TENDER

ROOFING REPLACEMENT
ROSS ROAD SCHOOL

SPECIFICATION
ISSUED FOR TENDER

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prepared by
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PART 1 - GENERAL

1.1 SUMMARY OF SECTION

.1 As summarized and described but not restricted to the following:
- .1 Provide rough carpentry work as indicated in Schedule.

1.2 REFERENCES

.1 The standards listed form part of this Specification to the extent of reference. The publications are in the text by the basic designation only.

.2 American Society for Testing and Materials International (ASTM):
- .1 ASTM E96/E96M-21, Standard Test Methods for Water Vapor Transmission of Materials
- .2 ASTM E136-19a, Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750 degrees celcius
- .3 ASTM F1667/F1667M-21a, Standard Specification for Driven Fasteners: Nails, Spikes, and Staples.

.3 Canadian Standards Association (CSA):
- .1 CSA B111-1974 (R2003), Wire Nails, Spikes and Staples.
- .2 CSA O141-05 (R2019), Softwood Lumber
- .3 CSA O151-17(R2022), Canadian Softwood Plywood.

.4 Underwriters Laboratories of Canada (ULC):
- .1 CAN/ULC S114-18, Standard Method of Test for Determination of Non-Combustibility in Building Materials

.5 National Building Code of Canada (NBC) 2015.

.6 National Lumber Grades Authority (NLGA), Standard Grading Rules for Canadian Lumber, latest edition.

1.3 ENVIRONMENTAL REQUIREMENTS

.1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage and disposal of materials.

1.4 WASTE MANAGEMENT

.1 Separate and recycle waste materials in accordance with Section 01 00 00 General Project Requirements.

.2 Separate wood waste and place in designated areas in the following categories for recycling: Solid wood/ softwood/ hardwood, composite wood, treated, painted, or contaminated wood in containers supplied by the Contractor.

.3 Separate corrugated cardboard and recycle.

1.5 DELIVERY, STORAGE AND PROTECTION OF PRODUCT

.1 Comply with manufacturer's recommendations for handling, storage and protection during installation.

.2 Protect and store materials off the ground, away from physical damage and from becoming wet, soiled or covered with ice or snow before, during and after installation.

.3 Label packages to include material name, production date and/or product code.

1.6 QUALITY ASSURANCE/QUALITY CONTROL

.1 Lumber identification: by grade stamp of an agency certified by Canadian Lumber Standards Accreditation Board.

.2 Plywood identification: by grade mark in accordance with applicable CSA standards.

PART 2 - PRODUCTS

2.1 LUMBER MATERIAL

.1 Softwood Lumber: unless specified otherwise:
- .1 Softwood, SPF Species, NLGA Grade 2 (or better).
- .2 G4S, (good four sides)
- .3 Moisture content 19% or less in accordance with:
  - .1 CSAO141
  - .2 NLGA Standard Grading Rules for Canadian Lumber

.2 Furring, blocking, nailing strips: cants, curbs, backing and sleepers:
- .1 Softwood, SPF series, NLGA Standard or better grade.
- .2 Moisture content: 19% or less, in accordance with:
  - .1 CSA O141
  - .2 NLGA Standard Grading Rules for Canadian Lumber.

2.2 SOFT WOOD PANEL MATERIALS

.1 Canadian Softwood Plywood: to CSA O151, exterior grade construction plywood 2 GS.

2.3 FASTENERS

.1 Nails, spikes and staples: to CSA B111 and ASTM F1667.

.2 Bolts: 1/2" min. diameter unless indicated otherwise, complete with nuts and washers.

.3 Proprietary fasteners: toggle bolts, expansion shields and lag bolts, screws and lead or inorganic fiber plugs, explosive actuated fastening devices, recommended for purpose by manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

.1 Verify that field conditions are acceptable and are ready to receive Work.

.2 Site verify dimensions, tolerances and method of attachment with other Work.

3.2 INSTALLATION

.1 Comply with requirements of NBC latest edition.

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

.3 Install sleepers as indicated.

.4 Provide space framing and furring as indicated.

.5 Align and plumb faces of furring and blocking to tolerance of 1:600.

.6 Install backing, nailers, curbs and other wood supports as required, secure using approved fasteners at all locations.

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

.8 Countersink bolts where necessary to provide clearance for other work.

.9 Prior to mechanically fastening all curbs etc, contractor to review deck area adjacent to ensure no piping and/or conduit are located that may be punctured/damaged or service disrupted

3.3 SCHEDULE

.1 Roof Curbs for Mechanical Curbs:
- .1 Solid Wood Construction & Anchorage:
- .2 2" x 6" construction.
- .3 3/4” plywood, mechanically fastened at 6” o.c.
- .4 Refer to details for height of curb and extent.
- .5 Ensure curb and parapet is leveled around perimeter.
- .6 Refer to details.

3.4 CLEANING

.1 Perform cleaning as soon as possible after installation to remove construction and accumulated environmental dirt.

.2 Upon completion of installation, remove surplus materials, rubbish, tools and equipment barriers.

END OF SECTION

PART 1 - GENERAL

1.1 SUMMARY OF SECTION

.1 As summarized and described herein, but not restricted to the following:
- .1 Remove existing roofing down to the existing vapour barrier prepare the roof to accept the new adhered roofing system.
- .2 Provide new two-ply modified bituminous membrane fully adhered roofing system complete with tapered insulation as noted on drawings.
- .3 Provide built-up parapets and curbs as required.
- .4 Provide tie-ins to all mechanical curbs for roof top equipment.
- .5 Provide new roof drains and rain water leaders to ground level.

1.2 APPROVED ROOF ASSEMBLY

.1 Approved Roof Assembly consists of the following:
- .1 Existing Sloped Metal Wood Deck
- .2 Existing BUR Vapour Barrier
- .4 Polyisocyanurate Inulation, fully adhered.
- .5 Overlayment Board with Integral Base Sheet – adhered, with additional fastening as noted below.
- .6 Cap Sheet – torch applied

.2 Glue pattern: Low-rise foam adhesive beads are to be 6” O.C. for insulation boards and overlayment boards.

.3 Mechanical fasteners (in addition to glues): Two rows of screws and plates is to be provided at 12” O.C at the edge of parapets and curbs as detailed.

1.3 REFERENCES

.1 American Society for Testing and Materials International (ASTM):
- .1 ASTM C208-12(2017), Specification for Cellulosic Fiber Insulating Board.
- .2 ASTM D6164/D6164M-16, Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Polyester Reinforcements.

.2 Canadian Roofing Contractors’ Association (CRCA) – Roofing Specifications Manual.

.3 Canadian Standards Association (CSA):
- .1 CSA A123.21-20, Standard test method for the dynamic wind uplift resistance of membrane-roofing systems.

.4 Nova Scotia Construction Safety Association (NSCSA), Occupational Health and Safety Act (OHSA)

.5 Underwriters Laboratories of Canada (ULC):
- .1 CAN/ULC S704, Standard for Thermal Insulation, Polyurethane and

Polyisocyanurate Boards, Faced

.6 National Building Code of Canada (NBC)

1.4 SUBMITTALS

.1 Provide shop drawings including manufacturer's technical data sheets for fully adhered system and installation methods for each component. Include a summary of the roofing system from top to bottom. (all components adhered except torched on cap sheet).

.1 Ensure manufacturer products especially adhesives specified can adhere to CSA A123.21 wind uplift recommendations.

.2 Provide layout for tapered areas of rigid insulation. Ensure tapered insulation indicate a positive slope to drain.

1.5 ENVIRONMENTAL REQUIREMENTS

.1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage and disposal of materials.

.2 Refer to the Manufacturer’s recommendations regarding installation of roofing system at ambient temperatures. Roofing system should be applied when temperatures are acceptable to the manufacturer's requirements.

.3 Refer to the Manufacturer’s recommendations of temperatures required for conditioning the materials prior to application and install and curing after.

.4 Install roofing on dry deck; must be clean, rust free, free of snow and ice, use only dry materials and apply only during weather that will not introduce moisture into roofing system. Scrape clean any Kraft paper and loose bitumen form the existing metal deck. Obtain approval from the manufacturer that the deck is cleaned adequate for adhesive installations.

.5 Only ‘Dry’ materials are to be installed. Materials that are installed wet, or materials that become wet during inclement weather to be removed and replaced.

1.6 SAFETY REQUIREMENTS

.1 Contractor to abide by NSCSA Occupational Health and Safety Act.

.2 Roof installers to have taken the NSCSA Fall Protection course and abide by the NSCSA Fall Protection Course Guidelines.

.3 Verify that construction guards / barriers are erected at the roof edge at openings and changes in roof elevation.

1.7 WASTE MANAGEMENT

.1 Contractor to remove debris immediately from site to a designated landfill approved by Provincial Regulations to accept existing roofing materials debris.

.2 Separate and recycle waste materials in accordance with all municipal guidelines.

1.8 PERFORMANCE CRITERIA

.1 Compatibility between components of roofing system is essential. Provide written declaration to Consultant stating that materials and components, as assembled in system, meet this requirement.

.2 Do roofing work in accordance with applicable, standard in Canadian Roofing Contractors Association (CRCA) Roofing Specifications Manual and to prescribed wind uplift requirements.

1.9 DELIVERY, STORAGE AND PROTECTION OF PRODUCT

.1 Comply with manufacturer's recommendations for handling, storage and protection during installation.

.2 Protect and store materials off the ground, away from physical damage and from becoming wet, soiled or covered with ice or snow before, during and after installation.

.3 Label packages to include material name, production date and/or product code.

.4 Store rolls of membrane in upright position. Store membrane rolls with salvage edge up.

.5 Place plywood runways over work to enable movement of material and other traffic.

.6 Store roofing material to meet manufacturer's recommendations.

1.10 QUALITY CONTROL

.1 Convene pre-installation meeting one week prior to beginning work of this Section.
- .1 Verify project requirements.
- .2 Review installation and substrate conditions.
- .3 Review manufacturer's installation instructions and warranty requirements.
- .4 Record meeting proceedings including corrective measures and other actions required to ensure successful completion of work and distribute to each attendee within one week of meeting.

1.11 QUALITY ASSURANCE

.1 Roofing applicator must be a good standing member of the CRCA and approved by the Roof Manufacturing Company selected on this Project, and have completed projects of this magnitude in the last five (5) years.

.2 Roofing manufacturer must have completed projects of this size, to the CSA A123.21 standards and using fully adhesive methods as noted, within the last five (5) years.

1.12 FIRE WATCH

.1 Hot work shall be kept 15m from flammable materials or openings in curbs, wall and roof junctions that could expose flames to combustible materials.

.2 Provide a self-adhered fire seal membrane over all combustible materials and at all cracks and openings between assemblies prior to hot works.

.3 A continuous fire watch shall be provided during the hot work and for a period of 60 minutes after its completion. A final inspection of the hot work area shall be completed 4 hours after completion of hot works.

.4 Fire Extinguishers: maintain one cartridge operated type with hose and shut-off nozzle, ULC labelled for A, B and C class protection, within 3 meters of torch applicator.

.5 Make sure all workers know the escape route.

.6 Store combustible materials away from heat and open flames.

1.14 WARRANTIES

.1 Roofing Contractor to supply the Owner with a CRCA warranty certifying work completed as installed to be free of roof defect for a period of two (2) years from date of substantial performance.

.2 Provide manufacturer's membrane warranty, ensuring that all components and adhesives within the system are fully compatible, and the roofing system will remain watertight for a period of a full ten (10) years from the date of substantial completion. This warranty is to include both labour and materials necessary to affect water tightness.

PART 2 - PRODUCTS

2.1 VAPOUR BARRIER / FIRE SEAL MEMBRANE (PARAPETS AND UPSTANDS)

.1 Modified Bitumen base flashing membrane, for use at parapets and upstands against plywood backing:

.1 Non-woven reinforcing matt, polyester coated and permeated with SBS bitumen, self-adhering one side.

.2 Thickness: 2.5mm (98mils) minimum
.3 The back surface is self-adhered, silicone treated film.
.4 Manufactured to ASTM D6164.
.5 Primer as per manufacturer's recommendations.

2.2 POLYISOCYANURATE RIGID INSULATION

.1 Polyisocyanurate roof insulation Type II, manufactured to CAN/ULC S704.
.1 Size Board: 1220 mm x 1220 mm or 1220 mm x 2440 mm
.2 Compressive strength: 170 kPa minimum
.3 Water absorption: 3.5% max (by volume)
.4 Tapered crickets: where noted on the drawings.
.5 R-Value: R40.

2.5 ROOFING ADHESIVES

.1 Insulation and Overlayment Board Adhesive:
.1 Must be compatible with roofing system components, and meet roofing warranty requirements.
.2 Meets testing requirements of CSA A123.21-14.
.3 Low rise, low odor, foam adhesive.
.4 Approved manufacturers: Soprema, IKO, or approved alternate.

2.6 OVERLAYMENT BOARD WITH INTEGRAL BASE SHEET

.1 180 g/m^2 non-woven polyester reinforced SBS membrane with thermofusible surface laminated on a 1/2" High Density Polyisocyanurate Insulation panel.
.1 Meets CAN/ULC-S706 and ASTM C208
.2 Cold adhered installation, to meet CSA A123.21 requirements.
.3 Membrane edges: self-adhesive and torched edges.

2.7 BASE FLASHING

.1 Base Sheet Flashing 180 g/m:
.1 Non-woven reinforcing matt, polyester coated and permeated with Modiflex SBS bitumen, thermo fusible plastic film over both sides.
.2 Thickness: 2.5 mm (98mils)
.3 Manufactured to ASTM D6164.
.4 Primer as per manufacturer's recommendations.
.5 Acceptable Manufacturers: IKO, Soprema

2.8 CAP SHEET AND CAP FLASHING

.1 Cap Sheet and Cap Flashing 250g/m:
.1 Non-woven reinforced polyester reinforcing mat, coated and permeated with SBS modified bitumen. The underside to be protected by thermofusible plastic film.

Membrane to be applied by torching only.

.2 Thickness: 5.0mm

.3 Coloured ceramic mineral granules embedded into top surface to provide protection against ultraviolet radiation; colour as selected by Consultant from full colour range.

.4 Manufactured to ASTM D6164 or ASTM D6162.

.5 Acceptable Manufacturers: IKO, Soprema

2.10 ACCESSORIES

.1 Stack Jack Flashings:

.1 Spun aluminum flashing sleeve with integral flange and matching removable cap.

.2 Urethane insulation pre-moulded to inner side of sleeve.

.3 Standard of Acceptance: based on Thaler SJ-26 or SJ-27, or approved alternate.

PART 3 - EXECUTION

3.1 REMOVAL OF EXISTING ROOFING SYSTEM

.1 Contractor to remove existing roofing system down to existing asphalt vapour barrier, on wood deck. Clean debris from vapour barrier to provide solid surface for adhesion of new roofing. Repair any cracks in existing vapour barrier with adhered vapour barrier or heat resealing.

.2 Only remove sufficient roofing to the deck that can be covered in a day, or the Contractor to temporarily protect. All temporary tie-ins are to be fully watertight.

.3 Remove and dispose of roofing materials immediately; no stockpiling of the removed roofing materials.

.4 Report any deteriorated wood deck immediately to HRCE Project Manager.

3.2 ROOFING INSTALLATION

.1 Vapour Barrier / Fire Seal Membrane Installation (Parapets and Upstands):

.1 Prime all surfaces to manufacturers recommendations

.2 Self adhere the base sheet flashing after primer application is fully dried.

.3 Application to provide a smooth surface, free of air pockets, wrinkles, fishmouths or tears.

.4 Ensure vapour barrier flashings are completed, and openings, crevices and all wood surfaces are covered for a fully watertight system.

.2 Insulation Panel Installation:

.1 Ensure the insulation panels are tightly fitted together.

.2 Discard broken insulation boards.

.3 Voids are to be completely filled with insulation.

.4 Install insulation to fit tightly next to curbs, parapets and roof protrusions.

.5 Fully adhere insulation panels to the vapour barrier to requirements of Part 1.

.5 Overlayment Board and Integral Base Sheet Installation:
- .1 Install boards with flush butt joint and wrap overlap membrane onto adjacent board.
- .2 Lap membrane at joint is self-adhesive and sealed to manufacturer's recommendations.
- .3 Stagger board/membrane joints per manufacturer's recommendations.
- .4 Cold adhered overlayment board to substrate, to requirements of Part 1.
- .5 Provide additional mechanical fastening as indicated.

.6 Base Flashing Installation:
- .1 Flashing membrane to be torch applied, over end joints of overlayment boards, and to seal overlayment board membrane to parapets and upstands. Each strip to have 75 mm side laps and end laps.
- .2 Application to provide a smooth surface, free of air pockets, wrinkles, fishmouths or tears.

.7 Cap Sheet Installation:
- .1 Once the base sheet and base flashing has been applied, and does not show defects, the cap sheet can be laid.
- .2 Cap sheet to be unrolled starting from the low point of the roof. Cap sheet to be rerolled from both ends prior to torching. Care must be taken for good alignment of the first roll (parallel with the edge of the roof).
- .3 Cap sheet to be torch welded on to the base sheet membrane, in accordance with recommendations of the membrane manufacturer. During this application, both surfaces to be simultaneously melted, forming an asphalt bead, pushed out in front of the cap sheet. While the membrane is still hot, apply enough pressure with a steel roller onto the side lap so as to have bitumen seep out to create a continuous bead of bitumen on the side lap. Care should be taken not to embed the granules into the bitumen.
- .4 Care must be taken not to burn the membranes, and their respective reinforcements.
- .5 Base sheet and cap sheet seams to be staggered a minimum of 300 mm.
- .6 Cap sheet to have side laps of 75 mm and end laps of 150 mm. Surface granules on end laps to be embedded prior to installation of following sheet.
- .7 Make sure the two membranes are properly welded, without air pockets, wrinkles, fishmouths or tears.
- .8 After installation of the cap sheet, check lap seams on the cap sheet.
- .9 During installation, care must be taken to avoid asphalt seepage greater than 5 mm at seams.

3.5 PROTECTION DURING WORK

.1 Cover walls and adjacent work where materials hoisted or used.

.2 Use warning signs and barriers. Maintain in good order until completion of work.

.3 Clean off drips and smears of bituminous material immediately.

.4 Dispose of rain water off roof and away from face of building until roof drains are installed and connected.

.5 Protect roof from traffic and damage. Comply with precautions deemed necessary by Consultant.

.6 At end of each day's work or when stoppage occurs due to inclement weather, provide protection for completed work and materials out of storage.

.7 Place plywood runways over work to enable movement of materials and other traffic.

3.6 PROTECTION AFTER WORK COMPLETED

.1 Contractor to repair damage caused by work of this contract - to adjacent roof and wall areas, and also to site areas such as lawns or paved areas that have damage caused by this contract.

3.7 CLEANING

.1 Contractor to provide clean-up for this roofing area. Debris and excess roofing items to be removed from the site.

END OF SECTION

PART 1 GENERAL

1.1 SUMMARY OF SECTION

.1 As summarized and described but not restricted to the following:
- .1 To provide metal flashing around perimeter of roof area.

1.2 REFERENCES

.1 The standards listed form part of this Specification to the extent of reference. The publications are in the text by the basic designation only.

.2 American Society for Testing and Materials International (ASTM):
- .1 ASTM A653/A653M-20, Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Ally Coated (Galvannealed) by the Hot-Dip Process.
- .2 ASTM D523-14(2018), Test Method for Specular Gloss
- .3 ASTM D822/D822M-13(2018), Practice for Filtered Open Flame Carbon Arc Exposures of Paint and Related Coatings
- .4 ASTM D4586/D4586M-07(2018), Standard Specification for Asphalt Roof Cement, Asbestos-Free
- .5 ASTM F1667/F1667M-21a, Driven Fasteners: Nails, Spikes and Staples

1.3 SUBMITTALS

.1 Samples:
- .1 Submit duplicate 2” x 2” (50 x 50 mm) samples of each type of sheet metal material, colour and finish.

1.4 ENVIRONMENTAL REQUIREMENTS

.1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage and disposal of materials.

1.5 WASTE MANAGEMENT

.1 Separate and recycle waste materials in accordance with General Requirements.

1.6 DELIVERY, STORAGE AND PROTECTION OF PRODUCT

.1 Comply with manufacturer’s recommendations for handling, storage and protection during installation.

.2 Protect and store materials off the ground, away from physical damage and from becoming wet, soiled or covered with ice or snow before, during and after installation.

.3 Label packages to include material name, production date and/or product code.

PART 2 - PRODUCTS

2.1 MATERIALS

.1 Prefinished Steel Sheet Flashing
- .1 Prefinished steel, with factory applied silicone modified polyester.
  - .1 To ASTM A653/A653M Z275 zinc coating designation; 26 gauge core steel. Shop pre-coated with modified silicone.
  - .2 Class F1S.
  - .3 Specular gloss: 30 units +/- 5 in accordance with ASTM D523
  - .4 Resistance to accelerated weathering for chalk rating of 8, colour fade 5 units, or less erosion rate less than 20% for ASTM D822
    - .1 Outdoor exposure 1000 hrs
    - .2 Humidity resistance 1000 hrs
  - .5 Ensure minimum 2" (50 mm) vertical leg on sheet metal flashing

2.2 ACCESSORIES

.1 Isolation coating: alkali resistant bituminous paint.

.2 Plastic cement: to ASTM D4586 Type I.

.3 Underlay for metal flashing: dry sheathing

.4 Cleats: of same material as flashing specified, and temper as sheet metal, minimum 2" (50 mm) wide. Thickness 22 gauge.

.5 Fasteners: of same material as sheet metal, to ASTM F1667, ring thread flat head roofing nails of length and thickness suitable for metal flashing application.

.6 Washers: of same material as sheet metal, with rubber packings.

2.3 FABRICATION

.1 Fabricate metal flashings and other sheet metal work in accordance with applicable CRCA 'FL' series details as indicated.

.2 Form pieces in 8'-0" (2440 mm) maximum lengths. Make allowance for expansion at joints.

.3 Hem exposed edges on underside 1/2" (13 mm). Miter and seal corners with sealant.

.4 Form sections square, true and accurate to size, free from distortion and other defects detrimental to appearance or performance.

.5 Apply isolation coating to metal surfaces to be embedded in concrete.

PART 3 - EXECUTION

3.1 INSTALLATION

.1 Use surface fasteners, installed at 2’-0” (610 mm) o.c.

.2 Counterflash bituminous flashings at intersections of roof with vertical surfaces and curbs. Flash joints using S-lock forming tight fit over hook strips.

.3 Lock end joints and caulk with sealant.

.4 Install surface mounted reglets true and level, and caulk top of reglet with sealant.

.5 Insert metal flashing into reglets under cap flashing to form weathertight junction.

.6 Caulk flashing at reglet cap flashing with sealant.

.7 Cut triangle on diagonal joint to minimize cut joint.

END OF SECTION