TRI-TECH PINNACLE
ROOF & BUILDING ENVELOPE CONSULTANTS

Specifications
~ Roof Replacement ~

Garnet A. Williams Community Centre
501 Clark Ave. West, Thornhill, ON
Project #23-0558

PREPARED FOR:
CITY OF VAUGHAN

VAUGHAN

CONTACT: Vick Vignarajah
SECTION: A1, A2, B1, C1, C2, D1, D2, D3 & SM1

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TABLE OF CONTENTS

01 11 00 - Scope of Work....3
06 10 00 - Rough Carpentry....6
07 41 13 – Sloped Metal Roofing....11
07 51 13 - Cold-Applied Built-Up Asphalt Roofing....16
07 62 00 - Sheet Metal Flashing & Trim....27
07 72 53 – Snow Guards....34
07 92 00 - Joint Sealants....36
SCHEDULE A – LIST OF PLANS & DETAILS....41

01 11 00 - Scope of Work

PART 1 GENERAL

1.1 GENERAL CONDITIONS

1.1.1 Conform to all sections in this document and to the requirements of the Canadian Roofing Contractors Association Roofing Manual Specifications as referred to herein.

1.1.2 Abide by all Federal, Provincial, Municipal and Local Laws or Codes, rules and regulations that in any way affect work including all amendments up to the project date. No plea of misunderstanding will be considered on account of ignorance thereof. Notify the Consultant immediately in writing of any provisions in drawings, specifications or Contract, which are contrary to or inconsistent with any law, rule or regulation.

1.1.3 Where documents differ, the most stringent interpretation will apply.

1.2 TYPE OF FACILITY

1.2.1 This Contract will be carried out on the premises of a recreational facility/building.

1.2.2 Exercise appropriate care and keep construction noise and disruption to an absolute minimum and to the satisfaction of the Owner.

1.2.3 Take special precautions where alterations are required above and in all areas occupied by staff, or pedestrians.

PART 2 ROOF REPLACEMENT

2.1 DEMOLITION PHASE

2.1.1 Remove and dispose of all the following existing components and assemblies within the Scope of Work, including but not limited to:

2.1.2 Sheet metal flashings, gravel surfacing, roof membrane(s), roofing overlay, insulation, vapour retarder, vents, roof drains, control joints, and all other accessories to the level of the existing metal deck

2.1.3 As directed by the Owner's Representative, remove, and dispose all marked pieces of redundant equipment.

2.2 RECONSTRUCTION PHASE

2.2.1 As directed by the owner's representative:

.1 All deteriorated deck shall be replaced or repaired.

.2 All deteriorated wood components shall be replaced or repaired.

.3 Deck shall be cleaned and prepared for application of vapour barrier.

2.2.2 **Roof Areas A1, A2, B1, C1, C2, D1, D2, D3 -** Supply and install the following new components and assemblies on built-up roof areas:

.1 Cold-applied adhesive and pea gravel top pour

.2 3-Ply composite felts

.3 13mm (0.5”) Fibreboard overlay

.4 1-Layer 76mm (3.0”) Polyisocyanurate insulation

.5 1-Layer 76mm (3.0”) Polyisocyanurate insulation

.6 1-Ply self-adhering vapour retarder

.7 2-Ply modified bituminous membrane flashings

.8 26-Gauge pre-painted steel in accordance with Canadian Sheet Metal standards.

2.3 EXISTING ASSEMBLIES

2.3.1 It is the Contractor's choice to cut and confirm the remaining roof assemblies. No additional costs will be accepted or approved for/or by the Owner. The known existing roofing assemblies are:

.1 Roof Areas A1, A2, D1, D2 & D3:

(a) 4-Ply asphalt & gravel built-up roof membrane

(b) 25mm (1.0") Fibreboard overlay

(c) 38mm (1.5") Polyisocyanurate insulation

(d) Kraft paper vapour retarder

(e) Metal deck

.2 Roof Areas B1, C1 & C2:

(a) 4-Ply asphalt & gravel built-up roof membrane

(b) 13mm (0.5") Fibreboard cover board

(c) 64mm (2.5") Polyisocyanurate insulation

(d) Kraft paper vapour retarder

(e) Metal deck

.3 Sloped Metal Roof Area SM1:

(a) Sloped metal panels

(b) Built-up roof system

(c) Metal deck

2.4 NEW ROOF ASSEMBLIES:

2.4.1 Roof Areas A1, A2, B1, C1, C2, D1, D2, D3:

.1 Supply and install the new roofing system comprised of the following (from the top down):

(a) Pea gravel in cold applied adhesive top pour

(b) 3-Ply composite felts in cold applied adhesive

(c) 13mm (0.5") Fibreboard overlay in adhesive

(d) 1-Layer 76mm (3.0") Polyisocyanurate insulation in adhesive

(e) 1-Layer 76mm (3.0") Polyisocyanurate insulation in adhesive

(f) 1-Ply self-adhering vapour retarder adhered in place over the existing metal deck

(g) All membrane flashings are to be 1-ply EPDM/SBR membranes in cold-applied adhesive.

(h) Conform to Section 07 51 13 – Cold-Applied Built-Up Asphalt Roofing.

2.4.2 Sloped Metal Roof Area SM1:

.1 Supply and install the new roofing system comprised of the following (from the top down):

(a) Sloped metal roof panels (standing seam)

(b) 1-Layer 76mm (3.0") Polyisocyanurate insulation between 89mm (3.5") z-girts (thermally broken at the base).

(c) 1-Ply self-adhering vapour retarder adhered in place to the gypsum boards

(d) 13mm (0.5") Gypsum boards mechanically secured in place

(e) Metal deck (existing)

(f) Conform to Section 07 41 13 – Sloped Metal Roofing.

2.5 ADDITIONAL REQUIREMENTS

2.5.1 Remove and dispose of the existing roofing components that are not required to remain as part of the new roofing system.

2.5.2 All electrical lines, satellite wires etc. are to be run through gooseneck style projections. If electrical lines are too short, extensions will need to be installed.

2.5.3 All hatches and rusted rooftop equipment shall be painted with two coats of rust inhibiting paint.

2.5.4 The built-up roof system beneath the sloped metal panels is to be removed and discarded from the roof system prior to installing the new sloped metal roof panels.

2.5.5 Supply and install new snow retention system adhered to the sloped metal panel surface. (ORIGINAL METAL by Snow Gem Inc./diamond style, or approved alternate).

2.5.6 New troughs and downspouts are to be installed along the base of all sloped roofs and/or to replace existing at all locations. The troughs and downspouts are to be equipped with double-line heat trace cables and must function properly upon completion.

2.5.7 Supply and install the new roofing components in accordance with the Contract Documents.

2.5.8 The Contractor will provide the Owner and the Consultant with as-built shop drawings upon close-out of the project.

2.5.9 Job site inspections are to be conducted daily by the material manufacturer.

2.5.10 Utilize a single source supplier of membrane and related primary materials.

2.5.11 Provide a 20-year manufacturer's full system warranty included within the base bid.

2.5.12 Dispose of all debris/waste in approved containers and transfer to an approved municipal and/or provincial disposal site(s).

2.5.13 All roof systems are to meet or exceed CSA A123.23 standards if/where required.

END OF SECTION 01 11 00

06 10 00 - Rough Carpentry

PART 1 GENERAL

1.1 GENERAL CONDITIONS

1.1.1 All conditions of the Contract and Divisions 00 and 01 apply to this section and to the requirements of the Canadian Roofing Contractors Association Roofing Manual Specifications as referred to herein.

1.1.2 Abide by all Federal, Provincial, Municipal and Local Laws or Codes, rules, and Regulations that in any way affect the Work, including all amendments up to the Project date.

1.1.3 All Standards, Regulations and Specifications listed herein are the latest edition.

1.2 CO-ORDINATION

1.2.1 Co-ordinate Work of this Section with Work of:

.1 Section 01 11 00 Summary of Work

.2 Section 07 31 13 Sloped Metal Roofing

.3 Section 07 51 13 Cold-Applied Built-Up Roofing.

.4 Section 07 62 00 Sheet Metal Flashing and Trim.

.5 Section 07 92 00 Joint Sealants.

1.3 REFERENCE STANDARDS

1.3.1 Carpentry materials, products, and accessories shall be in accordance with the most current applicable industry standards including but not limited to:

.1 ASTM INTERNATIONAL

(a) ASTM A123/A123M Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

(b) ASTM A307, Carbon Steel Bolts & Studs.

(c) ASTM A653/A653M Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvanealled) by Hot-Dip Process.

(d) ASTM-D1037 – Wood Based Fiber & Particle Panels (Hardboard, OSB)

(e) ASTM D1761 Mechanical Fasteners in Wood.

(f) ASTM D5456 Evaluation of Structural Composite Lumber Products.

(g) ASTM F1667, Nails, Spikes & Staples

.2 ANSI/ASME

(a) ANSI/ASME B18.6.1 – Wood Fasteners

(b) ANSI/ASME B18.6.3 – Steel Fasteners

.3 CSA INTERNATIONAL

(a) CAN/CSA Asphalt Coated Roofing Sheets

(b) CSA B111 - Wire Nails, Spikes and Staples.

(c) CSA 080 – Preservative Treatment of Timber by Pressure Process.

(d) CSA O112 Series - CSA Standards for Wood Adhesives.

(e) CSA O121 - Douglas Fir Plywood.

(f) CAN/CSA O122 - Structural Glued-Laminated Timber.

(g) CSA O141 - Softwood Lumber.

(h) CSA O151 - Canadian Softwood Plywood.

(i) CSA O153 - Poplar Plywood.

(j) CSA O325 - Construction Sheathing.

(k) CSA O437 Series - Standards on OSB and Waferboard.

.4 FOREST STEWARDSHIP COUNCIL (FSC)

(a) FSC-STD-01-001 - FSC Principle and Criteria for Forest Stewardship.

(b) FSC-STD-20-002 - Structure and Content of Forest Stewardship Standards V2-1.

(c) FSC Accredited Certified Bodies.

.5 NATIONAL LUMBER GRADES AUTHORITY (NLGA)

(a) Standard Grading Rules for Canadian Lumber.

.6 UNDERWRITERS' LABORATORIES OF CANADA (ULC)

(a) CAN/ULC-S706 - Standard for Wood Fibre Insulating Boards for Buildings.

1.4 QUALITY ASSURANCE

1.4.1 Lumber by grade stamp of an agency certified by Canadian Lumber Standards Accreditation Board.

1.4.2 Plywood, particleboard, OSB and wood based composite panels in accordance with CSA and ASTM standards.

PART 2 PRODUCTS

2.1 COMPATIBILITY

2.1.1 Compatibility between materials is an essential requirement of the Contract.

2.2 WOOD

2.2.1 BLOCKING AND ROUGH FRAMING

.1 Grade No. 2, Northern Softwood in accordance with “Standard Grading Rules for Canadian Lumber” as issued by National Lumber Grades Authority (N.L.G.A.).

.2 Spruce, #1Softwood, conforming to CSA 0151.

.3 Wood Cants: 89mm x 89mm (3.5” x 3.5”, 2x4 nominal).

.4 Wood Blocking: 38mm x 38mm (1.5” x 1.5”, 2x2 nominal), 38mm x 89mm (1.5” x 3.5”, 2x4 nominal), 38mm x 140mm (1.5” x 5.5”, 2x6 nominal) 38 x 184mm (1.5” x 7.25”, 2x8 nominal), 38mm x 254mm (1.5” x 9.25”, 2x10 nominal)), 38mm x 286.35mm (1.5” x 11.25” (2x12 nominal).

2.2.2 PLYWOOD SHEATHING

.1 Exterior, Spruce #1, conforming to CSA 0151 or O121, exterior grade, G1S. Thickness of 12.7mm (1/2”) and/or 19.05mm (3/4”) as noted on the Drawings.

2.2.3 WOOD PRESERVATIVE

.1 Copper or Zinc Naphthenate of 5% Pentachlorophenol solution, water repellent preservative to CSA Series 080, green or clear colour or approved alternate. If preservative is Ammonium Copper Quaternary (ACQ), then stainless steel 300 fasteners are to be used. FASTENERS

2.2.4 NAILS

.1 Ardox spiral, to CSA Standard B111, length to give 25.4mm (1") minimum penetration into the materials being fastened.

2.2.5 SCREWS

.1 Fasteners for wood: Galvanized steel wood screws with countersunk heads of size and length to provide a minimum 38mm (1.5") penetration into the underlying member.

.2 Fasteners for steel substrates: Flat head, self-tapping steel screw with galvanized finish as supplied by Fastening House, or Approved Alternate. Length: to suit. Penetrate through the member a minimum of 19.05mm (3/4").

.3 Fasteners for masonry and concrete substrates: Tapcon fasteners with "ClimaSeal" corrosion resistant finish, as manufactured by Buildex/Red Head, or Approved Alternate. Screw to be of sufficient length to penetrate into the substrate a minimum of 38mm (1.5").

.4 Bolts, Washers and Nuts: to ASTM A307. Size as indicated on the Drawings. Hot dipped galvanized or an approved equivalent corrosion resistant finish.

PART 3 EXECUTION

3.1 GENERAL

3.1.1 All carpentry Work is to comply with the best practices of trade and by skilled carpenters.

3.1.2 Provide carpentry alterations and comply with best trade practices. Anchor all wood blocking securely to the existing surfaces and to each other.

3.1.3 Make adjustments to the specified procedures caused by weather and site conditions only with the Owner's approval.

3.1.4 Maintain all equipment in good Working order to ensure the control of roofing operations and the protection of the Work. Equipment and laying techniques are to meet the approval of the Consultant.

3.2 EXAMINATION

3.2.1 Ensure that existing wood blocking to be incorporated with the Work is in good condition and is permanently and properly secured to the existing surfaces.

3.2.2 Inform the Consultant of any unacceptable conditions immediately upon discovery.

3.2.3 Proceed with installation only after the unacceptable conditions have been remedied.

3.2.4 Replace all damaged material and re-seal masonry anchors as required to conform to the design intent herein described.

3.2.5 Remove all sharp edges that would otherwise damage materials that come in contact.

3.3 INSTALLATION

3.3.1 Cut, align, plumb, and secure the wood to conform to the full intent of the Details. Shim the new wood assembly where required in order to obtain true to line levels.

3.3.2 Construct continuous members from pieces of the longest practical length. Treat all saw cuts with wood preservative.

3.3.3 Countersink bolts where necessary to provide clearance for other Work.

3.3.4 Install spanning members with "crown-edge" up.

3.3.5 Install cant strips and blocking as indicated on the Drawings, secured permanently to the structure trimmed and levelled to accommodate chamfers and slopes. Install to accommodate

insulation, roofing, and flashing materials.

3.3.6 Install continuous plywood sheathing, wood blockings, cants, studs, nailers and continuous shims where required and Detailed on the Drawings and Details. Shims are to be of sufficient height to ensure a minimum two (2%) percent positive slope on all parapet, perimeter, and dividing walls.

3.3.7 Install the roof sheathing in accordance with the requirements of the NBC (National Building Code).

3.3.8 Install furring and blocking as required to space-out and support facings, fascia, soffit, siding, and other work as required. All lumber is to be installed with butt joints offset 52mm (2”). Fasten at 457.2mm (18”) o.c. using a 57mm (2-1/4”) Ardox spiral nail.

3.3.9 Install furring to support siding applied vertically where sheathing is not suitable for direct nailing.

3.3.10 Install rough bucks, nailers and linings to rough openings as required to provide backing for frames and other work.

3.3.11 Frame, anchor, fasten, tie and brace members to provide necessary strength and rigidity.

3.3.12 Use nailing disks for soft sheathing as recommended by sheathing manufacturer.

3.3.13 Fabricate sleepers, expansion joints, perimeters, and walls as detailed. Maintain a minimum height of 304.8mm (12”) above the finished roof surface for sleepers and curbs and where permitted at walls.

3.3.14 Securely the anchor wood blocking, cant strips, nailers and shims in place at 304.8mm (12”) on centre in a staggered pattern. Fasten studs to the top and bottom plates with two screw fasteners. Fasten wood blocking, wood cant strips, nailers and shims to existing substrate with appropriate screw fasteners.

3.3.15 Fasten the plywood along the supported edges at a minimum of 152.4mm (6”) on centre. Fasten to the framing members within the field of the plywood panel at a maximum of 406.35mm (16”) on centre. Fasten the plywood to the framing and the existing substrate with the appropriate fasteners.

3.3.16 Re-fasten any loose existing wood blocking, cants, shims and plywood with screw fasteners where permitted to remain as part of the finished Work and to the satisfaction of the Consultant.

3.3.17 Coordinate Work to keep cutting and remedial Work to a minimum. Fasteners are to be of size and spacing required to assure secure anchorage. Fastener spacing of the wood blocking to the substrate and to each other is not to exceed 304.8mm (12”) o.c. unless otherwise accepted in writing by the Consultant.

3.3.18 Construct wood blocking as per Details. Build-up all perimeter Details to accommodate the height of the new roof assembly where required. Install wood blocking so that the new wood blocking extends a minimum of 101.6.35mm (4”) above the required finished roof surface. Install sloped wood blocking along the top of the perimeter sloping inward towards the roof. Build-up all unit curbs a minimum of 304.8mm (12”) above the finished roof level to accommodate the height of the new roof assembly.

3.3.19 Offset blocking layers 304.8mm (12”) and weave corners.

3.3.20 Assemble blocking using two staggered rows of nailing. Space nails in any row a maximum of 609.6.35mm (24”) on centre. Within 2440mm (8’) of outside corners, reduce maximum spacing to 304.8mm (12”) on centre.

3.3.21 Install asphalt protection board along the perimeters/curbs/walls, from the top of the existing deck to the top edge of the wood blocking along the perimeters/curbs/walls. The asphalt protection board is to be secured 152.4mm (6”) on centre horizontally with fasteners spaced

no more than 304.8mm (12") on centre vertically.

3.4 MECHANICAL CURBS

3.4.1 All fans, HVAC, vents, skylight curbs etc. are to be box framed to a minimum height of 204mm (8") above the finished roof surface.

3.4.2 This includes all roof top openings except drains, electrical conduits, soil stacks, hot stacks and vent stacks.

3.4.3 38mm (1-1/2") thick lumber is to be used or as detailed. Widths as may be required to achieve design intent.

3.4.4 Disconnecting, extending, and reconnecting electrical services to fans, HVAC units etc. Is to be completed by a Mechanical Contractor.

3.4.5 Extending ductwork and vent pipes to new elevations, as required, is to be performed as part of this Contract.

3.5 GAS LINE SUPPORTS

3.5.1 Install new adjustable supports at each pipe elbow, threaded joint, and where the pipe changes in direction, as well as approximately every 6' as per the current CSA B149.1 guidelines, Table 6.2 for the distance of the gas line/conduit tray.

3.5.2 Repair damage to adjacent materials caused by rough carpentry installation.

3.6 PROTECTION

3.6.1 Protect the installed products and components from damage during construction.

3.6.2 Repair damage to adjacent materials caused by rough carpentry installation.

3.7 CLEANING

3.7.1 Clean in accordance with 01 10 00 General Requirements.

3.7.2 Remove all surplus materials and debris resulting from the foregoing work daily as the Work proceeds and upon completion.

END OF SECTION 06 10 00

07 41 13 – Sloped Metal Roofing

PART 1 GENERAL

1.1 GENERAL CONDITIONS

1.1.1 All conditions of Contract and Divisions 0 and 1 apply to this section and to requirements of Canadian Roofing Contractors Association Roofing Manual Specifications as referred to herein.

1.1.2 Abide by all Federal, Provincial, Municipal and Local Laws or Codes, rules and regulations that in any way affect work including all amendments up to project date.

1.2 SECTION INCLUDES

1.2.1 Sloped Metal Roof Area SM1:

1.3 CO-ORDINATION

1.3.1 Co-ordinate work of this Section with work of:

.1 Section 01 11 00 Summary of Work

.2 Section 07 62 00 Sheet Metal Flashing and Trim.

.3 Section 07 92 00 Joint Sealants.

1.4 STANDARDS

.1 ASTM D412, Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers – Tension

.2 ASTM D7349/D7349M, Standard Test Method for Determining the Capability of Roofing and Waterproofing Materials to Seal around Fasteners

.3 ASTM E-108/CAN/ULC-S107, Fire Tests of Roof Coverings

.4 CGSB-37.58-M86, Membrane, Elastomeric, Cold-Applied Liquid, for Non-Exposed Use in Roofing and Waterproofing.

.5 CAN/CSA A123.3, Asphalt Saturated Organic Roofing Felt

.6 CAN/CSA A123.22/ASTM D1970, Self-adhering Underlayment for Ice Dam Protection

.7 CAN/CSA A123.16, Asphalt Coated Glass Base Sheets

.8 CSA B-111, Nails, Spikes and Staples.

.9 CRCA Roofing Specifications Manual-[1997]

.10 Safety Data Sheets (SDS)

1.5 QUALIFICATIONS

1.5.1 Contractor qualifications are listed in the GENERAL CONDITIONS under section 01 43 23 CONTRACTOR QUALIFICATIONS.

1.6 QUALITY CONTROL

1.6.1 Quality controls are listed in the GENERAL CONDITIONS under section 01 45 00 QUALITY CONTROL – GOOD ROOFING PRACTICES

1.7 PRE-START MEETING

1.7.1 A pre-start meeting is to be scheduled one week prior to any work commencing. The roofing contractor, the consultant, the on-site contact and/or owner's representative should be present.

1.7.2 The following items will be discussed at the pre-start meeting:

.1 methods and procedures relating to the roof assembly installation

.2 on-site procedures

.3 on-site material storage

.4 the construction schedule

1.8 DELIVERY, STORAGE & HANDLING

1.8.1 Delivery, storage, and handling are listed in the GENERAL CONDITIONS under section 01 66 00 STORAGE & DELIVERY OF MATERIALS.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 Standing Seam Metal: Restricted flatness steel sheet metallic coated by the hot-dip process and pre-painted by the coil-coating process to comply with ASTM A755/A755M. Metal colour (standard colour selection) confirmation to be obtained by Roofing Contractor in writing prior to metal panels being installed. The standing seam must be 2 3/8" high and tested in accordance with ASTM E1680 and meet or exceed the following performance requirements for steel roof:

.1 Air infiltration:

(a) Pressure 1.57PSF, Air Leakage Rate 0.0012 cfm/sq.ft.

(b) Pressure 6.25PSF, Air Leakage Rate 0.0001 cfm/sq.ft.

(c) Pressure 20.00PSF, Air Leakage Rate 0.0011 cfm/sq.ft.

.2 Static air pressure:

(a) 5 Gal/Hr per sq.ft. and static air, no leak

.3 Static pressure head water infiltration:

(a) The panel system shall be tested in accordance with ASTM E2140 and pass with no leakage. The test specimen must include a panel end lap condition and shall withstand being submerged under 6" of water for 6 hours

.4 Dynamic pressure water penetration

(a) The panel system shall be tested in accordance with AAMA 501.1, and pass with no water penetration, other than condensation, when exposed to dynamic rain and 70mph wind velocities for not less than five minutes duration.

2.1.2 Thermal Clips & Z-Girts: 89mm (3.5") NZ 300 girt or as recommended by Manufacturer to fit system or insulation thickness (whichever is greater).

2.1.3 Fasteners for attaching cladding to structural framing or other structural supports, for attaching flashing to cladding, and joining cladding components together shall be as recommended by the manufacturer.

2.1.4 Air/Vapour Retarder: Self-adhering membrane consisting of SBS rubberized asphalt which is laminated to a blue cross laminated polyethylene film. Minimum thickness of 1 mm (40 mil). Classification A1 as per CAN/ULC-S742. Acceptable product: Blueskin SA by Henry Company Canada or approved alternate.

2.1.5 Air/Vapour Retarder Membrane Primer: A low VOC (volatile organic compound) or water-based polymer emulsion suitable for application by brush, roller or spray. A rubber-based adhesive for self-adhered membranes. Acceptable products: Blueskin Adhesive, HE-573, Blueskin LVC Spray Primer, Blueskin LVC Adhesive or Aquatac Primer by Henry Company Canada or approved alternate

2.1.6 Air/Vapour Retarder Mastic/Sealant: Trowel consistency, solvent type, synthetic rubber-based sealant which cures to flexible film resisting air leakage, to seal around openings and leading edges. Acceptable

product: Air-Bloc LF by Henry Company Canada or approved alternate

2.1.7 Insulation 76mm (3.0") polyisocyanurate insulation (4'x4' boards). Type: closed cell polyisocyanurate foam roof board insulation with inorganic coated glass facer, meeting the requirements of CAN/ULC S704, Type 2 Class 3 materials and ASTM C1289, Type II, Class 2, Grade 2.

2.1.8 Thermal Clips & Z-Girts: 76mm (3.0") NZ 300 girt or as recommended by Manufacturer to fit system or insulation thickness (whichever is greater).

2.1.9 Subdeck: 0.5" Gypsum board 4'x8'. DensDeck Prime/EONIC by Georgia Pacific or approved alternate

2.1.10 Subdeck Fasteners: As recommended by Manufacturer

2.1.11 Elastomeric Sealant: 870-07 by Bakor Inc., Polyroof by Tremco, Garlaflex by Garland Canada or approved alternate

2.1.12 Mastic: Conforming to CGSB 37-GP-63M

2.1.13 Membrane Flashing Nails: 3/8" head diameter roofing nails, 11 gauge minimum, galvanized steel.

2.1.14 Wood Preservative: Copper naphthenate pentachlorophenol solution to CSA Std. 080.

NOTE: The contractor must supply all primers, mastics, and membranes from a single source Manufacturer. No alternates will be accepted without written approval from the Consultant

PART 3 EXECUTION

3.1 PREPARATION

3.1.1 It is the contractor's responsibility to obtain all required permits for this project and must carry this cost in his bid price.

3.1.2 The ground areas around the building are to be protected as much as possible. All disposal boxes must be placed on planks. The interior areas of the building, where the roofing contractor has access, are to be protected.

3.1.3 Inspect the structure and report any deficiencies to the Owner's Representative. Do not apply any new roofing over deficiencies, other than temporary waterproofing, until all deficiencies have been corrected.

3.1.4 Do not remove more of the existing roofing than can be completely waterproofed in one day.

3.1.5 The roofing contractor shall be responsible for all roof leaks (both on the existing roofing assembly and the new roofing assembly) at the building once they begin to set-up and load materials onto the roof at the beginning of the project.

3.1.6 The roofing contractor is responsible to disconnect and reconnect any mechanical, electrical conduit, cabling, and/or gas lines which are affecting the roof installation. The roofing contractor is responsible for all satellites. The satellites are to be moved and put back in the approximate same location. Roofing contractor is responsible for repositioning satellites to obtain proper signal.

3.1.7 If any heat tracing cables are present, they are to be re-installed up completion of the project, unless otherwise directed by the owner.

3.2 METAL FLASHINGS

3.2.1 Supply and install new metal drip edge around the perimeter of the roof. Flashing must extend a minimum of 76.2mm(3") onto the roof deck. On the eave, secure the drip edge of the top of the deck with nails 203.2mm(8") on centre.

3.2.2 Install new pre-painted galvanized metal flashing in all valleys and step flashings at all wall locations.

3.3 METAL ROOF PANEL

3.3.1 Directly over the completed roof substrate, install one-piece clips. [All anchor clips will be set on 16 gauge (1.5 mm) galvanized pre-punched bearing plates to distribute the loads on the board insulation.]

All anchor clips will be fastened into the structural roof substrate based on the following spacing pattern:

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

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

3.3.4 Be sure to capture all drilling debris during this operation with a rag or cloth placed on the panels at the drilling operation.

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

3.3.6 The seam caps shall be shipped with two (2) beads of factory applied hot melt sealant located inside the caps. To install the caps, hook one side of the cap over the panel edge and rotate over the opposite panel leg. For ease of installation, start at one end of the panel and work toward the opposite end.

3.3.7 A hand crimping tool is used to crimp the cap around the top of two adjacent panels.

3.3.8 Caps shall then be permanently seamed with manufacturers mechanical seamer.

3.3.9 Isolate dissimilar metals and masonry or concrete from metals with bituminous coating. Use gasketed fasteners where required to prevent corrosive action between fastener, substrate, and panels.

3.3.10 Limit exposed fasteners to extent indicated on contract drawings.

3.3.11 Seal laps and joints in accordance with roofing system manufacturer's product data.

3.3.12 Coordinate flashing and sheet metal work to provide weathertight conditions at roof terminations. Fabricate and install in accordance with standards of SMACNA Manual.

3.3.13 Provide for temperature expansion/contraction movement of panels at roof penetrations and roof mounted equipment in accordance with system manufacturer's product data and design calculations.

3.3.14 Installed system shall be true to line and plane and free of dents, and physical defects. In light gauge panels with wide flat surfaces, some oil canning may be present. Oil canning does not affect the finish or structural integrity of the panel and is therefore not cause for rejection.

3.3.15 At joints in linear sheet metal items, set sheet metal items in two ¼-inch- (6-mm-) beads of butyl sealant. Extend sealant over all metal surfaces. Mate components for positive seal. Allow no sealant to migrate onto exposed surfaces.

3.3.16 Remove damaged work and replace with new, undamaged components.

3.3.17 Touch up exposed fasteners using paint furnished by roofing panel manufacturer and matching exposed panel surface finish.

3.3.18 Clean exposed surfaces of roofing and accessories after completion of installation. Leave in clean condition at date of substantial completion. Touch up minor abrasions and scratches in finish.

3.4 FLASHING DETAILS

3.4.1 Membrane flashings: Apply all membrane flashings according to the manufacturer’s written instructions. Ensure that all membranes are compatible with each other.

3.4.2 Metal flashings: Supply and install new metal. Any scratched, bent or otherwise damaged metal will not be acceptable.

3.4.3 All flashings must be installed straight and true with no distortions. No irregular or poorly installed metalwork will be accepted.

3.4.4 Install sheet metal by S-lock seams. Hem all raw edges 12.7mm(1/2”). Mitre and seal all corners.

3.4.5 Flashing must be fastened securely to prevent movement or stripping by wind.

3.4.6 Ensure that no dissimilar metals are in contact with each other to avoid corrosion.

3.4.7 Replace all eavestroughs and downspouts to match the existing colour and profile.

3.9 CLEANING

3.9.1 Leave work area clean at end of each day

3.9.2 The roofing contractor is to use a magnetic broom at the end of each day of work to pick up all pieces of metal and nails falling to the ground during the roof replacement project.

3.10 PROTECTION

3.10.1 Protect installed products and components from damage during construction.

3.10.2 Repair damage to adjacent materials caused by metal panel installation.

END OF SECTION 07 41 13

07 51 13 - Cold-Applied Built-Up Asphalt Roofing

PART 1 GENERAL

1.1 GENERAL CONDITIONS

1.1.1 All conditions of Contract and Divisions 0 and 1 apply to this section and to requirements of Canadian Roofing Contractors Association Roofing Manual Specifications as referred to herein.

1.1.2 Abide by all Federal, Provincial, Municipal and Local Laws or Codes, rules and regulations that in any way affect work including all amendments up to project date.

1.2 SECTION INCLUDES

1.2.1 Roof Areas A1, A2, B1, C1, C2, D1, D2, D3

1.3 CO-ORDINATION

1.3.1 Co-ordinate work of this Section with work of:

.1 Section 01 10 00 General Requirements.

.2 Section 06 10 00 Rough Carpentry.

.3 Section 07 62 00 Sheet Metal Flashing and Trim.

.4 Section 07 92 00 Joint Sealants.

1.4 STANDARDS

1.4.1 Roofing materials, products, and accessories shall be in accordance with the most current applicable industry standards including but not limited to:

.1 CAN/CSA O80 SERIES – Wood Preservation.

.2 ASTM C1177/C1177M-[06], Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing.

.3 ASTM C1278/1278M. Fiber Reinforced Gypsum Panels.

.4 ASTM C1396/C1396M-[06a], Standard Specification for Gypsum Board.

.5 CSA A123.23: Single Compound, One-Component, Elastomeric, Chemical Curing.

.6 CSA A123.23: Membrane, Modified, Bituminous, Prefabricated, and Reinforced for Roofing.

.7 ASTM D41: Primer, Asphalt, Unfilled, for Asphalt Roofing, Dampproofing and Waterproofing.

.8 CGSB 37-GP-64M: Mat Reinforcing, Fibrous Glass, for Membrane Waterproofing Systems and Built-up Roofing.

.9 ASTM C165 Measuring Compressive Properties of Thermal Insulations.

.10 ASTM D6164/D6164M: Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Polyester Reinforcements.

.11 ASTM A653/A653M-10: Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by Hot-Dip Process.

.12 ASTM E84-12: Surface Burning Characteristics of Building Materials

.13 UL 790: Fire Tests of Roof Coverings – Class “A” as listed in TGFUC.R19921, Soprema Canada

.14 UL 1256: Fire Test of Roof Deck Constructions.

1.5 SYSTEM DESCRIPTION

1.5.1 Roof Areas A1, A2, B1, C1, C2, D1, D2, D3

.1 Cold-Applied Built-Up Asphalt Roofing System: Pea gravel broadcast into cold-applied adhesive, 3-plies of composite felts in cold-applied adhesive, fibreboard overlay in adhesive, two layers of polyisocyanurate insulation in adhesive, self-adhering vapour retarder adhered over the existing metal deck. Membrane flashings are to be 1-ply polyester reinforced EPDM/SBR in cold-applied adhesive.

1.6 QUALIFICATIONS

1.6.1 Contractor qualifications are listed in the GENERAL CONDITIONS under section 01 43 23 CONTRACTOR QUALIFICATIONS.

1.7 QUALITY CONTROL

1.7.1 Quality controls are listed in the GENERAL CONDITIONS under section 01 45 00 QUALITY CONTROL – GOOD ROOFING PRACTICES

1.8 PRE-START MEETING

1.8.1 A pre-start meeting is to be scheduled one week prior to any work commencing. The roofing contractor, the consultant, the on-site contact and/or owner's representative should be present.

1.8.2 The following items will be discussed at the pre-start meeting:

.1 methods and procedures relating to the roof assembly installation

.2 on-site procedures

.3 on-site material storage

.4 the construction schedule

1.9 DELIVERY, STORAGE & HANDLING

1.9.1 Delivery, storage, and handling are listed in the GENERAL CONDITIONS under section 01 66 00 STORAGE & DELIVERY OF MATERIALS.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 Roof Membrane (top-layer): Asbestos-free, waterproofing asphalt-coated, polyester/glass, scrim/glass mat, trilaminate reinforced, conforming to the requirements of ASTM D4601-98, Type II.

2.1.2 Roof Membrane Adhesive: Low odor, asbestos free cold process asphalt for use as an interplay and surfacing adhesive.

2.1.3 Flashing Membrane: Polyester reinforced EPDM/SBR single ply membrane, 1.14mm thick membrane.

2.1.4 Flashing Adhesive: Single-component bitumen modified moisture curing polyurethane.

2.1.5 Stripping Membrane: Vinyl-coated fibreglass mesh

2.1.6 Stripping Adhesive: Single-component bitumen modified moisture curing polyurethane.

2.1.7 Vapour Retarder Membrane: Self-adhering membrane consisting of SBS rubberized asphalt laminated to a slip resistant, cross laminated polyethylene surface film.

2.1.8 Vapour Retarder Adhesive/Primer: Quick drying adhesive primer formulated to prepare and promote adhesion to various deck surfaces.

2.1.9 Insulation: 76mm (3.0") polyisocyanurate insulation (4'x4' boards). Type: closed cell polyisocyanurate foam roof board insulation with inorganic coated glass facer, meeting the requirements of CAN/ULC S704, Type 2 Class 3 materials and ASTM C1289, Type II, Class 2, Grade 2.

2.1.10 Insulation Adhesive: Two-part, solvent free, moisture curing, urethane foam adhesive

2.1.11 Insulation Sump: Polyisocyanurate, pre-manufactured drain sump, minimum 8'x8'. Meeting the requirements of CAN/ULC S770.

2.1.12 Cover Board: 12.7mm (0.5") high density fiberboard insulation (4'x4' boards), factory coated on one side, conforming to CAN ULC-S706-09 Type II, Class 1

2.1.13 Mastic: One-part, solvent & asbestos free, moisture curing elastomer

2.1.14 Pea Gravel: Clean, water-washed pea gravel, naturally graded in size from 6mm to 16mm with not more than 5% passing a 6mm screen. Well graded, opaque, non-porous material, free from fines. Conforming to ASTM D1863-93.

2.1.15 Primer (Vapour Retarder): As recommended by material manufacturer

2.1.16 Asphalt Protection Board: 6.35mm (1/4") thick (4'x4') boards, torch safe, semi-rigid protection board.

2.1.17 Self-Adhering Membrane (Perimeter Parapets): Self-adhering, self-sealing, composite membrane consisting of a high softening point with SBS rubberized asphalt compound.

2.1.18 Self-Adhering Membrane Adhesive (Perimeter Parapets): Rubber based adhesive for self-adhering membranes.

2.2 ACCESSORIES

2.2.1 Wood Blocking, Plywood Sheathing: Construction grade; free from warping and visible decay; pressure-treated spruce, to CAN/CSA O80 SERIES-08.

2.2.2 Cant Strip: fire resistant, wood cant

2.2.3 Cant Strip Adhesive: solvent free, fastener free, insulation attachment; Fas-n-Free Adhesive by Tremco.

2.2.4 Metal Flashing: 26 gauge pre-painted galvanized; Series 8000 baked enamel finish; colour to match existing, to ASTM A653/A653M-10. 24-gauge metal for all cleats and hook strips. Colour to be confirmed by the Owner.

2.2.5 Pitch Pan: Pre-manufactured type; 16 oz. copper, fully soldered, minimum 152.4 mm (6") high above finished roof level, complete with copper caps and sealant.

2.2.6 Pitch Pan Sealant: M-1 Structural sealant and 1-part pourable sealer

2.2.7 Sealant: single component; moisture cure; polyurethane sealant conforming to ASTM-C920.

2.2.8 Fasteners: 25 mm square or round head, ring shanked galvanized or non-ferrous type, length as required to suit application.

2.2.9 Drains: boxed copper retro drain with flange, with dome and seals by Platinum Technologies Inc.

2.2.10 Control Flow Mechanism: By Platinum Technologies Inc.

2.2.11 Vent Stack: insulated aluminum vent stack with factory applied polyurethane foam insulation and vent stack cap. By Platinum Technologies Inc.

2.2.12 Gooseneck flashings: 30" stainless steel gooseneck 1.9" I.D with spun aluminum base By Platinum Technologies Inc.

2.2.13 Tall Cones: all sizes (1.5" – 12"): By Platinum Technologies Inc.

2.2.14 Termination Bar: 10' Alum Term Bar – Item NO. – Term-10 (#90354) By Platinum Technologies Inc.

2.2.15 Gas Line Supports: Adjustable gas line supports on insulated padding

2.2.16 Foam Gasket: EMSEAL MST Multi-Use Sealant Tape or EMSEAL UST Sealant Tape.

NOTE: The contractor must supply all primers, mastics, and membranes from a single source Manufacturer. No alternates will be accepted without written approval from the Consultant

PART 3 EXECUTION

3.1 PREPARATION

3.1.1 Supply and install perimeter safety warning as prescribed by the Ontario Occupational Health and Safety Code and all local codes before starting any other work.

3.1.2 It is the contractor's responsibility to obtain all required permits for this project and must carry this cost in his bid price.

3.1.3 The ground areas around the building are to be protected as much as possible. All disposal boxes must be placed on planks. The interior areas of the building, where the roofing contractor has access, are to be protected.

3.1.4 It is the responsibility of the roofing contractor to contact the Owner to mark the exact location of buried utilities.

3.1.5 Remove the existing roofing down to the existing metal deck. Dispose of all debris at an appropriate licensed dump site. No garbage is to be stored on the roof. Remove the existing metal flashings and membrane flashings down to the existing substrates.

3.1.6 Should the metal deck be found to be deteriorated, requiring replacement, the roofing contractor is responsible to document all areas with photographs and measurements indicated on a roof plan, on a daily basis and provide them to both the consultant and property manager/owner. Metal deck replacement quantities proposed for replacement are to be approved in writing by the owner/property manager prior to any area being replaced. Should the roofing contractor proceed to install any structural deck without photos, measurements and written approval, no additional funds will be paid for these areas. All pricing for the deck replacement will be taken from the unit prices provided in the tender form. Should approval not be obtained the same day, the roofing contractor will be responsible for temporarily waterproofing the area.

3.1.7 Should the existing metal deck require replacement, the roofing contractor is responsible to have an engineer review the installation of the metal deck and provide a written and stamped report indicating that the deck has been installed according to code requirements and is structurally adequate. All reports are to be submitted to the property manager and the consultant.

3.1.8 Inspect the structural deck and report any deficiencies to the Owner's Representative. Do not apply any new roofing over deficiencies, other than temporary waterproofing, until all deficiencies have been corrected.

3.1.9 Do not remove more of the existing roofing than can be completely waterproofed in one day.

3.1.10 The roofing contractor shall be responsible for all roof leaks (both on the existing roofing assembly and the new roofing assembly) at the building once they begin to set-up and load materials onto the roof at the beginning of the project.

3.1.11 The roofing contractor is responsible to disconnect and reconnect any mechanical, electrical conduit, cabling, and/or gas lines which are affecting the roof installation. The roofing contractor is responsible for all satellites. The satellites are to be moved and put back in the approximate same location. Roofing contractor is responsible for repositioning satellites to

obtain proper signal.

3.1.12 Should wall anchors, roof anchors, and/or davit arm bases require re-certification it will be the roofing contractor's responsibility to do so and is to be carried in the tender price.

3.1.13 Remove all designated redundant equipment, pipes, cones, pitch pans, conduits, unused anchors, davits and equipment as identified by the Owner.

3.2 REDUNDANT EQUIPMENT/OPENINGS

3.2.1 Remove all designated redundant equipment, pipes, cones, pitch pans, etc. Install new metal decking matching the existing thickness. Metal will be installed on a continuous bead of elastomeric sealant and screwed down with stainless steel self-tapping screws a minimum of 152.4mm (6") on centre around the perimeter. All redundant equipment will be marked with yellow paint by building operator.

3.3 CARPENTRY

3.3.1 Construct wood blocking as per details. Build-up all perimeter details to accommodate the height of the new roof assembly. Outside perimeter wood blocking is to be 8" above the finished roof surface (above finished surface) and sloped inward toward the roof. Install sloped wood blocking along the outside perimeters. Build-up all unit curbs a minimum of 304.8mm (12") above the finished roof level to accommodate the height of the new roofing assembly where required.

3.3.2 Offset blocking layers 304.8mm (12") and weave corners.

3.3.3 Assemble blocking using two staggered rows of nailing. Space nails in any row a maximum of 609.6mm (24") on centre. Within 2440mm (8') of outside corners, reduce maximum spacing to 304.8mm (12") on centre.

3.3.4 Install asphalt protection board along all perimeters, curbs and walls, from the top of the deck to the top of the details. The asphalt protection board is to be secured 6" on center horizontally with fasteners spaced no more than 12" on center vertically.

3.4 VAPOUR RETARDER

3.4.1 Verify all substrates to receive the vapour retarder primer are clean, dry and free from any contaminants that could affect adhesion of the primer and/or vapour retarder.

3.4.2 All substrates to receive vapour retarder are to be primed. The primer is to be applied by brush, roller or sprayer. Allow primer to be dry to touch prior to applying the vapour retarder.

3.4.3 Over the clean, dry and primed substrates (metal deck, wood blocking, etc.) apply 1-ply of self-adhered vapour retarder membrane fully adhered.

3.4.4 Roll out the vapour retarder and allow it to relax prior to application. Cut lengths to fit the application. Set in place and pull back the release film 152.4mm to 304.8mm (6" to 12") and place it on the prepared surface. Remove the release film from the remainder of the sheet and apply pressure to ensure proper contact with prepared surface.

3.4.5 Overlaps: side laps to be 76.2mm (3") and end laps to be 152.4mm (6")

3.4.6 Commence the vapour retarder application at the lowest edge of drain. Proceed up the slope form the lowest point on the roof.

3.4.7 At terminations and penetrations, the vapour retarder is to be extended up the vertical surface, above the insulation a minimum of 50.8mm (2"). Where cant strips are to be installed the vapour retarder is to be extended 50.8mm (2") above the top of the cant strip.

3.5 INSULATION & OVERLAY BOARDS

3.5.1 Ensure the vapour retarder is clean, dry, continuous and ready for insulation application.

3.5.2 Apply one layer of 3.0" polyisocyanurate insulation 1219mm (4' x 4' boards), in adhesive. Insulation is to be placed with all joints staggered a minimum of 609.6mm (2') per row.

3.5.3 Apply second layer of 3.0" polyisocyanurate insulation 1219mm (4' x 4' boards), in adhesive. Insulation is to be placed with all joints staggered a minimum of 609.6mm (2') per row.

3.5.4 Apply adhesive directly to the substrate in a bead pattern. The beads are to be between 12.7mm to 19mm (1/2" to ¾") wide beads. The beads are to be continuous and full length of each insulation board. The insulation is to be immediately placed into the adhesive. Do not allow the adhesive to skin over.

3.5.5 Each 1219mm x 1219mm (4'x4') insulation board shall have continuous beads applied, spaced 152mm (6") equally across the board, throughout the field of each roof area, on each layer of insulation. At perimeter and outside corners (within 10' of perimeters), the beads are to be placed 4" equally across the board.

3.5.1 Install one layer, 12.7mm (0.5") high density cover board, in adhesive over the polyisocyanurate insulation and carried over the drain sumps. The ribbons are to be between 13mm to 19mm (1/2" to ¾") wide ribbons. The ribbons are to be spaced 102mm (4") continuously across each board. Butt boards tightly together. Stagger all joints. Ensure that the joints of the polyisocyanurate insulation layer and the cover board are not directly over one another.

3.5.2 Ensure that all insulation boards are fully supported, joints staggered, and all edges are butted tight with no gaps between boards.

3.5.3 Do not apply more insulation & cover board than can be covered with membranes in the same workday.

3.5.4 Install sloped prefabricated insulation sumps 2438mm x 2438mm (8'x8') around all roof drains. Adjust the insulation thickness to accommodate the sumps.

3.5.5 No damaged or wet insulation will be accepted. All rejected materials will be marked and must be stored on site. They are not to be removed until the project is completed.

3.6 CANT STRIPS

3.6.1 Embed the cant strip into cold-applied adhesive at all horizontal to vertical transitions in the roof. The cant strip is to be continuous and butted tight.

3.6.2 No damaged or wet cant strip will be accepted. All rejected materials will be marked and must be stored on site. They are not to be removed until the project is completed.

3.7 MEMBRANE APPLICATION

3.7.1 Over the coverboard overlay, apply 3 plies (3-ply composite felts) of membranes in cold-applied adhesive at a rate of 20 – 25 lbs. per 100 sq.ft, over the newly installed overlay board.

3.7.2 All plies will be terminated at the top of the cant strip.

3.7.3 Start and finish membrane along roof edges, terminations and projections using starting and finishing strips; 304.8mm, 609.6mm and 914.4mm (12", 24" and 36") wide plies.

3.7.4 Starter strip is to be overlapped 660.4mm (26") with first ply then overlap each additional ply 625mm (24 2/3").

3.7.5 **Phased roofing will not be accepted**. If one, or two, or three plies are applied for whatever reason, the contractor must remove these plies and apply a new 3 ply system on top at no additional cost to the owner.

3.7.6 All end laps in the field of the roof are to be staggered.

3.7.7 Ensure the felts lie flat, with no wrinkles, fishmouths, or blisters, and are well bonded. All surfaces of the membrane must be completely coated with asphalt. No areas of dry felt in

contact with dry felt will be accepted.

3.7.8 No felts are to be left uncoated at days end for any reason.

3.8 GRAVEL

3.8.1 Apply a uniform flood coat of adhesive at a rate of 5 gal/100ft2 (2.0 L/m2). Immediately embed the new gravel into the adhesive at a rate of 500 lbs. per 100 square feet.

3.8.2 Sweep loose gravel back 20' from all corners on the roof. Apply another flood coat of adhesive and embed another layer of new, washed gravel into the adhesive.

3.8.3 Once the gravel has been applied, no cold-applied adhesive is to be visible.

3.9 NIGHT SEAL

3.9.1 Roofer is responsible to have all roofs closed-in and in a watertight condition at the end of each production day.

3.9.2 It is the Foreman's responsibility to thoroughly check this detail at the end of each day before leaving the roof.

3.10 MEMBRANE FLASHINGS

3.10.1 Install flashings, including laps, splices, joints, bonding, adhesion and attachment as required and in accordance with manufacturer's written instructions and details.

3.10.2 Membrane flashings will be comprised of 1 ply of EPDM/SBR in cold-applied adhesive with mesh reinforced laps.

3.10.3 The contractor is responsible to disconnect and reconnect any electrical conduit, metal railings, ladders, cabling, and/or gas lines which affect the roof installation.

3.10.4 Flashing membranes are to be terminated 304.8mm (12") above the base of vertical surfaces at all locations.

3.10.5 Perimeter (Outside Perimeters):

.1 Raise the existing perimeter to accommodate the height of the new roof assembly and slope inward towards the roof, as per details.

.2 Install 6.35mm (1/4") asphalt recovery board over exposed substrate. Asphalt recovery board is to be continuous. It is to extend from the top of the metal deck to the top of the wall.

.3 Raise the existing perimeter to accommodate the height of the new roof assembly, where required.

.4 Install continuous pressure treated wood blocking sloped inward towards the roof.

.5 Adhere flexible flashing membrane completely to the cant strip, wood blocking and the field of the roof and terminated along the outside perimeter, fully covering the wood blocking. Flashing membrane is to extend at 152.4mm (6") beyond the toe of the cant strip. The flashing membrane is to be nailed 457.2 (18") on center along the outside face. Where metal siding existing on the outside perimeter of the building, the membrane flashings are to extend a minimum of 50.8mm (2") onto the siding.

.6 Where flexible flashing membrane is terminated in the field of the roof, seal lap with stripping membrane embedded between alternate continuous courses of stripping adhesive, centred over the lap.

.7 Lap flexible flashing membrane ends 101.6mm (4") and adhere with flashing adhesive. Seal lap by embedding stripping membrane into stripping adhesive, centered over the joint and apply a 2nd coat of stripping adhesive over top of stripping membrane. Stripping membrane is to be fully embedded and covered with adhesive.

.8 Install new pre-painted metal flashings fully covering the perimeter membrane flashings and extending down over the outside perimeters.

.9 At high wall locations, a termination bar is to be installed through the flashing membranes, approximately 12.7mm (0.5") below the top of the membrane. It is to be secured 152.4mm (6") on centre.

.10 Fully cover the membrane flashings with new pre-painted metal flashings.

3.10.6 Masonry Wall (Inside Perimeter):

.1 Flashing membranes at masonry walls are to be terminated 304.8mm at the top of the masonry walls. If weep holes are present in the masonry, flashing membranes are to be kept one brick course below the weep holes.

.2 Apply one coat of quick dry primer on all surfaces to receive modified bituminous membranes at a rate of 150 sq.ft. per gallon. Ensure that all surfaces are clean and dry before primer application.

.3 After the application of the field membranes, apply 1-ply EPDM/SBR flashing membrane fully adhered in place.

.4 Continuously seal the top edge of the flashing membranes with elastomeric sealant.

.5 A termination bar is to be installed through the flashing membranes, approximately 12.7mm (0.5") below the top of the membrane. It is to be secured 152.4mm (6") on centre.

.6 Fully cover the membrane flashings with new pre-painted metal flashings and apply a continuous bead of sealant between the masonry and new metal flashings.

3.10.7 Equipment Curb Flashings:

.1 Build-up all unit curbs a minimum of 304.8mm (12") above the finished roof level to accommodate the height of the new roof assembly where required.

.2 Temporarily disconnect each HVAC/fan unit, completely lift the unit off the curb and set it on the roof while flashing the curb. The curb is to be set on plywood, protecting the roof membrane. Once the curb has been flashed, the unit is to be lifted off the roof and set back on the curb. Then once the unit has been reinstalled and reconnected it is to be tested to ensure it is working properly. The unit work must be performed only by qualified HVAC contractors. The roofing contractor is responsible for these costs in his bid price.

.3 After the application of the 4 ply field membranes, apply 1-ply EPDM/SBR membrane flashing in cold-applied adhesive, extending on the roof surface a minimum of 101.6mm(4") and extending over the top of the detail and down the outside face of the perimeter, fully covering the wood blocking. The membrane shall be nailed every 457.2mm(18") on centre along the outside face of the wall.

.4 Mesh reinforcements are to be installed at all seam locations and covered with additional cold-applied adhesive.

.5 Fully cover the membrane flashings with new 26-gauge pre-painted metal.

.6 Install a new foam gasket over top of the metal flashings prior to reinstalling mechanical equipment. Ensure that the foam gasket is continuous, creating a permanent seal between the mechanical equipment/skylights and metal flashings.

3.10.8 Equipment Sleepers/Separation Curb:

.1 Build-up all sleepers/separation curbs a minimum of 203.2mm (8") above the finished roof level to accommodate the height of the new roof assembly where required. Wood blocking to be pressure treated. Ensure positive drainage between sleepers, under the

mechanical equipment.

.2 Install 6.35mm (1/4") asphalt recovery board over exposed substrate. Asphalt recovery board is to be continuous. It is to extend from the top of the metal deck to the top of the sleeper.

.3 For sleepers, temporarily disconnect each HVAC/fan unit, completely lift the unit off the sleepers and set it on the roof while flashing the sleepers. The HVAC/fan unit is to be set on plywood, protecting the roof membrane. Once the sleepers have been flashed, new metal is to be installed, the unit is to be lifted off the roof and set back on the curb. Then once the unit has been reinstalled and reconnected it is to be tested to ensure it is working properly. The unit work must be performed only by qualified HVAC contractors.

.4 Apply one coat of quick dry primer on all surfaces to receive modified bituminous membranes at a rate of 150 sq.ft. per gallon. Ensure that all surfaces are clean and dry before primer application.

.5 After the application of the field membranes, apply 1-ply EPDM/SBR flashing membrane fully adhered in place.

.6 The flashings are to be extended a minimum of 203.2mm (8") onto the field of the roof, on both sides of the sleepers.

.7 Fully cover the membrane flashings with new pre-painted 26-gauge metal.

3.10.9 Pitch pans:

.1 All pitch pans will be replaced. Pitch pans must be a minimum of 152.4mm (6") high with a 101.6mm (4") primed roof flange. The sides of the pan will be a minimum of 50.8mm (2") from the projection. Where possible use a copper gooseneck instead of a pitch pan.

.2 Over the new 4 ply roofing membranes, embed the flange of the pitch pan/gooseneck in elastomeric sealant.

.3 Install 1 ply of EPDM/SBR membrane in cold-applied adhesive, over the flange applied tight to the upright and extending a minimum of 203.2mm (8") beyond the flange.

.4 Ensure the penetration and the inside walls of the new pitch pans are clean and free from any dirt or debris before applying any sealant.

.5 Apply M1 structural sealant around the inside walls and base of the pitch pan. Apply M1 sealant around the roof projection.

.6 Fill all pitch pans using 1-part pourable sealant.

.7 Install new pitch pans as required at mechanical units and at other roof penetrations/projections. No conduits, satellite cables, or gas lines are to be carried through the curb flashings. The roofing contractor is responsible for the disconnection and reconnection, where required.

3.10.10 Plumbing Vents:

.1 The stack jack flange must be primed before installation. Paint all existing vent stacks using double "D" aluminum paint.

.2 All existing plumbing vent pipes are to be extended to suit, so that the inside portion of the cap is within the plumbing vent pipe. Stacks to be a minimum of 304.8mm(12") above the finished roof surface. All stacks are to be pre-insulated as listed in the Materials section. Mechanically fasten cap with 2 self-tapping stainless-steel metal screws.

.3 Mechanically fasten a metal cone down to the metal deck. The cone must extend up past the finished roof level a minimum of 50.8mm (2"). Install the roofing vapour retarder so that it extends above the insulation surface and onto it 152.4mm (6"). The insulation should butt up against the metal cone.

.4 Over the new 4 ply roofing membranes, embed the flange of the stack in elastomeric sealant.

.5 Install 1 ply of EPDM/SBR membrane in cold-applied adhesive, over the flange applied tight to the upright and extending a minimum of 203.2mm (8") beyond the flange.

.6 Stack is to be insulated. Mechanically fasten cap with 2 self-tapping stainless-steel metal screws.

3.10.11 Furnace Stacks:

.1 Replace any damaged cones. Prime all flanges, paint all existing furnace stacks using double "D" aluminum paint.

.2 Mechanically fasten a metal cone down to the metal deck. The cone must extend up past the finished roof level a minimum of 50.8mm (2"). Install the roofing vapour retarder so that is extends above the insulation surface and onto it 152.4mm (6"). The insulation should butt up against the metal cone.

.3 Over the new 4 ply roofing membranes, embed the flange of the stack in elastomeric sealant.

.4 Install 1 ply of EPDM/SBR membrane in cold-applied adhesive, over the flange applied tight to the upright and extending a minimum of 203.2mm (8") beyond the flange.

.5 Replace any damaged rain collars and re-caulk all collars.

3.10.12 Overflow Scuppers:

.1 Remove the existing scupper drains and downpipes as required. Install new fully soldered copper scupper drains.

.2 The field membrane base sheet is to extend directly into the scupper opening fully covering the wood blocking.

.3 The new scupper drain is to be primed to accept new membranes. New scupper is to be set in a full bed of mastic.

.4 Install 1-ply EPDM/SBR membrane flashing fully adhered in place over the flange. The membrane flashings are to extend a minimum of 152.4mm (6") beyond the flange of the scupper onto the field of the roof in all directions and be carried into the scupper.

.5 New metal flashings are to be installed fully covering the membrane flashings and picture framing the scupper along the outside perimeter of the roof/wall.

3.10.13 Roof Drains:

.1 Plug the drains temporarily while working around them.

.2 Sump the area around the new drains 13mm (0.5") deep, a minimum of 1219mm (48") from the centre of the drain in all directions.

.3 Install new U-Flow drain inserts complete with U-Flow seals in a full bed of elastomeric sealant. Check the drainpipes on the underside of the deck to ensure the installation of the proper length of insert down-pipe. Ensure that the pipe does not impede the flow of water.

.4 Apply 1 coat of primer to the flange.

.5 Install 1 ply EPDM/SBR flashing membrane extending a minimum of 450mm (18") from the centre of the drain.

.6 The new metal strainer and control flow mechanism are to be installed immediately following the installation of the flashing membranes. Therefore, if the roof has 10 drains and only two drains have been flashed (that particular day), those two drains are

to have the metal strainer and control flow mechanism installed at the end of that workday.

3.11 GAS LINES

3.11.1 Wire brush all gas lines to remove surface rust.

3.11.2 Apply 2 coats of yellow rust inhibiting paint.

3.12 GAS LINE SUPPORTS

3.12.1 Install new adjustable supports at each pipe elbow, threaded joint, and where the pipe changes in direction, as well as approximately every 6' as per the current CSA B149.1 guidelines, Table 6.2 for the distance of the gas line/conduit tray.

Pipe O.D. Diameter in Inches (mm)	Maximum Spacing for Pipe Supports Feet (Metres)
0.5" (12.7mm) or less	Horizontal 6 feet (2 metres)
0.75-1.0" (19 -25.4mm)	Horizontal 8 feet (2.5 metres)
3-4" (75-102mm)	Horizontal 15 feet (5 metres)
5-8" (127-204mm)	Horizontal 20 feet (6 metres)
10" or larger	Horizontal 25 feet (8 metres)
All pipe sizes- Vertical	Every floor but not more than 125% of horizontal spacings.
Tubing- all sizes	Vertical & Horizontal 6 feet (2 metres)
Supports to be placed at all pipe unions, changes in directions (both sides) and at changes in elevation.	

3.13 WALKWAYS/SCUPPERS/MECHANICAL CONDENSATE PIPE/ROOF ACCESS

3.13.1 Install new concrete patio pavers on 25.4mm (1") extruded polystyrene insulation. The extruded polystyrene insulation is to be cut 50.8mm (2") smaller (all the way around) than the concrete patio pavers. Therefore, if the concrete paver is 609.6mm x 609.6mm (2'x2') the extruded polystyrene insulation should be 508mm x 508mm (1'8"x 1'8").

3.13.2 Install four concrete patio pavers pm 25.4mm (1") extruded polystyrene insulation, in a square pattern at roof hatch and all access doors.

3.14 FINISH

3.14.1 Perform a daily clean up to collect all wrappings, empty containers, and any other debris from the project site.

3.14.2 Upon completion, all debris is to be disposed of in a legally acceptable manner.

3.14.3 Prior to the final inspection, the Contractor is to perform a pre-inspection to review all work and to verify that all flashings have been completed as well as the application of all caulking.

END OF SECTION 07 52 16

07 62 00 - Sheet Metal Flashing & Trim

PART 1 GENERAL

1.1 GENERAL CONDITIONS

1.1.1 All conditions of the Contract and Divisions 0 and 1 apply to this section and to the requirements of the Canadian Roofing Contractors Association Roofing Manual Specifications as referred to herein.

1.1.2 Abide by all Federal, Provincial, Municipal and Local Laws or Codes, rules and regulations that in any way affect the work including all amendments up to the project date.

1.2 CO-ORDINATION

1.2.1 Co-ordinate the work of this Section with the work of:

.1 Section 01 11 00 Scope of Work.

.2 Section 07 51 13 Cold-Applied Built-Up Asphalt Roofing.

.3 Section 07 62 00 Sheet Metal Flashing and Trim.

.4 Section 07 92 00 Joint Sealants.

1.3 STANDARDS

1.3.1 THE ALUMINUM ASSOCIATION INC. (AAI)

.1 AAI-Aluminum Sheet Metal Work in Building Construction-[2002].

.2 AAI DAF45-[03], Designation System for Aluminum Finishes.

1.3.2 AMERICAN SOCIETY FOR TESTING AND MATERIALS INTERNATIONAL (ASTM)

.1 ASTM A167: Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.

.2 ASTM A240/A240M: Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications.

.3 ASTM A606: Steel, Sheet and Strip, High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, with Improved Atmospheric Corrosion Resistance.

.4 ASTM A653/A653M: Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by Hot-Dip Process.

.5 ASTM A792/A792M: Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by Hot-Dip Process.

.6 ASTM B32:Solder Metal.

.7 ASTM B370:Copper Sheet and Strip for Building Construction.

.8 ASTM B813; Flux

.9 ASTM D41; Asphalt Primer

.10 ASTM D226; Asphalt or Tar Saturated Roofing felt.

.11 ASTM D1970; Self-Adhering Ice Dam Protection

.12 ASTM D523:Test Method for Specular Gloss.

.13 ASTM D822:Filtered Open-Flame Carbon-Arc Exposures of Paint and Related Coatings.

.14 ASTM F1667; Nails, Spikes and Staples

1.3.3 CANADIAN ROOFING CONTRACTORS ASSOCIATION (CRCA)

.1 Roofing Specifications Manual, latest edition.

1.3.4 CANADIAN SHEET STEEL BUILDING INSTITUTE (CSSBI)

1. CSSBI Bulletin SSF-3; Care & Maintenance of Prefinished Sheet Steel Building Products.
2. CSSBI Technical Bulletin S-8; Quality & Performance Specification for Prefinished Sheet metal Used for Building Products.

1.3.5 CANADIAN STANDARDS ASSOCIATION (CSA INTERNATIONAL)

1. CSA A123.3: Asphalt Saturated Organic Roofing Felt.
2. AAMA/WDMA/CSA 101/I.S.2/A440-[2008], Standard/Specification for Windows, Doors, and Unit Skylights.
3. CSA A123.22; Self-Adhering Polymer Modified Eave Protection
4. CSA B111: Wire Nails, Spikes and Staples.

1.3.6 GREEN SEAL ENVIRONMENTAL STANDARDS

1. Standard GS-03-[93]; Anti-Corrosive Paints.
2. Standard GS-11-[97]; Architectural Paints.
3. Standard GS-36-[00]; Commercial Adhesives.

1.3.7 HEALTH CANADA/WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS)

1. Safety Data Sheets (SDS).

1.3.8 SHEET METAL & AIR CONDITIONING CONTRACTORS NATIONAL ASSOCIATION (SMACNA)

1. SMACNA Manual, latest Edition

1.4 APPROVAL

1.4.1 Do not install any metal work until the membrane flashings have been inspected and accepted by the Owner's Representative. The colour is to be determined by the Owner.

1.4.2 In all cases and prior to the fabrication of the finished product, supply and install a sample for approval by the Owner's representative.

1.5 SCHEDULE

1.5.1 Schedule the work so that the membrane flashings are not left exposed for more than 30 days.

1.6 GUARANTEE

1.6.1 Guarantee the metal flashing in conjunction with the membrane roofing for ONE (1) year. Submit on the same form as for the membrane roofing guarantee.

1.7 QUALITY CONTROL

1.7.1 Quality control for work of this Section is to be performed by the Consultant under the work of and as specified in Section 01 10 10 General Requirements.

1.7.2 Work of this Section is to be carried out by a specialist having a minimum of five years of related experience.

1.7.3 Work is to be performed in accordance with the practices and details of SMACNA Architectural Manual – 6th Edition (Sheet Metal and Air Conditioning Contractors National Association Inc.), unless otherwise required in the Contract Documents.

PART 2 PRODUCTS

2.1 COMPATIBILITY

2.1.1 Compatibility between roofing materials is an essential requirement of the Contract.

2.2 METAL COUNTERFLASHINGS

2.2.1 PREFINISHED STEEL METAL:

.1 Pre-painted galvanized steel, 0.46.35mm (26 ga.) core nominal thickness, Series 8000 with a baked enamel finish to ASTM A653.

.2 The finish is to be Dofasco Perspectra Series, Valspar WeatherX factory baked finish, or an approved alternate.

.3 The colour is to be approved by the Owner.

2.2.2 GALVANIZED STEEL:

.1 Galvanized sheet steel, Z275 (G90) zinc coating. Thickness as specified or shown on the Drawings.

2.2.3 HOOK STRIP:

.1 Fabricated from pre-finished steel, 0.56.35mm (24 ga.) core nominal thickness, Z275 (G90) zinc coating to ASTM A653. Width minimally 102mm (4”). Colour to match prefinished sheet metal where exposed. Starter strips are to be continuous.

2.2.4 COPPER:

.1 Copper to be 0.8mm (16 oz.) cold rolled to ASTM B370.

2.2.5 SOLDER & FLUX:

.1 Solder to be lead-free.

.2 Flux is a commercial preparation suitable for materials to be soldered.

2.2.6 WEDGES:

.1 Rolled Plumber sheet lead.

2.2.7 ISOLATION COATING:

.1 Asphalt based back paint for application to sheet metal in contact with masonry. Use asphalt primer to ASTM D41.

2.2.8 PITCH PAN:

.1 Size as specified in the Summary of Work or as shown in the Detail. One piece pre-fabricated aluminium of fabricated from 26 ga. pre-painted steel or 16 oz. Copper.

2.2.9 PITCH PAN FILLER:

.1 One (1) or two (2) part elastomer such as ChemLink M-1 Sealant, Sopramastic SP-2 or approved alternate.

2.2.10 TOUCH-UP PAINT:

.1 As recommended by the prefinished sheet metal Manufacturer.

2.2.11 FASTENERS:

.1 Nails: Hot dipped galvanized steel flat head roofing nails of length and thickness to suit the application.

.2 Where exposed, use Hex Head screws with 12.7mm (1/2") dome and neoprene washers as supplied by Weather Guard, or equal.

.3 Fasteners for masonry and concrete: Tapcon fasteners with “Climaseal” corrosion resistant finish, or an approved equivalent, of sufficient length to provide a minimum 38mm (1.5”) penetration into the substrate.

.4 Expansion Fasteners: A tamper-proof nail drive anchor which has a body formed from Zamac alloy. Zamac Nail-in.

PART 3 EXECUTION

3.1 GENERAL

3.1.1 Apply in accordance with the Drawings, Specifications and the requirements of the jurisdictional authorities and the Canadian Roofing Contractors Association's Roofing Manual.

3.1.2 Regard the Manufacturer's printed recommendations and Specifications as a minimum requirement for materials, methods and quality of Work not otherwise specified herein.

3.1.3 Make adjustments to the specified procedures caused by weather and site conditions only with the Owner's approval.

3.1.4 Maintain all the equipment in good working order to ensure control of roofing operations and protection of the Work. Equipment and laying techniques are to meet the approval of the Consultant.

3.2 FABRICATION

3.2.1 Shop fabricate the flashings and trims in accordance with the applicable requirements of SMACNA Architectural Manual and in accordance with the Contract Documents. Form sheet metal on a bending brake. Shaping, trimming and seaming on a bench.

3.2.2 Form sections square, true, and accurate to size, free from distortion, oil canning and other defects detrimental to the appearance and performance, and to the dimensions as indicated/required.

3.2.3 Fabricate the cap flashings, starter strips, and base counter flashings less than 304.8mm (12") in height in 2440mm (96") maximum lengths. Form the counter flashings between 304.8mm and 609.6.35mm (12" and 24") in height in 1219.2mm (48") maximum lengths.

3.2.4 Provide a counter flashing and an intermediate vertical flashing where the cap flashing is greater than 610 m (24") above the top of the roofing membrane. Form the vertical flashings in 1220 mm (48") maximum lengths.

3.2.5 Provide an "S-Lock" joint at all end joints and at all horizontal joints between the cap flashing and the vertical flashing and between the vertical flashing and the base counter flashing.

3.2.6 Hem all exposed edges at least 12.7mm (1/2") for appearance and stiffness.

3.2.7 Provide a horizontal stiffening "V" or "X" break on all face metal exceeding 228.6mm (9") in girth. Centre the V or X break in mid-span of the panel. Cross break the metal face flashing on all parapet flashings exceeding 457.2mm (18") in girth.

3.2.8 Mitre and form the standing seams at all corners. Make allowances for movement at the joints.

3.2.9 Apply an isolation coating to the metal surfaces to be embedded in concrete or mortar joints.

3.3 PITCH PAN FABRICATION / INSTALLATION

3.3.1 All boxes shall be minimum 152 mm (6.0") high above finished roof surface, with 125 mm (5.0") roof flange as approved by the Consultant. Make all seams continuous and soldered. Tapered rain collars to be included

3.3.2 Install new pitch pans where required

3.3.3 Apply asphalt primer on the underside of flange. Embed flange in a layer of mastic on to the modified roof membrane.

3.3.4 Modified Bitumen: Flash in with one ply base sheet membrane to manufacturer's recommendations.

3.3.5 Fill the bottom two-thirds (2/3) of the pitch pan with polyurethane foam. Apply polyurethane pitch pocket sealant on the exposed interior face and fill the top third of the pitch pan with the pourable sealer. The pourable sealer is to extend 13 mm (1/2") above the pitch pan at the centre and cove it to shed water.

3.3.6 Once the sealant has cured, apply the specified storm collar and clamp to existing protrusion to provide complete protection over the pitch pan. Apply sealant if required.

3.4 SCUPPER FABRICATION AND INSTALLATION – IF REQUIRED

3.4.1 Fabricate scuppers from copper. Fabricate scuppers to suit a 102 mm (4") diameter down spout and in general accordance with CRCA standard flashing detail FL 9. Solder all joints in the scupper. Ensure flange is continuous by filling in outside corners.

3.4.2 Fabricate deck flange to provide a 152 mm (6") wide apron. Ensure flange is continuous by filling in outside corners. Apply isolation coating on deck flange. Provide a gravel stop soldered in place across scupper opening.

3.4.3 Provide copper or stainless-steel strainers for outlet.

3.4.4 Install new scuppers at existing and/or new scupper locations, where applicable. Set pre-primed flange in a full bed of rubberized mastic for BUR and Modified bitumen membranes.

3.4.5 Install scuppers in general accordance with CRCA standard flashing detail FL. 9 or to Detail.

3.5 COPPER SLEEVE FABRICATION AND INSTALLATION- IF REQUIRED

3.5.1 Fabricate sleeve flashing for existing penetrations from copper.

3.5.2 Provide a two piece or split sleeve with a minimum height of 305 mm (12").

3.5.3 Fabricate deck flange to provide a 152 mm (6") wide apron. Ensure flange is continuous by filling in outside corners.

3.5.4 Fabricate sleeve and flange with flat lock joints suitable for field soldering.

3.5.5 Apply isolation coating on surface of penetration.

3.5.6 Install copper sleeve flashing around penetrations.

3.5.7 Close and solder all joints and seams. Clean copper on joint surfaces to receive solder with steel wool. Flux and fill joints with molten solder.

3.5.8 Wipe and wash clean all traces of acid from the flux immediately after the joints are made.

3.5.9 Install split storm collar in strict accordance with Manufacturer's recommendations. Apply silicone sealant, as specified in Section 07 92 00 - Joint Sealants, at joint between storm collar and gas line penetration.

3.5.10 Install rain collar with sealant bead.

3.6 SHEET METAL UNDERLAYMENT INSTALLATION- IF REQUIRED

3.6.1 Install self-adhesive bituminous membrane as per the Detail Drawings, according to Manufacturer's instructions.

3.6.2 Provide membrane underlayment beneath sheet metal flashings at all locations, except where membrane flashings are present.

3.6.3 Ensure all surface areas are free from frost, dust, grease, oil, loose or spalled material.

3.6.4 Apply primer as per Manufacturer's printed instructions. Allow the primer to dry and install underlayment membrane on the same day as priming.

3.6.5 Proceed only when weather is favourable. Should installation be undertaken at temperature below 4°C (40°F), consult Manufacturer regarding special procedures.

3.6.6 Maintain the recommended minimum side lap and end lap as per the Manufacturer's printed instructions.

3.6.7 Roll the membrane underlayment immediately after placement to ensure continuous adhesion. The roller to be of the type and size recommended by the Manufacturer.

3.6.8 Ensure the continuity of the membrane underlayment is maintained at all penetrations and terminations. Apply membrane sealant as required to fill inaccessible gaps following the Manufacturer's instructions.

3.6.9 Do not cover the membrane underlayment until it is reviewed and approved by the *Consultant*.

3.7 TERMINATION BAR INSTALLATION

3.7.1 Provide continuous termination bar along top of membrane flashings where indicated on Drawings and at locations and where membrane flashings terminate at the base of a wall and no other means of mechanical securement is specified or indicated.

3.7.2 Install the termination bar 3 mm (⅛") below the top edge of the base flashing membrane and mechanically secure to the masonry wall using 38 mm (1½") 'Tapcon fasteners, or Zamac Nail-ins at 152 mm (6") o.c.

3.7.3 Seal the top of the termination bar with rubberized mastic or polyurethane based sealant.

3.8 METAL DRIP EDGE FLASHING INSTALLATION- IF REQUIRED

3.8.1 Install new pre-finished aluminum metal drip edge along eaves at area of work.

3.8.2 Metal is to extend onto perimeter wood substrate 52 mm (2") minimum. Fasten metal to wood substrate with roofing nails installed every 152 mm (6") on-centre, along edge. Nails are to be set in 25 mm (1") and parallel from edge of metal.

3.8.3 Metal drip flashings to be fabricated up to 3048 mm (10') lengths and overlapped at joints 76.2mm (3") minimum. Apply sealant within joints prior to securement.

3.9 SHEET METAL INSTALLATION

3.9.1 Install the cap flashings, counter flashings, starter strips, and other miscellaneous sheet metal Work in accordance with the Contract Documents.

3.9.2 Provide a continuous starter (hook) strip where detailed or required to present a true, non-waving, leading edge. Fasten the starter strip to the substrate at a minimum of 304.8mm (12") on centre in a "Z" pattern using roofing nails of at least 25.4mm (1") length.

3.9.3 Ensure the parapet cap flashings are installed with a minimum positive slope of 2% toward the roof area. The slope is to be provided by the installation of continuous wood shims, plywood or wood blockings as detailed in accordance with Section 00 61 00 – Rough Carpentry.

3.9.4 Install cross-broken flat stock metal to entire parapet wall over 304.8mm (12") in height.

3.9.5 Caulk all horizontal joints less than 1:100 slope (1%).

3.9.6 Join all sheet metal with evenly spaced flat lock seams 25.4mm (1") wide to allow for thermal movement.

3.9.7 Counter flash bituminous flashing membranes at roof joints, walls, perimeters, parapets and curbs. Flash joints in metal flashings using S-locks and standing seams forming tight fit over hook strips. Construct internal and external mitres.

3.9.8 End joints where adjacent lengths of metal flashing meet to be made using an "S-lock" joint. This is to be executed by inserting the end of one length in a 25.4mm (1") deep "S" lock formed in the end of the adjacent length. The concealed portion of the "S" lock is to extend 25.4mm (1") outwards and is to be nailed to the substrate. Face nailing of joints will not be permitted.

3.9.9 Insert the top edge of the sheet metal flashing under the cap flashings to form weather tight junctions.

3.9.10 Turn the top edge of the flashings into recessed reglets or mortar joints a minimum of 25.4mm (1”). Fasten the sheet metal flashing into the reglet joint at a maximum spacing of 457.2mm (18”) or more often if required.

3.9.11 Ensure all fasteners are located a minimum of 304.8mm (12″) above the surface of the roofing membrane, unless otherwise detailed.

3.9.12 Where detailed or required, saw cut existing/new reglets into the masonry surfaces to receive metal flashings. The reglet is to be a minimum 19.05mm wide x 13 mm deep (3/4” x 1/2”).

3.9.13 Lock seam corners. Do not use pop rivets.

3.9.14 Install the sheet metal with concealed fasteners. Exposed fastening is permitted only upon the Consultant's approval.

3.9.15 Use lead plugs or an approved expansion shield and screw in place with rubber washers where metal is installed over concrete or masonry.

3.9.16 Do not secure metal work to cant strips.

3.9.17 Install sheet metal in a uniform manner, level, true to line, free of warp or distortions.

3.9.18 Install metal flashings under cap flashings and behind other claddings a minimum of 38mm (1.5”) to form a weather tight junction.

3.9.19 All outside perimeter cap flashings are to completely cover all fascia, or otherwise extend a minimum of 76.2mm (3”) below deck or wood blocking level.

3.9.20 Properly cover the area to be protected with the metal flashings lightly touching the gravel pour and firmly secured to prevent movement or stripping by the wind.

3.9.21 No irregular or badly fitted metal work will be accepted. Provide metal strips, cleats, as required.

3.9.22 Install self-adhering modified bituminous membrane over all exposed masonry, concrete or wood to be flashed with metal. Secure in place.

3.9.23 At walls or junctions, re-cut the reglet joint, wedge the flashings with lead wedge at 304.8mm (12") o.c. Turn top edge of flashing into reglet or mortar joint a minimum of 25.4mm (1”).

3.10 SEALANTS

3.10.1 Apply sealant at the junction between the sheet metal counterflashing and the reglet joint in accordance with Section 07 92 00 – Joint Sealants.

3.11 CLEANING

3.11.1 Remove completely from surfaces and crevices the flux residue, other deposits, stains and protections and wash the visible metal left unpainted

END OF SECTION 07 62 00

07 72 53 – Snow Guards

PART 1 - GENERAL

1.1 SUMMARY

1.1.1 WORK INCLUES

.1 ORIGINAL METAL (by Snow Gem Inc. or approved equivalent) snow guard that attached directly to the sloped metal panel

.2 Coordinate with the Manufacturer to assure proper placement of the snow guards.

.3 Provide appropriate snow guard securement for the roof system.

1.1.2 RELATED SECTIONS.

.1 Section 01 11 00 Scope of Work.

.2 Section 07 41 13 Sloped Metal Roofing

.3 Section 07 62 00 Sheet Metal Flashing and Trim.

.4 Section 07 92 00 Joint Sealants.

1.2 SYSTEM DESCRIPTION

1.2.1 COMPONENTS:

.1 A snow guard assembly that consists of individual metal snow guards. ORIGINAL METAL by Snow Gem (or approved equivalent).

1.2.1 DESIGN REQUIREMENTS:

.1 Spacing to be recommended by manufacturer or building Engineer.

.2 It is important to design new structures or assess existing structures to make sure that they can withstand retained snow loads.

1.3 SUBMITTAL

1.3.1 Submit manufacturer's Specifications, standard detail Drawings, installation instructions, and recommended layout.

1.4 QUALITY ASSURANCE

1.4.1 Installer to be experienced in the installation of specified roofing material and snow guards for not less than 5 years in the area of the project.

1.5 DELIVERY / STORAGE / HANDLING

1.5.1 Inspect material upon delivery and order replacements for any missing or defective items. Keep material dry, covered and off the ground until installed.

PART 2 PART 2 – PRODUCTS

2.1 MANUFACTURER

2.1.1 ORIGINAL METAL A division of Snow Gem Inc. 4800 Metalmaster Way, IL 60050, 888-766-4367 www.snowgem.com

2.1.2 Or approved equivalent

2.2 MATERIALS

2.2.1 ORIGINAL METAL by Snow Gem Inc. (or approved equivalent)

.1 Colour to be selected by Owner from standard colour chart

PART 3 PART 3 – EXECUTION

3.1 EXAMINATION

3.1.1 Substrate

.1 Inspect structure on which snow guard system is to be installed and verify that it will withstand any additional loading that it may incur. Notify general Contractor of any deficiencies before installing ORIGINAL METAL by Snow Gem Inc. (or approved equivalent).

.2 Verify that roofing material has been installed correctly prior to installing snow guards.

3.1.2 INSTALLATION

.1 Comply with architectural Drawings and snow guard manufacturer's recommendations for location of system. Comply with manufacturer's written installation instructions for installation and layout.

END OF SECTION 07 72 53

07 92 00 - Joint Sealants

GENERAL

1.1 GENERAL CONDITIONS

1.1.1 All conditions of the Contract and Divisions 0 and 1 apply to this Section and to the requirements of the Canadian Roofing Contractors Association Roofing Manual Specifications as referred to herein.

1.1.2 Abide by all Federal, Provincial, Municipal and Local Laws or Codes, rules and regulations that in any way affect the Work including all amendments up to the Project date.

1.2 CO-ORDINATION

1.2.1 Co-ordinate Work of this Section with Work of:

.1 Section 01 11 00 Scope of Work.

.2 Section 06 10 00 Rough Carpentry.

.3 Section 07 51 13 Cold-Applied Built-Up Asphalt Roofing

.4 Section 07 62 00 Sheet Metal Flashing and Trim.

1.3 REFERENCE STANDARDS

1.3.1 Sealant work, materials, products and accessories shall be in accordance with the most current applicable industry standards including but not limited to:

1.3.2 AMERICAN SOCIETY FOR TESTING AND MATERIALS INTERNATIONAL, (ASTM)

.1 ASTM C919:-Use of Sealants in Acoustical Applications.

.2 ASTM C920; Elastomeric Joint Sealants, Type S, grade NS.

.3 ASTM C1311; Solvent Release Sealants

1.3.3 DEPARTMENT OF JUSTICE CANADA (JUS)

.1 Canadian Environmental Protection Act, 1999 (CEPA).

1.3.4 GENERAL SERVICES ADMINISTRATION (GSA) - FEDERAL SPECIFICATIONS (FS)

.1 TT-S-00227E; Sealing Compound Elastomeric Type- Multi-Component, Class A, Type 2.

.2 TT-S-00230C; Sealing Compound elastomeric Type- Single component, Class A, Type 2.

1.3.5 HEALTH CANADA/WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM (WHMIS)

.1 Safety Data Sheets (SDS).

1.3.6 TRANSPORT CANADA (TC)

.1 Transportation of Dangerous Goods Act, 1992 (TDGA).

1.4 CLIMATE CONDITIONS

1.4.1 ENVIRONMENTAL LIMITATIONS

.1 Do not proceed with the installation of joint sealants under the following conditions:

(a) When ambient and substrate temperature conditions are outside the limits permitted by the joint sealant manufacturer.

(b) When joint substrates are wet.

.2 Joint-Width Conditions:

(a) Do not proceed with the installation of joint sealants where the joint widths are

less than those allowed by the joint sealant manufacturer for the applications indicated.

.3 Joint-Substrate Conditions:

(a) Do not proceed with the installation of joint sealants until contaminants capable of interfering with adhesion are removed from the joint substrates.

1.5 ENVIRONMENTAL REQUIREMENTS

1.5.1 Comply with the requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage, and disposal of hazardous materials; and regarding labelling and provision of Safety Data Sheets (SDS) acceptable to Labour Canada.

1.5.2 Conform to the manufacturer's recommended temperatures, relative humidity, and substrate moisture content for the application and curing of sealants including special conditions governing use.

1.6 WARRANTY

1.6.1 Provide all applicable material and labour Warranties offered by the material Manufacturer for a minimum of two (2) years.

1.6.2 Defective joint sealant installation covered under Warranty is to include but not be limited to:

.1 joint leakage, hardening, craze cracking, crumbling, melting, bubbling, shrinkage, runs, sags, change of colour, loss of adhesion, loss of cohesion and staining of adjoining or adjacent material surfaces.

1.6.3 Carry out all replacement and repair Work during the Warranty period as directed by the Consultant and at no additional cost to the Owner.

1.7 QUALITY CONTROL

1.7.1 Quality control for Work of this Section is to be performed by the Consultant under the Work of and as specified in Section 01 10 10 General Requirements.

PART 2 PRODUCTS

2.1 COMPATIBILITY

2.1.1 All materials in a sealant system are to be compatible with each other and with the substrate.

2.1.2 Colour or colours of the sealants are to be selected are to match existing substrate and are to be approved by the Consultant.

2.2 SEALANT MATERIALS

2.2.1 Exterior Metal To Wood, Masonry, Stone Or Porous Surfaces:

.1 One-part elastomeric, non-sag urethane based sealant. Accepted products:

(a) “Dymonic” as manufactured by Tremco

(b) “Sikaflex 1-A” as manufactured by Sika Canada

(c) “Vulkem 931” by Mameco as manufactured by Tremco

(d) “SK-1 Structural Sealant” as supplied by Chemlink.

2.2.2 Exterior And Interior Metal To Metal And Metal To Glass Joints:

.1 One-part Silicone based sealant. Accepted Products:

(a) “Spectrum 2” as manufactured by Tremco

(b) “Contractors SCS 1000 Sealant” as manufactured by GE Silicones Canada

(c) "DC 999-A Silicone Building & Glazing Sealant" as manufactured by DowCorning Canada.

2.3 JOINT BACKING

2.3.1 Extruded polyethylene, urethane, neoprene or vinyl foam recommended by sealant Manufacturer. Extruded closed-cell foam, Shore "A" Hardness 20, Tensile Strength of 140-200 Kpa.

2.3.2 Circular shape with a diameter 25% greater than the joint width before installation.

2.4 VOID FILLER

2.4.1 Glass fibre or Rockwool insulation with a nominal density of 14 kg/m^3 (2.86 lbs. / cu. ft.) Sized for 25% compression.

2.5 BOND BREAKER TAPE

2.5.1 Pressure sensitive plastic tape which will not bond to sealants. Supplied or recommended by the sealant Manufacturer.

2.6 PRIMER

2.6.1 As recommended by the sealant Manufacturer to assure adhesion of the compound and to prevent staining of the substrate.

2.7 CLEANING AGENTS

2.7.1 Joint cleaning compounds as recommended by the sealant Manufacturer. Xylol (Xylene), Methyl Ethyl Ketone (MEK) or non-corrosive type compatible with joint forming materials.

PART 3 EXECUTION

3.1 EXAMINATION

3.1.1 Inspect existing conditions, and substrates upon which Work of this Section is dependent. Report to the *Consultant* in writing any defects or discrepancies. Commencement of Work implies acceptance of existing conditions and assuming full responsibility for the finished condition of the Work.

3.1.2 Verify, before commencing Work, that the joint size, depth and substrate will not adversely affect execution, performance or quality of completed Work; and that the joints can be sealed in an acceptable condition by means of preparation specified in this Section. Verify site conditions together with sealant Manufacturer's representative.

3.1.3 Defective Work resulting from application to unsatisfactory joint conditions will be considered the responsibility of those performing the Work of this Section.

3.2 GENERAL

3.2.1 Apply in accordance with the Drawings, Specifications and requirements of the jurisdictional authorities and the Canadian Roofing Contractors Association's Roofing Manual.

3.2.2 Regard the Manufacturer's printed recommendations and Specifications as a minimum requirement for materials, methods and quality of Work not otherwise specified herein.

3.2.3 Make adjustments to the specified procedures caused by weather and site conditions only with the Consultants approval.

3.2.4 Conform to the Details.

3.2.5 Examine joints before caulking to ensure that the configuration, surface and widths are suitable for the sealant and service, and that the execution of caulking and performance of sealants will not be adversely affected.

3.2.6 Verify, before commencing the Work, that the joint size, depth and substrate will not adversely affect the execution, performance or quality of the completed Work; and that joint can be sealed in an acceptable condition by means of the preparation specified in this Section. Verify the site conditions together with the sealant Manufacturer's representative.

3.2.7 Defective Work resulting from the application to unsatisfactory joint conditions will be rejected.

3.3 REMOVAL & PREPARATION

3.3.1 Remove the existing sealant and backing material and all deleterious material from the joint. Use the method of surface preparation suitable for substrate that does not damage adjacent surfaces, as recommended by the sealant Manufacturer.

3.3.2 Rake out joints, cracks and crevices to receive sealant to a depth measuring half (1/2) the joint width.

3.3.3 Brush, scrub, scrape or grind the inner face surfaces to remove loose mortar, dust, oil, grease, oxidation, mill scale, and other materials which will affect the adhesion and integrity of the sealant.

3.3.4 Wipe down metal surfaces with clean cellulose sponges or rags soaked in solvent compatible with the sealant, and dry with clean cloths. Ensure solvents do not damage painted surfaces.

3.3.5 Ensure that surfaces have not been coated with release agents, coating or other treatments, or that, if present, they are entirely removed.

3.3.6 Examine joint sizes and correct to achieve width to depth ratio of 1:2 with joint size no less than 12.7mm (1/2") width and 25.4mm (1") depth.

3.3.7 Install joint filler to achieve correct depth, if required.

3.3.8 Where necessary to prevent staining, mask adjacent surfaces prior to priming and sealant application.

3.3.9 Apply bond breaker tape where required to sealant Manufacturer's printed instructions.

3.4 JOINT DEPTH

3.4.1 Provide the following Depth To Width Ratios:

.1 Masonry:

(a) 6.35mm (1/4") deep, up to 12.7mm (1/2") wide

(b) 9.53.16mm (3/8") deep, up to 19.05mm (3/4") wide

(c) 12.7mm (1/2") deep, up to 25.4mm (1") wide

(d) 19.05mm (3/4") deep, up to 50.8mm (2") wide.

.2 Non Porous Materials:

(a) Joint depth and width to be not be less than 6.35mm (1/4").

(b) Maintain a minimum of a 2:1 width to depth ratio or what is listed above in 3.3.1.1 and 3.3.1.2, whichever is more stringent.

3.5 PRIMING

3.5.1 Prime the inner face surfaces of joints as necessary for the substrate, in accordance with the sealant Manufacturer's Specification, to provide full adhesion and to prevent staining of the face surface at the joint.

3.5.2 Prime surfaces prior to installing the joint backing rod.

3.6 JOINT FILLING AND BACKING

3.6.1 Install joint backing where required to maintain the joint depth.

3.6.2 Pack joints tightly with sealant in accordance with the Manufacturer's Specifications using pressure guns. Fill joints completely to the required depths with sealant compound. Use sufficient pressure to fill all voids and joints. Sealant is to bond to both sides of the joint.

3.6.3 Apply bond breaker tape, prior to applying sealant, where joints are of insufficient size to install backer rod or at 90° junctions or where recommended by the sealant Manufacturer or *Consultant.* Ensure bond surface area meets the minimum required size recommended by the sealant Manufacturer.

3.6.4 Mask, with masking tape, all surfaces adjacent to joints which are likely to become coated with sealant during sealant application.

3.6.5 Apply sealant using gun dispenser with proper size nozzle for joint to be sealed to leave a weather tight, airtight installation.

3.6.6 Fill joints completely to required depths with sealant compound. Use sufficient pressure to fill all voids and joints solid. Sealant shall bond to both sides of the joints but not to backing material. ***Superficial pointing with skin bead is not acceptable***.

3.6.7 Form surface of sealant with full bead, smooth, free from ridges, wrinkles, sags, air pockets or embedded impurities. Neatly tool surface to create a slightly concave joint.

3.6.8 Slope sealant surface at top of surface reglet flashings to create positive water shed.

3.6.9 Finish joints smooth, free of wrinkles, ridges, air pockets and imbedded foreign materials. Tool joints to a slight concave surface using a soap/water mixture.

3.6.10 Cure sealants in accordance with the sealant Manufacturer's instructions.

3.6.11 Do not cover up sealants until proper curing has taken place.

3.6.12 Do not allow sealants to cover or spot surfaces outside of joints. Use masking tape on all surfaces adjacent to joints which may become coated with sealant during the caulking process.

3.7 CLEAN UP

3.7.1 Remove from surfaces of other work sealant smears, droppings and masking tape immediately after caulking. Use recommended cleaners as required.

3.7.2 Clean surfaces soiled by Work of this Section. Do not use chemicals, scrapers, or other tools in cleaning which will damage surfaces. Make good other Work.

3.7.3 Clean up and remove from the job site on a daily basis, all rubbish and surplus materials resulting from this Work.

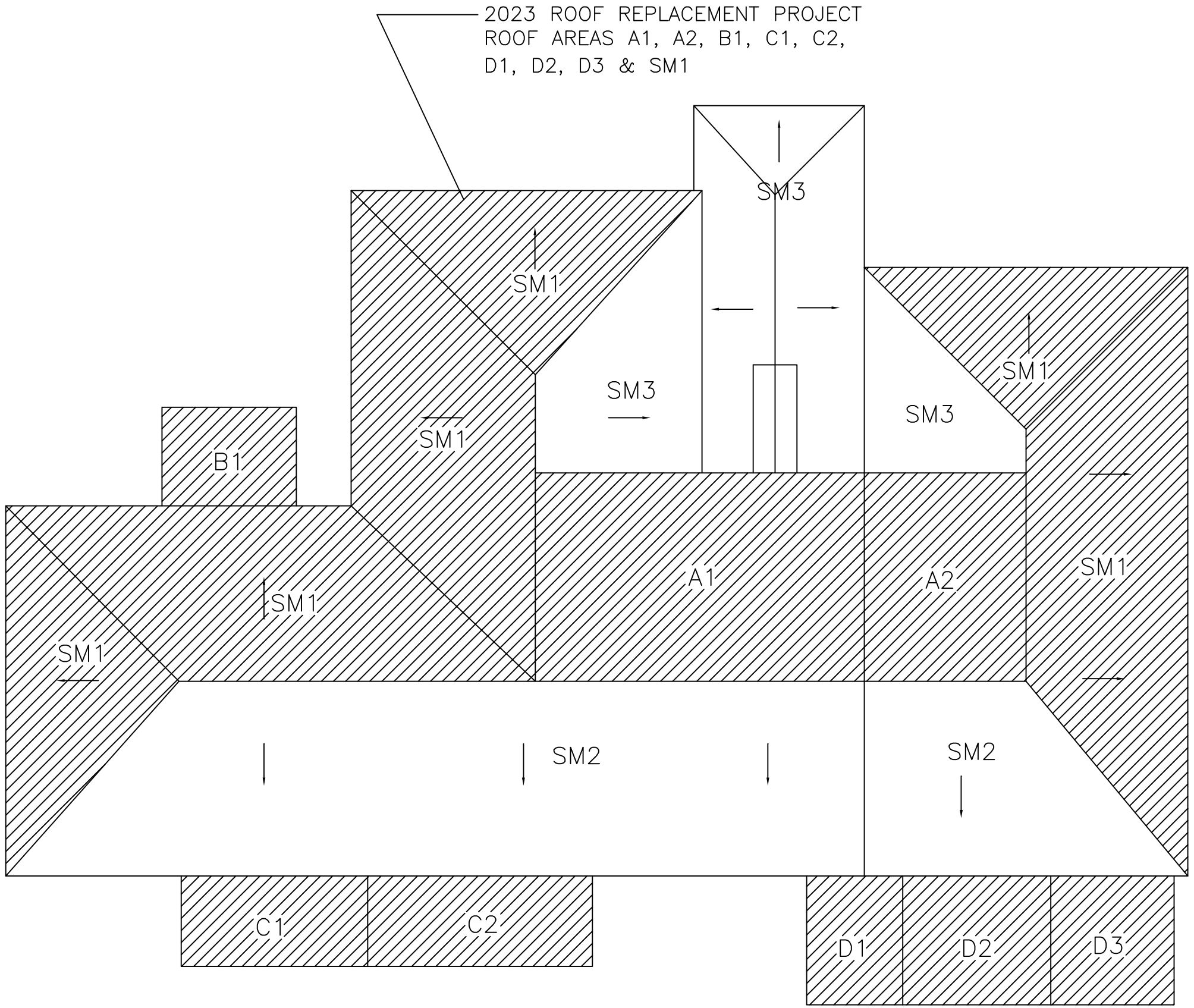
3.7.4 Joint sealants shall be protected from physical damage and the elements until such time as the sealant will not be affected by same.

END OF SECTION 07 92 00

SCHEDULE A – LIST OF PLANS & DETAILS

Dwg #	Drawing Title	Issued/Revised	Date
1	Roof Plan	For BID	April 2023
2	Perimeter Detail	For BID	April 2023
3	Drain Detail	For BID	April 2023
4	Curb Detail	For BID	April 2023
5	Soil Stack Detail	For BID	April 2023
6	Furnace Stack Detail	For BID	April 2023
7	Wall Detail	For BID	April 2023
8	Scupper Detail	For BID	April 2023
9	Sleeper/Separation Curb Detail	For BID	April 2023
10	Sloped Metal Roof Panel Detail	For BID	April 2023
11	Sloped Metal Gutter Detail	For BID	April 2023

END OF LIST OF PLANS AND DETAILS



LEGEND

— — CONTROL JOINT ——— EXPANSION JOINT

ROOF TOP UNITS

- HVAC ON CURB
- FAN ON CURB
- SKYLIGHT
- HVAC ON SLEEPERS
- ROOF HATCH
- UNIT ON SLEEPERS

PROJECTIONS

- FURNACE STACK
- PITCH PAN
- SOIL STACK
- VENT STACK

DRAINAGE

- DRAIN (EXISTING)
- DRAIN (NEW)
- SCUPPER (NEW)

MISCELLANEOUS

- GAS LINE
- SATELLITE DISH
- PAVER WALKWAY
- ROOF ANCHOR
- WALKWAY
- CORE TEST

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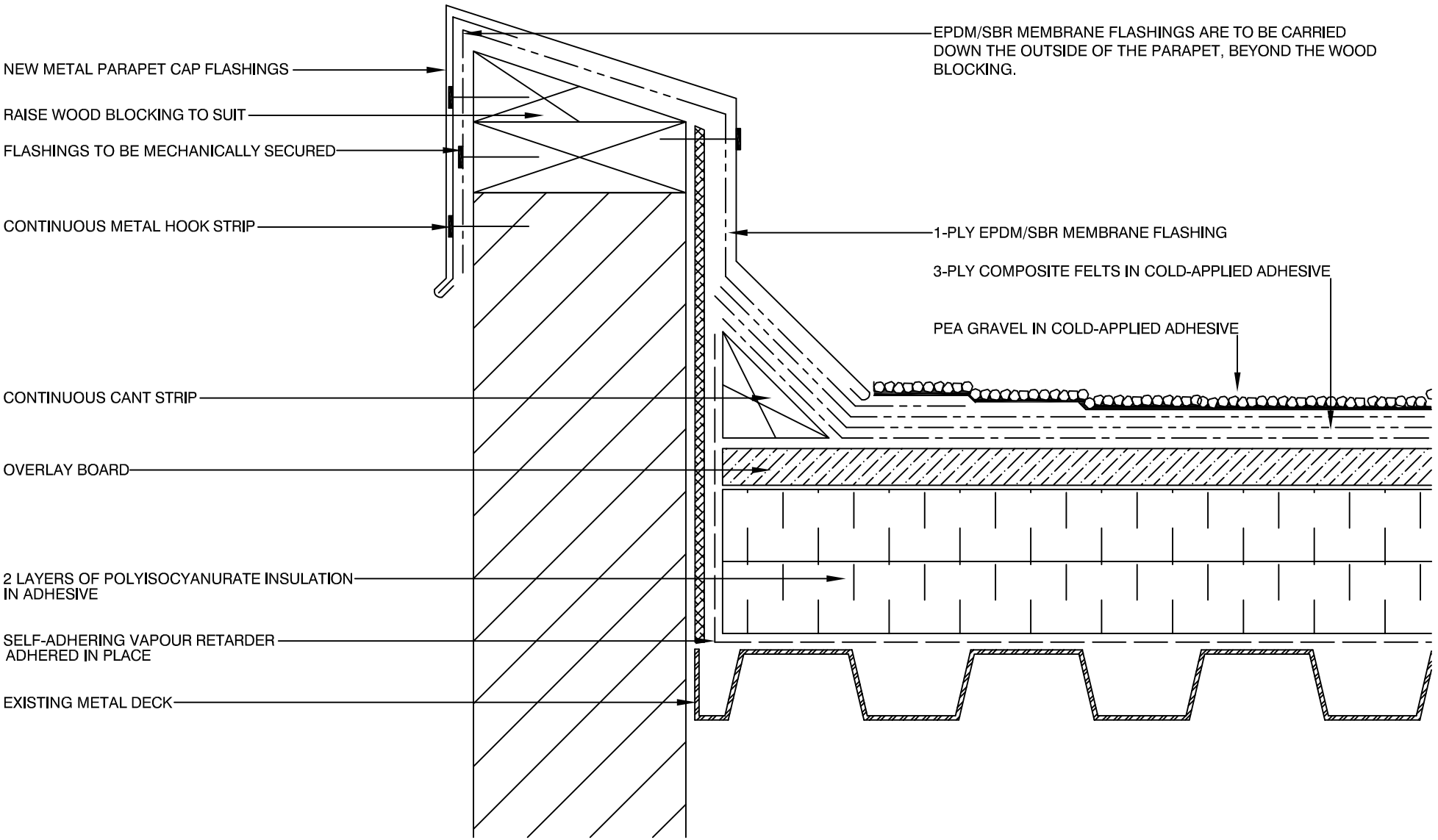
CLIENT
CITY OF VAUGHAN

PROJECT ADDRESS/NAME
GARNET A WILLIAMS CC
501 CLARK AVE., W., THORNHILL, ON

DRAWING TITLE
ROOF PLAN

FILE NO.	SCALE	DRAWING NUMBER
23-0558	N.T.S.	1

DATE
APRIL 2023



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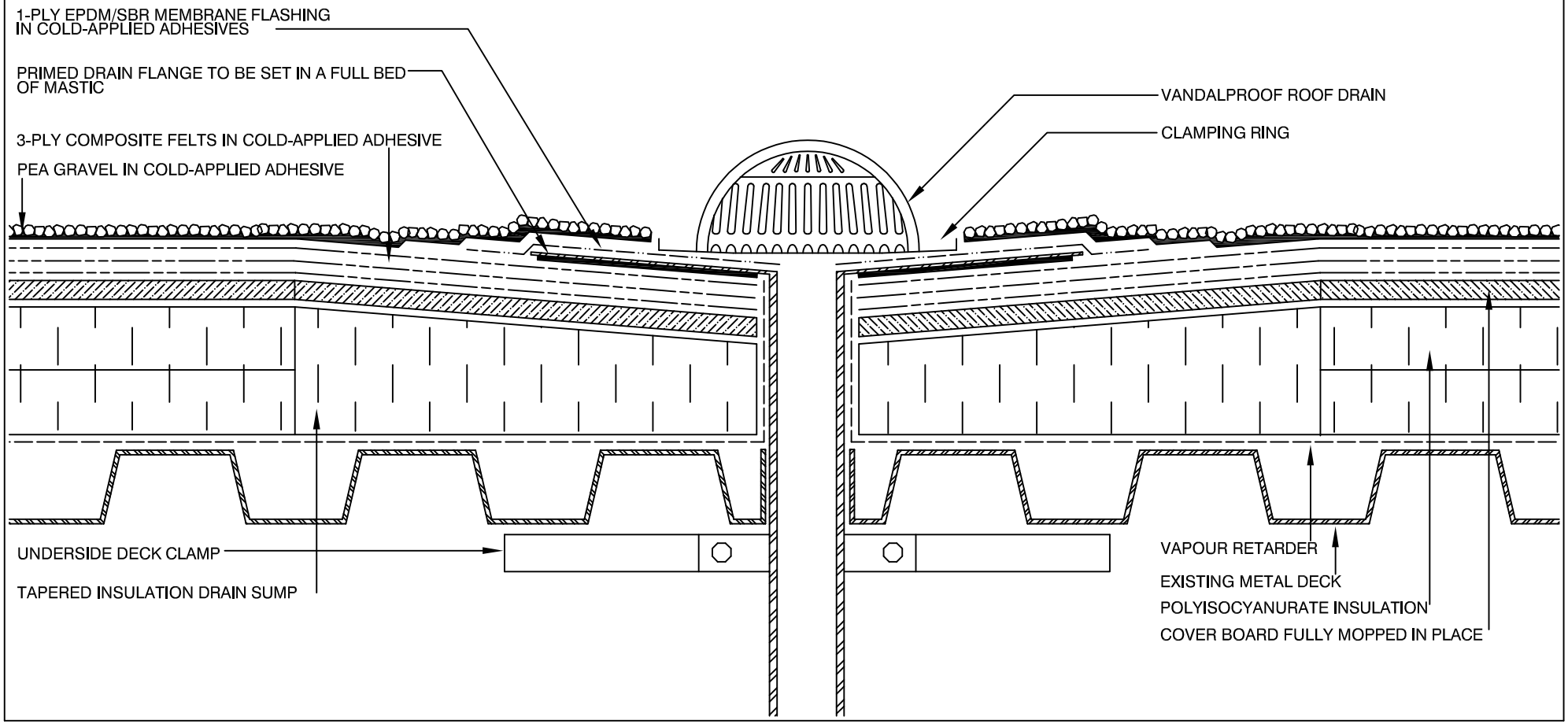

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DRAWING TITLE
DRAIN DETAIL

FILE NO.
23-0558

SCALE
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DRAWING NUMBER
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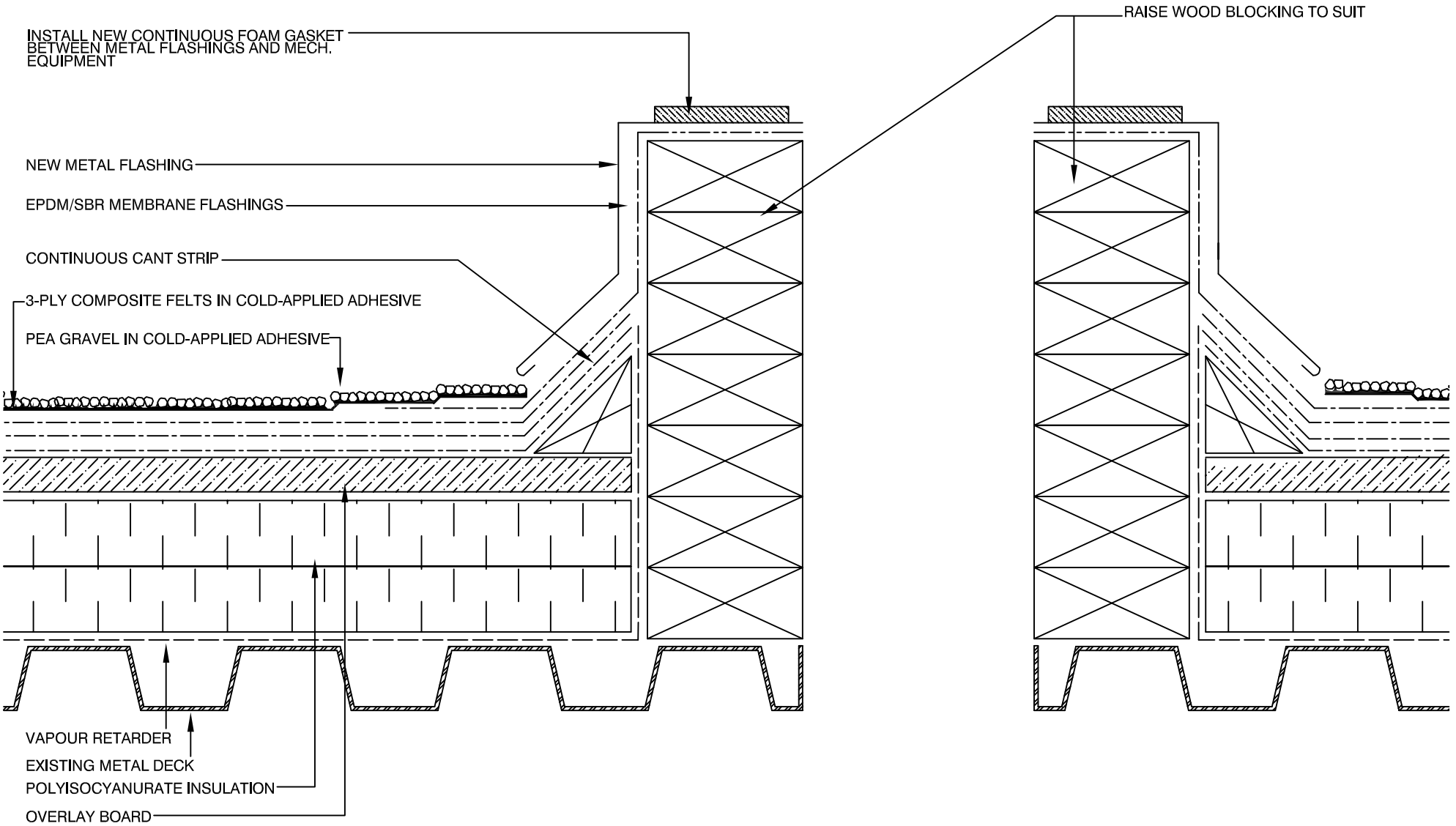
DATE
APRIL 2023



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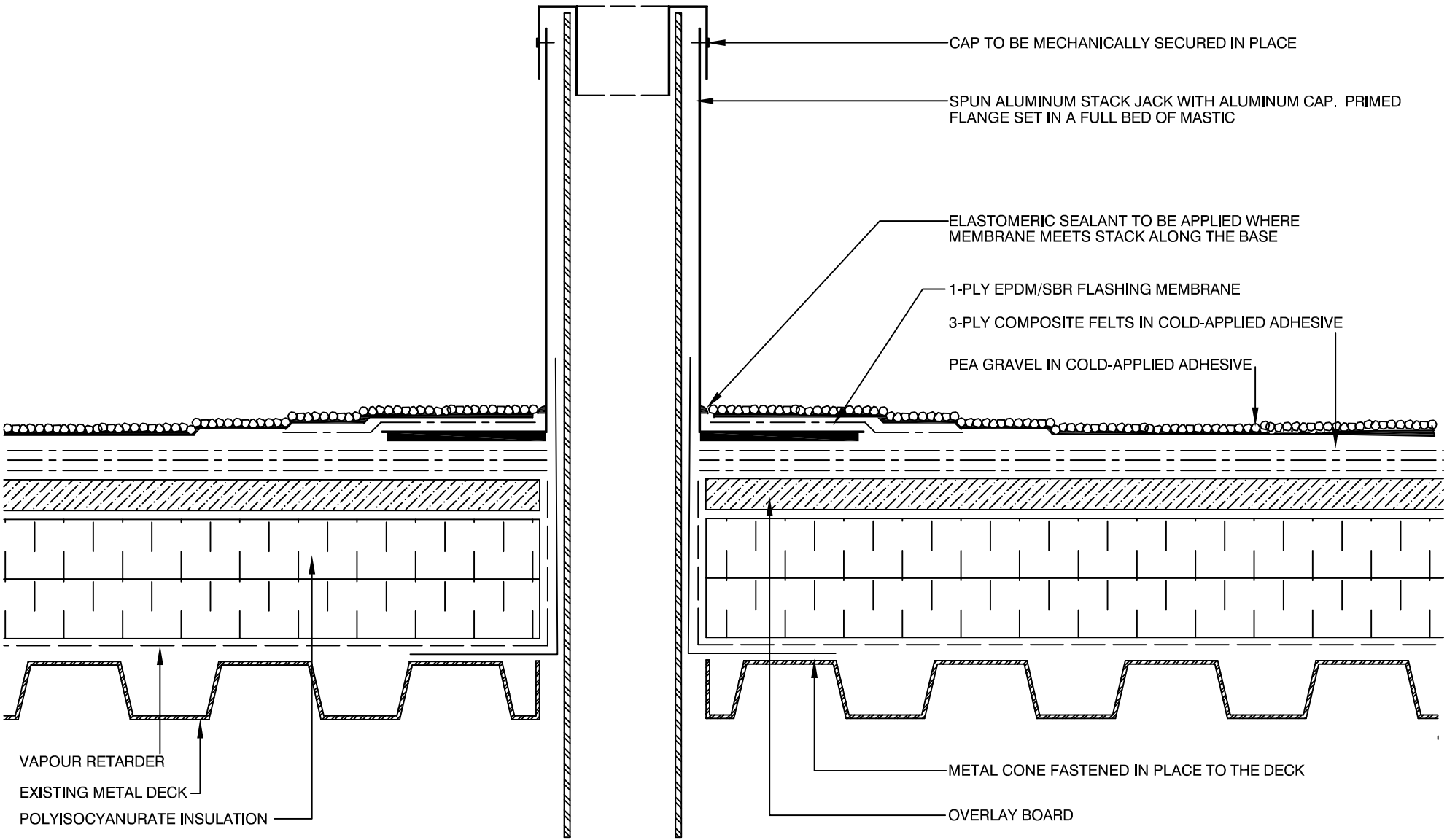

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DATE: APRIL 2023

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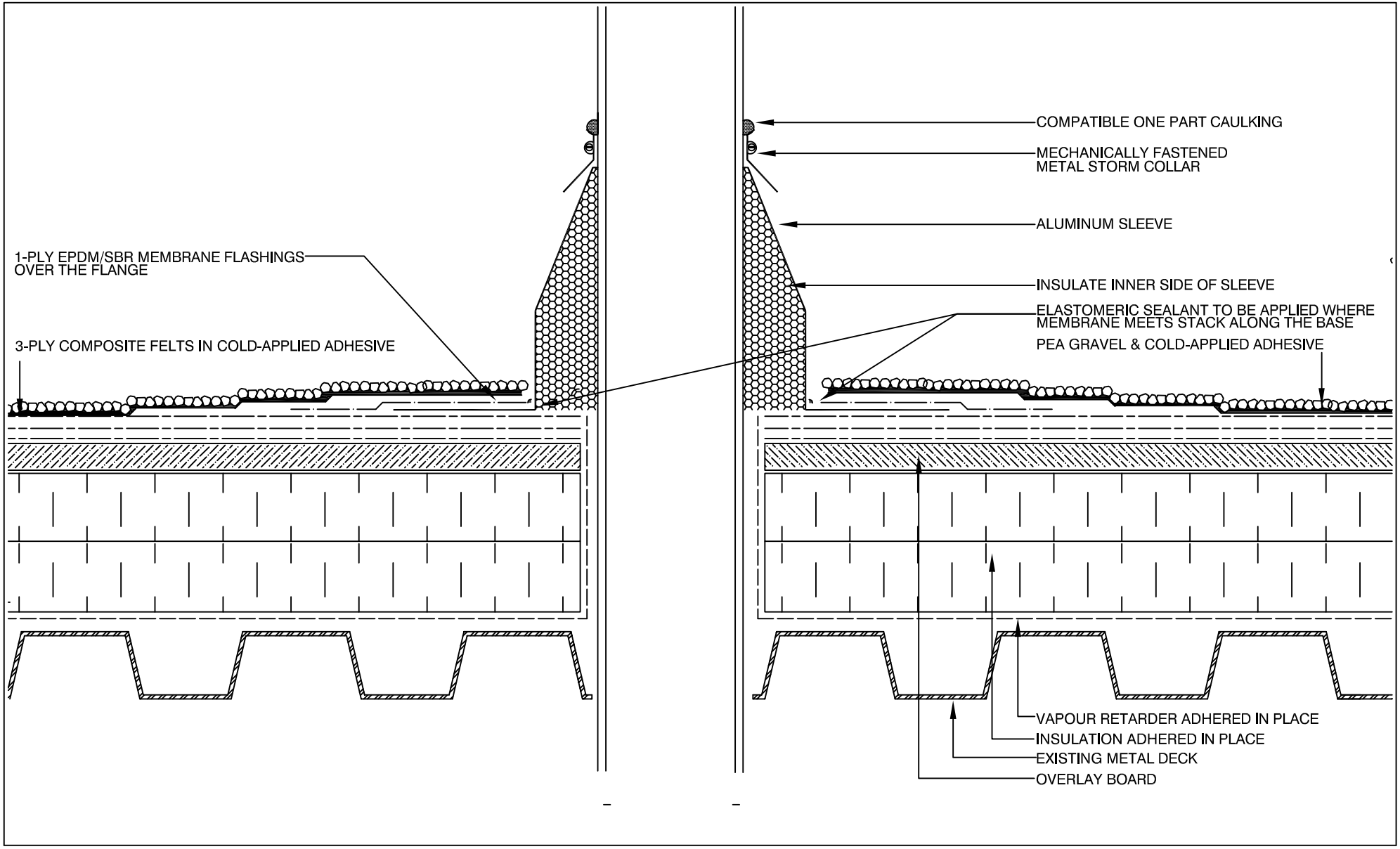

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FURNACE STACK DETAIL

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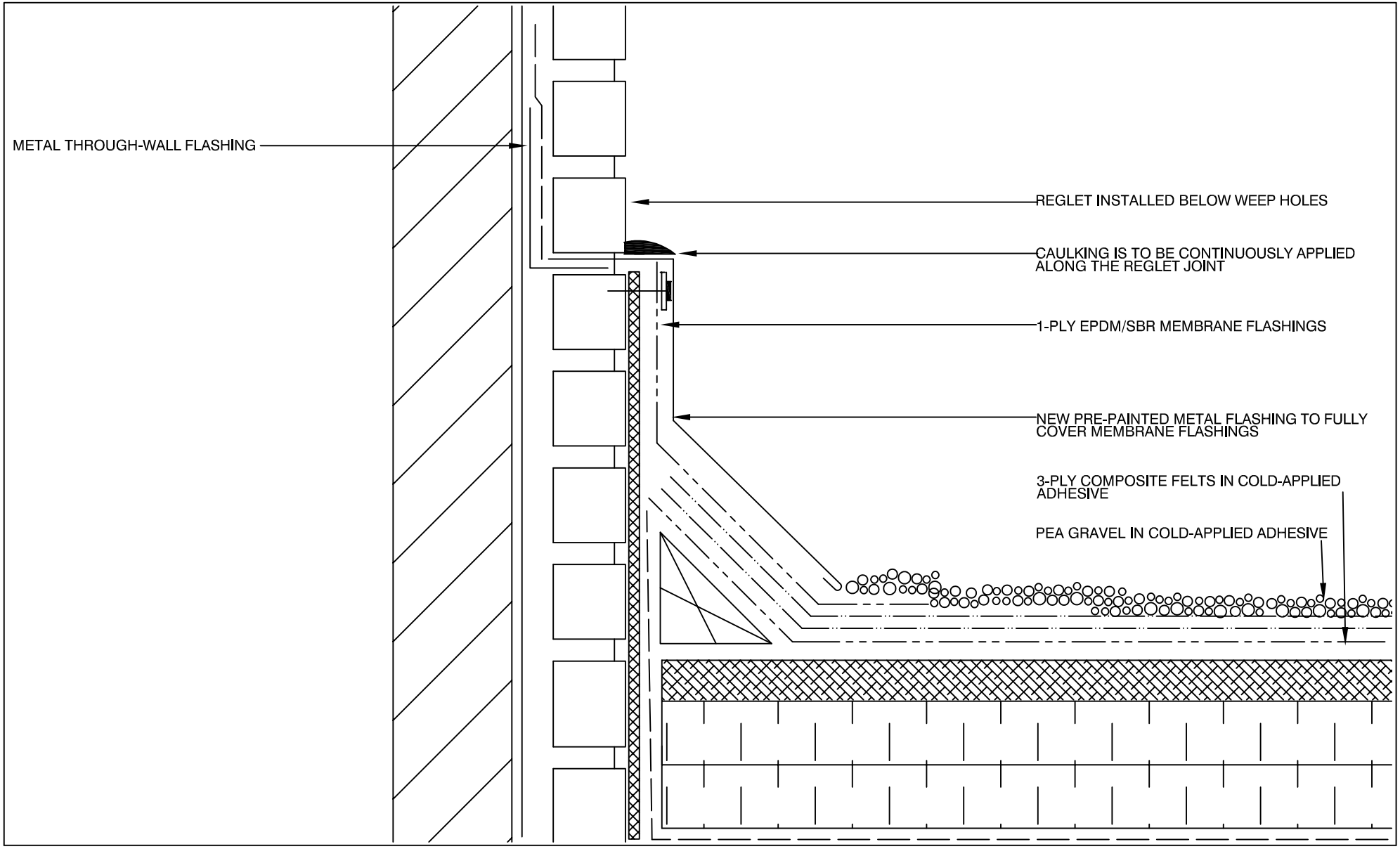

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MASONRY WALL DETAIL

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23-0558

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7

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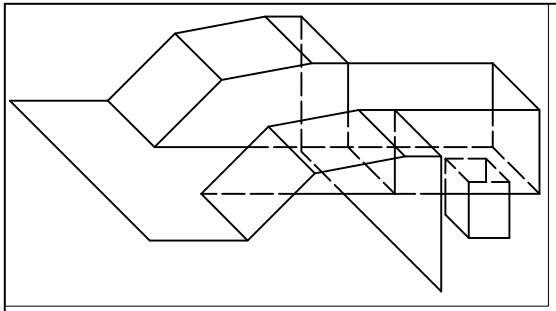
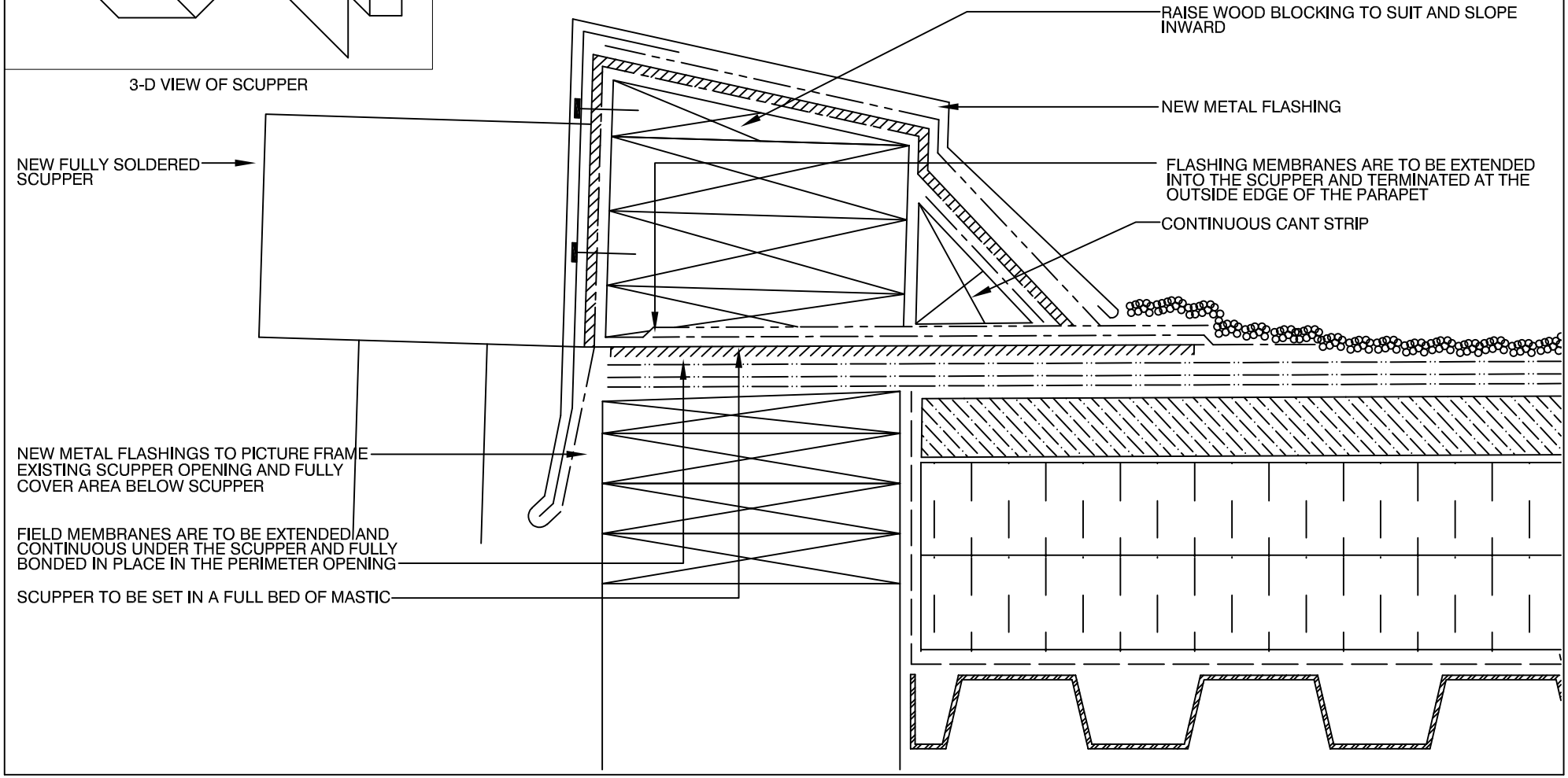
APRIL 2023



3-D VIEW OF SCUPPER



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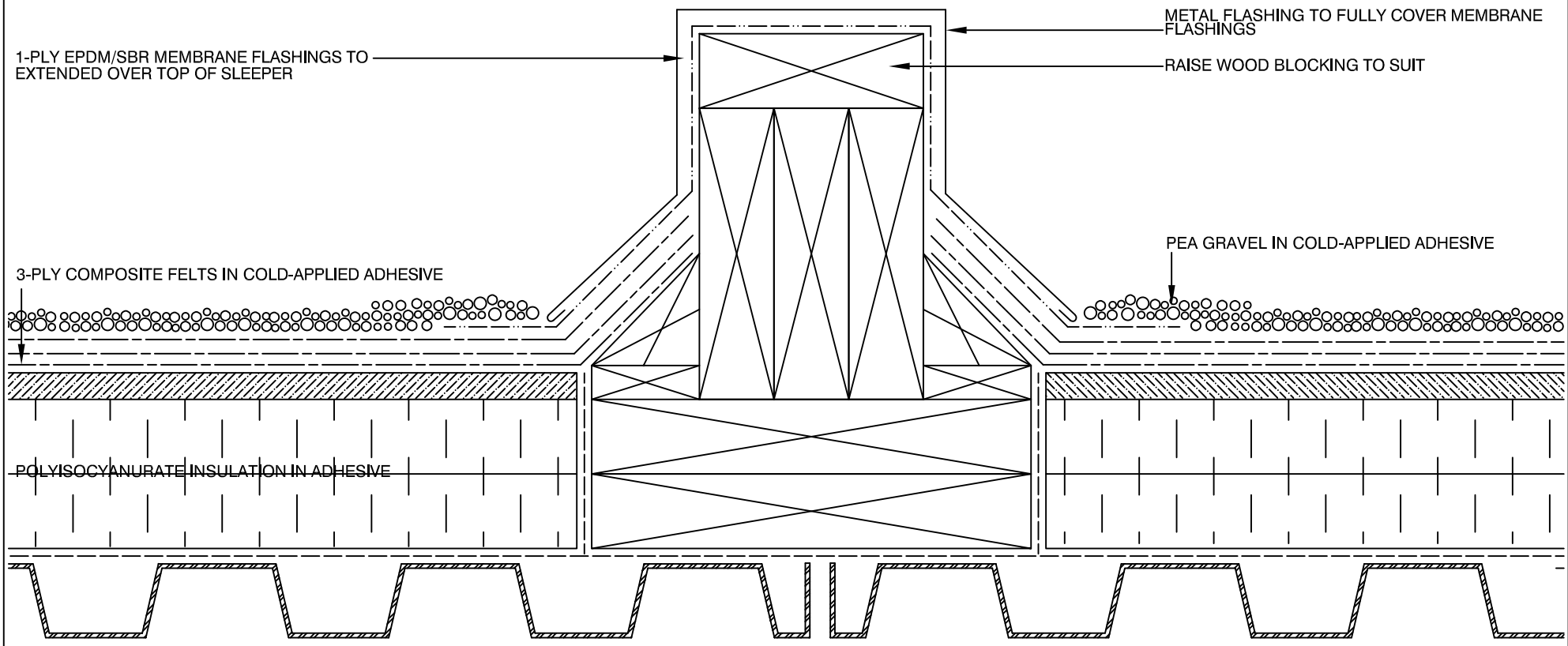

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DRAWING TITLE
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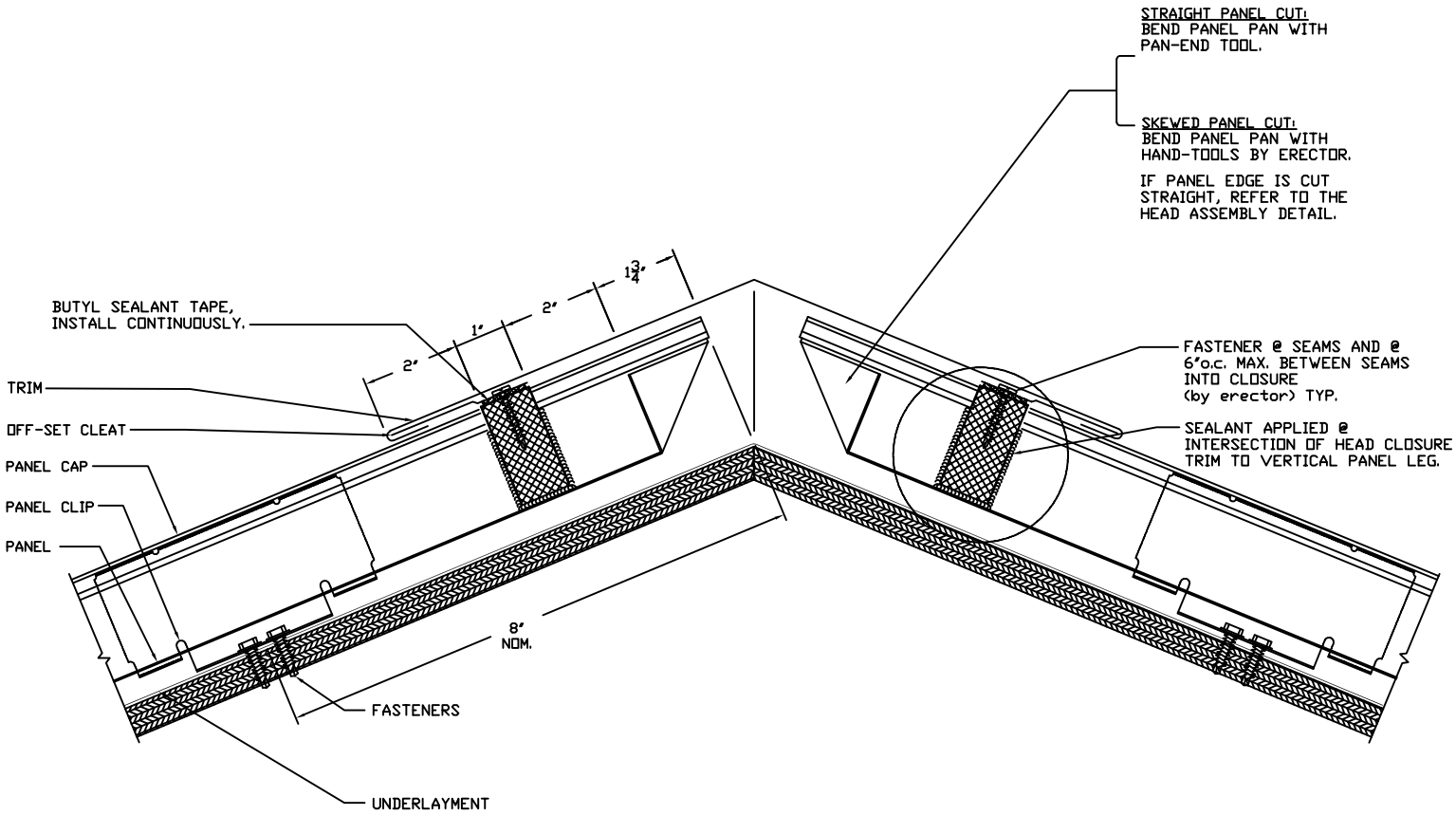

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DRAWING TITLE
METAL PANEL DETAIL

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23-0558

SCALE
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DRAWING NUMBER
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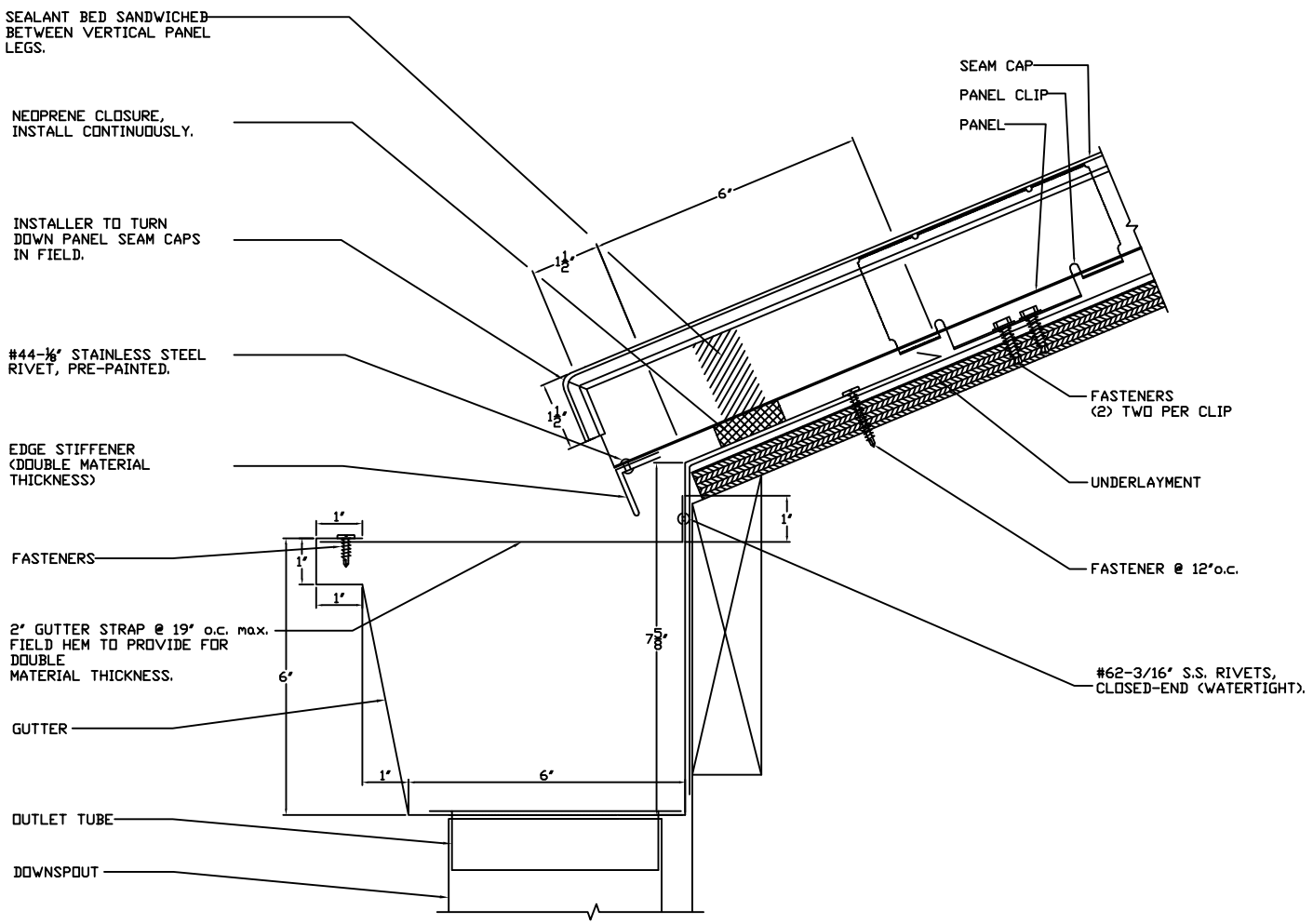
APRIL 2023



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DRAWING TITLE
METAL PANEL GUTTER DETAIL

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23-0558

SCALE
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DRAWING NUMBER
11

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