1.1 General

.1 A Stipulated Price tender is required for the full work specified here and shown on the drawing(s).

.2 Canadian General Standards Board (CGSB)

.3 The Contractor shall carryout the project in strict accordance with the requirements of the Ontario Regulation 403/97, Ontario Building Code and all its amendments.

.4 Except for Building Permit, Contractor shall secure and pay for all other permits, fees, inspections required by all authorities having jurisdiction.

.5 The Contractor shall register this project with The Ministry of Labour, complete Registration of Constructors and Employers Engaged in Construction form and post/display at the project.

.6 The Contractor must take responsibility of their work area as the "Constructor" under the Occupational Health and Safety Act. The Contractor must post signage and control all traffic in and out of their work area per the requirements of the Occupational Health and Safety Act.

.7 The Contractor shall comply with all provincial, municipal and local by-laws, ordinances, and safety requirements of all authorities having jurisdiction.

.8 No interruptions are allowed to the daily operations of the building for the entire duration of this project. All work shall be carried out with safety of public and staff in mind, and at no time shall their safety be adversely affected.

.9 Client will only pay for materials delivered and installed on site.

.10 The Contractor not to engage any subtrade(s) to perform any work under this contract without prior authorization and approval by the Client.

1.2 Scope of work

.1 Complete removal and disposal of all roofing components down to the existing roof deck, and the installation of new roofing system as per specifications and project drawings.

- .1 New Roofing System "NR1" – Slope Asphalt Shingle Roofing Assembly – Roof Sections F, G, H, I, J, K, L & M:
  - .1 New laminated asphalt shingles,
  - .2 New Ice and Water Shield Protection Membrane at locations as specified,
  - .3 New Underlayment on all roof areas not covered with Ice and Water Shield Protection Membrane,
  - .4 Existing Wood Deck

.2 New Roof Snow Retention System:

- .1 Supply and install a new snow retention system on the new asphalt shingle roofing assembly for roof sections F, G, H, I, J, K, L & M as shown on project drawings. Colour to be selected by the client at a later date.

.3 Site Setup & Garbage Disposal:

- .1 Ground setup areas are limited around the building. The contractor is responsible for coordinating the site ground setup area and location with the building manager and the Client representative.

.2 Contractor is responsible for applying and obtaining any and all road/street, sidewalk, etc. permits as required from authorities having jurisdiction in order to place garbage disposal, and set up/staging area around the building. All associate costs shall be included in the base contract bid amount and paid by the Contractor at no additional cost to the project or contract.

.3 In the event that the ground setup area and the location of the garbage disposal bin need to be placed on a suspended vault/roof slab and/or an underground garage slab, then the Contractor shall provide temporary engineered shoring below the existing slab for the duration of the project. Contractor to provide engineer stamped shop drawing for the shoring of the slab for review and approval. All associate costs shall be included in the base contract bid amount and paid by the Contractor at no additional cost to the project or contract.

.4 Rooftop Mechanical Units, Stacks & Curbs: Contractor is responsible for all modifications to all mechanical rooftop units, stacks, and the supply and installation of new curbs and/or curb adaptors as per project drawings, and as required for the proper installation of new roofing systems, including flashing membrane, metal flashing and trims, as shown on project drawings. Allow for disconnection, lifting, lowering and reconnection of all equipment and related ductwork where applicable and as required to perform specified work. It is anticipated that all said elements and equipment will be raised as a result of height increase of the new roofing assembly. All work shall be performed by licensed professionals & sub-Contractors. Prior to disconnecting any rooftop unit and connections (gas, electrical, etc.), the Contractor is responsible to provide 48 hours of advanced notice to the Client and Consultant to schedule an equipment shut down. No one unit can be off-line for more than one working day, at any given time. Contractor is responsible to remove and reinstall all existing rooftop equipment and projections to facilitate the replacement of roofing assemblies.

.5 Contractor shall review existing designated substances report as provided by the Client and perform all work in accordance with the recommendations within the report and all other authorities having jurisdiction. Cost associated with any abatement shall be part of the scope of this project and included within the base bid amount.

.4 Contractor not to disturb any existing building elements on building walls; any damaged equipment and/or building feature shall be replaced immediately by the Contractor to the satisfaction of the Client.

.5 Contractor to comply with Occupational Health and Safety Act and regulations for the installation of roof perimeter safety rails, construction fences, overhead protection hoarding at the location of all entrances, exit doors, canopies and ramps around the building. Hoarding shall be installed prior to the commencement of re-roofing operations and remain until completion, where applicable.

.6 Contractor shall supply and install overhead protection along the building wall located at the west side of the building for a total of approximately 160 feet at the location shown on the plan drawing as “OP-1”.

.7 Contractor is responsible to maintain clean and safe job site conditions at all times, and at the end of each working period (day/night shifts) to a level that is satisfactory to the Client for use by facility operators after wok period; note that the facility regular operation will continue throughout the reroofing construction period,

.8 Contractor shall perform minimum of two (2) roof cut tests per roof section, and patch to industry standards at no additional cost to the client and the Contract. Results of roof cut tests shall be summarized in a report by the Contractor with photographs of all test areas and submitted to the Consultant. All tests shall be performed at the time of pre-construction meeting.

.9 Supply and install new 24 gauge prefinished metal flashing for all details as indicated on details drawings and as per specifications on all roofs.

.10 Supply and install new 12.7mm plywood sheathing where existing roof flashing substrates are damaged or contaminated.

.11 Replace all roofing accessories such as: gravity ridge air vents, bathroom/kitchen exhaust fan stack flashings, plumbing vent stack booths, galvanized metal tall cones, rain collars, rain caps, caulking, perimeter metal flashings, metal counter flashings, etc.

.12 Visually inspect all interior connections for existing plumbing/mechnical stacks and hot chimney stacks from the interior of the building. Report any encountered loose and improper connections to the Client/Consultant immediately.

.13 Supply and install plywood sheathing on all site setup areas. Plywood shall be laid prior to the commencement of any work. Any damages to the surfaces are the responsibility of the Contractor to make good to Client’s satisfaction.

.14 The Contractor must maintain a minimum five (5) person crew on site, on a daily basis, at all times for the duration of the construction period. The crew must have at least two (2) professional and skill workers performing the work on hand for the day. This requires minimum two qualified roofers during roofing operations, two sheet metal mechanics during metal work, etc.

.15 Clean existing and apply new sealant at all joints of the existing eavestroughs and downpipes.

.16 Provisional Items:

.1 Complete removal and disposal of all roofing components down to the existing roof deck, and the installation of new roofing system as per specifications and project drawings.

.1 New Roofing System “NR2” – Slope Metal Roofing Assembly – Roof Sections F, G, H, I, J, K, L & M:

.1 New Havelock Legacy Standing Seam Panels.

.2 New High Temperature Grade SBS Modified Bituminous

Membrane
.3 New 9.5mm Plywood Sheathing
.4 Existing Wood Deck

.2 Supply and installation of a new layer of 9.5mm Plywood sheathing over the existing roof deck, fastened as shown on project drawings for new roofing assembly “NR2” only.

.3 Supply and installation of eighteen (18) SRV-12 Ventilator gravity vents on new curbs as per project drawings. The new ventilators will not be located at the same locations as the existing gravity square vents; therefore, the contractor shall close the roof deck openings with matching wood deck boards and create new openings for the new eighteen (18) ventilators. The locations for the new eighteen (18) ventilators will be along the roof ridge and will be identified by the Consultant at a later date.

.4 Supply and installation of a new engineered snow retention system on the new slope metal roofing assembly for roof sections F, G, H, I, J, K, L & M. Colour to be selected by the client at a later date.

.5 Supply and installation of a new snow retention system on the new asphalt shingle roofing assembly for roof sections F, G, H, I, J, K, L & M as shown on project drawings. Colour to be selected by the client at a later date.

.6 Complete replacement of all existing eavestroughs and downpipes with new prefinished, 22-gauge metal eavestroughs and downpipes, to match existing locations, length, size, and as shown on project drawings. Colour to be selected by the client at a later date.

1.3 Submittals

.1 Submit to Consultant submittals listed below for review. Be prepared to submit with reasonable promptness and in an orderly sequence so as not to cause any delay in the Work:
.1 Written work schedule for approval;
.2 Site Specific Health and Safety Plan for approval;
.3 Proposed method of access to site including storage of materials and location of garbage bin;
.4 Notice of Project from Ministry of Labour;
.5 Samples of any or all specified materials if requested by Consultant, prior to start of the Work;
.6 Shop drawings and product data, as specified;
.7 Inspection & Testing reports, as specified;
.8 Statutory Declaration and Certificate of Clearance;
.9 Safety Data Sheets (Formerly: Material Safety Data Sheets MSDS);
.10 All other related documents as required by the Client;
.11 Copy of proof that Contractor and site staff are approved applicator of specified assembly and material;
.12 Colour samples as specified.

1.4 Examination of site and documents

.1 The Contractor shall make a careful examination of the site with respect to all

matters relating to the work including but not limited to the means of access and egress, any obstacles and the rights and interests of others which may be interfered with during the course of the work.

.2 The Contractor shall make a careful examination of the full extent of the work to be performed including all requirements referred to in the Specifications, the Drawings and Contract Documents, which are necessary for the full and complete construction of the work and the conditions under which it will be performed. No allowance will be made subsequently for any conditions, which are commonly known or apparent by examination. Any questions and/or clarifications from the Contractor must be sent in an official Request For Information (RFI) format, and in writing. RFI must be sent to the Consultant with advanced time to be reviewed and reply to as follows:
   .1 Ten (10) business days for RFI's that relates to contract documents including specifications and drawings,
   .2 Three (3) business days for nonemergency site related issues after commencement of construction activities, and throughout the course of construction,
   .3 Immediate for any emergency site issues throughout the course of construction,

.3 Plans of existing conditions are available for review upon request; and are provided for guidance only and must be verified by the Contractor and SubContractors.

.4 Drawings are, in part, diagrammatic and are intended to convey the scope of work and indicate general and approximate locations and arrangement of work. Obtain more accurate information about locations, arrangement and sizes from study and co-ordination of drawings and site conditions.

1.5 Layout

.1 Verify existing conditions on the site and dimensions shown on the drawings and report any errors or inconsistencies to Consultant before commencing work. Note any/all irregularities affecting the work of any Section of the Specification.

.2 Lay out work in accordance with lines and levels, as shown on drawings. When dimensions and levels are not shown on the drawings, determine site dimensions and levels so that all new work is installed to precisely correct sizes.

1.6 Job conditions

.1 Report in writing to Consultant, prior to commencing work, any conditions or defects encountered on the site upon which the work depends, and which may adversely affect the performance of the work.

.2 Do not commence work until such conditions or defects have been investigated and corrected.

.3 Commencement of work implies acceptance of surfaces and conditions. No claim for damages or resulting extra work will be accepted except where such conditions cannot be determined prior to construction.

.4 Be responsible for making good, repair and restoration of existing conditions

on public or private properties at no cost to the Client. In all cases blend with existing conditions.

.5 Any item not specifically mentioned in the description of the Work or shown on the drawings but implied or required to complete with work, will be considered to be included in the total price.

.6 Contractor shall submit for approval a proposed method of access to site, storage of materials, and location of garbage bin before starting work. All making good and repairs required due to the work shall be the responsibility of the Contractor. This includes planting, fencing, walks, paving, etc.

1.7 Safety

.1 Contractors to comply to Occupational Health and Safety Act and regulations for Construction Projects particularly but not limited to the following:

.1 All workers working above three (3) meters must comply with the requirements for a fall arrest system in section 26 of the regulation.

.2 All ladders used on the project must comply with section 78-83 of the regulations.

.3 Comply with section 125-142 for scaffolding, section 209 for hoisting and section 207 for safety barriers as stipulated in the regulations.

.4 Comply with all requirements of Ontario Regulation 213/07: Fire Code under Fire Protection and Prevention Act, 1997, c. 4, and its latest revisions and amendments. The Contractor shall provide fire watch after all torching applications are completed in strict accordance with all requirements of Ontario Regulation 213/07: Fire Code under Fire Protection and Prevention Act, 1997, c. 4, and its latest revisions and amendments

.2 Contractor shall comply with all requirements of construction site health and safety guidelines during COVID -19 pandemic as required by the Government of Ontario. Information regarding these requirements can be found at: https://www.ontario.ca/page/construction-site-health-and-safety-during-covid-19, and all other government sources.

.3 The Contractor shall comply with all Provincial and Local Fire code and regulations.

.4 The Contractor shall comply with provisions of The Occupational Health and Safety Act (latest edition): Regulations for Construction Projects; Construction Safety Act; regulations of the Ontario Ministry of Labour; Workplace Hazardous Materials Information System (WHMIS) Regulation; and the Canadian Construction Safety Code (latest edition), and all amendments. Follow the recommendations of The Construction Health and Safety Manual issued by the Construction Safety Association of Ontario and Low-slope Roofing Health and Safety Manual issued by Infrastructure Health and Safety Association (IHSA).

.5 Contractor shall work in conjunction with the proper safety associations operating under the authority of the Ontario Worker's Compensation Act. The Contractor shall not, in any manner, endanger the safety or unlawfully interfere with the convenience of the public.

.6 Before commencement of Work, and throughout Contract, maintain on Site readily accessible to those who may be exposed to hazardous materials, a list of all hazardous materials proposed for use on Site, or Workplace, together with current Safety Data Sheets (Formerly: Material Safety Data Sheets MSDS). Additionally, maintain on site all related required documents as required by all provincial, municipal and local authorities having jurisdiction.

.7 Provide Client/Consultant with a copy of the list of hazardous materials and SDS as required.

.8 Safety precautions are part of the construction techniques and processes for which the Contractor is solely responsible.

.9 Erect and maintain fencing and barricades in accordance with governing regulations and as required, ensuring public safety.

.10 Maintain all public, fire and maintenance access to and from the building and parking garage.

.11 Construct and maintain hoardings, covered ways and protective canopies as required, to maintain access to the building and provide public safety.

.12 Engage and pay for the services of a Professional Engineer registered in the Province of Ontario to design and supervise construction and maintenance of hoardings, covered ways, tie back lines and protective canopies.

.13 The Contractor shall provide and pay for the design and preparation of all required shop drawings pertaining to the hoardings, covered ways, tie backs and protective canopies.

.14 Smoking on site is not permitted.

.15 Provide a minimum of three (3) safety helmets for authorized visitors to the workplace.

.16 Protect public, staff and those on the Work from injury. Equipment when not in use shall have keys removed and locked up in secure location.

.17 Before commencement of work and upon Client's and/or Consultant's request, provide Life Safety Check list (Schedule 8), The Contract Notification (Schedule 6), site specific safety plan including fire safety plan, indicating location of hoarding, fencing, disposal bin, material storage, etc.… for review and approval.

1.8 Overtime

.1 The Contractor and SubContractors shall include for any and all overtime rates that may be incurred in execution of the work included in the tender. All work must be done to the entire satisfaction of the Client and Consultant.

.2 When progress of the Work falls behind the schedule submitted by the Contractor, and upon instructions from the Consultant, the Contractor shall increase the forces on the site as well as hours worked each day in order to catch up to the schedule. This work shall be done without extra cost to the Client.

1.9 Qualification of contractor & workers

.1 The Contractor and Sub-Contractor named during the bid and installation periods, must be officially recognised as an approved applicator by the

product manufacturer for at least ten (10) years.

.2 Minimum of 10 years' experience manufacturing sealed insulating glass units meeting ASTM E 2190.

.3 Submit proof of qualifications as required and specified within relevant sections for each trade.

.4 Only skilled trade persons, officially employed by the Contractor operating adequate and necessary equipment, will be authorized to perform all work.

.5 Provide at least one person with each trade, to be present at all times during execution of the work of that trade, and thoroughly trained, approved by manufacturer, and experienced in performing the work, and to direct all work performed under that Section. Continuously inspect all work to ensure it is properly executed.

.6 For operating equipment use only thoroughly trained and experienced operators.

.7 For installation of various items of work, or for finishing work of any trade, use only personnel thoroughly trained and experienced operators.

.8 In the acceptance or rejection of finished work, no allowance will be made for lack of skill on the part of people employed.

1.10 Temporary facilities

.1 Provide on-site portable toilets. Do not use existing toilet facilities inside the building. Place portable toilets at locations as directed by Client. Keep portable toilets clean at all times.

1.11 Coordination with other work

.1 Coordinate and cooperate with all other trades working in the area so that no delay or unnecessary rework is required. Any such rework, delay or cause for delay shall be deemed the result of Contractor's coordination or lack thereof and shall be at the sole expense of the Contractor.

.2 Ensure that all SubContractors examine the Drawings and Specification covering the work of all other SubContractors which may affect the performance of their own work.

.3 It is the Contractor's responsibility to ensure that all work is carried out in compliance with the Contract Documents and to accept responsibility for delays or costs arising from his failure to inspect a SubContractor's work.

.4 Ensure that all SubContractors and other trades cooperate with other SubContractors whose work attach to, or are affected by their own work, and ensure that all required adjustments are made to allow proper attachment of adjoining work.

.5 Ensure that SubContractors requiring anchorages or openings to be left for the installation of their work furnish the necessary information to the parties concerned in ample time so that proper provision can be made to install such anchorages or openings.

.6 Take field dimensions relative to the work. Fabricate and erect work to suit field dimensions and field conditions.

.7 Provide all forms, templates, anchors, sleeves, inserts and accessories required to be fixed to or inserted into the work and set in place or instruct the

related trades as to their location.

.8 Provide free access to Consultant and other authorized personnel to all areas of the Work. Allow for slight delays to the progress of the work to facilitate Consultant's or Client's inspection and testing.

.9 Coordinate access and allow sufficient time to Client's separate Contractors during the course of the work.

1.12 Material storage & handling

.1 All materials shall be delivered and stored in their original packaging, bearing the manufacturer's name, related standards and any other specification or reference accepted as standard.

.2 Obtain Client's approval of the location and extent of all on-site storage areas.

.3 Contractor shall be responsible for the security of all materials and equipment.

.4 Remove any plastic packaging from boards immediately upon receipt of delivery. Failure to remove plastic packaging may result in entrapment of condensation or moisture, which may cause application problems that are not the responsibility of manufacturer.

.5 Any protective, plastic factory packaging that is used to wrap boards for shipment is intended to provide temporary protection from moisture exposure during transit only and is not intended to provide protection during storage after delivery.

.6 All materials shall be adequately protected and permanently stored in a dry, well ventilated and weatherproof location. Only materials to be used the same day shall be removed from this location. During winter, materials shall be stored in a heated location with a 10 degrees Celsius minimum temperature, removed only as needed for immediate use. Materials shall be kept away from open flame or welding sparks.

.7 Boards and thermal insulation, and other material stored outside shall be stored level and off the ground and protected by a properly secured waterproof covering. Provide means for air circulation around and under stored bundles of gypsum boards. Use adequate supports to keep the bundles flat, level, dry and off wet grounds/roofs.

.8 Materials delivered in rolls shall be carefully stored on end, with selvage edges up. Metal flashings and counter-flashings shall be stored in such a way as to prevent wrinkling, twisting, scratches and other damage.

.9 Store rolls of felt and membrane in upright positions. Store membrane rolls with selvage edges up.

.10 Store all thermal insulation panels protected from weathering elements and deleterious materials.

.11 The Contractor shall avoid stockpiling of materials on roofs or suspended slabs, which could, at certain places, affect the loading of such roofs or suspended slabs.

.12 Provide and maintain dry, off-ground weatherproof storage.

.13 Remove only in quantities required for same day use.

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

.15 Store sealants at +5 degrees Celsius minimum when required by material manufacturer.

.16 Prevent contact with materials which may cause discoloration or staining.

1.13 Environmental requirements

.1 Do not install new material when temperature remains below -18 degree Celsius for torch application, or to manufacturers' recommendations application temperature.

.2 Minimum temperatures for solvent-based adhesive is -5 degree Celsius, or as per material manufacture's printed instructions.

.3 Do not install sealants when temperature is at or remains below limit set by the material manufacturer.

.4 Install new material on dry surfaces, free of snow and ice, use only dry materials and apply only during weather that will not introduce moisture into new assembly.

1.14 Permits, inspection & approval certificates

.1 The Client shall apply and pay for the Building Permit (if required). Contractor will be responsible to close the permit.

.2 The Contractor shall be responsible for, and shall pay all costs, for all other permits, tests, inspections and certificates, as required by the local municipality and all regional, provincial, and federal authorities having jurisdiction.

.3 The Contractor shall comply with all by-laws, ordinances, and safety requirements of all authorities having jurisdiction.

.4 Copies of inspection/approval certificates must accompany any invoices.

1.15 Standards & codes

.1 All Standards, Codes, Regulations, Contract Forms, Manuals, Installation, Application and Maintenance Instructions, referred to in this specification, unless otherwise specified, shall be understood to be the latest published edition including all amendments.

.2 The laws of the place of the work shall govern the work.

1.16 Certification of materials

.1 Prior to the commencement of any work, obtain written certification from the manufacturer(s) of the suitability of the materials selected to the applications required, and that all materials used are compatible with each other and with existing materials.

.2 If the material designated for a given application is not certifiable, provide alternate, certifiable materials for the application and submit the change to the Consultant for review.

1.17 Compatibility

.1 Compatibility between components of the specified system under this contract is essential. Provide written declaration from material's manufacturer to Client/Consultant, stating that materials and components, as assembled in system, meet this requirement and are compatible to each other.

1.18 Manufacturer's representative

.1 The material manufacturer can delegate a representative to visit the work site at commencement of work. It is anticipated that the manufacturer will assign a technical representative to visit the site during the execution of the work to ascertain proper application of their products. The said representative shall inform the Client/Consultant of their visit(s).

.2 At all times, the Contractor shall permit and facilitate access to the work site and all associated areas to said manufacturer's representative.

1.19 Protection

.1 The building will remain occupied during the work; therefore it is essential that access to the existing building be maintained at all times. It is also required from the Contractor to install interior and exterior temporary protection below all construction areas during the project.

.2 Supply and install a construction barrier around the work areas and directly below all work areas, including overhead protection hoarding. The Client/ Consultant shall approve the construction barrier around the work areas, and hoardings.

.3 Maintain all emergency and service access routes clear at all times. Provide all barricades and signs necessary to direct vehicular and pedestrian traffic around construction areas.

.4 Protect all trees and planting areas that are to remain, in accordance with the General Conditions. Make good all damage at no extra cost.

.5 Protect, relocate and maintain existing, active services wherever they are encountered.

.6 Erect suitable safety barriers as required for security and to make the site safe for pedestrians.

.7 Construct and maintain hoardings, covered ways and protective canopies as required to maintain access to the building and public safety. Erect hoarding around all work and storage areas.

.8 Construct hoarding to minimum height of 2400 mm using, but not limited to, plywood sheets, suitable columns, and steel/wood framing.

.9 Take precautions to protect openings made in existing building from entry of elements and of persons during construction and to protect existing structure and finishes from damage.

.10 Provide suitable protection to prevent rain, ground water, frost, and snow or wind damage to exposed sections of the building.

.11 Provide adequate securement of any object placed and/or stored on roof(s) against wind. Ensure that nothing can be airborne or fly-off roof(s) during wind events.

.12 Adequately protect the work at all stages, and maintain the protection until the work is completed. Remove and replace any work and materials damaged that cannot be satisfactorily repaired at no extra cost.

.13 Damaged work shall be made well by the original trade, but at the expense of those causing damage.

.14 Provide and maintain in accordance with applicable provincial and municipal

regulations and NBC, all necessary precautions during execution of the work to fully protect occupants, public and Clients from loss, damage, death or injury through neglect, carelessness or incompetence of Contractor, his employees, or SubContractors including the condition of his equipment.

.15 Protect building, roof, terraces, and all site surfaces from construction activities and be responsible for the repair of any damage.

.16 Provide a protective barrier between the work areas and the building interior to maintain non-work areas usable and dust-free. Protective barrier shall be capable of withstanding potential weather damage and/or vandalism, and shall fully protect occupants from the Work.

.17 Dusty operations shall be contained behind dustproof enclosures. Protect building interior from the intrusion of dust, smoke, odours, chemical contamination, or any other debris resulting from the work for the duration of project. It is required from the Contractor to supply and install dust proof enclosure(s) on the interior of the facility at all work area for a distance of minimum 1.2m away from the interior side of the wall cladding 'CL1'. Contractor is also required to temporary tape all doors and doorframes of any/all rooms where dusty operations are taking place. Furthermore, contractor is required to coordinate with facility staff on daily basis in order to temporary cover with dust proof material and tape all building air duct supplies/returns and bag all interior sensors and heat detectors where dusty operations are taking place.

.18 Protect floor and wall surfaces during the Work from all construction activities by using exterior plywood sheathing panels.

.19 Do not load any part of the structure during the work with loads greater than it is calculated to bear safely when completed. Make all temporary supports as strong as permanent support.

.20 Engage and pay for the services of a Professional Engineer registered in the Province of Ontario to design and supervise construction and maintenance of all temporary shoring.

.21 Verify the location of garbage bin prior to delivery, to avoid placement of bin over any suspended slabs, unsound grounds and hazardous areas on site. If the garbage bin or any heavy material and/or equipment should be placed over suspended slabs, such as underground garages, trenches, etc..., provide signed and sealed engineered shop drawings and load calculations to Consultant, to avoid overloading of the slab. Allow for all measures to be taken as a result of engineered shop drawings, such as shoring of the slab as required to carry out the replacement project.

.22 Do not remove any area of the existing clad wall assembly on daily basis that can't be covered, watertight and completed with the new roofing system on the same day. At no time any area of the building and/or roof shall remain exposed overnight.

.23 Protect all work areas and ensure no leaks occur during the construction phase. In the event that work performed by the Contractor resulted in leak(s) into the building, adjacent areas to the building, or outside the building;

Contractor will be responsible to immediately repair areas to stop leak(s), and repair and/or replace all damages resulted from the leak(s) to the satisfaction of the Client. In addition, Contractor is responsible to carryout follow-up visits to the leak(s) area(s) to ensure all leak(s) have stopped and no longer persisting.

.24 Ensure that the existing underground, drives and parking areas around the building are maintained and protected at all times during all phases of construction.

1.20 Plant & machinery

.1 Provide all form work, motorized lifts, scaffolding, equipment, tools and machinery for the proper execution of the work.

.2 When machinery weight is excessive, the existing walls and slabs shall be properly shored during repair operations where appropriate.

.3 Construct and maintain scaffolding in a secure and safe manner. Erect scaffolding independent of walls. Use scaffolding in such a manner as to interfere as little as possible with other trades, traffic, or with normal usage of the building.

.4 Take all necessary precautions to adequately protect the building, paving and landscape materials, including shrubs and trees, from damage.

.5 Make good at no extra cost and to the satisfaction of the Client any damage resulting from the provision and/or usage of form work, scaffolding, etc. Maintain all public, fire and maintenance access to and from the building.

1.21 Scaffolding

.1 Install overhead protection hoarding and scaffolding at the outside of the building access doors, on the ground level as required. Design scaffolding to safely support the loads it will be subjected to during the Work. Erection of scaffolding shall be by the scaffolding supplier.

.2 All scaffolding shall be designed and approved in the field by a Professional Engineer registered in the Province of Ontario and experienced in scaffolding design.

.3 The Contractor shall provide and pay for the design and preparation of all temporary scaffolding shop drawings. The shop drawings shall bear the seal of the approved Professional Engineer.

.4 Scaffolding shall be installed in accordance with the reviewed and approved shop drawings, and shall be reviewed by the Contractor's scaffolding design engineer prior to commencement of any work.

.5 Comply with the requirements of the Occupational Health and Safety Act and Regulations for Construction Projects, latest edition, and with guidelines/data sheets published by the Construction Safety Association of Ontario.

.6 The scaffolding supplier and Contractor shall work together to provide proper maintenance and service to the scaffolding, ensuring safety at all times.

.7 Provide, install and maintain all barricades, warning signs, temporary marking, etc., as may be necessary for protection of the public below and around the construction area.

1.22 Temporary services

.1 The existing electrical service may be used as a temporary service for lighting and the operation of electrical tools and motors during construction to the extent that there is sufficient capacity. Where capacity is insufficient, provide a temporary electrical service. Arrange with Client's representative on site for use of existing services and avoid overloading of circuits. Where necessary to complete the Work, remove existing electrical elements and provide temporary elements as required at no additional cost to the Contract. Re-install all elements following completion of the Work to their original condition and satisfaction of Client.

.2 The existing water service may be used as a temporary service during construction to the extent that there is sufficient capacity. Where capacity is insufficient, provide a temporary water supply. Arrange with Client's representative on site for the placement of supplied water containers. Where necessary to complete the Work, remove existing plumbing elements and provide temporary elements as required at no additional cost to the Contract. Re-install all elements following completion of the Work to their original condition and satisfaction of Client.

.3 The Client will pay for the cost of the power supply for the existing service only. Any additional cost to the existing services as a result of this project shall be paid by the Contractor.

.4 Extension cords shall be supplied by the trade performing the work.

1.23 Building access

.1 Workers are not permitted access to the building interior without prior authorization from the Client.

1.24 Inspection

.1 Give timely notice when any phase of the work is ready for review and notice in writing when the work is complete and ready for final review. The Contractor shall notify the Consultant and inspection and testing agencies not less than 48 hours prior to each part of the work being ready for review or testing.

.2 All materials are subject to inspection by the Consultant on arrival on the site. Any materials not meeting the specifications will be rejected and must be removed from the site immediately.

.3 Allow in the Contract Amount for the costs associated with providing facilities and access for inspections of the work, excluding the cost of the Consultant's time which will be paid for by the Client.

.4 The Consultant shall measure quantities of Unit Price items after preparation is complete but prior to placement of the materials. Provide access for measurements. Do not allow materials to be placed until Consultant has measured quantities.

.5 The cost of re-inspection due to deficient work will be the Contractor's responsibility, including the cost of the Consultant.

.6 Allow for in the Contract Amount, all costs associated with providing facilities and access for inspection of the work required by the manufacturers of the specified materials.

.7 Immediately notify the Consultant of any unforeseen conditions encountered during the execution of the work which:
  .1 Requires correction or repair, in the good judgment of the Contractor, in conjunction with the work of the Contract or in order that the work of the Contract may proceed and for which Changes in the Work are required to be made, or,
  .2 Represents a quantity of work that is appreciably greater than that foreseen, as generally defined by the Contract.

.8 Prior to demobilization from the site, the work shall be reviewed & inspected by the Client, Consultant and the Contractor. All outstanding work, defects and deficiencies noted and non-compliances with these specifications or the recommendations of material manufacturer shall be corrected immediately.

1.25 Maintenance

.1 Maintain all parts of the work from the time of installation until final acceptance.

.2 Report immediately, in writing to the Consultant, all incidents of damage to the installation by vandals, prior to acceptance.

1.26 Warranty

.1 Comply with all warranty procedures required by manufacturer, including notifications, scheduling, and inspections.

.2 Warrant all work for the period specified from the date of acceptance. Where not noted otherwise, the minimum period for warranty shall be two (2) years.

.3 Asphalt Shingle Roofing:
  .1 Manufacture Warranty: The product manufacturer shall supply the owner with a written and signed document, certifying the performance of his/her products and the consistency of the properties of such products affecting their performance for a period of time as per Manufacturer's Standard Warranty period. Minimum warranty period by the manufacturer shall not be less than Fifteen (15) years.
  .2 Contractor Warranty: The roofing contractor shall supply the owner with a written and signed document, certifying that all work completed shall remain as installed, free from any roofing defects, and leaks for a period of Two (2) years from date of acceptance. The warranty document shall state that the roofing contractor will be responsible for the repair of any defects within the roofing system and/or damages caused to the building elements and occupant's belonging as a result of roofing defects and/or leaks for the duration of the warranty period. Comply with all warranty procedures required by manufacturer, including notifications, scheduling, and inspections

.4 Slope Metal Roofing:
  .1 Manufacture Warranty: Provide a manufacturer's written warranty: Furnish panel manufacturer's written warranty covering failure of factory-applied exterior finish within the warranty period. Warranty period for forty (40) years after the date of Substantial Completion. The values below are based on normal environments and exclude any aggressive atmospheric

conditions.

.2 Contractor Warranty: For work in this section, warranty by installer against defects or deficiencies in materials or workmanship shall be for a period of two (2) year from the date of substantial completion.

.5 Flashing and Sheet Metal:

.1 The work described in Section 07 60 00 – Flashing and Sheet Metal shall be guaranteed against all defects and deficiencies in materials and workmanship for a three (3) year period from the date of Substantial Performance of the Work.

.2 Submit each warranty:

.1 Identifying the party as warrantor/guarantor.

.2 Issued in both the Contractor's and Owner's names.

.3 Including labour and materials for removal, repair and/or replacement of products provided as part of the Work and adjacent damaged materials.

.3 The warranty shall cover the replacement or repair of the Work of this Section resulting from faulty materials and/or workmanship.

.4 Promptly correct, at no expense to the Owner, any defects or deficiencies that become apparent within the warranty period.

.6 Sealant:

.1 The work described in Section 07 90 00 – Joint Protection shall be guaranteed against all defects and deficiencies in materials and workmanship for a minimum five (5) year period, or sealant manufacturer's standard period of warranty from the date of Substantial Performance of the Work.

.2 Best & Better Choice Sealant – 20 year Weatherseal Warranty (DC 790) by the manufacturer.

.3 Defects include, but are not limited to, sag, air pockets, wrinkles, ridges, embedded foreign materials, failure in adhesion or cohesion, air and moisture leakage, staining of adjacent materials, cracking, crumbling, melting, shrinkage, running, bubbling, or change of colour.

.4 Submit each warranty:

.1 Identifying the party as warrantor/guarantor

.2 Issued in both the Contractor's and Owner's names

.3 Including labour and materials for removal, repair and/or replacement of products provided as part of the Work and adjacent damaged materials.

1.27 Clean up & removal of rubbish

.1 As work proceeds and at the completion of the work each day remove all debris, garbage and surplus material from the site.

.2 Clean all roof/work areas, interior spaces below work area, and grounds around building at the end of each working day. Remove all construction debris from site on daily basis and as frequently as required to keep site clean at all times.

.3 Provide and keep during the duration of the contract a garbage bin on site.

Location to be approved by the Consultant and the Client's representative. Empty bin as frequently as required to avoid spillage of debris.

.4 Obtain Client's approval of the location(s) of disposal bin(s).

.5 Storage of debris outside disposal bin will not be allowed overnight.

.6 Cleaning of the area of the work shall include, but not be limited to:

.1 The removal of rubbish and other unsightly material and/or debris from the face of the building, adjacent ground areas, interior of the building and from the roof and terrace surfaces.

.2 Use of magnet to collect all and any nails or fasteners fallen to ground below the work area being done.

.3 The removal of dust and other debris from the window frames and sills by brushing and/or other suitable methods.

.7 Power sweep paved surfaces to remove earth contamination resulting from construction activities prior to final acceptance.

.8 Immediately remove all garbage and debris from site upon completion of the overall project.

1.28 Make good

.1 Contractor will be held responsible for repairs to any elements if damaged during the construction project period. Repairs shall take place immediately to the satisfaction of the Client.

.2 Make good to all damages resulting from work carried out under this Contract. Restore and blend to match surrounding existing conditions.

.3 Unless otherwise specified or required by codes or by-laws to meet a certain requirement or both, make good new work to match existing work.

.4 Where existing work is to be made good, the new work shall match the old work in material, construction and finish, unless otherwise noted or specified.

.5 Leave landscaping, including sod, walkways, pavers, pots, flower beds, shrubs, trees, furniture, and the like, in a clean condition. Re-instate any damaged sections in the result of the construction to the original state at all locations.

1.29 Project & work schedule

.1 The Project Schedule:

.1 Project Start Date: Project must commence before March 1st, 2025.

.2 Construction Start Date: Construction activities must commence before April 1st, 2025.

.3 Completion Date: Construction activities must be at 100% total completion prior to August 27th, 2025,

.2 Submit a written work schedule showing the timing of all phases of the work for approval by the Client within Ten (10) days of the award of the project. This schedule shall encompass the entire project.

.3 Hours of work on the site shall be first approved by the Client.

.4 Noisy and dust raising operations may only be carried out between hours set by local authorities/municipality by-laws, and/or instructed by the Client.

.5 No work shall be performed on Sundays or Statutory Holidays. Work on Saturday maybe allowed if authorized by the Client and allows by local

authorities/municipality by-laws.

.6 All work hours shall comply with the local noise bi-laws of authorities having jurisdiction.

.7 Seventy-two (72) working hours notice will be required for work to be performed outside the designated times detailed herein. Include for all overtime for work carried out outside normal working hours.

1.30 Shop drawings & samples

.1 Contractor shall submit engineered shop drawing(s) for:
- .1 New Engineered Slope Metal Roofing.
- .2 New Engineered Snow Retention System for Slope Metal Roofing
- .3 Scaffolding and overhead protection.

.2 Shop drawings shall indicate installation method, materials, finishes, sizes, positive slope for tapered layout, accessories, installation instructions, any applicable load calculations, references to regulatory codes/OBC, etc.

.3 Shop drawings shall be designed and stamped by a licensed Professional Engineer having jurisdictions in the Province of Ontario, where required.

.4 Submit two (2) copies of Technical Data Sheets and Safety Data Sheets (Formerly: Material Safety Data Sheets MSDS) for all materials.

.5 No fabrication, delivery and or installation shall commence until all shop drawings have been approved by the Consultant.

.6 Submit two (2) hard copies and one electronic copy of all shop drawings to the Consultant. The Contractor shall check, correct, date, stamp reviewed and sign all shop drawings before submission. The Consultant will review all submissions and will return them to the Contractor. The Consultant's review is for general arrangement only, and review does not relieve the Contractor of responsibility for errors, omissions, or conforming to the Contract documents without prior written permission from the Consultant.

.7 Copies of all reviewed shop drawings shall be kept on the site in a neat orderly condition. Only copies marked with the Consultant's review stamp shall be permitted on the site.

.8 Submit for review samples in single set as requested in respective specification Sections. Label samples as to origin and intended use in the Work.

.9 As a minimum, submit one sample of the following for review and approval by the consultant:
- .1 Slope metal roof panel,
- .2 Asphalt shingles,
- .3 Eavestroughs and gutters,
- .4 Downpipes,
- .5 Roofing Membrane,
- .6 Prefinished Sheet Metal Flashing,
- .7 Sealants,
- .8 Colour of paint drawdowns,
- .9 All submittals shall include colour charts.

.10 Deliver samples prepaid to Consultant's business address.

.11 Notify the Consultant in writing, at the time of submission, of any deviations in samples from requirements of Contract Documents.

.12 Adjustments made on samples by the Consultant are not intended to change the Contract Price. If adjustments affect the value of Work, state such in writing to the Consultant prior to proceeding with the Work.

.13 Make changes in samples that the Consultant may require, consistent with Contract Documents.

1.31 The work

.1 Where the drawings or specifications call for the work to be performed by a specific Contractor or SubContractor, it implies only that the work is of such nature or trade. The Contractor is fully responsible for all of the work performed under the Contract, including determining which trade or section performs the work.

.2 It is the Contractor's responsibility to ensure the work of all SubContractors is in full conformity with the Contract documents.

1.32 Security/safety restrictions

.1 A list of all Contractors and SubContractors working on the project must be forwarded within twenty-four 24 hours of request to the Consultant.

.2 It is the Contractor's responsibility to maintain a clean and safe workplace.

.3 Workers are required to wear proper safety protection. Safety boots are to be worn at all times. Hard hats are to be work where overhead work is being performed. Eye, nose and ear protection is to be worn where required. Shirts must be worn at all times. No shorts are allowed.

.4 There will be no smoking in any part of the building or meeting areas of the construction site.

.5 Parking on Site: Parking will only be allowed for construction vehicles to load and unload construction materials, tools, equipment and staff. Parking is not allowed for workers personal vehicles anywhere on site. Vehicles are subject to be towed at Contractor's expense. Contractor vehicles will not be allowed to park in garbage pick-up areas around the building. In the event that Contractor parks their vehicles in areas as designated for garbage pickup, and the garbage truck is unable to access area(s), the cost associated with building garbage disposal company will be forwarded to the Contractor for payment.

1.33 Changes to the contract

.1 No changes to the scope of work is allowed without prior authorization from the Client and Consultant in a form of an official Change Order signed by all parties.

.2 Any work performed by the Contractor outside the scope of these documents (specifications & project drawings) without a signed Change Order will not be considered for payment by the Client. The Client and Consultant may request from the Contractor to remove extra untheorized work at no cost to the contract.

End of Section 01 00 00

Part 1 - General

1.1 Section includes

.1 Meetings.
.2 Coordination.

1.2 Meetings

.1 Provide physical space and make all arrangements for meetings according to the requirements of Section 01 00 00, General Requirements.
.2 During the course of Work and two (2) weeks prior to project completion, schedule a progress meeting.
.3 Contractor's representative shall record the meeting minutes. Type, reproduce and distribute copies of minutes to all meeting participants and those otherwise identified by the Owner, Consultant or Contractor as requiring same.
.4 Review previous minutes during next scheduled meeting and record all clarifications, errata, objections, and changes to the previous minutes in the next minutes.

1.3 Coordination

.1 Incorporate mutually agreed variations to Contract Documents into Agreement, prior to signing.
.2 Allocate areas of site for field offices and sheds, for storage of materials, access, traffic, and parking facilities.
.3 During construction, coordinate use of site and facilities in cooperation with Owner. Completely follow through with all procedures for submittals, reports, records, schedules, coordination of drawings, recommendations, resolution of ambiguities, and settling of conflicts according to the Contract Documents.
.4 Provide information required for preparation of coordination drawings. Review and approve revised drawings for submission to Consultant.

1.4 Preconstruction meeting

.1 Within five (5) days after award of Contract, request a meeting of parties in Contract to discuss and resolve administrative procedures and responsibilities.
.2 Owner's representative, Consultant, Contractor and major Subcontractors to be in attendance.
.3 Establish time and location of meeting and notify parties concerned minimum five (5) working days before meeting.
.4 Review with Owner and consultant all mutually agreed variations to the Contract Documents that are incorporated into the Agreement.
.5 Agenda to include the following:
  .1 Appointment of official representatives of participants in the Work.
  .2 Schedule of Work, progress scheduling.
  .3 Schedule of submission of shop drawings, samples, colour chips.
  .4 Requirements for temporary facilities, offices, storage sheds, utilities, fences.
  .5 Proposed changes, change orders, procedures, approvals required, mark-up percentages permitted, time extensions, overtime, administrative

requirements.
.6 Take-over procedures, acceptance, warranties.
.7 Monthly progress claims, administrative procedures, holdbacks (GC).
.8 Transcript of insurance policies.

1.5 Progress meetings

.1 During course of Work and two (2) weeks prior to project completion, schedule a progress meeting.
.2 Contractor, major Subcontractors involved in Work, Consultant, and Owner's representative are to be in attendance.
.3 Notify parties minimum five (5) days prior to meetings.
.4 Contractor's representative shall record the minutes. Type, reproduce and distribute copies of minutes within three (3) business days and transmit to meeting participants, affected parties not in attendance, the Consultant and the Owner.
.5 Agenda to include the following:
.1 Review, approval of minutes of previous meeting.
.2 Review of Work progress since previous meeting.
.3 Field observations, problems, and conflicts.
.4 Problems that impede construction schedule.
.5 Review of off-site fabrication delivery schedules.
.6 Corrective measures and procedures to regain projected schedule.
.7 Revision to construction schedule.
.8 Process schedule, during succeeding work period.
.9 Review submittal schedules: expedite as required.
.10 Maintenance of quality standards.
.11 Review proposed changes for effect on construction schedule and on completion date.
.12 Other business.

End of Section 01 31 00

Part 1 - General

1.1 Section includes

.1 Administration.
.2 Shop Drawings and product data.
.3 Samples.
.4 Certificates and transcripts.

1.2 Administration

.1 Submit to Consultant submittals listed for review promptly and in orderly sequence to avoid any delay in the Work. Failure to submit in ample time is not considered sufficient reason for an extension of Contract Time and no claim for extension by reason of such failure will be allowed.
.2 Work affected by the submittal shall not proceed until review is complete.
.3 Review all submittals prior to submission to the Consultant. This review represents that necessary requirements have been determined and verified, or will be, and that each submittal has been checked and coordinated with the requirements of the Work and the Contract Documents. Submittals not stamped, signed, dated and identified as to the specific project will be returned without being examined and shall be considered rejected.
.4 Verify field measurements of all affected adjacent areas. Work shall be coordinated.
.5 Contractor's responsibility for errors and omissions in submission is not relieved by Consultant's review of submittals.
.6 Contractor's responsibility for deviations in submission from requirements of Contract Documents is not relieved by Consultant's review.
.7 Keep one (1) reviewed copy of each submission on site.

1.3 Shop drawings and product data

.1 The term Shop Drawings means drawings, diagrams, illustrations, schedules, performance charts, brochures and other data which are to be provided by the Contractor to illustrate details of a portion of the Work.
.2 Indicate materials, methods of construction and attachment or anchorage, erection diagrams, connections, explanatory notes and other information necessary for completion of Work. Where articles or equipment attach or connect to other articles or equipment, indicate that such items have been coordinated, regardless of the Section under which the adjacent items will be supplied and installed. Indicate cross-references to design drawings and specifications.
.3 Adjustments made on Shop Drawings by the Consultant are not intended to change the Contract Price. If adjustments affect the value of Work, state such in writing to the Consultant prior to proceeding with the Work.
.4 Make changes in Shop Drawings as the Consultant may require, consistent with Contract Documents. When resubmitting, notify the Consultant in writing of any revisions other than those requested.
.5 Submit one (1) transparency and three (3) prints of Shop Drawings for each requirements requested in specification Sections and as the Consultant may reasonably request.

.6 Submit six (6) copies of manufacturer's printed product literature, specifications, product data sheet, brochures, and installation instructions for all products requested in specification Sections and as the Client/Consultant may request where Shop Drawings will not be prepared due to standardized manufacture of product.

.7 If upon review by the Consultant, no errors or omissions are discovered or if only minor corrections are made, the transparency will be returned and fabrication and installation of Work may proceed. If Shop Drawings are rejected, noted copy will be returned and re-submission of corrected Shop Drawings, through the same procedure indicated above, shall be performed before fabrication and installation of Work may proceed.

.8 All Shop Drawings shall be designed and stamped by a licenced Professional Engineer having jurisdictions in the Province of Ontario.

1.4 Samples

.1 Submit for review samples in triplicate as requested in respective specification Sections. Label samples as to origin and intended use in the Work.

.2 Deliver samples prepaid to Consultant’s business address.

.3 Notify the Consultant in writing, at the time of submission, of any deviations in samples from requirements of Contract Documents.

.4 Adjustments made on samples by the Consultant are not intended to change the Contract Price. If adjustments affect the value of Work, state such in writing to the Consultant prior to proceeding with the Work.

.5 Make changes in samples that the Consultant may require, consistent with Contract Documents.

1.5 Certificates and bonds

.1 Provide all valid bond documents immediately as requested by the Owner.

.2 Upon expiration of any certificate, immediately provide new valid certificate to the Owner and Consultant.

.3 Contractor shall notify all bonding authorities and insurance provider, on a regular and frequent basis, of all changes to the Work and mutually agreed variations to the Contract Documents. Written copies of such notices shall be copied to both the Owner and Consultant.

End of Section 01 33 00

Part 1 - General

1.1 Related Documents:

.1 All Drawings and Specifications apply to this Section.

1.2 Provide Mock-up for the following:

.1 2m x 2m section of the new roofing assembly and flashing system at the eaves of the roof, complete with all flashing membrane, metal flashing, fasteners, sealant, etc. as shown on project drawings.

.2 1m section of new provisional snow retention system.

.3 2.4m x 2.4m of new provisional 9.5mm plywood sheathing over the existing wooden roof deck.

1.3 Install mock-up only after all Shop Drawings have been approved.

1.4 Mock-ups shall be complete in all respects and shall represent the final complete system.

1.5 Construct mock-ups in location and orientation at Project site approved by Consultant.

1.6 Do not place orders for materials, and do not fabricate until mock-ups are approved.

1.7 Proved forty-eight (48) hour notice to Consultant for review of Mock-ups. Where review of mock-ups may require revisions, Contractor to make the required revisions free of charge.

1.8 Do not install mock-up components or materials in the completed Project.

1.9 Mock-ups shall be removed and disposed of upon approval, and may not become part of the finished work.

1.10 Design and provide structural framework assemblies as required in order to support and display mock-ups.

1.11 There shall be no cost to the Contract for the preparation, display, review, modifications, and revisions of Mock-ups.

Part 2 - Products not used

Part 3 - Execution not used

End of Section 01 43 39

Part 1 - General

1.1 Section includes

.1 Inspection and testing, administrative and enforcement requirements.

1.2 Related requirements

.1 Section 01 00 00 – General Requirements

1.3 Inspection & testing

.1 All work will be inspected for quality assurance by the Consultant, except as noted.

.2 The Contractor is responsible to retain the services of sub-trades, testing and inspection companies as specified for parts of work being performed under this contract, or as a whole. Cost associated for these inspections and testing shall be part of the contract base bid amount and paid by the Contractor.

.3 Sealant Test:

.1 Contractor to follow material manufacturer's printed instructions and recommendations for test methods and procedures for surface preparation and adhesion of new Sealants. It is anticipated that at least six (6) adhesion tests will be performed on the newly installed joint sealants at random locations. Contractor shall coordinate all testing with the testing company and consultant. The cost for testing will be paid through contract Testing Allowance as approved by Owner/Consultant.

.4 Water Test:

.1 Perform one (1) water test upon successful installation of new wall assembly at the first section where wall is completed from top to bottom. The water test shall be performed in accordance with water pressure required in ASTM E1105 – 15 Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Skylights, Doors, and Curtain Walls, by Uniform or Cyclic Static Air Pressure Difference. The water test shall be performed by the Contractor for a minimum period of 4 hours with the Consultant present on site. Contractor is responsible for exterior and interior access during water test. Water supply is located onsite and can be used by the Contractor. However, water pressure may not be sufficient for testing. Contractor is responsible to provide pumps as required to produce required water pressure. The cost for testing will be paid through contract Testing Allowance as approved by Owner/Consultant.

.5 The Owner will pay the cost(s) of inspection(s) except where inspection(s) reveal work not in accordance with the Contract. The Contractor shall bear the cost of such inspection(s) and test(s) as may be required by the Consultant to verify the acceptability of corrected work, including but not limited to Infrared Thermographic scan, cut test(s) opening, moisture probe test(s) of new assembly if believed to be wet by the Consultant due to leak(s) during construction phase.

.6 The Contractor shall advise the Consultant not less than twenty-four (24) hours prior to the recommencement of any work to be inspected or tested, and ensure that proper facilities and co-operation are provided and that no

work is carried out without the required inspection and testing.

.7 Promptly provide Consultant with safe access to all parts of the work requiring inspection.

.8 The inspection of the work shall in no way relieve the Contractor from his responsibilities and guarantees as required under this contract.

.9 Supplementary quality assurance observations and inspections may be made by product manufacturer representative(s). The Contractor shall provide safe access to the work for this purpose.

1.4 Rejected work

.1 All deficiencies noted in the reports of the Consultant submitted during the course of the work and those noted in the final report following the nominal completion to the work shall receive the immediate attention of the Contractor, and shall be rectified within five (5) business days after reported to the Contractor. Subsequent to correction of such deficiencies, the Contractor shall notify the Consultant in writing to enable the corrective work to be effectively re-inspected.

End of Section 01 45 00

Part 1 - General

1.1 Section includes

.1 Cleaning.
.2 Project record documents.
.3 Spare parts and maintenance materials.
.4 Take over procedures.

1.2 Progressive cleaning

.1 Maintain the work in tidy condition, free from accumulation of waste products and debris.
.2 Make arrangements with and obtain permits from authorities having jurisdiction for disposal of waste and debris.
.3 Remove waste material and debris from the site and deposit in waste container at the end of each working day.
.4 Clean interior areas prior to start of finish work; maintain areas free of dust and other contaminants during finishing operations.

1.3 Final cleaning

.1 Remove waste products and debris and leave the work clean and suitable for occupancy by Owner.
.2 Remove surplus products, tools, construction machinery and equipment. Remove waste products and debris other than that caused by the Owner or other Contractors.
.3 Clean and polish all exposed glass surfaces and metal frames affected by the Work. Replace broken, scratched or disfigured glass.
.4 Remove stains, spots, marks and dirt from decorative work, electrical and mechanical fixtures, furniture fitments, walls, floors and ceilings other than that which is caused by the Owner or other Contractors.
.5 Broom clean and wash exterior walks, steps and surfaces other than that which is caused by the Owner or other Contractors.

1.4 Project record documents

.1 Submit one (1) copy of complete volumes in final form seven (7) days prior to Substantial Performance.
.2 Copy will be returned with Consultant's comments. Revise contents of documents as required prior to final submittal.
.3 One (1) week prior to Substantial Performance of the Work submit to the Consultant two (2) final copies of operating and maintenance manuals.
.4 Organize data in the form of an instructional manual in binders of commercial quality, 8 ½ x 11 inch maximum ring size.
.5 Cover: identify each binder with typed or printed title Project Record Documents; list title of Project, identify subject matter of contents.
.6 Arrange contents under Section numbers and sequence for Table of Contents.
.7 Provide tabbed fly leaf for each separate product and system, with typed description of product and major component parts of equipment.
.8 Contract Drawings & Shop Drawings: Provide with reinforced punched bind tab. Bind in with text; fold larger drawings to size of text pages.

.9 As-Built Drawings: It is the responsibility of the Contractor for keep track of any changes, supply and submit As-Built drawings. Provide with reinforced punched bind tab. Bind in with text; fold larger drawings to size of text pages.

.10 For Each Product or System: List names, addresses and telephone numbers of subcontractors and suppliers, including local source of supplies and replacement parts.

.11 Product Data: Mark each sheet to clearly identify specific products and component parts, and data applicable to installation; delete inapplicable information.

1.5 Final inspection and declaration procedures

.1 Contractor's Inspection: The Contractor and all Subcontractors shall conduct an inspection of the Work, identify deficiencies and defects; repair as required. Notify the Consultant in writing of satisfactory completion of Contractor's Inspection and that corrections have been made. Request a Consultant's Inspection.

.2 Consultant's Inspection: Consultant and Contractor will perform an inspection of the Work to identify obvious defects or deficiencies. The Contractor shall immediately correct Work accordingly.

.3 Completion: submit a written certificate that the following have been performed:

.1 Work has been completed and inspected for compliance with Contract Documents.

.2 Defects have been corrected and deficiencies have been completed,

.3 Work is complete and ready for Final Inspection.

.4 Final Inspection: When the items noted above are completed, request a final inspection of the Work by the Owner and Consultant. If the Consultant deems Work incomplete, complete the outstanding items and request a re-inspection.

.5 Declaration of Substantial Performance: When the Consultant considers deficiencies and defects have been corrected and it appears requirements of the Contract have been substantially performed, make application and publish for certificate of Substantial Performance.

.6 Commencement of Lien and Warranty Periods: The date of the Owner's acceptance of the submitted declaration of Substantial Performance shall be the date for commencement for the warranty period and commencement of the lien period unless required otherwise by the lien statute of the Place of Work.

.7 Declaration of Total Performance: When the Owner and Consultant consider final deficiencies and defects have been corrected and it appears requirements of the Contract have been totally performed make application for certificate of Total Performance. If the Owner and or Consultant deem Work incomplete, complete the outstanding items and request a re-inspection.

.8 Final Payment: Following completion of the lien period, submit claim for final payment in accordance with the General Conditions.

1.6 Re-inspection

.1 Should status of the Work require re-inspection by Consultant due to failure of Work to comply with Contractor's claims for inspection, Owner may deduct amount of Consultant's compensation for re-inspection services from payment to Contractor.

End of Section 01 77 00

Part 1 - General

1.1 Standards

.1 Read and conform to the requirements in Division 1 which form an integral part of the specifications.

.2 This section specifies the work related to the removal and disposal of existing clad wall assembly and associated glazing systems, sheet metal and all other accessories.

1.2 Shop drawings:

.1 Refer to Section 01 00 00 “General Requirements”, Shop Drawings & Samples, and requirements of Section 01 33 00 “Submittal Procedures”.

1.3 Existing condition

.1 Review "Designated Substance Report" and take precautions to protect environment.

.2 Adjacent areas which are not part of this contract shall be maintained in good condition before, during and after the construction activity.

.3 Should any suspected designated substances be encountered, work shall stop and the consultant shall be notified. Work shall not proceed thereafter until a written notice issued by the consultant.

1.4 Protection

.1 Prevent movement, settlement, or damage to adjacent structures, utilities, and landscaping features, and parts of building to remain in place. Provide bracing and shoring required to carry out the specified work.

.2 Keep noise, dust, and inconvenience to occupants to minimum.

.3 Protect building systems, services and equipment.

.4 Provide temporary dust screens, covers, railings, supports and other protection as required.

.5 Fire Extinguishers: maintain one (1), ULC labelled extinguisher for A, B and C class protection, on roof per applicator, within ten (10) meters of any open flame application area, or where open flame is used on site.

.6 Maintain fire watch as required by local regulations and codes during and after construction operations cease.

.7 It is the responsibility of the contractor to prevent any damage to the adjacent buildings and their services as well as the working area.

.8 The contractor shall prevent debris from blocking drainage points.

.9 During construction work, exposed surfaces of finished walls shall be protected with tarps in order to prevent damage. The contractor shall assume full responsibility for any damage.

.10 Make good damage caused by demolition to the satisfaction of Client.

Part 2 - Products

Not used

Part 3 - Execution

3.1 Preparation

.1 Inspect building and site with Client’s & Consultant’s representative and verify extent and location of items designated for removal, abatement, disposal, alternative disposal, recycling, and items to remain.

.2 Carryout Utility Locates above and below all work areas to protect all existing elements.

.3 In the event that excavation is required, or placement of heavy equipment on grounds will require to carryout locates, then the Contractor shall carryout Utility Locates and protect all above and below grade utilities. Preserve active utilities traversing site in operating condition as required by the Client or operation of the building.

.4 Notify and obtain approval of utility companies before starting demolition.

.5 Disconnect/reconnect, cap, plug or divert, as required, existing public utilities and building utilities within the property and work area where they interfere with the execution of the work, in conformity with the requirements of the authorities having jurisdiction. Mark the location of these and previously capped or plugged services on the site and indicate location (horizontal and vertical) on the record drawings. Support, shore-up and maintain pipes and conduits encountered.

.1 Immediately notify Client's & Consultant's representative and utility company concerned in case of damage to any utility or service, designated to remain in place.

.2 Immediately notify the Client's & Consultant's representative should uncharted utility or service be encountered, and await instruction in writing regarding remedial action.

.6 Close off all access to construction areas before commencement of any work on site. Applicable warning signs must be posted prior to the start of the construction activities.

.7 Mechanical and electrical services shall be disconnected by approved contractors in accordance with the requirements of the local authority having jurisdiction.

.8 The consultant shall be notified of any disconnection seventy-two (72) hours in advance.

.9 Mechanical and electrical services shall be re-connected by approved & licenced sub-contractors and trades to their original conditions as required.

3.2 Removal and disposal

.1 Demolish, remove and dispose of all existing systems and items as indicated in related Sections and within the scope of work of all existing material, including all accessories, as required in order to carry out the specified Work.

.2 Roofing material shall be removed and disposed of down to the structural decking; structural decking to remain.

.3 Remove and discard existing ice and water shield and underlayment membrane from the existing roof deck.

.4 All flexible membrane flashings shall be removed and disposed of to the existing building substrate surfaces for all perimeter parapet walls, upturns, counter flashings, curbs, and all roofing details within the area of scope of work. Contractor will not be allowed to leave behind any of the existing flexible membrane flashings.

.5 Do not remove and/or disturb areas outside the scope of this project.

.6 Remove existing services and barriers as required and restore to original conditions when construction work is completed. Cost associated with this work shall be included in Contractor's base Bid Price and is considered to be part of scope of this Project.

.7 At the end of each working day, the work site must be left in safe condition. Protect all surrounding areas as required.

3.3 Cleaning

.1 On completion, remove all temporary facilities from site and reinstate site as indicated on drawings, or to match existing conditions prior to construction activities.

.2 The site shall be cleaned to the satisfaction of Client and Consultant to the extent to match prior to construction conditions.

End of Section 02 41 00

Part 1 - General

1.1 Related work

.1 Section 07 60 00 – Flashing and Sheet Metal

1.2 Description of work

.1 Refer to Section 01 00 00 “General Requirements”, item 2. Scope of Work.

1.3 Shop drawings:

.1 Refer to Section 01 00 00 “General Requirements”, item 30. Shop Drawings & Samples, and requirements of Section 01 33 00 “Submittal Procedures”.

1.4 Standards

.1 Read and conform to the requirements in Division 1 which form an integral part of the specifications.

.2 This section specifies the work related to the installation of parapet details.

1.5 Existing condition

.1 Adjacent areas which are not part of this contract shall be maintained in good condition before, during and after the construction activity.

.2 Should any suspected designated substances be encountered, work shall stop and the consultant shall be notified. Work shall not proceed thereafter until a written notice issued by the consultant.

1.6 Quality assurance

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

.2 Plywood, particleboard, OSB and wood based composite panels in accordance with CSA and ANSI standards.

Part 2 - Products

2.1 Materials

.1 Lumber: unless specified otherwise, softwood, S4S, moisture content 19% (S-dry) or less in accordance with following standards:

- .1 CAN/CSA-O141.
- .2 NLGA Standard Grading Rules for Canadian Lumber.
- .3 Wood Blocking: Pressure treated grade - All pressure treated wood materials shall bear the stamp of the Canadian Wood Preservers Bureau and meet CSA-080 standards.
- .4 Plywood:
  - .1 9.5 mm Canadian Softwood Plywood (CSP) sheathing grade to CSA O151, standard construction sheathing.
  - .2 12.7 mm thick, pressure-treated grade - to CSA O151, standard construction.

2.2 Fastener finishes

.1 Galvanizing: to CAN/CSA-G164, use galvanized fasteners for pressure-preservative.

.2 Nails, spikes and staples to CSA B111-1974.

.3 Bolts: 12.5 mm diameter unless indicated otherwise.

2.3 Wood preservative

.1 Preservative: to CAN/CSA-O80 Series, stained finish.

.2 Fire Retardant: to CAN/CSA-O80.20

Part 3 - Execution

3.1 Construction

.1 Comply with requirements of NBC 2012 supplemented by following paragraphs.

.1 Comply with requirements of Ontario Building Code.

.2 Install all wood blocking and plywood in strict accordance with the detail drawings.

.3 Install members true to line, levels and elevations, square and plumb.

.4 Construct continuous members from pieces of longest practical length.

.5 Install spanning members with "crown-edge" up.

3.2 Furring and blocking

.1 Furring and blocking shall be installed to space out and provide solid support to facings, metal counter flashings.

.2 Align and plumb face of furring and blocking to tolerance of 1:600

3.3 Nailing strips, grounds and rough bucks

.1 Rough bucks, nailers and linings to rough openings shall be installed to provide solid support for frames and other work.

3.4 Fasteners

.1 Install wood cants, fascia backing, nailers, curbs and other wood supports as required and secure using galvanized fasteners.

.2 Anchor and fasten, tie and trace members to provide necessary strength.

.3 Re-secure all loose wood boards and plywood sheathing throughout as instructed by the consultant.

3.5 Surface applied wood preservative

.1 Re-treat surfaces that were exposed during cutting, trimming or boring with liberal brush application of preservative before installation.

End of Section 06 10 00

Part 1 - General

1.1 References & standards

.1 Canadian General Standards Board (CGSB)
- .1 CAN/CGSB-37.4- [M89], Fibrated, Cutback Asphalt, Lap Cement for Asphalt Roofing.
- .2 CAN/CGSB-37.5- [M89], Cutback Asphalt Plastic Cement.
- .3 CAN/CGSB-51.32- [M77], Sheathing, Membrane, Breather Type.

.2 Canadian Roofing Contractors' Association (CRCA)
- .1 CRCA Specification.

.3 Canadian Standards Association (CSA)
- .1 CSA A123.21, Standard Test Method For The Dynamic Wind Uplift Resistance Of Membrane-Roofing Systems.
- .2 A123.1-05/A123.5-05 (R2015), Asphalt Shingles Made From Organic Felt and Surfaced With Mineral Granules / Asphalt Shingles Made From Glass Felt and Surfaced With Mineral Granules.
- .3 A123.2-03 (R2018), Asphalt Coated Roofing Sheets.
- .4 A123.3-05 (R2015), Asphalt Saturated Organic Roofing Felt.
- .5 A123.51-14 (R2018 Asphalt Shingle Application on Roof Slopes 1:6 and Steeper.
- .6 CSA B111-1974 (R2003), Wire Nails, Spikes and Staples.

.4 ASTM International (ASTM):
- .1 ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
- .2 ASTM D226 - Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing.
- .3 ASTM D228 - Standard Test Method for Sampling, Testing, and Analysis of Asphalt Roll Roofing, Cap Sheets, and Shingles Used in Roofing and Waterproofing.
- .4 ASTM D1079 – Standard Terminology Relating to Roofing and Waterproofing.
- .5 ASTM D1970 - Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection.
- .6 ASTM D3018 - Standard Specification for Class A Asphalt Shingles Surfaced with Mineral Granules.
- .7 ASTM D3161 - Standard Test Method for Wind-Resistance of Asphalt Shingles (Fan-Induced Method).
- .8 ASTM D3462 - Standard Specification for Asphalt Shingles Made from Glass felt and Surfaced with Mineral Granules
- .9 ASTM D4586 - Standard Specification for Asphalt Roof Cement, Asbestos-Free.
- .10 ASTM D4869 - Standard Specification for Asphalt-Saturated Organic Felt Underlayment Used in Steep Slope Roofing.
- .11 ASTM D6381 - Standard Test Method for Measurement of Asphalt

Shingle Mechanical Uplift Resistance.

.12 ASTM D6757 - Standard Specification for Underlayment Felt Containing Inorganic Fibers Used in Steep-Slope Roofing.

.13 ASTM D7158 - Standard Test Method for Wind Resistance of Sealed Asphalt Shingles (Uplift Force/Uplift Resistance Method).

.14 ASTM E108 - Standard Test Methods for Fire Tests of Roof Coverings.

.15 ASTM F1667 - Standard Specification for Driven Fasteners: Nails, Spikes, and Staples.

.16 ASTM D6163 – Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Glass Fiber Reinforcements

.17 ASTM D6164 – Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Polyester Reinforcements

1.2 Design & performance requirements

.1 The new roofing system shall include roofing system materials required to achieve roofing membrane manufacturer's warranty.

.2 Roofing system shall resist environmental and wind (uplift) loads, normal movement of structure, and effects of those loads in accordance with the building code and the following:

.1 Roofing system assemblies shall have been successfully tested by a qualified testing agency to resist project roofing uplift pressures in accordance with the building code.

.2 UL tested systems and components.

.3 Movement within roofing system, and between roofing system and building structure.

.4 Material compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by roofing membrane manufacturer based on testing and field experience.

.5 Roofing system shall prevent water from entering building and roofing assembly through roofing membrane.

.6 Fire-Resistance Ratings: Provide fire-resistance-rated roof assemblies per CAN/ULC-S126 and CAN/ULC-S107

1.3 General application

.1 Apply roofing in accordance with these specifications.

.2 Apply roofing in accordance with NRCA Roofing Manual specifications, and CRCA.

.3 Regard manufacturer's printed recommendations as minimum requirement of materials, method and workmanship not otherwise specified herein.

.4 Ensure surfaces upon which work is to be carried out are properly prepared and ready before work is performed.

.5 During re-roofing work, exposed surfaces of finished walls shall be protected with tarps in order to prevent damage. Contractor shall assume full responsibility for any damage.

.6 All materials shall be delivered and stored in their original packaging, bearing the manufacturer's name, related standard and any other specification or reference accepted as standard.
.7 Contractor should avoid stockpiling of materials on roofs, which could, at certain places, affect the loading of such roofs.
.8 Complete the entire roofing operation including the installation of the sheet metal up to line of termination of each day's work.
.9 Leave the roof areas and the grounds below clean of debris, left by the roofing operations.
.10 Complete the Contractor Attendance Sheet on daily basis and submit to the Roof Consultant.

1.4 Description of work

.1 See Section 01 00 00 – General Requirements for scope of work.

1.5 Shop drawings & submittals

.1 Refer to Section 01 00 00 “General Requirements”, item 30. Shop Drawings & Samples, and requirements of Section 01 33 00 “Submittal Procedures”.

1.6 Related documents

.1 All Project Drawings, Specification Sections, provisions included in the Contract, included but not limited to General Requirements, Client Supplementary Conditions, and Client Procurement and Contracting Requirements apply to this Section.

1.7 Manufacturer’s representative

.1 The roofing materials manufacturer can delegate a representative to visit the work site at commencement of work. It is anticipated that the manufacturer will assign a technical representative to visit the site during the execution of the work to ascertain proper application of their products. The said representative shall inform the consultant of their visits.
.2 At all times, the contractor shall permit and facilitate access to the work site and roofs to said manufacturer's representative.

1.8 Storage and handling

.1 All materials shall be delivered and stored in their original packaging, bearing the manufacturer's name, related standards and any other specification or reference accepted as standard.
.2 All materials shall be adequately protected and permanently stored in a dry, well ventilated and weatherproof location. Only materials to be used the same day shall be removed from this location. During winter, materials shall be stored in a heated location with a 10oC minimum temperature, removed only as needed for immediate use. Materials shall be kept away from open flame or welding sparks.
.3 Materials delivered in rolls shall be carefully stored on end, with selvage edges up. Metal flashings and counter-flashings shall be stored in such a way as to prevent wrinkling, twisting, scratches and other damage.
.4 The contractor shall avoid stockpiling of materials on roofs, which could, at certain places, affect the loading of such roofs.
.5 Provide and maintain dry, off ground weatherproof storage.

.6 Store rolls of felt and membrane in upright position. Store membrane rolls with selvage edge up.
.7 Remove only in quantities required for same day use.
.8 Place plywood runways over work to enable movement of material and other traffic.
.9 Store sealants at +5 oC minimum.
.10 Store insulation protected from weather and deleterious materials.

1.9 Environmental requirements

.1 Do not install roofing when temperature remains below 10 OC for shingle application.
.2 Minimum temperature for solvent based adhesive is 5 OC.
.3 Install roofing on dry deck, free of snow and ice, use only dry materials and apply only during weather that will not introduce moisture into roofing system.

1.10 Protection

.1 Requirements stated in Section 01 00 00 “General Requirements” apply to all aspects of work.
.2 During roofing work, exposed surfaces of finished walls shall be protected with tarps in order to prevent damage. The contractor shall assume full responsibility for any damage.
.3 Do not use open flame on site during this project.

1.11 Warranties

.1 Refer to General Requirements Section 01 00 00, Item 1.26 Warranty

1.12 Compatibility

.1 Compatibility between components of the new roofing system is essential. Provide written declaration from material’s manufacturer to Engineer or Consultant, stating that materials and components, as assembled in system, meet this requirement.

1.13 Quality assurance

.1 Upon request from the owner, the roofing membrane manufacturers shall supply, at their expense, the results of mechanical and chemical testing performed on the materials supplied.

1.14 Samples

.1 Submit duplicate samples of full-size specified shingles and all other roofing material to the roofing consultant for approval.

Part 2 - Products

Products specified herein are based on materials manufactured by Owens Corning Roofing and Asphalt, LLC. Similar products by CertainTeed or GAF are acceptable. The award shall be based on the Products specified in the tender documents. Alternate materials that are not listed maybe proposed as a substitution after the award. Requests shall include complete product’s list and system description.

All products specified below must comply with the requirements of ONE listed asphalt shingle manufacturer in order to obtain system warranty. All products must be compatible with roof membrane manufacturer’s printed requirements.

2.1 Ice and water shield protection membrane

.1 Mat-faced skid resistant surface, self-adhering, self-sealing, bituminous ice and water barrier.
.2 Roll Width: 36 in (914 mm).
.3 Selvage: 3 in (76 mm).
.4 Standards/Qualifications: ASTM D1970, ASTM E108/UL 790 (Class A Fire Resistance1).
.5 Approved Products:
.1 WeatherLock® Mat by Owens Corning Roofing and Asphalt, LLC,
.2 Winterguard by CertainTeed,
.3 Stormguard Film-Surfaces Leak Barrier by GAF,

2.2 Underlayment membrane

.1 Synthetic Roof Underlayment: to ASTM D 226, ASTM D 4869, ASTM E 108/UL 790 (Class A Fire Resistance),
.1 Length per roll: 286 ft (87.17m)
.2 Width per roll: 42 in (1.07m)
.3 Nominal weight per roll: 25 lb (11.34kg)
.2 Top surface: slip resistance
.3 Approved Products:
.1 by Owens Corning Roofing and Asphalt, LLC,
.2 by CertainTeed,
.3 by GAF,

2.3 Laminated Asphalt shingles

.1 Product Attributes: Includes SureNail Technology or similar; a woven fabric reinforcing strip in the nailing zone on the shingle's top surface.
.2 Nominal Size: 13-1/4 in (337 mm) by 39-3/8 in (1000 mm).
.3 Exposure: 5-5/8 in (143 mm).
.4 Shingles per Square: 64.
.5 Bundles per Square: 3 bundles of 20 or 22 shingles.
.6 Coverage per Square: 98.4 sq ft (9.1 sq m).
.7 Colour: To be selected from standard range of manufacturer's colour chart,
.8 Standards/Qualifications: ASTM D228, ASTM D3018 (Type 1), ASTM D3161 (Class F Wind Resistance), ASTM D3462, ASTM D7158 (Class H Wind Resistance), ASTM E108/UL 790 (Class A Fire Resistance), CSA A123.5.
.9 Approved Products:
.1 TruDefinition® Duration® (Algae Resistant) Shingles by Owens Corning Roofing and Asphalt, LLC,
.2 Landmark PRO by CertainTeed,
.3 Timberline by GAF,

2.4 Asphalt shingle starter strip

.1 Pre-Cut by asphalt shingle manufacturer,
.2 Nail applied starter course. Individual starter shingle is 6-5/8 in (168 mm) by 39-3/8 in (1000 mm).
.3 Standards/Qualifications: ASTM D3462, ASTM D3161 (Class F Wind Resistance), ASTM E108/UL 790 (Class A Fire Resistance), CSA A123.5, ICC-ES AC438, UL ER2453-01

2.5 Hip and ridge shingles

.1 Pre-Cut by asphalt shingle manufacturer,

.2 Nominal Size: 12 in (305 mm) by 10 ⅝ in (270 mm) with 8 in (203 mm) exposure,

.3 Standards/Qualifications: ASTM D3018 (Type 1), ASTM D3161 (Class F Wind Resistance), ASTM D3462, ASTM E108/UL790 (Class A Fire Resistance), ICC-ES AC438, UL ER2453-01.

2.6 Plastic cement

.1 Asphalt Plastic Roofing Cement meeting the requirements of ASTM D 4586, Type I or II or CAN/CGSB-37.5.

.2 Lap Cement meeting the requirements of D 3019, Non-Asbestos-Fibered, Type III or CAN/CGSB-37.4.

.3 ASTM D2822, Standard Specification for Asphalt Roof Cement.

2.7 Fasteners for asphalt shingles

.1 Galvanized steel or stainless-steel nails complying with ASTM F1667, minimum 12-gauge, 0.0808 in (2.05 mm) shank with 3/8 in (9.5 mm) diameter head. Check local building code requirements.

2.8 Eavestroughs and downspouts

.1 22 – gauge prefinished 127mm (5”) eavestroughs & down pipes, colour to be selected from standard chart of colours at a later date.

2.9 Eavestrough sealant

.1 Polyurethane bituminous resin liquid flashing (Alsan flashing, or approved equal), with one ply of new polyester reinforcement at all seams and joints with a minimum width of 250mm, centred at the seam.

2.10 Metal drip edge flashing

.1 Min. 24 Ga., See Section 07 62 00, Sheet Metal Flashing and Trim; colour to be selected by the owner at a later date.

2.11 Caulking

.1 See Section 07 90 00, Joint Protection; colour to be selected by the owner at a later date.

2.12 Metal flashing

.1 See Section 07 62 00, Sheet Metal Flashing and Trim; colour to be selected by the owner at a later date.

2.13 Leaves - guard

.1 Size: to match eavestroughs,

.2 Approved Products:

.1 ProGuard II aluminum leaves guards by Kaycan,

.2 OR, Rhino Gutter Guard,

.3 OR, aluminum Drop-In Gutter GuardTM by Gutter World with 0.25” mesh opening,

2.14 Plumbing vent stack flashing

.1 Size: match existing pipe size,

.2 Colour: to be selected by the client from standard range of manufacturer’s colour chart,

.3 Approved Products:

.1 Oatey Roof Flashing, Double seal No-Caulk Collar,
.2 PNP Series or SNP Series by The Neverleak Company,
.3 StretchFit/Thermoplastic RoofFlashings by Duraflo,

2.15 Gravity air ridge vents

.1 Plastic vents for slope roof application.
.1 Ventilation: 75 sq. in. of net free area,
.2 Colour: to be selected by the client from standard range of manufacturer's colour chart,
.3 Approved Products:
.1 PRO75 WeatherPro Series by Duraflo,
.2 Ventsure Plastic Slant Vents by Owens Corning,
.3 Master Flow by GAF

2.16 Bathroom / kitchen exhaust fan vents

.1 Vents for slope roof application.
.1 Colour: to be selected by the client from standard range of manufacturer's colour chart,
.2 Approved Products:
.1 Gooseneck Roof Exhaust Vent with associated Collar/Damber by Duraflo,
.2 Or approved equal

2.17 Snow retention system (Provisional):

.1 Pro 100 – SGSP100 (stainless steel) Snow Guard Assembly (Heavy Duty) for asphalt shingle application, by Euramax Canada Inc., or approved equal.

2.18 Heat tracing cable system:

.1 Reuse existing

Part 3 - Execution

3.1 Surface inspection and preparation

.1 The removal of all existing roofing components down to the deck must be completed prior to proceeding with this work.
.2 Before commencing work, and on continuous basis the Contractor is responsible to use own forces and inspect the area below roof deck and the underside of the roof deck for any existing conditions and elements; such as electrical conduits, electrical junction boxes, gas lines, telecommunication conduits, heating/air conditioning/HVAC related equipment/components, etc. Furthermore, to map out all their findings in a schematic format for reference. This work includes removal of any ceiling tiles, other protecting covering on the inside of the building ceilings, but not removal of fixed drywall and permanent surfaces.
.3 Before commencing work, all other specified previous roofing components must be installed and approved by the Client/Consultant.
.4 Before commencing work, the Client's representative, together with the Consultant shall inspect and approve the deck condition as well as the parapet walls, roof drains, vent outlets and others.
.5 Before commencing work, all surfaces must be smooth, dry, clean and free of ice, and debris. No salt or calcium shall be used to remove ice or snow.

.6 Do not install materials in conditions of rain, snow or fog.

3.2 Installation

.1 Underdriving or overdriving fasteners will affect the integrity of the roofing system and will not be allowed and shall be removed from the system. New roofing products affected by underdriving or overdriving fasteners shall be replaced immediately at no extra cost to the contract.

.2 When mechanical fasteners are used for the installation of new roofing assembly, the Contractor is responsible to inspect and locate all below roof deck (including the underside of the roof deck) existing elements and/or services, such as: electrical conduits, electrical junction boxes, gas lines, telecommunication conduits, heating/air conditioning/HVAC related equipment/components, etc. The Contractor must take extra care and attention not to disturb and/or damage any of the existing elements and/or services installed below or on the underside of the roof deck. The Contractor shall immediately repair and restore elements and/or services in the event of any damages resulting from roofing operations and the use of fasteners. The Contractor must use low-rise, two-part polyurethane adhesive at no extra cost to the contract where high concentration of existing services is located, and these areas must be identified and reported to Consultant a minimum 48 hours in advance. Adhesive material and rate of application to be approved by the Consultant.

.3 Upon Owner's authorization, replace damaged and rotten existing wood decking as directed by the Consultant/Owner's representative. Removed damaged planks/sheathing and install new wood planks/sheathing decking over the structural joists/rafters/members. New wood shall be nailed to all structural wooden joists/rafters/members using galvanized spiral nails with a maximum nail spacing of 150 mm on centre, along the rafters, and to match existing pattern. New wood plank/sheathing thickness shall match existing. Install roofing elements on clean and dry surfaces, in accordance with the manufacturer's requirements and recommendations.

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

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

.6 Apply only as much insulation to the roof as can be covered the same day with roofing membrane. At the conclusion of each working day, seal exposed edges of the roof insulation. This seal shall be cut and removed upon continuation of the work.

.7 Contractor is to complete all work in conformance with CRCA recommendations and this specification.

3.3 Manufacturer's instructions

.1 Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

3.4 Workmanship

.1 Install new material only after building substrate materials are dry.
.2 Install new material to maintain continuity of thermal/water/air/vapour protection to building elements and spaces.
.3 Fit new material tight around electrical boxes, plumbing and heating pipes and ducts, around exterior doors and windows and other protrusions.
.4 Cut and trim new material neatly to fit spaces. Butt joints tightly, offset vertical joints. Use only new material which are free from chipped, broken edges, deformation, or any other chemical/physical damages.
.5 All new material must be in perfect connection, without any significant differences in level, and must be adhered/installed on all their surfaces completely as specified.
.6 Apply only as much new material as can be covered in the same day.

3.5 Examination, surface inspection and preparation

.1 Verify existing site conditions.
.2 Remove all existing roofing components down to the wooden deck level.
.3 Replace and remediate structural components, and members asp per structural drawings.
.4 Examine substrates and immediately inform Client/Consultant of any found defects.
.5 Prior to commencement of work ensure all substrates are firm, straight, smooth, dry, free of snow, ice or frost, and clean of dust and debris.
.6 Verify that roof penetrations and plumbing stacks are in place and flashed to deck surface.
.7 Verify roof openings are correctly framed prior to installing material.
.8 Verify deck surfaces are dry and free of ridges, warps, or voids.
.9 Before commencing work, the Owner's representative, together with the roofing consultant shall inspect and approve the deck condition, vent outlets and others.
.10 Before commencing work, all surfaces must be smooth, dry, clean and free of ice, and debris. No salt or calcium shall be used to remove ice or snow.
.11 Do not install materials in conditions of rain, snow or fog.
.12 Follow shingle manufacturer's recommendations for acceptable roof deck materials.
.13 Broom clean deck surfaces under eave protection and underlayment prior to their application.

3.6 Removal & disposal

.1 Remove & discard all layers of the existing shingles, flashings, underlayment, all roofing accessories, etc., to the wood deck. Upon Owner's authorization, remove existing damaged/rotten wood deck at designated roof sections as instructed by the Owner's representative, down to the structural rafters.
.2 Remove all roofing accessories and discard.
.3 All roofing components and materials shall be removed from the site and taken to an approved dump site on daily basis.

3.7 Installation of ice and water shield protection membrane

.1 Install new self-adhesive underlayment & ice and water shield eaves

protection membrane using manufacturer's installation instructions, in accordance with local building code requirements and as instructed on project drawings. When local codes, installation instructions, or projects drawings are in conflict with respect to minimum requirements, the local building code requirements shall take precedence as a minimum. However, if the project drawings indicate installation of ice and water shield eaves protection membrane beyond minimum local building code requirements, then project drawing requirements will be enforced and are to be installed as part of scope of this project.

.2 The installation of new self-adhesive underlayment & ice and water shield eaves protection membrane shall be performed as per material manufacturer's installation instructions.

.3 The new self-adhesive underlayment & ice and water shield eaves protection membrane shall also be installed along all valleys, hips, ridges, penetrations and around all roof flashing details.

.4 Membrane shall be unrolled dry on sheathing boards for alignment and relaxing prior to installation.

.5 Install new self-adhesive underlayment & ice and water shield eaves protection membrane with end laps of minimum 150mm on roof decks sloped 5:12 and greater. On roofs with slopes from 2:12 up to 4:12, see application instructions printed on each package and/or as per manufacturer's printed instructions. All side laps shall be minimum 75mm.

.6 Stagger end joints by a minimum of 300mm.

.7 Install new metal drip edge at all eaves and gable ends (rakes) as shown on project drawings. Metal drip edge shall be installed tight with fascia boards. Weather-lap all joints for 50 mm. Secure flange with nails spaced maximum 250mm on centre.

.8 Peel back the silicone release sheet and adhere the membrane to the substrate.

.9 Remove the protective strip on the side lap and apply primer.

.10 Complete membrane installation by rolling over the entire surface as it is installed with 34 kg rollers; roll along each centre and each overlap and finish along sides by aligning roller edge to lower part of overlap. Watch for air pockets beneath end joints. Do not lance; instead roll air towards edge of seams.

.11 Application of the membrane shall provide a surface free of air pockets, wrinkles, fishmouths or tears.

.12 Ensure that all head/end laps and all side laps are fully sealed.

3.8 Installation of underlayment membrane

.1 Unroll the underlayment parallel with the eaves. The eaves edge of the underlayment should go over the metal drip edge at eaves but go under the drip edge flashing along the rake.

.2 Ensure that underlayment is installed free of wrinkles.

.3 Around the perimeter of the underlayment, place nails approximately 150mm apart and about 25mm in from the edge. In the main area of the

underlayment, two rows of nails are to be installed. The first is placed 300mm up from the bottom edge and the second is 600mm from that same edge (or in fact 300mm from the upper edge). This nailing pattern shall separate the 915mm wide underlayment sheet into thirds. Nail along these two rows 300mm-380mm apart. Nail placement should be alternated so that one row places the nail opposite the open area of the first, creating a zigzag pattern, resulting in a simple pattern with all nails being approximately 300mm-380mm apart.

.4 Succeeding courses should be unrolled in a similar manner overlapping the previous course by 50mm. Ensure to roll underlayment out straight as the underlayment will tend to slide down the pitch of the roof and end up crooked. The spacing of nails in this overlap area should be approximately 150mm apart, centred in the 50mm area.

.5 If the length of the roll is not sufficient to complete the entire run, an end lap of 150mm is required. Install two rows of nails 150mm apart to hold the end lap edges in place. End laps should be located 180mm to 200mm from any other end lap that may be in the preceding.

.6 Apply underlayment a minimum of 150mm over hips and ridges, approximately 150mm over valley liners and up 150mm or more where the roof meets a vertical surface.

3.9 Installation of asphalt shingles:

.1 Install asphalt shingles (including started shingles as well as hip and ridge shingles) in accordance with material manufacturer's installation instructions and in accordance with local building code requirements.

.2 Starter shingle course, hip/ridge shingles must be pre-cut and manufactured by asphalt shingle manufacturer. The use of on site cut starter shingle course and hip/ridge shingle will not be allowed.

.3 Install starter course at lowest roof edge and along rake with edge of shingles extending 1/4 in (6.4 mm) over edge of roof. Sealant strip should be closest to roof edge.

.4 Install first and successive courses of shingles stepping diagonally up and across roof deck with material manufacturer's recommended offset at each succeeding course. Maintain uniform exposure of shingles at each succeeding course. Use of a chalk line every other course is recommended.

.5 Fasten shingles to deck with number of roofing nails per shingle and type of nails specified by material manufacturer, or in accordance specified by local Authority Having Jurisdiction.

.6 All fasteners must be driven flush with the shingle surface and penetrate at least 3/4 in (19.1 mm) into the wood deck. Where the deck is less than 3/4 in (19.1 mm) thick, the fastener should be long enough to penetrate fully and extend through the roof sheathing.

.7 Install new shingles at valleys, eaves, rakes, hips and ridges in accordance with material manufacturer's installation instructions and local building code requirements, and as shown on project drawings.

.8 Hand-seal all asphalt shingle tabs in accordance with asphalt shingle

material manufacturer's printed instructions for: high wind, low-slope, steep slope and cold weather applications.

.9 Low Slope Roofing System Installation

.1 Install low slope roofing system in accordance with material manufacturer's installation instructions and in accordance with local building code requirements.

.2 Low slope roofing system should only be installed on roofs with a slope of ¼:12 to 2:12.

.3 Apply only when the weather conditions are dry and the ambient temperature is 45°F (7°C) and rising. Do not install when water in any form (i.e. rain, dew, ice, frost, snow) exist.

.4 Apply only over clean, dry, dust-free surfaces.

.5 Ensure installation of ice and water shield on roof deck does not prevent or interfere with ventilation of the existing structure

3.10 Installation of flashing around penetrations & curbs:

.1 Vent pipes & gravity vents:

.1 Remove all existing plumbing vent boots, gravity vents, stacks and discard; install new plumbing vent boot flashings, gravity vents and stacks at locations shown on the roof plan drawing.

.2 The flashing installation shall be as per asphalt shingle manufacturers printed instructions.

.3 Install a 610mm square piece of self-adhering ice and water shield membrane lapping over roof deck and underlayment around all openings. Ensure new ice and water shield membrane is seal tightly to all pipe.

.4 Ensure to apply approved sealant/mastic between the top of the boot/stack flashings and underside of the asphalt shingle tabs. In addition, nail all tabs down around the boot flashing; nails shall be installed between tabs only (no exposed nails).

.2 Curbs:

.1 Remove all existing curb flashings & discard.

.2 Install self-adhering ice and water shield membrane extending at least 200mm up the curb and 305mm onto the roof surface. Lap the membrane over the roof deck and underlayment.

.3 Install new metal step flashings and new prefinished metal flashings.

3.11 Completion of work:

.1 The Contractor shall complete the work within two weeks of being authorized to start. Clean all roofs and ground on daily basis, at the completion of the roofing activities.

3.12 Final inspection:

.1 The Contractor shall attend a final inspection meeting with Owner's representative and Consultant. Any deficiencies shall be rectified immediately by the Contractor and approve by the Consultant.

End of Section 07 31 13

Part 1 - General

1.1 Standards and design criteria

.1 Design roof systems in accordance with:
- .1 CAN/C.S.A. Standard S136, latest edition for the Design of Cold-Formed Steel Structural Members.
- .2 Canadian Sheet Steel Building Institute Standards 10M, 20M.
- .3 National Building Code of Canada
- .4 Ontario Building Code
- .5 Applicable local codes and standards
- .6 ASTM A653/A653M-04a Specification for Sheet Steel, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated by the Hot-Dip Process.
- .7 ASTM A792/A792M-03, Specification for Sheet Steel, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.
- .8 CSSBI S8-2001, Quality & Performance Specification for Prefinished Sheet Steel Used for Building Products.
- .9 CSSBI Fact Sheet #3, Care and Maintenance of Prefinished Sheet Steel Building Products.
- .10 CSSBI Fact Sheet #13, Position Paper on Oil Canning.
- .11 CSSBI Fact Sheet # 24, Natural Finish Metallic Coatings.

.2 Deflection of the roof system is not to exceed 1/180th of the span for the specified live loading, or as per applicable local code.

.3 Design roof system to accommodate thermal movement of the roof sheet caused by ambient temperature range, without causing deterioration of the roof system.

.4 Design roof system to withstand dead loads, snow loads, snow build-up and rain load. Design fastener and clip systems to withstand wind uplift on the roof and sliding forces induced by environmental loads.

1.2 Description of work

.1 Refer to Section 01 00 00 “General Requirements”, item 2. Scope of Work.

.2 General Requirements Section 01 00 00 is part of these specification and shall apply as if repeated here.

1.3 Submittals & shop drawings

.1 Engineered shop Drawings are required for new slope metal roofing assembly.

.2 Refer to Section 01 00 00 “General Requirements”, item 30. Shop Drawings & Samples, and requirements of Section 01 33 00 “Submittal Procedures”.

1.4 Contractor qualifications

.1 Manufacturer of metal roof system, and installer shall demonstrate at least ten years experience in projects similar in scope.

.2 The roofing contractor shall be, during the bidding period as well as during installation, officially recognized as an approved applicator by the metal roofing materials manufacturer.

.3 Roofing work shall be performed only by skilled applicators, employed by a company operating all adequate and necessary equipment to execute such work.

1.5 Manufacturer's representative

.1 The roofing materials manufacturer shall delegate a representative to visit the work site at commencement of work. It is anticipated that the manufacturer will assign a technical representative to visit the site during the execution of the work to ascertain proper application of their products. The said representative shall inform the consultant of their visits.

.2 At all times, the contractor shall permit and facilitate access to the work site and roofs to said manufacturer's representative.

1.6 Storage and handling

.1 Store roofing products in accordance with manufacturer's recommendations, and protected from elements.

.2 Protect prefinished steel during fabrication, transportation, site storage and erection, in accordance with CSSBI Standards.

.3 All materials shall be delivered and stored in their original packaging, bearing the manufacturer's name, related standards and any other specification or reference accepted as standard.

.4 All materials shall be adequately protected and permanently stored in a dry, well ventilated and weatherproof location. Only materials to be used the same day shall be removed from this location. During winter, materials shall be stored in a heated location with a 10 degree C. minimum temperature, removed only as needed for immediate use. Materials shall be kept away from open flame or welding sparks.

.5 Materials delivered in rolls shall be carefully stored on end, with selvage edges up. Metal flashings and counter-flashings shall be stored in such a way as to prevent wrinkling, twisting, scratches and other damage.

.6 The contractor shall avoid stockpiling of materials on roofs, which could, at certain places, affect the loading of such roofs.

.7 Provide and maintain dry, off-ground weatherproof storage.

.8 Remove only in quantities required for same day use.

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

.10 Store sealants at +5 degree C minimum.

.11 Store all insulation panels protected from weathering elements and deleterious materials.

1.7 Protection

.1 Requirements stated in Section 01 00 00 "General Requirements" apply to all aspects of work.

.2 Do not remove any area of the existing roofing assembly including any related structural components/members on daily basis that can't be covered and completed with the new roofing system on the same day. At no time, any area of the building and/or roof shall remain exposed overnight.

.3 During roofing work, all exposed surfaces of finished interior floors, walls and all other building interior elements and features shall be protected with tarps in order to prevent damages. In addition, all exterior building elements in close proximately to work are needs to be tarped at protected. Contractor

shall assume full responsibility for any damages and immediately make good to any damages to the satisfaction of the Owner.

1.8 Warranties

.1 Refer to General Requirements Section 01 00 00, Item 1.26 Warranty.

1.9 Compatibility

.1 Compatibility between components of the new roofing system is essential. Provide written declaration from material's manufacturer to Engineer or Consultant, stating that materials and components, as assembled in system, meet this requirement.

Part 2 - Products

Products specified herein are based on materials manufactured by Havelock Metal Co. Similar products by Agway or Butler are accepted and are considered approved equal. The award shall be based on the Products specified in the tender documents. Alternate materials that are not listed herein may be proposed as a substitution after the award of contract and shall be equal or of higher quality specified herein. Request shall include complete product list, system description, and shall meet the requirements of the specified warranties . All roofing products specified below and any proposed submission must comply with the requirements of ONE listed metal roof manufacturer in order to obtain system warranty. All products must be compatible with the metal roof manufacturer's printed requirements.

2.1 Roof system components

.1 Roof System: Legacy Standing Seam by Havelock Metal Co.

- .1 Waterproofing underlayment membrane:
  - .1 Self-Adhesive high temperature grade roof underlayment and eave protection membrane composed of SBS modified bitumen.
  - .2 Product Properties:
    - .1 Thickness of 1mm
    - .2 Dimensions 22.9m x 0.91m
    - .3 Weight 0.97 kg/m^2
    - .4 Top surface – slip-resistant, tri-laminated woven polyethylene
    - .5 Bottom surface – self-adhesive, covered with a release protection film
  - .3 Approved products:
    - .1 Lastobond Shield HT by Soprema Inc.
    - .2 Or approved equal
- .2 Waterproofing Membrane Primer:
  - .1 Adhesive Primer:
    - .1 Odourless polyether based adhesive Use Colply EP by Soprema Inc. for slope <3% (3/8 in per ft), and Colply EF Flashing by Soprema Inc. for slope >3% (3/8 in per ft).
    - .2 Composed of SBS synthetic rubbers, adhesive enhancing resins and volatile solvents.
  - .2 Approved products:
    - .1 ELASTOCOL STICK by Soprema Inc.
    - .2 Or approved equal

.3 Sub-Girts:
.1 Minimum 18 gauge formed galvanized steel, ASTM A653M Grade 230 with Z275 zinc coating.
.2 Z-bars and all sub-girts shall be perforated with weepers for proper drainage as shown on project drawings.
.4 Clip System:
.1 Thermally responsive clips to be fabricated from a minimum of 0.91 mm (.036") steel, with a minimum Z275 galvanized coating designed to accommodate expansion and contraction of the roof sheet.
.2 Roof Fasteners: As specified by the manufacturer, to resist wind uplift and sliding snow forces.
.5 Prefinished Roof Sheet, exposed to exterior:
.1 Profile: Legacy Standing Seam by Havelock Metal Co. (Gauge 22), with mechanical lock, 38mm rib height, with double lock seams. Panels to have minor intermediate ribs, and 397mm wide.
.2 Panel: Z275 galvanized (zinc coated) sheet steel conforming to ASTM A653M structural quality Grade 230 having a nominal core thickness 0.76mm (0.030”).
.6 Standing Seams
.1 Formed by mechanically folding the interlocked panel legs (double-fold = 180°)
.2 Standing seams for the full length of the roof panel with sealant of non-skinning, non-drying sealant on the unexposed side.
.3 Standing seams to be mechanically machined seamed at panel side-laps.

2.2 Panel finishes

.1 Coating:
.1 PVDF (Kynar 500®) Prefinished Steel
.2 Finish System: Factory-applied 70 % PVDF (Kynar 500®) two-coat system (primer + topcoat).
.3 Film Thickness: 0.75 - 1.85 mils total.
.4 Gloss: 20 - 35 GU @ 60°.
.5 Humidity Resistance: Pass 2,000 hours @ 100 % RH, 95 °F.
.6 Salt Spray Resistance: Pass 1,000 hours @ 5 % NaCl, < 5 % #6 blisters.
.7 Flexibility (T-Bend): 0T - 3T, no cracking or pick-off.
.8 Adhesion: No adhesion loss (ASTM D 3359).
.9 Pencil Hardness: HB - 2H.
.10 Reverse Impact: No cracking or adhesion loss.
.11 Acid & Graffiti Resistance: No effect to 20 % H?SO?, 10 % HCl, or paint removal tests.
.12 Warranty: 40-year limited warranty for film integrity, chalk, and colour fade.
.13 Compliance: Meets or exceeds AAMA 2605 high-performance architectural finish standards.

2.3 Colour

.1 Colour to be selected from the manufacturer's standard colour range at a later date.

2.4 Accessories

.1 Metal Flashing, Trims, Ridge/Rake Caps & Closures: In accordance with material manufacturer's requirements and/or as indicated on plan & detail project drawings. As otherwise indicated, all components shall be formed from same materials as the roof sheet, and as indicated in detail drawings. Custom fabricated to suit architectural details, as required.

.2 Foam Closures: Foam and metal closures to suit profiles selected, to manufacturer's recommendations.

.3 Sealants: In accordance with manufacturer's recommendation with compatible material.

.4 Exposed Fasteners:

.1 Stainless steel or cadmium plated, self-tapping sheet metal screws with powder coated heads pre-painted to match the colour of the new cladding material. Fasteners shall be equipped with rubber neoprene washer.

.5 Concealed Fasteners: #14 Type AB S.M.S.

.6 Butyl Tape: As specified and where required by the material manufacturer.

.7 Leaves - Guard: size to match new gutter top opening, aluminum Drop-In Gutter Guard™ by Gutter World or approved alternate, 0.25" mesh.

.8 Plumbing Vent Stack Flashing: As approved by the metal roof manufacturer, or Master Flash by Vicwest, OR Oatey Roof Flashing or approved alternate, Double seal No-Caulk Collar, to match existing pipe size, colour to match existing.

.9 Static Air Vents: SRV-12 Ventilator, complete with Decorative Base, by Agway Metal, Or Approved Equal.

.10 Provisional:

.1 Downpipes & Gutter: 22 Gauge prefinished sheet steel metal as per Section 07 60 00 – Flashing and Sheet Metal. Profile and girt as indicated on project drawings. Colour to be selected from the standard colour chart.

.2 Gutter & Down Pipe Sealant: Waterproofing one-component polyurethane bitumen resin liquid applied flashing and polyester reinforcement, Alsan Flashing by Soprema, or approved equal.

2.5 Fabrication

.1 Fabricate roof components to comply with dimensions, profiles, gauges and details as specified and as shown on approved engineering shop drawings, including fascia and soffit panels and all companion flashing.

.2 Fabricate all components of the system in the factory, ready for field installation.

.3 Provide roof sheet and all accessories in longest practicable length to minimize field lapping of joints.

Part 3 - Execution

3.1 Surface inspection and preparation

.1 The removal of all existing roofing components down to the deck must be completed prior to proceeding with this work.

.2 Before commencing work, and on continuous basis the Contractor is responsible to use own forces and inspect the area below roof deck and the underside of the roof deck for any existing conditions and elements; such as electrical conduits, electrical junction boxes, gas lines, telecommunication conduits, heating/air conditioning/HVAC related equipment/components, etc. Furthermore, to map out all their findings in a schematic format for reference. This work includes removal of any ceiling tiles, other protecting covering on the inside of the building ceilings, but not removal of fixed drywall and permanent surfaces.

.3 Before commencing work, all other specified previous roofing components must be installed and approved by the Client/Consultant.

.4 Before commencing work, the Client's representative, together with the Consultant shall inspect and approve the deck condition as well as the parapet walls, roof drains, vent outlets and others.

.5 Before commencing work, all surfaces must be smooth, dry, clean and free of ice, and debris. No salt or calcium shall be used to remove ice or snow.

.6 Do not install materials in conditions of rain, snow or fog.

3.2 Installation

.1 Install roofing elements on clean and dry surfaces, in accordance with the manufacturer's requirements and recommendations.

.2 When mechanical fasteners are used for the installation of new roofing assembly, the Contractor is responsible to inspect and locate all below roof deck (including the underside of the roof deck) conditions and elements; such as electrical conduits, electrical junction boxes, gas lines, telecommunication conduits, heating/air conditioning/HVAC related equipment/components, etc. The Contractor must take care and attention not to disturb existing elements and services installed below or on the underside of the roof deck. The Contractor must use adhesives (to be approved by the Consultant) where high concentration of existing services is located, and these areas must be identified and reported to Consultant a minimum 48 hours in advance.

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

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

.5 Apply only as much new roofing material to the roof as can be covered the same day with roofing membrane. At the conclusion of each working day, seal exposed edges of the roof insulation. This seal shall be cut and removed upon continuation of the work.

.6 Contractor is to complete all work in conformance with OIRCA/CRCA recommendations and this specification.

3.3 Manufacturer's instructions

.1 Compliance: comply with manufacturer's written data, including product technical bulletins, product catalogue installation instructions, product carton installation instructions, and data sheets.

3.4 Workmanship

.1 Install new material only after building substrate materials are dry.
.2 Install new material to maintain continuity of thermal/water/air/vapour protection to building elements and spaces.
.3 Fit new material tight around electrical boxes, plumbing and heating pipes and ducts, around exterior doors and windows and other protrusions.
.4 Cut and trim new material neatly to fit spaces. Butt joints tightly, offset vertical joints. Use only new material which are free from chipped, broken edges, deformation, or any other chemical/physical damages.
.5 All new material must be in perfect connection, without any significant differences in level, and must be adhered/installed on all their surfaces completely as specified.
.6 Apply only as much new material as can be covered in the same day.

3.5 Examination

.1 Examine interior of the building and provide protection for occupants, building elements and goods.
.2 Examine substrates and immediately and inform Client/Consultant of any found defects.
.3 Prior to commencement of work ensure all substrates are firm, straight, smooth, dry, free of snow, ice or frost, and clean of dust and debris.
.4 When other Trades are Involved: examine work of other trades over which roof system will be applied for conformity to drawings. Report all discrepancies to the Consultant before beginning work on the roof system.

3.6 Waterproofing membrane installation

.1 Before installation of any self-adhesive material, apply primer suitable for the application of self-adhesive membrane over the entire wood deck surface and all exposed roof surfaces to receive new vapour retarder. Allow for curing of the primer as per manufacturer's recommendations.
.2 Avoid over application of primer and spillage to adjacent areas and interior of the building, ensuring all openings are properly sealed prior to primer application.
.3 Waterproofing membrane shall be installed parallel to the slope of the roof deck.
.4 Membrane shall be unrolled dry on sheathing boards for alignment prior to installation.
.5 Membrane shall be unrolled dry on sheathing boards to be relaxed as per membrane manufacturer's printed instructions prior to installation.
.6 Each strip should overlap the preceding strip by 75mm along the side joint and 150mm at the ends (or as per the membrane material manufacturer's printed instructions). At the end laps angle-cut the corners that will be covered by the following roll.
.7 Stagger end joints by a minimum of 300mm.
.8 Peel back the silicone release sheet and adhere the membrane to the substrate.
.9 Remove the protective strip on the side lap and apply primer.
.10 Complete waterproofing membrane fastening by rolling over the entire

surface as it is installed with 34kg rollers; roll along each centre and each overlap, and finish along sides by aligning roller edge to lower part of overlap. Watch for air pockets beneath end joints. Do not lance; instead, roll air towards the edge of seams.

.11 Application of the membrane shall provide a watertight surface, free of air pockets, wrinkles, fishmouths or tears.

.12 Ensure that all head/end laps and all side laps are fully sealed and waterproofed with sufficient bituminous membrane coverage.

3.7 Roof panel installation

.1 Sub-girt framing system:

.1 Install sub-girts in strict accordance with approved engineered shop drawings. Frame all openings in the roof cladding.

.2 In-Seam Clips:

.1 Clips shall be supplied and installed as per approved engineered shop drawings.

.2 Attach clips using fasteners as recommended by the manufacturer and indicated on approved engineering shop drawings, to suit the substrate.

.3 Roof Metal Panel Installation:

.1 Panels shall be supplied and installed as per approved engineered shop drawings.

.2 Install exterior prefinished roof panels on panel support clips, using the manufacturer's proper construction procedure. Ensure the metal roofing sheet side-lap is positively retained by clips, and proper sheet coverage is maintained.

.3 Install the snap-cap at all side laps as shown on the approved shop drawings. Mitre snap-cap as required to resist water entry.

.4 Where indicated on approved shop drawings, secure the end-lap of metal roofing sheets in accordance with the manufacturer's specifications and details to provide a weather-tight seal. Exposed fasteners to match the colour of the roof sheet.

.5 Provide notched and formed closures, sealants against weather penetration, at changes in pitch, and at ridges and eaves, where required.

.6 Install all companion flashing: gutters, ridge air ventilators, trims and metal flashings as shown on the shop drawings and detail drawings. Use concealed fasteners when possible. Exposed fasteners to match the colour of the roof sheet.

3.8 Others

.1 It is expected that all roof accessories (i.e. tall cons, rain collars, drains, aluminum vent stacks, electrical/mechanical/gas line stacks, etc...) will be replaced with new.

3.9 Touch-up and cleaning

.1 Clean exposed panel surfaces in accordance with manufacturer’s instructions.

.2 Repair and touch up with colour matching high grade enamel minor surface damage, only where permitted by the Consultant and only where appearance

after touch-up is acceptable to Consultant.

.3 Replace damaged panels and components that, in opinion of the Consultant, cannot be satisfactorily repaired.

End of Section 07 61 00

Part 1 - General

1.1 General instructions

.1 All work of this Section to conform to the appropriate requirements of the most recent edition of the Ontario Building Code.

.2 Coordinate work of the Section, and with other related sections, to ensure satisfactory and expeditious completion of the Work.

.3 Review and update all work schedules with Consultant on a regular basis.

.4 Examine the Work of this, and all related sections, to confirm the extent, location, quality, and condition prior to commencing.

.5 Discontinue work during severe rain, wind, heat, cold, or other such inclement weather and monitor time lost in relation to Environment Canada daily norms. Lost time will only be considered where actual conditions exceed norms.

1.2 Summary

.1 Furnish all labour, materials, equipment and services necessary to perform the Work of this Section as specified.

.2 Protect and repair as necessary, all materials adjacent to, or affected by this Work.

.3 Install new metal copings and counter flashings, as indicated and directed, and shown on detail drawings.

1.3 Submittals

.1 Submit shop drawings in accordance with Section 01 33 00 – Submittal Procedures.

.2 Submit duplicate 50 mm x 50 mm samples, for review by Consultant and approval by Client, of each type of sheet metal material, colour and finish.

.3 Before work commences, verify in writing that materials submitted and approved are mutually compatible and are compatible with existing materials. Support verification with manufacturers(s) data and/or certification.

.4 If a material submitted and approved is not suitable for verification and/or certification, submit alternate material for verification and certification for review by Consultant and approval by Client.

.5 Upon request, submit Material Safety Data Sheets.

1.4 References

.1 ASTM A525M-87 - Specification for General Requirements for Steel Sheet, Zinc coated. (Galvanized) by Hot-Dip Process

.2 ASTM B117-90 - Test Method of Salt Spray (Fog) Testing

.3 CAN/CAS-S136-M89 - Cold Formed Steel Structural Members

.4 CGSB-1-GP-108 - Bituminous Paint

.5 CRCA - Canadian Roofing Contractors' Association Roofing Specification Manual

1.5 Quality assurance

.1 Perform work of this Section by competent workers skilled and experienced in using the specified materials.

.2 Execute work of this Section under the continuous supervision and direction of a competent person specializing in the type of work specified.

.3 Arrange, and make allowance for all inspections and tests considered necessary by the Consultant. The Consultant and/or her/his designated representative as approved by the Client may conduct inspections and tests.

1.6 Product delivery, storage and handling

.1 Deliver all materials in original, unopened packaging with the manufacturer(s) labels intact.

.2 Store and protect all materials from precipitation, ground moisture and temperature extremes by use of weatherproof coverings and raised platforms.

.3 Follow precautionary statements on product labels for storage and handling before use and make reference to applicable Safety Data Sheets;

.4 Obtain Client's approval of the location and extent of all on-site storage areas.

.5 Pallets of materials shall not be double stacked.

.6 Protect metal during handling and storage to prevent rusting, staining, abrasion of finish coatings, bending and denting.

.7 Take all necessary precautions to protect pre-finished metal surfaces against scratching.

1.7 Job site conditions

.1 Prior to reinstallation of metal flashings, inspect those areas to receive the metal flashing to ensure that they are clean, dry, sound, smooth and continuous.

.2 Do not apply work during rain, fog or snow. Do not work over damp, frozen or unsuitable surfaces.

.3 Commencement of Work is acceptance of the surfaces and conditions and assumes full responsibility for finished condition of the Work.

1.8 Warranty

.1 Refer to General Requirements Section 01 00 00, Item 26 WARRANTY.

Part 2 - Products

2.1 Metal Flashings:

.1 24 Gauge thickness or as otherwise shown, commercial quality, prefinished galvanized sheet steel as approved. Apply 8000 Series coating to dry film on surfaces exposed to view. Colour of the new metal flashing will be selected by the Client at a later date from standard colour chart.

2.2 Prefinished Sheet Steel:

.1 24 Gauge thickness or as otherwise shown, commercial quality, prefinished galvanized sheet steel as approved, to closely match existing metal work. Apply 8000 Series coating to dry film on surfaces exposed to view. Colour of the new metal flashing will be selected by the Client at a later date from standard colour chart.

2.3 Splice Covers:

.1 Of same material and temper as prefinished sheet steel, minimum 50 mm wide and 22 Ga. Minimum thickness.

2.4 Cleats and Edge Strips:

.1 Of same material and temper as prefinished sheet metal, minimum 50 mm

wide and 18 GA. Minimum thickness.

2.5 Anchors:

.1 Stainless steel.

2.6 Fasteners:

.1 Stainless steel, head colour same as exterior sheet if exposed. Screw type only.

2.7 Solvent:

.1 "MEK", Methyl Ethyl Ketone solvent to clean surfaces, or approved alternate.

2.8 Bituminous Paint:

.1 Alkali resistant isolation coating, conforming to CGS 1 GP-108.

2.9 Touch-Up Paint:

.1 As recommended by coating manufacturer.

2.10 Metal Drip Flashing:

.1 Same as Metal Flashings

2.11 Sealants:

.1 As specified in Section 07 90 00.

2.12 Miscellaneous:

.1 Provide all appropriate incidental materials required to properly finish the Work specified.

Part 3 - Execution

3.1 Preparation

.1 Subsequent to installation of new waterproofing materials, install metal counter flashings along base of the existing above grade walls.

.2 Ensure that waterproofing is fully cured prior to installation of new flashing materials.

3.2 Shop fabrication

.1 Fabricate metal flashings and other sheet metal work in accordance with applicable CRCA FL series specifications.

.2 Form flashings to closely match profiles shown on drawings.

.3 Brake form pieces in maximum lengths suitable for the Work. Make allowances for expansion & contraction at all joints. Cut, drill and shape in shop where possible.

.4 Hem exposed edges on underside 12 mm minimum. Mitre and seal corners with sealant, in sliplock flashing to allow for thermal expansion.

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

.6 Form bends with straight sharp lines, angles and arises; and form sheets into true planes free from twists, buckles, dents and other visual distortions.

.7 Apply isolation coating to metal surfaces in contact with concrete, mortar, or dissimilar metals.

3.3 Flashing installation

.1 Install metal flashing with concealed fasteners free from distortion and other defects detrimental to appearance or performance as shown and directed on project drawings.

.2 Install metal flashing with uniform wash to exterior, level in length or uniform

in slope, straight in alignment with plumb up-stands or faces.

.3 Flashing shall be anchored to backup wall with corrosion resistant fasteners, plumb and level, free of warp or twist.

.4 Flashing shall be firmly secured by means of “S” lock cleats at seams and joints, with adequate provision for expansion and contraction.

.5 Cover joints in horizontal flashings with matching splice covers to Consultant’s approval.

.6 Fasten splice covers with self-tapping stainless screw fasteners.

.7 Install vertical metal trim shingle-style with minimum overlap of 50 mm.

.8 Metal fasteners shall be compatible with metal flashings.

.9 Heads of fasteners shall be concealed wherever possible, or otherwise shall be same colour as finished flashing.

.10 Double-back exposed edges of metal flashing at least 12 mm.

.11 Protect dissimilar metal materials from electrolytic action and from contact with concrete materials with a heavy coating of bituminous paint.

3.4 Clean up

.1 At the completion of the work each day remove all debris, garbage and excess materials from the site.

.2 Storage of debris will not be allowed overnight.

.3 Upon completion of the work, clean up all debris, excess materials and equipment and remove from site.

.4 All drippage or spills of sealants or primers shall be cleaned to approval of Consultant.

.5 Wash down all metal surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths. Take care to remove dirt from corners. Wipe surfaces clean.

.6 Cleaning shall be in accordance with the requirements and satisfaction of the Consultant and Client.

End of Section 07 60 00

Part 1 - General

1.1 Summary

.1 Section includes:
- .1 Snow guards for metal roofs.
- .2 Non-penetrating attachment system.
- .3 Colour-matched metal strips.

1.2 References

.1 Aluminum Association (AA) - Aluminum Standards and Data, 2003 Edition.

.2 Astm international (astm):
- .1 B85-03 - Standard Specification for Aluminum-Alloy Die Castings.
- .2 B221-04a - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.

1.3 System description

.1 Attachment system to provide attachment to standing seam metal roofs:
- .1 With only minor dimpling of panel seams.
- .2 Without penetrations through roof seams or panels.
- .3 Without use of sealers or adhesives.
- .4 Without voiding roof warranty.

.2 Loading: Design snow guard system to resist minimum in-service vector load, as specified by material manufacturer.

.3 Factor of safety: Utilize a factor of safety, as specified by material manufacturer, to determine allowable loads from ultimate tested clamp tensile load values.

1.4 Submittals

.1 Submit shop drawings for new snow guards. Shop drawings to indicate the location of new snow guards, roof plan layouts, attachment details, etc…All shop drawings shall be designed and stamped by a licensed Professional Engineer having jurisdictions to practice in the Province of Ontario.

.2 No fabrication and or installation shall commence until all shop drawings have been reviewed and approved by the Roofing Consultant.

1.5 Quality assurance

.1 Mock up:
- .1 Refer to Mock-Ups, Section 01 43 39.

Part 2 - Products

2.1 Manufacturers

.1 Products by Alpine SnowGuards, S-5! Colorgard - Metal Roof Innovations, Ltd., or Snow Gem, or approved alternate.

2.2 Components

.1 Clamps:
- .1 Manufactured from 6061-T6 aluminum extrusions conforming to ASTM B221 or aluminum castings conforming to ASTM B85 and to AA Aluminum Standards and Data.
- .2 Clamp model: No. S-5-U Or as recommended by material manufacturer.
- .3 Set screws: 300 Series stainless steel, 18-8 alloy, 3/8 inch diameter, with round nose point.

.4 Attachment bolts: 300 Series stainless steel, 18-8 alloy, 10 mm diameter, with flat washers.

.2 Cross members:
- .1 Manufactured from 6061-T6 alloy and temper aluminum extrusions conforming to ASTM B221 and AA Aluminum Standards and Data.
- .2 Receptacle in face to receive colour-matched metal strips.
- .3 Provide splice connectors ensuring alignment and structural continuity at end joints.

.3 Colour Strips: Same material and finish as roof panels; obtained from roof panel manufacturer.

.4 Snow and Ice Clips: Aluminum, with rubber foot, minimum 3 inches wide.

Part 3 - Execution

3.1 Examination

.1 Prior to beginning installation, verify that:
- .1 Panel seaming is complete.
- .2 Panel attachment is sufficient to withstand loads applied by snow guard system.
- .3 Installation will not impeded roof drainage.

3.2 Preparation

.1 Clean areas to receive attachments; remove loose and foreign matter that could interfere with installation or performance.

3.3 Snow guard installation

.1 Examination
- .1 Prior to beginning installation, verify that:
  - .1 Panel seaming is complete.
  - .2 Panel attachment is sufficient to withstand loads applied by snow guard system.
  - .3 Installation will not impeded roof drainage.

.2 Preparation
- .1 Clean areas to receive attachments; remove loose and foreign matter that could interfere with installation or performance.

.3 Installation
- .1 Install system in accordance with manufacturer's instructions and approved Shop Drawings.
- .2 Place clamps at maximum 32 inches on center or as required by in-service loads.
- .3 Place clamps in straight, aligned rows.
- .4 Place both set screws on same side of clamp.
- .5 Tighten set screws to manufacturer's recommended torque. Randomly test set screw torque using calibrated torque wrench.
- .6 Insert color-matched metal strips into cross members, staggering strips to cover cross member joints.
- .7 Attach cross members to clamps; tighten bolts to manufacturer's recommended torque.
- .8 Install splice connectors at cross member end joints.

.9 Do not cantilever cross members more than 4 inches beyond last clamp at ends.

.10 Install two SnoClips per panel between panel seams.

End of Section 07 72 53.01

Part 1 - General

1.1 General instructions

.1 Materials shall be new and in perfect condition, free from defects that may impair strength, performance, durability or appearance.

.2 Work shall be executed to the highest standards of workmanship in the industry, by fully trained applicators in strict accordance with the printed directions of the sealant manufacturer.

.3 Review and update all work schedules with Consultant on a regular basis.

.4 Examine the Work of this, and all related Sections to confirm the extent, location, quality, and condition prior to commencing.

.5 Discontinue work during severe rain, wind, heat, cold, or other such inclement weather and monitor time lost in relation to Environment Canada daily norms. Lost time will only be considered where actual conditions exceed norms.

1.2 Summary

.1 Work Included:

.1 Furnish all labour, materials, equipment and services necessary for the removal, replacement and/or supply of all caulking and sealant materials as detailed and/or as specified in the following areas:

.1 Joints between new metal flashings, and between new metal flashings and metal corner caps. Locations of damaged joints between glass panes as indicated on roof plan.

.2 Exposed screw fastener heads.

.3 All associated caulking as instructed by the Consultant.

.2 Clean and prepare all surfaces, and prime all substrate materials to a condition acceptable for the installation of the sealant materials.

.3 Application of primer to porous surfaces is mandatory unless superior adhesion is achieved to approval of Consultant.

.4 Apply the specified sealant materials.

.5 Make good any materials affected by sealant installation procedures, or affected by sealant materials.

1.3 Submittals

.1 Provide submittals, product data and shop drawings in accordance with Section 01 33 00 - Submittal Procedures.

.2 Before commencement of work, and before any materials are delivered to job site, submit to Consultant a complete list of materials proposed for use in the Work, including identification of manufacturer and product names. Certify that, where applicable, materials meet relevant ASTM or CGSB standards. Provide any certificates requested.

.3 Submit to Consultant all appropriate technical and product data, including written application recommendations from the manufacturer. Provide written confirmation from the manufacturer as to the compatibility of all materials to be used.

.4 Upon request, submit appropriately sized samples of each type of material and colour to be used to Consultant for approval.

.5 Cure samples under conditions anticipated at job site during application.

1.4 Reference standards

.1 Reference Standards outlined in this Section include:

.1 CAN/CGSB-19.13-M87 Sealing Compound, One-component, Elastomeric, Chemical Curing.

.2 CAN/CGSB-19.18-M87 Sealing Compound, One-component, Silicone Base, Solvent Curing.

.3 ASTM C-920 – Standard Specifications for Elastomeric Joint Sealants.

.4 ASTM C1521 – 13 Standard Practice for Evaluating Adhesion of Installed Weatherproofing Sealant Joints.

.2 Identify any revisions to the referenced standards and notify Consultant of same.

.3 Conform to most stringent requirements of referenced standard or revision.

1.5 Quality assurance

.1 All sealant materials and accessories shall be applied by a Contractor approved by the manufacturer. Provide written evidence of approval from manufacturer prior to commencement of the work, on request.

.2 Applicators shall have a minimum five (5) years proven experience in all phases of caulking work specified herein. Submit verification of experience on request.

.3 Employ only fully trained and skilled workers and execute work in strict accordance with sealant manufacturer's printed instructions.

.4 All materials shall be new and in perfect condition, free from defects that may impair strength, performance, durability or appearance.

.5 Work shall be executed to the highest standards of workmanship in the industry, by fully trained applicators in strict accordance with the printed directions of the sealant manufacturer.

1.6 Product delivery, storage and handling

.1 Deliver all materials in original, unopened packaging with the manufacturer's labels intact.

.2 Store all materials in such a manner so as to protect them from precipitation, ground moisture, temperature extremes, sunlight and construction activities by use of weatherproof coverings and raised platforms. Interior storage shall be employed when and where necessary, with the express written consent of the Client.

.3 Pallets of materials shall not be double stacked.

.4 Protect materials from freezing. Silicone sealants do not freeze so can be stored in conditions down to -40C. Materials suspected of having been subjected to freezing are not to be used unless the manufacturer verifies, in writing, that the material has not been damaged.

.5 Remove and replace any damaged, wet or broken materials.

.6 Store materials away from open flame or ignition sources.

.7 Do not transport any materials through the building without the written consent of the Client.

.8 Follow precautionary statements on product labels for storage and handling

before use and make reference to applicable Safety Data Sheets.

1.7 Job site conditions

.1 Apply sealant materials at ambient temperatures, relative humidity, and weather conditions satisfactory to manufacturer(s) and in any case under dry conditions only.

.2 Do not apply sealants during inclement weather conditions.

.3 Do not apply any sealant at ambient temperatures below 5 degrees Celsius without obtaining manufacturer's written recommendations for review and approval by Consultant.

.4 Prior to installation, inspect areas to receive sealant material to ensure that they are clean, dry, sound, smooth and free from dust, dirt, laitance, frost and other deleterious matter.

1.8 Environmental and safety requirements

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

.2 Conform to manufacturer's recommended temperatures, relative humidity, and substrate moisture content for application and curing of sealants including special conditions governing use.

.3 Arrange for the building staff to operate ventilation systems on maximum outdoor air and exhaust during interior installation of caulking and sealants. Ventilate area of work as required by use of approved portable supply and exhaust fans.

1.9 Warranty

.1 Refer to General Requirements Section 01 00 00, Item 26 WARRANTY.

1.10 Testing

.1 Contractor to retain the services of a testing company and carryout sealant adhesion test at locations as directed by Consultant in accordance with ASTM C1521 – 13 Standard Practice for Evaluating Adhesion of Installed Weatherproofing Sealant Joints or as per material manufacturer's recommended test methods. Cost associated with this test will be paid from contract testing allowance.

1.11 Swri validation

.1 All exterior weatherproofing sealants to be validated by the Sealant Weatherproofing Restoration Institute (www.SWRIONLINE.org)

Part 2 - Products

In the context of this Specification, the terms "caulking compound" and "sealant" are deemed the same.

Products manufactured by Dow Corning, Tremco, and GE are considered approved alternatives. Contractors seeking approval for alternate products/materials other than those named shall submit their request to the Consultant in writing for review and approval, only after award of contract. All roofing products specified herein and any proposed submission must comply with the requirements of ONE of the above listed roofing material manufacturer. All products must be compatible with roofing

membrane manufacturer's printed requirements.

2.1 Primers:

.1 As recommended by sealant manufacturer(s) to ensure superior adhesion and prevent staining of adjacent materials.

2.2 Cleaning Materials:

.1 Ethyl alcohol, ketone solvent, xylol, or methyl-ethyl-ketone (MEK), as supplied or recommended by sealant manufacturer(s) and compatible with all adjacent materials.

2.3 Masking Tape:

.1 As supplied or recommended by sealant manufacturer(s) and compatible with all adjacent materials.

2.4 Bond Breaker Tape:

.1 Pressure sensitive plastic tape, which will not bond to sealants, as supplied or recommended by the sealant manufacturer.

2.5 Colours:

.1 Selected by Consultant from manufacturer's standard range of colours to closely match existing materials and to Client's approval.

2.6 Exterior joint sealant:

.1 Medium-modulus, one-component, pre-pigmented, neutral-cure elastomeric silicone sealant; Compliance: Sealant shall meet or exceed requirements of ASTM C920, Type S, Grade NS, Class 50, Use NT, G, M, A, and O,

.2 Approved Products:

.1 Dow Corning® 795 Silicone Building Sealant, or approved equal,

.2 Dow Corning® 790 Silicone Building Sealant, or approved equal,

.3 Dow Corning®756 SMS Silicone Building Sealant, or approved equal,

.4 Following are considered approved and shall be used for indicated surfaces:

Material	Dow Corning	Tremco
Steel	DOW CORNING® 756	Spectrem® 2/Dymonic 100
Masonry	DOW CORNING® 790 or 795	Spectrem® 3 /Spectrem® 2/Dymonic 100
Aluminum	DOW CORNING® 790, 756, or 795	Spectrem® 1 /Spectrem® 2/Dymonic 100
Vinyl	DOW CORNING® 790, 756, or 795	Spectrem® 2/Dymonic 100
Wood*	DOW CORNING® 790, 756, or 795	Tremsil®400/Tremsil® 600/Dymonic 100

* Primer should be used for wood if not sealed (painted)

2.7 Other materials:

.1 Provide appropriate information to Consultant relating to other materials necessary for the proper installation of any materials listed above.

2.8 Closed Cell Backer Rod:

.1 Closed-cell polyethylene foam with a continuous outer skin to ASTM C 1330 Type C. Select a backer-rod diameter that is approximately 25% larger than the width of the joint.

Part 3 - Execution

3.1 Examination

.1 Examine all existing surfaces and substrates upon which work of this Section is dependent; report to the Consultant, in writing on any defects or discrepancies. Commencement of work implies acceptance of existing conditions and assuming full responsibility for finished condition of the Work.

.2 Before commencement of work, verify acceptability of existing site conditions with sealant manufacturer's representative to joint size, depth and condition of substrate; that all joints can be sealed as specified in an acceptable manner and that the execution, performance and quality of work will not be adversely affected by any existing conditions.

3.2 Manufacturer's requirements

.1 Contractor to follow sealant manufacturer's printed instructional technical manual (latest edition) for all preparation and installation procedures.

3.3 Preparation of surfaces

.1 Protect adjacent surfaces from damage. Use planks, plywood, drop sheets and other forms of protection as required.

.2 Clean joints of all contaminants and impurities by abrading with a wire brush, grinding, saw-cutting, or as otherwise required to permit application of new caulking.

.3 Clean surfaces of all joints and spaces that are to be sealed in an approved manner. Ensure that surfaces are sound, dry and free of dust, grease, oil, oxidation, other contaminants, laitance or loose and/or foreign materials which may adversely affect the adhesion of the sealant. Clean metals of oxides, mill and foreign materials by wire brushing, grinding or sanding.

.4 Wipe metal surfaces to be sealed, except pre-coated metals, with cellulose sponges or clean rags soaked with cleaning material and wipe dry with clean cloth. Where joints are to be sealed with silicone based sealants clean joint with methyl-ethyl-ketone (MEK) only. Clean pre-coated materials with solutions or compounds that will not injure finish and which are compatible with joint primer and sealant. Check that ferrous metal surfaces are painted before applying sealant. Ensure that solvents do not damage adjacent painted/coated surfaces.

.5 Ensure that all materials in contact with sealant are compatible.

.6 Where required, mask adjacent surfaces prior to priming and application of caulking to prevent staining and/or contamination of terrace surfaces intended for application of waterproofing.

.7 Test substrate for adhesion.

3.4 Application

.1 Install backer rods prior to the installation of new sealant for all joints.

.2 Apply all sealants, primers, joint backing, bond breakers to manufacturer's

printed instructions.

.3 Sealant shall be installed with required width to depth ratio as per manufacturer's printed instructions, or as shown on contract drawings.

.4 Primer selection shall be in accordance with manufacturer's written recommendations. Primer shall be applied with a clean, dry, lint-free cloth. Flooding of the surface with primer should be avoided.

.5 Conform to manufacturer's printed directions for materials requiring site mixing, heating, or special handling. Consult with manufacturer to determine requirements for application of sealant when ambient temperature of substrate is below 5 degrees Celsius.

.6 Do not use sealants that have been stored for a period of time exceeding the maximum recommended shelf-life.

.7 Use sufficient gun pressure to completely and uniformly fill joints and voids to proper depth.

.8 Form surface of sealant with full bead, smooth, and free from ridges, wrinkles, sags, air pockets, and embedded impurities. Neatly tool surface to a slight concave joint.

.9 There shall be no air voids throughout the entire joint cross section.

.10 Immediately remove excess sealant materials or droppings in an approved manner from adjacent finished surfaces, as work progresses. Do not use scrapers, chemicals, or other tools that could damage finished surfaces.

.11 Ensure that methods of protection do not interfere with proper sealant curing. Consult with manufacturer(s) for appropriate curing methods and times.

.12 Remove masking materials immediately after joints have been sealed and tooled.

.13 Make good other work damaged by work of this Section.

3.5 Clean up

.1 At the completion of each work day remove all debris, garbage and excess materials from the site.

.2 Storage of debris will not be allowed overnight.

.3 Upon completion of the work, clean up all debris, excess materials, and equipment and remove from site.

.4 All drippage or spillage of sealants or primers shall be cleaned to approval of Consultant.

End of section 07 90 00