

Project: New Fire Station No. 1
RFT# T-FD-22-01
Highlands Boulevard, Millbrook, ON

Date: June 21, 2022
Owner: Township of Cavan Monaghan
Greenview File: 164.21.005

This Addendum forms part of the Tender Documents and shall supersede all prior issued tender documentation and/or Addenda as noted, and specifically applicable.

This Addendum consists of 1 page(s), and 1 attachment.

- Section 07 54 16 Ketone Ethylene Ester (KEE) Roofing.

1. Project Manual:

- .1 Delete Section 07 52 00 Modified Bituminous Membrane Roofing.
- .2 Add Section 07 54 16 Ketone Ethylene Ester (KEE) Roofing.

2. Drawings:

- .1 Building Design Drawings:
 - .1 Drawing 000:
 - .1 Revise Construction Assembly 451 CANOPY (TOP TO BOTTOM), as follows:
 - .1 Single-ply KEE membrane roofing.
 - .2 13mm Underlayment Board.
 - .3 1 ½" Galvanized Steel Deck.
 - .4 8" Structure.
 - .5 1 ½" 26 Gauge Prefinished Soffit Panel.

End of Addendum 06

Part 1 General

1.1 Section Includes

- .1 This section includes uninsulated Ketone Ethylene Ester (KEE) fully adhered canopy roof systems.
- .2 Other requirements for canopy roofing drains, system accessories, trims, finishes.

1.2 Related Requirements

- .1 Section 05 12 00 - Steel Steel Framing: Canopy structure.
- .2 Section 05 31 23 - Steel Roof Decking: Roof deck substrate.
- .3 Section 07 21 13 - Board Insulation.
- .4 Section 07 27 00 - Air Barriers: Wall air barrier for roof/wall interface.
- .5 Section 07 61 00 - Sheet Metal Roofing.

1.3 Reference Standards

- .1 ASTM D6754/D6754M-10 - Standard Specification For Ketone Ethylene Ester Based Sheet Roofing.
- .2 ASTM D4434/D4434M-11 - Standard Specification for Poly(Vinyl Chloride) Sheet Roofing.
- .3 ASTM D8154-17e1 - Standard Test Methods for 1H-NMR Determination of Ketone-Ethylene-Ester and Polyvinyl Chloride Contents in KEE-PVC Roofing Fabrics.
- .4 ASTM C552-13 - Standard Specification for Cellular Glass Thermal Insulation.
- .5 ASTM C1177/C1177M-17 - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing.
- .6 ASTM C1278/C1278M-17 - Standard Specification for Fiber-Reinforced Gypsum Panel.
- .7 ASTM D3273-21 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber
- .8 ASTM D2377-14(2019) - Standard Test Method for Tack-Free Time of Caulking Compounds and Sealants.
- .9 ASTM C910-16(2021) - Standard Test Method for Bond and Cohesion of One-Part Elastomeric Solvent Release-Type Sealants.
- .10 CSA-0151-09 - Canadian Softwood Plywood.
- .11 CAN/CSA-A123.21-14 (R2019) - Standard Test Method for the Dynamic Wind Uplift Resistance of Membrane-Roofing Systems.
- .12 CAN/ULC-S107-19 - Standard Methods of Fire Tests of Roof Coverings.
- .13 CAN/ULC-S701.1-2017 - Standard for Thermal Insulation, Polystyrene Boards.
- .14 CAN/ULC-S704.1-2017 - Standard for Thermal Insulation, Polyurethane and Polyisocyanurate Boards, Faced.
- .15 CRCA (Canadian Roofing Contractors' Association) - CRCA Roofing Specifications Manual.
- .16 FM (Factory Mutual) - Roof Assembly Classifications.
- .17 Province of Ontario Roofing Contractors Association - Roofing Specifications Manual.
- .18 ULC-FR-17 - Fire Resistance Directory (2017 Edition).

1.4 Administrative Requirements

- .1 Section 01 31 00: Project management and coordination procedures.
- .2 Coordination:
 - .1 Coordinate with other work having a direct bearing on work of this section.
 - .2 .2 Coordinate the work with the installation of associated metal flashings, as the work of this section proceeds.

1.5 Performance Requirements

- .1 Provide Products that are compatible with one another under field conditions, as demonstrated by roofing manufacturer.
- .2 Provide watertight roofing system capable of resisting specified uplift pressures, thermally induced movement and exposure to weather without failing during the specified warranty period.

1.6 Informational Submittals

- .1 Section 01 33 00: Submission procedures.
- .2 Installation Data: Manufacturer's special installation requirements, including special precautions required for installing the membrane.

1.7 Action Submittals

- .1 Product Data: For all components.
- .2 Submit Shop Drawings for prefabricated work and metal perimeter details.
- .3 Shop Drawings for Sloped Insulation: Indicate degree of slope and layout of sloping insulation on roof surfaces.
- .4 MSDS Sheets: for adhesives, waterproofing components and insulation components.
- .5 Two Samples illustrating sheet colour; size: 254 mm x 254 mm.
- .6 Provide Submittals prior to initial Pre-Installation Meeting.

1.8 Closeout Submittals

- .1 Section 01 78 00: Submission procedures.
- .2 At the conclusion of roofing project, contractor to supply Close-Out Manual containing as a minimum: all as-built drawings, tapered insulation plan (if applicable), roof anchor plan (if applicable), manufacturers' warranties, maintenance manual with recommended maintenance schedule and procedures.

1.9 Certificates

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

1.10 Quality Assurance

- .1 Manufacturer: Qualified manufacturer having roofing systems listed by UL and Factory Mutual.
- .2 Installer: a company and persons specializing in the application of single ply roofing, with minimum 10 years documented experience licensed or approved to apply roofing system by manufacturer. In addition Installer must be Bondable and have completed previous roofing projects for the Owner and approved by the Owner, or, must be bondable and must be a member of the Canadian Roofing Contractors Association (CRCA). Employ workers trained and certified by manufacturer, including a full-time on-site supervisor with a minimum of five years experience installing similar work, able to communicate verbally with Project Manager, Consultant, and employees, and qualified by the manufacturer to furnish warranty of type specified.
- .3 Use application methods consistent with CRCA Roofing Specifications and roofing membrane manufacturer's instructions.

1.11 Pre-installation Meetings

- .1 Meeting: prior to commencement of the work, review and document methods and procedures related to roofing system construction , including the following:
 - .1 Participants: authorized representatives of the Contractor, Project Manager, Consultant, 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 structural loading conditions and limitations of roof deck both during and after roofing application.

- .5 Review flashing details, special roofing details, roof drainage, roof penetrations, equipment curbs, and other conditions affecting roofing installation.
- .6 Review governing regulatory requirements, and requirements for insurance and certificates as applicable.
- .7 Review safety requirements, including temporary fall-arrest measures.
- .8 Review field quality control procedures.

1.12 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 water-based adhesives 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.

1.13 Environmental Requirements

- .1 Do not apply any roofing materials during inclement weather.
- .2 Do not install Products when temperatures are outside of manufacturers listed temperature range of acceptability.
- .3 Consider effects of wind chill on adhesives, and ensure they will not prematurely set before proper adhesion takes place.
- .4 Keep water-based Products from freezing. Do not apply water-based Products if surface temperatures are below 5 degrees C.

1.14 Warranty

- .1 Warranty, General: Warranties specified shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of Contract Documents.
- .2 Roof System Warranty, General: 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.
- .3 Manufacturer's Warranty: Manufacturer agrees to repair or replace components of built-up roofing that fail in materials or workmanship within specified warranty period. Failure includes roof leaks. Components of built-up roofing includes roof membrane, base flashings, roof membrane accessories, roof insulation, fasteners, roof insulation, fasteners, and vapour retarder and other components of built-up roofing. For areas of complete replacement, Manufacturer to provide inspections of roof surface in year two (2), year five (5), year ten (10) and year fifteen (15) of this warranty. Inspection to include visual inspection, minor repairs and limited cleaning of debris.
 - .1 Warranty Period: Fifteen (20) years from Date of Substantial Performance.
- .4 Installer's Warranty: Submit Roofing Installer's warranty, on warranty form acceptable to Project Manager, signed by the Installer, covering the Work of this Section and related Sections indicated above, including all components of the built-up roofing such as built-up roofing membrane, base flashing, roof insulation, fasteners, cover boards, boards, vapour retarders, roof pavers, and walkway products, for the following warranty period:
 - .1 Warranty Period: Two (2) years from Date of Substantial Performance.

Part 2 Products

2.1 Manufacturers

- .1 Source Limitations: Provide roofing system components from or approved in writing by roofing system manufacturer.
- .2 Tremco; Product: TremPly Systems.
- .3 Dow; Product: Elvaloy.
- .4 Other manufacturers offering compliant materials that meet specifications.

2.2 System Description

- .1 Roofing System: Assembly of components including single ply KEE membrane with supporting underlayment and flashings on a metal deck, including but not limited to:
 - .1 Underlayment board.
 - .2 Roof membrane.
 - .3 Roof flashings.

2.3 Performance Requirements

- .1 General Performance: Roofing system shall remain weathertight and withstand specified uplift pressures, thermally induced movement, and exposure to weather without failure due to defective manufacture, fabrication, or installation.
- .2 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.
- .3 Fire-Resistance Ratings: Provide fire-resistance-rated roof assemblies per CAN/ULC-S126, Class A.

2.4 Roof Membrane/flashings

- .1 Roofing Membrane: Ketone Ethylene Ester, with base polyester fabric yarn reinforcement.
 - .1 Tensile Strength, minimum, CGSB 37 GP 56M: Machine direction, 14 kN/m (80 lbf/in); cross machine direction, 10 kN/m (57 lbf/in).
 - .2 Ultimate Elongation, minimum, CGSB 37 GP 56M: machine direction, 50.0 percent; cross machine direction, 40.0 percent.
 - .3 Low Temperature Flexibility CGSB 37 GP 56M: -26 deg. C (-15 deg. F).
 - .4 Thickness: 60 mil.
 - .5 Basis of Design: Tremply KEE.
 - .6 Colour: As selected by Owner.
- .2 Membrane Ply Sheet Adhesive, flashing adhesive: Low VOC, solvent-borne Nitrile/PVC polymeric adhesive for horizontal and vertical applications. Basis of Design: Tremply KEE Bonding Adhesive.
- .3 Flashings and Flashing Accessories: T-Joints, Corners, Molded Pipe Boots – Unreinforced, as per manufacturers instructions.

2.5 Protection Boards

- .1 Underlayment Board: Impact resistant, specially engineered gypsum panels with glass facers; mold resistant, to ASTM D3273. Dens Deck Prime by Georgia Pacific or approved equal.
 - .1 Minimum Thickness: 13 mm.
- .2 Mechanical Fasteners.
 - .1 Factory-coated steel fasteners and plates complying with corrosion-resistance provisions in FM 4470, designed for fastening roofing components to substrate, tested by manufacturer for required pullout strength and wind uplift resistance, and acceptable to roofing manufacturer.

2.6 Auxiliary Roofing Materials

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

- .2 Water Block Sealant: Low VOC, non-curing secondary sealant as per manufacturer.
- .3 Fasteners: Factory-coated steel fasteners and metal or plastic plates designed for fastening roofing components to substrate, tested by manufacturer for required pullout strength, and acceptable to roofing manufacturer.
- .4 Termination Bar: 1 mm (0.040 inch) aluminum, with pre-punched holes at 406 mm (16 inches) o.c., metal snap-on cover, and sealant cup.
- .5 Scuppers/Edge Metal: Thermoplastic coated metal, as per manufacturer.
- .6 Metal Flashing Sheets: as per Section 07 62 00.
- .7 Miscellaneous Accessories: Provide miscellaneous accessories recommended by roofing manufacturer.
- .8 Thermoplastic Coated Metal: 24 gauge, galvanized with 20mil thermoplastic face.

Part 3 Execution

3.1 Examination

- .1 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.
- .2 Report: Provide written report to Owner indicating conditions that do not meet requirements.
- .3 Proceed with installation once non-complying conditions have been corrected.

3.2 Preparation

- .1 Clean substrate of substances and projections detrimental to roofing installation according to roofing manufacturer's written instructions.
- .2 Prevent materials from entering roof drains and conductors and from contacting surfaces of other construction.
- .3 Substrate-Joint Penetrations: Prepare joints as required to prevent asphalt and adhesives from penetrating joints, entering building, or damaging roofing components or other construction.
- .4 Bring any concerns of rot, deformation, or concerns to the immediate attention of the owner or their consultant.

3.3 Roofing Membrane Installation

- .1 General: Install roofing membrane system components according to roofing manufacturer's written instructions, applicable referenced roofing system approval, and approved shop drawings.
- .2 Cooperate with testing agencies and personnel engaged or required to perform services for installing roofing.
- .3 Coordinate installation of roofing to protect roofing system components and structure from exposure to precipitation.
- .4 Install roofing membrane according to roofing manufacturer's written instructions and applicable recommendations of CRCA for Single Ply Assemblies.
- .5 Plan placement of membrane so water will flow over or adjacent to, but not against membrane seams.
- .6 Evenly apply membrane adhesive to the back of the membrane sheet at coverage rate of 1.3m²/0.5L and to top of coverboard at rate of 1.1m²/0.5L. Allow adhesive to set at appropriate rate and carefully apply the membrane sheet to the area of adhesive applied to the roof coverboard.
- .7 Roll membrane to ensure full bond is achieved with a clean #75 weighted roller.
- .8 Roll membrane to ensure full bond is achieved with #75 weighted roller.
- .9 Avoid foot traffic on membrane while adhesives cure. Do not store materials or complete construction related activities on top of the completed membrane without appropriate protection.

- .10 Lay adjacent membrane sheets in same application method as initial membrane sheet. Keep overlap free of bonding adhesive to allow for heat welded seams
- .11 Extend field membrane to top of cants and mechanically fasten into place.
- .12 Filed test membrane to ensure 100% bond.
- .13 All seams exceeding 3 M in length, must be completed with automatic welder.

3.4 Underlayment Board Installation

- .1 Place gypsum board in parallel rows with ends staggered, tightly fitted. Mechanically fasten to conform to local jurisdiction for wind uplift in regard to fastener type, length, density and placement.
- .2 Place sheathing with long axis of each sheet transverse to steel deck ribs, with end joints staggered, in firm contact with one another, and fully supported on ribs.
- .3 Mechanically fasten roof board to deck using screws and pressure distribution plates.
- .4 Number and pattern of screws per board shall meet local jurisdiction for wind uplift requirements. A minimum of eight fasteners in the field, 12 fasteners at the perimeter and 14 fasteners at corners.

3.5 Flashing And Stripping Installation

- .1 Refer to Drawings.
- .2 Position sheets prior to adhesion to ensure appropriate coverage.
- .3 Apply bonding adhesive to front and back of the sheet, keep adhesive free from membrane overlap for heat welding.
- .4 Extend membrane a minimum of 150mm onto field of roof at all flashing details.
- .5 Where membrane terminates vertically, secure into place with termination bar and overcoat bar with sealant.
- .6 Primer all metal and wood substrates as required by the manufacturer.
- .7 Ensure membrane is installed free of wrinkles, blisters and/or fishmouths.
- .8 Walls: Extend flashing membrane 150mm onto field of the roof and 300mm vertically minimum. Where flashing membrane extends beyond 750mm above the roof, utilize a second sheet and termination bar to achieve the desired height.
- .9 Parapets: Extend flashing membrane 150mm onto the field of the roof, and extend to outside parapet face. On exterior horizontal termination, apply water block sealant to back of flashing sheet and secure into place.
- .10 Scuppers: Fabricate scuppers with thermoplastic coated metal. Apply metal scupper through wall and secure flange onto field of roof and entire wall surrounding opening. Apply unreinforced flashing membrane extending into throat of the scupper and fully concealing flange at parapet and field of the roof.
- .11 Metal Edge: Extend field membrane a minimum of 100mm over outside edge. Lay metal edge in bead of waterblock sealant and secure into place with fasteners. Conceal edge of metal at field of roof with unreinforced detailing membrane
- .12 Vent Stacks: Install pre fabricated vent stacks as per manufacturers written instructions.
- .13 Install walkway panel at roof access and where selected by owner – allow for 150' of installation.

3.6 Field Quality Control

- .1 Roofing Inspector: Owner will engage a qualified roofing inspector to perform roof tests and inspections. Roofing Inspector's quality assurance inspections shall comply with criteria established in applicable standards.
- .2 Final Roof Inspection: Arrange for roofing system manufacturer's technical personnel to inspect roofing installation on completion. Notify Consultant and Owner 48 hours in advance of date and time of inspection.
- .3 Repair or remove and replace non-complying components of roofing. Retest to demonstrate compliance.

3.7 Protecting And Cleaning

- .1 Protect roofing from damage and wear during construction according to manufacturer's instructions.

- .2 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.
- .3 Clean overspray and spillage from adjacent construction.

End of Section