PART 1 - GENERAL

1.1 WORK INCLUDED

.1 This section includes the removal of existing roofing systems and associated curbs, flashings, membranes, insulation and wood blocking to facilitate the installation of the new roofing systems. Existing roofing systems to be removed down to the steel or wood decks in their entirety.

1.2 EXISTING CONDITIONS

.1 Items to be demolished or removed are to be based on their condition on date that Tender is accepted.

1.3 PROTECTION

.1 Prevent damage of adjacent structures and services. Repair damage caused by demolition as directed by Consultant.

.2 Ensure that demolition work does not adversely affect or contribute to excess air and noise pollution.

.3 Fires and burning of waste or materials is not permitted on site.

.4 Do not bury waste or materials on site.

.5 Prevent extraneous materials from contaminating air beyond application area, by providing temporary enclosures during demolition work.

.6 Cover or wet down dry materials and waste to prevent blowing dust and debris.

.7 Store equipment to be relocated on site in accordance with the Owner's instructions.

1.4 REGULATORY REQUIREMENTS

.1 Ensure work is performed in compliance with applicable Federal, Provincial and Municipal Regulations.

PART 2 – PRODUCTS

Not applicable.

PART 3 – EXECUTION

3.1 PREPARATION

.1 Inspect site and verify extent and location of items designated for removal, disposal, recycling, salvage, relocation and items to remain.

.2 Locate and protect utilities. Preserve active utilities traversing site in operating condition.

3.2 SAFETY CODE

.1 Observe construction safety measures of Provincial Government, including but not limited to the Occupational Health and Safety Act, Chapter 7; Workers' Compensation Board and Municipal authority provided that in any case of conflict or discrepancy the more stringent requirement shall apply.

.2 Ensure that volatile waste is stored in closed containers and removed from premises daily.

.3 WHMIS:

.1 Comply with requirements of Workplace Hazardous Materials Information System (WHMIS) regarding use, handling, storage and disposal of hazardous materials; and regarding labelling and provision of safety data sheets acceptable to Labour Canada and Health and Welfare Canada.

.4 Ensure that pollution and environmental control of construction activities are exercised as specified and as required during the Work.

.5 Submit to Consultant prior to commencement of Work, printed information detailing means and methods so the following will be carried out:

.1 To ensure the health and safety of persons at or near the work.

.2 To ensure the measures and procedures of the regulatory agencies specified are carried out.

.3 To ensure every employee, self-employed person and employer performing Work under this Contract complies with the regulatory agencies specified.

3.3 REMOVAL OF DEBRIS

.1 Provide dumpsters and obtain necessary permits and/or permission to locate on, or adjacent to the property.

.2 All materials removed from the site to be in accordance with HRM and Provincial requirements.

3.4 EQUIPMENT RELOCATION

.1 Relocate electrical and mechanical equipment as shown on the Project Drawings.

.2 Store and handle relocated equipment in accordance with the equipment manufacturer's literature.

3.5 RESTORATION

.1 Restore areas and existing works outside areas of demolition to match condition of adjacent, undisturbed areas or as indicated on drawings.

3.6 CLEANUP

.1 Upon completion of work, remove debris, trim surfaces and leave work site clean.

END OF **SECTION 02 41 00**

PART 1 – GENERAL

1.1 REFERENCES

.1 CSA B111-1974 Wire Nails, Spikes and Staples

.2 CAN/CSA-G164-M92 Hot Dip Galvanizing of Irregularly Shaped Articles

.3 CSA 0121-M1978 Douglas Fir Plywood

.4 CAN/CSA-0141-91 Softwood Lumber

.5 CSA 0151-M1978 Canadian Softwood Plywood

.6 National Lumber Grades Authority (NLGA) Standard Grading Rules for Canadian Lumber 1991

.7 CSA 080 Series

1.2 QUALITY ASSURANCE

.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 MATERIALS

.1 Furring, blocking, nailing strips, grounds, rough bucks, curbs, fascia backing and sleepers:
- .1 S2S is acceptable.
- .2 Board sizes: Standard or better grade.
- .3 Dimension sizes: Standard light framing or better grade.
- .4 Post and trimmer sizes: Standard or better grade.

2.2 PANEL MATERIALS

.1 Douglas fir plywood (DFP): to CSA 0121, standard construction.

.2 Canadian softwood plywood (CSP): to CSA 0151, standard construction.

2.3 ACCESSORIES

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

.2 Bolts: 12 mm diameter unless indicated otherwise, complete with nuts and washers.

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

2.4 FINISHES

.1 Galvanizing: to CAN/CSA-G164, use galvanized fasteners for exterior work, gallery air areas, pressure-preservative treated lumber.

2.5 WOOD PRESERVATIVE

.1 Pressure applied wood preservative in accordance with the Canadian Wood Preservation Association and CSA 080 Series.

.2 **All wood used on this project shall be pressure treated.**

PART 3 – EXECUTION

3.1 PREPARATION

.1 Wood Preservative
Treat material in accordance with CSA 080 series where used as:
.1 Wood cants, fascia backing, curbs, nailers, sleepers on roof deck.
.2 Wood furring where in contact with exterior masonry and concrete walls.

.2 Re-treat surfaces exposed by cutting, trimming or boring, with liberal brush application of ‘end cut’ preservative before installation. Apply preservative by dipping, or by brush to completely saturate and maintain wet film on surface for minimum three-minute soak on lumber and one-minute soak on plywood.

3.2 INSTALLATION

.1 Comply with requirements of NSBC, supplemented by the following paragraphs.

.2 Install furring and blocking as required to space-out and support facings, fascia, soffit, siding and other work as required.

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

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

.5 Install wood cants, fascia backing, nailers, curbs and other wood supports as

required and secure using galvanized fasteners.

3.3 ERECTION

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

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

END OF **SECTION 06 10 00**

PART 1 – GENERAL

1.1 GENERAL CONDITIONS

.1 The General Conditions of the contract as well as provisions of Division 1 at the beginning of these specifications shall be deemed to apply and be a part of this section of the specification.

1.2 WORK INCLUDED

.1 Remove the existing roofing ballast, insulation, roofing membrane, underlayment board and flashings to facilitate the new installation.

.2 To complete the two-ply modified bitumen roofing system including flashings in strict accordance with the manufacturer's instructions, the drawings and specifications, and summarized but not restricted to:
- .1 underlayment board
- .2 vapour retarder
- .3 insulation
- .4 roofing membrane
- .5 membrane flashings
- .6 metal flashings
- .7 roofing system to conform to FM class I-90 wind uplift standards

.3 All other work as called for on the drawings as required to complete the roofing project, including but not restricted to:
- .1 Caulking as shown on the drawings and as required to complete the work.

.4 As-built drawings, warranties and literature to Consultant's approval.

.5 Removal and Re-install of all roof top mechanical equipment, work to be completed by HRCE.

1.3 ACCEPTABLE MANUFACTURERS

.1 The following manufacturers of modified bitumen systems will be approved for use on this project, provided they meet the design criteria as specified herein and as shown on the drawings and can meet the I-90 Factory Mutual Underwriters wind requirements.
- .1 IKO
- .2 Soprema
- .3 Henry Bakor

1.4 REFERENCE STANDARDS

.1 Where CSA, CRCA or CGSB Standards of Specifications are named in this Section, it shall refer to the latest edition.

1.5 QUALITY ASSURANCE

.1 This roofing system must be applied by a roofing contractor authorized by the roofing manufacturer.

.2 When the Project is in progress, the roofing system manufacturer will provide the following:

1. Report progress and quality of the work as observed.
2. Provide bi-weekly job site inspections.
3. Report to the Owner in writing any failure or refusal of the Contractor to correct unacceptable practices called to the Contractor's attention.
4. Confirm after completion that manufacturer has observed no application procedures in conflict with the specifications other than those that may have been previously reported and corrected.

.3 There shall be no deviation from this specification or the approved shop drawings without prior written approval by the Consultant.

1.6 SUBMITTALS

.1 Submit samples and product literature for all products. Do not order materials until they have been reviewed by the Consultant.

.2 Submit shop drawings for the tapered insulation system and fastening layouts.

1.7 PRODUCT DELIVERY, STORAGE AND HANDLING

.1 Deliver materials in original unopened containers labelled with manufacturer's name, brand name, installation instructions and identification of various items.

.2 Store materials, between 59°F and 80°F. If exposed to lower temperature, restore to 59°F minimum temperature before using.

.3 Store materials in dry area and protect from water and direct sunlight. Store membrane rolls on end, one pallet high, and selvage edge up. Do not store in a leaning position.

.4 No materials are to be stored on adjoining roof section

1.8 WARRANTY

.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 (non-prorated) in the name of the Owner, stating 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 put the roof back into a water tight condition.

1.9 RELATED WORK BY OWNER

.1 The owner will remove ceilings where required so that the roofer can install new drains and drain lines.

.2 The owner will disconnect and remove fans so the roofer can build the new curbs.

1.10 RELATED WORK BY ROOFER

.1 HRCE will insulate all drain bodies and replace and insulate at least five feet of each lateral line.

1.11 MOCK-UP FOR ROOF PARAPET METAL FLASHING

.1 Provide a full-scale mock-up of the roof edge metal flashing as shown on architectural detail 1/A-102, including a sample horizontal lap joint.

.2 Obtain approval from Consultant prior to commencing work.

PART 2 – PRODUCTS

2.1 GENERAL

.1 The components of this roofing system are to be products of the manufacturer's modified bitumen roofing system or accepted by the manufacturer in writing and approved by the Consultant.

.2 Compatibility between components of the roofing system is critical. The contractor shall verify compatibility with the manufacturer prior to submission and the manufacturer shall provide a letter stating that all components are compatible.

2.2 UNDERLAYMENT

.1 Mould and Moisture Resistant, non-combustible, solid core underlayment board to provide smooth surface for Vapour Retarder application. Provide primer for Vapour Retarder as per manufacturer’s recommendations.

.2 Manufactured as per ASTM C1177/C1177M.

.3 Size Boards: 48” (1220 mm) wide x 96” (2440 mm) long x 1/2” (12.7mm) thick minimum.

.4 Standard of Acceptance based on the following, or approved alternate:
- .1 CGC Securock Glass Mat Roof Board.
- .2 Georgia Pacific DensDeck Prime Roof Board.
- .3 Manufacturers Soprema, IKO and Henry/Bakor may use proprietary products provided they meet or exceed those listed in items 1 and 2.

2.3 VAPOUR RETARDER

.1 SBS Modified bitumen, self-adhering membrane. Primer/adhesive is required and

as per manufacturer's recommendations on compatibility.

.2 Thickness to be 0.8 mm with Water Vapour Transmission of 0.05 perms.

.3 Standard of Acceptance: Vapor Bloc SA by Henry Company, IKO MVP and Soprema Sopravap'r.

2.4 INSULATION

.1 Polystyrene Insulation Type II Board manufactured to CAN/ULC-S701 and ASTM C578. Contains no CFC, HCFC or HFC blowing agents.

.2 Insulation shall be ship lapped or installed in two layers with staggered joints.

.3 Thermal resistance must be based on the latest NRC aged R-values. The average R-value for the roof must be no less than R-30.

.4 The existing deck is assumed to be flat and hence the slope will be created with a top layer of tapered insulation, sloping at 1% minimum.

.5 Provide insulation adhesive. To be Henry Adhesive Thermostik 840-10 as the "Basis of Design".

2.5 OVERLAYMENT BOARD

.1 Asphaltic cover board composed of a mineral-fortified asphalt core between two layers of high-strength reinforcing fiberglass mat, thickness ½". Two layers over polystyrene and laid with staggered joints.

.2 Acceptable Products:
- .1 Soprema Sopraboard
- .2 IKO Protection Board – Protectoboard
- .3 Celotex Structodek

2.6 MEMBRANES

.1 Base Sheet: 180 g/m:
- .1 Non-woven reinforcing mat, polyester coated and permeated with SBS modified bitumen. This membrane is applied with cold adhesive.
- .2 Thickness: 2.2mm (87mils)
- .3 Bottom side coated with sand to allow adhesion with cold process adhesive.
- .4 Top surface thermofusible film to allow adhesion with torch applied cap.
- .5 Manufactured to ASTM D6164 for Type 1, Grade 'S' materials.
- .6 Approved Manufacturers:
  - .1 Soprema
  - .2 Bakor by Henry Company
  - .3 IKO
- .7 An integral base sheet and overlayment board is acceptable.
- .8 Non-Flammable Fire Resistive Adhesive is required and as per

manufacturer's recommendations on compatibility. Bakor 930-38 is the "basis of design".

.2 Base Sheet Flashing 180 g/m:
- .1 Non-woven reinforcing mat, polyester coated and permeated with Modiflex SBS bitumen, self-adhering one side, thermofusible plastic film over.
- .2 Thickness: 2.5mm (98mils)
- .3 Poly Film (thermofusible) covers the top surface; the back surface is self-adhered, silicone treated film.
- .4 Manufactured to ASTM D6164.
- .5 Primer as per manufacturer's recommendations.
- .6 Approved Manufacturers:
  - .1 Soprema
  - .2 Bakor by Henry Company
  - .3 IKO

.3 Cap Sheet and Cap Flashing 250g/m:
- .1 Non-woven reinforcing mat, strengthened with polyester reinforcement, 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: 4.0mm (158mils)
- .3 Coloured ceramic mineral granules embedded into top surface to provide protection against ultraviolet radiation.
- .4 Manufactured to CGSB 37-GP-56M, TYPE 1, CLASS A GRADE 2.
- .5 Approved manufacturers:
  - .1 Soprema Sopralene Flam 250
  - .2 Bakor by Henry Company NP 250gM4
  - .3 IKO Torchflex TP 250 CAP

2.7 SHEET METAL

.1 As detailed on the drawings and to the following specifications:
- .1 For visible areas: prefinished aluminum flashing, embossed, silver colour to match existing on site.

2.8 VENT STACK FLASHINGS

.1 Vent Stack Flashings: Thaler SJ-26, Insulated.

2.9 ACCESSORIES

.1 Provide all other accessories, termination bars etc., as required to complete the project.

2.10 ROOF DRAIN

.1 RD-1: cast iron body, under deck clamp and sump receiver to suit roof construction, flashing clamp ring with integral gravel stop, bearing pan, aluminum dome,

stainless steel mesh screen over dome, waterproof flange, extensions.

Acceptable Material:

- Smith
- Watts
- Zurn ZA-100-A-C-R

.2 Provide shop drawings.

.3 Installation shall be in accordance with the manufacturer's recommendations to suite roof construction.

2.11 CAULKING

.1 Caulking to be elastomeric or approved equal.

PART 3 – EXECUTION

3.1 GENERAL

.1 All work shall be undertaken in accordance with the manufacturer's instructions, the drawings and specifications and to Consultant's approval.

.2 Protect all walls, windows and adjacent areas while hoisting equipment and materials on the roof.

.3 Prior to removing roof top equipment the owner will disconnect any electrical and protect areas below from dust and moisture damage.

.4 Keep dumpster away from building as per division 1. When placing dumpster on asphalt ensure that it is placed on a plywood or rubber mat to avoid damage. Any damage to the asphalt or any concrete areas will be repaired at the costs of the contractor.

.5 Maintain warning signs throughout the project.

.6 Roof drains to remain in operation at all times.

.7 Co-ordinate installation with roof access points to avoid travelling over new products after installation. Where travelling over new roof is required protect with plywood.

.8 Cover interior areas with 6 mil polyethylene when removing and re-installing roof top equipment.

3.2 ROOF DECK CRITERIA

.1 Remove all existing roofing system components to provide a proper substrate to receive the roofing system. Ensure that existing deck is not damaged during removals.

.2 Should the roofer not be satisfied with the deck condition, he shall advise the Consultant accordingly. Do not proceed with installation until any defects in the substrate have been corrected.

.2 Commencement of work shall imply acceptance of surfaces and conditions.

3.3 SUBSTRATE PREPARATION

.1 Before any membrane is laid, install all sleeves, anchors and other items to be secured to or pass through the roof.

.2 Repair any substrate joints, cracks, or any substrate-to-wall junctions and any other substrate-to-penetration gaps, which are greater than ¼", with pourable sealer. Take measures necessary to contain the pourable sealer.

Acceptable Material:

- Soprema ALSAN RS 230 Flash, Henry Pumadeq Flex 31 MV and N-Fleece or approved equivalent
- Soprema ACTIF or approved equivalent

.3 Substrate surface and new insulation surface shall be dry and clear of any foreign materials.

3.4 INSTALLATION

.1 Install roofing elements on clean and dry surfaces.

.2 Roofing work shall be performed on a continuous basis as surface and weather conditions allow.

.3 Adjoining surfaces shall be protected against any damage that could result from the roofing installation.

.4 Apply only as much insulation to the roof as can be covered the same day with roofing membrane. After each day's work, seal exposed edges of the roof insulation. This seal shall be cut and removed upon continuation of the work.

.5 Do not continue construction activity over completed roof membranes without protection approved by the Consultant and/or roofing inspector.

.6 Apply roof sheathing, perimeter plywood and vapour barrier membrane to provide water tight interior, to roof which is ready for same.

3.5 EQUIPMENT

.1 Maintain all equipment and tools in good working order.

.2 Use torch types recommended by the manufacturer of the elastomeric asphalt membranes.

3.6 VAPOUR RETARDER

.1 Prime the underlayment board and install self-adhered vapour barrier to the underlayment board.

.2 Apply the self-adhering vapour barrier membrane to the underlayment board in accordance with manufacturer's recommendations.

.3 Temperature is to be above 5ºC when applying the membrane.

.4 Verify there are no air bubbles or fish mouths in the application.

.5 Tie-ins to other wall areas of the building envelope are to be properly tied in to form a complete and continuous air/vapour enclosure, roof and wall conditions.

3.7 INSULATION

.1 Adhere insulation to vapour retarder with adhesive. Supply Adhesive as per manufacturer's instructions.

.2 Provide built-up "crickets" to roof, where shown on drawings, with minimum 1.5% slope, from high to low point at drain, using layered rigid insulation of no less thickness than 2" per layer.

.3 Fit rigid roof insulation tightly together. Provide sprayed low expansion thermal insulation, compatible with the rigid insulation, to areas where voids occur as identified by the Consultant.

3.8 OVERLAYMENT BOARD INSTALLATION

.1 Mechanically fasten the first layer of overlayment board over the insulation panels, through rigid insulation panel to the roof deck to requirements of FM Class 1-90. Fasteners to be a minimum of 6" (150 mm) from the board edge. Stagger joints of two layers of protection board to fully protect insulation panels.

.2 Fasteners and fastening pattern to agree with the approved shop drawings for this project.

.3 Fastener length should reflect the thickness of the insulation and the protection board. Contractor to review the location of conduit mounted to the underside of the steel deck, and verify that fasteners bypass the conduit. Contractor to repair damage or disruption to the cable/conduit under this contract.

.4 Adhere top layer of protection board with adhesive in accordance with the manufacturer's instructions. Stagger joints from the first layer of protection board.

.5 If an overlayment board with integral base is used as the top layer, it is to be installed using a cold adhered process. No mechanical fastening will be permitted.

3.9 BASE SHEET

.1 Base sheet membrane to be fully adhered over protection board with cold process adhesive ensuring joints terminations are fully buttered. Each strip to have 3" (75mm) side laps and 6" (150mm) end laps.

.2 Base sheet to be re-rolled from both ends.

.3 Adhere the base sheet flashing after primer application is fully dried.

.4 Application to provide a smooth surface, free of air pockets, wrinkles, fish mouths or tears.

.5 Apply membrane perpendicular to slopes for roofs of less than 1:12 slope. Apply membrane parallel to slope on roofs of 1:12 or greater.

.6 Apply self-adhesive membrane for flashing and penetrations.

3.10 BASE FLASHING

.1 Primer coating must be applied and dry before application of the base sheet strips.

.2 Base flashing shall be laid in strips 36" wide to the vertical surfaces, extending on to the flat surface of the roof a minimum of 4". Side laps shall be 3" and shall be staggered a minimum of 4" with the laps of the base sheet.

.3 Flashing Penetration:

.1 Flash all penetrations (pipes, round supports, soil stacks, cold vents, etc.) passing through the membrane, as detailed on the drawings or as per Consultant's instructions in the absence of details.

3.11 CAP SHEET

.1 Install cap sheet once the base sheet and base flashing have been applied and do not show any defects.

.2 Cap sheet shall be unrolled starting from the low point of the roof. Cap sheet shall be re-rolled from both ends. Care must be taken to ensure alignment of the first roll (parallel with the edge of the roof).

.3 Cap sheet shall be torch welded onto the base sheet membrane. During this application, both surfaces shall be simultaneously melted, forming an asphalt bead that shall be pushed out in front of the cap sheet.

.4 Base sheet and cap sheet seams shall be staggered a minimum of 12".

.5 Cap sheet shall have side laps of 3" and end laps 6". Surface granules on end laps must be embedded prior to installation of following sheet.

.6 Extend cap sheet up all vertical surfaces, a minimum of 6" above the top of the cant.

.7 After installation of the cap sheet, check all lap seams on the cap sheet.

.8 Embed granules on all side and end laps to achieve a uniform appearance over the entire roof.

3.12 APPLICATION OF METAL FLASHINGS

.1 Flashings shall be as detailed and meet CRCA FL Specifications as noted or required.

.3 Membrane flashing shall be covered with metal counter flashing as shown on the drawings or to Consultant's approval.

.4 Exposed edges of all sheet metal work shall be doubled back ½" in such a manner as to conceal them from view and to provide stiffeners.

.5 All metal joints and cap flashings shall be caulked.

.6 All bends to be machine made.

.7 All joints in straight runs of flashing shall be S lock.

.8 Flashing lap joints shall meet CRCA standards and be watertight.

3.13 ROOF DRAINS

.1 Install roof drains in accordance with the manufacturer's instructions, and latest edition of the National Plumbing Code.

.2 Upon demolition, notify the Consultant if there are any issues with the plumbing.

3.14 CLEANING

.1 At the end of each working day the contractor shall clean all areas and secure any materials left on the building.

.2 Remove any bituminous markings from finished surfaces.

.3 Replace or repair defaced or disfigured finishes caused by work of this section.

END OF **SECTION 07 13 52**