C4.7.1 Built-Up Bituminous Roofing (BUR), Metal Flashing and Trim

Specify as follows:

- Provision of Safety Data Sheets (SDS) for roofing and metal cladding products.
- Roofing Subcontractor having completed satisfactory installations similar to current project during the past five years. Submit written list of successfully completed projects.
- Roofing Subcontractor to provide record of membership of Ontario Industrial Roofing Contractors' Association (OIRCA) or Canadian Roofing Contractors' Association (CRCA) before commencing roofing installation.
- Applicators having min five years' experience installing built-up bituminous roofing.

Warranty

Roofing subcontractor's warranty:

Specify as follows:

- Submit written OIRCA warranty for built up bituminous roofing and membrane flashings for two-year period.
- Include materials, labour, workmanship, tools, and equipment.
- Repair or replacement of work judged defective by TDSB.
- Repair or replacement of other work damaged due to faulty or defective work, including leaks in roofing membrane, membrane flashing, and related sheet-metal work.
- Roofing Subcontractor to enter into three-year maintenance agreement with TDSB after expiration of initial warranty. During this period, Roofing Subcontractor to provide labour, materials, and tools, at no cost to the TDSB, to repair or replace defects, including leakage and failure to stay in place.

Manufacturer's warranty:

- Specify roofing Subcontractor to provide, upon completion of the project, a No Dollar Limit (NDL), non-pro-rated, system warranty from a primary roofing material manufacturer, for twenty (20) years, commencing at Substantial Performance of Work, as follows:
    - Include and make good (including replacement of deteriorated or damaged insulation substrate) defects in materials and workmanship in roofing and metal flashing work.
    - Provide labour, materials, tools, and equipment to repair or replace any material defects.
    - Written warranty shall be in form approved by the TDSB, covering roof assembly, including vapour retarder, roof insulation, roof membrane, flood coat and gravel and flashings.
    - Provide inspection of completed roof during years two, five and ten.

Materials

Specify as follows:

- Prime water-resistant and silicone-treated fire-resistant gypsum board with glass fibre mat facing, square edges, in conformance to ASTM-C1177/C1177M, 13 mm (1/2″) thick, square edges. Acceptable Products as follows:
    - CertainTeed Gypsum Canada Inc.: GlasRoc Roof Board.
    - CGC: Securock Roof Board.
    - G.P. Gypsum Corporation: DensDeck Prime Fireguard.
- Deck sheathing adhesive recommended by deck-sheathing manufacturer.
- Primer, as required.
- Two-ply organic felt and asphalt membrane.
- Self-adhesive modified-bitumen membrane.
- One-ply organic felt and asphalt built-up conventional roof overlay.
- Four-ply glass-fiber and asphalt built-up conventional membrane roof system.

- Asphalt**:** to CSA-A123.4, Type 2 and 3.
- Rubberized asphalt: Styrene-Ethylene-Butylene-Styrene (SEBS) polymer modified asphalt 100% solid, breaking ultimate elongation of min 1300% at 25°C, cold bending down to –29°C, average softening point from 90.6°C to 98.9° C, as follows:
    - Type 2: for slopes up to 1:8.
    - Type 3: for slopes over 1:8.
    - Fashings: rubberized asphalt.
- Saturated organic felts**:** perforated asphalt felts to CSA-A123.3 No.15.
- Inorganic glass-fiber felts: to ASTM-D2178, supplied by the following:
    - GAF Materials Corporation: GAF GlasIV.
    - IKO Industries Ltd.: Type IV Glass Ply Sheet.
    - Johns Manville Inc.: GlasPly IV.
- Closed-cell polyisocyanurate foam-board insulation: max 1200 x 1200 mm (48″ x 48″) board size, max 65 mm (2½″) thickness per layer, as follows:
    - CAN/ULC-S704, Type 3, Class 2, HCFC-free;
    - Underwriters' Laboratories of Canada (ULC) testing;
    - Canadian Construction Materials Centre (CCMC) test evaluation requirements;
    - Factory Mutual (FM) 4450 requirements for Class1 fire and 1–60 windstorm classifications.
- Organic/inorganic felt facers: of thickness required to provide RSI value indicated on Drawings based on an RSI value (LTTR) of 0.97 per 25 mm (1″) thickness conforming to CAN/ULC-S770.
- Install insulation in multiple layers to achieve total required thickness to achieve minimum RSI value indicated, supplied by the following:
    - Atlas Roof Corporation: ACFoam-II Roof Insulation.
    - GAF Materials Corporation: EnergyGuard Polyiso Insulation.
    - Hunter Panels LLC: H-Shield Polyisocyanurate Insulation.
    - IKO Industries Ltd.: IKOTherm Polyisocyanurate Insulation.
    - Johns Manville Inc.: ENRGY 3 Roof Insulation.

        - Soprema: Sopra-Iso

- Tapered insulation: multiple-ply, asphalt impregnated roof board conforming to CAN/CSA-A247, Fibreboard Type 1, slopes as indicated.
- Tapered polyisocyanurate board conforming to CAN/ULC-S704, slopes as indicated, supplied by the following:
    - Accu-Plane Systems Inc.: Accu-Board.
    - Everest Supply Inc.: Everslope Tapered Fibreboard Roof Insulation.
    - Posi-Slope Enterprises Inc.: Posi-Slope Tapered Fibreboard Roof Insulation.
    - Soprema
- Fibreboard overlay: multiple ply, asphalt-impregnated roof board, or asphalt-coated fiberboard, 13 mm (1⁄2″) thick, conforming to CAN/CSA-A247, Type 1, as follows:
    - Minimum Density: 272 kPa.
    - Board size: 1220 x 1220 mm (48″ x 48″).
- Sealers: plastic cement: asphalt, conforming to CAN/CGSB-37.5 supplied by the following:
    - GAF Materials Corporation: Matrix Standard Plastic Roof Cement No. 203.
    - IKO Industries Ltd.: Roofcraft Plastic Cement.
    - Johns Manville Inc.: Industrial Roof Cement.
- Precast Concrete Pavers: solid, air-entrained, hydraulically pressed concrete pavers, conforming to CAN/CSA-A231.1, min weight 60 kg/m5, non-slip finish, 610 x 610 mm (24″ x 24″) in size, supplied by Brooklin Concrete Products Limited, Landscaping Paving Slab, natural finish, natural colour.
- Paver Pedestals: high-density polyethylene pedestals and levelling plates c/w integral spacer ribs on upper surface, supplied by Pave-El Paver Pedestals, model No. 7X, manufactured by Envirospec Inc.
- Protection Board: min 6 mm (1⁄4″) thick multi-ply, semi-rigid, glass-fiber, mineral-reinforced asphalt protection board, supplied by the following:
    - Henry Company Canada: Globeglas Re-cover Board.
    - IKO Industries Ltd.: Protectoboard Asphaltic Panels.
    - Johns Manville Inc.: RetroPlus Roof Board.

- Soprema Inc.: Sopraboard Roof Protection Board.

- Cant Strips: 75 x 75 mm (3″ x 3″) cant strips, cut from 38 mm (1 1⁄2″) thick asphalt impregnated fiberboard, supplied by the following:
  - GAF Materials Corporation: GAF Energy Guard Perlite Cant Strip.
  - IKO Industries Ltd.: Perlite Fire Resistant Cant Strip.
  - Johns Manville Inc.: FesCant Plus Cant Strip.
- Fasteners and plates: conforming to FM 4470 Standard for wind uplift and corrosion resistance.
- Hex head screws: with neoprene washers by Atlas Bolt or approved alternative.
- Deckfast hexagonal thermal barrier metal plates and screws: 25 mm (1″) longer than thickness of the gypsum board being fastened, conforming to or exceeding FM 4470, SPR 1 Corrosion Test Procedure and Guidelines for Roofing Fasteners.
- Roof Gravel: 10–15 mm (1⁄3″–5⁄8″) clean crushed stone, slag or gravel, conforming to ASTM – D1863.

Membrane Flashing Sheets

Specify as follows:

- Min 2.2 mm (3⁄32″) thick SBS-modified bituminous membrane mopped/Torched System, conforming to CGSB-37-GP-56M, min 180 g/m5 polyester reinforcement, Type 1, Class A, Grade 1, supplied by the following:
  - Henry Company Canada: modified PLUS NP 180 P/S.
  - GAF Materials Corporation: GAF Ruberoid Modified Base Sheet.
  - IKO Industries Ltd.: Modiflex MP-180-FS BASE.
  - Johns Manville Inc.: DynaMop PR 2.2 P/S.
  - Soprema Inc.: Elastophene 180 PS.

Cap Sheet

- Mopped/Torched System: min 3 mm (1⁄8″) thick SBS modified bituminous membrane conforming to CGSB-37-GP-56M, 250 g/m5 polyester reinforcement, Type 1, Class A,

Grade 2, supplied by the following:

- Henry Company Canada: modifiedPLUS NP 250 gT4.
- GAF Materials Corporation: GAF Ruberoid SBS Heat-Weld Plus FR.
- IKO Industries Ltd.: Torchflex TP-250 CAP.
- Johns Manville Inc.: DynaWeld Cap 250.
- Soprema Inc.: Sopralene Flam 250 GR.

Roofing Accessories

- Drains: Thaler RD-4A. Vandal-proof Aluminum roof drain, diameter to suit site dimensions or approved alternative.
- Mechanical drain seals: Specify U-Flow mechanical seal.
- Sleeves: Specify 0.8 mm (1⁄32″) Galvalume or spun aluminum with 125 mm (5″) dia flange.
- Vent stack flashings: Specify Thaler SJ-31 spun aluminum sleeve to fit vent stack with adequate clearance for insulation and a spun aluminum removable cap and stainless-steel vandal cap, or approved alternative.
- Sealant: per membrane manufacturer recommendations.

Construction Issues

- Roofing inspection: roofing inspector to conduct coordination meeting before commencement of roofing work.
- Field quality control: TDSB designated inspection and testing company to inspect and test roofing application.

Renovations and Additions

- School Principal to be advised of the roofing schedule for work occurring while building occupied.
- Review re-roofing protocol with TDSB Project Supervisor.

Metal Flashing and Trim

Specify as follows:

- Non-custom colour runs meeting minimum industry standard quantities, to avoid costs premiums.
- Film coatings guaranteed against chalking and fading for min five years.
- Min 22 ga base metal for prefinished metal flashings and trim.
- Exposed surfaces: 8000 Series factory-applied two-coat silicon modified polyester, prefinished steel sheet.
- Commercial quality zinc-steel sheet conforming to ASTM-A653/A653M, with Z275 designation zinc coating to ASTM-A924/A924M. Class: F2S.
- Min 25 micrometer thick, 30 units plus or minus 5 degrees specular gloss, conforming to ASTM-D523.
- Rating of 8 resistance to accelerated weathering for chalk, colour fade max 7 units and erosion rate max 20% conforming to ASTM-D822, as follows:
    - Outdoor exposure: 1000 hours.
    - Humidity resistance exposure: 1000 hours.
    - Clear wash coat finish to unexposed or reverse side.

Warranty

- Five-year extended warranty on prefinished metal against chalking, fading, and rust.