturer's field observations at start-up and at intervals of approximately 30 percent, 60 percent, and 90 percent 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 Sales 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 Sales Representative indicating procedures followed, weather conditions and any discrepancies found during inspection.
4. Provide a final report from the Sales Representative, certifying that the roofing system has been satisfactorily installed according to the project specifications, approved details and good general roofing practice.

3.9 SCHEDULES

A. Base (Ply) Sheet:
1. FlexBase Plus 80: 80 mil SBS (Styrene-Butadiene-Styrene) rubber modified roofing base sheet reinforced with a fiberglass and polyester composite scrim. ASTM D 6162, Type III.
a. Tensile Strength, ASTM D5147
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 650 lbf XD 650 lbf
2) 50 mm/min. @ 23 +/- 2 deg. C MD 2891 N XD 2891 N
c. Elongation at Maximum Tensile, ASTM D5147
1) 2 in/min. @ 73.4 +/- 3.6F 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 (-34.4 deg. C)

B. Thermoplastic/Modified Cap (Ply) Sheet:
1. KEE-Stone FB 60: 60 mil thermoplastic, ketone ethylene ester (KEE) roofing membrane with polyester scrim. ASTM D 6754
a. Breaking Strength, ASTM D 751, Proc. B, Strip
1) 375 lbf. (1,668 N)
b. Tear Strength, ASTM D 751
1) 120 lbf. min. (534 N)
c. Elongation at Break (%), ASTM D 751, Proc. B, Strip
1) 40.0%

C. Interply Adhesive:
1. Green-Lock Plus Membrane Adhesive: Cold applied solvent free membrane adhesive: low V.O.C. compliant performance requirements:
a. Non-Volatile Content ASTM D 4586 100%
b. Density ASTM D 1475 11.4 lbs./gal. (1.47 g/cm3)
c. Viscosity Brookfield Spindle T-E at 5 rpm 124,000 cPs.
d. Flash Point ASTM D 93 375 deg. F min. (232 deg. C)
e. Slope: up to 3:12
2. KEE-Lock Foam Spatter Spray: Dual component, single bead spatter applied urethane insulation/membrane adhesive.
a. Tensile Strength (ASTM D 412) 250 psi
b. Density (ASTM D 1875) 8.5 lbs./gal.
c. Viscosity (ASTM D 2556) 22,000 - 60,000 cP
d. Peel Strength (ASTM D 903) 17 lb./in.
e. Flexibility (ASTM D 816) Pass @ -70 deg F (-56.7 deg C)

D. Flashing Base Ply:
1. FlexBase Plus 80: 80 mil SBS (Styrene-Butadiene-Styrene) rubber modified roofing base sheet reinforced with a fiberglass and polyester composite scrim. ASTM D 6162, Type III.
a. Tensile Strength, ASTM D5147
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 D5147
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 D5147
1) 2 in/min. @ 73.4 +/- 3.6F 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 (-34.4 deg. C)

E. Flashing Cap (Ply) Sheet:
1. KEE-Stone NF 60 Flashing: 60 mil thermoplastic, ketone ethylene ester (KEE) roofing membrane with polyester scrim. ASTM D 6754.
a. Breaking Strength, ASTM D 751, Proc. B, strip
1) 375 lbf
b. Tear Strength ASTM D 751

1) 145 lbf. minimum.

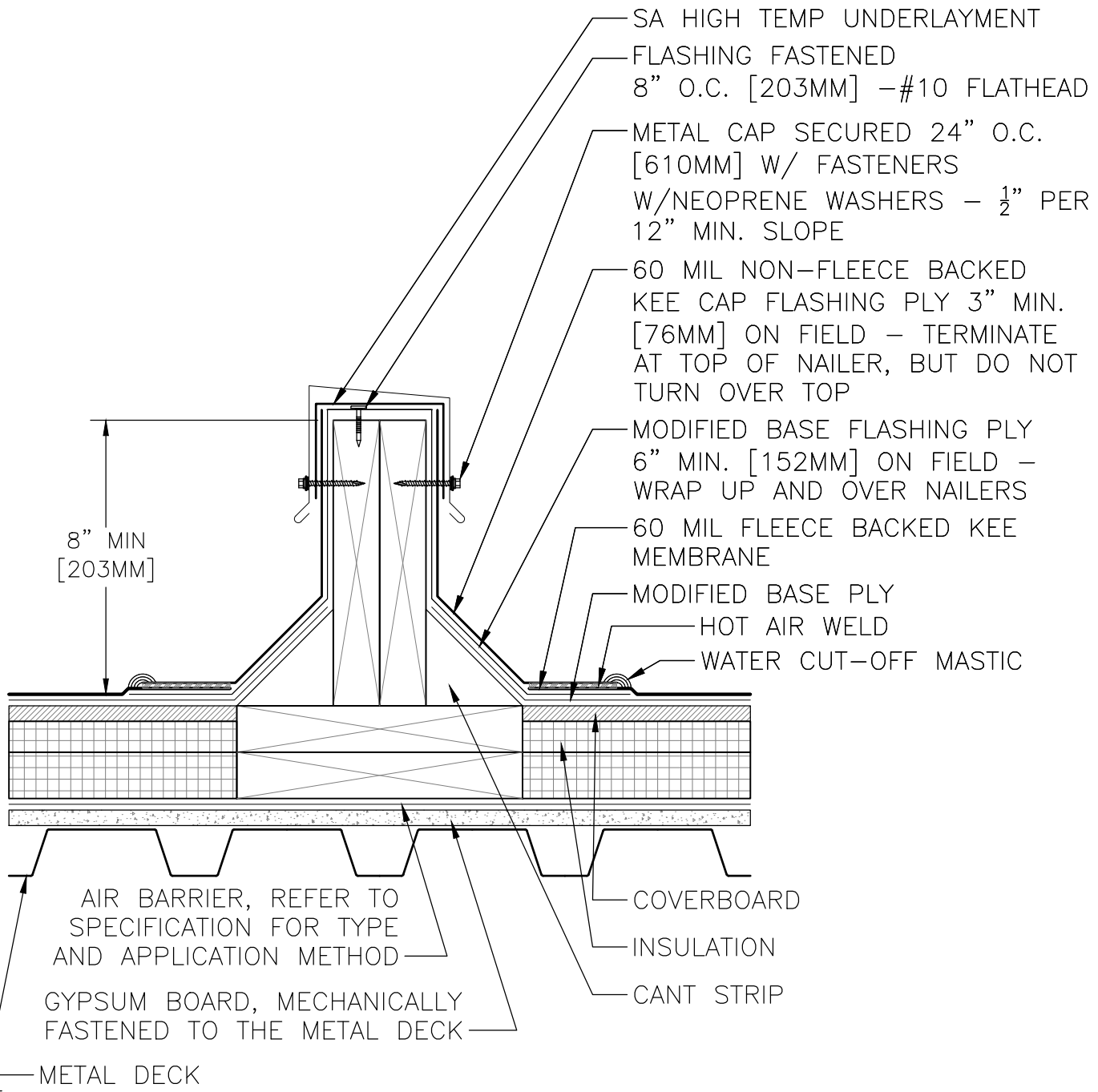
c. Elongation at Break (%), ASTM D 751, Proc. B, Strip

1) 35.0%

F. Flashing Ply Adhesive:

1. KEE-Lock Flashing Adhesive: Modified Silane, roller-grade adhesive.
   a. Density (ASTM D 1475) 10.8 lbs./gal.
   b. Viscosity (ASTM D 2556) 900,000 cP.
2. Green-Lock Plus Flashing Adhesive: Cold applied solvent free flashing adhesive: low 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. 122,500 cPS
   d. Flash Point ASTM D 93 375 deg. F min. (191 deg. C)

END OF SECTION



NOTE:

1. REFERENCE SPECIFICATION FOR MEMBRANE ADHESIVE TYPE, AND INSULATION/COVER BOARD TYPE AND ATTACHMENT METHOD.
2. ASSURE ROOF AIR BARRIER PROPERLY TIES INTO WALL SYSTEM AIR BARRIER, IF PRESENT.

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

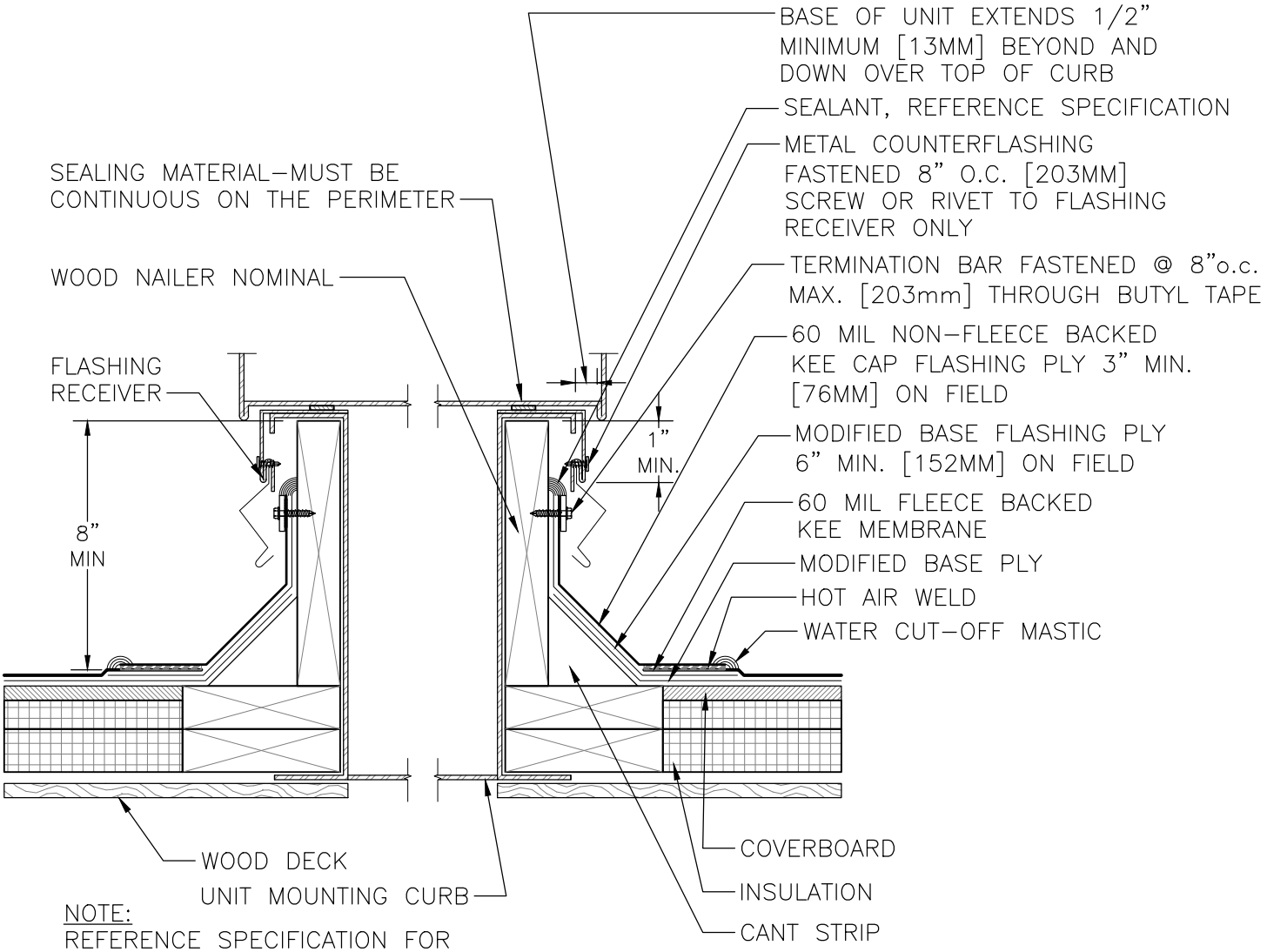
AREA DIVIDER

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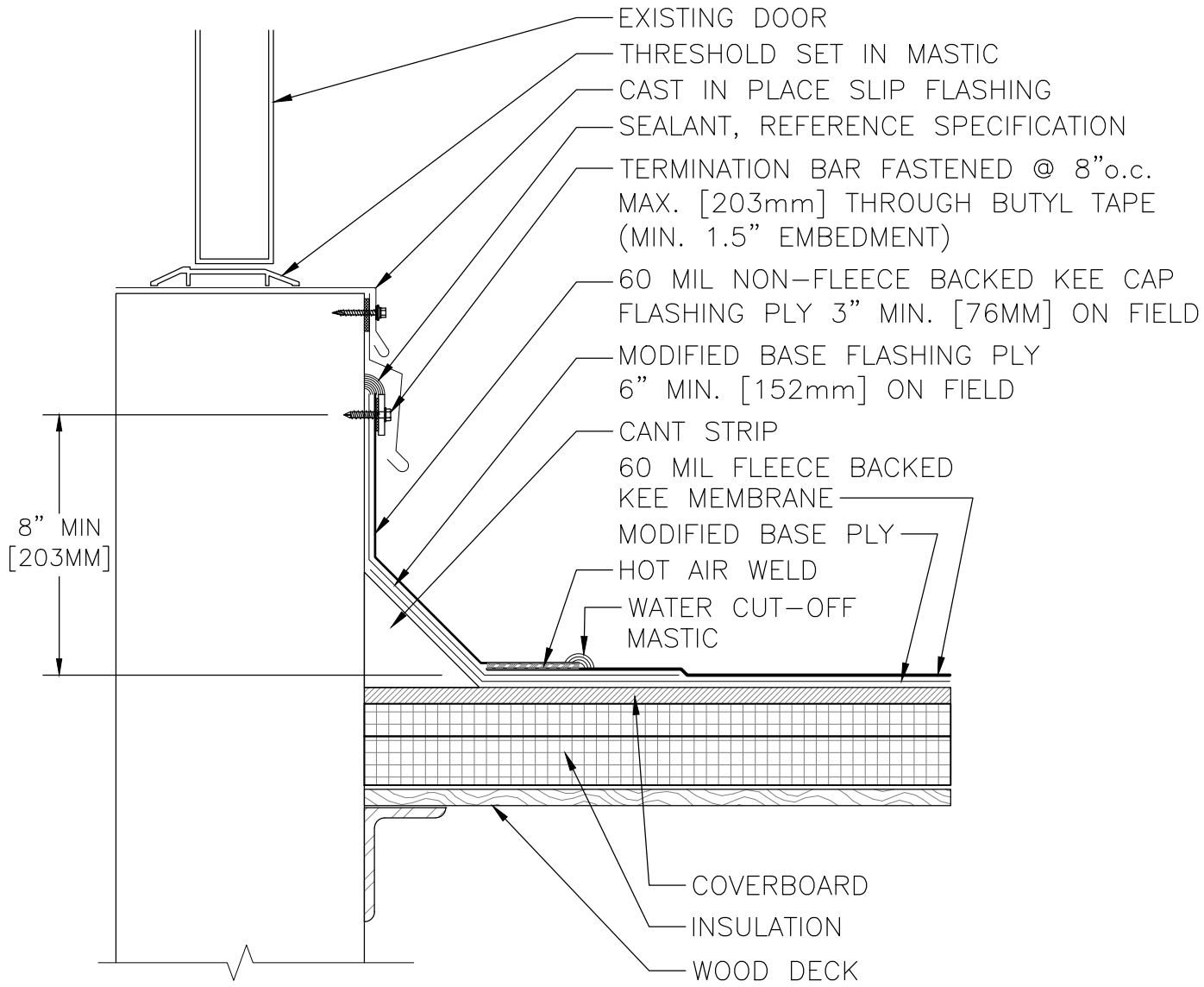
CURB DETAIL / AIR HANDLING STATION

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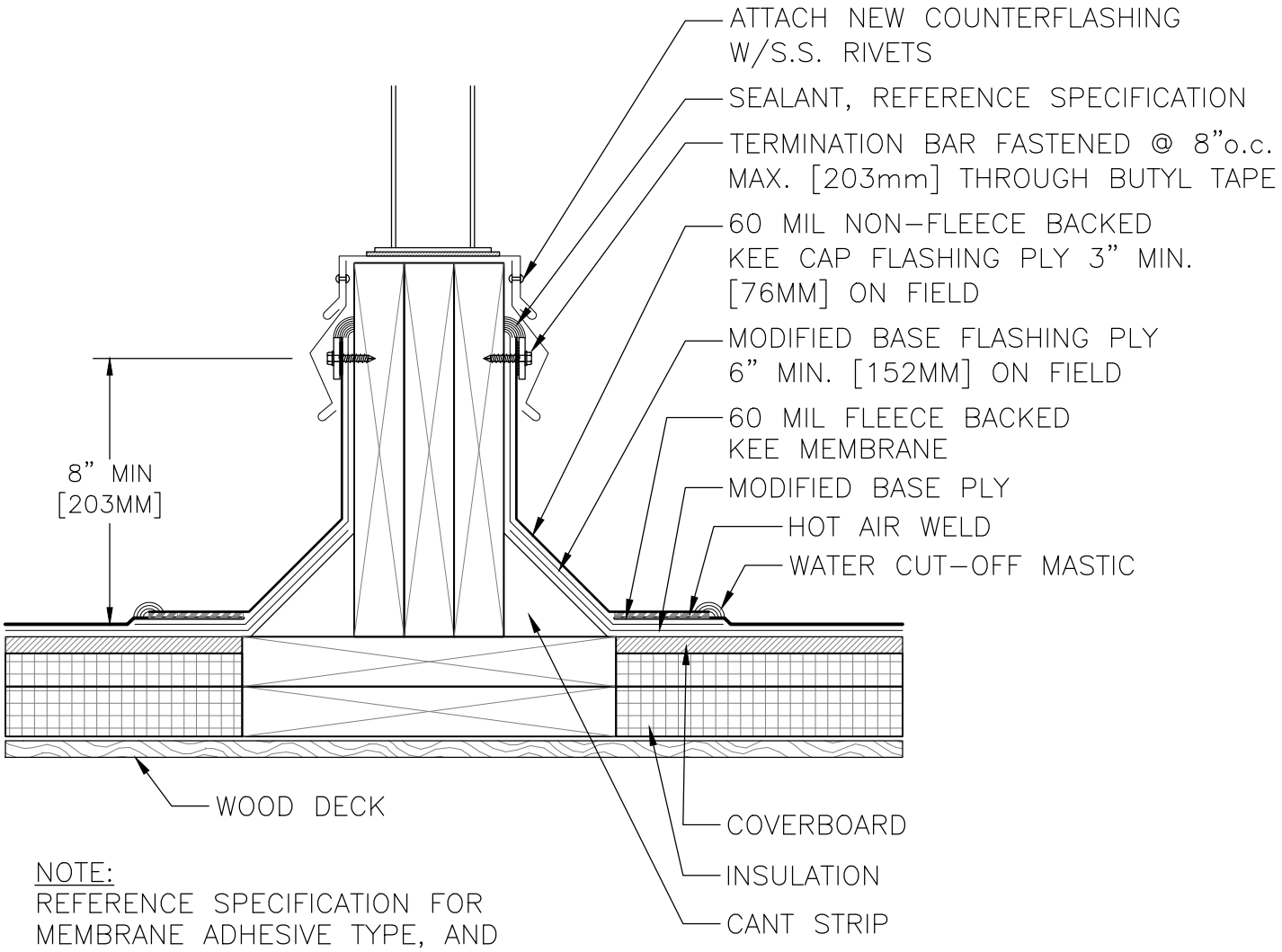
DOOR THRESHOLD DETAIL

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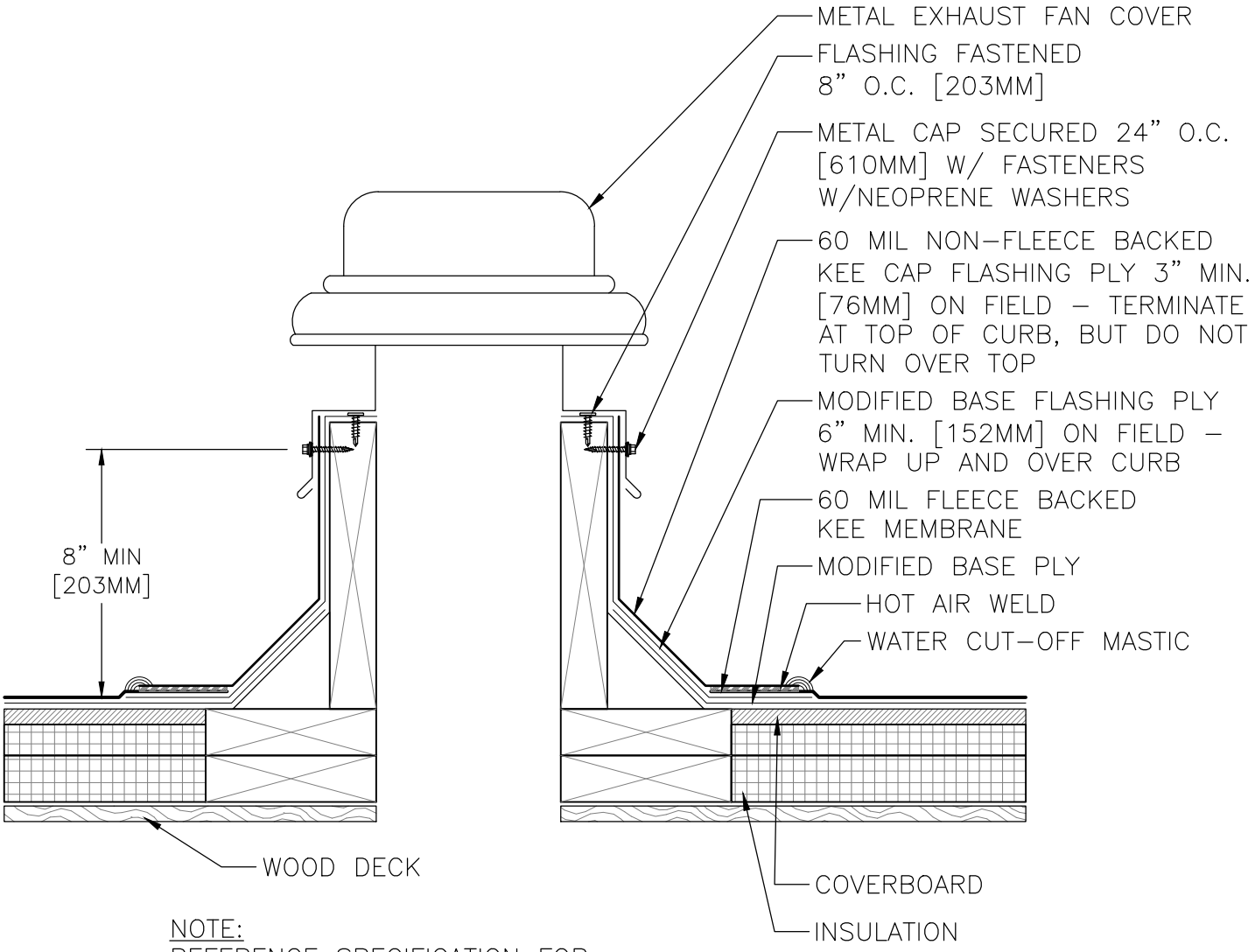
EQUIPMENT SUPPORT - EXISTING

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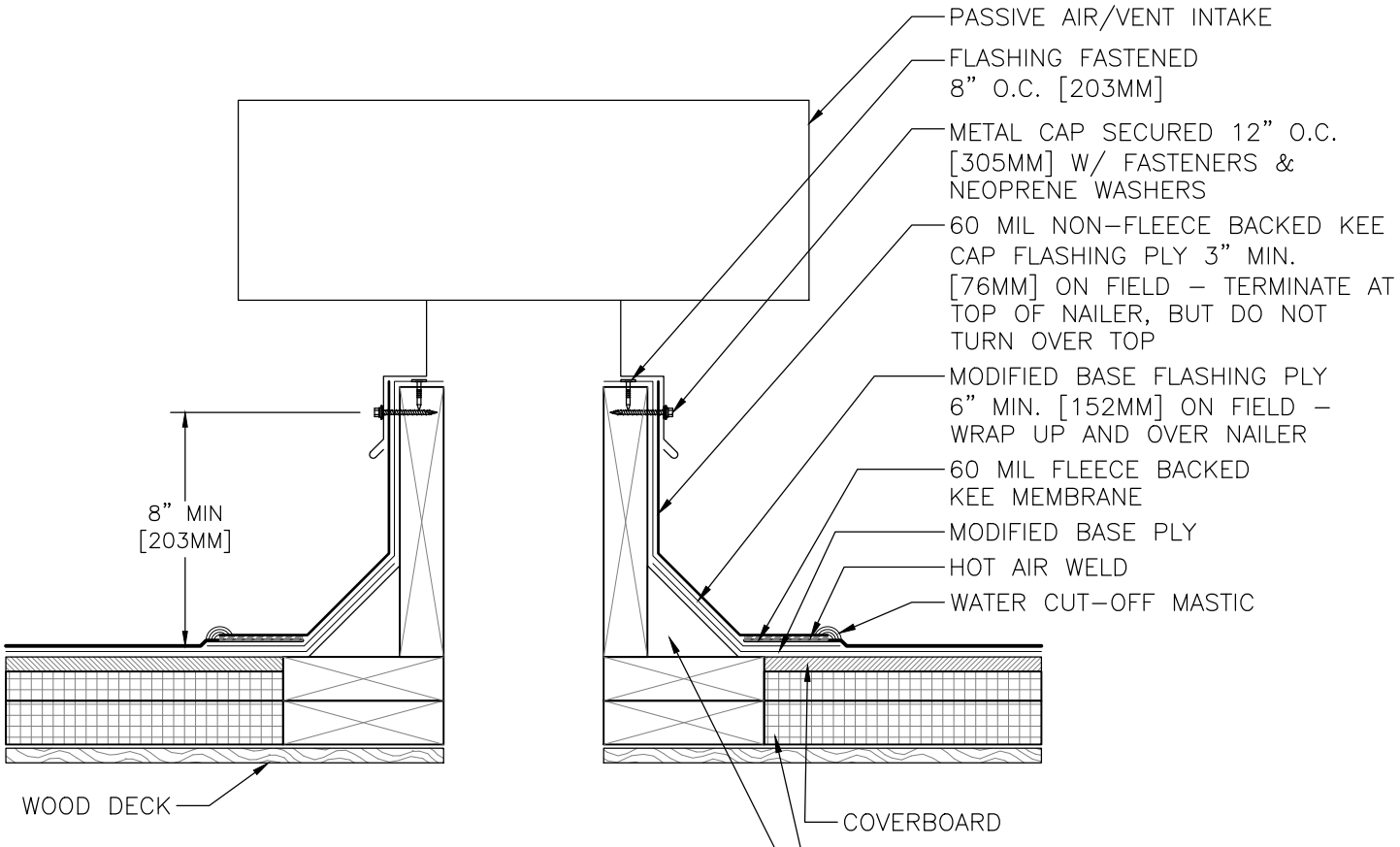
EXHAUST FAN

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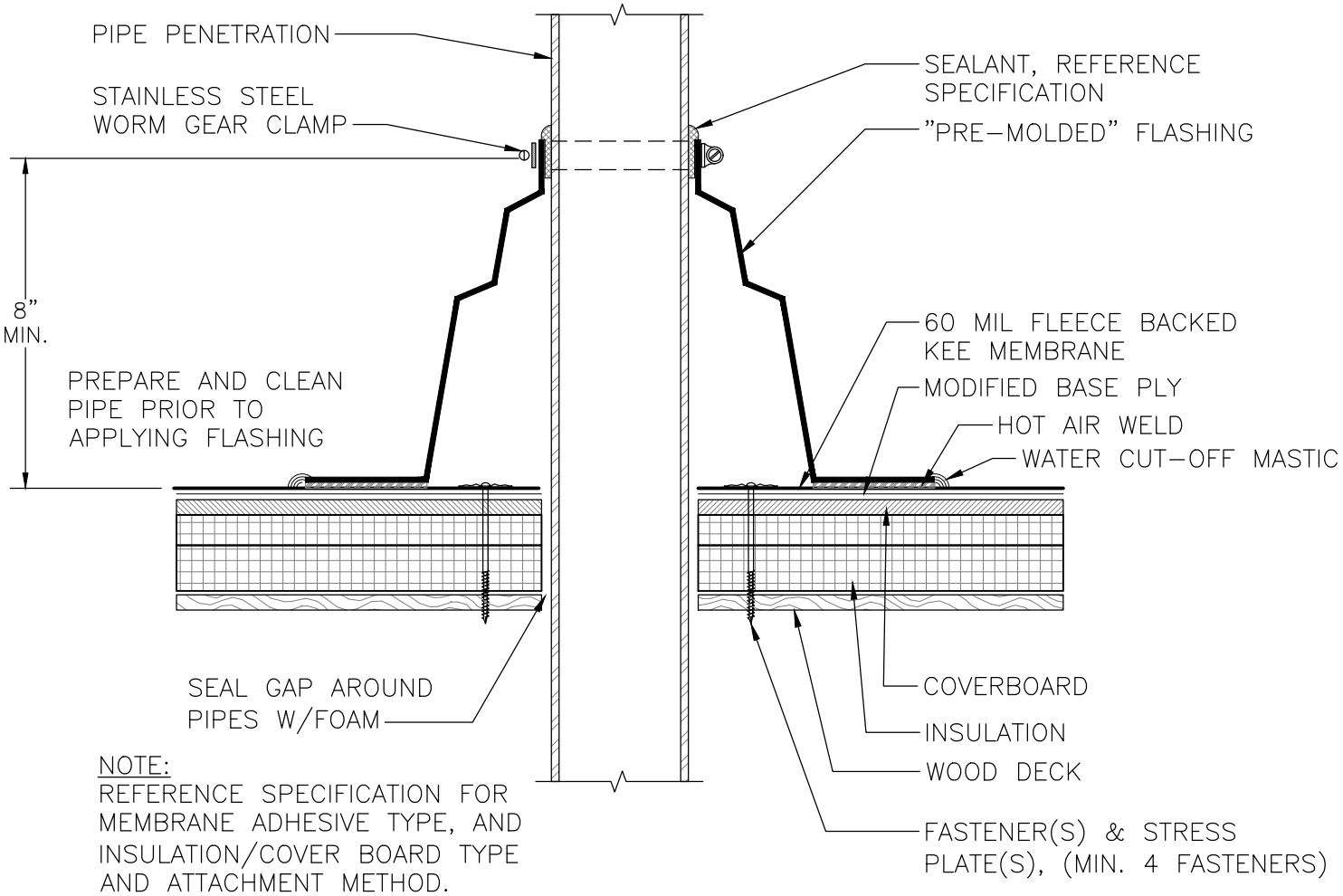
PASSIVE AIR / VENT INTAKE

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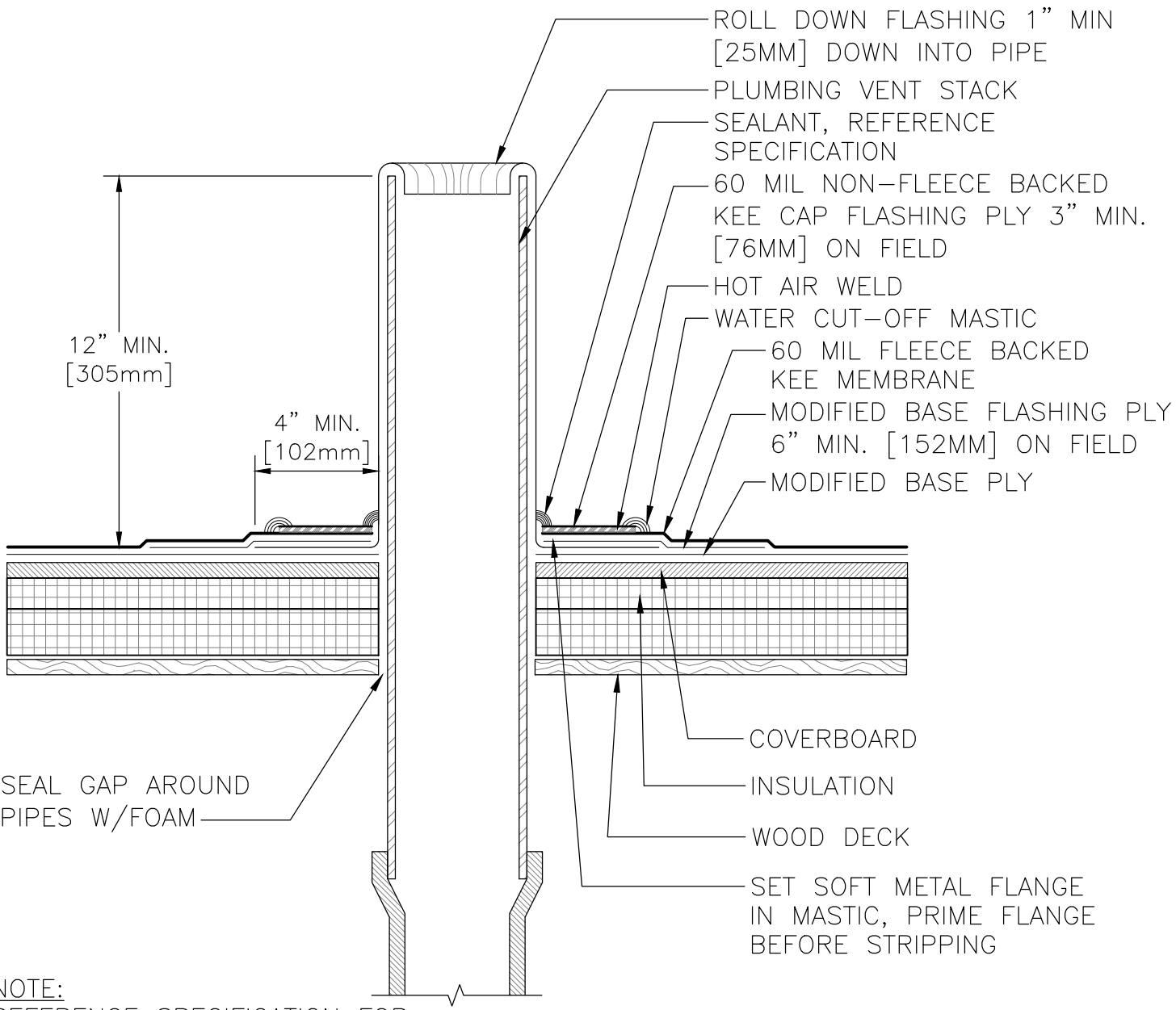
PIPE/TUBE PENETRATION - PRE-MOLDED FLASHING

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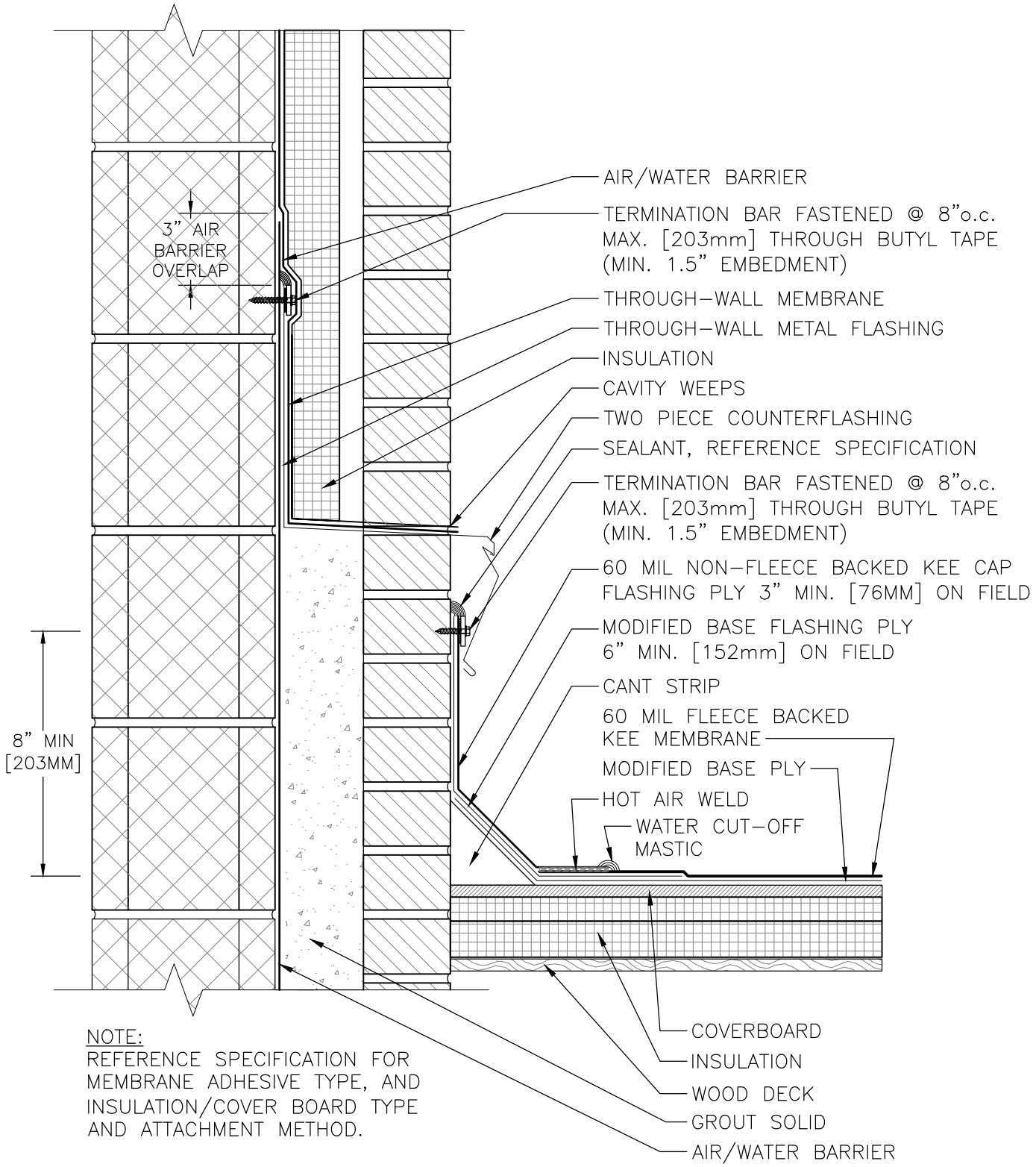
PLUMBING STACK

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

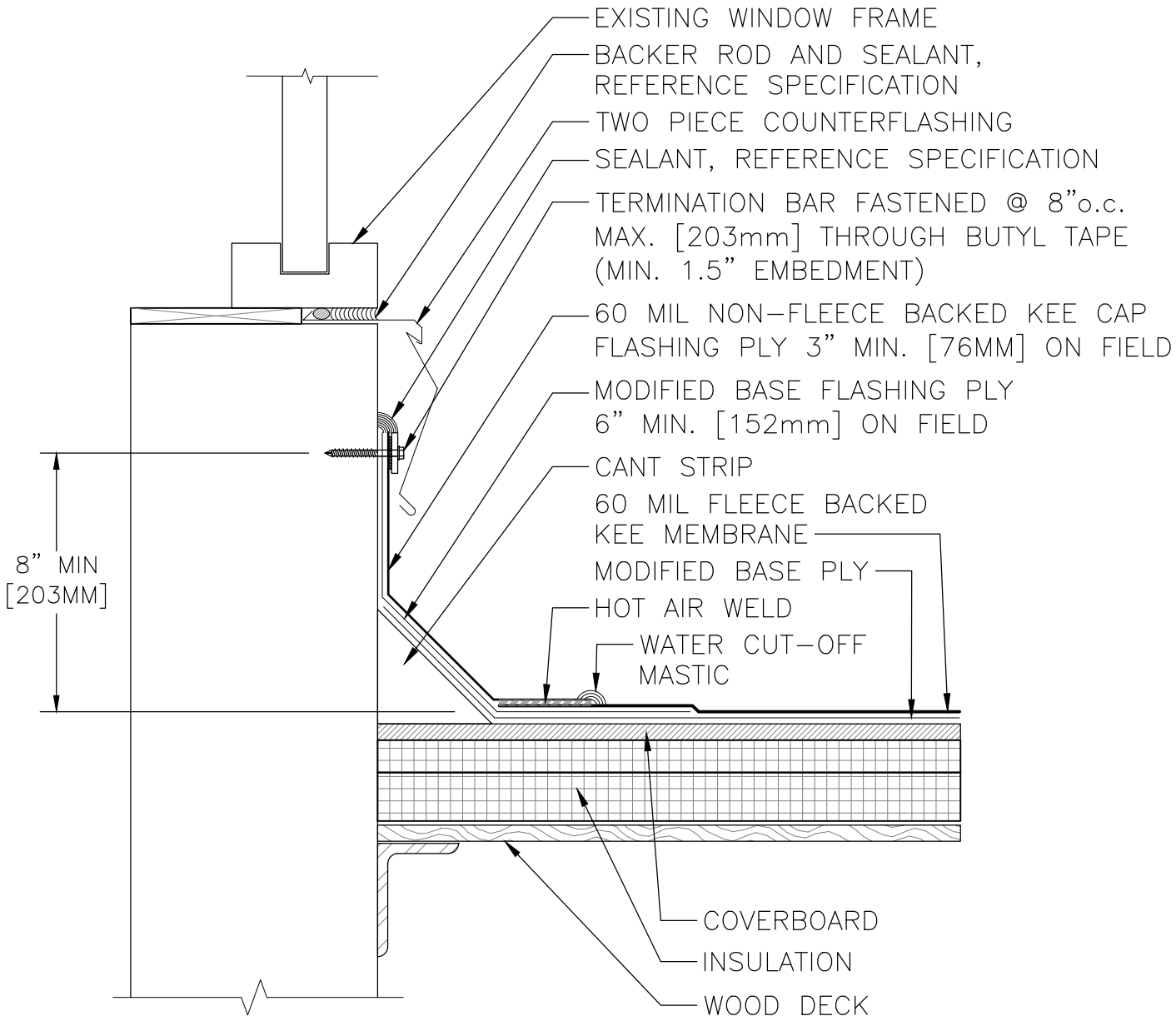
WALL FLASHING WITH THROUGH-WALL FLASHING

since 1895

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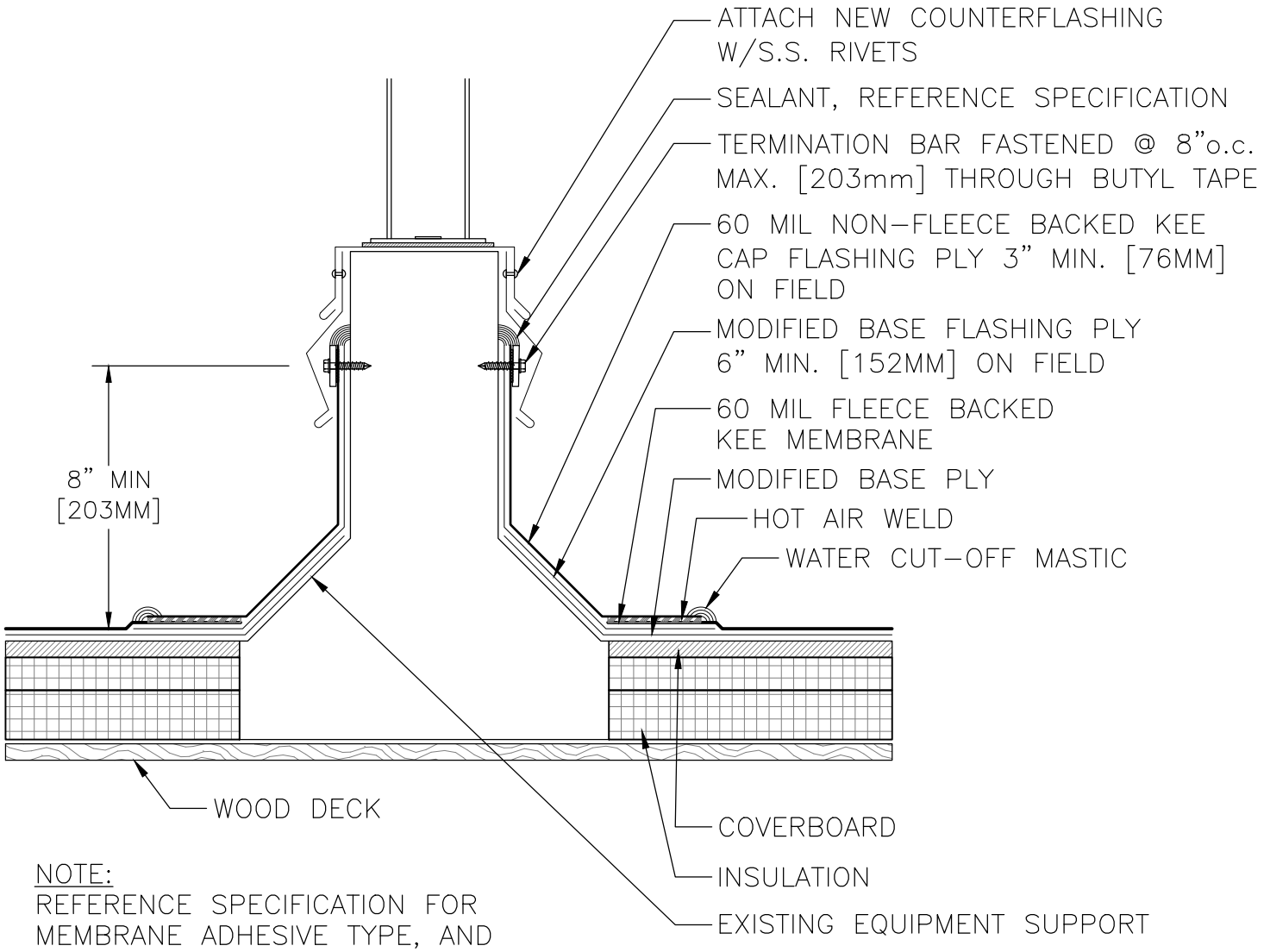
WINDOW SILL FLASHING

since 1895

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

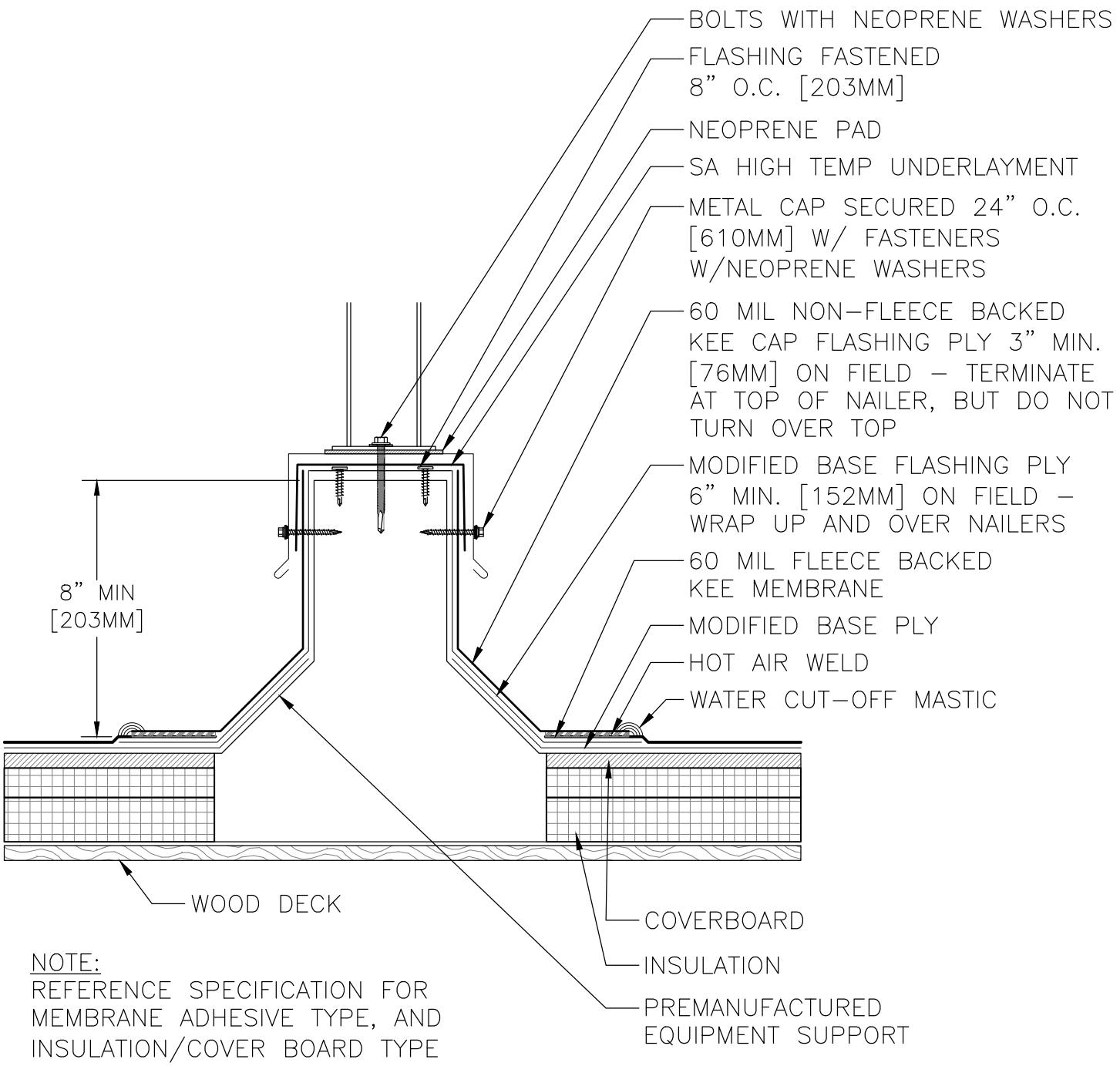
EQUIPMENT SUPPORT - PREMANUFACTURED - EXISTING

since 1895

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

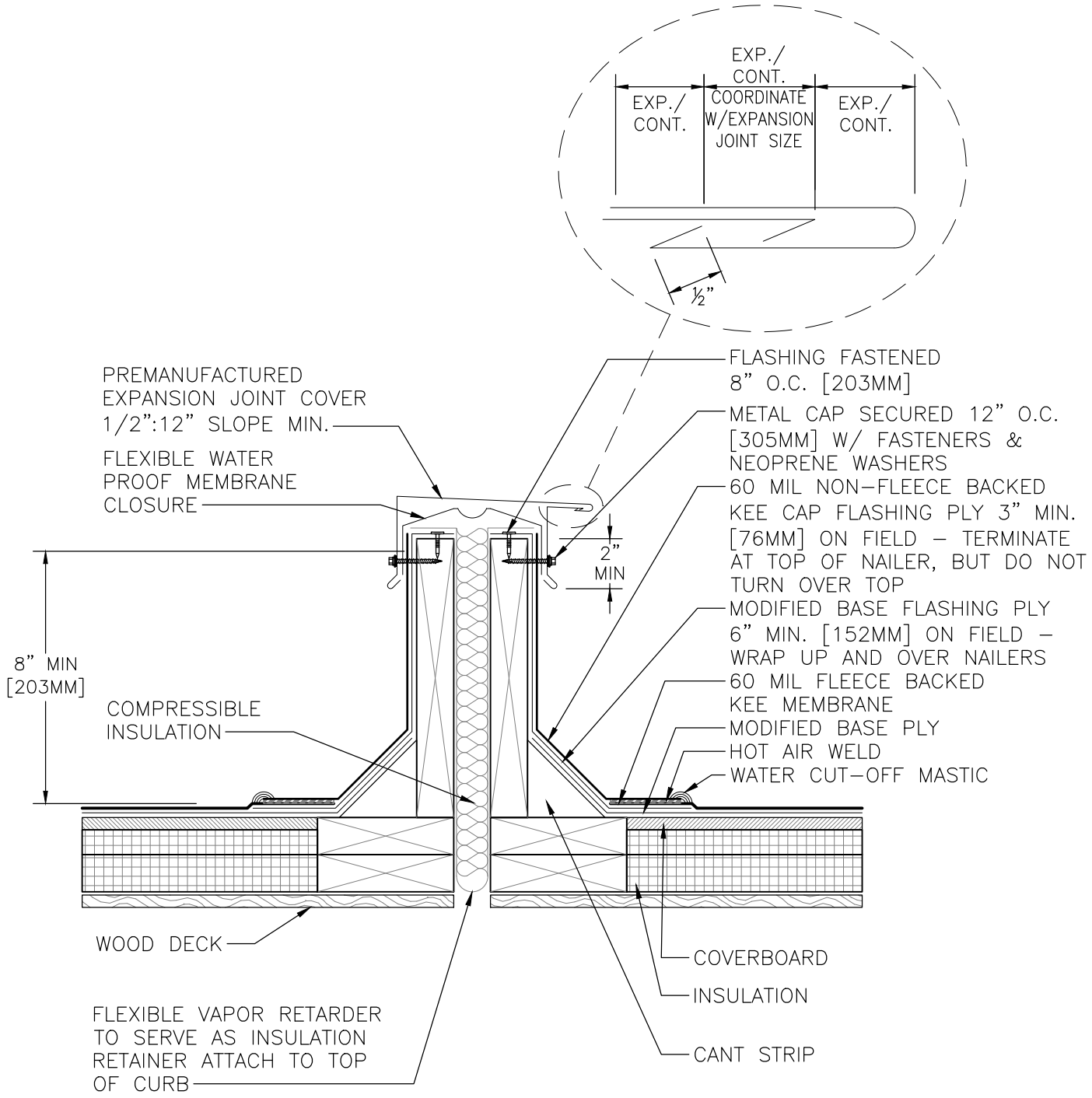
EQUIPMENT SUPPORT PREMANUFACTURED - NEW CONSTRUCTION

GARLAND
since 1895

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

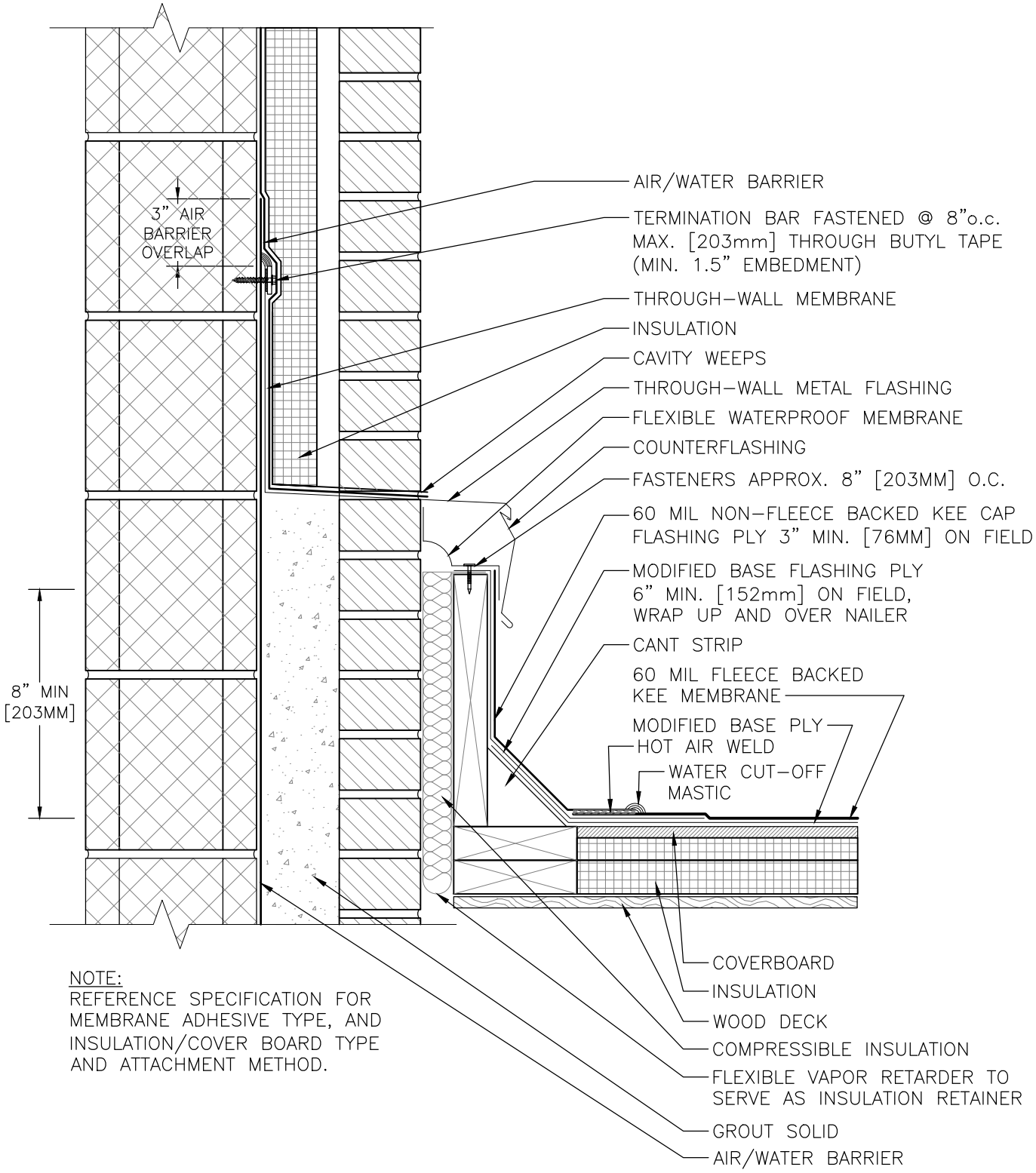
EXPANSION JOINT

since 1895

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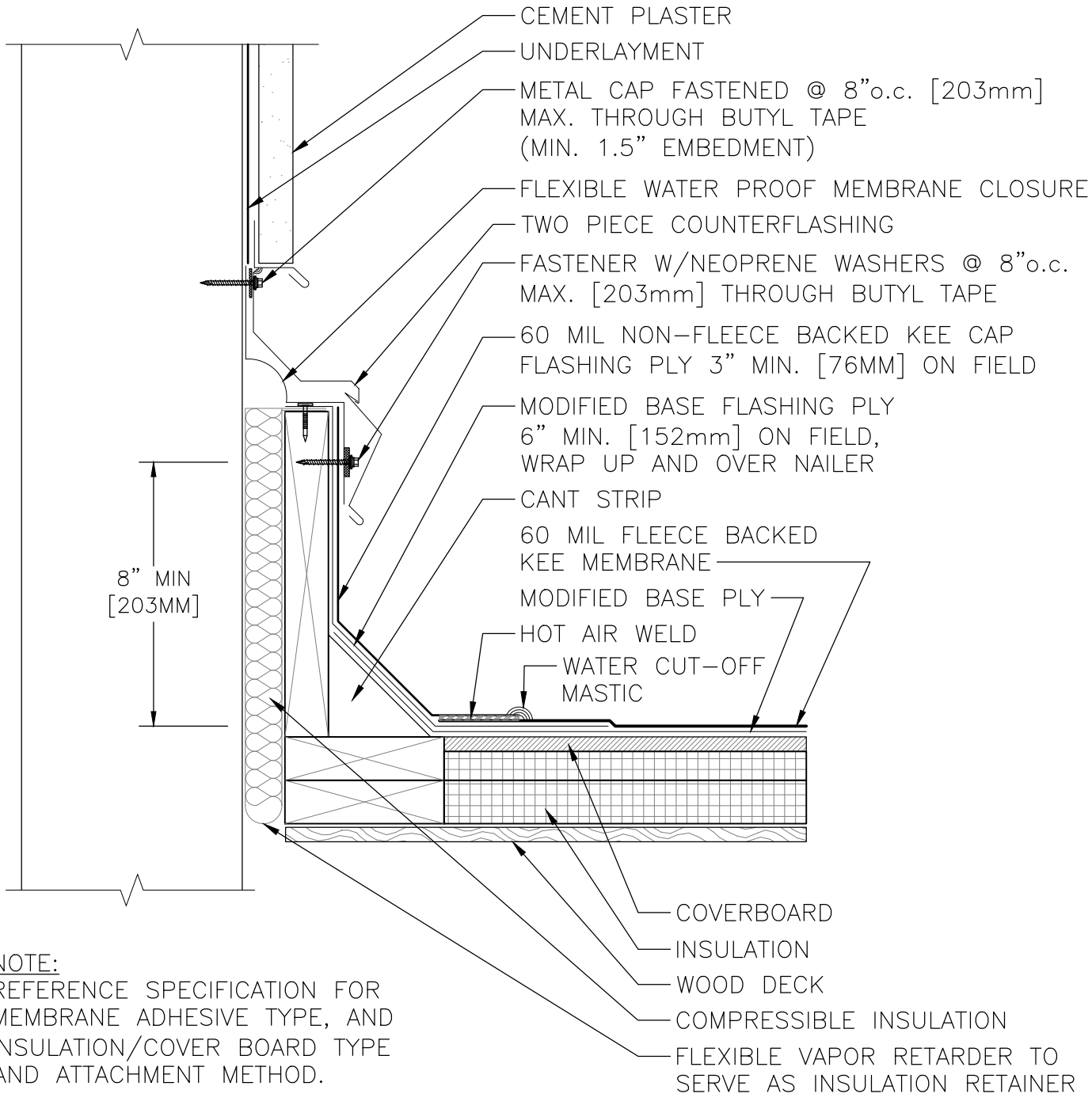
EXPANSION JOINT AT WALL WITH THROUGH-WALL FLASHING

GARLAND
since 1895

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

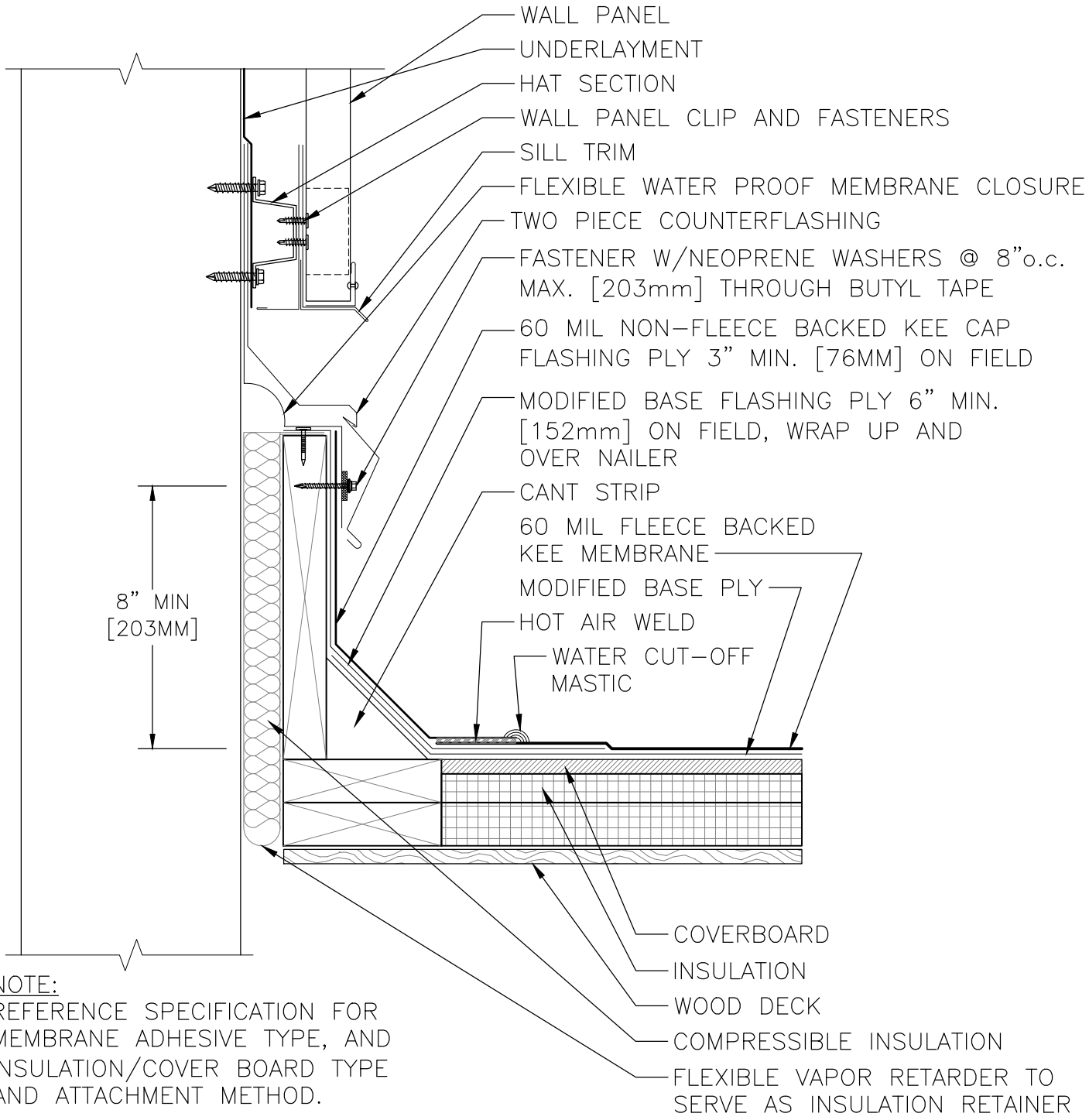
EXPANSION JOINT AT WALL WITH CEMENT PLASTER

GARLAND since 1895

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

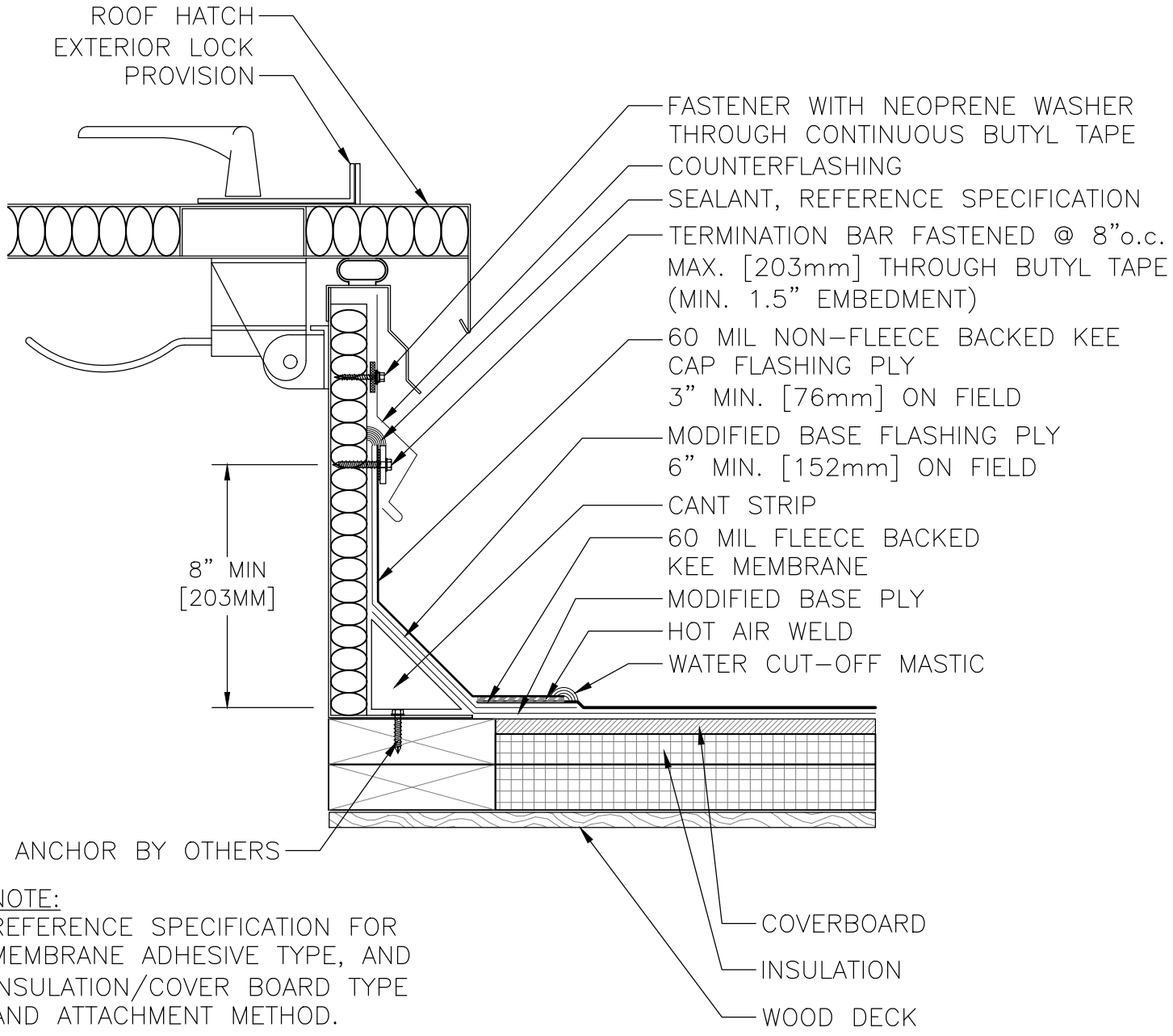
EXPANSION JOINT AT WALL WITH WALL PANEL

since 1895

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DRAWINGS ON $8\frac{1}{2}$"x11 TITLE BLOCKS ARE NOT TO SCALE.

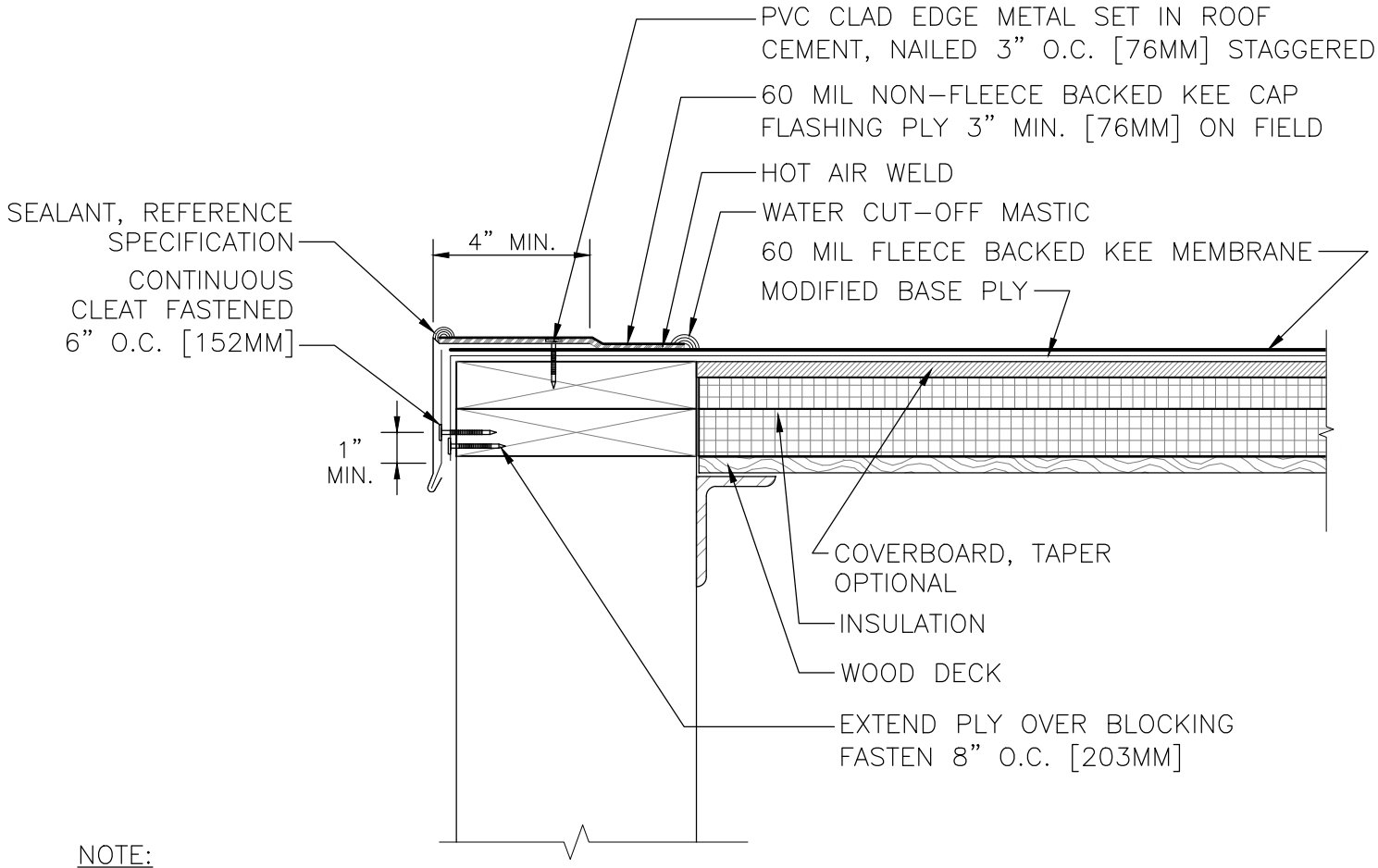
HATCH DETAIL

since 1895

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

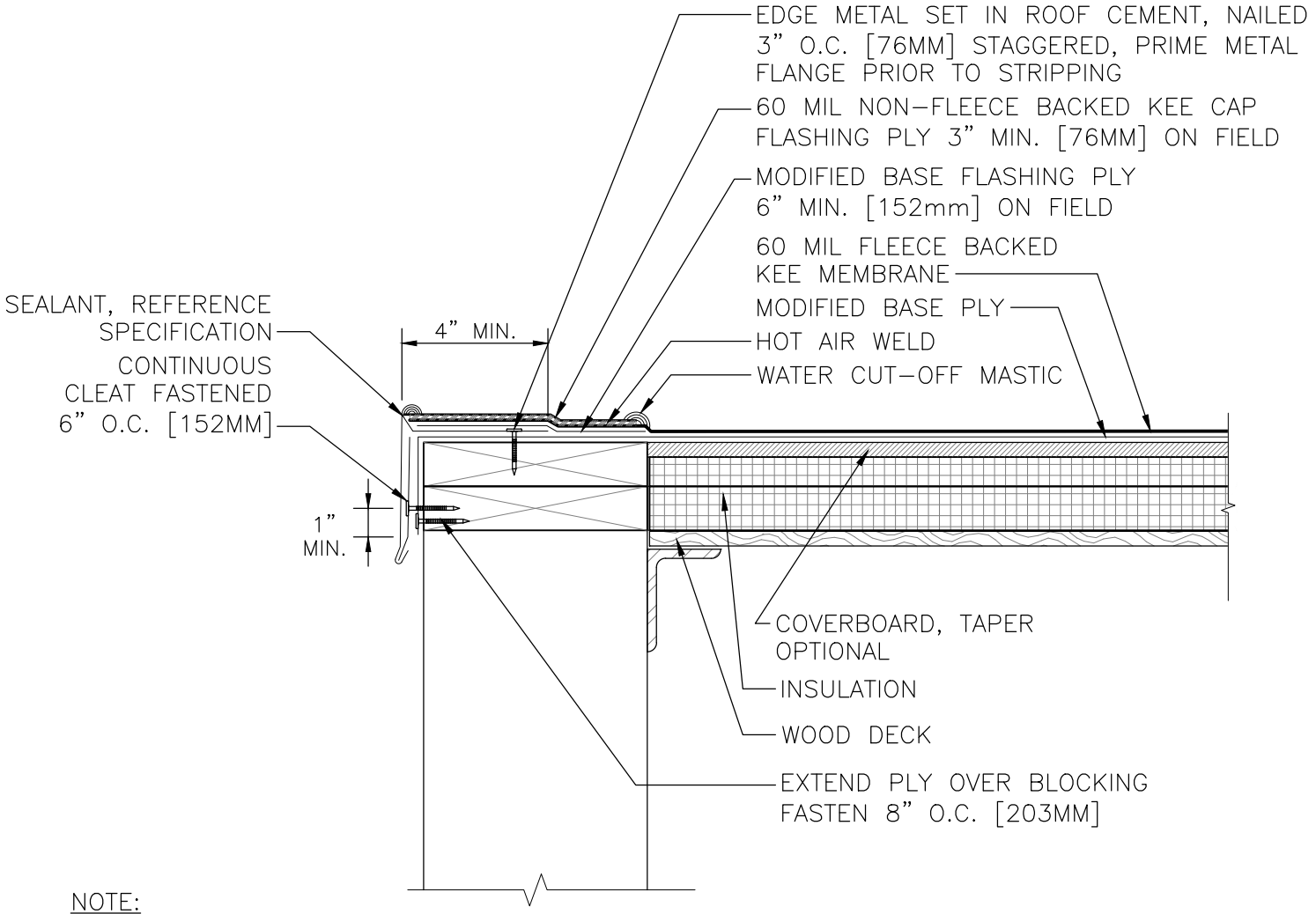
METAL EDGE - DRIP EDGE (ALTERNATE) w/PVC CLAD EDGE METAL

since 1895

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DRAWINGS ON $8\frac{1}{2}$"x11 TITLE BLOCKS ARE NOT TO SCALE.

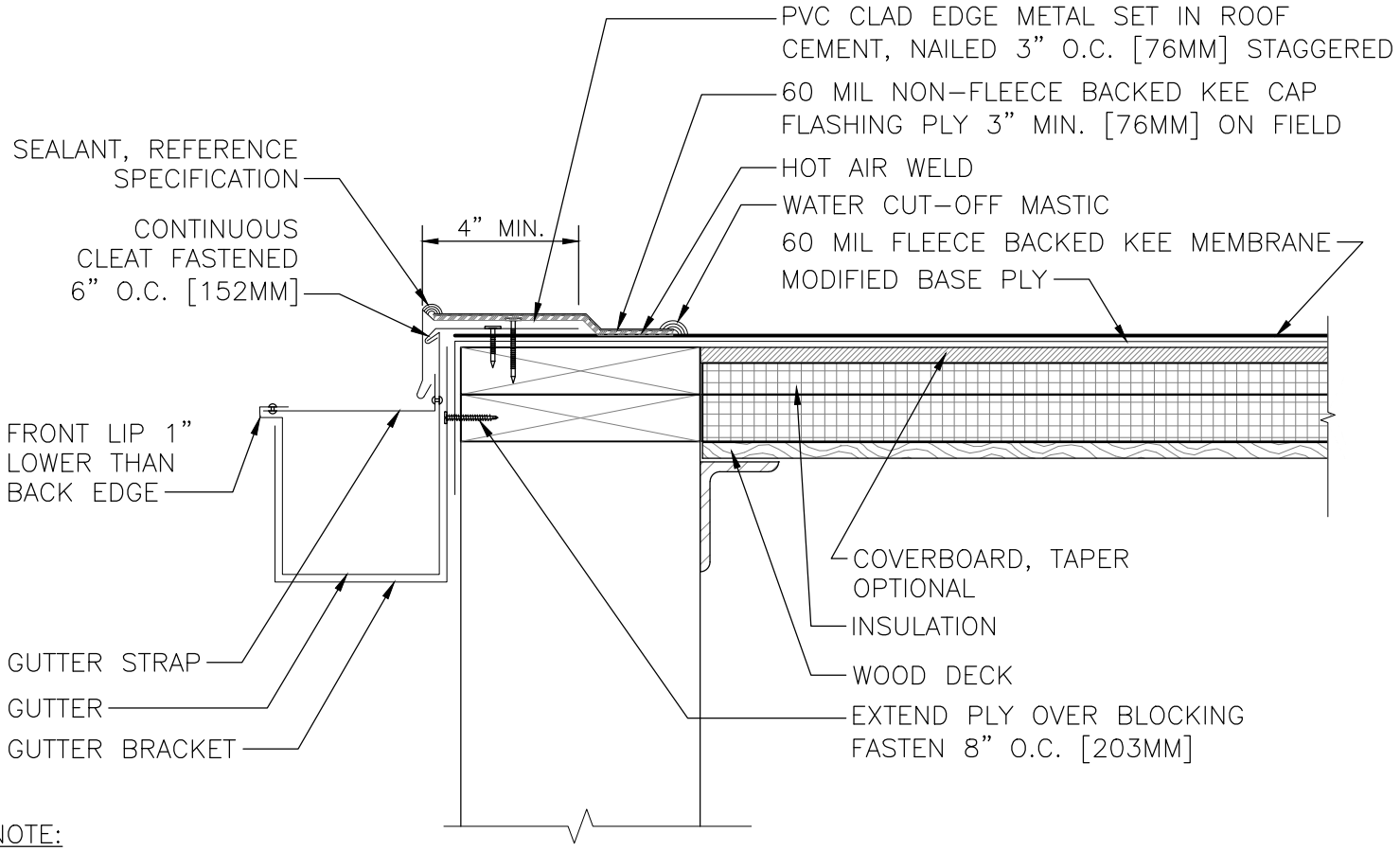
METAL EDGE - DRIP EDGE

since 1895

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NOTE:
1. REFERENCE SPECIFICATION FOR MEMBRANE ADHESIVE TYPE, AND INSULATION/COVER BOARD TYPE AND ATTACHMENT METHOD.
2. INSTALL COMPONENTS TO MAINTAIN POSITIVE DRAINAGE TO THE GUTTER.

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

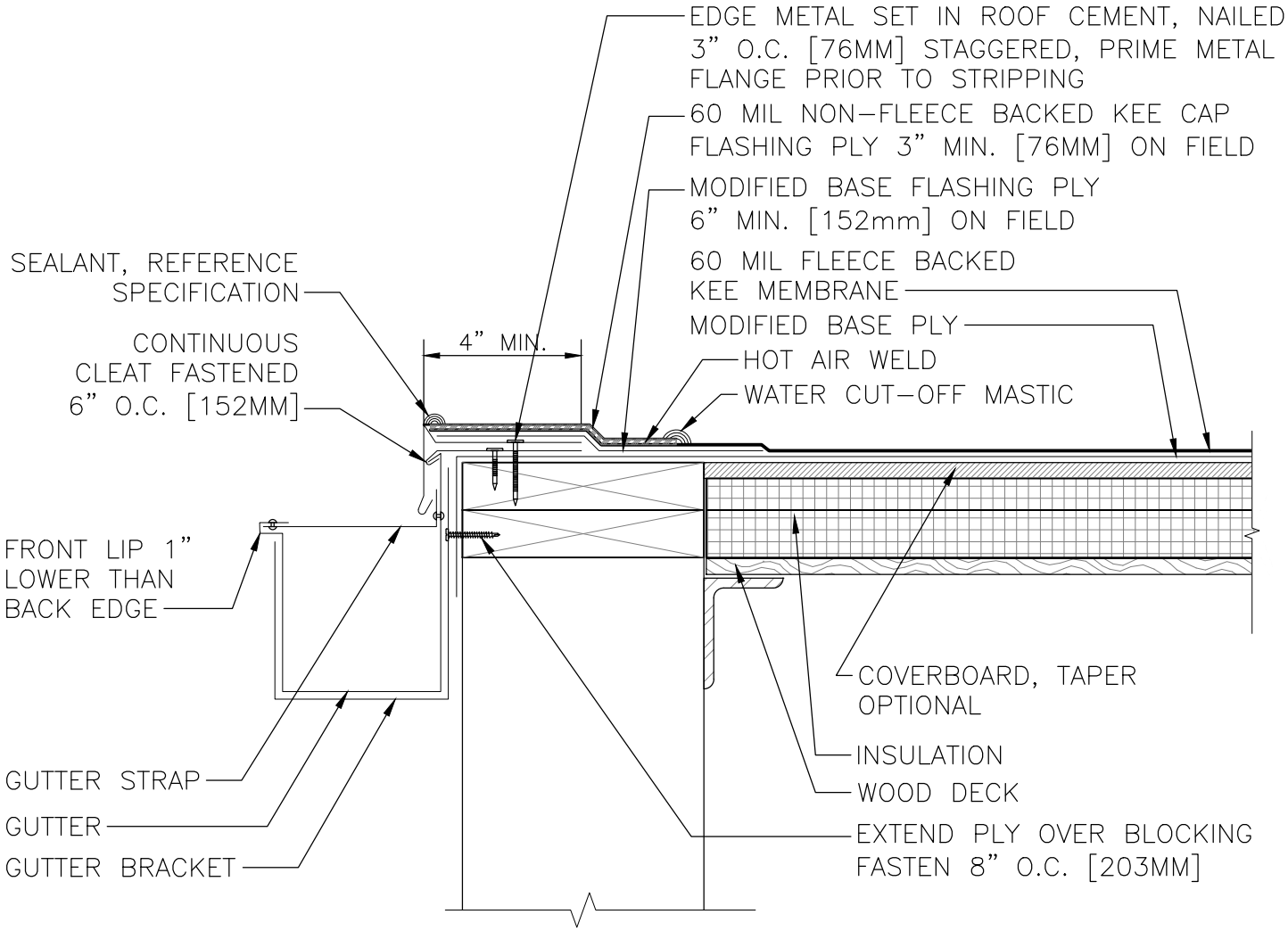
METAL EDGE - DRIP EDGE w/GUTTER (ALTERNATE) w/PVC CLAD EDGE METAL

GARLAND since 1895

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1. REFERENCE SPECIFICATION FOR MEMBRANE ADHESIVE TYPE, AND INSULATION/COVER BOARD TYPE AND ATTACHMENT METHOD.
2. INSTALL COMPONENTS TO MAINTAIN POSITIVE DRAINAGE TO THE GUTTER.

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

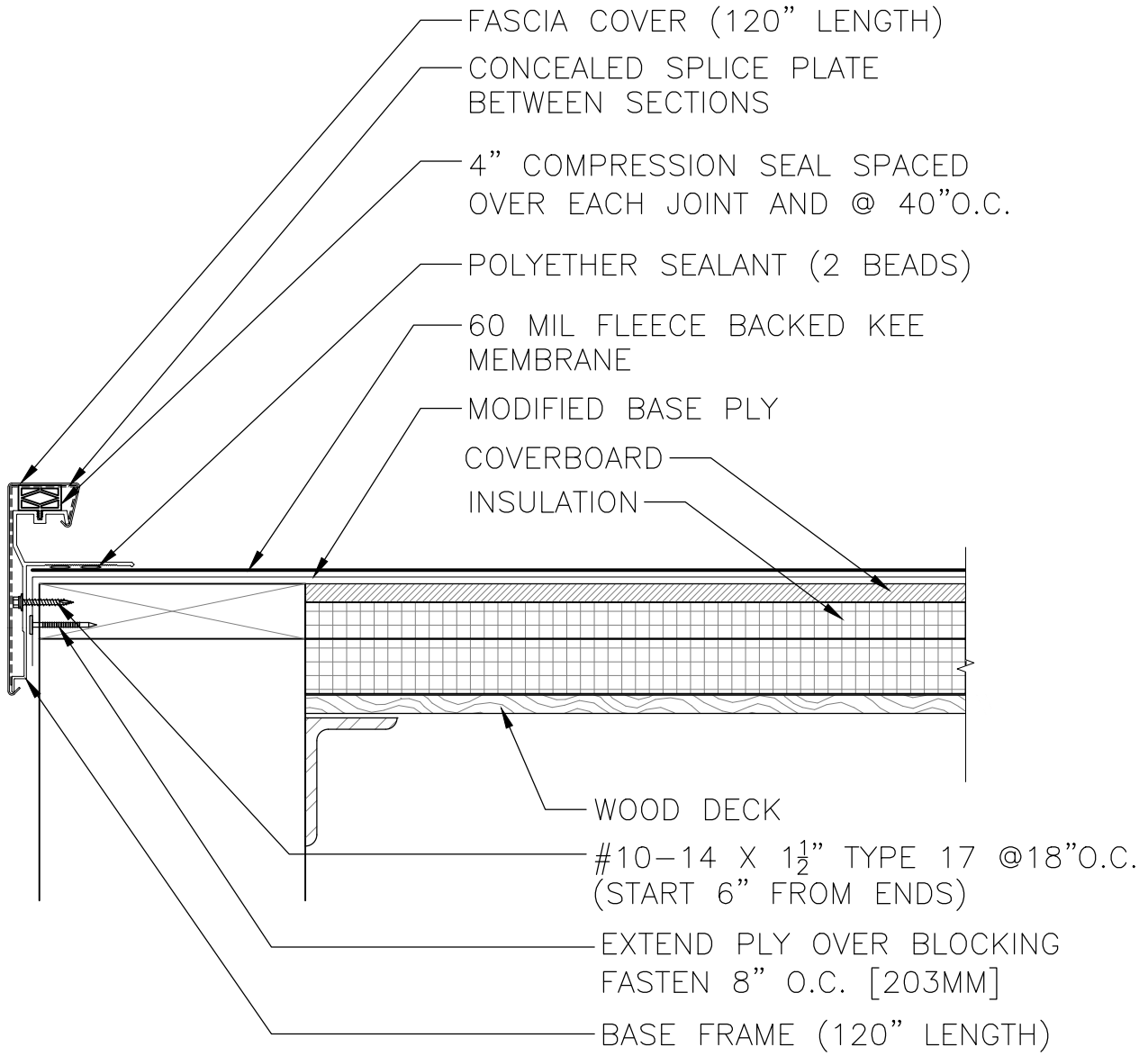
METAL EDGE - DRIP EDGE WITH GUTTER

GARLAND
since 1895

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

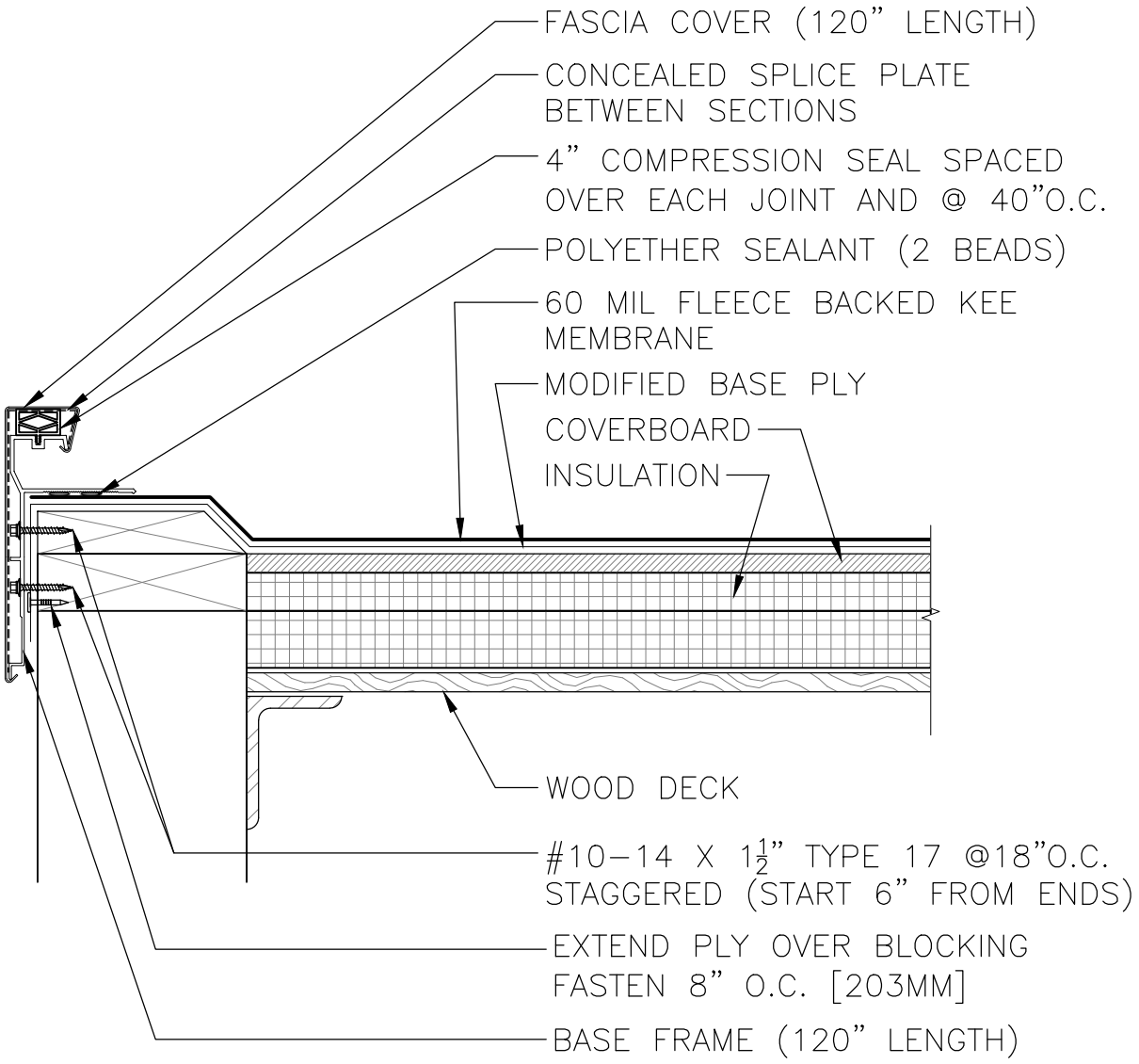
METAL EDGE - ES-1 FLASHLESS SNAP-ON FASCIA

GARLAND
since 1895

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

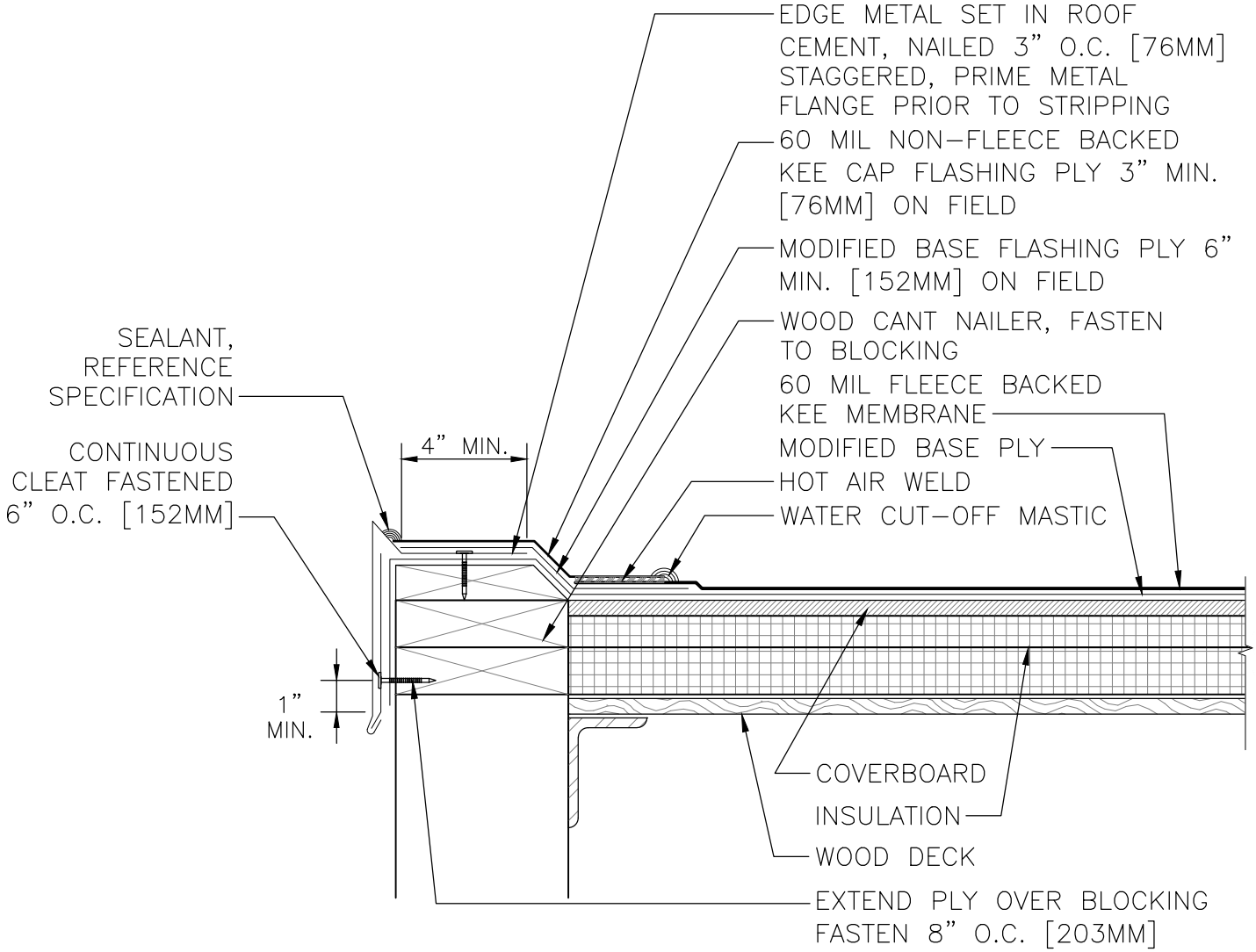
METAL EDGE - ES-1 FLASHLESS SNAP-ON FASCIA -RAISED

since 1895

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

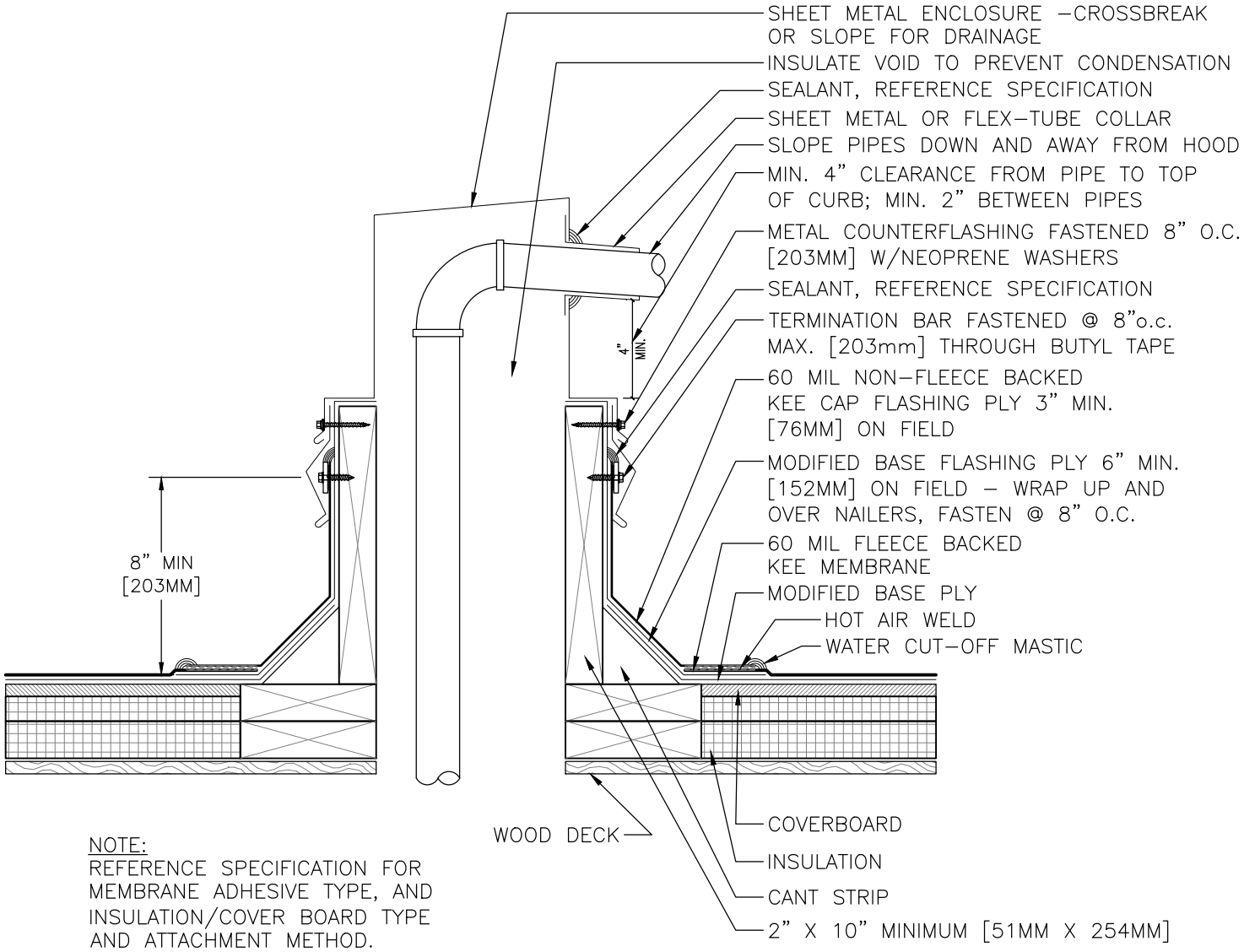
METAL EDGE - RAISED

since 1895

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DRAWINGS ON $8\frac{1}{2}$"x11 TITLE BLOCKS ARE NOT TO SCALE.

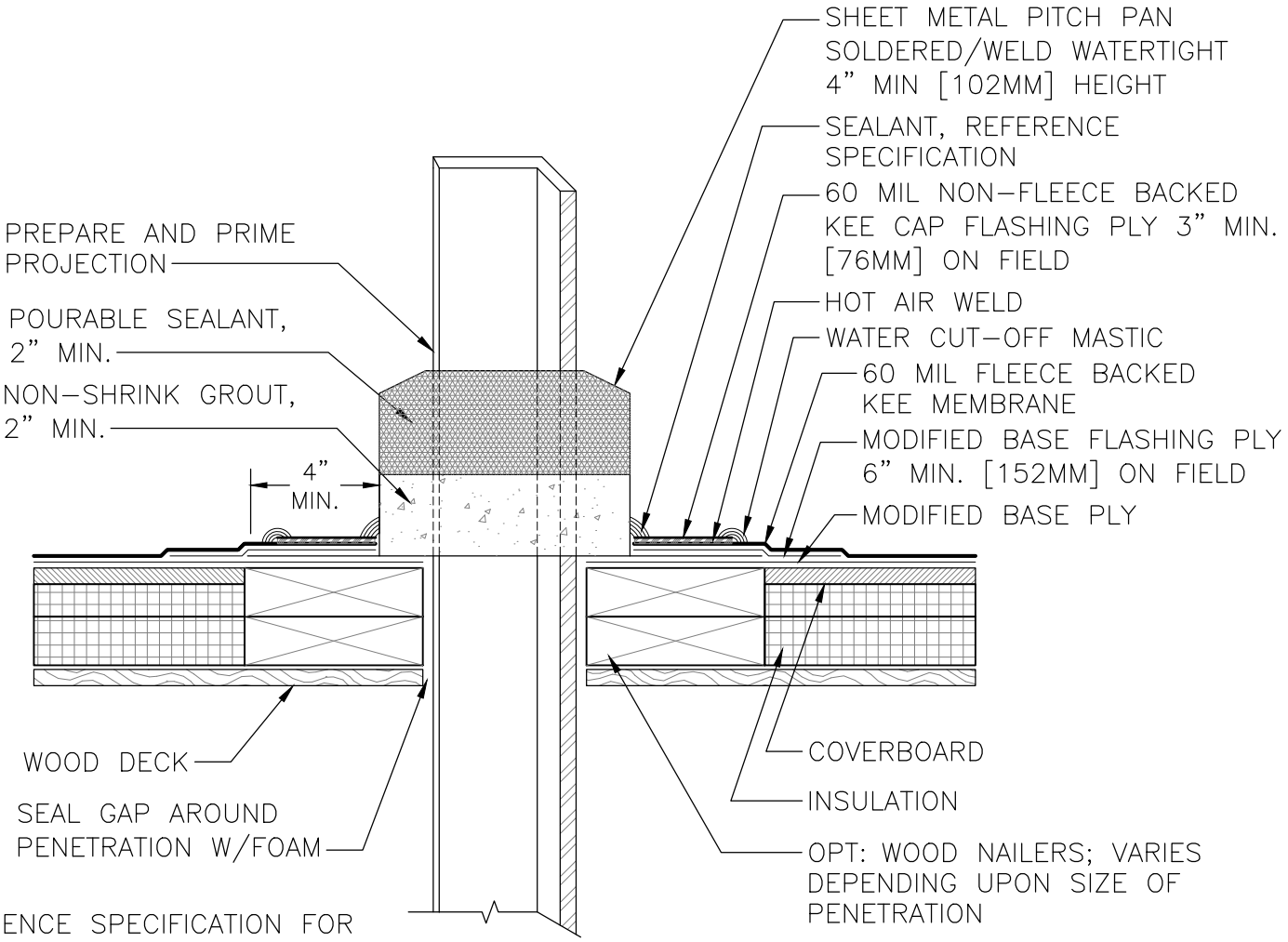
PIPE HOUSING

GARLAND
since 1895

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DRAWINGS ON $8\frac{1}{2}$"x11 TITLE BLOCKS ARE NOT TO SCALE.

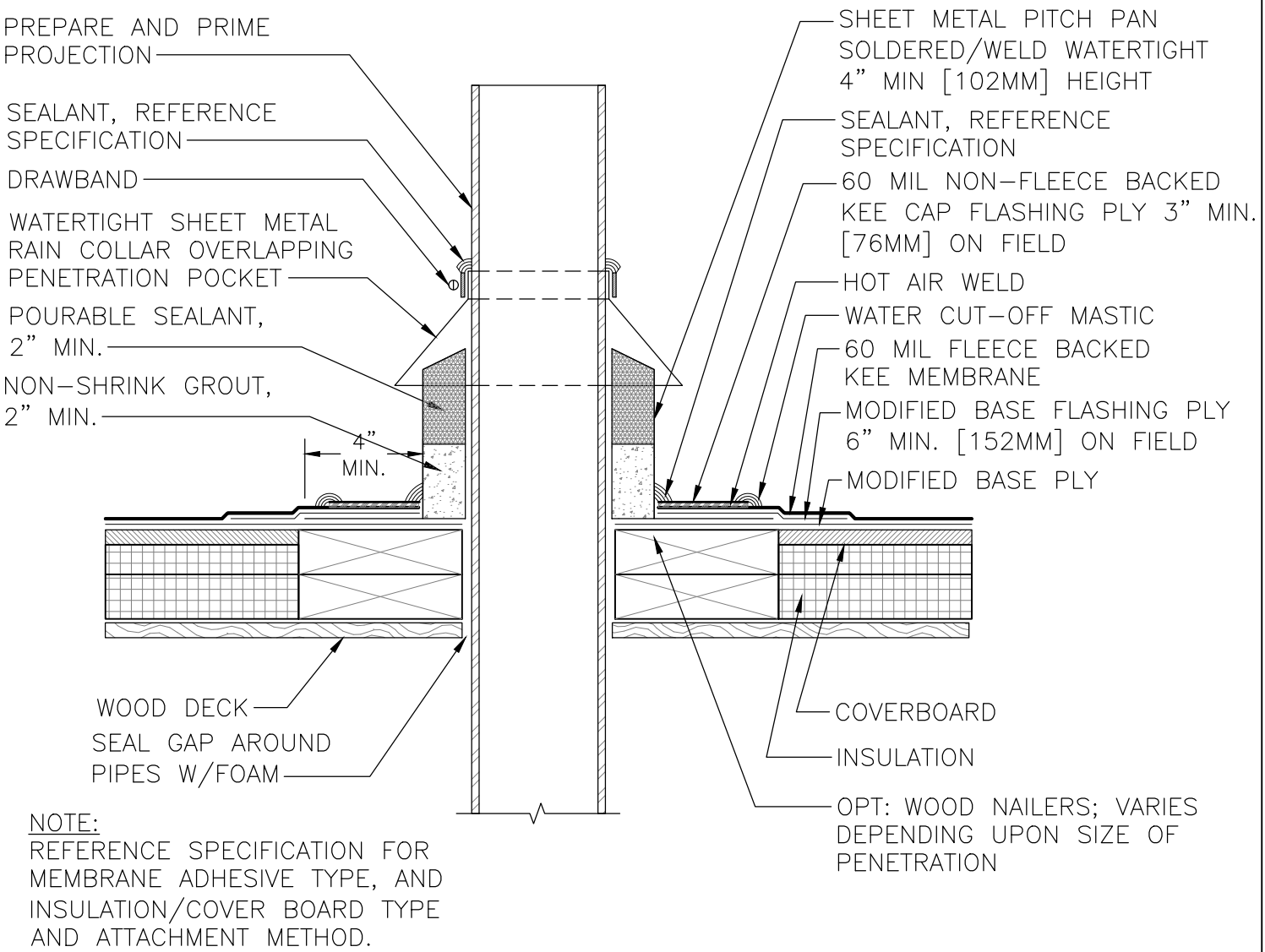
PITCH POCKET (STEEL ANGLE)

GARLAND
since 1895

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

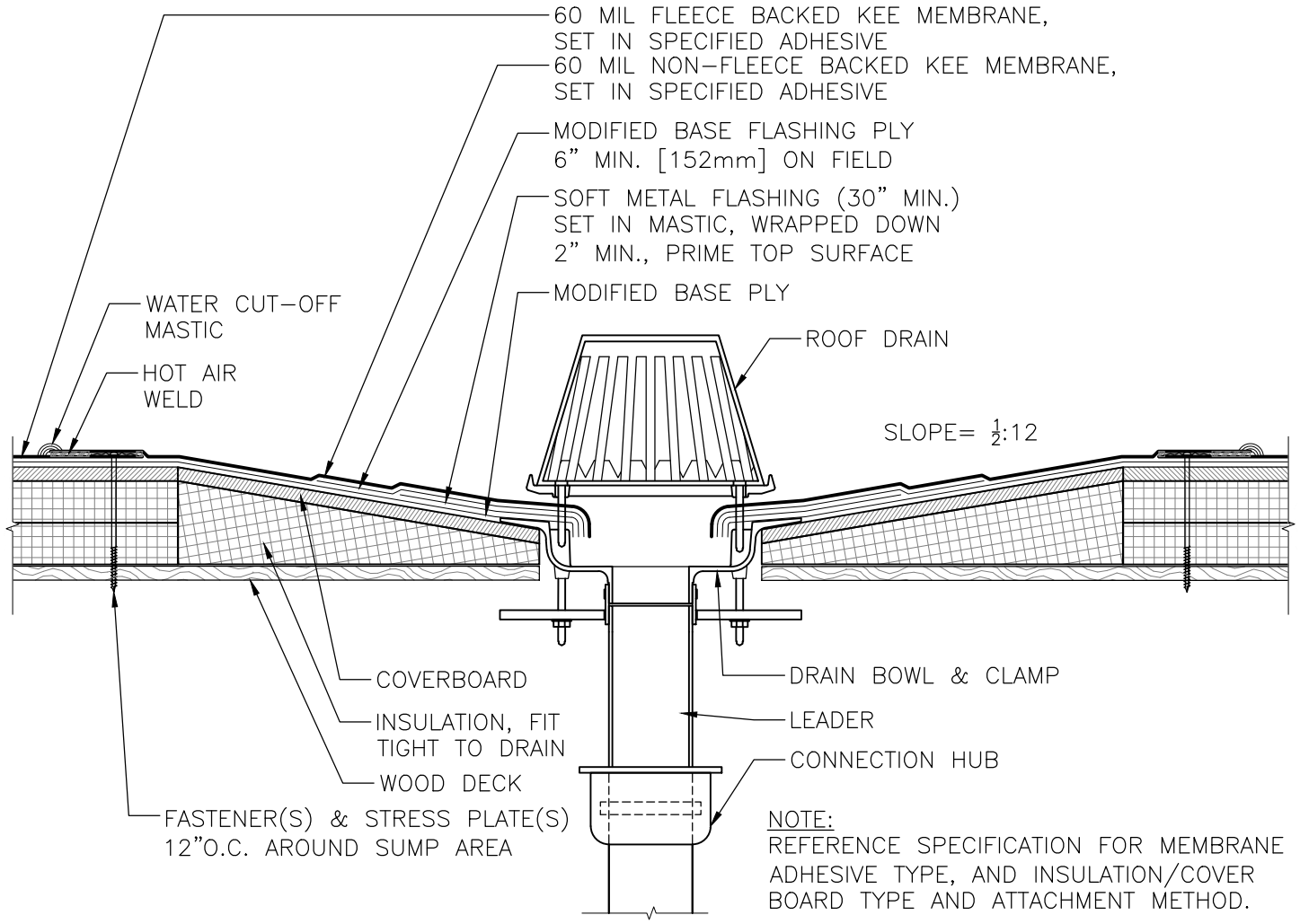
PITCH POCKET (PIPE)

since 1895

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DRAWINGS ON 8 1/2"x11 TITLE BLOCKS ARE NOT TO SCALE.

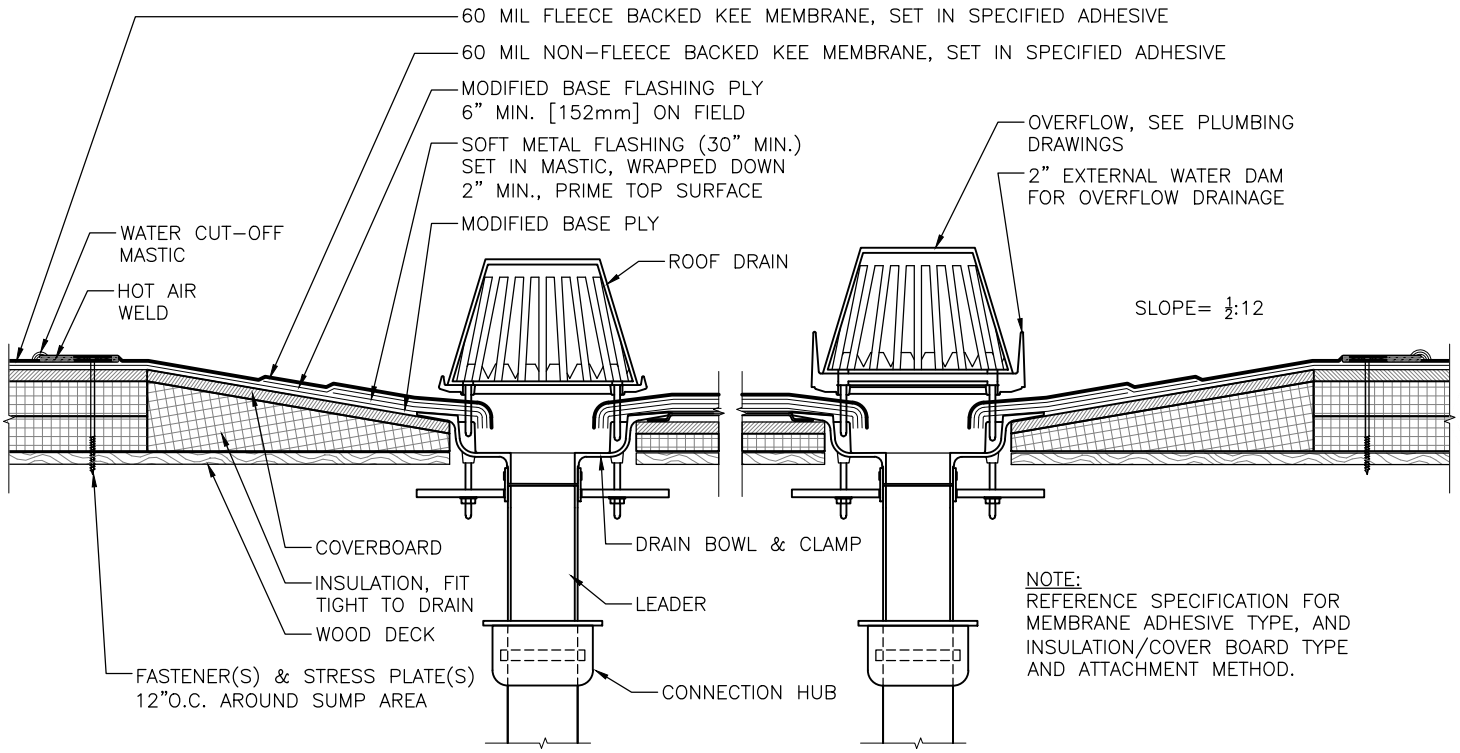
ROOF DRAIN

since 1895

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

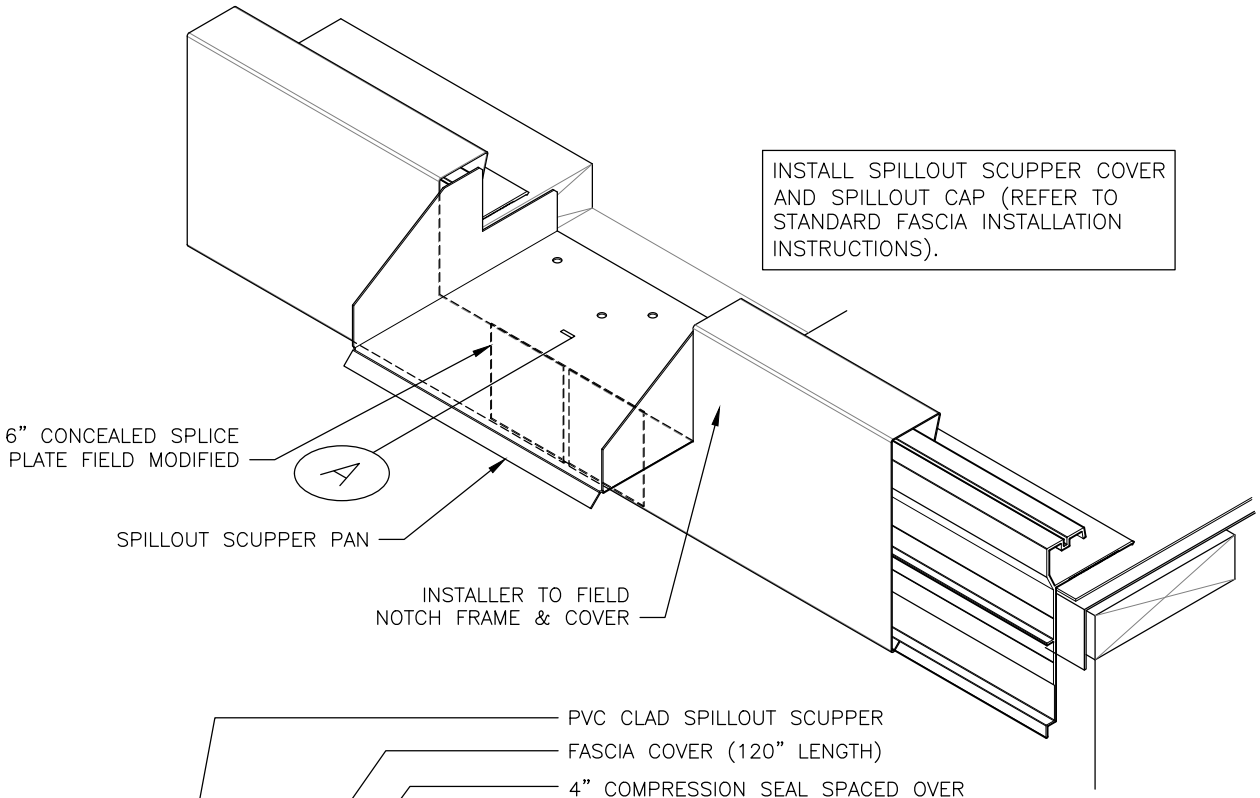
ROOF DRAIN AND OVERFLOW SUMPED

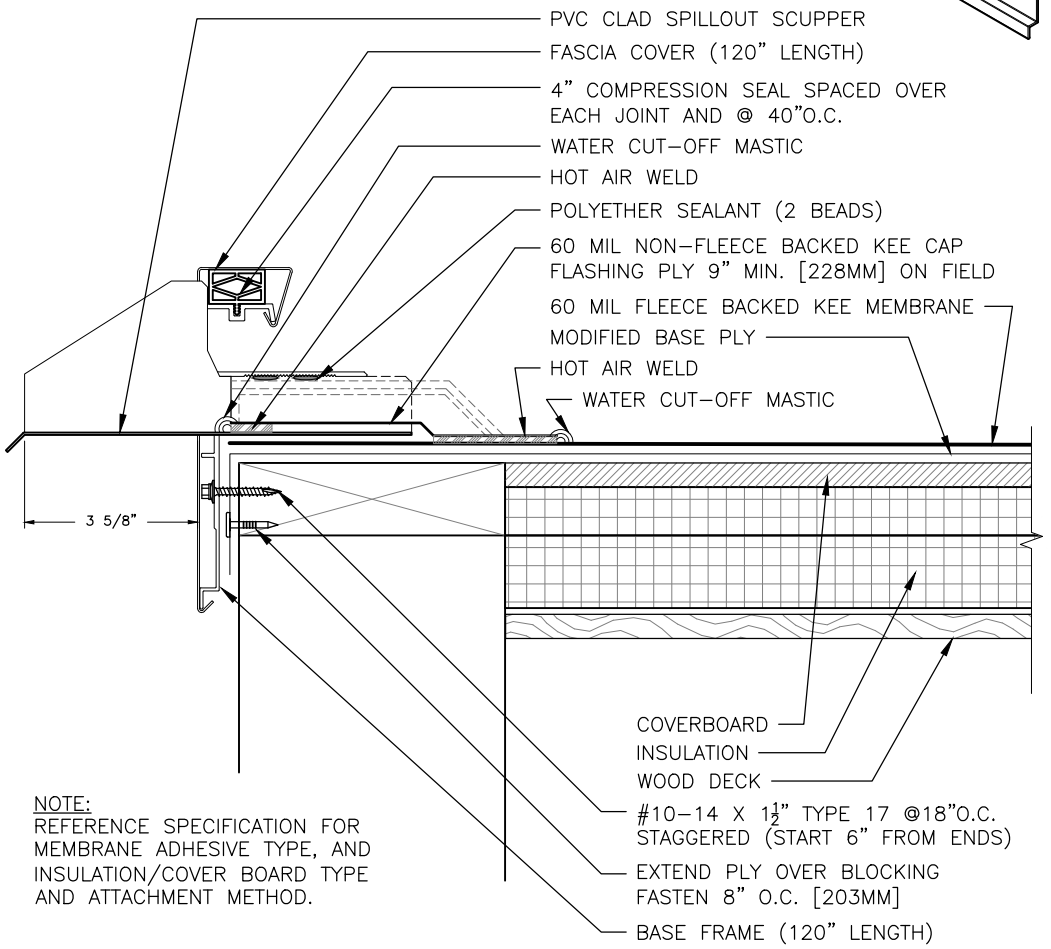
since 1895

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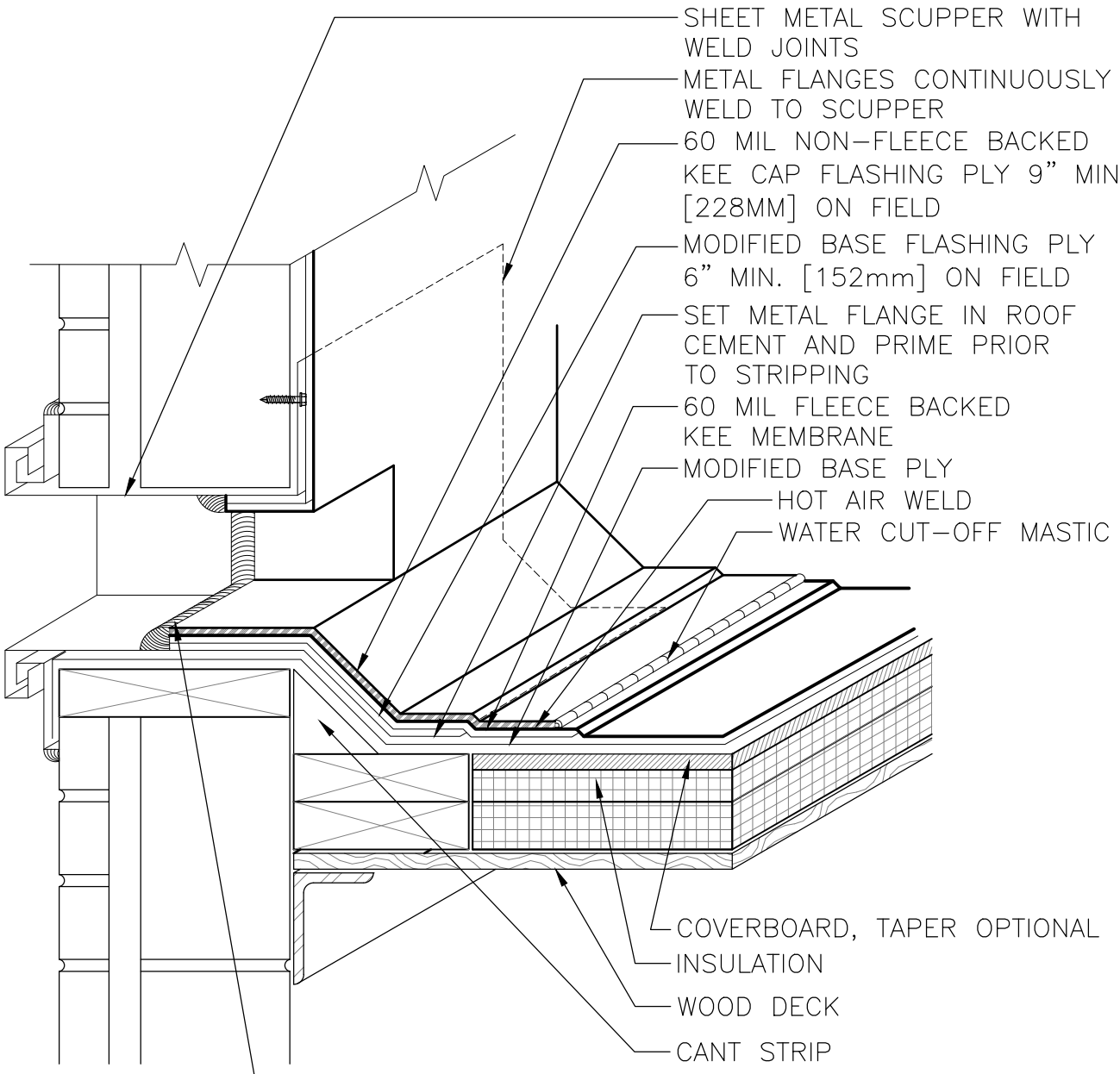
SCUPPER THROUGH ROOF EDGE - FLASHLESS SNAP-ON FASCIA

GARLAND
since 1895

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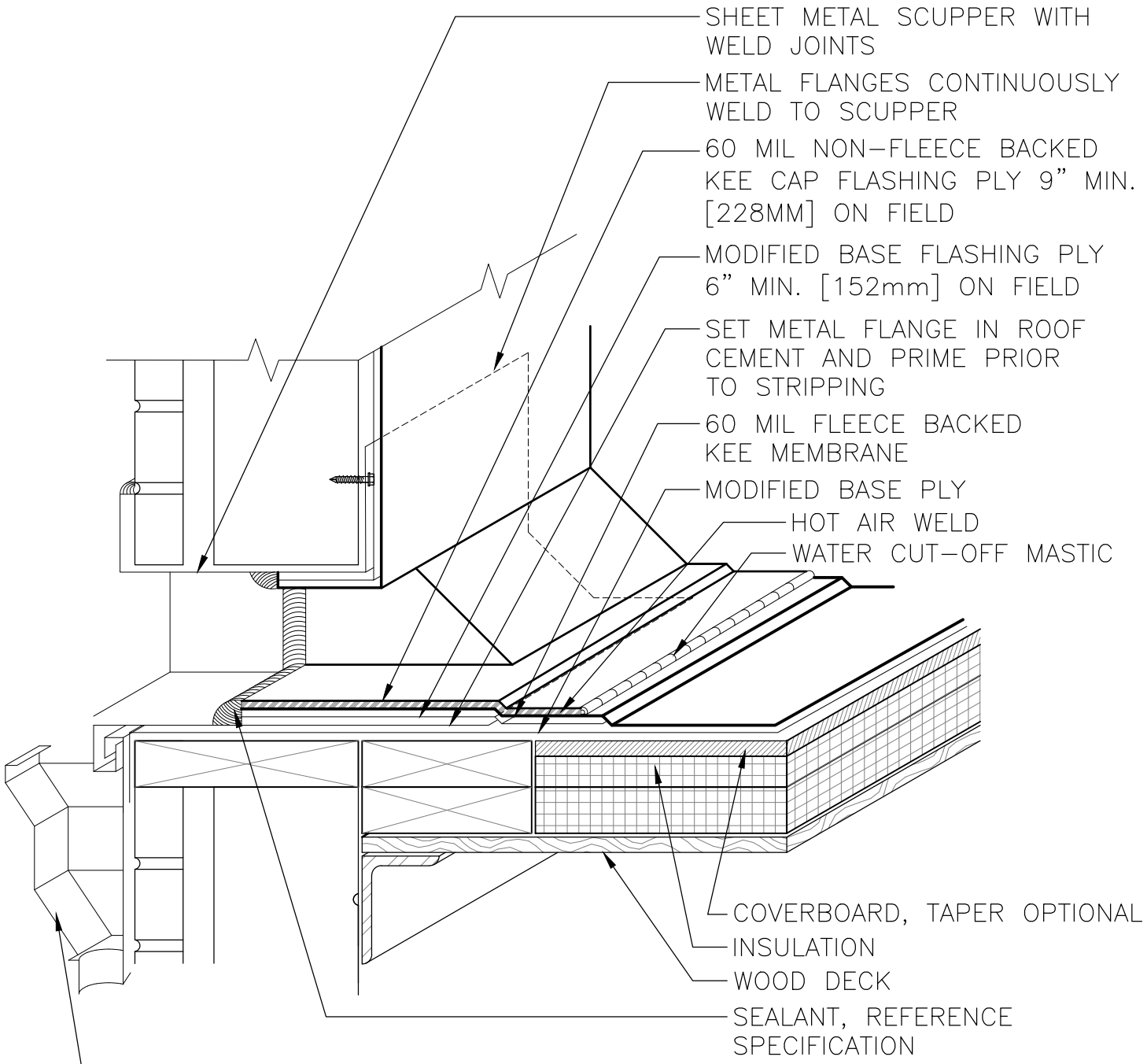
SCUPPER THROUGHWALL - OVERFLOW

since 1895

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DRAWINGS ON $8\frac{1}{2}$"x11 TITLE BLOCKS ARE NOT TO SCALE.

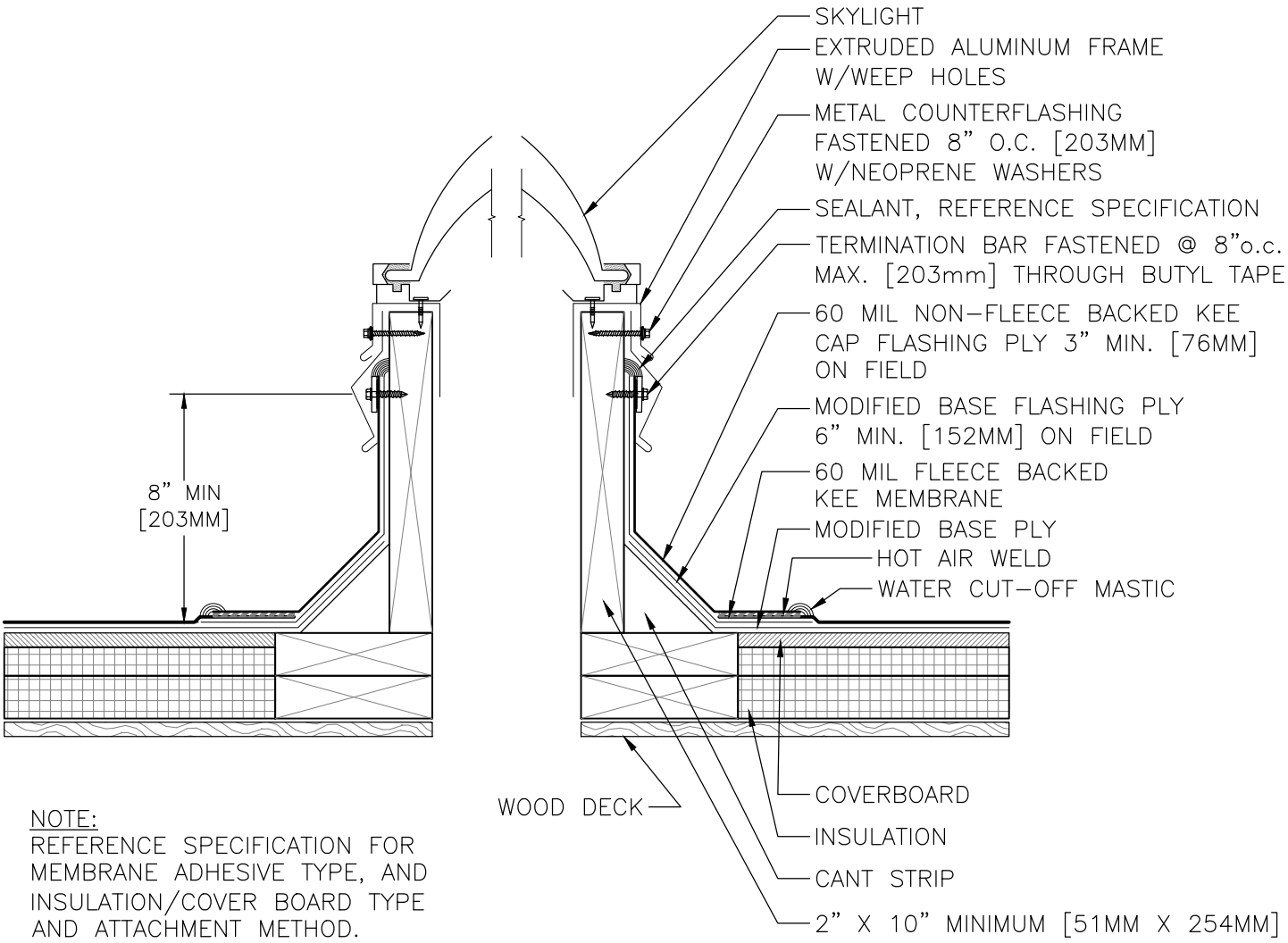
SCUPPER THROUGHWALL

GARLAND since 1895

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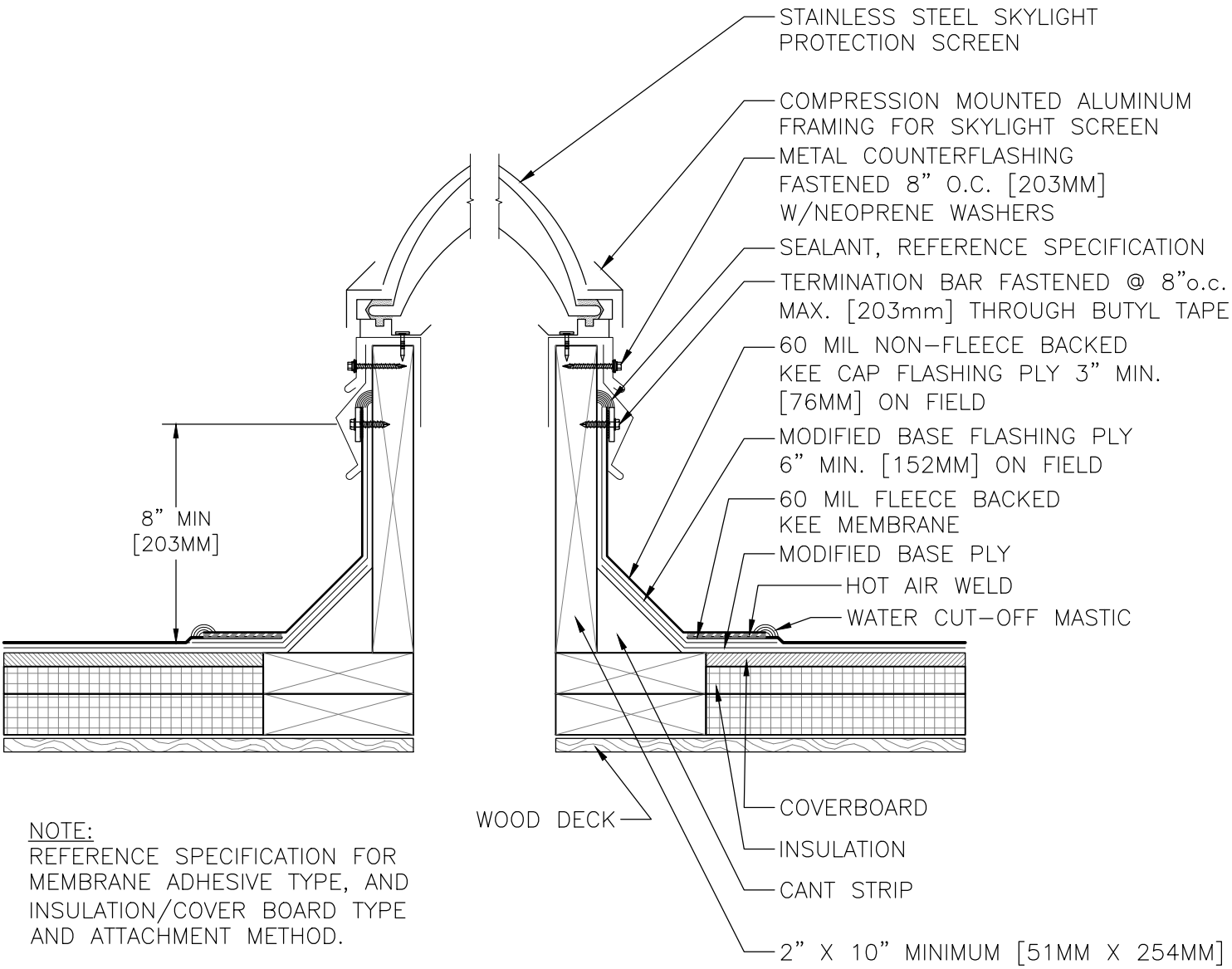
SKYLIGHT

GARLAND
since 1895

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THE GARLAND COMPANY UK, LTD

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

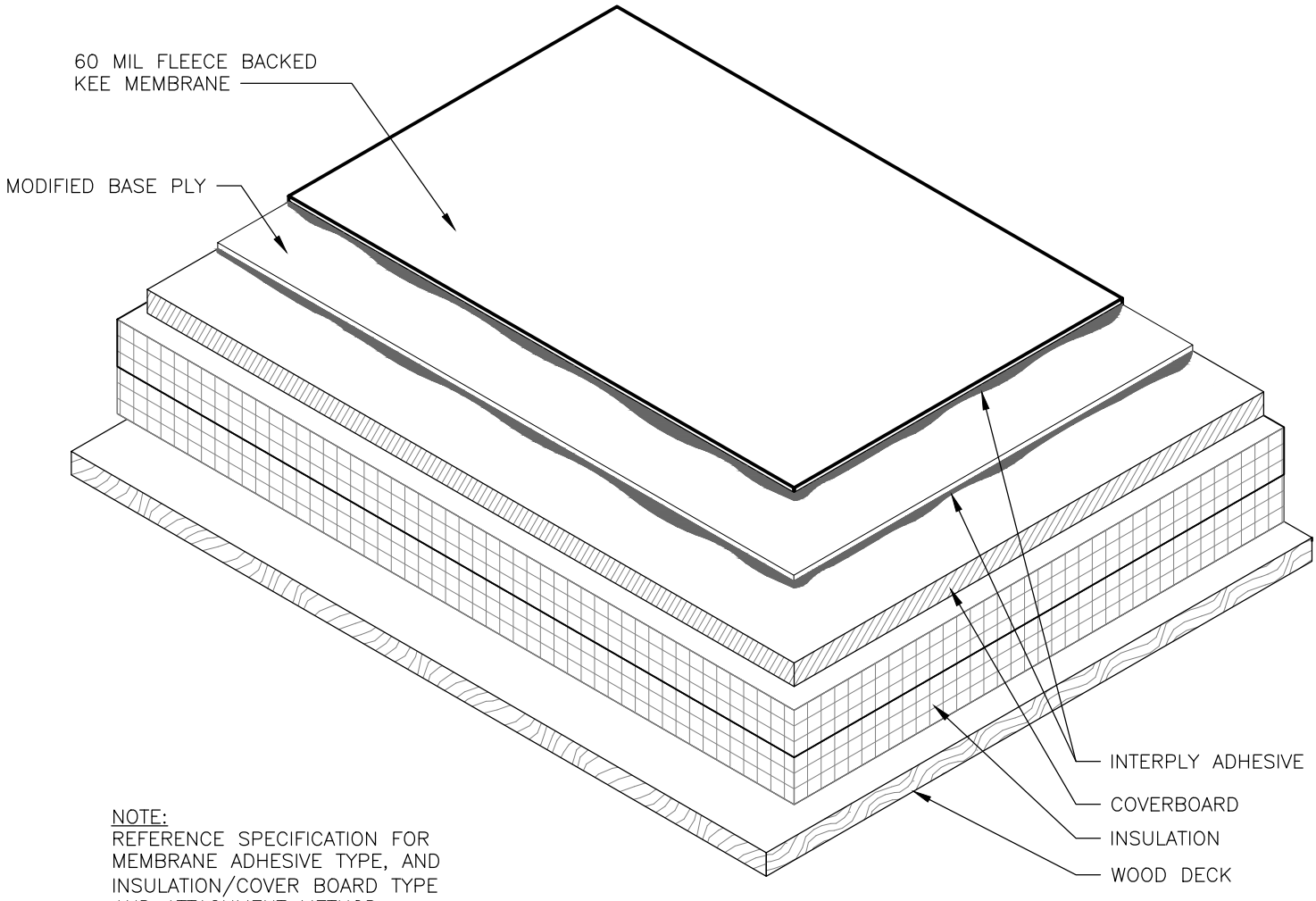
SKYLIGHT W/PROTECTION SCREEN

since 1895

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

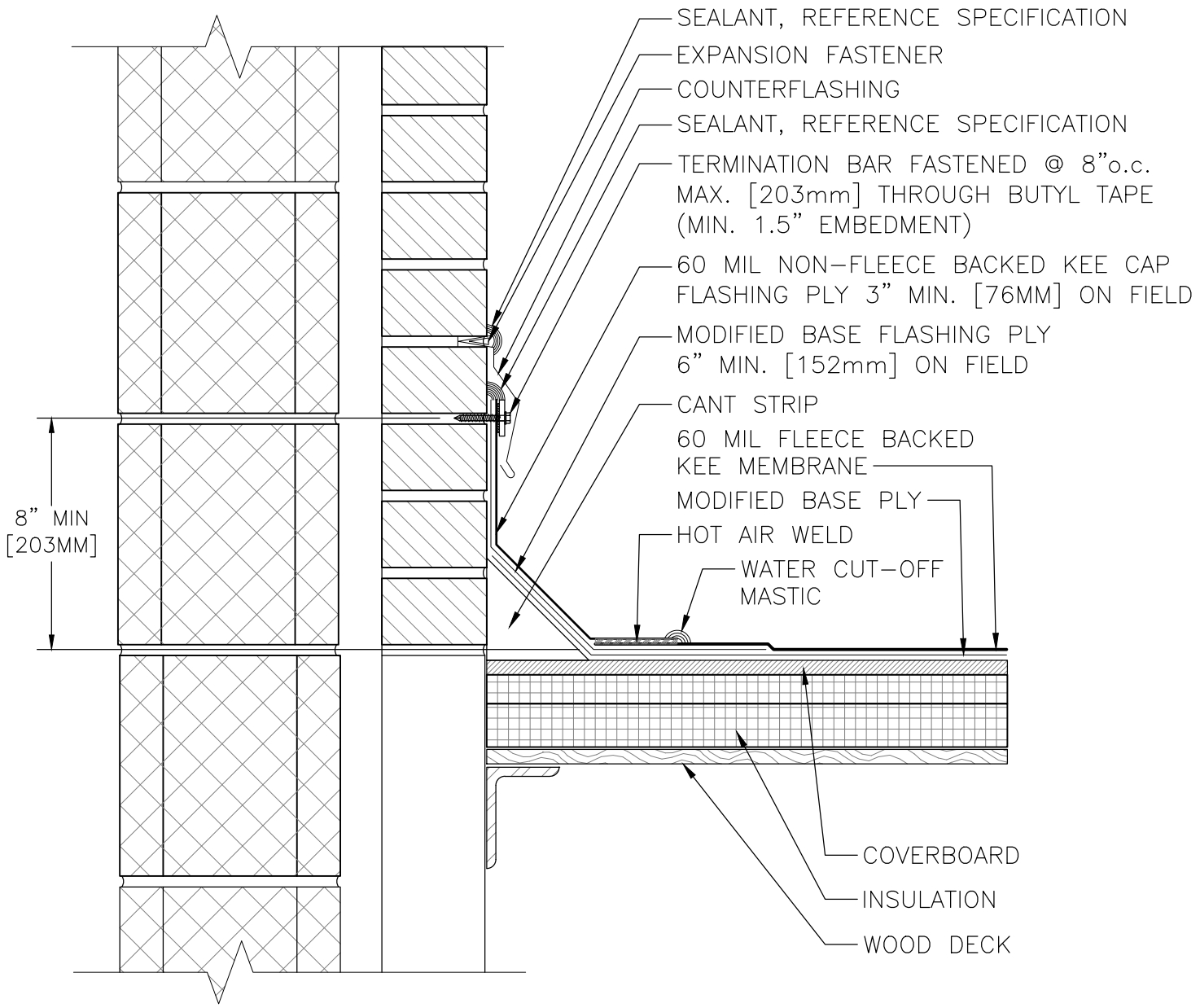
TYPICAL ROOF SYSTEM SURFACE

since 1895

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REFERENCE SPECIFICATION FOR MEMBRANE ADHESIVE TYPE, AND INSULATION/COVER BOARD TYPE AND ATTACHMENT METHOD.

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

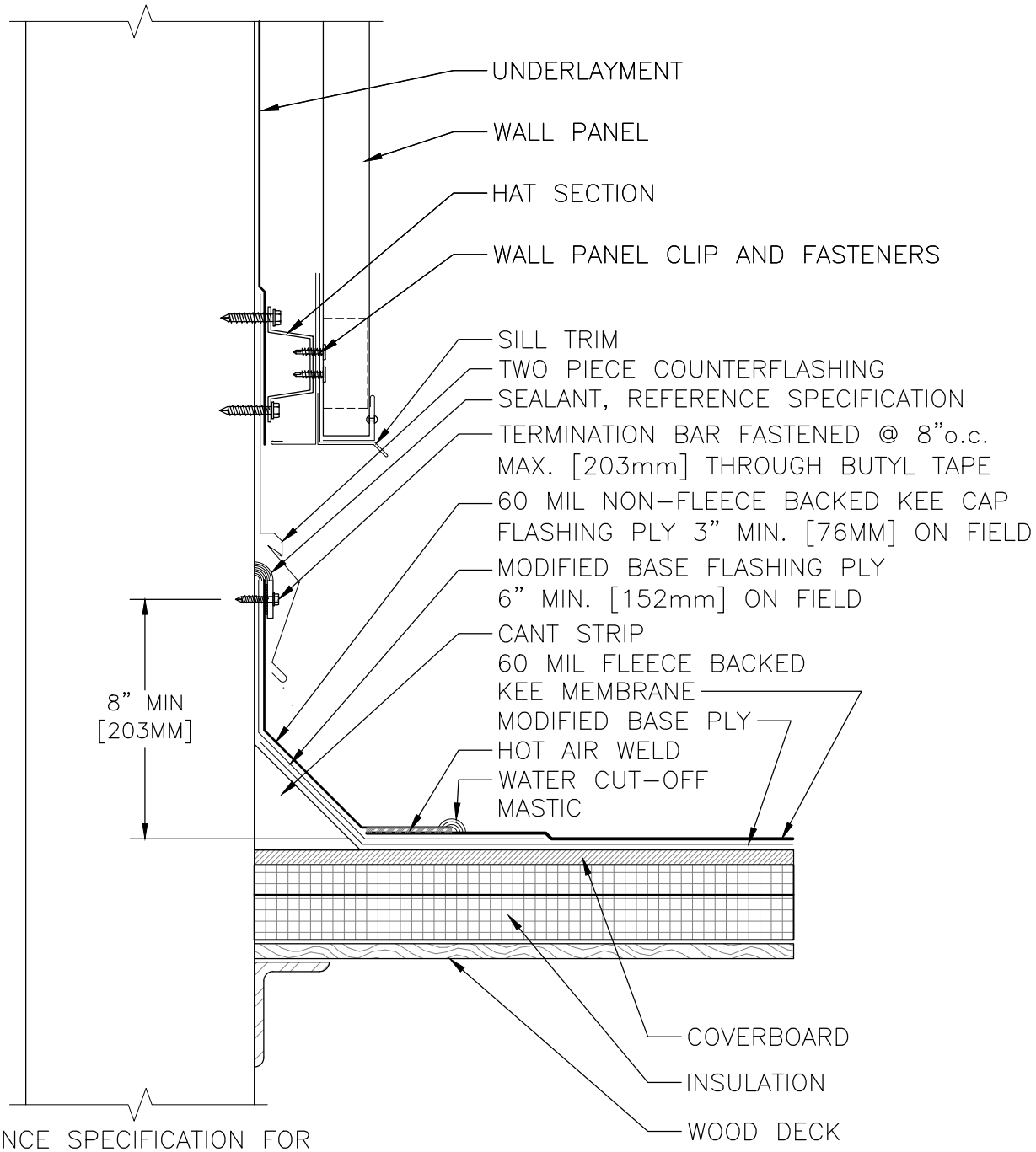
WALL FLASHING - REGLET MOUNTED COUNTERFLASHING

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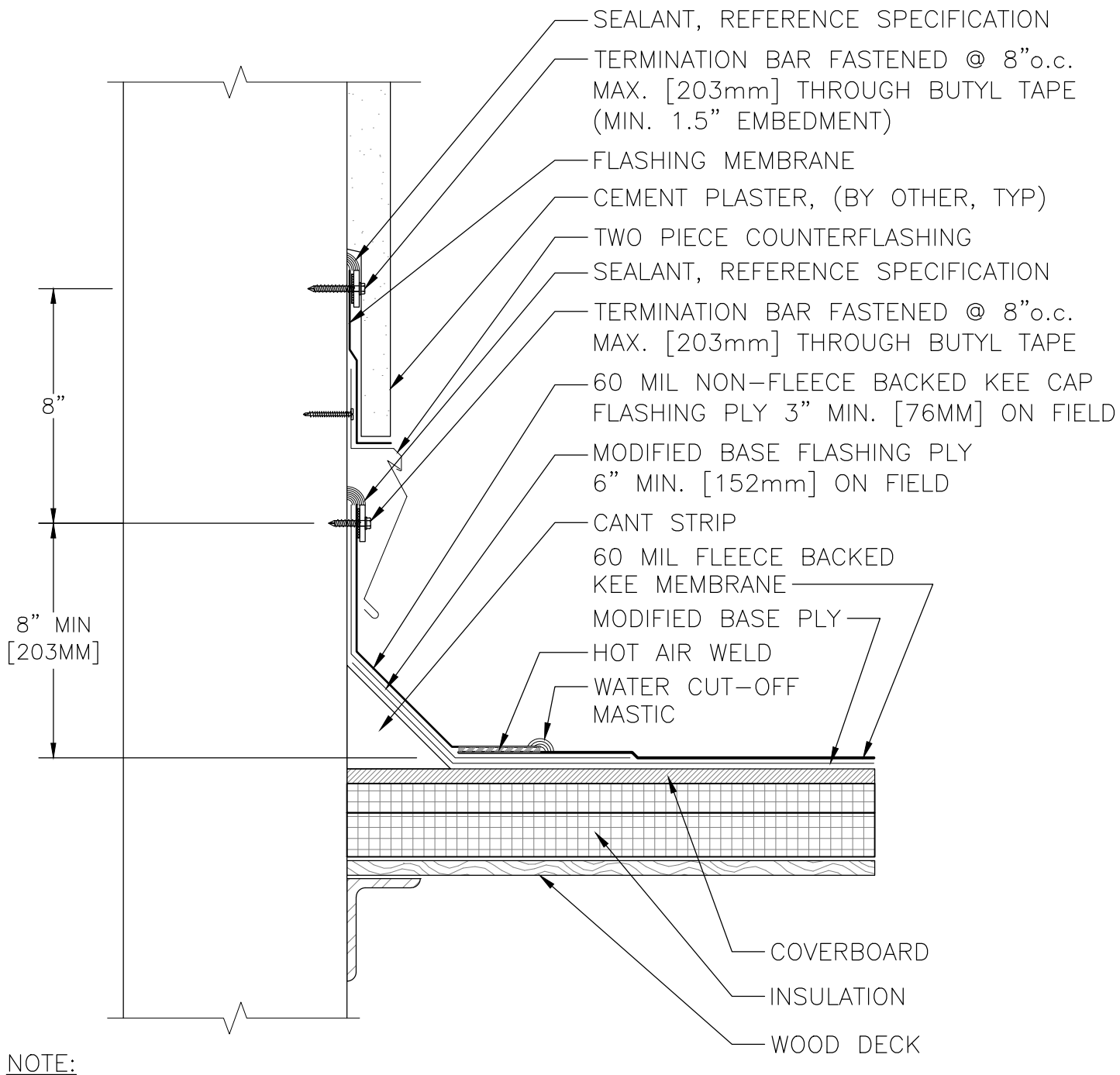
WALL FLASHING AT WALL PANEL

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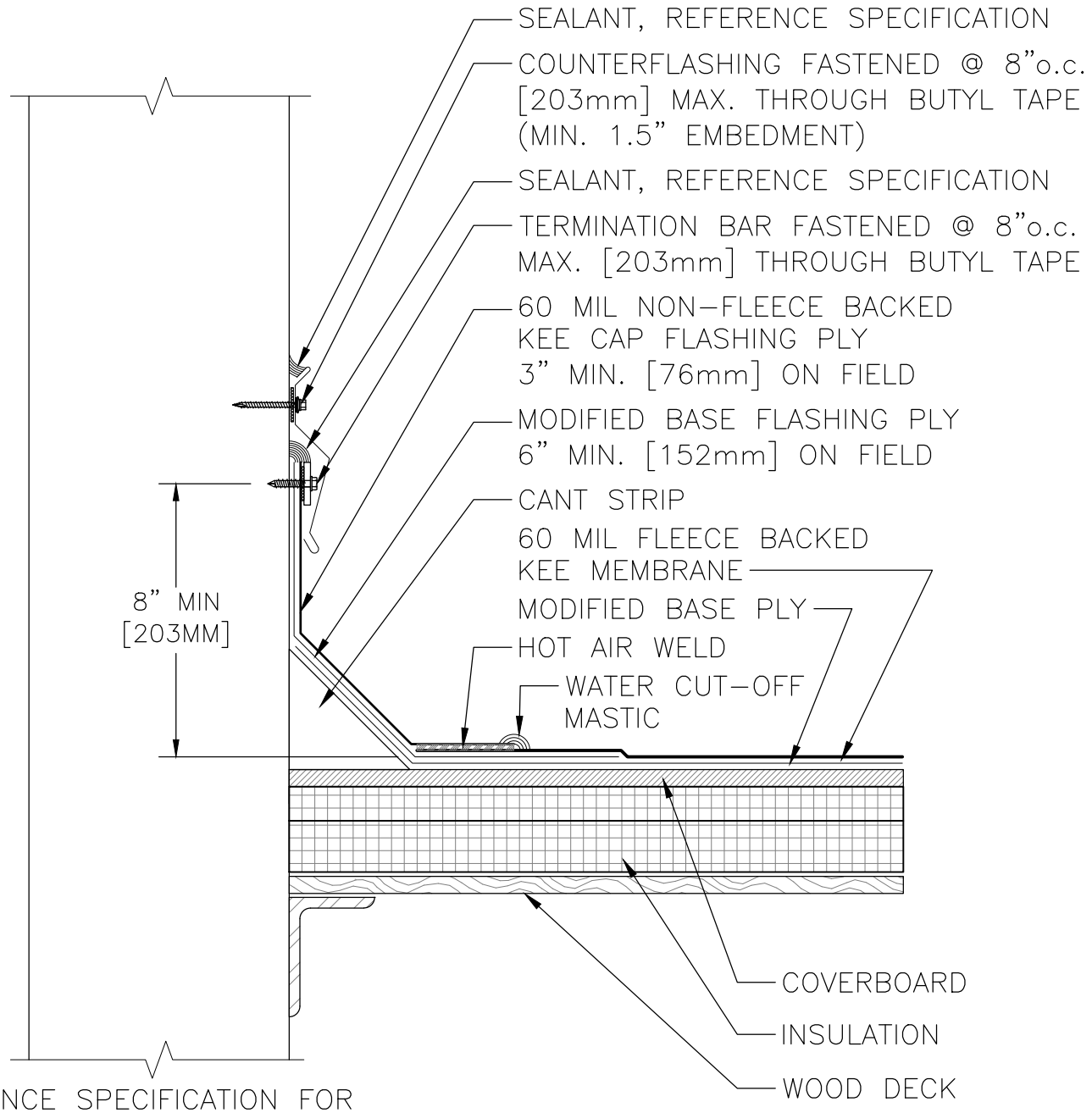
WALL FLASHING AT CEMENT PLASTER WALL - NEW CONSTRUCTION

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WALL FLASHING - SURFACE MOUNTED COUNTERFLASHING

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