SPEC NOTE: This guide specification is intended for use when specifying a hot-applied rubberized asphalt membrane roofing system. Make any required selections, such as board size, thickness, etc. Where selection is indicated with an [OR] statement, select the appropriate paragraph and delete the inappropriate statement. Delete all SPEC NOTEs and [OR] statements prior to final printing.

DISCLAIMER: The manufacturer has reviewed the product information contained in this guide specification. The information is organized and presented to assist the specification writer working on a construction project to select the appropriate products and to save time in writing the project specification Section. The specification writer is responsible for product selection as well as the use and application of this information, and should contact the manufacturer to ensure that all options are available and that the associated specification information is valid and correct.

1 General

1.1 SECTION INCLUDES

.1 Built-up rubberized asphalt membrane roofing, hot-applied method.

SPEC NOTE: Edit to suit project requirements.

1.2 RELATED SECTIONS

.1 Section 03 31 00 - Structural Concrete: Structural concrete deck.

[OR]

.1 Section [03 41 13 - Precast Concrete Hollow Core Planks]: Structural precast concrete deck.

[OR]

.1 Section 05 31 00 - Steel Decking: Structural metal roof deck.

.2 Section 06 10 00 - Rough Carpentry: [Structural wood deck,] cants, blocking and curbs.

.3 Section 07 22 00 - Roof and Deck Insulation: Roof insulation.

.4 Section 07 26 00 - Vapour Retarders: Roof vapour retarder.

.5 Section 07 27 00 - Air Barriers: Connection of wall air barrier system to roofing system.

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

.7 [Section 07 65 00 - Flexible Flashing.]

.8 Section 07 71 00 - Roof Specialties: Manufactured gravel stops, fascias, expansion joints, reglets and scuppers.

.9 Section 07 72 00 - Roof Accessories: Manufactured vents, hatches, and walkways.

.10 [Section 07 76 00 - Roof Pavers: Roof [ballast] [decking] pavers.]

.11 Section 07 92 00 - Joint Sealants.

.12 Section [_____] - [_____]: Roof anchors.

.13 Section 22 14 26 - Facility Storm Drains: Roof drains.

SPEC NOTE: Edit the following Article in conjunction with the requirements of Part 2 - Products and Part 3 - Execution. Delete those reference standards not required by the Project.

1.3 REFERENCES

.1 [ASTM C931/931M-01: Standard Specification for Exterior Gypsum Soffit Board.]

.2 ASTM D2178-97a: Standard Specification for Asphalt Glass Felt Used in Roofing and Waterproofing.

.3 ASTM D6152-99: Standard specification for SEBS-Modified Mopping Asphalt Used in Roofing.

.4 CGSB 37-GP-9Ma: Primer, Asphalt, Unfilled, for Asphalt Roofing, Dampproofing and Waterproofing.

.5 CGSB 37-GP-52M: Roofing and Waterproofing Membrane, Sheet Applied, Elastomeric.

.6 CAN/CGSB-51.33-M89: Vapour Barrier Sheet, Excluding Polyethylene, for Use In Building Construction.

.7 CAN/ULC-S704-2001: Standard for Thermal Insulation, Polyurethane and Polyisocyanurate Boards, Faced.

.8 CAN/ULC-S706-02: Standard for Wood Fibre Thermal Insulation for Buildings.

1.4 PERFORMANCE REQUIREMENTS

SPEC NOTE: Tremco Therm 50, Therm 100 and Tremco POWERply Upgraded are three- or four-ply roofing systems incorporating a composite ply base membrane with subsequent plies of fibreglass roofing felts set in modified hot melt adhesive. Tremco Therm 200 is a three- or four-ply roofing system incorporating polyester roofing felts. Select desired roofing system only after consulting with the local Tremco representative to discuss the benefits and costs of each Tremco roofing system.

.1 Roofing System: [three-][four-]ply hot-applied built-up roofing system with [thermal barrier underlay board], rigid board insulation, [polyester][fibreglass][composite ply base membrane and fibreglass] roofing felts set in [rubberized asphalt][modified hot melt adhesive], [roof pavers] and aggregate surfacing; [Therm [50][100][200]] [POWERply Upgraded] by Tremco Canada.

.2 Provide Products that are compatible with one another under field conditions, as demonstrated by roofing manufacturer.

.3 Provide watertight roofing system capable of resisting specified uplift pressures, thermally induced movement and exposure to weather without failing during the specified warranty period.

SPEC NOTE: Delete the following paragraph if compliance with Factory Mutual requirements is not applicable.

.4 [Factory Mutual: comply with FMG Fire / Windstorm Classification FM 1A-[60][90].]

1.5 SUBMITTALS

.1 Submit Product data as specified in Section [01 00 00][01 33 00][_____].

.2 Product Data: for each major component, including membrane, [thermal barrier underlay board], vapour retarder, rigid board insulation, [pavers] and adhesives. Highlight critical criteria for proper installation.

SPEC NOTE: Request shop drawings only for very large or complex projects, or for sloped insulation applications. Shop drawings add expense to the Project.

.3 Submit Shop Drawings for prefabricated work and details as specified in Section [01 00 00][01 33 00][_____].

.4 Shop Drawings: Include plans, sections, details in accordance with performance requirements, and for attachment to other portions of the Work.

.5 Shop Drawings for Sloped Insulation: Indicate degree of slope and layout of sloping insulation on roof surfaces. Ensure positive drainage to roof drains.

1.6 CERTIFICATES

.1 Manufacturer Certificates: Signed by roofing manufacturer verifying that installer is approved, authorized or licensed by manufacturer to install specified Products.

.2 Installer Certificates: Signed by installer verifying that they have the specified qualifications described below.

1.7 TEST REPORTS

.1 Submit test reports as specified in Section [01 00 00][01 33 00][_____].

.2 Product Test Reports: based on the evaluation of comprehensive tests conducted by an independent testing agency of the specified roofing Products.

.3 Manufacturer Field Inspection Reports: manufacturer's written acceptance of roofing installation based on regular inspections.

1.8 QUALITY ASSURANCE

.1 Manufacturer: qualified manufacturer having roofing systems listed by UL [and approved for use by Factory Mutual].

.2 Installer: a company and persons specializing in the application of protected elastomeric roofing, [with minimum [3][5][___] years documented experience] [and] [licensed or approved to apply roofing system by manufacturer] [_____].

.3 Conform to CRCA Roofing Specifications and roofing membrane manufacturer's instructions.

1.9 PRE-INSTALLATION MEETINGS

.1 Conduct pre-installation meeting as specified in Section [01 00 00][01 31 00][_____].

.2 Meeting: prior to commencement of deck installation, review and document methods and procedures related to roof deck and roofing system construction , including the following:

.1 Participants: authorized representatives of the Contractor, [Construction Manager,] [Owner,] Consultant, roofing Subcontractor, roofing manufacturer, and installers of roof accessories and roof-mounted equipment.

.2 Review methods and procedures related to roofing installation, including manufacturer's written installation instructions.

.3 Review construction schedule and confirm availability of Products, Subcontractor personnel, equipment and facilities.

.4 Review deck installation criteria and finishes for conformance with roofing system criteria, including issues of flatness and fastening.

.5 Review structural loading conditions and limitations of roof deck both during and after roofing application.

.6 Review flashing details, special roofing details, roof drainage, roof penetrations, equipment curbs, and other conditions affecting roofing installation.

.7 Review governing regulatory requirements, and requirements for insurance and certificates as applicable.

.8 Review safety requirements, including temporary fall-arrest measures.

.9 Review field quality control procedures.

1.10 DELIVERY, STORAGE AND HANDLING

.1 Deliver and store Products undamaged in original containers with manufacturer's labels and seals intact.

.2 Store Products in designated areas elevated off the ground and protected from ultra-violet radiation, inclement weather and construction activities.

.3 Store solvent-based liquids away from excessive heat and open flame.

.4 Store adhesives and sealants at temperature above 5 degrees Celsius.

.5 Store membrane rolls on end, dry, and protected from moisture and damage. Cover rolls, insulation and other moisture-sensitive Products with tarpaulins.

.6 Store Products on roof deck in a manner to prevent overloading the structure and properly secured to prevent movement due to wind or other forces. [Prevent permanent deformation of deck.]

1.11 ENVIRONMENTAL REQUIREMENTS

.1 Do not apply any roofing materials during inclement weather.

.2 Comply with manufacturer's recommendations for minimum and maximum temperatures and humidity during application.

.3 Do not install Products when temperatures are below -18 degrees C.

.4 Consider effects of wind chill on adhesives, and ensure they will not prematurely set before proper adhesion takes place.

.5 Keep water-based Products from freezing. Do not apply water-based Products if temperatures are below 5 degrees C.

1.12 WARRANTY

.1 Submit extended warranties in accordance with the General Conditions of the Contract.

.2 Installer's Extended Warranty: standard [CRCA] [OIRCA] 2 year warranty, commencing from the date of Substantial Performance of the Work.

.3 Manufacturer's Extended Warranty: a written guarantee that the manufacturer will replace, at no cost to the Owner, any portion of the roofing membrane which experiences actual leaks resulting from defects in the manufacture of the membrane for a period of [10][15] years, commencing from the date of Substantial Performance of the Work.

1.13 MAINTENANCE

SPEC NOTE: Include the option for an inspection in the tenth year for roofs having a 15 year warranty.

.1 Arrange for roofing manufacturer to conduct periodic visual inspections of roof surface during the second, [and] fifth [and tenth] years after Substantial Performance of the Work.

.2 Record noted deficiencies and arrange for their proper repair under warranty.

2 Products

2.1 MANUFACTURERS

.1 Manufacturers of hot-applied rubberized asphalt membrane roofing systems having Products considered acceptable for use:
.1 Tremco Canada.
.2 [_____].
.3 [_____].

.2 Substitution Procedures: refer to Section [01 00 00][01 62 00][_____].

2.2 MATERIALS

.1 [Primer: non-fibrated, asbestos free, water-based, low-VOC formulation; to CGSB 37-GP-9Ma; eg. Tremco Improved TREMprime WB.]

[OR]

.1 [Primer: non-fibrated, asbestos free, asphalt cutback primer, to CGSB 37-GP-9Ma; eg. Tremco TREMprime QD.]

SPEC NOTE: Specify a thermal barrier underlay board where codes require compliance with CAN/ULC-S126 - Fire Test of Roof Deck Components. This standard outlines a test method for determining the spread of fire along the underside of a roof deck and for evaluating a roof system's fuel contribution. Typically, metal decks may require the addition of a thermal barrier, depending upon specific code requirements.

.2 Thermal Barrier Underlay Board: 13 mm thick glass mat faced gypsum panel with water-resistant core, and meeting the following criteria:
.1 Combustibility: Noncombustible to ASTM E136.
.2 Surface Burning Characteristics: to ASTM E84, maximum flame spread of 0, smoke developed of 0.
.3 Manufacturer and Product Name: Dens-Deck by G-P Gypsum.

[OR]

.2 Thermal Barrier Underlay Board: 16 mm thick gypsum board, to ASTM C931/931M; square edges.

.3 Roof Vapour Retarder: [as specified in Section [07 26 00][_____].] [double layer kraft laminated with asphalt and edge reinforced, providing maximum water vapour permeance of 20 ng/Pa•s•$m^{2;}$ to CAN/CGSB-51.33-M, Type 2.]

SPEC NOTE: Where roof insulation is already specified elsewhere, edit the first paragraph to suit project conditions. Otherwise, delete the first paragraph and edit the second paragraph as required.

.4 Roof Insulation: [Polyisocyanurate rigid board][_____], as specified in Section [07 22 00][_____].

[OR]

.4 Roof Insulation: Polyisocyanurate rigid board; to CAN/ULC-S704, Type 3, Class 2, closed cell type:
- .1 Long Term Thermal Resistance (CAN/ULC-S770): minimum RSI 1.01 per 25 mm of thickness.
- .2 Compressive Strength (ASTM D1621): 140 kPa.
- .3 Dimensional Stability (ASTM D2126): < 2 percent linear change.
- .4 Water Absorption (ASTM C209): < 1 percent by volume.
- .5 Edges: square.
- .6 Faces: non-asphaltic, fibre-reinforced felt facers both sides.
- .7 Combustibility: meets CAN/ULC-S107-M87 and CAN/ULC-S126-M86.
- .8 Thickness: [minimum two layers required,] [[_____] mm] total thickness [as indicated on Drawings].
- .9 Manufacturer and Product Name: Trisotech Roof Insulation by Tremco Canada.

.5 Overlay Board: 12 mm thick asphalt-coated fibreboard, to CAN/ULC-S706, Type I, Grade 1.

SPEC NOTE: Select fibreglass felts or polyester roofing felts. Contact local Tremco representative to determine recommended Products and their effect on the warranty.

.6 Roofing Felt: 0.92 mm thick, non-woven continuous filament, spunlaid, thermally bonded, heat-resistant polyester felt membrane; 190 g/m^2 weight; Poly-THERM Roofing Ply by Tremco Canada.

[OR]

.6 Roofing Felt: glass ply felt membrane; [293][390][524][585] g/m^2 weight; to ASTM D2178, Type [IV][VI]; [THERMglass Premium][THERMglass][POWERply Type IV][POWERply Type VI] by Tremco Canada.

SPEC NOTE: Specify the following membrane as the base ply in the Tremco THERM 50, THERM 100, and POWERply Upgraded roofing systems.

.7 Composite Ply Membrane: 1.4 mm thick polyester-glass-polyester tri-laminate reinforced asphalt-coated sheet; BURmastic Composite Ply by Tremco Canada.

.8 Aggregate Ballast: pea gravel free of fines, long splinters, dust or foreign matter, nominal 9 mm diameter.

2.3 ACCESSORIES

.1 Adhesive for Underlay Board, Vapour Retarder, Roof Insulation Boards and Overlay Boards: Single-component, solvent free, moisture curing, low VOC, asphaltic urethane adhesive; meeting UL and tested by Factory Mutual; Fas-n-Free Adhesive by Tremco Canada.

.2 Bitumen: elastomeric modified bitumen, mopping grade; [THERMastic [50][100]] [POWERply Modified Hot Melt Adhesive] by Tremco Canada.

.3 Mechanical Fasteners: Flat-head, countersunk, self-tapping screws; size, type and length in accordance with FMG; corrosion resistant coating in accordance with FM 4470, with locking plastic or metal plates.

SPEC NOTE: Select either Tremco TRA for hot-applied elastomeric membrane flashings, OR Poly-THERM for hot-applied polyester flashings.

.4 Flashing Membrane: [as specified in Section [07 65 00][_____].] [1.14 mm thick, reinforced EPDM/SBR elastomeric sheeting; TRA by Tremco Canada.] [0.92 mm thick, non-woven continuous filament, spunlaid, thermally bonded, heat-resistant polyester felt membrane; 190 g/m^2 weight; Poly-THERM Roofing Ply by Tremco Canada.]

.5 Pavers: [as specified in Section [07 76 00][_____].] [[610 x 610] [___ x ___] mm size, [50][___] mm thick, precast concrete paver units; [smooth][diamond][_____] pattern; [_____] colour [as selected by Consultant].]

.6 Paver Pedestals: [as specified in Section [07 76 00][_____].] [prefabricated, adjustable plastic pavers pads.] [site fabricated, approximately 100 x 100 mm size rigid extruded polystyrene pads, 25 mm thick; having a minimum compressive strength of 210 KPA.]

.7 Stack Flashings: Prefabricated aluminum sleeves; sizes to suit applications; [_____] by [_____].

.8 Roof Drains: [as specified in Section [22 14 26] [_____].

.9 Metal Flashing: as specified in Section [07 62 00][_____].

.10 Stripping Membrane: Vinyl-coated fibreglass mesh; Burmesh by Tremco Canada.

SPEC NOTE: Select from one of the following after contacting the local Tremco representative to determine recommended Products.

.11 Stripping Adhesive: [Bitumen, as specified above.] [One-part rubberized elastomer; [Polyroof][Polyroof SF] by Tremco Canada.] [Single-component bitumen modified polyurethane, vertical grade, Tremlar LRM-V] by Tremco Canada.

.12 Pitch Pan: premanufactured type; 0.61 mm thick galvanized steel sheet, minimum 100 mm high.

.13 Sealant: as specified in Section [07 92 00][_____].

.14 Termination Bar: 3 mm thick aluminum bar, 25 mm wide profile, pre-drilled for mechanical attachment.

.15 Prefabricated Control or Expansion Joint Flashing: [as specified in Section 07 71 00][_____].] [sheet butyl reinforced with closed cell urethane foam backing, seamed into metal flashing flanges, including sheet butyl counter flashing each side.]

.16 Cant Strips: purpose made asphalt impregnated wood fibreboard, 75 x 75 mm size.

3 Execution

3.1 EXAMINATION

.1 Inspect existing conditions to ensure they are suitable for roofing work to begin. Do not proceed until unacceptable conditions are corrected.

.2 Ensure substrate is solid, clean, dry and free of any contaminants prior to commencing any roofing work.

.3 Ensure Products are dry prior to installation. Replace damaged Products.

3.2 PREPARATION

.1 [Protect existing roofing from damage with minimum 13 mm thick plywood runways.]

.2 Remove all existing roof membrane components down to the deck and remove from the roof surface.

.3 Prime metal and concrete surfaces designated to be covered with asphaltic Products.

.4 Apply primer at an average rate of 4.3 m^2/litre. Allow to cure.

.5 Ensure primer does not enter building through cracks and other openings.

SPEC NOTE: Include the following paragraph for wood deck applications.

.5 [Wood Deck: Remove protruding nails and re-secure deck as required to provide level surface. Mechanically fasten single-ply rosin paper. Lap sides 50 mm and ends 100 mm. Secure with nail-type fasteners, spaced 225 mm OC along side laps and 450 mm OC along end laps; located minimum 300 mm from sheet edges.]

3.3 THERMAL BARRIER UNDERLAY BOARD

SPEC NOTE: Select either mechanically-attached OR adhered method of application. Coordinate with Products listed in Part 2.

.1 Mechanically attach thermal barrier underlay board to roof deck with screws and plates using one fastener per 0.27 m^2. Stagger boards 300 mm. Drive fasteners flush to top surface.

[OR]

.1 Adhere thermal barrier underlay board to metal deck with approved adhesive at [manufacturer's recommended rate] [rate of [___] L/m^2]. Stagger boards 150 mm.

.2 Install thermal barrier underlay boards with long axis perpendicular to ribs, with end joints fully supported.

.3 Firmly butt each board to surrounding boards. Do not jam or deform boards.

.4 Cut and fit boards where roof deck intersects vertical surfaces.

.5 Provide filler boards every 450 mm in both directions [and secure with minimum two fasteners per board].

.6 Tape joints of thermal barrier underlay board with 50 mm wide tape.

3.4 VAPOUR RETARDER

.1 [Adhere] [Loosely lay] roof vapour retarder over [thermal barrier underlay board] [roof deck] [with approved adhesive at [manufacturer's recommended rate] [rate of [___] L/m^2]].

.2 Overlap vapour retarder minimum 100 mm for side laps and 150 mm for end laps.

.3 Extend vapour retarder under cant strips and blocking. Extend to perimeter and deck protrusions.

.4 Seal roof vapour retarder to wall air/vapour barrier system with flexible flashing membranes to ensure continuity of building air/vapour barrier envelope.

3.5 INSULATION AND OVERLAY BOARD

.1 Install insulation boards to maintain continuity of thermal envelope, as specified in Section [07 22 00][_____]. Minimize joints.

SPEC NOTE: Select either a mechanically-fastened or fully-adhered method of application, and edit the following paragraphs accordingly. A mechanically-fastened method of securement should only be used on metal or wood roof decks.

.2 [Mechanically fasten base layer of roof insulation, through vapour retarder, thermal barrier underlay board and roof deck. Use minimum 1 fastener per 0.3 m^2 of board area. Stagger joints 150 mm.]

[OR]

.2 Adhere base layer of roof insulation to vapour retarder with approved adhesive at [manufacturer's recommended rate] [rate of [___] L/m^2].

.3 Adhere top layer of roof insulation to base layer of roof insulation with approved adhesive at [manufacturer's recommended rate] [rate of [___] L/m^2].

.4 [Adhere tapered roof insulation where indicated and in accordance with approved Shop Drawings.]

.5 Fit insulation tight to roof penetrations.

.6 Firmly butt insulation boards. Do not jam or deform boards.

.7 Minimize lipping between adjacent boards.

.8 Stagger joints minimum 300 mm.

.9 Adhere single layer of overlay board over roof insulation with approved adhesive at [manufacturer's recommended rate] [rate of [___] L/m^2].

.10 Stagger overlay board seams with insulation board seams.

3.6 CANT STRIPS

.1 Install cant strips at intersections of roofing and vertical surfaces.

.2 Embed in a continuous bed of approved adhesive applied to overlay boards.

.3 Lay true to line, level and with flush, butt joints and accurately mitred corners.

3.7 ROOF MEMBRANE

.1 Install [three] [four] plies of roof membrane in shingle fashion, starting at roof low point. Apply membrane perpendicular to overlay board joints. Conform to manufacturer's recommended method.

SPEC NOTE: Use the following Paragraph for three-ply applications.

.2 Overlap starter strips 660 mm with first ply, then overlap each succeeding ply 625 mm.

SPEC NOTE: Use the following Paragraph for four-ply applications.

.2 Overlap starter strips 740 mm with first ply, then overlap each succeeding ply 700 mm.

.3 Place ply sheets to ensure water will flow over or parallel to, but not against, exposed edges.

.4 Shingle in direction to shed water. Extend ply membranes over and terminate beyond cants and cut evenly.

.5 Embed plies in bitumen, at a minimum rate of 1.2 L/m^2, and solidly coating each ply for full width.

.6 Ensure complete and continuous seal and contact between bitumen and ply membranes, including ends, edges and laps without wrinkles, fish mouths or blisters.

.7 Do not step or walk on felts during or immediately after application until bitumen has set.

.8 Install each ply so that it shall be firmly and uniformly set, without voids, into bitumen. Thoroughly and effectively broom or roll each membrane application to ensure full adhesion.

.9 Lap ply membrane ends 150 mm. Stagger end laps 1.0 metres minimum.

.10 Overlap previous day's work 600 mm, as required.

.11 Terminate all ply layers to outer edge of roof perimeter.

SPEC NOTE: Select either Elastomeric Flashings OR Two-Ply Polyester Flashings.

3.8 ELASTOMERIC FLASHINGS

SPEC NOTE: When the project manual includes Section 07 65 00 - Flexible Flashing, use paragraph .1 and delete paragraphs .3 through .27. Otherwise, remove reference to Section 07 65 00 and edit remaining paragraphs to suit project requirements.

.1 Provide membrane flashings [as specified in Section [07 65 00][_____]] [and] [in accordance with manufacturer's written installation guidelines.]

.2 Install flashings to ensure the roof is watertight at the end of each Working Day.

.3 Extend base ply of flashing membrane minimum 100 mm over roof membrane. Extend cap ply of flashing membrane 50 mm beyond edge of base ply flashing.

.4 Extend flashing membranes minimum 200 mm up vertical surfaces.

.5 Secure flashings at 200 mm OC. Secure vertical flashings through termination bar.

.6 Overcoat end lap edges with one-part rubberized elastomer stripping adhesive and membrane.

.7 Tie-in leading edge of elastomeric sheet flashing with stripping ply membrane embedded between alternate courses of stripping ply adhesive.

SPEC NOTE: Edit the following paragraphs .8 through .27 to suit project requirements when flexible flashings are not specified in Section 07 65 00. Delete unnecessary paragraphs.

.8 Canted Eave:
- .1 Extend reinforced elastomeric sheeting over outside face of cant and extend minimum 25 mm below blocking. Mechanically fasten with 38 mm common roofing nails, 200 mm OC.
- .2 Extend reinforced elastomeric sheeting down over cant strip and embed in bitumen from top of cant to at least 150 mm beyond toe of cant onto roof.
- .3 Ensure complete bond and continuity without wrinkles or voids. Lap sheeting ends 100 mm and adhere with bitumen.

.9 Canted Eave with Fascia
- .1 Extend reinforced elastomeric sheeting over outside face of cant and fascia and secure to underside of fascia. Mechanically fasten with 38 mm common roofing nails, 200 mm OC.
- .2 Extend reinforced elastomeric sheeting down over cant strip and embed in bitumen onto roof surface a minimum of 150 mm.
- .3 Ensure complete bond and continuity without wrinkles or voids. Lap sheeting ends 100 mm and adhere with bitumen.

.10 Low Parapet Wall Flashing
- .1 Seal exposed joint between the wall and roof deck for airtight seal.
- .2 Adhere elastomeric sheeting completely to flashing surface, cant, and roofing with bitumen.
- .3 Ensure complete bond and continuity without wrinkles or voids. Lap sheeting ends 100 mm and adhere with bitumen.
- .4 Extend elastomeric sheeting up and over parapet at least 38 mm and face nail with 38 mm common roofing nails, 200 mm OC.

.11 Gravel Stop
- .1 Prior to setting and nailing horizontal flanges of edge flashings, uniformly trowel a 1.5 mm thick layer of bitumen to roofing surface designated to receive metal flange.
- .2 Install metal gravel stop with formed drip edge, incorporating lock-type joints to allow expansion and contraction. Set flange in bitumen.
- .3 Nail interior portion of flange to wood blocking 75 mm OC, staggered.
- .4 Prime metal flange with asphaltic primer.
- .5 Fully adhere a sufficiently wide strip of elastomeric sheeting to flashing with bitumen. Ensure complete bond and continuity without wrinkles or voids lap sheeting ends 100 mm and adhere with bitumen. Elastomeric sheeting to cover gravel stop completely and overlapping onto adjacent roof minimum 150 mm.
- .5 Seal edge of flashing membrane at metal upturn as specified in Section [07 92 00][_____].

.12 Flashing At [Edges] [and] [Gutters]
- .1 Fabricate and install new one-piece [edge.][gutter with downspouts. Slope gutter to downspouts.]
- .2 Prior to setting and nailing horizontal flanges of gutter, uniformly trowel a 1.5 mm thick layer of bitumen to roofing surface designated to receive metal flange.
- .3 Nail flange to wood blocking 75 mm OC, staggered.
- .4 Prime metal flange with asphaltic primer.
- .5 Adhere sufficiently wide strip of elastomeric sheeting completely to flashing surface with bitumen. Ensure complete bond and continuity without wrinkles or voids lap sheeting ends 100 mm and adhere with bitumen. Elastomeric sheeting to cover gravel stop completely and overlap onto adjacent roof a minimum of 150 mm.
- .6 Seal edge of flashing membrane at metal upturn as specified in Section [07 92 00][_____].

.13 Wall Flashing
- .1 Seal exposed joint between the wall and roof deck for airtight seal.
- .2 Adhere elastomeric sheeting completely to flashing surface, cant and roofing with bitumen.
- .3 Ensure complete bond and continuity without wrinkles or voids. Lap sheeting ends 100 mm and adhere with bitumen.
- .4 Elastomeric sheeting width: sufficient to extend at least 150 mm beyond toe of cant onto roof surface and 200 mm above the roof surface.
- .5 Secure top of elastomeric sheeting to vertical plane with termination bar. Mechanically fasten 300 mm OC. Overcoat bar with end lap stripping adhesive and membrane.

.14 Building Expansion Joints
- .1 Fill joint with loose insulation.
- .2 Provide [13][19][___] mm thick plywood to top of wood blocking, secured one side only; as specified in Section [06 10 00][_____].
- .3 Apply foam rubber or 25 mm thick mineral fibre insulation to top of plywood.
- .4 Install elastomeric sheeting centred over expansion joint.
- .5 Fully adhere sheeting to horizontal and vertical blocking surfaces with bitumen. Press sheeting into adhesive. Ensure complete bond and continuity without wrinkles or voids.
- .6 Elastomeric Sheeting Width: Sufficient to extend onto adjacent roofing minimum 150 mm.
- .7 Lap sheeting ends 100 mm and adhere with bitumen.

.15 Expansion Joint at Wall
- .1 Extend roof membrane from deck level up wall sufficiently and secure to wall.
- .2 Fill joint with loose insulation.
- .3 Install blocking, sheathing and compressible insulation as detailed on Drawings and as specified in Section [06 10 00][_____].
- .4 Adhere elastomeric sheeting completely to flashing surface, cant and roofing with bitumen.
- .5 Ensure complete bond and continuity without wrinkles or voids. Lap sheeting ends 100 mm and adhere with bitumen.
- .6 Elastomeric Sheeting Width: sufficient to extend at least 150 mm beyond toe of cant onto roof surface and 200 mm above the roof surface.
- .7 Secure top of elastomeric sheeting to vertical plane with a termination bar. Mechanically fasten 300 mm OC. Overcoat bar with end lap stripping adhesive and membrane.

.16 Area Divider
- .1 Install elastomeric sheeting centered over area divider extending onto roof membrane a minimum of 150 mm beyond toe of cant on either side.
- .2 Fully adhere sheeting with bitumen. Press sheeting into adhesive. Ensure complete bond and continuity without wrinkles or voids.
- .3 Lap sheeting ends 100 mm and adhere with bitumen.

.17 Control Joint
- .1 Install elastomeric sheeting centered over joint.
- .2 Fully adhere sheeting to horizontal and vertical blocking surfaces with bitumen. Press sheeting into adhesive. Ensure complete bond and continuity without wrinkles or voids.
- .3 Flashing Width: Sufficient to extend onto adjacent roofing minimum 150 mm.
- .4 Lap sheeting ends 100 mm and adhere with bitumen.

.18 Curb Flashing
- .1 Fully adhere sheeting to horizontal and vertical blocking surfaces with bitumen. Press sheeting into adhesive. Ensure complete bond and continuity without wrinkles or voids.
- .2 Elastomeric Sheeting Width: Sufficient to extend from top of curb down onto adjacent roofing minimum 150 mm. Mechanically fasten sheeting on top face of curb.
- .3 Lap sheeting ends 100 mm and adhere with bitumen.
- .4 If membrane does not completely cover sleeper, secure top edge with a termination bar. Mechanically fasten 300 mm OC. Overcoat bar with end lap stripping adhesive and membrane.

.19 Projection Flashing
- .1 Apply bitumen to prepared area and Provide aluminum base over pipe and set into the bitumen.
- .2 Select proper step of rubber cap and cut off above index ring.
- .3 Install cap onto base collar and press edge to ensure proper seal.
- .4 Provide clamp around pipe and rubber cap. Prime flange.
- .5 Install elastomeric sheeting with stripping ply adhesive and membrane.
- .6 Cover flange completely. Extend flashing minimum 100 mm onto adjacent roofing. Remove wrinkles and voids. Lap flashing ply ends 100 mm.

.20 Lead Plumbing Vents
- .1 Provide lead plumbing vent flashing.
- .2 Flange: minimum 100 mm wide; extend completely around periphery of vent flashing. Set flange into bitumen. Neatly dress flange with wood blocking.
- .3 Prime lead flange with asphaltic primer.
- .4 Pipe Greater Than 50 Mm OD: Bend lead inside pipe minimum 25 mm; replace cracked lead.
- .5 Pipe 50 mm OD or Less: Cut lead at vent top. Provide integral lead cap.

.21 Cartwheel and Collar: Provide cartwheel and collar flashing around projection using elastomeric sheeting and bitumen.

.22 Coping
- .1 Test mortar bond of coping units. Remove loose mortar from bell joint and clean surfaces.
- .2 Pack bitumen into bell joint and extend up onto bell approximately 75 mm and down onto shank of adjoining unit a similar distance.
- .3 Cut proper lengths of 150 mm wide reinforcement membrane and dry trowel membrane into bitumen; tight and wrinkle-free.
- .4 Overcoat reinforcing membrane with bitumen.

.23 Pitch Pans
- .1 Uniformly apply a 3 mm thick layer of bitumen to surfaces designated to receive metal flange.
- .2 Install pre-manufactured pitch pan into adhesive. Prime flange prior to installation.
- .3 Ensure minimum 50 mm clearance between projection and side wall.
- .4 Fully adhere elastomeric sheeting to flashing surface with bitumen. Cover flange completely. Extend flashing at least 100 mm onto adjacent roofing. Ensure complete bond and continuity without wrinkles and voids. Lap sheeting ends minimum 100 mm.
- .5 Fill pitch pan 25 mm from top with pitch pan base filler.
- .6 Fill remainder with rubberized elastomer mastic. Crown top of mastic to ensure water run-off.

.24 Equipment Stands (Pipe)
- .1 Provide 200 mm high sleeve flashing with 100 mm wide flange. Flange to extend completely around flashing periphery. Solder joints. Double solder vertical joints.
- .2 Nail flange to wood blocking minimum 75 mm OC; staggered.
- .3 Prime flange with asphaltic primer.
- .4 Install elastomeric sheeting to stand and roofing with continuous 1.5 mm thick application of bitumen.
- .5 Sandwich top edge of sheeting between two layers flashing tape.
- .6 Secure top of sheeting with stainless steel drawband. Seal top of drawband and sheeting-to-pipe interface. Provide watershed and tool neatly.
- .7 Fabricate umbrella and install drawband; cover sleeve flashing minimum 75 mm. Install immediately above sleeve flashing. Tighten drawband.
- .8 Wipe clean top of umbrella and projection with metal cleaner. Prime surface with metal primer.
- .9 Seal projection-to-sheet metal interface. Provide watershed and tool neatly.

.25 Piping Through Roof Boxes
- .1 Install wood blocking as specified in Section [06 10 00][_____].
- .2 Provide two-piece pipe box. Fabricate bottom portion with 100 mm flange. Notch top section to fit over piping. Provide openings 200 mm above the roof surface.
- .3 Set flange in mastic, nail flange to wood blocking at 75 mm OC. Prime flange.
- .4 Fill box interior with mineral fibre insulation.
- .5 Fasten top and closure detail to bottom.

.6 Clean surfaces of box and piping with metal cleaner and then prime. Seal joint between box and piping.
.7 Install elastomeric sheeting with bitumen and membrane.

.26 Roof Drain
.1 Install drain assembly in accordance with manufacturer's written installation guidelines.
.2 Plug and seal drain to prevent water entry until service connection is completed.
.3 Provide 600 x 600 mm size elastomeric sheeting reinforcement, centered over drain; and fully adhered with bitumen. Remove wrinkles and entrapped air.
.4 Apply mastic to exposed edge of membrane inside the drain opening.
.5 Reclamp flashing collar to drain in bed of bitumen.
.6 Trim excess sheeting within drain.

.27 Roof Drain Insert
.1 Cut 225 mm OD opening through membrane and insulation; coinciding with existing drain opening.
.2 Install roof drain insert into existing drain pipe in accordance with drain insert manufacturer’s written installation guidelines.
.3 Adhere drain flange to membrane with bitumen.
.4 Provide 900 x 900 mm size elastomeric sheeting reinforcement, centered over drain; and fully adhere sheeting with bitumen. Remove wrinkles and entrapped air.
.5 Trim excess sheeting within drain.
.6 Seal leading edge of sheet with reinforcing membrane embedded between alternate continuous courses of bitumen.

[OR]

3.8 TWO-PLY POLYESTER FLASHINGS

SPEC NOTE: When the project manual includes Section 07 65 00 - Flexible Flashing, use paragraph .1 and delete paragraphs .3 through .22. Otherwise, remove reference to Section 07 65 00 and edit remaining paragraphs to suit project requirements.

.1 Provide membrane flashings [as specified in Section [07 65 00][_____]] [and] [in accordance with manufacturer’s written installation guidelines.]

.2 Install flashings to ensure the roof is watertight at the end of each Working Day.

.3 Fully adhere two-plies of flashing membrane and overcoat with bitumen.

.4 Extend base ply minimum 100 mm over roof membrane. Extend cap ply 50 mm beyond edge of base ply flashing.

.5 Extend flashing membranes minimum 200 mm up vertical surfaces.

.6 Secure flashings at 200 mm OC.

.7 Secure vertical flashings through termination bar.

SPEC NOTE: Edit the following paragraphs .8 through .22 to suit project requirements when polyester flashings are not specified in Section 07 65 00. Delete unnecessary paragraphs.

.8 Canted Eave:
.1 Extend plies of flashing membrane down cant and at least 150 mm beyond toe of cant onto roof surface.
.2 Extend plies of flashing membrane over outside face of cant and extend minimum 25 mm below blocking. Mechanically fasten with 38 mm common roofing nails, 200 mm OC.
.3 Ensure complete bond and continuity without wrinkles or voids.

.9 Canted Eave with Fascia
.1 Extend plies of flashing mmbrane down over cant strip and embed in bitumen onto roof surface a minimum of 150 mm.
.2 Extend plies of flashing membrane over outside face of cant and fascia and secure to underside of fascia. Mechanically fasten with 38 mm common roofing nails, 200 mm OC.
.3 Ensure complete bond and continuity without wrinkles or voids.

.10 Low Parapet Wall Flashing
- .1 Seal exposed joint between the wall and roof deck for airtight seal.
- .2 Adhere two plies of flashing membrane and overcoat with bitumen. Extend plies minimum 150 mm beyond toe of cant onto roof surface.
- .3 Ensure complete bond and continuity without wrinkles or voids.
- .4 Extend flashings up and over parapet at least 38 mm and face nail using a furring strip with 38 mm common roofing nails, 200 mm OC.

.11 Gravel Stop
- .1 Prior to setting and nailing horizontal flanges of edge flashings, uniformly trowel a 1.5 mm thick layer of bitumen to roofing surface designated to receive metal flange.
- .2 Install metal gravel stop with formed drip edge, incorporating lock-type joints to allow expansion and contraction. Set flange in bitumen.
- .3 Nail interior portion of flange to wood blocking 75 mm OC, staggered.
- .4 Prime metal flange with asphaltic primer.
- .5 Install two plies of flashing reinforcement to flange. Extend bottom flashing membrane course from edge to 100 mm beyond metal flange. Extend top flashing membrane course from edge to 50 mm beyond edge of bottom ply. Lap ends 100 mm. Set both plies and laps in alternating courses of mastic applied in continuous 1.5 mm thick applications. Ensure complete bond and continuity without wrinkles or voids.
- .6 Seal edge of flashing membrane at metal upturn as specified in Section [07 92 00][_____].

.12 Flashing At [Edges] [and] [Gutters]
- .1 Fabricate and install new one-piece [edge.][gutter with downspouts. Slope gutter to downspouts.]
- .2 Prior to setting and nailing horizontal flanges of gutter, uniformly trowel a 1.5 mm thick layer of bitumen to roofing surface designated to receive metal flange.
- .3 Nail flange to wood blocking 75 mm OC, staggered.
- .4 Prime metal flange with asphaltic primer.
- .5 Seal flange with two strips of flashing ply embedded between alternate applications of bitumen. Extend first ply 100 mm beyond flange and extend second ply 50 mm beyond first ply.

.13 Wall Flashing
- .1 Seal exposed joint between the wall and roof deck for airtight seal.
- .2 Adhere two plies of flashing membrane and overcoat with bitumen.
- .3 Ensure complete bond and continuity without wrinkles or voids.
- .4 Flashing Width: sufficient to extend at least 150 mm beyond toe of cant onto roof surface and 200 mm above the roof surface.
- .5 Form 6 mm hook dam by bending rear ege back on itself.
- .6 Secure into 25 mm deep reglet with lead wedges 200 mm OC.
- .7 Lap counterflashings 100 mm at side laps and extend counterflashing 75 mm over base flashing.
- .8 Install counterflashing into receiver of through-wall flashing.

.14 Expansion Joint at Wall
- .1 Extend vapour retarder from deck level up wall sufficiently and secure to wall.
- .2 Fill joint with loose insulation.
- .3 Install blocking, sheathing and compressible insulation as detailed on Drawings and as specified in Section [06 10 00][_____].
- .4 Adhere two plies flashing membrane completely to flashing surface, cant and roofing with bitumen.
- .5 Ensure complete bond and continuity without wrinkles or voids. Lap ends 100 mm and adhere with bitumen.
- .6 Flashing Width: sufficient to extend at least 150 mm beyond toe of cant onto roof surface and 200 mm above the roof surface.

.15 Area Divider
- .1 Install two plies flashing membrane centered over area divider extending onto roof membrane a minimum of 150 mm beyond toe of cant on either side.
- .2 Fully adhere and overcoat both plies with bitumen. Ensure complete bond and continuity without wrinkles or voids.

.16 Curb Flashing
- .1 Fully adhere and overcoat two plies flashing membrane with bitumen. Ensure complete bond and continuity without wrinkles or voids.
- .2 Flashing Width: Sufficient to extend from top of curb down onto adjacent roofing minimum 150 mm. Mechanically fasten flashing on top face of curb.

.17 Projection Flashing
- .1 Apply bitumen to prepared area and Provide aluminum base over pipe and set into the bitumen.
- .2 Select proper step of rubber cap and cut off above index ring.
- .3 Install cap onto base collar and press edge to ensure proper seal.
- .4 Provide clamp around pipe and rubber cap. Prime flange.
- .5 Install two ply stripping with stripping ply adhesive and membrane.
- .6 Cover flange completely. Extend flashing minimum 100 mm onto adjacent roofing. Remove wrinkles and voids. Lap flashing ply ends 100 mm.

.18 Lead Plumbing Vents
- .1 Provide lead plumbing vent flashing.
- .2 Flange: minimum 100 mm wide; extend completely around periphery of vent flashing. Set flange into bitumen. Neatly dress flange with wood blocking.
- .3 Prime lead flange with asphaltic primer.
- .4 Pipe Greater Than 50 Mm OD: Bend lead inside pipe minimum 25 mm; replace cracked lead.
- .5 Pipe 50 mm OD or Less: Cut lead at vent top. Provide integral lead cap.
- .6 Install two ply stripping with stripping adhesive and membrane.

.19 Pitch Pans
- .1 Uniformly apply a 3 mm thick layer of bitumen to surfaces designated to receive metal flange.
- .2 Install pre-manufactured pitch pan into adhesive. Prime flange prior to installation.
- .3 Install two plies stripping with flashing membrane and bitumen. Cover flange completely. Extend flashing at least 100 mm onto adjacent roofing. Ensure complete bond and continuity without wrinkles and voids.
- .4 Fill pitch pan 25 mm from top with pitch pan base filler.
- .5 Fill remainder with rubberized elastomer mastic. Crown top of mastic to ensure water run-off.

.20 Piping Through Roof Boxes
- .1 Install two ply stripping with bitumen and membrane.

.21 Roof Drain
- .1 Install drain assembly in accordance with manufacturer's written installation guidelines.
- .2 Plug and seal drain to prevent water entry until service connection is completed.
- .3 Provide two plies flashing membrane, 600 x 600 mm size, centred over drain.
- .4 Embed two plies reinforcement membrane in alternate continuous applications of bitumen, leaving no voids. Extend top ply of reinforcement 50 mm beyond bottom ply.
- .5 Apply mastic to exposed edge of membrane inside the drain opening.
- .6 Reclamp flashing collar to drain in bed of bitumen.
- .7 Trim excess membrane within drain.

.22 Roof Drain Insert
- .1 Cut 225 mm OD opening through membrane and insulation; coinciding with existing drain opening.
- .2 Install roof drain insert into existing drain pipe in accordance with drain insert manufacturer’s written installation guidelines.
- .3 Adhere drain flange to membrane with bitumen.
- .4 Provide two plies flashing membrane reinforcement, 900 x 900 mm size, centred over drain.
- .5 Embed two plies reinforcement membrane in alternate continuous applications of bitumen, leaving no voids. Extend top ply of reinforcement 50 mm beyond bottom ply.
- .7 Trim excess membrane within drain.

3.9 SURFACING

.1 Install concrete pavers on pedestals where indicated on Drawings.

.2 Flood coat roof surface with bitumen applied at a rate of 2.7 kg/m2.

.3 Immediately broadcast aggregate ballast into bitumen at a rate of 19.5 kg/m^2, covering flood coat completely.

.4 Do not use power buggies or heavy equipment to distribute ballast.

.5 Rake out aggregate to a neat, even surface.

3.10 FIELD QUALITY CONTROL

.1 Contractor Inspection: Prior to application of aggregate surfacing, inspect completed membrane and flashing for punctures, tears, and discontinuously sealed seams.

.2 Apply additional layer of membrane over punctures and tears, extending minimum 50 mm beyond damaged area in all directions, and seal seams.

.3 Manufacturer's Field Service: arrange for manufacturer's technical representative to regularly inspect the roofing application (minimum twice per week) and confirm that the roofing system installation is in strict accordance with manufacturer's recommendations.

3.11 CLEANING

.1 Refer to Section [01 74 00][_____].

.2 Clean drains, gutters and downspouts of debris, ensuring free drainage.

.3 Clean adjacent roof surfaces, levels and ground level areas of debris and excess Products.

3.12 PROTECTION

.1 Adequately protect Products and work from damage by weather, traffic and other causes.

.2 At the end of each Working Day, seal exposed edges of roofing membrane to be watertight.

.3 Protect adjacent Work from damage. Repair damage.

END OF SECTION