

DIVISION 7: Thermal & Moisture Protection

Section 07700 Roof Top Accessories : Railings and Walkways

1. GENERAL

1.1. Contractor shall supply all materials, labour, tools and equipment as required to complete the rooftop railings and walkways as in the Specifications.

1.2. Quality Assurance

1.2.1 A. Railings Structural Requirements:

1. Handrail, wall rail and guardrail assemblies and attachments shall withstand a minimum concentrated load of 200 pounds (90719 g) applied horizontally or vertically down at any point on the top rail.
2. Handrail assemblies and guards shall be designed to resist a load of 50 pounds per linear foot (0.73 kN/m) applied in any direction at the top and to transfer this load through the supports to the structure.
3. Infill area of guardrail system capable of withstanding a horizontal concentrated load of 200 pounds (90719 g) applied to one square foot (8165 g/sm) at any point in the system. Load not to act concurrently with loads on top rail of system in determining stress on guardrail.

B. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.

1. Install in areas designated by Consultant.
2. Do not proceed with remaining work until workmanship and installation are approved by Consultant.
3. Refinish mock-up area as required to produce acceptable work.

1.3. Scope of Work

1.3.1 The general scope of work shall include, but not be limited to, the supply of labour, materials, equipment, services and transportation to execute the following work in accordance with the specifications:

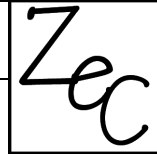
- .1 Replacement of metal walkway and railings at locations shown.

1.4. Equipment

1.4.1 Provide all necessary equipment required for the work. Conform to applicable safety codes and regulations of authorities having jurisdiction.

1.5. Qualifications

- .1 Installation of the railings and walkways shall be carried out by a recognized specialized installer, having at least five (5) years of proven satisfactory experience, with skilled mechanics thoroughly trained and competent in all phases of work.



- .2 Provide evidence of compliance with the Provincial and/or Federal requirement regarding worker's compensation insurance for disability benefits, occupations, sickness/disease, and/or death of his employees.

1.6. Jobsite Inspections

- .1 Contractor shall visit the site prior to bidding and examine and determine the conditions under which the work of this section shall be performed.

1.7. Submittals

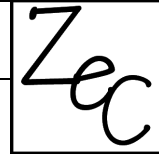
- .1 Submit under provisions of Section 01 30 00 - Administrative Requirements.
- .2 Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Installation methods.
- .3 Shop Drawings: Including but not limited to indication of profiles, sizes, connections, sizes and types of fasteners and accessories; showing fabrication and installation of handrails and guardrails including but not limited to plans, elevations, sections, details of components, anchor details, and attachment to adjoining units of work.
- .4 Selection Samples: For each system specified, two complete sets of color chips representing manufacturer's full range of available finishes.
- .5 Verification Samples: For each system specified, two samples, minimum size 6 inches (150 mm) long, representing actual system components and finishes.

1.8. Delivery, Storage and Handling

- .1 Deliver all materials to the job site in their original unopened containers, with all labels intact.
- .2 Store materials in strict accordance with manufacturer's recommendations.

1.9. Guarantee

- .1 Submit a guarantee of work of this Section covering any defects in the Work due to faulty products and/or work appearing within a period of four (4) years from the date of Substantial Performance of the Work.



1.10. PROJECT CONDITIONS

- .1 Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.
- .2 Field Measurements: Where railings/walkways are indicated to fit to other construction, check actual dimensions of other construction by accurate field measurements before fabrication; show recorded measurements on final shop drawings.
- .3 Coordinate fabrication and delivery schedule of handrails and walkways with construction progress and sequence to avoid delay of railing installation.

2 MATERIALS

2.1 Walkway sections:

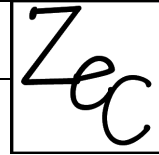
- .1 Custom designed to meet project specific requirements
Clearance Height Required: 6".
Required Length of Platform: to match existing.
Required Width of Platform: double wide to match existing (24")
- .2 Deck Bases: Hot-dipped galvanized steel, 12 by 16 inch (305 by 406 mm).
- .3 Metal Components: Hot-dipped galvanized steel.
- .4 Walking Surfaces: 12 inch (305 mm) Punched Interlock Grating with anti-skid surface.
- .5 Railings: Standard railings shall be provided on all ramps and platforms 4 feet (1.22 m) or more above adjacent level.

2.2 Fitted Support Pads:

- .1 Designed specifically to fit non-penetrating rooftop supports for additional protection of the rooftop envelope. Slip resistant pads are heat molded with a small lip to hold the support pad and reduce movement on the rooftop. Holes in the pad save weight and allow for venting and drainage.
Support Pad Material: 100 percent recycled rubber.
- .2 Dimensions: Custom size as recommended by the manufacturer.

3 EXECUTION

- 3.1.1 Remove existing walkways and discard.
- 3.1.2 Do not work ambient temperature is less than 5°C unless prior approval from consultant is obtained.



A. EXAMINATION

1. Do not begin installation until substrates have been properly prepared.
2. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
3. Field Measurements and Quantity Take Off: A manufacturer certified technician shall perform on-site field measurements, coordinate design and layout, designate and tag products based on project conditions.

B. PREPARATION

1. Clean roofing surfaces in accordance with the roofing manufacturer's instructions prior to installation.
2. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for each substrate under the project conditions.
3. For ballasted or built-up roofs, all loose aggregate shall be removed from an area 2 inch (51 mm) outside each base footprint.

C. INSTALLATION

1. Prefabricated supports shall be installed as per the product specifications and or project specific submittals.
 - a. Install an additional sheet of roofing material, a support pad, or a deck plate beneath the base of each stand.
2. Place the supports:
 - a. Center each stand beneath the component so supports are aligned.
 - b. If more than one section is being supported, adjust for even weight distribution.
 - c. Set walkway into support without dropping or causing undue impact.
 - d. Cut and fit supports to suit site conditions.
3. Adjustable Supports: Adjust height of each support to achieve proper height and level before installing supported item.
 - a. Level hangers, rollers or struts before installing component.
 - b. Make final height adjustments to provide even distribution of load on all supports.

D. FIELD QUALITY CONTROL

1. When requested by consultant, provide a factory-trained representative of manufacturer to visit site while work is in progress to assure that installation complies with design requirements and manufacturer's installation requirements.
2. After system startup, correct any deficiencies that arise, including but not limited to, improper location or position, improper seating or level on the roof, lack of roof pads or deck plates, inadequate operation, and as directed by Architect.

1.2 PROTECTION

1. Protect installed products until completion of project.
2. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION 07700



DIVISION 7: THERMAL AND MOISTURE PROTECTION

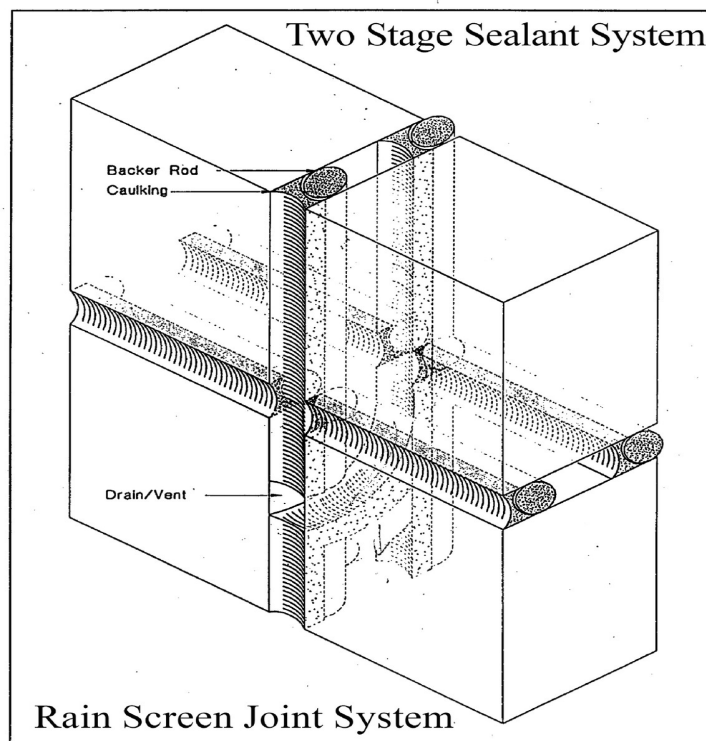
Section 07900 – Sealant Restoration

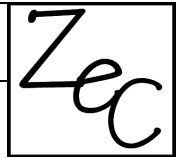
1. GENERAL

- 1.1. Contractor shall supply all materials, labour, tools and equipment as required to complete all caulking (sealant) work as described in the Specifications and following the sealant manufacturer's written recommendations.
- 1.2. Scope of Work
 - 1.2.1 Preparation of, and application of sealant to the existing precast panels and skylight glazing units, framing and flashing members. The work shall include but not be limited to the following areas:

Precast Panels

- Precast panels (vertical and horizontal joints). Please note that the sealant replacement around the windows and the cap beads (blue lined areas on the elevation drawings) are priced as optional items.
- The current joints are comprised of a two-stage caulking. The inner bead is not sloped to the exterior to facilitate drainage. This scope includes removal and replacement of the exterior bead only plus creation of the drain bid above the foundation walls.





Skylights

Both skylights are to be 'face sealed' upon replacement of the fogged glass units. The scope shall include:

- Perimeter of each sloped glass unit at skylight
- Junction between the perimeter flashing and purlins
- All metal to metal joints located at the pressure plate connections and perimeter flashing
- Seal all fasteners (head)
- Joints between the drip flashing located at the base of the skylight and the top of the roof counter flashing
- Remove and replace the silicone weatherseal beads at the glass to glass joints.

1.3 Equipment

- .1 Provide all necessary equipment required for the work. Obtain and pay for erection and operation permits. Conform to applicable safety codes and regulations of authorities having jurisdiction.

2. QUALITY CONTROL

2.1 Qualifications

- .1 The specified work shall be carried out by a recognized specialized Contractor, having at least eight (8) years of proven satisfactory experience, with skilled mechanics thoroughly trained and competent in all phases of caulking work.
- .2 Provide evidence of compliance with the Provincial and/or Federal requirement regarding worker's compensation insurance for disability benefits, occupations, sickness/disease, and/or death of his employees.

2.2 Jobsite Inspections

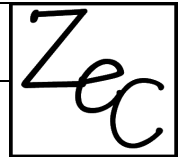
- .1 Contractor shall visit the site prior to bidding and examine and determine the conditions under which the work of this section shall be performed.
- .2 Contractor shall arrange for the sealant manufacturer's representative to inspect the site and provide written project recommendations.

2.3 Submittals

- .1 Prior to starting the work, the Contractor shall submit:
 - List of the materials to be provided under this Section.
 - Manufacturer's product data and specifications for each material.
 - Sealant manufacturer's project recommendations.
 - Valid copy of the Property Damage and Public Liability Insurance policy.



- Provincial and/or Federal certificate regarding worker's compensation insurance
 - .2 At the Consultant's request, submit samples of materials to be used on the project.
- 2.4 Delivery, Storage and Handling
- .1 Deliver all materials to the job site in their original unopened containers, with all labels intact.
 - .2 Store materials in strict accordance with manufacturer's recommendations.
- 2.5 Environmental Conditions
- .1 Apply sealants only to completely dry surfaces, and at air, substrate and material temperatures above minimum established by manufacturer's specifications.
- 2.6 Mock-Up
- .1 If requested by the Consultant, construct mock-ups where directed to demonstrate i.) old sealant removal and surface preparation prior to new sealant installation and ii.) location, size, shape, colour and depth of joints complete with back-up material, primer and new sealant. Mock-up may be part of finished work.
 - .2 Notify the Consultant of mock-up completion and allow forty-eight (48) hours for inspection of mock-up before proceeding with work.
- 2.7 Warranty
- .1 Submit a guarantee of work of this Section covering a period of four (4) years from date of Substantial Performance of the Contract.
 - .2 Defective work shall include, but not be restricted to, joint leakage, cracking, crumbling, melting, running, loss of adhesion, loss of cohesion, or staining of adjoining or adjacent work or surface.
3. MATERIALS
- 3.1 Colours of sealant to be selected by the Owner from the range of manufacturer's standard colours.
 - 3.2 Primers are to be recommended by sealant manufacturer.
 - 3.3 Sealant used for repairs to be as follows:
 - 3.3.1 Precast Caulking: Tremco Dymonic FC OR Sika Sikaflex-1a.
 - 3.3.2 Silicone cap beads: Tremco Tremsil 400 OR DC CWS



All Sealants to meet the specified requirements of applicable CGSB standards.

- 3.4 Cleaning material for surfaces to receive sealant: Methylenekeytone-MEK or similar, Isopropyl Alcohol or as recommended by the manufacturer of the sealant.
- 3.5 Aluminum closures: shall be as per the existing members installed at some of the skylights and shall match the colour of the framing.

4. EXECUTION

4.1 Examination

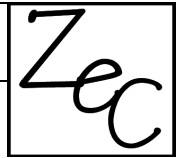
- 4.1.1 Examine the areas and conditions under which the work will be performed. Review planned operating procedures with the Consultant. Do not proceed with work until any unsatisfactory conditions are corrected in a manner acceptable to both the Owner and the Consultant.
- 4.1.2 Verify the specified environmental condition exist before commencing work.
- 4.1.3 Contractor shall arrange for the sealant manufacturer's representative to visit the site to approve surface preparation and installation procedures at the start of the work.

4.2 Surface Preparation

- 4.2.1 Consult and follow sealant manufacturer's project recommendations.
- 4.2.2 All unsealed joints shall be cleaned with MEK or Isopropyl Alcohol prior to application of sealant.
- 4.2.3 Efforts shall be made to remove the inadequately applied and/or deteriorated sealant at all sealed precast, metal to metal and metal to glass joints.
- 4.2.4 Examine joint sizes and correct as required to allow for anticipated movement and to achieve proper width/depth ratio per manufacturer's recommendations for specified sealant.
- 4.2.5 Where necessary to protect adjacent surfaces (i.e. fixtures, equipment, etc.) mask adjacent surfaces by suitable means prior to priming and/or caulking.
- 4.2.6 Report in writing, to the Consultant, any conditions which may be detrimental to the proper performance of the work. Proceeding with the work shall be taken as acceptance of the existing surfaces and conditions.

4.3 Application

- 4.3.1 Have a trained representative on site at all times who is responsible for on-site operations.



- 4.3.2 Carry out all work in strict accordance with the Manufacturer's printed instructions. Provide to the Consultant, prior to commencement a copy of these instructions.
 - 4.3.3 Sealant shall be applied to ensure that all joints and voids are completely filled.
 - 4.3.4 Remove all existing sealants/caulking, materials from all glass and metal substrates by cutting and abrading.
 - 4.3.5 At the precast joints introduce a drain bead with a drain hole located 1" above the foundation wall.
 - 4.3.6 Thoroughly clean with a solvent (i.e. Methylenekeytone-MEK or similar) prior to the placement of the new silicone sealant.
 - 4.3.7 Prior to sealing the fasteners check the condition of each fastener and the compression of the pressure plate to the glass.
 - 4.3.8 Carefully 'shoot' all sealant joints so that ample sealant is applied to all glass to metal interfaces. At metal to metal joints use a 'butterfly' joint in order to bridge the seam in the joint. Use of a bond breaker tape will be necessary. Use a silicone sealant such as Dow Corning 795 (colour to match frame).
 - 4.3.9 Immediately following the placement of the new sealant, firmly tool all joints in order that "wetting out" of the substrate is achieved.
 - 4.3.10 Clean adjacent surfaces immediately and leave work neat and clean. Remove excess and droppings using recommended cleaners as work progresses.
- 4.4 Clean-Up
- 4.4.1 At the completion of work, as well as day-to-day basis, the Contractor shall be responsible for leaving the building site as it was originally found. All debris and garbage that is generated by the Contractor shall be removed from the building site.

END OF SECTION 07900

1 **DIVISION 8**

Section 08400 – Aluminum Doors

1.1 **SECTION INCLUDES**

- .1 Design, labour, Products, tool, equipment and services necessary for aluminum work in accordance with the Contract Documents.

1.2 **REFERENCES**

- .1 AAMA CW-10, Care and Handling of Architectural Aluminum from Shop to Site.
- .2 ANSI, H35.1M Alloy and Temper Designation Systems for Aluminum (Metric).
- .3 ASTM A167, Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet and Strip.
- .4 ASTM B209M, Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
- .5 ASTM E283, Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.
- .6 ASTM E331, Standard Test Method for Water Penetration of Exterior Windows, Curtain Walls and Doors by Uniform Static Air Pressure Difference.
- .7 ASTM F738M, Specification for Stainless Steel Metric Bolts, Screws, and Studs.
- .8 CAN/CGSB-1.108-M, Bituminous Solvent Type Paint.
- .9 CAN/CGSB-19.13-M, Sealing Compound, One-Component, Elastomeric, Chemical Curing.
- .10 CSA W59-M, Welded Steel Construction (Metal Arc Welding).

1.3 **DESIGN REQUIREMENTS**

- .1 Design aluminum work in accordance with following Climatic Design Data for Toronto contained in the Ontario Building Code:
 - .1 Design temperature: January 1% °C, July 2 1/2%
 - .2 Hourly wind pressures: 1 in 30 year occurrence.
- .2 Design aluminum work to accommodate following without producing detrimental effect:
 - .1 Cyclic 40°C daily thermal swing of components.
 - .2 Cyclic, dynamic loading and release of loads such as wind loads.
 - .3 1/2" vertical deflection in supporting structure and movement of supporting structure due to live, dead load, and creep or deflections, seismic load, sway displacement and similar items.
- .3 Design to prevent accumulation of condensate on interior side of aluminum work framing under the following service conditions:

- .1 Interior temperature: 25°C.
- .2 Exterior temperature: -25°C.
- .3 Interior RH: 30%.
- .4 Restrict air infiltration/exfiltration, through entrance assemblies to 0.0003 m³/s C m² and doors to 2.78 m³/s C m² at reference pressure differential of 75 Pa, when measured in accordance with ASTM E283.
- .5 Design and detail controlled drainage path to actively discharge water, which enters into or forms within aluminum work, to exterior; prevent accumulation or storage of water within aluminum work. Prevent water from entering interior when tested in accordance with ASTM E331.
- .6 Design and detail air barrier, vapour retarder, and rainscreen products and assemblies into continuous and integrated aluminum work envelope. Optimize aluminum work design to align envelope layers and to minimize thermal bridges.
- .7 Prevent deflection and permanent or progressive glazing displacement. Restrict horizontal and vertical mullion deflection to less than L/175 (under uniformly distributed positive design wind load), and 7/16" maximum regardless of span.
- .8 Design anchorage inserts for installation as part of other Sections of Work. Design anchorage assemblies to accommodate construction and installation tolerances.
- .9 Design and provide glazed canopy in location indicated. Canopy shall be as shown and shall be designed to handle all applicable loads without detrimental effect.

1.4

SUBMITTALS

- .1 Shop drawings:
 - .1 Submit shop drawings in accordance with the Conditions of the Contract indicating: Plans, sections, details, type of extrusions, profiles, finishes, panels, operating components, doors, related flashings, closures, fillers, and end caps, hardware, attachments to other works, operational clearances, installation details and sealants
- .2 Products and glazing types.
- .3 Anchorage inserts, system installation tolerances.
- .4 Section and hardware reinforcement, anchorage, assembly fixings.
- .5 Detailing, locations, and allowances for movement, expansion, contraction. Indicate measurements on the shop drawings.
- .6 Product Test Reports:
 1. Provide test reports for each type of aluminum-framed entrance door used in the project.
 2. Test reports must be based on evaluation of comprehensive tests performed by a qualified preconstruction testing agency.
 3. Test reports must indicate compliance with performance requirements
- .7 Samples for Initial Selection:
 1. Provide samples for units with factory-applied color finishes.
 2. Provide samples of hardware and accessories involving color selection

1.5 **QUALITY ASSURANCE**

- .1 Retain a Professional Engineer, licensed in Province of Ontario, with experience in aluminum work of comparable complexity and scope to perform the following services as part of the Work of this Section:
 - .1 Design of aluminum work.
 - .2 Review, stamp, and sign shop drawings.
 - .3 Conduct on-Site inspections and prepare and submit inspection reports.
- .2 Mock-up (only if requested by Consultant):
 - .1 Fabricate, deliver, and erect one, full scale mock-up of each type of aluminum work, in location acceptable to Consultant.
 - .2 Demonstrate full range of Products, finishes, textures, quality of fabrication, and workmanship.
 - .3 Mock-up may form part of final Work, if acceptable to Consultant. Remove and dispose of mock-ups which do not form part of Work.

1.6 **DELIVERY, STORAGE, AND HANDLING**

- .1 Handle aluminum work in accordance with AAMA CW-10.
- .2 Protect aluminum surfaces with strippable coating. Do not use adhesive papers or sprayed coatings which bond when exposed to sunlight or weather. Do not remove before final cleaning of building.

1.7 **EXTENDED WARRANTY**

- .1 Submit a warranty for aluminum work in accordance with General Conditions, except that warranty period is extended to 5 years.
 - .1 Warrant against failure to meet the design criteria and requirements such as interior leakage, insulating glass unit failure, finish degradation, frame condensation.
 - .2 Coverage: Complete replacement including affected adjacent Work.

2 Products

2.1 **ACCEPTABLE MANUFACTURER(S) AND SYSTEM(S)**

- .1 Aluminum entrance framing (where curtain wall framing is not used): Comdor or Kawneer for glass doors and accessories (i.e. Heavy Wall by Kawneer for non-thermal doors and Insulpor for thermal doors).
- .2 Aluminum doors: to match existing. Ensure that the mid post is removable.

2.2 **MATERIALS**

- .1 Aluminum extrusions and channels: ASTM B211 and ANSI H35.1 AA6063 alloy, T6 temper.
- .2 Aluminum sheet: ASTM B209 and ANSI H35.1 AA1100 aluminum alloy, H14 temper, minimum 0.05" (18 ga.) for sheets less than 24" wide and minimum 0.08" (14 ga.) for sheets of a greater dimension.

- .3 Reinforcements and anchors: ASTM A167, Type 304 to AISI No. 2B finish. Size as shown.
- .4 Glass and glazing materials: To match existing. All single glass to be tempered. All double glazed sealed units to accommodate Low E tempered lite.
- .5 Aluminum work sealant: CAN/CGSB-19.13-M; Single-Component, silicone sealant; 'Spectrem 1' by Tremco or '790 Silicone Building Sealant' by Dow Corning Corporation. Colour as selected by Consultant.
- .6 Joint backing: Closed cell foam polyethylene rod, oversized minimum 30-50% larger than joint width and compatible with joint sealant. Product as recommended by sealant manufacturer.
- .7 Airseal transition membrane: 'Permabarrier System 4000' by WR Grace Ltd., 'Blueskin SA' by Bakor, or 'Soprseal Stick 1100' by Soprema Inc. Membrane to come complete with applicable primer. Galvanized sheet metal may be used to act as an air barrier also where it is appropriate to use it as detailed.
- .8 Anchors, clips, and angles: Extruded aluminum or stainless steel.
- .9 Shims and blocking for frame: Rigid plastic, wood is not permitted.
- .10 Flashings, closures and trim: 1/32" minimum aluminum sheet, finish to match extrusion finish.
- .11 Screws, bolts and other fasteners: ASTM F738M; Stainless Steel Type 304.
- .12 Isolation coating: CAN/CGSB-1.108-M; Bitumastic coating, acid and alkali resistant material.
- .13 Foam insulation: One component polyurethane foam for installation within closures and fillers; Enerfoam by Abisko Manufacturing Inc.
- .14 Mullion: Key removable mullion. Colour to match the new doors.
- .15 Door closer: LCN 4040 XP
- .16 Hinges: Hager AB850
- .17 Automatic Operator:
- .18 Kick Plate: 18 guage min/ C32 finish tape
- .19 Touchless Push Button: Camden CM-332
- .20 Push Bar: Corbin Russwin ED 5000 series
- .21 Door Operator: Ability to detect & handle high winds (under heavy wind load) - Besam SW200i or Horton 7100

2.3 **FABRICATION**

- .1 Fabricate sections true to detail, free from defects impairing appearance, strength and durability. Fabricate extrusions with sharp, well defined corners.

- .2 Fabricate panel system in accordance with reviewed shop drawings.
- .3 Fabricate, fit, and secure framing joints and corners accurately, with flush surfaces, and hairline joints. Apply frame sealant at joints for weatherproof seams.
- .4 Conceal anchors, reinforcement and attachments from view. Fabricate reinforcement in accordance with design requirements.
- .5 Do not expose manufacturer's identification labels on aluminum assemblies.
- .6 Fabricate continuous sill flashings with intermediate anchor clips, and joint reinforcing, form to profile shown. Fabricate filler and closure pieces as necessary for a complete and weather tight installation.
- .7 Do not expose manufacturer's identification labels on aluminum assemblies.
- .8 Fabricate doors and rails complete with internal reinforcements, cut-outs, and recesses to accommodate finish hardware. Reinforce cut-outs to assure adequate strength.
- .9 Fabricate aluminum work closures and trim from aluminum sheet. Form to profile shown. Make weathertight.
- .10 Double weatherstrip doors. Install weatherstripping in specially extruded ports and secure to prevent shrinkage or movement.
- .11 Fabricate glazing recess with drainage to exterior.

2.4 ALUMINUM DOORS

- .1 Fabricate doors as per manufacturer's directions and details.
- .2 Glazing: Insulating glazed units in entrance framing and single glazing at doors.
- .3 Glazing stop: Square, snap-on type, designed for neoprene glazing system.
- .4 Equip doors with full weatherstripping at perimeter. Install weatherstripping throughout the full length and width of doors at jambs and heads. Weatherstripping to be supplied by door hardware supplier for installation by this Section.
- .5 Aluminum door hardware: Stainless steel push/pulls to be "D" style 1 " diameter to be supplied by finish hardware supplier for installation by door manufacturer.

3 Execution

3.1 INSTALLATION

- .1 Install aluminum work in accordance with reviewed shop drawings, manufacturer's written instructions and AAMA CW-I-9.
- .2 Install Work of this Section securely, in correct location, level, square, plumb, at proper elevations, free of warp or twist.
- .3 Apply isolation coating at 32 mils dry film thickness to prevent corrosive or electrolytic action between dissimilar materials such as aluminum to concrete, masonry, galvanized steel and similar conditions.
- .4 Install flashings, closures, and trim pieces.
- .5 Fill voids between aluminum framing and adjacent construction with foam insulation.
- .6 Install sills in maximum lengths possible. For sills over 4'-0" in length, maintain 1/8"

to 1/4" space at each end.

.7 Glazed and panel canopies:

- .1 Prepare surface of canopy in accordance with the applicable Sections.
- .2 Install prefinished aluminum panels in accordance with reviewed shop drawings, aluminum sheets shall be 1 piece full length.
- .3 Prime surfaces and apply sealant around aluminum sheets in accordance with manufacturer's printed directions for a weatherproof assembly. Tool caulked joints and remove excess sealant.
- .8 Refer to Contract Drawings for glazing type locations. Install glazing in accordance with Section 08800.
- .9 Automatic door operator to be supplied and installed by Section 08715. Install doors and hardware to manufacturers' written instructions. Clean and adjust hardware for correct performance.
- .10 Install aluminum door manufacturer's standard weatherstripping at door frame perimeter. Install weatherstripping throughout entire length and width of doors at jambs and heads.
- .11 Adjust operable parts for correct function.
- .12 Remove damaged or unacceptable Products and assemblies from Site and replace to Consultant's acceptance.
- .13 Install glass presence markers, in two cross stripes extending from diagonal corners. Maintain markers until final clean-up.

3.2 **ERECTION TOLERANCES**

- .1 Tolerances: Non-cumulative.
 - .1 Maximum variation from plumb: 1/16"/10 ft non-cumulative or 1/2"/100 ft, whichever is less.
 - .2 Maximum misalignment of two adjoining members abutting in plane: 0.03".
 - .3 Vertical and horizontal positions: +/- 1/8".
 - .4 Racking of face: 1/4", nil in elevation.
 - .5 Operable components: Consistent with smooth operation and weatherproof performance.
 - .6 Maximum perimeter sealant joint between aluminum entrance and adjacent construction: 1/2".

3.3 **GLAZING PERIMETER AIRSEAL**

- .1 Install glazing perimeter airseal at entire perimeter of each insulating glass unit to achieve an airseal from insulating glass unit to frame. Do not obstruct path of cavity drainage and air pressure equalization.

3.4 **AIRSEAL TRANSITION MEMBRANE**

- .1 Install primer and airseal transition membrane in accordance with manufacturer's instructions.
- .2 Overlap airseal transition membrane 3" minimum and lap in direction of waterflow.
- .3 Coordinate airseal transition to adjacent parts of Work.

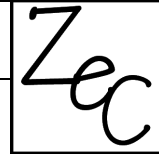
3.5 **JOINT BACKING AND ALUMINUM WORK SEALANT**

- .1 Prepare substrate surface and mask as recommended by sealant manufacturer.
- .2 Install joint backing and sealant at aluminum work and perimeter joints for weather tight installation in accordance with sealant manufacturer's instructions. Tool sealant. Remove excess sealant.

3.6 **CLEANING**

- .1 Maintain aluminum work, inside and outside, in clean condition throughout construction period.
- .2 Remove labels, protective material, and glass presence markers from prefinished surfaces.
- .3 Remove CAN/CSA A440-M certification labeling when directed by Consultant, in writing.
- .4 Wash aluminum work with solution of mild detergent in warm water, with particular attention to recesses and corners. Wipe surfaces clean and dry.

END OF SECTION 8400



DIVISION 8: DOORS AND WINDOWS

Section 08800 – Glazing Replacement

1. GENERAL

1.1. Contractor shall supply all materials, labour, tools and equipment as required to complete the glass replacement at the skylights as described in the Specifications.

1.2. Quality Assurance

1.2.1 Every pane of glass shall be factory labeled and label shall remain in place until final cleaning.

1.3. Scope of Work

1.3.1 The general scope of work shall include, but not be limited to, the supply of labour, materials, equipment, services and transportation to execute the following work in accordance with the specifications:

.1 Replacement of the fogged glass units.

1.4 Equipment

1.4.1 Provide all necessary equipment required for the work. Conform to applicable safety codes and regulations of authorities having jurisdiction.

2. QUALITY CONTROL

2.1 Qualifications

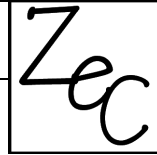
.1 Installation of the glazing shall be carried out by a recognized specialized installer, having at least eight (8) years of proven satisfactory experience, with skilled mechanics thoroughly trained and competent in all phases of work.

.2 Provide evidence of compliance with the Provincial and/or Federal requirement regarding worker's compensation insurance for disability benefits, occupations, sickness/disease, and/or death of his employees.

.3 All glazing to conform to IGMAC (Insulating Glass Manufacturer's Association of Canada) procedures.

2.2 Jobsite Inspections

.1 Contractor shall visit the site prior to bidding and examine and determine the conditions under which the work of this section shall be performed.



2.3 Submittals

- .1 Prior to starting the work, the Contractor shall submit:
 - Submit confirmation that the units are approved by IGMAC.
 - List of the materials to be provided under this Section.
 - Manufacturer's product data and specifications.
 - Valid copy of the Property Damage and Public Liability Insurance policy.
 - Provincial and/or Federal certificate regarding worker's compensation insurance
- .2 At the Consultant's request, submit samples of materials to be used on the project.

2.4 Delivery, Storage and Handling

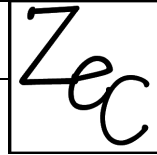
- .1 Deliver all materials to the job site in their original unopened containers, with all labels intact.
- .2 Store materials in strict accordance with manufacturer's recommendations.

2.5 Guarantee

- .1 Submit a guarantee of work of this Section covering any defects in the Work due to faulty products and/or work appearing within a period of four (4) years from the date of Substantial Performance of the Work.
- .2 Submit a guarantee of work of this Section covering fogging and any product defects in the newly installed glazing units within a period of twenty (20) years from the date of Substantial Performance of the Work.

3. MATERIALS

- 3.1 Setting blocks: neoprene, Shore 'A' durometer hardness 80 to 90 points.
- 3.2 Glazing seals: all of the double glazed units to be dual sealed with silicone edge seals and PIB (polyisobutylene) as primary seal to CAN219.13-M82 and CAN/CGSB-19.18-M87.
- 3.3 Glazing tape for the inboard and outboard lites: preshimmed polyisobutylene tape; acceptable product: 'Polyshim', or 'Vision Strip" by Tremco.
- 3.4 Insulating Glass: Low 'E' factory sealed double glazed units, to CAN/CGSB-12.8-90 using dual seal. Dehydrate air space with hermetically sealed inner and outer panes at periphery with flexible sealer. Insulating glass units shall be manufactured to conform to IGMAC recommendations.
 - .1 Nominal thickness: 25mm



- .2 Laminated glass: One layer of tempered glass for the outboard lite and clear annealed for the inboard lite with clear vinyl interlayer overall thickness to match existing. Glass thicknesses minimum 6mm.
- .3 Tempered glass: Thickness to match existing. Fully tempered float glass to CAN/CGSB-12.1-M90. Tempered glass identification must be sandblasted and visible after installation.
- .4 Colour of glass units to match existing.

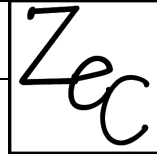
The current glass make for the green coloured glass is 6mm clear annealed Solexia and 6mm clear Low E #3 1" O/A. Please note that the new glass is to have a tempered lite on the outboard side with laminated on the interior.

- 3.5 Sealants: Dow Corning 795 or Spectrem 2 by Tremco or approved equal.
- 3.6 Primer: as recommended by the sealant manufacturer.
- 3.7 Joint backing: non-gassing foam rope, compressed minimum 25% when installed: Sof-Rod by Tremco.

4. EXECUTION

4.1 Application

- 4.1.1 Remove existing glazing units and discard.
- 4.1.2 Do not glaze when ambient temperature is less than 5°C. Ensure that glazing rabbets, stops and glass are dry, free of frost, grease, oil, dust, rust, old glazing tape and other substances detrimental to adhesion of compounds and sealants.
- 4.1.3 Remove applicable framing members, clean frame surfaces, sealant tool sealant properly so water drainage is adequately directed. Particular attention must be paid when sealing the connection where the sloping purlins meet the vertical mullions.
- 4.1.4 Clean sealing surfaces at perimeter of glass and rabbets before applying glazing tapes, gaskets and compounds. Use solvents and cleaning agents recommended by manufacturer of sealing materials.
- 4.1.5 Install glazing tape uniformly with accurately formed corners and bevels. Ensure that proper contact is made with glass and rabbet interfaces.
- 4.1.6 Set glass on setting blocks, spaced as recommended by glass manufacturer. Provide at least one setting block at quarter points from each corner.
- 4.1.7 Centre glass in glazing rabbet to maintain specified clearances at perimeter on all four sides. Maintain centered position of glass in rabbet and provide the required sealer thickness on both sides of glass.



4.1.8 Upon installation of the pressure plates, seal ends of plates with the specified silicone material.

4.2 Clean-Up

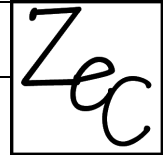
4.2.1 At the completion of work, as well as day-to-day basis, the Contractor shall be responsible for leaving the building site as it was originally found. All debris and garbage that is generated by the Contractor shall be removed from the building site.

4.2.2 Avoid using abrasives, steel wool, razor blades, solvents, alkaline or other harsh cleaning agents.

4.2.3 Remove glazing compound droppings promptly from all surfaces as the work progresses.

4.2.4 Replace scratched, or otherwise damaged glass without cost to the Owner.

END OF SECTION 08800



DIVISION 9: FINISHES

Section 09900 – Painting

1. GENERAL

1.1. Scope of Work

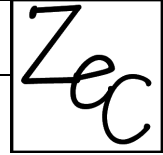
- .1 Painting of the following members:
 - Steel supporting structure for the roof screens
 - Metal panels and doors at the roof screens
- .2 Optional scope of work will be to remove the existing metal panels and supply new powder coating aluminum screens with vertical slats. Colour to match existing.

1.2 The Occupation Health and Safety Act

- .1 Conform to the requirements of the Occupation and Safety Act and Regulations for Construction Projects for the Province of Ontario (latest edition).
- .2 The Contractor shall make available on site all required drawings and material safety data sheets as required by the Ministry of Labour and the Government of Ontario.

2. WORK INCLUDED

- 2.1 Comply with Division 1, General Requirements and all documents referred to therein.
- 2.2 Provide all labour, materials, products, equipment and services to complete the painting and finishing work required and/or indicated on the Drawings and specified herein.
- 2.3 Provide surface preparation to receive painting and finishing specified under this Section of the work, in accordance with the Master Painters Institute (MPI) Painting Specification Manual and as specified herein.
- 2.4 Examine the Specifications and Drawings for the work of other Sections regarding the provisions for prime and finish coats. Paint or finish all materials installed throughout the project which are required to be painted and which are left unfinished or unpainted by other Sections.
- 2.5 The only exception to the requirements of the preceding paragraph is where the drawings, Specifications, or Schedules state positively and explicitly that a surface is not to be finished.



3. REFERENCES

- 3.1 ASTM D523-14 Standard Test Method for Specular Gloss.
- 3.2 CAN/CGSB 1.213-2004 Etch Primer (Pretreatment Coating or Tie Coat) for Steel and Aluminum.
- 3.3 CAN/CGSB 85.100-93 Painting.

4. SUBMITALS

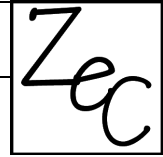
- 4.1 Submit 2 samples of every colour, in the required number of coats on 8"x 8" pieces of hardboard. Include specifications of materials, products and installation procedure used to obtain the finish. Resubmit samples until colours have been approved by the Consultant.
- 4.2 Colours shall as selected by the Regional Representative from standard colour list.
- 4.3 Retain samples at job site until completion of the work.
- 4.4 Two (2) weeks after award of Contract submit to the Consultant a complete list of paint and finish materials to be used, showing the name of the manufacturer, the catalogue number, grade and quality of the materials proposed for use.
- 4.5 Materials and products delivered to the work shall comply with the approved list.

5. MOCK-UP

- 5.1 A sample installation area located in the building will be designated by the Consultant.
- 5.2 Apply samples of finishes in the presence of the Consultant, Contractor and paint manufacturer. Apply samples with the correct material, number of coats, colour, texture and degree of gloss required. Refinish if required, until approval of the Consultant is obtained.
- 5.3 Leave sample installation undisturbed until completion of the Work. Approved sample installation shall serve as a standard for similar work throughout the Project. Work which does not match the approved finishes shall be corrected and refinished at no expense to the Regional Representative.

6. PRODUCT DELIVERY AND STORAGE

- 6.1 Store materials in a single place. Keep storage clean and tidy.



- 6.2 Accept only paint and finishing materials and products delivered to the site in the manufacturer's unbroken, sealed containers, with manufacturer's label indicating type of paint, colour and instructions for reducing.
- 6.3 Store packaged materials undamaged in their original wrappings or containers with manufacturer's labels and seals intact.
- 6.4 Before commencement of work, remove electrical plates, surface hardware, canopies of lighting fixtures, and other escutcheons or appurtenances. Reinstall items in satisfactory condition when painting is completed. Do not clean hardware with solvents which will remove permanent lacquer
- 6.5 Use sufficient drop cloth and protective coverings for the full protection of floors and surfaces not to be painted.
- 6.6 Protect materials and products from frost.

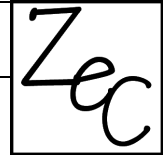
7. QUALITY CONTROL

7.1 Qualifications

- .1 Painting work shall be carried out by a recognized specialized Contractor having at least ten (10) years of proven satisfactory experience, with skilled painters thoroughly trained and competent in all phases of work.
- .2 Provide evidence of compliance with the Provincial and/or Federal requirement regarding worker's compensation insurance for disability benefits, occupations, sickness/disease, and/or death of his employees.
- .3 Arrange with the paint manufacturer's and Canadian Paint and Coatings Association (CPCA) representatives to visit the site prior to the commencement of the painting operation to discuss the painting and finishing procedures to be used and to analysis the surface conditions in order that alternative recommendations may be made to the Consultant should adverse conditions exist.
- .4 Arrange with the paint manufacturer and CPCA to visit the site at intervals during the surface preparation and painting operations to insure that the proper surface preparation has been completed, the specified paint products are being used, the proper number of coats are being applied and the agreed finishing procedures are being used, and that the paint manufacturer

7.2 Jobsite Inspections

- .1 Contractor shall visit the site prior to bidding and examine and determine the conditions under which the work of this section shall be performed.



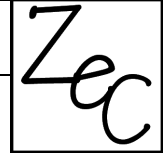
- .2 Contractor shall arrange for the manufacturers' representatives to inspect the site and provide written project recommendations.
- .3 The construction will be reviewed on behalf of the Owner by Zec Consulting Inc. The Contractor is required to cooperate with, and provide access to Zec. The Contractor shall give Zec 24 hours advance notice for review.
- .4 Any work not accepted by the Consultant shall be immediately corrected by the Contractor to the Consultant's satisfaction.

7.3 Delivery, Storage and Handling

- .1 Deliver all materials to the job site in their original unopened containers, with all labels intact.
- .2 Store materials in strict accordance with manufacturer's recommendations.

7.4 Environmental Conditions

- .1 Apply materials at air, substrate and material temperatures above minimum established by manufacturer's specifications.
- .2 Atmosphere at the area of work shall be dust free.
- .3 Temperatures, humidity, and moisture content of surfaces shall conform to the following:
 - Temperatures; No painting shall be performed when temperatures on the surface, or the air in the vicinity of painting work are below 5°C. The minimum temperatures allowed for paints shall be 7°C. for interior work and 10°C for exterior work, unless specifically approved by the Consultant.
 - Relative humidity shall not be higher than 85%.
 - Moisture of surfaces shall be tested by an electronic Moisture Meter.
 - Moisture content of wallboard shall not exceed 12%, of masonry, concrete or concrete block, 12% for solvent type paint.
 - Masonry surfaces shall be tested for alkalinity. .6 Maximum moisture content of wood; 15%.
- .4 Masonry and concrete block must be installed at least 28 days prior to painting, with a moisture content not exceeding 12%, before painting commences. This is not to be construed as including a "wetting down" process for latex.



- .5 All areas where painting work is proceeding shall have adequate continuous ventilation and sufficient heating to maintain temperatures above 7°C. for 24 hours before and after paint application.
- .6 Take all necessary precautions to prevent fire hazard and spontaneous combustion.
- .7 Where toxic materials, and both toxic and explosive solvents are used, take appropriate precautions and prohibit smoking

7.5 Guarantee

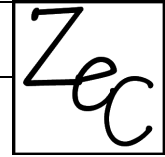
- .1 Submit a guarantee of work of this Section covering a period of four (4) years from date of Substantial Performance of the Contract.

7.6 Construction Review and Testing

- .1 The construction will be reviewed on behalf of the Owner by Zec Consulting Inc. The Contractor is required to cooperate with, and provide access to Zec. The Contractor shall give Zec 24 hours advance notice for review.
- .2 The work shall be reviewed by the Consultant at the following stages:
 - a) Surface preparation.
 - b) After application of each paint coating.
 - c) The Contractor shall not applied any paint prior to review of the surface preparation by the Consultant. All work shall meet or exceed the more stringent of the manufacturer's requirements of this specification.
- .3 Any work not accepted by the Consultant shall be immediately corrected by the Contractor to the Consultant's satisfaction.

8. MATERIALS

- 8.1 All paint materials used on the project shall be listed on the Qualified Products List which is issued by the Interdepartmental Qualification Board of Paint Materials.
- 8.2 Paint materials to be products of a single manufacturer.
- 8.3 The paint used on this project shall be for exterior application.
- 8.4 Paint: PPG Permanizer or approved equal.



9. EXECUTION

- 9.1 Apply paint materials in strict accordance with the manufacturer's requirements. Do not use any other paint application method unless prior approval is given by the Consultant in writing.
- 9.2 Caution must be used when selecting coatings for use on all galvanized metal surfaces. These substrates may have a factory-applied stabilizer, which is used to prevent white rusting during storage and shipping. Such stabilizers must be removed by either brush blasting, sanding or chemical treatment. Use appropriate primer recommended by the paint manufacturer.
- 9.3 Prepare surfaces by grinding and sanding all loose paint and rust. Verify that all surfaces that are to receive paint are clean and free of dirt, dust, oil, grease, mildew, fungus, frost, efflorescence, laitance, peeling coating, chalking coating and any other foreign materials
- 9.4 Mask and cover adjacent surfaces as required to produce neat and true paint lines at discontinuous edges.
- 9.5 Prime clean surfaces with primer recommended by the paint manufacturer.
- 9.6 Apply paint only when air, surface, and product temperatures are above 35°F (2°C) and at least 5°F (3°C) above the dew point. Air and surface temperatures must remain above 35°F (2°C) for the next 48 hours. Do not apply late in the day when dew and condensation are likely to form or if rain or snow is expected. On large expanses of metal, temperatures must be 50°F (10°C) or higher.
- 9.7 Stir thoroughly. When using more than one container of the same color, intermix to ensure color uniformity.
- 9.8 Apply both coats with a high-quality brush, roller, paint pad, or by spray equipment.

Airless Spray: Minimum requirements: 1 gal./min. flow rate; pressure 1800-2400 psi; tip 0.015" - 0.021".

Spray equipment must be handled with due care and in accordance with manufacturer's recommendation. High-pressure injection of coatings into the skin by airless equipment may cause serious injury.

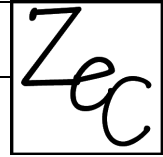
Brush: Polyester/Nylon Brush

Roller: 3/8" - 3/4" nap roller cover.

Thinning: Do not thin.

9.9 Cleaning

- .1 Promptly as the work proceeds and on completion of the work, remove all paint where spilled, splashed or spattered. During progress of the work keep premises free from unnecessary accumulation of tools, equipment, surplus materials and debris. At



conclusion of the work leave premises neat and clean to the satisfaction of the Consultant, Paint Inspector and/or Owner

- .2 Leave finished work area in a neat condition with no evidence of overspray on adjacent surfaces. Spills shall be cleaned up as per manufacturer's recommendations.
- .3 Dispose of scrap materials, trash, empty container, etc. as required by local, state and federal regulations.
- .4 At the completion of work, as well as day-to-day basis, the Contractor shall be responsible for leaving the site as it was originally found. All debris and garbage that is generated by the Contractor shall be removed from the building site.

END OF SECTION 09900