

SECTION 07 55 53.13 - ELASTOMERIC PROTECTED MEMBRANE ROOFING, HOT-APPLIED

PART 1 - GENERAL

1.1 RELATED SECTIONS

- A. Section 07 62 00 – Sheet Metal Flashings and Trims
- B. Section includes elastomeric protected membrane roofing system, hot-applied.

1.2 REFERENCES

- A. References, General: The most recent adopted versions of the following references apply to the Work of this Section.
- B. Asphalt Roofing Manufacturers Association/National Roofing Contractors Association (ARMA).
 - 1. Quality Control Guidelines for the Application of Built-up Roofing
- C. ASTM International (ASTM).
- D. Canadian General Standards Board (CGSB).
- E. Canadian Roofing Contractors Association (CRCA)
 - 1. Roofing Specifications Manual
 - 2. Roofing Reference Manual
- F. National Roofing Contractors Association.
 - 1. NRCA - The NRCA Roofing Manual
- G. Sheet Metal and Air Conditioning Contractors' National Association (SMACNA).
 - 1. Architectural Sheet Metal Manual.
- H. Underwriters Laboratories of Canada (ULC).
 - 1. ULC - Fire Resistance Directory
 - 2. CAN/ULC-S102 - Surface Burning Characteristics of Building Materials and Assemblies
 - 3. CAN/ULC-S107 - Fire Tests of Roof Coverings
 - 4. CAN/ULC-S126 - Standard Method of Test for Fire Spread Under Roof-Deck Assemblies
 - 5. CAN/ULC-S701 - Thermal Insulation, Polystyrene, Boards and Pipe Covering

1.3 DEFINITIONS

- A. Roofing Terminology Definitions: ASTM D1079 and the following:
 - 1. CRCA Roofing Specifications Manual.
 - 2. CRCA Reference Manual.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Conference: Prior to commencing Work, conduct at Project site.
 - 1. Meet with Owner, testing and inspecting agency representative, roofing Installer, roofing manufacturer's representative, and installers of related work.
 - 2. Review installation methods and procedures, including manufacturer's written instructions and requirements of referenced standards.
 - 3. Review and finalize construction schedule. Verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
 - 4. Review structural loading limitations of roof deck during roofing operations.
 - 5. Review base flashings, edge conditions and terminations, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that affects roofing.
 - 6. Review requirements of authorities having jurisdiction and requirements for insurance and certificates if applicable.
 - 7. Review temporary protection requirements for roofing.
 - 8. Review roof observation, inspection, and repair procedures.
 - 9. Examine deck substrate conditions and finishes for compliance with requirements.

1.5 ACTION SUBMITTALS

- A. Product Data: For each specified product.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For Installer.
 - 1. Include original letter from Manufacturer written for this Project indicating manufacturer's approval.
- B. Contractor's Product Certificate: Notarized certificate, listing product names and numbers and manufacturers' names, indicating that products to be provided and the completed roofing system meet the requirements of the Contract Documents. Submit the following as attachments:
 - 1. Test Reports based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified testing agency.
 - 2. Evidence of compliance with performance requirements.
 - 3. Statement indicating that proposed system components are compatible.
- C. Warranties: Unexecuted copy of warranties.
- D. Inspection Reports: Daily reports of Roofing Inspector. Include weather conditions, description of work performed, tests performed, defective work observed, and corrective actions taken to correct defective work.

1.7 CLOSEOUT SUBMITTALS

- A. Maintenance Data.
- B. Warranties:

1. Manufacturer's and Installer's executed warranty documents. Submit prior to acceptance of Work.

1.8 QUALITY ASSURANCE

- A. Quality Standards: Perform Work of this Section in accordance with the following:
 1. CRCA Reference Manual.
 2. NRCA Roofing Manual
- B. Manufacturer Qualifications: A qualified manufacturer with minimum five years' experience in manufacture of specified products in successful use on similar projects and able to provide roofing system meeting specified requirements. Systems listed by UL and Factory Mutual.
- C. Installer Qualifications: A manufacturer-approved firm with minimum five years' experience in installation of specified products in successful use on similar projects, employing workers trained by manufacturer, including a full-time on-site supervisor with a minimum of three years' experience installing similar work, able to communicate verbally with Contractor and employees, and qualified by the manufacturer to furnish warranty of type specified.
- D. Roofing Inspector Qualifications: A technical representative of manufacturer not engaged in the sale of products and experienced in the installation and maintenance of the specified roofing system, qualified to perform roofing observation and inspection specified in Field Quality Control Article, to determine Installer's compliance with the requirements of this Project, and approved by the manufacturer to issue warranty certification. The Roofing Inspector shall be one of the following:
 1. An authorized full-time technical employee of the manufacturer.
 2. An independent party certified as a Registered Roof Observer by RCI, retained by the Contractor or the Manufacturer and approved by the Manufacturer.

1.9 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products in manufacturer's original containers, dry, undamaged, with manufacturer's seals and labels intact.
- B. Store products in weather protected environment, clear of ground and moisture. Protect foam insulation from direct exposure to sunlight.
- C. Handle and store roofing materials and place equipment in a manner that does not result in permanent deflection of deck.

1.10 PROJECT CONDITIONS

- A. Weather Limitations: Comply with manufacturer's written instructions and warranty requirements.
- B. Do not apply roofing membrane to damp or frozen deck surface or when precipitation is occurring.
- C. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed the same day.

1.11 WARRANTY

- A. Roof System Warranty: Warranties specified in this Section include the following components and systems specified in other sections supplied by the roofing system Manufacturer, and installed by the roofing system Installer:
1. Sheet metal flashing and trim, including roof penetration flashings.
 2. Manufactured copings, roof edge, counterflashings, and reglets.
 3. Roof curbs, hatches, and penetration flashings.
 4. Roof and parapet expansion joint assemblies.
 5. Metal roof, wall, and soffit panels and trim.
- B. Manufacturer's Warranty: Manufacturer's standard or customized form, in which manufacturer agrees to repair or replace components of roofing that fail in materials or workmanship within specified warranty period.
1. Manufacturer's warranty includes roofing membrane, base flashings, roofing membrane accessories, roof insulation, fasteners, and other components of roofing.
 2. Manufacturer to provide inspections of roofing systems in year two (2), five (5), ten (10) and fifteen (15) of this warranty. Inspection to include visual inspection, minor repairs and limited cleaning of debris with reporting to building owner.
 3. Warranty Period: 20 years from date of Substantial Completion.
- C. Installer's Warranty: Roofing system Installer's warranty, on warranty form at end of this Section signed by Installer, covering the Work of this Section, including all components of roofing such as roofing membrane, base flashing, roof insulation, fasteners, cover boards, substrate boards, roof pavers, and walkway products, for the following warranty period:
1. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

- A. Adhered Elastomeric Sheet Membrane Protected Roofing System: Elastomeric protected membrane in cold-applied adhesive on concrete deck, and including the following:
1. Concrete Deck
 2. Roof membrane sheet and membrane base flashing sheet.
 3. Slip sheet.
 4. Drainage board
 5. Loose-laid insulation.
 6. Water pervious filter fabric.
 7. Aggregate ballast.
 8. Metal flashings.
 9. Accessories.
- B. Flashings and Fastening: Provide base flashings, perimeter flashings, detail flashings, and component materials and installation techniques that comply with requirements and recommendations of the following:

1. CRCA Roofing Manual for construction details and recommendations.
2. SMACNA Architectural Sheet Metal Manual for construction details.

2.2 PERFORMANCE REQUIREMENTS

- A. General Performance: Roofing system shall remain weathertight and withstand, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, or installation.
- B. Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by roofing manufacturer based on testing and field experience.
- C. Exterior Fire-Test Exposure:
 1. UL 790, Class A
 2. CAN/ULC S107, Class A

2.3 PRIMER

- A. Asphalt based, bituminous primer. ASTM D 41.

2.4 ROOFING MEMBRANE AND FLASHING MEMBRANE

- A. Elastomeric, polyester-reinforced sheet with EPDM and SBR elastomers. Specifically designed for inverted roofing.
 1. Breaking Strength, minimum, CGSB 37-GP-52: machine direction (1446 N); cross machine direction (1288 N).
 2. Tear Strength, minimum, CGSB 37-GP-52: machine direction (313 N); cross machine direction (348 N).
 3. Low Temperature Flexibility, minimum, CGSB 37-GP-52: -40 deg. F (-40 deg. C).

OR

SBS Modified Bitumen Membrane, bilaminate reinforced, one ply s/s, one ply s/g. to meet and/or exceed ASTM D 6162, Type III, Grade S and CSA A123.23.

1. Thickness, minimum, 100mills, to ASTM D 5147.
2. Low Temperature Flexibility, minimum, -40 Deg C, to ASTM D5147.
3. Tensile Strength @-18 Deg C, minimum, 70 kN/m MD 67 kN/m XMD, to ASTM D5147.
4. Tear Strength, minimum, 2600N MD 2600N XMD, to ASTN D5147.

- B. Flashing Membrane Sheet: Same as roof membrane sheet.

2.5 ROOFING MEMBRANE ACCESSORIES

- A. General: Auxiliary materials recommended by roofing manufacturer for intended use and compatible with roofing.

- B. Membrane Adhesive/Horizontal Lap Stripping Adhesive: SEBS modified asphalt, mopping grade, elastomeric modified bitumen hot melt.
 - 1. Elongation, minimum, 900%, ASTM D412.
 - 2. Low Temperature Flexibility, minimum, -18 Deg C, ASTM D3111.
- C. Vertical Lap and Stripping Adhesive: One-part polymer-modified roof elastomer, trowel grade.
 - 1. Tensile Strength: ASTM D412: min 650 kPa @100% elongation
 - 2. Elongation at -34 deg. C (-30 deg. F), minimum, ASTM D412: 100 percent
 - 3. Elongation at 25 deg. C (77 deg. F), minimum, ASTM D412: 100 percent.
 - 4. Flexibility at -40 deg. C (-40 deg. F), pass, ASTM D 3111
- D. Stripping Reinforcement Fabric: non-shrinking, non-rotting, vinyl coated, woven glass bonded mesh.
 - 1. Tensile strength to ASTM D 146
- E. Flashing Adhesive: Single Component, moisture curing polyurethane – trowel grade.
 - 1. Ultimate Elongation, minimum, 700%, ASTM D412.
 - 2. Ultimate Tensile Strength, minimum, 250psi, ASTM D412.
- F. Asphalt Mastic: to ASTM D 4586

2.6 ACCESSORIES

- A. Termination Bar: 1 mm (0.040 inch) aluminum, pre-drilled for mechanical attachment.
- B. Sealing Tape: Butyl, as recommended by manufacturer.
- C. Miscellaneous Membrane Accessories: Flexible molded boots and collars, pourable sealers, preformed corners, in-seam sealants, and other accessories.
- D. Stack Flashing: Spun aluminum pre-insulated to suit application with min 450mm integral deck flange.
- E. Scuppers: 26 gauge pre-painted steel with flange, formed to fit site conditions.
- F. Metal Flashings: As specified in section 07 62 00.
- G. Sealant: One part polyurethane as recommended by warranting manufacturer, colour to closely match metal flashings.
- H. Drain Inspection Boxes: Aluminum vegetated roof boxes with removable lid and punched openings for drainage.
- I. Primer: As per manufacturer.

2.7 ROOF INSULATION

- A. General: Preformed roof insulation boards manufactured or approved by roofing manufacturer, selected from manufacturer's standard sizes suitable for application, of thicknesses indicated.

- B. Extruded-Polystyrene Board Insulation: CAN/ULC-S701 Type VI, shiplap-edged, with integral high-density skin:
 - 1. Thermal Resistance: R5 per 25mm of thickness.
 - 2. Compressive Strength: 241 kPa
 - 3. Water Vapour Permeance: Max 1.1 perms, ASTM E 96.
 - 4. ASTM C 578
 - 5. Total Thickness: 100mm (Two Layer 50mm each)
- C. Insulation Cant Strips: High density asphalt impregnated fibreboard.
- D. Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated. Material: High Density Fibreboard

2.8 ROOF INSULATION ACCESSORIES

- A. General: Roof insulation accessories recommended by insulation manufacturer for intended use and compatible with roofing.
- B. Slip Sheet: Polyethylene slip sheet, 0.15 mm thick.
- C. Drainage Layer: High Density polyethylene dimpled drainage board.
- D. Tapered Insulation: Pre-engineered, high density, asphalt impregnated, fibreboard.

2.9 BALLAST MATERIALS

- A. Aggregate Filter Fabric: Woven or nonwoven polypropylene, polyolefin, or polyester fabric, water permeable and resistant to UV degradation, type and weight as recommended by roofing system manufacturer for application
- B. Aggregate Ballast: Reuse Existing
- C. Precast Pavers: 50mm tick, 600mm x 600mm, textures wear surface pattern.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine surfaces and site conditions, with Installer, for compliance with requirements, prior to commencing work.
 - 1. Verify surfaces and site conditions are ready to receive work.
 - 2. Verify deck is supported and secure.
 - 3. Verify that roof openings and penetrations are in place, curbs are set and braced, blocking, curbs, wood cants, and nailers are anchored to roof deck at penetrations and terminations, that wood nailers match insulation thickness, and roof drain bodies are properly installed.
 - 4. Verify deck surfaces are clean, dry, and free of snow or ice.
- B. Report: Provide written report to Owner indicating conditions that do not meet requirements.
- C. Proceed with installation once non-complying conditions have been corrected.

3.2 PREPARATION/DEMOLITION

- A. Remove all existing roof components down to the structural concrete deck. Dispose of at a licensed facility.
- B. Clean substrate of substances and projections detrimental to roofing installation according to roofing manufacturer's written instructions.
- C. Prevent materials from entering roof drains and conductors and from contacting surfaces of other construction.
- D. Substrate-Joint Penetrations: Prepare joints as required to prevent asphalt and adhesives from penetrating joints, entering building, or damaging roofing components or other construction.
- E. Seal open joints in concrete to prevent bitumen from entering the facility.
- F. Remove and discard all capped obsolete curbs from roof area.
- G. Prime existing concrete deck and all parapet walls prior to application of asphalt.

3.3 INSTALLATION, GENERAL

- A. Install roofing membrane system components according to roofing manufacturer's written instructions, applicable referenced roofing system approval, and approved shop drawings.
- B. Cooperate with testing agencies and personnel engaged or required to perform services for installing roofing.

3.4 ROOFING MEMBRANE INSTALLATION

- A. Ensure substrate is clean, free of moisture and no major defects are present.
- B. Prime entire concrete surface at rate recommended by manufacturer.
- C. Start installation of roofing in presence of manufacturer's technical personnel.
- D. Coordinate installation of roofing to protect roofing system components and structure from exposure to precipitation.
- E. Adhere tapered insulation in membrane adhesive applied at 25lbs/sq.
- F. Conceal tapered insulation with one ply composite felt prior to installation of roof membrane. Fully conceal tapered insulation with felt adhered in SEBS asphalt applied at 25lbs/sq.
- G. Cant Strips: Secure cant strips at junctures of roofing at vertical intersections with membrane adhesive.
- H. Membrane Sheet: Adhere to substrate according to membrane manufacturer's written instructions.
 - 1. Adhere membrane without wrinkles, blisters or fishmouths in a continuous application of membrane adhesive applied at rate 1.2 kg/m².

2. Overlap membrane sheet edges and ends minimum 100 mm and seal by membrane adhesive. Seal permanently waterproof.
3. Reinforce membrane seams. Apply stripping adhesive (two courses) with reinforcing mesh, minimum 150 mm wide over seam, fully conceal reinforcing mesh with second application of stripping adhesive.
4. Extend membrane to top of cant strips.
5. Seal membrane around roof penetrations.
6. Leave seams exposed until inspected.

3.5 FLASHING AND STRIPPING INSTALLATION

- A. Base Flashing: Install flexible flashing sheet at roof edges and at penetrations through roof. Secure to substrates according to roofing manufacturer's written instructions.

1. Prime substrates with primer if required.
2. Flashing Sheet Application:
 - a. Embed flashing sheet in a uniform coverage of Flashing Adhesive. Apply at rate of 1.2kg/m².
3. Unless stated otherwise, extend base flashing up walls or parapets a minimum of 300 mm above insulation and 150 mm onto field of roofing.
4. Mechanically fasten top of base flashing securely at terminations and perimeter of roofing.
5. Reinforce flashing and flashing-to-membrane seams with application of stripping adhesive (two courses) and reinforcing mesh.
6. Seal top termination of base flashing with a metal termination bar and application of sealant. All termination bars must be applied same day as flashing installation.

- B. 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 flashing adhesive.
3. Ensure complete bond and continuity without wrinkles or voids. Lap sheeting ends 100 mm and adhere with flashing adhesive.
4. Extend elastomeric sheeting up and over parapet at least 38 mm and face nail with 38 mm common roofing nails, 200 mm OC.

- C. Flashing At Edges and Gutters

1. Fabricate and install new one-piece 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 cold flashing adhesive 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 flashing adhesive. Ensure complete bond and continuity without wrinkles or voids lap sheeting ends 100 mm and adhere with flashing adhesive. Elastomeric sheeting to cover gravel stop completely and overlap onto adjacent roof a minimum of 150 mm.

- D. 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 flashing adhesive.
3. Ensure complete bond and continuity without wrinkles or voids. Lap sheeting ends 100 mm and adhere with flashing adhesive.
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.

E. Building Expansion Joints

1. Fill joint with loose insulation.
2. Provide 13 mm thick plywood to top of wood blocking, secured one side only.
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 flashing adhesive. Press sheeting into adhesive. Ensure complete bond and continuity without wrinkles or voids.
6. Lap sheeting ends 100 mm and adhere with flashing adhesive.

F. 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 flashing adhesive. Press sheeting into adhesive. Ensure complete bond and continuity without wrinkles or voids.
3. Lap sheeting ends 100 mm and adhere with flashing adhesive.

G. Control Joint

1. Install elastomeric sheeting centered over joint.
2. Fully adhere sheeting to horizontal and vertical blocking surfaces with flashing adhesive. Press sheeting into adhesive. Ensure complete bond and continuity without wrinkles or voids.
3. Lap sheeting ends 100 mm and adhere with flashing adhesive.

H. Curb Flashing

1. Fully adhere sheeting to horizontal and vertical blocking surfaces with flashing adhesive. Press sheeting into adhesive. Ensure complete bond and continuity without wrinkles or voids.
2. Mechanically fasten sheeting on top face of curb.
3. Lap sheeting ends 100 mm and adhere with flashing adhesive.
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.

I. Projection Flashing

1. Apply stripping adhesive to prepared area and Provide aluminium base over pipe and set into the stripping adhesive.
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.
7. Remove wrinkles and voids. Lap flashing ply ends 100 mm.

J. Pitch Pans

1. Uniformly apply a 3 mm thick layer of stripping adhesive 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 flashing adhesive. Cover flange completely. 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 pourable sealer. Crown top of mastic to ensure water run-off.
7. Install metal cap and caulk conduit penetration.

K. Scuppers

1. Uniformly apply a 3 mm thick layer of stripping adhesive to surfaces designated to receive metal flange.
2. Install pre-manufactured scupper into adhesive. Prime flange prior to installation.
3. Prime top of scupper at area to receive flashing membrane.
4. Extend flashing membrane 150mm into scupper beyond parapet wall and 150mm onto field of roof beyond flange in continuous spread of flashing adhesive.

L. Piping Through Roof Boxes

1. Install wood blocking as specified in drawings.
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 flashing adhesive and membrane.

M. 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 flashing adhesive.
4. Provide 900 x 900 mm size elastomeric sheeting reinforcement, centered over drain; and fully adhere sheeting with flashing adhesive. 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 flashing adhesive.

N. Stripping Installation:

1. Install stripping where metal flanges and edgings are set on roofing, and in sealing end laps and leading edges of flashings.
2. Ensure surfaces are clean and dry. Trowel apply stripping mastic at rate of 20 ft²/gal (0.5m²/L) per course. Set stripping fabric into freshly applied trowel course of stripping mastic. Fully cover fabric with a top course of stripping mastic.

3.6 ROOF SLIP SHEET, DRAINAGE BOARD, INSULATION INSTALLATION

- A. Slip Sheet: Loose lay slip sheet over completed cured membrane installation prior to installation of insulation.
- B. Install drainage board over entire field of roof.
- C. Place insulation boards; butt in close contact. Place channel cut face of first insulation layer down against slip sheet. Bevel insulation to allow snug fit at cants. Cut neatly around protrusions through roof.
- D. Install insulation in a continuous straight line with joints staggered, abutting edges and ends. Fit insulation within 6 mm of projections and penetrations.
- E. Install second course of insulation on top of primary course. Stagger joints minimum of 12 inches from previous course.

3.7 BALLAST INSTALLATION

- A. Aggregate Ballast Filter Fabric Installation: Install fabric over insulation, overlapping edges and ends minimum 300 mm. Extend fabric 50 to 75 mm above ballast at perimeter and penetrations. Apply additional layer of fabric around penetrations to prevent aggregate from getting between penetration and insulation. Do not cover drains or restrict water flow to drains.
- B. To roofed area, apply aggregate ballast uniformly over filter fabric at rate required by insulation manufacturer, but not less than the following, carefully spreading aggregate to not damage roofing and base flashings:
 1. Aggregate Ballast Weight: 50 kg/sq. m.
- C. Install stainless steel perforated gravel guard at all drain and scupper locations.
- D. Install concrete pavers (4) at roof access points.

3.8 FIELD QUALITY CONTROL

- A. Manufacturers Field Service: Arrange for manufacturer's technical representative to regularly inspect the roofing application (minimum twice per week, additional inspections as required) and confirm that roofing system application is in strict accordance with manufacturers guidelines and recommendations, provide inspection report within 24 hours of each visit.
- B. Contractor Inspections: Contractor to inspect membrane before installation of slip sheet for punctures, tears and membrane variances. Apply additional layer of waterproofing over punctures and tears extending a minimum of 150mm beyond damaged area in all directions, ensure seam treatment in continuous without voids.
- C. Repair or remove and replace non-complying components of roofing. Retest to demonstrate compliance.

3.9 PROTECTING AND CLEANING

- A. Protect roofing from damage and wear during construction according to manufacturer's instructions.
- B. Correct deficiencies in or remove roofing that does not comply with requirements, repair substrates, and repair or reinstall roofing to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.
- C. Clean overspray and spillage from adjacent construction.

SECTION ENDS