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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.

2 SCOPE OF WORK

The scope of this project involves the replacement of slope glazing skylights labelled on Project Drawings as S1 and S2 located on the building roofs at the following City of Peterborough facilities:

.1 Provincial Courthouse, 70 Simcoe Street, Peterborough, ON

.1 Scope of work includes the following:

.1 Removal and disposal of two (2) existing skylights and associated accessories from the site.

.2 Supply and install two (2) new slope glazing skylight systems, including all associated components, framing, insulating glas units, flashings, sealants, etc., as specified and indicated on Project Drawings.

.3 Repairs to interior finishes and exterior roofing details.

.2 Site Setup & Garbage Disposal:

.1 Ground setup areas is limited around the building. Contractor is responsible to coordinate site ground setup area and location with building manager and Client representative.

.2 In the event that the ground setup area and the location of garbage disposal bin needs to be placed on suspended vault/roof slab and/or underground garage slab, then the contractor shall provide temporary engineered shoring below the existing slab for the duration of the

project. Contractor to provide an engineer stamped shop drawing for the shoring of the slab for review and approval.

.3 Interior Cut Test Openings:
  .1 Contractor is responsible for performing two (2) interior cut openings on interior drywall areas at the top of the existing slope glazing skylights S1 and S2 (one each). The openings shall expose the top of the existing mullion to reveal the existing securement method. The openings shall be a minimum of 24” x 24” in size. Contractor to inform the Consultant and allow for a site review of the openings.
  .2 Contractor to ensure existing securement conditions explored in the openings are considered in the preparation of the engineered shop drawings.
  .3 Contractor to repair all openings and make good to interior finishes after test areas have been reviewed by the Consultant. Contractor to paint the entire wall located above the top of both skylights, colour to match the existing.

.4 Hours of Operations:
  .1 Weekdays:
    .1 On daily basis, only after 5:00pm, and before 7:30am.
    .2 No work will be allowed on site from 8:00am to 5:00pm.
  .2 Weekends:
    .1 No restrictions, work can be performed any time during weekends.

.5 Interior Protections:
  .1 The interior of the building will remain occupied and in use by the client during the construction work. Contractor is responsible to supply and install construction grade tarp over all existing office/material/goods/spaces inside the building, located under the areas of work and as deemed necessary by the Client. Contractor shall arrange with the building management and/or staff in order to visit the building interior on daily basis and install interior protection (tarp) to ensure all material/goods/spaces/equipment are fully protected from dust, debris, leaks, etc… for the duration of roof/skylight work.
  .2 All interior of the building shall be meticulously cleaned prior to 7:30am each morning before the building is opened for normal daily operations.

.6 Contractor shall review the 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.

.7 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.

.8 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.

.9 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 skylight construction period.

.10 The Contractor must maintain a minimum three (3) person crew on site, on daily basis, at all times for the duration of construction period. The crew must have at least two (2) professional and skill workers performing the work on hand.

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 roofing material;
- .12 Colour samples as specified.
- .13 Photographs and Video Recordings: Showing existing conditions all roofs, walls, adjoining areas, grounds and overall site, including exterior and interior finish surfaces, which might be misconstrued as having been damaged by rehabilitation operations. Submit before Work begins.

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.

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.

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.

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/Vaping 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.

8 OVERTIME

.1 The Contractor and SubContractors shall include for any and all overtime rates that may be incurred in execution of the specified 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.

9 QUALIFICATION OF CONTRACTOR & WORKERS

.1 The Contractor throughout the bid and installation periods, must be officially recognised as an approved applicator by the product manufacturer for at least ten (10) years.

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

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

.4 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.

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

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

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

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.

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.

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 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.

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

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

.8 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.

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

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

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

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

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

13 ENVIRONMENTAL REQUIREMENTS

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

.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 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.

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.

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.

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.

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.

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.

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 temporary protection below areas of work for slope glazing skylights S1 and S2 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.
.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 roofing assembly 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.

.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.

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.

21 SCAFFOLDING

.1 Install overhead protection hoarding and scaffolding at the outside and inside of the building access doors, on the ground level, and below work area 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.

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.

23 BUILDING ACCESS

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

24 SITE REVIEW

.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.

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.

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 **New Aluminum Windows**

.1 Workmanship Warranty: Contractor shall supply the owner with a written and signed document, certifying that all work completed shall remain as installed, free from any deficiencies, for a period of Two (2) years from date of Substantial Performance of Work. The warranty document shall state that the contractor will be responsible for the repair/replacement of any defects for the duration of the warranty period.

.2 Manufacturer Warranty: Provide written warranty in form acceptable to Owner jointly signed by Manufacturer, Installer and Contractor warranting work to be watertight, free from deflective materials, defective workmanship, glass breakage due to defective design, and agreeing to replace components which fail within Ten (10) year from date of Substantial Completion.

.3 Warranty shall include the following:

.1 The insulating glass units shall be free from condensation, fogging material obstruction of vision as a result of dust or film formation on the internal glass surfaces by any cause under design conditions.

.2 The insulating glass units shall not change their mechanical design properties and shall not in any way deteriorate, degrade, delaminate, or change their visual appearance.

.3 The glass units will not break due to thermal shock and temperature differential due to inherent glass faults, other than extrinsic glass breakage.

.4 Internal fogging shall be deemed to occur when light transmission of the glass is reduced by 5% in any 50 mm x 50 mm area.

.5 Failure will be deemed to occur when the internal dew point exceeds -40C in a 21C ambient temperature (when tested in accordance with ASTM E576).

.6 Warrant that glazing work is water and weather tight and free from distortion; that glazing materials will not deteriorate from exposure to the atmosphere and weather, will not be displaced, and will be free from permanent deformation under load; and that glass and insulating glass units will not be broken, cracked, or scratched by causes resulting from defects in material, workmanship, or design of glazing installation .

.7 Cracked or scratched glass, shrinking, cracking, staining, hardening, sagging of glazing materials; loosening or rattling of glass; and leaking of glazed joints will be considered defective work.

.8 Warranty shall provide for the removal of defective Products, replacement with new Products conforming to the specifications, and restoration of work damaged by removal and replacement including labour and installation costs.

Provide written warranty stating organic coating finish will be free from fading more than 10%, chalking, yellowing, peeling, cracking, pitting, corroding or non-uniformity of colour, or gloss deterioration beyond manufacturer's descriptive standards for Five (5) years from date of Substantial Completion and agreeing to promptly correct defects.

.4 **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.

.5 **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 five (5) year period 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.

27 CLEAN UP & REMOVAL OF RUBBISH

.1 As work proceeds and at the completion of the work at each work shift, 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 roof 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.

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.

29 PROJECT & WORK SCHEDULE

.1 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.

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

.3 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.

.4 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.

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

.6 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.

30 SHOP DRAWINGS & SAMPLES

.1 Contractor shall submit engineered shop drawing(s) for:

.1 New Slope Glazing Skylight, including all associated accessories, securement anchors, and IGU glazing design.

.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 12" x 12" insulating glass unit (IGU) with selected colour and coating, showing glazing materials, edge and corner details

.2 12" length of all extruded aluminum framing members: rafters, purlins, bottom curb/gutter, and pressure plate, face cap, etc.

.3 Prefinished Sheet Metal Flashing,

.4 Sealants,

.5 Colour of paint drawdowns,

.6 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.

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.

.3 All roofing work shall be preformed by the Contractor and shall not be sub-contracted to any sub-trade.

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/vaping 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.

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 three (3) 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 0.5m section of the new bottom flashing assembly for details 2/A1, complete with new support frame, aluminum frame, all flashing membrane, metal flashing, sealant, fasteners, etc. as shown.
- .2 0.5m section of the new flashing assembly for details 1/A1, complete with all flashing membrane, metal flashing, sealant, fasteners, etc. as shown.

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 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, 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 all items as indicated in related sections and within scope of work of all existing window & glazing material including all accessories as required in order to carry out specified work. All existing material shall be removed and disposed of down to the existing structure as indicated within specifications and project drawings.

.2 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 price and is considered to be part of scope of this project.

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

2.4 Cleats and Edge Strips: Of same material and temper as prefinished sheet metal, minimum 50 mm wide and 18 GA. minimum thickness.

2.5 Anchors: Stainless steel.

2.6 Fasteners: Stainless steel, head colour same as exterior sheet if exposed. Screw type only.

2.7 Solvent: "MEK", Methyl Ethyl Ketone solvent to clean surfaces, or approved alternate.

2.8 Bituminous Paint: Alkali resistant isolation coating, conforming to CGS 1 GP-108.
2.9 Touch-Up Paint: As recommended by coating manufacturer.
2.10 Metal Drip Flashing: same as Metal Flashings
2.11 Sealants: As specified in Section 07 90 00.
2.12 Miscellaneous: 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 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: As recommended by sealant manufacturer(s) to ensure superior adhesion

and prevent staining of adjacent materials.

2.2 Cleaning Materials: 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: As supplied or recommended by sealant manufacturer(s) and compatible with all adjacent materials.

2.4 Bond Breaker Tape: Pressure sensitive plastic tape, which will not bond to sealants, as supplied or recommended by the sealant manufacturer.

2.5 Colours: 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: 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: 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

PART 1 - GENERAL

1.1 SUMMARY

.1 This Section specifies thermally broken, glazed aluminum skylights, components, and accessories which forms an integral part of exterior cladding enclosure of the facility.

1.2 RELATED SECTIONS

.1 Section 01 00 00 – General Requirements
.2 Section 01 31 00 – Project Management & Coordination
.3 Section 01 33 00 – Submittal Procedures
.4 Section 01 43 39 – Mock-Ups
.5 Section 01 45 00 – Quality Control
.6 Section 01 77 00 – Close-out Procedures
.7 Section 02 41 00 – Demolition & Removal
.8 Section 07 60 00 – Flashing and Sheet Metal
.9 Section 07 90 00 – Joint Protection
.10 Section 08 81 00 – Glazing – Insulated Glass Unit

1.3 REFERENCES & STANDARDS

.1 Aluminum Association (AA)
  .1 DAF 45 [2003], Designation System for Aluminum Finishes.
.2 American Architectural Manufacturers Association (AAMA).
  .1 AAMA-501-[2005], Methods of Test for Exterior Walls.
  .2 AAMA-1600/I.S 7-[2000], Voluntary Specification for Skylights.
  .3 AAMA-2603-[2002], Voluntary Specification, Performance Requirements and
  .4 Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels.
  .5 AAMA-2604-[2005], Voluntary Specification, Performance Requirements and
  .6 Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels.
  .7 AAMA-2605-[2005], Voluntary Specification, Performance Requirements and
  .8 Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.
  .9 AAMA CW-10-[2004], Care and Handling of Architectural Aluminum From Shop to Site.
.3 ASTM International (ASTM).
  .1 ASTM A653 / A653M – [09a], Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
  .2 ASTM B209-[07], Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
  .3 ASTM B221-[08], Specification for Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
  .4 ASTM E283 [04], Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Skylights, and Doors Under Specified

Pressure Differences Across the Specimen.

.5 ASTM E331 [00], Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Skylights, by Uniform Static Air Pressure Difference.

.6 ASTM D2240 – [05], Standard Test Method for Rubber Property—Durometer Hardness.

.4 Canada Green Building Council (CaGBC).

.1 LEED® Canada-NC Version 1.0-[2004], LEED (Leadership in Energy and Environmental Design): Green Building Rating System Reference Package For New Construction and Major Renovations including Addendum 2007.

.5 Canadian General Standards Board (CGSB).

.1 CAN/CGSB-12.8-[97], Insulating Glass Units.

.2 CAN/CGSB-12.20-[M89], Structural Design of Glass for Buildings.

.3 CAN/CGSB-19.13-[M87], Sealing Compound, One-Component, Elastomeric, Chemical Curing.

.6 CSA International (CSA)

.1 CAN/CSA-S157 [2005], Strength Design in Aluminum.

.2 CAN/CSA-S136–[2007], North American Specification for the Design of Cold-Formed Steel Structural Members.

.3 CAN/CSA W59.2 [M1991(R2003)], Welded Aluminum Construction.

.7 Environmental Choice Program (ECP)

.1 CCD 45 [1995], Sealants and Caulking Compounds.

.8 Underwriter's Laboratories of Canada (ULC)

.1 CAN/ULC-S710.1 [2005], Standard for Thermal Insulation – Bead-Applied One Component Polyurethane Air Sealant Foam, Part 1: Materials Standard for Thermal Insulation - Bead - Applied One Component Polyurethane Air Sealant Foam, Part 1: Materials.

1.4 ADMINISTRATIVE REQUIREMENTS

.1 Co-ordination: Co-ordinate work of this Section with work of other trades for proper time and sequence to avoid construction delays.

.2 Pre-installation Meeting: Convene pre-installation meeting after Award of Contract and one week prior to commencing work of this Section to verify project requirements, substrate conditions and coordination with other building sub-trades, and to review manufacturer's written installation instructions.

.1 Comply with Section 01 31 00 Project Management and coordination.

.2 Attend meeting two (2) weeks prior to start and ensure meeting attendees include as minimum:

.1 Owner's representative;

.2 Consultant;

.3 Glazing subcontractor;

.4 Manufacturer's Technical Representative.

.3 Ensure meeting agenda includes review of methods and procedures related to glazed aluminum skylight installation including co-ordination with related work.

.4 Record meeting proceedings including corrective measures and other actions required to ensure successful completion of work and distribute to each attendee within one (1) week of meeting.

1.5 ACTION AND INFORMATIONAL SUBMITTALS

.1 Make submittals in accordance with Contract Conditions and Section 01 33 00 Submittal Procedures.

.2 Product Data: Submit product data including manufacturer's literature for glazed aluminum skylight extruded members, panels, components, and accessories, indicating compliance with specified requirements and material characteristics.

.1 Submit list on skylight manufacturer's letterhead of materials, components, and accessories to be incorporated into Work.

.2 Include product names, types, and series numbers.

.3 Include contact information for manufacturer and their representative for this Project.

.3 Shop Drawings:

.1 Shop drawings shall include the overall skylight assembly, including aluminum framing and insulating glass units, and shall indicate all design loads.

.2 Submit stamped engineered shop drawings indicating elevations, detailed design, dimensions, member profiles, joint locations, arrangement of units, member connections, and thickness of various components.

.3 Show following items:

.1 Calculations or modelling confirming that new system conforms to specified performance, design parameters and energy requirements,

.2 Show size and location of seismic restraints. Include seismic design calculations,

.3 Structural integrity of skylight, anchorage inserts, and system installation tolerances,

.4 Details of special shapes,

.5 Overall reinforcing, anchorage, assembly fixings,

.6 Drainage details and flow diagrams,

.7 Air barrier and vapour retarder continuity and path of cavity drainage and air pressure equalization (as applicable),

.8 Anchorage system,

.9 Interfacing with building construction,

.10 Provisions for system expansion and contraction; detailing, locations, and allowances for movement, expansion, contraction,

.11 Thermal breaks.

.4 Indicate glazing details, methods, locations of various types and thickness of glass, emergency breakout locations, and internal sealant requirements.

.5 Clearly indicate locations of exposed fasteners and joints for Consultant's acceptance.

.6 Clearly show where and how manufacturer's system deviates from Contract Drawings and these Specifications (if any).

.4 Samples:

.1 Submit duplicate 300 x 300 mm sample sections showing prefinished aluminum surface, finish, colour, and texture, and including section of infill panel.

.2 Submit duplicate 300 x 300 mm sample sections of insulating glass unit showing glazing materials and edge and corner details.

.5 Thermal Performance: Submit verification that Insulating Glass Units used in skylight meets RSI values specified.

.6 Test Reports:

.1 Submit test reports showing compliance with specified performance characteristics and physical properties including air infiltration, water infiltration and structural performance.

.7 Field Reports: Submit manufacturer's field reports within 3 days of manufacturer representative's site visit and inspection.

.8 Installer Qualifications:

.1 Submit letter verifying installer's experience with work similar to work of this Section.

.9 Warranty: Submit specified warranties.

1.6 CLOSEOUT SUBMITTALS

.1 Operation and Maintenance Data: Supply maintenance data for skylight for incorporation into manual specified in Section 01 77 00 Closeout Procedures.

.2 Sustainable Design Closeout Documentation.

.1 Provide calculations on end-of-project recycling rates, salvage rates, and landfill rates for work of this Section demonstrating percentage of construction wastes which were recycled.

.2 Submit verification from recycling facility showing receipt of materials.

.3 Record Documentation: In accordance with Section 01 77 00 Closeout Procedures.

.1 List materials used in skylight work.

.2 Warranty: Submit warranty documents specified.

1.7 QUALITY CONTROL

.1 Comply to section 01 45 00

1.8 DELIVERY STORAGE AND HANDLING

.1 Delivery and Acceptance Requirements:

.1 Deliver glazed aluminum skylight materials and components in manufacturers original packaging with identification labels intact and in sizes to suit project.

.2 Material Handling: To AAMA CW-10.

.3 Storage and Handling Requirements: Store materials off ground and protected from exposure to harmful weather conditions and at temperature conditions recommended by manufacturer.

.1 Material storage: To AAMA CW-10.

.4 Packaging Waste Management:
.1 Remove waste packaging materials from site and dispose of packaging materials at appropriate recycling facilities.
.2 Collect and separate for disposal paper and plastic material in appropriate on-site storage containers for recycling in accordance with Waste Management Plan.

1.9 WARRANTY

.1 Refer to section 01 00 00, General Requirements.

PART 2 - PRODUCTS

2.1 MANUFACTURER

.1 Products specified herein are based on product manufactured by IBG Canada, similar products by Alumicor, Kawneer & Windspec 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.

.2 All products specified below must comply with the requirements of ONE listed manufacturer in order to obtain specified warranty. All products must be compatible with manufacturer's printed requirements.

2.2 DESCRIPTION

.1 Aluminum framed skylights.

2.3 DESIGN CRITERIA

.1 Design skylight to AAMA CW-DG-1 and to AAMA-1600/I.S 7.
.1 Design glazed aluminum skylight following rainscreen principles.
.2 Ensure horizontal members are sealed to vertical members.
.3 Ventilate and pressure equalize air space outside exterior surface of insulation to exterior.

.2 Design aluminum components to CAN/CSA S157 with span deflection to 19 mm L/200 maximum.
.1 Thermal expansion: Ensure skylight can withstand temperature differential of 85 degrees C and is able to accommodate interior and exterior system expansion and contraction without damage to components or deterioration of seals.
.2 Ensure system is designed to accommodate:
.1 Movement within skylight assembly.
.2 Movement between skylight and perimeter framing components.
.3 Dynamic loading and release of loads.
.4 Deflection of structural support framing.
.3 Glass dimensions: refer to Section 08 81 00 – Glazing – Insulating Glass Unit
.4 Air infiltration: 0.3 L/s/m2 maximum of wall area to AAMA-1600/I.S 7, ASTM E283 at differential pressure across assembly of 75 Pa.
.5 Water infiltration: None to AAMA-1600/I.S 7, ASTM E331 at differential pressure across assembly of 480 Pa.
.6 Ensure interior surfaces have no condensation before exposed edges of sealed units reach dew point temperatures during testing to AAMA

501.

.7 Maintain continuous air barrier and vapour retarder throughout building envelope and skylight assembly.

.8 Ensure no vibration harmonics, wind whistles, noises caused by thermal movement, thermal movement transmitted to other building elements, loosening, weakening, or fracturing of attachments or components of skylight occur.

2.4 MATERIALS

.1 Framing System:

.1 Framing Members: Fabricate from 6063-T6, or 6061-T6 extruded aluminum; temper and alloy as recommended by the manufacturer for design loading, cross-sectional configuration, fabrication requirements and required finish. Include an integral gutter system to control water infiltration and condensation.

.2 Provide tubular rafter and purlin framing members with flush condensation gutters. Do not anchor sill members through integral secondary gutter area on pitches less than 4” on 12” slope from horizontal.

.3 Formed flashing and closures: minimum 0.062-inch-thick aluminum sheet.

.4 Condensation and Water Infiltration Control: Provide framing system which will collect and channel condensation and water infiltration to the exterior through baffled weep holes or drain tubes in the sill or perimeter framing members.

.5 Fabricate work to be straight, plumb, level, and square. Provide work to sizes, shapes and profiles indicated on approved shop drawings. Make work with uniform, tight joints.

.6 Use factory-performed heliarc welding with all exposed welds finished to match adjacent material.

.7 Acceptable Material: IBG Canada Ltd., Windspec, Oldcastle Building Envelope, Alumicor and Kawneer, or approved equal.

.2 Finishes:

.1 Pre-painted aluminium, colour to be selected by the Owner/Client.

.1 Organic Coating (high performance fluorocarbon):

.2 Comply with requirements of AAMA 2605.

.3 Surfaces cleaned and given conversion coating pre-treatment prior to application of 0.3 mil dry film thickness of epoxy or acrylic primer following recommendations of finish coat manufacturer.

.4 Finish coat of 70% minimum fluorocarbon resin fused to primed surfaces at temperature recommended by manufacturer, 1.0 mil minimum dry film thickness.

.5 Acceptable coatings are Trinar by Akzo Coatings, Inc.; Nubelar by Glidden Company; Fluoroceram by Morton International, Inc.; Duranar by PPG Industries Inc.; and Fluropon by Valspar Corporation.

.6 Provide in either 2, 3, or 4 coat system as required for color

selected.

.3 **Glazing Technique:**

.1 Two-Sided Structural Silicone Glazing: Two sides of each glass unit shall be retained with glazing caps mechanically secured with glazing clips with two remaining sides secured to a continuous aluminum fin at purlins using a shear-type structural silicone sealant joint. Comply with AAMA Two-Sided Structural Glazing Guidelines for Aluminum Framed Skylights. Temporary caps at appropriate spacing must be installed to secure the glass unit silicone sealant cures (approximately 14-21 days under normal weather conditions). Remove temporary caps following sealant cure.

.2 Sloped Glass: Refer to specification Section 08 81 00

.3 Insulated Aluminum Closures: Provide rigid, or batt-type, or spray foam insulation to reduce heat transfer and uncontrolled condensation where required.

.4 **Glazing Requirements:**

.1 Refer to Section 08 81 00

.5 **Glazing Gaskets and Blocking:**

.1 Continuous Cushion Below Glazing Infill: Provide extruded, dense EPDM, black rubber gaskets with 60 plus or minus 5 Shore A durometer complying with ASTM C864.

.2 Continuous Spacer Above Glazing Infill: Provide extruded, closed-cell sponge EPDM, black rubber gaskets complying with ASTM C509.

.3 Ozone Resistance: Fabricate gaskets of material to withstand one part per million ozone for 500 hours at 20 percent elongation at 100F when tested in accordance with ASTM D1149.

.4 Silicone setting blocks with a durometer of Shore A 85-80 plus/minus 5.

.6 **Anchors and Fasteners:**

.1 Provide cadmium plating for lag, sleeve and stud bolt anchors not exposed to the weather.

.2 Provide anchor fasteners fabricated of stainless steel for anchors exposed to the weather.

.3 Provide 300 Series stainless steel for bolted connections where fasteners may be exposed to the weather and where bolted connections may penetrate secondary gutter of sill member.

.7 **Sealants:**

.1 Skylight manufacturer recommends the use of Dow Corning 795 silicone sealant. Surfaces shall be cleaned and primed as required by sealant manufacturer to assure proper sealant adhesion. Sealants shall be applied in accordance with sealant manufacturer's guidelines and joint dimensions held as shown on approved shop drawings.

.2 Exterior metal to glass corner and cap seals shall be black in color using Dow Corning 795 silicone sealant. Exposed metal to metal joints shall be sealed with a standard color Dow Corning 795 silicone sealant.

.3 Sealants shall exhibit adequate adhesion to samples of metal and glass when tested in accordance with ASTM C794.

.4 Structural sealants shall be compatible with all contact substrates and components.

2.5 SKYLIGHT FABRICATION

.1 Do aluminum welding to CAN/CSA W59.2.

.2 Fabricate aluminum assemblies of extruded sections to sizes and profiles indicated.

.1 Ensure vertical and horizontal members are tubular extrusions designed for shear block corner construction. Notch and overlap purlin components into rafters to ensure positive drainage.

.2 Rafter depth sizes as indicated.

.3 Construct skylights square, plumb and free from distortion, waves, twists, buckles, or other defects detrimental to performance or appearance.

.4 Fabricate skylight with minimum clearances and shim spacing around perimeter and ensure installation and dynamic movement of perimeter seal is enabled.

.5 Accurately fit and secure joints and corners.

.1 Ensure joints are flush, hairline, [and weatherproof].

.6 Prepare skylight to receive anchor devices.

.7 Use only concealed fasteners.

.1 Where fasteners cannot be concealed, countersunk screws finished to match adjacent material may be used upon receipt of written approval from Consultant.

PART 3 - EXECUTION

3.1 INSTALLERS

.1 Use only manufacturer authorized installers for with 10 years minimum experience in similar work of this Section.

3.2 EXAMINATION

.1 Verification of Conditions: Verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for skylight installation in accordance with manufacturer’s written instructions.

.1 Visually inspect substrate in presence of Consultant.

.2 Inform Consultant of unacceptable conditions immediately upon discovery.

.3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Consultant.

3.3 INSTALLATION

.1 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: Comply with manufacturer's product data, including product technical bulletins, product erection/installation instructions, and product carton instructions for installation.

.2 EXAMINATION

.1 Site Verification of Conditions: Verify that substrate conditions are acceptable for product installation in accordance with manufacturer's instructions.

.3 PREPARATION

.1 Preparation: Take measurements of as-built and adjacent construction and examine conditions of substrates, supports and other conditions under which this work is to be performed and notify Consultant in writing, of circumstances detrimental to the proper completion of the work. Do not proceed with work until unsatisfactory conditions are corrected.

.4 INSTALLATION

.1 Skylight Installation:

.1 Match profiles, sizes and spacings indicated on approved engineered shop drawings. Ensure that weep and condensation control system operate properly. Do not perform structural silicone sealant work when the metal temperature is below 0 degrees C without written approval from silicone sealant manufacturer.

.2 Coordinate installation with adjacent work such as roofing, sheet metal and other work to ensure a complete weatherproof assembly. Anchor work securely to supporting structure but allow for differential and thermal movement.

.3 Isolate between aluminum and dissimilar metals with a protective coating or plastic strip to prevent electrolytic corrosion.

.4 Site Tolerances: The as-built support and adjacent construction should be held to within ± 1/2 inch of the theoretical dimensions.

.5 Install components plumb and true in alignment with established lines and elevations.

.6 Install components to properly drain potential water infiltration and condensation occurring within framing system and moisture migrating from within the skylight to the exterior.

.7 Comply with manufacturer's written installation instructions.

.8 Specifier Note: Coordinate article below with Division 1 Quality Assurance and Quality Control Sections.

3.4 FIELD QUALITY CONTROL &TESTING

.1 Field Inspection: Coordinate field inspection in accordance with Section 01 45 00 Quality Control.

.2 Site Installation Tolerances:

.1 Sealant space between skylight and adjacent construction: 13 mm maximum.

.3 Manufacturer's Services:

.1 Coordinate manufacturer's services with Section 01 45 00 - Quality Control.

.2 Submit to Consultant a written agreement from the manufacturer to perform the manufacturer's services.

.3 Schedule manufacturer's review of work procedures at stages listed:

.1 Product Application: 1 off site review.

.2 Fabrication and Handling: 1 review at authorized installers fabrication facilities.

.3 Installation: 3 site reviews at commencement of Work, 50% completion of Work, Upon completion of Work.

.4 Submit manufacturer's written reports to Consultant describing:

.5 The scope of work requested.
.6 Date, time, and location.
.7 Procedures performed.
.8 Observed or detected non-compliances or inconsistencies with manufacturers' recommended instructions.
.9 Limitations or disclaimers regarding the procedures performed.
.10 Obtain reports within seven days of review and submit immediately to Consultant.

.4 Testing
.1 Testing of assembly will be performed by an inspection and testing firm designated and paid for by the testing allowance;
.2 A minimum of 1 test shall be performed. In the case of a skylight assembly failing the testing criteria, Contractor pay for a re-test of the skylight assembly in question plus one additional window, chosen by the Consultant or Owner;
.3 Inspection and testing by the inspection company to be performed on site. Inspection and testing will be performed to ensure that windows meet specified design criteria. Coordinate and cooperate with inspection and testing company.
.4 Tested assembly shall meet or exceed requirements of this Section;
.5 Copies of test reports shall be provided to Contractor and Consultant.
.6 At conclusion of tests there shall be no glass breakage, damage of fasteners, hardware parts, or any other damage;
.7 Assemblies not meeting design criteria will be replaced at no cost to Owner.

3.5 CLEANING

.1 Leave work area clean end of each day.
.2 Final cleaning: Upon completion, remove surplus materials, rubbish, tools, and equipment.
.3 Collect recyclable waste and dispose of or recycle field generated construction waste created during construction or final cleaning related to work of this Section.
.4 Remove recycling containers and bins from site and dispose of materials at appropriate facility.

3.6 PROTECTION

.1 Protect installed products and components from damage during construction.
.2 Repair damage to adjacent materials caused by glazed aluminum skylight installation.

End of Section 08 63 00

PART 1 - GENERAL

1.1 SUMMARY

.1 This Section specifies Double-Glazed Solar Control Insulating Glass Units.

1.2 RELATED SECTIONS

.1 Section 01 00 00 – General Requirements
.2 Section 01 31 00 – Project Management & Coordination
.3 Section 01 33 00 – Submittal Procedures
.4 Section 01 43 39 – Mock-Ups
.5 Section 01 45 00 – Quality Control
.6 Section 01 77 00 – Close-out Procedures
.7 Section 02 41 00 – Demolition & Removal
.8 Section 07 60 00 – Flashing and Sheet Metal
.9 Section 07 90 00 – Joint Protection
.10 Section 08 63 00 – Metal-Framed-Skylight

1.3 REFERENCES & STANDARDS

.1 ANSI Z 97.1 - Glazing Materials Used in Buildings, Safety Performance Specifi-cations and Methods of Test.
.2 ASTM C 1036 - Standard Specification for Flat Glass.
.3 ASTM C 1048 - Standard Specification for Heat-Treated Flat Glass--Kind HS, Kind FT Coated and Uncoated Glass.
.4 ASTM C 1376 - Standard Specification for Pyrolytic and Vacuum Deposition Coatings on Glass.
.5 ASTM E 2188 – Standard Test Method for Insulating Glass Unit Performance.
.6 ASTM E 2190 - Standard Specification for Insulating Glass Unit Performance and Evaluation.
.7 CPSC 16CFR-1201 - Safety Standard for Architectural Glazing Materials.
.8 Glass Association of North America (GANA) Glazing Manual.

1.4 DEFINITIONS

.1 Sealed Insulating Glass Unit Surfaces:
  .1 Surface No. 1: Exterior surface of outer lite.
  .2 Surface No. 2: Interior surface of outer lite.
  .3 Surface No. 3: Exterior surface of inner lite.
  .4 Surface No. 4: Interior surface of inner lite.
.2 Airspace: Space between lites of an insulating glass unit that contains dehydrated air or other inert specified gas.

1.5 SUBMITTALS

.1 Comply with Section 01 33 00 - Submittal Procedures.
.2 Product Data: Submit manufacturer's product data, including performance characteristics and installation instructions.
.3 Shop drawings shall include the overall skylight assembly, including aluminum framing and insulating glass units, and shall indicate all design loads.
.4 Shop Drawings: Submit manufacturer's or fabricator's shop drawings, including plans, elevations, sections, and details, indicating glass dimensions, tolerances, types, thicknesses, and coatings. All Shop

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

.5 Samples: Submit manufacturer's samples of each type, thickness, and coating.

.6 Fabricator's Certification: Submit fabricator's certification by manufacturer.

.7 Cleaning Instructions: Submit manufacturer's cleaning instructions.

.8 Warranty: Submit specified warranties.

1.6 QUALITY ASSURANCE

.1 Manufacturer's Qualifications: Minimum of 10 years' experience manufacturing solar control coated glass.

.2 Fabricator's Qualifications:

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

.3 Certified by coated glass manufacturer.

.4 Mock-Ups:

.1 Comply with Section 01 43 39 – Mock-Up

.2 Comply with Section 01 45 00 - Quality Control

.3 Obtain acceptance of mock-ups by consultant before proceeding with work.

1.7 DELIVERY, STORAGE, AND HANDLING

.1 Delivery:

.1 Deliver glass to site in accordance with manufacturer's instructions.

.2 Deliver glass in manufacturer's or fabricator's original containers and packaging, with labels clearly identifying product name and manufacturer.

.2 Storage:

.1 Store glass in accordance with manufacturer's instructions.

.2 Store glass in clean, dry area indoors.

.3 Protect from exposure to direct sunlight and freezing temperatures.

.4 Apply temporary coverings loosely to allow adequate ventilation.

.5 Protect from contact with corrosive chemicals.

.6 Avoid placement of glass edge on concrete, metal, and other hard objects.

.7 Rest glass on clean, cushioned pads at 1/4-points.

.3 Handling:

.1 Handle glass in accordance with manufacturer's instructions.

.2 Protect glass from damage during handling and installation.

.3 Do not slide 1 lite of glass against another.

.4 Do not use sharp objects near unprotected glass.

1.8 WARRANTY

.1 Refer to section 01 00 00, General Requirements.

PART 2 - PRODUCTS

2.1 MANUFACTURER

.1 Products specified herein are based on product manufactured by Guardian

Glass Similar products by manufacturers of same quality and standard as specified here in are acceptable, upon review. 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.

.2 All products specified below must comply with the requirements of ONE listed manufacturer in order to obtain system warranty. All products must be compatible with manufacturer's printed requirements.

2.2 FABRICATORS

.1 Sealed Insulating Glass Units, Heat-Strengthened Glass, Tempered Glass:

2.3 SOLAR CONTROL INSULATION COATED GLASS

.1 Double-Glazed Sputter-Coated Insulating Glass Units:

.1 Conformance: ASTM E 2190.

.2 **Outboard Lite:** Sputter-coated Clear Float glass.

.1 Clear Float Glass: ASTM C 1036, Type 1, Class 1, Quality q3.

.2 Vacuum Deposition Sputtered Coating: ASTM C 1376.

.3 Coating on Surface No. 2: Solarban® R100.

.4 Glass Thickness: 6mm.

.5 Heat Treatment: Tempered; ASTM C 1048, Kind FT; CPSC 16CFR-1201; ANSI Z 97.1 as necessary to meet applicable codes and performance requirements.

.6 Glazing Colour: Solarbronze or as selected by the Client from the standard colour.

.3 **Air Space:** 1/2" (12.7 mm) wide, hermetically sealed, 5% Air, 95% dehydrated Argon space.

.4 **Inboard Lite:** Laminated Safety Glass.

.1 Laminated Glass: 3mmClear_060PVB_3mmClear.

.2 Laminated Glass to ASTM C1172. Use materials that have a proven record of no tendency to bubble, discolour, or lose physical and mechanical properties after fabrication and installation

.3 Clear Float Glass: ASTM C 1036, Type 1, Class 1, Quality q3.

.4 Glass Thickness: 3 mm.

.5 Heat-Treatment: Tempered; ASTM C 1048, Kind FT; CPSC 16CFR-1201; ANSI Z 97.1 as necessary to meet applicable codes and performance requirements.

.6 Interlayer Type: Laminate glass with polyvinyl butyral interlayer or as required to comply with interlayer manufacturer's written instructions and local Code.

.1 Interlayer Thickness: 0.060" (1.52mm), provide thickness not less than that indicated and as needed to comply with requirements.

.5 Glass Unit Performance Characteristics:

.1 Transmittance UV: 0%

.2 Transmittance Visible: 25%

.3 Transmittance Total Solar: 11%

.4 Exterior Solar Reflectance: 20%

.5 Exterior Visible Reflectance: 15%

.6 Interior Visible Reflectance: 13%

.7 U-Value Winter Nighttime: 0.24

.8 U-Value Summer Daytime: 0.22

.9 Shading Coefficient: 0.19
.10 Solar Heat Gain Coefficient: 0.17
.11 Light to Solar Gain: 1.47

.6 Edge Seals: ASTM E 2188, with aluminum spacers, dual-sealed with a primary seal of polyisobutylene and a secondary seal of silicone sealant for glass-to-spacer seals.

.7 Sealant: Approved by glass manufacturer..

PART 3 - EXECUTION

3.1 EXAMINATION

.1 Examine areas to receive glass. Notify Architect of conditions that would adversely affect installation. Do not proceed with installation until unsatisfactory conditions are corrected.

3.2 PREPARATION

.1 Verify glazing openings are correct size and within tolerance.

.2 Verify glazing channels, recesses, and weeps are clean and free of obstructions.

3.3 GLAZING

.1 Install glass in accordance with manufacturer's instructions, except where local codes or GANA Glazing Manual indicate more stringent requirements.

3.4 FIELD QUALITY CONTROL

.1 Coated glass, when viewed from minimum of 10 feet, exhibiting slightly different hue or color not apparent in hand samples, will not be cause of rejection of glass units, as determined by Architect.

.2 Verify glass is free of chips, cracks, and other inclusions that could inhibit structural or aesthetic integrity.

3.5 CLEANING

.1 Clean glass promptly after installation in accordance with manufacturer's instructions.

.2 Remove labels from glass surface.

.3 Do not use harsh cleaning materials or methods that would damage glass.

3.6 PROTECTION

.1 Protect installed glass from damage during construction.

.2 Protect installed glass from contact with contaminating substances resulting from construction operations.

.3 Remove and replace glass that is broken, chipped, cracked, abraded, or dam-aged in other ways during construction period, including natural causes, accidents, and vandalism.

End of Section 08 81 00