



PERMA-SEAL INSULATION TECHNOLOGY

The most energy efficient roofing system under the sun

SECTION 07 53 24

EPDM roofing membrane applied over spray applied polyurethane foam

TTR SYSTEMS ROOF SPECIFICATION

This specification has been numbered, organized and formatted in accordance with the Master Format, Section Format and Page Format documents published jointly by Construction Specifications Canada (CSC) and Construction Specifications Institute (CSI).

The content of this specification is of general order and must be adapted to the specific requirements of a project. It is offered as a guide to experienced and knowledgeable construction professionals who must assume full responsibility for its interpretation and use. TTR Roofing International, Inc. is a material supplier for EPDM roofing membrane applied over spray applied polyurethane foam.

Square brackets [] containing texts indicate an option to be selected/inserted by the specifier. Remove brackets and unused options before printing.



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Part 1 - General

1.01 SECTION INCLUDES

- A. Labour, products, equipment and services necessary for re-roofing in accordance with the Contract Documents.
- B. Materials and installation for ethylene propylene terpolymer (EPDM) roofing for retrofitting conventional BUR.

1.02 REFERENCES

- A. UL-790/ASTM E-108 Class A Fire Resistance Rating.
- B. ASTM D4637 Standard Specification for EPDM Sheet Used in Single-Ply Roof Membrane.
- C. CGSB 37-GP-52M-1984, "Roofing and Waterproofing Membrane, Sheet Applied Elastomeric."
- D. ANSI/SPRI RD-1, 2003 'Standard for Retrofit Roof Drains.'
- E. ULC/ORD-C790-4-1996 Roof Drains

1.03 PRE-INSTALLATION MEETING

- A. Prior to commencement of the work, the successful contractor is to attend a mandatory pre-construction meeting with the owner's representative. The contract documents, specifications, and scope of work shall be reviewed and confirmed.

1.04 SUBMITTALS

- A. Product Data: Manufacturer's printed data sheets or catalogue pages describing the products to be incorporated into the roof, in accordance with Section [01 33 00 – Submittal Procedures].
- B. Shop Drawings: In accordance with Section [01 33 00 – Submittal Procedures].
 - 1. Indicate [flashing,] [penetration,] [field fabricated seam] details.
- C. Material Safety Data Sheets: WHMIS MSDS in accordance with Section [02 61 33 – Hazardous Materials].
- D. Manufacturer's Instructions: Indicate special handling criteria, installation sequence, cleaning procedures and [_____].
- E. Maintenance Data: Sample Annual Inspection and Report forms.

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F. Warranty: Sample [10 year] [20 year] Warranty Certificate.

1.05 QUALITY ASSURANCE

A. Regulatory Requirements: Comply with Department of Labour and Occupational Health and Safety Act.

B. Installer Qualifications: Use adequate numbers of skilled, qualified personnel thoroughly trained and completely familiar with the specified requirements and methods needed for proper performance of the work of this Section.

1.06 MOCK-UPS

1. Construct mock-up in accordance with Section [01 45 00 – Quality Control].
2. Construct mock-up [10 m²] [100 sq. ft.] minimum size showing typical lap joint, [one inside corner] [and] [one outside corner].
3. Mock-up will be used:
 1. To judge workmanship, substrate preparation, operation of equipment and material application.
4. Locate [where directed] [where indicated].
5. Allow [24] hours for inspection of mock-up by [Consultant] [Architect] [Engineer] before proceeding with roofing work.
6. When accepted, mock-up will demonstrate minimum standard of quality required for this Work. [Approved mock-up may [not] remain as part of finished Work.] [Remove mock-up and dispose of materials when no longer required and when directed by [Consultant] [Architect] [Engineer].]

1.07 DELIVERY, STORAGE AND HANDLING

1. Deliver, handle, store and protect materials in accordance with Section [01 51 00 – Common Product Requirements].
2. Provide and maintain dry, off-ground weatherproof storage.
3. Store materials on supports to prevent deformation.
4. Remove only in quantities required for same day use.
5. Store uncured flashing and jointing materials to prevent premature curing and freezing.



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6. Store roofing materials in accordance with manufacturer's written instructions.

1.08 WASTE MANAGEMENT AND DISPOSAL

- A. Separate and recycle waste materials in accordance with construction/demolition waste management and disposal practices.
- B. Remove from site and dispose of packaging materials at appropriate recycling facilities.
- C. Collect and separate for disposal [paper] [corrugated cardboard] [_____] packaging material [_____] in appropriate on-site bins for recycling in accordance with waste management practices.
- D. Fold up metal banding, flatten and place in designated area for recycling.
- E. Dispose of waste foam daily in location designated by [Consultant] [Architect] [Engineer] and decontaminate empty drums in accordance with foam manufacturer's instructions.
- F. Divert metal drums from landfill to metal recycling facility as approved by [Consultant] [Architect] [Engineer].
- G. Unused adhesive and sealant materials must not be disposed of into sewer system, into streams, lakes, onto ground or in other location where they will pose health or environmental hazard. Divert unused materials to municipal hazardous materials depot approved by [Consultant] [Architect] [Engineer].
- H. Divert wood materials from landfill to [recycling] [reuse] [composting] facility approved by [Consultant] [Architect] [Engineer].
- I. Collect, package and store EPDM membrane cut-offs and waste material for recycling and return to recycler in accordance with waste management practices.

1.09 SITE CONDITIONS

- A. Ambient Conditions:
 - 1. Apply polyurethane insulation and EPDM membrane only when surfaces and ambient temperatures are within manufacturer's prescribed limits.
 - 2. Do not install EPDM membrane when air and substrate temperature remain below [5 degrees C (40° F)] causing condensation in accordance with manufacturer's recommendations or when wind chill gives equivalent cooling effect causing condensation.



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3. Install EPDM membrane on dry substrate, free of water, snow and ice. Use only dry materials and apply only during weather that will not introduce moisture into system.

1.10 SPECIAL WARRANTY

- A. Warrant EPDM membrane and flashings will stay in place and remain leak-proof for a period of [10] [20] years in accordance with roofing system contractor's standard Warranty. Include annual inspection service and report with Warranty.
- B. Warranty to be subject to annual inspection by roofing system contractor at no additional cost as per Annual Inspection Check List & Report forms referenced in 1.4 Submittals.



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Part 2 - Products

2.01 MANUFACTURER

A. Acceptable roofing system manufacturer:

TTR Roofing International, Inc.

5317 Fruitville RD, Sarasota 34232

Toll Free: 1-877-253-4762

Phone #: 1-954-727-3102

Fax #: 1-954-727-5127

Email: support@ttrsystems.com

Web: www.ttrsystems.com

2.02 MATERIALS

A. Roofing System: TTR Tri-Thermal Roofing spray-in-place polyurethane roofing foam insulation covered by a fully adhered EPDM membrane, and consisting of the following:

1. Polyurethane insulation: TTR Tri-Thermal Roofing's TTR007F Polyfoam, HFC blown (zero-ozone depleting) liquid spray monolithic system, medium density rigid polyurethane insulation, 38 mm to 50 mm (1-1/2" to 2") thickness, 7.1R Value, Class A Fire Tested rating to UL-790/ASTM E-108.
2. Membrane adhesive: TTR Tri-Thermal Roofing's TTR007G Adhesive, two-part spray applied polyurethane adhesive, containing no VOC's, CFC's or HCFC's, 13 mm (1/2") thickness.
3. Membrane: Firestone RubberGard non-reinforced, black or white colored EPDM (Ethylene Propylene Diene Terpolymer) cured, single ply membrane, 1.5 mm (.060") thickness, 30.5 m (100'-0") long rolls x 3 m or 6.1 m (10'-0" or 20'-0") widths. Membrane to meet or exceed the minimum requirements set forth by ASTM D4637, and CGSB 37-GP-52M, for Class 1, Class A, non-reinforced EPDM single ply roofing membrane.
4. Seam tape: Firestone QuickSeam Splice Tape, 76.2 mm (3") wide x 30.5 m (100'-0") rolls x 0.77 mm (0.030") thickness, black or white colored rubber polymer base.
5. Elastomeric U.V. protection: Gaco Western 3200 series coatings.
6. Cap flashing: 24 gauge galvanized steel [precoated as per color selected from manufacturer's standard colours] [_____precoated color].
7. Cap flashing fasteners: 25.4 mm (1") min. galvanized self-tapping screws fitted with rubber grommets, colour to match cap flashing.

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8. Retrofit drains: Hercules Retrodrain one-piece seamless body of 3 mm (.125", 11 gauge) spun aluminum, extra large 445 mm (17-1/2") deck flange with depressed sump area, cast aluminum strainer dome and clamping ring, 305 mm (12") long drain stem, U-Flow Seal, [75 mm (3")] [100 mm (4")] [125 mm (5")] [150 mm (6")] diameter, to ANSI/SPRI RD-1 and ULC/ORD-790.4.



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Part 3 - Execution

3.01 PREPARATION

- A. Clean roof surfaces receiving polyurethane foam insulation by sweeping, power washing or dry/wet vac.
- B. Prior to beginning work, ensure:
 - 1. Substrates are firm, straight, smooth, dry, free of water, snow, ice or frost, and swept or vacuumed clean of dust and debris.
 - 2. Curbs have been built.
 - 3. Drains have been installed at proper elevations relative to finished surfaces.
 - 4. Plywood and lumber nailer plates have been installed to walls and parapets as indicated.
- C. Test substrate for moisture as necessary using drill holes, cut tests, hydrometer, or infrared thermography to identify any wet roof areas.
- D. Remove wet areas and ensure deck surfaces are dry before introducing new insulation to level of removed areas.
- E. Install new insulation by matching existing or using polyurethane foam.
- F. If necessary, install relief vents to ensure any hidden moisture is vented from between vapour retarder/barrier and new roof assembly.

3.02 SAFETY REQUIREMENTS

- A. Protect workers as recommended by polyurethane foam and membrane manufacturers.
- B. Ensure workers wear gloves, respirators, dust masks, long-sleeve clothing, eye protection and protective clothing when applying foam insulation.
- C. Do not permit workers to eat, drink or smoke while applying foam insulating and adhesive.
- D. Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage and disposal of insulation, adhesive, sealing tape and membrane.

3.03 APPLICATION



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A. Polyurethane Foam Insulation

1. Install retrofit drain in area to be completed that day. Do not install more retrofit drains than are needed for the day.
2. Using foam insulation, build up low areas to reduce or eliminate ponding and to create uniform surface for receiving membrane. Up to 38 mm (1-1/2") only depth of ponding will be acceptable after a rainfall.
3. Use transit level to ensure positive damage slope from roof perimeter to drain locations.
4. Build foam up around pipes and curbs to shed water away from roof protrusions.
5. Protect adjacent surfaces and equipment from damage by over-spray and dusting of insulation material.
6. Apply foam 38 mm to 50 mm (1-1/2" to 2") thickness and allow approximately 45 minutes to off-gas and cure sufficiently, before applying membrane adhesive.

B. EPDM Membrane

1. Position membrane over insulation starting at highest point and allow membrane to relax for 1/2 hour.
2. Overlap sheets minimum 75 mm (3") at both side laps and end laps.
3. Fold back EPDM membrane to expose polyurethane foam.
4. Spray on slow acting urethane adhesive over surface of cured polyurethane insulation just prior to applying membrane.
5. Apply foam adhesive 6 mm (1/4") thickness to ensure any indentations in the insulation are filled while permitting the EPDM to be fully adhered to the insulation.
6. If necessary, use wind screens and avoid overspray when applying adhesive.
7. Pull membrane into urethane adhesive and ensure membrane is placed within 10 minutes of urethane adhesive being sprayed onto polyurethane foam insulation.

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8. Roll or broom membrane from centre of sheet in direction of roll to ensure adhesive contact is made between rubber and foam insulation, and to minimize or eliminate wrinkles in membrane.
9. At protrusions, seal membranes at base of protrusion using EPDM seam tape and cover with second application of polyurethane foam to a height of 200 mm (8") up protrusion. Spray elastomeric U.V. protective coating over exposed foam insulation at rate recommended by manufacturer.
10. Apply 75 mm (3") wide EPDM seam tape to membrane overlaps using solvent adhesive.
11. Apply roofing in sections and seal at end of day to protect against any overnight rainfall.

C. New Drain Inserts

1. Fit new drain inserts to original drain locations to facilitate drainage.
2. Apply water block or mastic to stem and base of drain to seal drain insert. Use one (1) tube of water block or mastic for each [250 mm (10")] drain insert.
3. Install sealing ring gasket or similar to bottom of drain stem to seal stem to rainwater leader and to prevent back-up of water into ceiling spaces in the event of a plugged drain.
4. Install 3" seam tape to drain flange using adhesive to ensure adhesion and seal made to drain flange while installing spray applied polyurethane foam.
5. Install additional roof drain(s) at low spots where indicated on roof plan, if necessary at end of sentence.
6. Upon completion of EPDM membrane install clamping ring on drain- apply water block mastic bead to both underside and topside of membrane under clamping ring and install.

D. Cap Flashings

1. At roof edge or curbs, carry membrane over roof eave and cover with metal cap flashing. Secure cap flashing with precoated screw fasteners at 610 mm (24") centres and as shown on engineering drawings.

3.08 WALKWAYS



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- A. Install walkway [EPDM 13mm (1/2") thick walkway pads] [duck boards] [concrete paving slabs] [in accordance with manufacture's instructions] [and] as indicated.

3.04 CLEANING

- A. Clean Work in accordance with Section [01 74 11 – Cleaning].
- B. Clean to [Consultant's] [Engineer's] [Architect's] approval, soiled surfaces, spatters, and damage caused by work of this Section.
- C. Check drains to ensure proper function, and remove debris, equipment and excess material from site.

END OF SECTION