

## PART 1 - GENERAL

### 1.1 PRICING

- .1 All costs associated with the work required by and associated with this Section shall be included as part of the Contract Price and in the price listed in item #1 of the Bid Form.

### 1.2 GENERAL INSTRUCTIONS

- .1 Read and conform to:
  - .1 the General Conditions and the Supplementary Conditions of the Contract;
  - .2 Division 1 requirements and documents referred to therein.

### 1.3 SUMMARY

- .1 Work Included: Provide concrete floor finishing including but not limited to following:
  - .1 dry shake floor hardener.
  - .2 curing and sealing.
  - .3 premoulded joint filler.
  - .4 sawcutting construction and control joints in concrete.
  - .5 caulking construction and control joints and over premoulded joint filler with sealant.
- .2 Related Requirements: Specifications throughout entirety of Divisions of this Project are directly applicable to this Section, and this Section is directly applicable to them.

### 1.4 REFERENCES

- .1 Reference Standards: Latest published editions of reference standards listed in this Section in effect as of closing date and time of the Request for Tenders for the Contract, including any amendments adopted, are applicable unless otherwise indicated.

### 1.5 ADMINISTRATIVE REQUIREMENTS

- .1 Pre-Installation Meetings:
  - .1 Prior to starting work of this Section, convene a pre-installation meeting at Project site to review Project requirements and site conditions with pertinent parties. Conform to requirements of Section 01 30 00.

### 1.6 SUBMITTALS

- .1 Product Data: Submit manufacturer's literature and data sheets for each type of material provided under this Section for the Project in accordance with requirements of Section 01 30 00. Ensure data sheets provide required information including detailed instructions for installing as well as maintaining, preserving and keeping materials in clean and safe conditions. Provide adequate warning of maintenance practices or cleaning agents detrimental to specified materials.
- .2 Safety Data Sheets (SDS): Submit SDS for inclusion in Operation and Maintenance Manual specified in Section 01 70 00, for adhesives, sealants and any other material designated by Consultant.

- .3 Maintenance Data: Submit maintenance manuals in accordance with Section 01 70 00 to the Consultant. Contribute to this manual complete, detailed and specific instruction for maintaining, preserving and keeping clean surfaces of this work and which give adequate warning of maintenance practices or materials detrimental to sealed surfaces.

## **1.7 QUALITY ASSURANCE**

- .1 Qualifications:
  - .1 Manufacturers: Provide Products for Work of this Section by manufacturer with minimum 10 years' experience in the manufacture of such materials.
  - .2 Installers: Provide work of this Section executed by competent installers with minimum 5 years' experience in the application of the Products, systems and assemblies specified in this Section and with the approval and training of the Product manufacturers.
  - .3 Cast in place concrete and concrete materials shall be inspected and tested by a CSA certified testing laboratory.
- .2 Single Source Responsibility: Ensure primary materials provided in this Section are obtained from 1 source by a single manufacturer and secondary materials are obtained from sources recommended by primary materials manufacturers.
- .3 Mock-ups: Provide mock-ups in locations designated by Consultant and as required to demonstrate quality of workmanship. Maintain mock-ups during construction in an undisturbed condition as a standard for judging the completed work. As a minimum, Provide slab panel at least 1220 mm (4'-0") by 1525 mm (5'-0") feet and 100 mm (4") thick to demonstrate specified slab finish. Provide each slab panel with full length joint line.

## **1.8 DELIVERY, STORAGE AND HANDLING**

- .1 Store materials on Site in manner to prevent damage thereto. Protect materials from inclement weather. Comply with CSA A23.1.
- .2 Protect materials and work of this Section from damage in accordance with CSA A23.1. Protect other work from damage resulting from this work. Replace damaged work which cannot be satisfactorily repaired.

## **1.9 PROJECT CONDITIONS**

- .1 Temporary Lighting: Minimum 1-200 W light source, placed 2.5 m (8') above floor surface, for each 40 m<sup>2</sup> (430 sq ft) floor being finished.
- .2 During hot weather or cold weather, conform to requirements of CSA A23.1 for mixing, placement and protection of concrete in extreme weather. During cold weather, Provide temporary heating and enclosures required.

## **1.10 WARRANTY**

- .1 The Contractor warrants the work of this Section for a period of 5 years against defects and/or deficiencies in accordance with General Conditions of the Contract. Promptly correct any defects or deficiencies which become apparent within this 5 year warranty period, to the satisfaction of the Consultant and at no expense to the Owner. Defects include but are not limited to: failure of floor finish to remain in place, bonding failure, finish becoming defective, spalling and/or cracking.

## **PART 2 - PRODUCTS**

### **2.1 MANUFACTURERS**

- .1 Products of following manufacturers (or equivalent) may be acceptable subject to conformance to requirements of Drawings, schedules and Specifications:
  - .1 Adsil Advanced Silane Technology.
  - .2 Advanced Floor Products, Inc.
  - .3 ChemRex Inc.
  - .4 CPD Construction Products
  - .5 Day1 (Solomon Colors)
  - .6 Euclid Chemical
  - .7 PROSOCO.
  - .8 Sika Canada Inc.
  - .9 W.R. Meadows of Canada
- .2 Substitution Limitations: Comparable Products from manufacturers listed herein offering functionally and aesthetically equivalent Products in Consultant's opinion and subject to Consultant's review, will be considered provided they meet the requirements of this Specification.

### **2.2 DESCRIPTION**

- .1 Design and Performance Requirements:
  - .1 Concrete finishing shall comply with applicable CSA and ACI standards and best practices whether specifically listed in this Section or not. Generally, perform Work in accordance with CSA-A23.1/A23.2.
  - .2 Place cast-in-place concrete of appropriate properties for intended use in accordance with requirements of applicable CSA-A23.1/A23.2 for applicable concrete exposure class and content of mix. Refer to Section 03 30 00.
  - .3 Coordinate with finish flooring supplier and installer to ensure adequate slab flatness is provided for floor finish scheduled to be installed on slab.
  - .4 Finish concrete floors with a smooth, dense, steel trowel finish to achieve the following tolerances per CSA-A23.1/A23.2 (Table 22)
    - .1 For surfaces scheduled to have thick-set tile, for concrete surfaces exposed to view (sealed concrete) in back-of-house areas, under raised flooring, and unless otherwise indicated: Class A (Overall FF 20 and FL 15)
    - .2 Under resilient finishes and other flooring less than or equal to 3 mm thick: Class B (Overall FF 25 and FL 20)
    - .3 Under thin-set flooring (tiling), and concrete surfaces exposed to view (sealed concrete) in public areas: Class C (Overall FF 30 and FL 25)
    - .4 At helicopter hangar: Class D (Overall FF 50 and FL 40)
  - .5 Repair cracks in concrete floors to suit the floor finish and long-term serviceability requirements of floor.
  - .6 Tolerances: Construct forms to produce plumb and level concrete and true to linear building lines. Conform to CSA A23.1, Clause 6.4 for maximum variations (not accumulative).

- .7 Static Coefficient of Friction: Ensure floor surfaces are stable, firm and slip resistant after completing finishing procedures (where exposed). Provide Products with the following minimum values as determined by ASTM D2047 unless otherwise indicated:

- .1 Level Surfaces: Minimum 0.6.
- .2 Ramp Surfaces: Minimum 0.8.

## 2.3 MATERIALS

- .1 Dry-shake Floor Hardener: Provide factory-mixed, ready-to-use dry shake floor hardener. Ensure items are delivered to the Site in sealed, moisture resistant bags, ready to apply, finish and cure.
  - .1 Non-Metallic Quartz Hardener: Provide 1 of following:
    - .1 "Surflex" by Euclid Chemical,
    - .2 "Maximent HD" by ChemRex Inc.,
    - .3 "Diamag 7" by Sika Canada Inc.
  - .2 Use in following locations: Exposed 'sealed' concrete floors subject to wheel traffic ~~-(sally port) and helipad. Do not use on floors subject to steel wheels.~~
- .2 Liquid Densifier/Sealer and Dustproofing Compound (SLR): "LS/CS-SCS Indoor Gold" by PROSOCO, or "Liqui-Hard" by W.R. Meadows Inc. or equivalent ~~meeting LEED v4 emissions criteria.~~
  - .1 Gloss Level: Low sheen
  - .2 Film Forming Protective Treatments: Follow application of penetrating concrete floor densifier with minimum of two coats of general-purpose medium gloss, film forming sealer to treat surfaces to increase resistance damage from water, staining, and abrasion.
    - .1 Basis-of-Design: "Bellatrix" by W.R. Meadows Inc. or approved equivalent.
  - .3 Use in following locations: Where interior horizontal concrete slabs are indicated on Drawings and Schedules to be 'sealed' or marked as 'exposed'. Do not use on floors exposed to water, salts and inorganic acids.
- .3 Joint Sealants: In accordance with performance requirements of Section 07 92 00.
  - .1 Standard Joint Sealant: 2 component, chemically reactive polyurethane modified sealant over premoulded joint filler; self-levelling, grey colour. Provide 1 of following:
    - .1 Vulkem 245 by Tremco, or equivalent ~~meeting LEED v4 criteria.~~
  - .2 Heavy Duty Sealant for Sawcut Joints: Epoxy modified joint sealant, cold-applied, 2 component, pour grade self levelling compound with minimum Shore A Hardness of 80 and Shore D Hardness of 50.
    - .1 Loadflex by Sika Canada Inc., or equivalent ~~meeting LEED v4 criteria.~~
  - .3 Backer Rod: Extruded, closed cell, circular polyethylene foam, sized 25% larger than joint width into which it will be installed.
- .4 Miscellaneous Materials:
  - .1 Water for Curing: Water conforming to CSA A23.1, Clause 7.4.1 clear and entirely free from any elements which might cause staining of concrete.
  - .2 Polyethylene Film (for Water Curing): Minimum 0.1 mm (4 mils) thick, complying with maximum allowable moisture loss requirements of ASTM C156.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- .1 Site Verification of Conditions: Verify actual site dimensions and location of adjacent materials prior to commencing work. Notify Consultant in writing of any conditions which would be detrimental to the installation. Commencement of work implies acceptance of previously completed work.

### **3.2 PREPARATION**

- .1 After concrete has been placed, strike off concrete level and flush to screeds with true straight edge.
- .2 Immediately after striking off concrete, level and consolidate with wooden darby or bull float. Complete levelling and consolidation before free moisture (bleeding) rises to surfaces.
- .3 Wait until concrete stiffens sufficiently to sustain foot pressure with only about 6 mm (1/4") indentation.
- .4 Float concrete with hand float or with power float. If free bleeding water remains on surface at this time, remove it before floating.

### **3.3 INSTALLATION**

- .1 Floor Finishing:
  - .1 Laser screed floor slabs as scheduled herein, using laser screed vehicle. Laser vibratory screed is to be operated only by trained and qualified personnel who are familiar with equipment.
  - .2 Power screed interior floor slabs with mechanical vibratory screeding equipment. Machine float and machine trowel floor surfaces to smooth, level and dense surfaces free from trowel marks, ridges and depressions, except where specified otherwise.
  - .3 Power screed exterior floor slabs with mechanical vibratory screeding equipment. Float using magnesium floats and trowel to level and dense surfaces and finish to sidewalk "swirl" texture.
  - .4 Use hand held vibrators and hand screed, float and trowel areas where power equipment is inaccessible, to same density and surface quality specified in Contract Documents for floors finished with power operated equipment.
  - .5 For concrete mixes containing steel fibre reinforcement, ensure finishing process leaves surface free of protruding fibres. If fibres protrude from surface after concrete has set, remove protruding fibres by grinding.
- .6 Non-Metallic Quartz Hardener:
  - .1 In areas indicated to receive non-metallic quartz hardener, power screed floor slab and float.
  - .2 Over floated concrete (at plastic stage), apply premixed non-metallic quartz shake in 2 equal applications at right angles to total application rate of 7.5 kg/m<sup>2</sup> (1.5 lbs/sq ft) of floor area. Distribute evenly. Do not throw shake. Float between application of shake and after second shake application with power float. Machine trowel to smooth, level and dense surface, in uniform colour, free from trowel marks, ridges, pinholes and other defects.

- .7 Liquid Densifier/Sealer and Dustproofing Compound: In areas to receive penetrating floor sealer, prepare surfaces as recommended, mix and apply at rate of application in accordance with manufacturer's recommendation.
- .8 Miscellaneous Finishes:
  - .1 In areas specified to receive subsequent epoxy or urethane floor overlay or coating, finish concrete floor surface with 1 pass steel trowel.
  - .2 Swirled Finish: In final trowelling of Steel Trowel Finish, where swirled finish is scheduled, impart slightly textured surface to concrete by spin trowelling.
  - .3 Install abrasive nosings to stair treads prior to placement of concrete and hand trowel treads to swirl, non-slip surface.
- .2 Sawcutting of Control Joints And Construction Joints:
  - .1 Saw cut control joints (contraction joints) to CSA-A23.1/A23.2, 24 hours maximum after placing of concrete, and before concrete develops random contraction cracks. Do not postpone sawing operations beyond these time limitations.
  - .2 Refer to Section 03 30 00 for joint requirements for structural work. For other requirements, provide control joints in unreinforced slabs, spaced at maximum 4.5 m (14.76 ft) on centre in square patterns.
  - .3 Construct control joints for a depth equal to no more than one-fourth of concrete thickness. Do not cut through reinforcement, heating systems and other embedded items.
  - .4 Form control joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades, minimum 3 mm (1/8 inch) wide, ensuring cutting action will not tear, abrade, or otherwise damage surface.
  - .5 Continuously spray water on saw blade during sawing. Grind edges of sawcuts to eliminate burrs; do not grind to bevel or chamfer joint edges.
  - .6 After sawing and grinding, clean joints with jet of water and blow-out with compressed air. Immediately broom clean, residue caused by sawing operation as work progresses.
  - .7 When cleaned joints are dry and prior to traffic being allowed over area, install temporary filler using polyethylene rope in such joints to prevent contamination.
  - .8 Install joint-filler strips at junctions with slabs-on-grade and vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated on Drawings and Schedules.
  - .9 Do not fill isolation joints, construction joints and control joints sooner than 120 Days after concrete placement. Execute joint sealing during cool, dry ambient conditions when slab is in contracted state to minimize future joint separation at sealant filled joints.
  - .10 Ensure joints are clean and sound. Remove oil, dirt, debris, paint and other materials that may be a bond breaker. Remove temporary filler from sawcut joints. Clean joints and blow with compressed air.
  - .11 Extend joint fillers full width and depth of joint, terminating flush with finished concrete surface, unless otherwise indicated on Drawings and Schedules. Overfill joints during placement. Cut flush or grind flush with floor within 24 hours after placement.
- .3 Curing/sealing of Floors:
  - .1 Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with CSA A23.1/A23.2 for cold-weather protection and hot-weather protection during curing.
  - .2 Begin curing after finishing concrete but not before free water has disappeared from concrete surface.

- .3 Curing Methods: Cure formed and unformed concrete for at least seven days, or until minimum structural strength of concrete indicated in Section 03 30 00, and as required by CSA A23.1/CSA 23.2 (Table 2) for exposure class and floor finishes specified.
- .4 Joint Sealant:
  - .1 Following joint sealant installation Specifications, do not apply in areas of concrete slab to receive subsequent floor finishes such as quarry tile, ceramic tile, carpet, resilient tile and epoxy topping system.
  - .2 Do not fill isolation joints, construction joints and control joints sooner than 120 Days after concrete placement. Execute joint sealing during cool, dry ambient conditions when slab is in contracted state to minimize future joint separation at sealant filled joints.
  - .3 Remove temporary filler from sawcut joints. Remove 6 mm (1/4") scored strip from top of premoulded joint filler. Clean joints and blow clean with compressed air.
  - .4 Reinstall backer rod into construction/expansion joints, set to proper sealant depth per sealant manufacturer's printed directions. Fill remainder of joint with standard joint sealant.
  - .5 No sooner than 120 Days, fill interior sawn construction and control joints in concrete slabs full depth with heavy duty sawcut joint sealant in accordance with manufacturer's printed directions. Joints must be overfilled with sealant and then shaved flush with slab surface once hardened.
  - .6 Caulk over premoulded isolation joint fillers with specified standard joint filler sealant.
  - .7 Prime wall of joint as recommended by sealant manufacturer. Mix sealant as directed by manufacturer. Coat surfaces of metal in contact with sealant with primer as recommended by sealant manufacturer.
  - .8 Fill exterior sawn construction and control joints and over premoulded isolation joint filler with specified standard joint sealant.
  - .9 Comply with manufacturer's application and substrate temperature requirements.

### **3.4 REPAIR/RESTORATION**

- .1 Crack Repair:
  - .1 After concrete has cured, examine concrete floor surfaces and repair cracks. Route cracks out with mechanical router to minimum depth of 13 mm (1/2"). Then clean and fill cracks in same manner as control joints.
  - .2 Correct defects in defined traffic floor only by grinding or removal and replacement of defective slabs. Areas requiring corrective work will be identified by Consultant. Verify corrected areas with Consultant.
- .2 Perform corrective work at times convenient to the Consultant and at no cost to the Owner.

### **3.5 FIELD QUALITY CONTROL**

- .1 Employ services of a trained concrete technician from staff of surface hardener manufacturer to give assistance to this Section in proper use of material during initial periods of installation.
- .2 Give 5 (five) Days' notice to surface hardener manufacturer in advance of commencing work.
- .3 Independent inspection and testing company may be appointed and paid for by the Owner to carry out inspection and testing as directed by the Consultant.
- .4 Perform tests in accordance with CSA A23.2.

- .5 Forward inspection company's reports of tests to the Consultant with opinion or reason for any abnormalities noted thereon.
- .6 Cooperate with and assist Inspection Company's personnel during inspection and tests.
- .7 Remove defective materials and completed work which fail tests and replace as directed by the Consultant.

### **3.6 FLOOR FINISHING SCHEDULE**

<b>Scheduled Floor Finish</b>	<b>Concrete Finish Required</b>	<b>Hardener</b>	<b>Curing/Sealing Method*</b>
Carpet	Steel Trowel	None Required	Dissipating curing compound or water or poly curing.
Resilient Flooring	Steel trowel followed by blastrack.	None Required	Dissipating curing compound (where approved by flooring manufacturer), or water or poly curing
Trowel Applied Composition Flooring (Epoxy, Urethane Acrylic, Polyester):	Steel trowel followed by blastrack in accordance with CSA A23.1.	If recommended by composition flooring material manufacturer	Poly curing
Liquid Applied Rubber or Plastic Membrane (Mechanical Waterproofing):	Steel trowel in accordance with CSA A23.1	None required	Water or poly curing
Thinset Ceramic and Quarry Tile, Clay Tile and Brick Tile	Steel trowel in accordance with CSA A23.1	None required	Water or poly curing
Ceramic and Quarry Tile, Clay Tile and Brick Tile over mortar bed	Steel trowel followed by blastrack in accordance with CSA A23.1	None required	Water or poly curing
Exposed Concrete – <u>Interior</u>	Steel trowel in accordance with CSA A23.1.	Non-Metallic Quartz Hardener	Curing/sealing compound
<u>Exposed Concrete – Exterior</u>	<u>Nonslip Broom Finish (final texture to be determined in coordination with the Owner)</u>	<u>Non-Metallic Quartz Hardener</u>	<u>Curing/sealing compound</u>

- .1 \* Curing/Sealing Method: Refer to room finish schedule for specific types of sealers required on exposed concrete floors.
- .2 \*\* Exposed concrete finishes: Provide swirled finish where concrete is scheduled to be exposed at ramps or in staircases.

**END OF SECTION**



## PART 1 - GENERAL

### 1.1 PRICING

- .1 All costs associated with the work required by and associated with this Section shall be included as part of the Contract Price and in the price listed in item #1 of the Bid Form.

### 1.2 GENERAL INSTRUCTIONS

- .1 Read and conform to:
  - .1 the General Conditions and the Supplementary Conditions of the Contract.
  - .2 Division 1 requirements and documents referred to therein.

### 1.3 SUMMARY

- .1 Work Included: Provide architectural woodwork including but not limited to following:
  - .1 architectural cabinet casework.
  - .2 architectural cabinet casework drawers and doors.
  - .3 edgebanding for architectural cabinet casework and doors.
  - .4 edgebanding for architectural cabinet shelves on visible and semi-exposed edges.
  - .5 Countertops with integral sinks.
  - .6 architectural cabinet casework hardware.
  - .7 closet and utility shelving.
  - .8 trim and mouldings.
- .2 Related Requirements: Specifications throughout the entirety of Divisions of this Project are directly applicable to this Section, and this Section is directly applicable to them.

### 1.4 REFERENCES

- .1 Definitions:
  - .1 In the context of architectural cabinetry, the following definitions apply (and shall be used in this Section) in accordance with North American Architectural Woodwork Standards (NAAWS), Section 10 and amended as follows:
    - .1 Exposed Surfaces: Defined as all surfaces exposed to view in open casework or behind transparent doors. These include:
      - .1 Surfaces visible when doors and drawers are closed, including knee spaces.
      - .2 Underside of cabinet bottoms over 1067 mm (62") above finished floor level, including cabinet bottoms behind light valances and bottom edge of light valances.
      - .3 Cabinet tops under 2032 mm (80") above finished floor, or if 2032 mm (80") and over and visible from an upper building level or floor.
      - .4 Front edges of stretchers, ends, divisions, tops and bottoms.
      - .5 Sloping tops of cabinets that are visible.
      - .6 Shelves (including edgebanding).
      - .7 Divisions and partitions.

- .8 Interior face of ends (sides), backs, and bottoms (including pull-outs). Also included are the interior surfaces of cabinet top members 914 mm (36") or more above the finished floor.
- .9 Interior face of door and applied drawer fronts.
- .2 Semi-Exposed Surfaces: Defined as those interior surfaces only exposed to view when doors or drawers are opened. These include:
  - .1 Tops and bottoms shelves, including front edgebanding (front edge is considered exposed).
  - .2 Divisions and partitions (front edge is considered exposed).
  - .3 Interior face of ends (sides), backs, and bottoms (including pull-outs). Also included are the interior surfaces of cabinet top members 914 mm (36") or more above the finished floor.
  - .4 Drawer sides, sub-fronts, backs, and bottoms.
  - .5 The underside of cabinet bottoms between 610 mm (24") and 1067 mm (42") above the finished floor.
  - .6 Security and dust panels or drawer stretchers.
  - .7 The faces of cabinet ends of adjoining units that butt together.
- .3 Concealed Surfaces: Defined as those exterior or interior surfaces that are covered or not normally exposed to view. These include:
  - .1 Toe space unless otherwise specified.
  - .2 Sleepers, stretchers, and solid sub-tops.
  - .3 The underside of cabinet bottoms less than 610 mm (24") above the finished floor.
  - .4 The flat tops of cabinets 2032 mm (80") or more above the finished floor, except if visible from an upper floor or building level.
  - .5 The three non-visible edges of adjustable shelves.
- .2 Reference Standards: Latest published editions of reference standards listed in this Section in effect as of the closing date and time of the Request for Tenders for the Contract, including any amendments adopted, are applicable unless otherwise indicated.

## **1.5 ADMINISTRATIVE REQUIREMENTS**

- .1 Pre-Installation Meetings:
  - .1 Prior to starting work of this Section, convene a pre-installation meeting at the Project site to review Project requirements and site conditions with pertinent parties. Conform to requirements of Section 01 30 00.
- .2 Coordination:
  - .1 Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that architectural woodwork and related items can be supported and installed as indicated.
  - .2 Perform pre-wiring and partial mounting of electrical and audio/visual equipment and concealed wiring required. Finalize location of outlets and similar items with the Consultant prior to installation.
  - .3 Where woodwork is indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication, and indicate measurements on Shop Drawings.
  - .4 Coordinate fabrication schedule with construction progress and the Construction Schedule to avoid delaying the Work.

- .5 Locate concealed framing, blocking, and reinforcements that support woodwork by field measurements before being enclosed, and indicate measurements on Shop Drawings.

## 1.6 SUBMITTALS

- .1 Product Data: Submit manufacturer's literature and data sheets for each type of material provided under this Section for the Project in accordance with requirements of Section 01 30 00. Ensure data sheets provide required information including detailed instructions for installing as well as maintaining, preserving and keeping materials in clean and safe conditions. Provide adequate warning of maintenance practices or cleaning agents detrimental to specified materials.
- .2 Safety Data Sheets (SDS): Submit SDS for inclusion in Operation and Maintenance Manual specified in Section 01 70 00, for adhesives, sealants and any other material designated by Consultant.
- .3 Shop Drawings:
  - .1 Submit Shop Drawings indicating material characteristics, details of construction, connections and relationship with adjacent construction.
  - .2 Indicate locations and sizes of cutouts and holes for plumbing and electrical fixtures, lavatories and similar items required in architectural woodwork; coordinate with appropriate trades.
  - .3 Clearly indicate material being supplied and show connections, attachments, reinforcing, anchorage and location of exposed fastenings in accordance with NAAWS Section 1.
  - .4 Field Measurements: Take field measurements prior to preparation of Shop Drawings and fabrication to ensure proper fitting of work. Do not proceed with fabrication until Shop Drawings have been reviewed.
- .4 Samples: Submit samples in accordance with Section 01 30 00 in following sizes:
  - .1 minimum 300 mm (12") long x 460 mm (18") wide x 25 mm (1") thick solid wood.
  - .2 minimum 300 mm (12") square and of specified thickness, plastic laminate or wood veneer as applicable, mounted on 19 mm (3/4") core and finished as specified. Submit samples for Consultant's approval prior to fabrication.
    - .1 For each colour of plastic laminate or wood veneer species selected (as applicable), submit manufacturer's standard 300 mm x 460 mm (12" x 18") chips.
  - .3 minimum 300 mm (12") square x 13 mm (1/2") thick countertop materials.
  - .4 each type of hardware.
- ~~.5 Certificates:
  - ~~.1 Submit Architectural Woodwork Manufacturers Association of Canada (AWMAC) Guarantee Certificate which covers replacing, reworking and refinishing of defects due to faulty workmanship or defective materials which become apparent within 2 years following date of Substantial Performance of the Work.~~
  - ~~.2 Submit final inspection report prepared by AWMAC inspection under Guarantee Inspection Service (GIS).~~~~

## 1.7 QUALITY ASSURANCE

- .1 Qualifications:
  - .1 Manufacturers: Provide Products for Work of this Section by manufacturer with minimum 10 years' experience in the manufacture of such materials.

- .2 Installers: Provide Work of this Section executed by competent installers with minimum 5 years' experience in the application of the Products, systems and assemblies specified and be a member of AWI/AWMAC in good standing for the previous 2 years.
- .3 Metal Fabricator: Provide metal work of this Section performed by firm capable of producing the required Shop Drawings of quality levels that are necessary to meet the requirements specified herein. Ensure the retained fabricator possesses modern architectural metal fabricating equipment capable of doing cutting, fitting, bending and installing of steel and stainless steel finishes.
- .4 Welders: Welding shall be performed by welders having minimum certification requirements of CSA W47.1 to suit the type of welding performed. Ensure welders are familiar with welding procedures for welding steel and aluminum.
- .2 Single Source Responsibility: Engage a qualified woodworking firm to assume undivided responsibility for production and installation for the Work described in this Section.
- ~~.3 Guarantee and Inspection Service (GIS):~~
  - ~~.1 Subject architectural wood work of this Section to inspection at plant and at Site by appointed inspector approved by local AWMAC Chapter. All costs attributable to GIS shall be included in the Contract Price.~~
  - ~~.2 The GIS process non-exhaustively includes the following:~~
    - ~~.1 review of Shop Drawings to determine methods and materials conform to specified standards;~~
    - ~~.2 review of mock-ups to establish quality control standards;~~
    - ~~.3 detailed inspection of manufactured components to verify their adherence to Shop Drawings, approved mock-ups and conformance to AWMAC - NAAWS.~~
- .4 Mock-ups: Provide mock-ups in locations designated by the Consultant and as required to demonstrate quality of workmanship. Maintain mock-ups during construction in an undisturbed condition as a standard for judging the completed work. Approved mock-ups may become part of completed work if the mock-up remains undisturbed at the time of Substantial Performance of The Work. Provide mock-ups for following items:
  - .1 Basic cabinetry consisting of one base cabinet, one wall hung cabinet, and one countertop. Base cabinet to have minimum one drawer.

## 1.8 DELIVERY, STORAGE AND HANDLING

- .1 Delivery and Acceptance Requirements:
  - .1 Do not deliver finished Products during rainy or damp weather.
  - .2 Do not deliver Work of this Section until the building and storage areas are sufficiently dry to ensure Products will not be damaged by changes in relative humidity and moisture content. Deliver, store and handle Products of this Section in accordance with NAAWS Section 2.
  - .3 Do not deliver and Install damaged Products. Replace damaged Products in accordance with requirements of this Section.
  - .4 Storage and Handling Requirements: Cover and protect finished surfaces with heavy Kraft paper and other acceptable means. Put in cartons for protection. Do not remove protective covers until immediately prior to final cleaning.

## 1.9 SITE CONDITIONS

- .1 Ambient Conditions: Ensure conditions conform to requirements of NAAWS Section 2 and moisture contents of wood for interior locations at time of installation are at established Optimum Moisture Content and Optimum Indoor Relative Humidity as outlined in NAAWS Section 2.

## 1.10 WARRANTY

- .1 The Contractor warrants the work of this Section for period of 3 years from the date of Substantial Performance of the Work against defects and deficiencies in accordance with General Conditions of the Contract. Promptly correct defects or deficiencies which become apparent within this warranty period, to the satisfaction of the Consultant and at no expense to the Owner. Defects include but are not limited to: delamination of plastic laminate, opening of seams, warpage and extensive colour fading.

## PART 2 - PRODUCTS

### 2.1 DESCRIPTION

- .1 Regulatory Requirements:
  - .1 Provide work of this Section in accordance with North American Architectural Woodwork Standards (NAAWS), except as specified otherwise herein. Any reference in this Section to grades and any use of terminology that is capitalized herein but not otherwise defined in the Contract Documents shall have the definitions given to such grades and terminology in "NAAWS" (and such definitions are hereby, by reference, made a part of this Section). The requirements of this Section govern and modify NAAWS.
  - .2 Fire-Test-Response Characteristics:
    - .1 Where fire-retardant materials are indicated, Provide materials with specified fire-test-response characteristics as determined by a testing and inspecting agency acceptable to Authorities Having Jurisdiction.
    - .2 Identify materials with appropriate markings of applicable testing and inspecting agency on surfaces of materials that will be concealed from view after installation.
    - .3 Flame-spread index shall be in accordance with OBC requirements when tested according to CAN/ULC-S102.
- .2 Design and Performance Requirements:
  - .1 Architectural Drawings and details are diagrammatic and are only intended to show design concept, aesthetics, interfacing requirements, configuration, components and arrangements. They are not intended to identify or solve completely problems of thermal and structural movements, assembly framing, engineering design, fixings and anchorages.
  - .2 Ensure millwork casework (e.g. countertops, wall cabinets, cabinet drawers and similar items) are capable of supporting structural loads without deflection in accordance with Casework Integrity Tests in Appendix A of AWMAC- NAAWS Standard Manual of the current edition as at the closing date and time of the Request for Tenders for the Contract.
  - .3 All composite wood Products and laminating adhesives used in millwork shall not contain added urea-formaldehyde resins.
  - ~~.4 Adhesives shall be non-toxic, low VOC, non-solvent glue to comply with AWMAC Quality Standards Manual, Canadian Eco-Logo' program, and LEED requirements.~~

- .5 All cabinets shall be flush overlay construction.
- .6 Design millwork so that no sharp edges are exposed. Provide minimum 25 mm radiused corner to countertops.
- .7 All cabinets doors and drawers shall be provided with locks as indicated on the Drawings. Key in accordance with the requirements to be provided by the Owner to the Contractor.
- .8 Incorporate all required mechanical, electrical and communication services into millwork so that wires and pipes are hidden from view. Provide access panels to all services to allow for future adjustment.
- .9 Provide built-in valance lighting underneath all upper cupboards over counter tops.
- .10 All architectural woodwork hardware shall be stainless steel of durable quality to meet standards of AINSI/BHMA grade 1 Cabinet Hardware.
- .11 All door, drawer and other exposed millwork edges shall have applied appropriately sized PVC edge strip, heat applied.
- .12 Plastic laminate-to-plastic laminate edges are not permitted.
- .13 Provide marine-grade plywood to all bottoms of sink cabinet boxes and areas that may come into contact with water.
- .14 Minimum nominal thickness and material for cabinet components and shelf deflection, type of materials, thicknesses, span width and total load distribution: In accordance with AWMAC-NAAWS Standard Manual Section 10, current edition.
- .15 Minimum nominal thickness and material for cabinet components and shelf deflection, type of materials, thicknesses, span width and total load distribution: In accordance with NAAWS Section 10.
- .3 Framing Lumber (Concealed Framing): Softwood or hardwood lumber as specified in this Section of uniform grain and colour, free from sap, shakes, knots, splits and other defects with grade marked by NLGA and meeting CAN/CSA O141 requirements as applicable. No cross grain permitted. Provide concealed wood of the most appropriate grade required to satisfy fabrication, utility and structural requirements.
- .4 Architectural Lumber (Exposed framing, solid members and trim): Clear, straight, kiln dried, hardwood lumber as specified in this Section, of species indicated on Drawings. Provide lumber kiln-dried to moisture content recommended by AWS, free from blemishes that would be apparent after finish is applied. Where species are not indicated on the Drawings, provide:
  - .1 Transparent Finish: Maple, quarter sawn, Premium grade, matched for compatibility of grain and colour.
  - .2 Opaque Finish: Natural Birch, quarter sawn, Premium grade.
- .5 Panel Products: Conform to the requirements of AWMAC AWS Section 4.
  - .1 Medium Density Fibreboard Core (MDF): All wood core substrates shall be MDF unless used in areas subject to moisture. Provide MDF Products manufactured from 100% recycled materials, without the use of added formaldehyde resins and with the following characteristics:
    - .1 Minimum density: 770 kg/m<sup>3</sup> (48 lb. /cu ft.)
    - .2 Surface characteristics: In accordance with ANSI/NPA A208.2
    - .3 Grade: Minimum 155.
    - .4 Finish and Texture: To match the Consultant's sample.
    - .5 Where indicated, Provide industrial grade MDF certified to meet Class 1 surface burning characteristics of CAN/ULC-S102 and UL 723 with maximum Flame Spread rating of 25 and maximum Smoke Developed of 200.

- .6 Acceptable Products:
  - .1 Medium Density Fibreboard Core (MDF): Decorative panels, "Medite II®" by Sierra Pine Ltd; or equivalent Products manufactured by Flakeboard Company Limited; Uniboard Canada Inc.; or Tafisa Canada and Company, Ltd.; (or Equivalent)
  - .2 Veneer Core (Plywood): Provide exterior grade, veneer core (plywood) at countertop cores and splashes where sinks are scheduled to be installed and at other locations as required to meet design requirements. Provide fire-retardant treatment as required to meet OBC stipulations. Conform to AWS Section 4.
    - .1 Softwood plywood (rough framing and rough carpentry only):
      - .1 Premium Grade, Douglas Fir plywood - CSA O121, or Western Softwood Plywood - CSA O151 or Poplar plywood - CSA O153-M. Provide Grade G2S where exposed on two sides and Grade G/Solid where exposed on one side. Consider fitment doors exposed on both sides.
    - .2 Hardwood Plywood (wood cores): Conforming to the requirements of ANSI/HPVA HP-1.
      - .1 Water-resistant plywood "PureBond™" by Columbia Forest Products; or "HyBrid Panel – SkyPly" by Rosenberg Forest Products; (or Equivalent).
    - .3 Provide veneer core (plywood) for following applications:
      - .1 millwork cores subject to moisture,
      - .2 cabinet bases in contact with floor, and
      - .3 countertop cores in other locations designated on the Drawings.
- .6 Facings:
  - .1 Facing Adhesive: As recommended by the manufacturer and containing no added urea-formaldehyde. Provide water-resistant adhesive for areas subject to moisture.
  - .2 High Pressure, Paper Base, Decorative Laminates:
    - .1 Fire-Test Response Characteristics: Ensure decorative laminates meet flame spread requirements for Class A (Class I) rating in accordance with CAN/ULC S102.2. Flame spread index: < 25; Smoke developed Index: 0.
    - .2 Provide following types and thicknesses conforming to ANSI/NEMA LD3 and ANSI/NEMA LD3.1 and AWS Section 4:
      - .1 Horizontal General Purpose: HGS - 1.2 mm (0.048").
      - .2 Vertical General Purpose: VGS - 0.7 mm (0.028").
      - .3 Postforming Horizontal: HGP - 1.0 mm (0.039").
      - .4 Postforming Vertical: VGP - 0.7 mm (0.028").
      - .5 Backer Sheet: BKM - 1.0 mm (0.039").
  - .3 Plastic Laminate Types (PLAM):
    - .1 Products of the following manufacturers (or Equivalent manufacturers) are acceptable subject to conformance to the requirements of the Contract Documents:
      - .1 Arborite High Pressure Laminates;
      - .2 Pionite Decorative Laminates

- .2 Colours and Finishes: To be selected by the Consultant at a later date from the manufacturer's full colour range including solid and woodgrain patterns, including cross-grain patterns and printed patterns in suede or matte finishes.
  - .1 Maximum Number of Colours, Finished and Patterns: 5.
- .7 Architectural Woodwork Hardware and Accessories:
  - .1 Provide hardware meeting or exceeding the applicable ANSI/BHMA A156 Series (Grade 1) standards.
  - .2 Slides:
    - .1 Heavy Duty Drawer Slides – more than 610 mm (24") wide, Capacity: 68.04 kg (150 lbs)
      - .1 Side Mounted Telescoping Ball Bearing drawer slide with full extension and 25 mm (1") overtravel (length as required to suit the drawer size). Provide one of the following (or Equivalent):
        - .1 Model No. Accuride – 3640 by Hafele America Company
        - .2 Model No. 8505 by Knappe & Vogt Canada Inc.
        - .3 Model No. KA 555 by Hettich Canada Ltd.
  - .3 Cabinet Door Hinges and Stays:
    - .1 Ensure cabinet hinge pin is not removable (tack weld or cap). Provide hinges complete with one-piece non-removable pin with tapered tips
    - .2 Wood Door Hinges:
      - .1 Frameless Concealed Hinges (European Type) – 165° to 170° opening: Self-closing concealed hinges with integrated soft close. Manufacturer's recommended number of hinges shall suit the door size and thickness. Provide one of the following:
        - .1 "Salice Concealed Wide Angle Hinges - No. 329.07 Series" by Hafele America Company.
        - .2 "Blum Concealed - Clip-Top Hinge" by Richelieu Hardware Ltd.
        - .3 "Intermat 9943" or "Intermat 9956" by Hettich Canada Ltd.
        - .4 or Equivalent to the above.
      - .2 Piano Hinges: Stainless steel. Provide hinges in the manufacturer's recommended size and length to suit door size and thickness.
        - .1 "Model No. 351.10 series" by Hafele America Company or Equivalent. Finish: AISI No. 4, Satin Finish.
  - .4 Door and Drawer Locks:
    - .1 Lock locations are noted Drawings. Provide locks in accordance with the Owner's keying requirements unless otherwise indicated in the Contract Documents.
    - .2 Wood Framed Doors and Drawers:
      - .1 Cylinder Locks: Provide adjustable locking system with lock throw, orientation and size to suit cabinet size. Provide one of the following:
        - .1 "Cylinder Module System; Model No. 232 Series" by Hafele America Company complete with cam locks or deadbolt locks and cores as required to suit applications indicated.



- .2 "Disc Tumbler Furniture Locks - Removacore" by CompX International Inc. complete with cam locks or deadbolt locks and cores as required to suit applications indicated .
- .5 Handles (Doors and Drawers):
  - .1 D-Pulls: Provide one of the following:
    - .1 "Model No. "Furniture Handle 10 mm 562.10.96" by Hewi or Equivalent.
    - .2 Finish: to be selected by Consultant at a later date.
- .6 Recessed Shelf Pilasters, Standards and Clips:
  - .1 Provide required accessories to mount wood shelves. Provide one of the following:
    - .1 "KV255" pilaster and "KV256" adjustable clip supports by Knappe & Vogt Canada Inc.
    - .2 "120-10 Series" pilasters and "1903-2G" clip supports by Richelieu Hardware Ltd.
- .7 Door and Drawer Stops, Bumpers and Catches:
  - .1 Drawer and Hinged Door Bumpers: Provide two clear resilient, press-fit bumpers per door or drawer.
  - .2 Built-in Drawer Stops: Resilient type recommended by the manufacturer.
  - .3 Magnetic Door Catch: Holding Power: 3 kg to 4kg (6.6 lbs to 8.8 lbs) Finish: Heavy duty cast aluminum. Provide one of the following (or Equivalent):
    - .1 Model No. 246.26 Series by Hafele America Company
    - .2 Model No. 918 by Knappe & Vogt Canada Inc.
- .8 Spring Latch (workstation 155):
  - .1 Provide Steel and Nylon spring catch and strike where indicated on Drawings; "Spring Catch, 32 mm, Press-In Strike – 245.07.711" by Hafele (or Equivalent).
- .8 Cable Management Grommets: Provide 54 mm (2-1/8") diameter grommets in numbers indicated at locations shown on reviewed Shop Drawings. Finish: to be selected at a later date.
  - .1 "Flip Top Series", by Mockett;
  - .2 "Round Plastic Cable Grommets; Model No. 429.9 Series" by Hafele.
  - .3 or Equivalent to the above.
- .9 Waste Receptacle Ring:
  - .1 Provide 200mm diameter, Stainless Steel surface mounted waste chute where indicated on drawings; "61436171" by Richelieu or TM1B – 6" Trash Grommet by Mockett (or Equivalent).
- .10 Closet Coat Rods: "KV660" by Knappe and Vogt Manufacturing Company (or Equivalent), 27 mm (1-1/16") od stainless steel rod complete with "KV734 – Full Circle" polished chrome flanges. Size rods to suit closet widths.
- .11 Solid Polymer Surfacing (SPS): Section 06 61 16.
- .12 Fastenings:
  - .1 Include the necessary fastenings, anchors and accessories required for fabrication and erection of the Work of this Section.
  - .2 Fastenings include non-exhaustively: anchor bolts, machine bolts, toggle bolts, male/female bolts, lag screws, expansion shields, sleeves, brackets, washers and nuts.

- .3 Provide exposed fasteners, where approved and shown on reviewed Shop Drawings, of the same texture, colour and finish as the base material on which they occur unless otherwise shown or noted in the Contract Documents. Use only stainless steel fasteners with stainless steel components.
- .4 Supply bolts complete with washers and nuts required for complete installation. Provide lock washers where vibration may loosen bolted fastenings.
- .5 Ensure thread dimensions are such that nuts and bolts fit without rethreading or chasing threads.
- .6 Bevelled hexagon head bolts: ASTM A307.
- .7 Bonding Cements: Achieve with solvents or adhesives, suitable for use with Product and application.

## **2.2 COMPONENTS**

- .1 Casework and Frames Construction: Conforming to AWS Section 10 unless otherwise indicated in the Contract Documents. Provide Premium grade quality construction and finishing unless otherwise indicated in the Contract Documents.
  - .1 Standing and Running Trim:
    - .1 Species For Transparent Finishing: Maple
    - .2 Species For Opaque Finishing: Birch
  - .2 Provide Premium Grade quality construction and finishing unless otherwise indicated in the Contract Documents.
  - .3 Casework Construction Type: Type A – Frameless construction with edge banded front edges.
  - .4 Interface Style: Style 1 – Flush Overlay unless otherwise indicated in the Contract Documents.
  - .5 Exposed Surfaces Core: Medium Density Fiberboard Core (MDF) unless otherwise indicated in the Contract Documents.
  - .6 Semi-Exposed and Concealed Surfaces Core: Medium Density Fiberboard Core (MDF) unless otherwise indicated in the Contract Documents.
  - .7 Edge Banding: Minimum 0.5 mm (0.02") thick ABS or PVC edgebanding, per AWS Section 10, Rule 4.4.26. Provide edgebanding for exposed (visible) and semi-exposed edges of the type specified in this Section.
    - .1 Case bodies: minimum 0.5 mm (0.0197") thick.
    - .2 Doors, drawer fronts, and false fronts: minimum 3 mm (1/8") thick.
    - .3 Pattern: wood grain to match door faces unless otherwise indicated in the Contract Documents.
  - .8 Facing: Plastic Laminate as specified in this Section.
  - .9 Plastic Laminates:
    - .1 Exposed Surfaces Finish: HGS for horizontal surfaces and VGS for vertical surfaces in accordance with AWS Section 4, Rule 4.2c.
      - .1 Finish: To be selected by Consultant from manufacturer's full range at a later date.
    - .2 Semi-Exposed Surfaces Finish: Plastic laminate; HGS for horizontal surfaces and VGS for vertical surfaces in accordance with AWS Section 4, Rule 4.2c.

- .1 Finish: Identical to exposed surfaces finish.
- .3 Concealed Surfaces Finish: Backing sheet; Provide BKV at vertical locations and BKH at horizontal locations; unless otherwise indicated in the Contract Documents.
- .2 Stainless Steel Countertops and Backsplashes: Refer to Section 12 35 71, Stainless Steel Casework.

## **2.3 FINISHES**

- .1 Factory Finishing: Defer only final touch up, cleaning, and polishing until after installation. As far as practical, ensure casework is factory finished unless otherwise indicated or unavoidable:
  - .1 Apply finishes in accordance with AWS Section 5.
  - .2 Transparent Wood Finishing:
    - .1 Exposed parts: AWS System – 5, Varnish, Conversion or System – 7, Vinyl, Catalyzed.
    - .2 Semi-Exposed parts: AWS System – 5, Varnish, Conversion or System – 7, Vinyl, Catalyzed.
    - .3 Staining: Match the Consultant's sample.
    - .4 Sheen: Satin in accordance with ASTM D523.
  - .3 Opaque Wood Finishing:
    - .1 Exposed parts: AWS System – 5, Varnish, Conversion.
    - .2 Semi-Exposed parts: AWS Exposed parts: AWS System – 5, Varnish, Conversion.
    - .3 Staining: Match the Consultant's sample.
    - .4 Sheen: Satin in accordance with ASTM D523.
  - .4 Field Touch-Up: Ensure that field touch-up is performed by the installing trade and that the architectural woodwork manufacturer will perform factory finishing. Field touch-up includes filling and touch-up of exposed job-made nail and screw holes, refinishing of raw surface resulting from job fitting, repair of job-inflicted scratches and mars and final cleaning up of finished surfaces.

## **2.4 FABRICATION**

- .1 Fabricate joints accurately fitted, coped where possible, and well glued up. Fabricate joints mitred to perfect fit and alignments carefully matched.
- .2 Fabricate finished woodwork in one piece where possible. Fabricate running members in the longest lengths obtainable.
- .3 Fabricate to conceal fastenings.
- .4 Provide plastic laminate Work in shop in accordance with ANSI/NEMA LD3. Provide backer sheets to panels to ensure balance.
- .5 Fabricate exposed gables to match the required exposed finishes.
- .6 Exposed wood construction:
  - .1 Fabricate joints carefully matched for grain and colour.
  - .2 Fabricate millwork with slow fed machines free from sticker and/or sander markings, with sections and moulding work cut accurately to profiles.
  - .3 Sandpaper woodwork, smooth removing burrs, feathers, sleeves, raised grain and sharp arises and leave exposed surfaces perfectly clean and smooth ready for finishing.

- .4 Provide edges noted to be solid, as minimum 6 mm (1/4") thick wood to match the exposed veneer to visible and semi-exposed edges, glued to the core prior to the application of face veneers. Provide plastic laminate or elastomeric edges to plastic laminate work visible or semi-visible edges.
- .7 Countertops:
  - .1 Fabricate and assemble countertops and side and back splashes in shop to profiles and lengths required.
  - .2 Fabricate cutouts for services penetrations as required.
  - .3 Verify governing dimensions before fabricating items which abut wall surfaces.
  - .4 Provide cutouts required and round internal corners, chamfer edges and seal exposed core.
  - .5 Provide sidesplashes at abutting ends of counters and at adjoining walls, unless otherwise indicated on the Drawings.
  - .6 Provide a 6 mm (1/4") drip groove approximately 13 mm (1/2") in from the underside edge.

### **PART 3 - EXECUTION**

#### **3.1 EXAMINATION**

- .1 Verification of Conditions: Verify actual Site dimensions and location of adjacent materials prior to commencing the Work. Notify the Consultant in writing of any conditions which would be detrimental to the installation.
- .2 Evaluation and Assessment: The commencement of work constitutes the Contractor's acceptance of previously completed work.

#### **3.2 PREPARATION**

- .1 Wood Surface Preparation for Finish:
  - .1 Verify and determine wood species, grain direction and structure, properties of finish, application method and exposure to elements. Check moisture content to avoid movement of wood caused by expansion and contraction due to changes in moisture content. Verify grain cut as it may interfere with adhesion of finish.
    - .1 Apply wood finishing Product in following order and as needed for specific appearance and application specified in this Section. Sanding sealer to control penetration of subsequent coats to create more uniform finish. Stain to colour wood and highlight grain for final finish. Filler to fill pores of wood and control penetration of subsequent coats. Apply filler across grain forcing it into pores followed with rubbing and sanding when dried. For staining requirements mix stain with filler before applying for uniform finish. Finish coats to Provide protection to wood.
  - .2 Woodwork for Clear Finish or Stain:
    - .1 Sand smooth all woodwork to be finished using 150 grit paper followed by a second sanding using 220 grit paper and clean surfaces free of dust using brush, compressed air or tack rags before applying first coat. Abrade surfaces with stiff brush to remove loose fibers and splinters. Fill nail holes, splits and scratches with non-shrinking filler tinted to match local grain condition after first coat is dry. Sand lightly between coats with No. 220 sandpaper and remove dust.

- .3 Wood Surface Preparation for Opaque Coating:
  - .1 Seal knots and sapwood in surfaces to receive paint with alcohol-based primer-sealer. Seal door edges. Sand smooth rough surfaces of woodwork to be finished using 150 grit paper followed by a second sanding using 220 grit paper. Sand in the direction of the grain. Clean surfaces free of dust before applying the first coat using brush, compressed air or tack rags. Fill nail holes, splits and scratches with non-shrinking filler after the first coat is dry. Remove salt deposits that may appear on wood surfaces treated with fire retarder.
  - .2 Prepare plywood surface by removing dirt and debris. Fill screw and nail holes or minor imperfections with recommended filler and sand properly to receive finish coating. Plywood requiring stained or painted finish shall be primed with top quality alkyd primer. Use only penetrating quality stain over plywood.
  - .3 Woodwork for Clear Finish or Stain: Sand smooth all woodwork to be finished using 150 grit paper followed by a second sanding using 220 grit paper and clean surfaces free of dust using brush, compressed air or tack rags before applying first coat. Abrade surfaces with stiff brush to remove loose fibers and splinters. Fill nail holes, splits and scratches with non-shrinking filler tinted to match local grain condition after first coat is dry. Sand lightly between coats with No. 220 sandpaper and remove dust.
  - .4 Remove salt deposits that may appear on wood surfaces treated with fire retarder.
  - .5 Ensure resilient flooring under millwork cabinets are provided prior to proceeding with the Work of this Section.

### 3.3 INSTALLATION

- .1 Install the Work of this Section in accordance with the corresponding Product section of the AWMAC AWS.
- .2 Grade: Install woodwork to comply with requirements for grade specified in this Section for fabrication of type of woodwork involved.
- .3 Assemble woodwork and complete fabrication at Site to comply with requirements for fabrication specified in this Section and to the extent that it was not completed in shop.
- .4 Install woodwork level, plumb, true, and straight. Shim as required with concealed shims. Install level and plumb (including tops) to a tolerance of 3 mm in 2400 mm (1/8" in 8'-0").
- .5 Scribe and cut woodwork to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.
- .6 Anchor woodwork to anchors or blocking built in or directly attached to substrates. Secure with countersunk, concealed fasteners and blind nailing as required for complete installation. Use fine finishing nails or finishing screws for exposed fastening, countersunk and filled flush with woodwork and matching final finish if transparent finish is indicated in the Contract Documents..
- .7 Cabinets: Install without distortion so doors and drawers fit openings properly and are accurately aligned. Adjust hardware to center doors and drawers in openings and to Provide unencumbered operation. Complete installation of hardware and accessory items as indicated in the Contract Documents.
- .8 Install cabinets with no more than 3 mm in 2400 mm (1/8" in 8'-0") sag, bow, or other variation from a straight line.
- .9 Maintain veneer sequence matching of cabinets with transparent finish.
- .10 Fasten wall cabinets through back, near top and bottom, at ends and not more than 400 mm (16") o.c. with No. 10 wafer-head screws sized for 25 mm (1") penetration into wood framing, blocking, or hanging strips.

- .11 Countertops: Anchor securely by screwing through corner blocks of base cabinets or other supports into underside of countertop. Install countertops with a maximum of 3 mm in 2400 mm (1/8" in 8'-0") sag, bow, or other variation from a straight line.
- .12 Align adjacent solid-surfacing-material countertops and form seams to comply with the manufacturer's written recommendations using adhesive in color to match countertop. Carefully dress joints smooth, remove surface scratches, and clean the entire surface.
- .13 Secure backsplashes to tops with concealed metal brackets at 400 mm (16") o.c. and to walls with adhesive.
- .14 Touch up finishing work specified in this Section after the installation of woodwork. Fill nail holes with matching filler where exposed.
- .15 Install solid polymer counter top surfaces at locations indicated on the Drawings in accordance with the manufacturer's recommendations to meet design requirements.
- .16 Provide the Work of this Section true and straight and securely fastened in place.
- .17 Mitre exposed corners and butt joints.
- .18 Provide plastic laminate countertops plumb and true, neatly scribed to adjoining surfaces.
- .19 Thoroughly fix and anchor the Work of this Section into position.
- .20 Mechanical and Electrical Fittings:
  - .1 Provide openings required to accommodate mechanical and electrical fittings as part of the Work of this Section and provide a core sealant to protect counter cores which are exposed to accommodate:
    - .1 mechanical services and fittings.
    - .2 washroom accessories.
  - .2 Locate and Install lenses where indicated on the Drawings. Carefully align lenses, shown in continuous lines, so that they appear as straight lines. Mount lenses perfectly level or plumb. Lenses shall fit tightly without showing space or light leak between frame and lenses. Remove improperly installed lenses and reinstall at no cost to the Owner.
  - .3 Mechanical and electrical fittings and services will be provided as part of the Work of Divisions 21, 22 23, 26, 27 and 28.
- .21 Installation of Architectural Woodwork Hardware:
  - .1 Install architectural woodwork hardware in accordance with AWMAC, AWS and manufacturer's requirements and templates. Adjust architectural woodwork hardware to Provide smooth operation and ensure clearances are maintained. Repair damage to adjacent surfaces resulting from failure to conform with this requirement.
  - .2 Provide lubricants required and use in a manner to ensure smooth function of hardware consistent with the manufacturer's recommendations.
  - .3 Verify that fastening components are tightened securely. Align screws, bolts and similar fastenings such that relationship of screw head indentations, similar surfaces and slots are perpendicular to the matching vertical or horizontal position when on the same surface. Do not burr or otherwise mar edges of surfaces of hardware components. Repair the defects caused by the Work of this Section to the satisfaction of the Consultant.
  - .4 Conform to keying requirements specified in this Section.

### **3.4 FINISHING**

- .1 Prime unexposed surfaces including the backs of fitments against walls and underside of fitments.

- .2 Before priming, treat knots and sap streaks, with a coat of shellac and then prime with a wood primer.
- .3 Shop finish natural finished wood surfaces.

**3.5 ADJUSTING AND CLEANING**

- .1 Repair damaged and defective woodwork, where possible, to eliminate functional and visual defects; where not possible to repair, replace woodwork.
- .2 Adjust joinery for uniform appearance.
- .3 Clean, lubricate, and adjust hardware.
- .4 Clean woodwork on exposed and semi-exposed surfaces. Touch up shop-applied finishes to restore damaged or soiled areas.

**END OF SECTION**

## **PART 1 - GENERAL**

### **1.1 PRICING**

- .1 All costs associated with the work required by and associated with this Section shall be included as part of the Contract Price and in the price listed in item #1 of the Bid Form.

### **1.2 GENERAL INSTRUCTIONS**

- .1 Read and conform to:
  - .1 the General Conditions and the Supplementary Conditions of the Contract;
  - .2 Division 1 requirements and documents referred to therein.

### **1.3 SUMMARY**

- .1 Work Included: Provide joints sealants including but not limited to the following:
  - .1 Exterior joints in vertical surfaces and nontraffic horizontal surfaces
  - .2 Exterior joints horizontal traffic surfaces
  - .3 Interior joints vertical surfaces and horizontal nontraffic surfaces
- .2 Related Requirements: Specifications throughout the entirety of the Divisions of this Project are directly applicable to this Section, and this Section is directly applicable to them.

### **1.4 REFERENCES**

- .1 Definitions:
  - .1 In the context of general purpose joint sealants, the following definitions apply in accordance with ASTM C920 for performance characteristics and are used accordingly in this Section:
    - .1 Sealant types:
      - .1 Type S: Single component sealant;
      - .2 Type M: Multi-component sealant;
    - .2 Rheological Properties:
      - .1 Grade P: Pourable or self-leveling sealant;
      - .2 Grade NS: Non-sag sealant
    - .3 Movement:
      - .1 Class 100/50: Sealant which can withstand an increase of at least 100% and a decrease of at least 50% of the joint width as measured at the time of applications
      - .2 Class 50: a sealant which can withstand an increase and a decrease of at least 50% of the joint width as measured at the time of applications
      - .3 Class 35: a sealant which can without an increase and a decrease of at least 35% of the joint width as measured at the time of applications
      - .4 Class 25: a sealant which can withstand an increase and a decrease of at least 25% of the joint width as measured at the time of applications



- .5 Class 12 ½: a sealant which can withstand an increase and a decrease of at least 12.5% of the joint width as measured at the time of applications
- .4 Usage:
  - .1 Use T: a sealant designed for use in joints in pedestrian and vehicular traffic areas such as walkways, plazas, decks and parking garages
  - .2 Use NT: a sealant designed for use in joints in nontraffic areas
  - .3 Use I: sealant designed for use in joints which are submerged continuously in a liquid
  - .4 Use M: a sealant that meets the requirements of ASTM C920 when tested on mortar specimens for adhesion and cohesion after cyclic movement requirements of ASTM C719 and adhesion in peel requirements of ASTM C794
  - .5 Use G: a sealant that meets the health, safety, emergency response hospital procedure and policy requirements of ASTM C920 and this Specification when tested on glass specimens or adhesion and cohesion after cyclic movement requirements of ASTM C719 and adhesion in peel requirements after ultraviolet exposure through glass of ASTM C794
  - .6 Use A: a sealant that meets the requirements of ASTM C920 when tested on aluminum specimens in accordance with for adhesion and cohesion after cyclic movement requirements of ASTM C719 and adhesion in peel requirements of ASTM C794
  - .7 Use O: a sealant that meets the requirements of ASTM C920 when tested on substrates other than the standard substrates in accordance with for adhesion and cohesion after cyclic movement requirements of ASTM C719 and adhesion in peel requirements of ASTM C794
- .2 Reference Standards: Latest published editions of reference standards listed in this Section in effect as of the closing date and time of the Request for Tenders for the Contract, including any amendments adopted, are applicable unless otherwise indicated.

## **1.5 ADMINISTRATIVE REQUIREMENTS**

- .1 Pre-Installation Meetings:
  - .1 Prior to starting work of this Section, convene a pre-installation meeting at the Project site to review the Project requirements and site conditions with pertinent parties. Conform to requirements of Section 01 30 00.

## **1.6 SUBMITTALS**

- .1 Product Data: Submit manufacturer's literature and data sheets for each type of material provided under this Section for the Project in accordance with requirements of Section 01 30 00. Ensure data sheets provide required information including detailed instructions for installing as well as maintaining, preserving and keeping materials in clean and safe conditions. Provide adequate warning of maintenance practices or cleaning agents detrimental to specified materials.
- .2 Material Safety Data Sheets: Submit MSDS for inclusion in operation and maintenance manual without limitations for adhesives, sealants and any other material later designated by Consultant.
- .3 Compatibility Testing Report: Prior to Supply or installation, test exterior sealant materials for compatibility with joint substrates. Test for staining and adhesion of materials including substrates treated with sealers, curing compounds and water repellants and materials which

may contact sealant. Submit written report of test results to the Consultant in accordance with Section 01 30 00.

**.4 Colours:**

.1 Colour Hierarchy: Submit sealant colours for acceptance in accordance with the following general colour hierarchy. Between 2 dissimilar materials, colour the sealant to match the material with the higher relative position on the colour hierarchy scale (highest is at ".1"):

- .1 Concrete.
- .2 Masonry.
- .3 Metal extrusions.
- .4 Metal (formed).

.2 For fully concealed joints, Provide the manufacturer's standard color of sealant which has the best overall performance characteristics for the application shown.

.5 Samples: Submit samples in accordance with Section 01 30 00. Provide cured, colour samples of the manufacturer's standard range of colours in each type of sealant and caulking compound for colour selection by the Consultant. Submit samples of primer, bond breaker tape and joint backing material, if requested.

**1.7 QUALITY ASSURANCE**

.1 Installer Qualifications: Provide work of this Section executed by competent installers who have a membership in good standing in the Sealant and Waterproofing Association and with a minimum of 5 years' experience in the application of the Products, systems and assemblies specified herein and with the approval and training of the Product manufacturers. Include lists of completed projects with the projects' names, the names of the consultants on the projects and contact persons.

.2 Testing Agency Qualifications: Retain an independent testing agency qualified in accordance with ASTM C1021 to conduct the testing indicated, as documented according to the sealant manufacturer's recommendations. Ensure materials are verified for suitability in accordance with ASTM C719 and ASTM C661.

**.3 Preconstruction Testing:**

.1 Test elastomeric joint sealants for compliance with requirements of ASTM C920 and, where applicable, to other standard test methods.

.2 Test elastomeric joint sealants for compliance with requirements of ASTM C920 for adhesion and cohesion under cyclic movement, adhesion-in peel and indentation hardness.

.3 Test other joint sealants for compliance with the requirements indicated in this Section by referencing standard specifications and test methods.

.4 Prior to commencement of sealing, arrange for the sealant manufacturer's technical representative to visit the Place of the Work and inspect the surfaces and joints to be sealed.

.5 Test for compatibility of sealant and accessory Products with joint substrates. Test results and written recommendations for primers and substrate preparation required for proper adhesion. For materials failing tests, obtain the joint sealant manufacturer's written instructions for corrective measures, including the use of specialty formulated primers.

.4 Single Source Responsibility: Ensure primary materials provided in this Section are obtained from 1 source by a single manufacturer and secondary materials are obtained from sources recommended by primary materials manufacturers.

**.5 Mock-ups:**

- .1 Conform to requirements of Section 01 40 00. At the Site, in area(s) designated by the Consultant, erect sample panels 1 m (39") long for determined type(s) of sealant joint design, showing location, size, shape and depth of joint complete with backup materials, primer, caulking and sealant, bond, colour and quality of installation work.
- .2 If requested, conduct a field test for joints designated. Construct additional mock-ups if required to obtain approval. Do no sealant work until mock-ups have been approved. Approved mock-ups become the standard of comparison for sealant and caulking work on site and may become part of the finished installation if left undisturbed at the time of Substantial Performance of The Work.

**1.8 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver caulking and sealant materials to the Site in original, unopened containers with manufacturers' labels and seals intact. Labels shall identify manufacturer's name, brand name of Product, grade and type, application directions and shelf life or expiry date of Product.
- .2 Handle and store materials in accordance with manufacturer's printed directions. Store flammable materials in safe, approved containers to eliminate fire hazards.
- .3 Do not use caulking and sealant materials that have been stored for period of time exceeding maximum recommended shelf life of materials.

**1.9 PROJECT CONDITIONS**

- .1 Environmental Requirements: Do not apply any sealant under adverse weather conditions, when joints to be sealed are damp, wet or frozen or when at ambient temperatures below 5 deg C (40 deg F). Maintain minimum temperature of application during application and for 8 hours after application. Consult the manufacturer for specific instructions before proceeding; obtain the Consultant's approval.
- .2 Do not proceed with installation of joint sealants where joint widths are less than those allowed by the joint sealant manufacturer for applications indicated, and until contaminants capable of interfering with adhesion are removed from joint substrates.

**1.10 WARRANTY**

- .1 The Contractor warrants the work of this Section for period of 5 years from Substantial Performance of the Work against defects and deficiencies in accordance with General Conditions of the Contract. Promptly correct defects or deficiencies which become apparent within this warranty period, to the satisfaction of the Consultant and at no expense to the Owner. Defects include but are not limited to: cracking, crumbling, melting, shrinkage, sag, adhesion or cohesion failure, reversion, air and moisture leakage, marbling or streaking due to improper mixing, discolouration due to dirt pick-up during curing and staining of adjacent materials.

**1.11 MANUFACTURER'S GUARANTEE (EXTERIOR SEALANTS)**

- .1 Provide sealant manufacturer's non-stain guarantee naming the Owner as beneficiary and covering defects and deficiencies and weather tightness of complete membrane and flashings for 20 years from Substantial Performance of the Work.
- .2 Provide a guarantee covering the materials described in this Section. The guarantee shall include the furnishing, repair and replacement of such materials at the manufacturer's expense

and to the extent required for the work of this Section which does not comply with performance and other requirements specified herein.

## **PART 2 - PRODUCTS**

### **2.1 MANUFACTURERS**

- .1 Products of following manufacturers are acceptable subject to conformance to requirements of Drawings, schedules and Specifications:
  - .1 BASF Inc.
  - .2 CPD Construction Products;
  - .3 Dow Corning
  - .4 Euclid Chemical Canada Ltd.
  - .5 Momentive Performance Materials;
  - .6 Hilti (Canada) Limited
  - .7 Pecora Corporation
  - .8 Sika Canada Inc.
  - .9 Tremco Canada
  - .10 W. R. Meadows
  - .11 or Equivalent to the above.

### **2.2 DESCRIPTION**

- .1 Regulatory Requirements:
  - .1 Ensure sealants comply with ~~LEED and~~ requirements of Authorities Having Jurisdiction with regards VOC emission.
- .2 Performance Requirements:
  - .1 Provide exterior and interior elastomeric joint sealants establishing and maintaining water tight, water resistant and air tight continuous joint seals without staining or deteriorating joint substrates.
  - .2 Ensure elastomeric sealants provided comply with ASTM C920 and other standards specified herein for type, grade, class and uses.
  - .3 Provide Products with capability, when tested for adhesion and cohesion under maximum cyclic movement in accordance with ASTM C719, to withstand required percentage change in joint width existing at the time of installation and remain in compliance with other requirements of ASTM C920 for uses indicated.
  - .4 Provide elastomeric sealants that are non-staining and have undergone testing in accordance with ASTM C1248 for joint substrates indicated for the Project.

### **2.1 EXTERIOR JOINT SEALANTS**

- .1 Single component, nonsag, neutral curing silicone sealant, ASTM C920, Type S, Grade NS, Class 100/50 or Class 50 as required for applications and joint design, for Use NT or nonstaining silicone sealant according to ASTM C 1248.

- .1 Exterior joints in vertical surfaces and horizontal non-traffic surfaces as follows:
  - .1 Construction joints in cast-in-place concrete.
  - .2 Control and expansion joints in unit masonry.
  - .3 Joints between different materials listed above.
  - .4 Perimeter joints between materials listed above and frames of doors, windows and louvers.
  - .5 Other joints as indicated on Drawings and Schedules.
- .2 Acceptable Products:
  - .1 "Dowsil 790" or "Dowsil 795" or "Dowsil CCS" by Dow Chemical of Canada ULC
  - .2 "Spectrem 1" or "Spectrem 2" by Tremco Incorporated
  - .3 "Sikasil WS-290" or "Sikasil WS-295" by Sika Canada Inc.
  - .4 "Silpruf SCS2000" or "Silpruf LM SCS2700" by GE Silicones (Momentive Performance Materials)
  - .5 "890NST" or "864NST" by Pecora Corporation
  - .6 Approved equivalent.
- .2 Single component, nonsag, low dirt pick-up, non-staining, neutral curing silicone sealant, ASTM C920, Type S, Grade NS, Class 100/50 or Class 50 as required for applications and joint design, for Use NT.
  - .1 Exterior joints in vertical surfaces and horizontal non-traffic surfaces as follows:
    - .1 Joints between plant-precast architectural concrete units.
    - .2 Joints in stone masonry and cladding.
    - .3 Joints in metal panel substrates.
    - .4 Joints between different materials listed above.
    - .5 Other joints as indicated on Drawings and Schedules.
  - .2 Acceptable Products:
    - .1 "Spectrem 3" or "Spectrem 4 TS" by Tremco Incorporated
    - .2 "Dowsil 756 SMS" by Dow Chemical of Canada ULC
    - .3 "Silpruf NB SCS9000" by GE Silicones (Momentive Performance Materials)
    - .4 "Sikasil WS-290" or "Sikasil WS-295" by Sika Canada Inc
    - .5 Approved equivalent.
- .3 Single-Component, Nonsag, Traffic-Grade, Neutral-Curing Silicone Joint Sealant, ASTM C920, Type S, Grade NS, Class 100/50, for Use T.
  - .1 Exterior joints in horizontal traffic surfaces as follows:
    - .1 Control and expansion joints in brick pavers.
    - .2 Isolation and contraction joints in cast-in-place concrete slabs.
    - .3 Joints between plant-precast architectural concrete paving units.
    - .4 Joints in stone paving units, including steps.
    - .5 Tile control and expansion joints.
    - .6 Joints between different materials listed above.
    - .7 Other joints as indicated on Drawings and Schedules.
  - .2 Acceptable Products:
    - .1 "Dowsil 790" or "Dowsil NS Parking Structure Sealant" by Dow Chemical of Canada ULC
    - .2 "Spectrem 800/900SL" by Tremco Incorporated
    - .3 "Sikasil -728 SL" or "Sikasil -728 NS" by Sika Canada Inc.
    - .4 "301 NS" or "311 NS" by Pecora Corporation

- .5 Approved equivalent.
- .4 Single-Component or Multicomponent, Pourable, Traffic-Grade, Urethane Joint Sealant, ASTM C920, Type S or Type M, Grade P, Class 25 or Class 50 as required by joint design, for Use T.
  - .1 Exterior joints in horizontal traffic surfaces subject to water immersion as follows:
    - .1 Joints in pedestrian plazas.
    - .2 Joints in swimming pool decks.
    - .3 Other joints as indicated on Drawings and Schedules.
  - .2 Acceptable Products:
    - .1 "TH901" or "Vulkem 45 SSL" by Tremco Incorporated
    - .2 "MasterSeal SL 1 or MasterSeal SL 2" by Master Builders Solutions
    - .3 "Urexpan NR-201" by Pecora Corporation
    - .4 "Sikaflex - 1CSL" or "Sikaflex 2C SL" by Sika Canada Inc.
    - .5 Approved equivalent.

## **2.2 INTERIOR JOINT SEALANTS**

- .1 Single component, nonsag, neutral curing silicone or urethane sealant, ASTM C920, Type S or Type M, Grade NS, Class 50, Class 35 or Class 25 as required for applications and joint design, for Use NT.
  - .1 Interior joints in vertical surfaces and horizontal nontraffic surfaces as follows:
    - .1 Control and expansion joints on exposed interior surfaces of exterior walls.
    - .2 Perimeter joints of exterior openings.
    - .3 Tile control and expansion joints.
    - .4 Vertical joints on exposed surfaces of interior unit masonry and concrete walls and partitions.
    - .5 Joints on underside of plant-precast structural concrete beams and planks.
    - .6 Perimeter joints between interior wall surfaces and frames of interior doors, windows and elevator entrances.
    - .7 Other joints as indicated on Drawings and Schedules.
  - .2 Acceptable Products:
    - .1 "Dowsil 791" or "Dowsil 795" or "Dowsil CWS" by Dow Chemical of Canada ULC
    - .2 "Spectrem 2" or "Spectrem 3" or "Dymonic" or "Dymonic FC" by Tremco Incorporated
    - .3 "SilPruf LM SCS2700" by GE Silicones (Momentive Performance Materials)
    - .4 "890NST" or "890FTS" or "864NST" or "PCS" or "DynaTrol I-XL" or "DynaTrol II" by Pecora Corporation
    - .5 "SikaSil WS-295" by Sika Canada Inc.
    - .6 Approved equivalent.
- .2 Mildew-Resistant, Single-Component, Nonsag, Silicone Joint Sealant, ASTM C920, Type S, Grade NS, Class 25, for Use NT
  - .1 Mildew-resistant interior joints in vertical surfaces and horizontal nontraffic surfaces as follows:
    - .1 Joints between plumbing fixtures and adjoining walls, floors, and counters.
    - .2 Tile control and expansion joints.
    - .3 Other joints as indicated on Drawings and Schedules.
  - .2 Acceptable Products: Mildew-Resistant, Single-Component, Acid-Curing or Neutral Curing Silicone Joint Sealant, ASTM C920, Type S, Grade NS, Class 25, for Use NT.

- .1 "Dowsil 786 Mildew Resistant" or "Dowsil Tub/Ceramic/Tile" by Dow Corning Corporation
  - .2 "Silicones; Sanitary SCS1700" by GE Silicones (Momentive Performance Materials)
  - .3 "Tremsil 200 Sanitary" by Tremco Incorporated
  - .4 "Sikasil GP/GP HT" by Sika Canada Inc.
  - .5 "898 NST" by Pecora Corporation
- .3 Nonsag, paintable, nonstaining latex complying with ASTM C834 or butyl rubber sealant complying with ASTM C1311.
  - .1 Surface Burning Characteristics: Flame spread, and smoke developed indexes not greater than 25 and 450, respectively.
  - .2 Interior acoustical joints in vertical surfaces and horizontal nontraffic surfaces as follows:
    - .1 Acoustical joints at top and bottom of gypsum board partitions; at top of masonry walls and through non fire-rated penetrations in gypsum and masonry walls.
    - .2 Other joints as indicated on Drawings and Schedules.
  - .3 Acceptable Products:
    - .1 "AC-20 FTR" or "AIS-919" by Pecora Corporation
    - .2 "SHEETROCK Acoustical Sealant" by CGC Inc.
    - .3 "QuietZone Acoustic Sealant" by Owens-Corning Canada Inc.
    - .4 "Tremco Acoustical Sealant" by Tremco Ltd.
    - .5 "QuietSeal" or "QuietSeal 350" by Serious Materials.
    - .6 "CP506 – Smoke and Acoustic Sealant" by Hilti
    - .7 "RCS20" by GE Silicones (Momentive Performance Materials)
    - .8 "MasterSeal NP520" by Master Builders Solutions
- .4 Single-Component or Multicomponent, Traffic-Grade, Silicone or Urethane Joint Sealant, ASTM C920, Type S or Type M, Class 25 or Class 50 as required by joint design, for Use T
  - .1 Interior traffic joints as follows:
    - .1 Isolation joints in cast-in-place concrete slabs. Refer to Section 03 35 00 for filling of contraction joints.
    - .2 Acceptable Products:
      - .1 "Dowsil 790" by Dow Corning Corporation
      - .2 "301 NS" or "311 NS" "300 SL" or "310 SL" by Pecora Corporation
      - .3 "Spectrem 800/900SL" by Tremco Incorporated
      - .4 "Sikaflex - 1CSL or Sikaflex 2C SL" by Sika Canada Inc.
      - .5 "MasterSeal SL1" or "MasterSeal SL2" by Master Builders Solutions
- .5 Single-Component or Multicomponent, Traffic-Grade, Silicone or Urethane Joint Sealant, ASTM C920, Type S or Type M, Class 25 or Class 50 as required by joint design, for Use T
  - .1 Interior traffic joints as follows:
    - .1 Control and expansion joints in stone flooring.
    - .2 Control and expansion joints in tile flooring.
    - .3 Other joints as indicated on Drawings and Schedules.
  - .2 Acceptable Products: As recommended by flooring manufacturer and conforming to TTMAC guidelines.
- .6 Single-Component Silicone complying with ASTM C920, Grade NS, Class 25 or butyl rubber sealant complying with ASTM C1311.
  - .1 Interior traffic joints as follows:

- .1 Concealed sealants for bedding thresholds and sills.
- .2 Acceptable Products:
  - .1 "Dowsil 758" by Dow Corning Corporation
  - .2 "Tremco Butyl Sealant" by Tremco Incorporated
  - .3 "BC-158" or "BA-98" by Pecora Corporation
  - .4 "MasterSeal NP1" by Master Builders Solutions
- .7 Silicone glazing sealant, ASTM C920, Type S, Grade NS, Class 25, Use NT.
  - .1 Glazing applications as follows:
    - .1 Non-structural sealing for butt-glazing in interior applications and other non-moving glazing joints.
  - .2 Acceptable Products:
    - .1 "Dowsil 799" or "Dowsil Glazing" by Dow Chemical of Canada ULC
    - .2 "UltraGlaze SSG4000" or "UltraGlaze SSG4000AC" by GE Silicones (Momentive Performance Materials)
    - .3 "Tremsil 200" by Tremco Incorporated
    - .4 "Sikasil - N Plus" by Sika Canada Inc.
- .8 Single-Component, Nonsag, Urethane Tamper-resistant Security Joint Sealant, ASTM C920, Type S or Type M, Grade NS, Class 12.5, for Use NT, Shore A hardness 40 +/- 5 in accordance with ASTM C661.
  - .1 Interior tamper-resistant security joints as follows:
    - .1 Moving (e.g. perimeters of exterior openings) and non-moving (e.g. fixture joints) in public and supervised locations such as [day rooms,] [exercise rooms,] [cafeterias,] and similar locations.
  - .2 Acceptable Products:
    - .1 "Pecora Dynaflex™ SC" by Pecora Corporation
    - .2 "Masterseal CR195" by Master Builders Solutions.
    - .3 "DOWSIL™ 995 Silicone Structural Sealant" by Dow Chemical of Canada ULC
    - .4 "Sikaflex 11FC" or "Sika Construction Adhesive"

## **2.3 COMPONENTS**

- .1 Joint Backing: Preformed, compressible, resilient, non-waxing, non-extruding, non-staining strips of closed cell polyethylene or urethane foam, compatible with joint substrates and are approved by the sealant manufacturer based on field experience and laboratory test. Sizes and shapes to suit various conditions, diameter 25% greater than joint width. Backing shall be compatible with sealant, primer and substrate.
- .2 Bond Breaker Tape: As recommended by the sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.
- .3 Joint Primer: Non-staining, suitable for substrate surfaces, compatible with joint forming materials and as recommended by the sealant manufacturer for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.



- .4 Masking Tape: Provide non-staining, non-absorbent tapes and sheets which effectively mask sealant without leaving an adhesive residue compatible with joint sealants and surfaces adjacent to joints.
- .5 Cleaning Material: Non-corrosive, non-staining, solvent type, xylol, methyl-ethyl-ketone (MEK), toluol, isopropyl alcohol (IPA) or as recommended by the sealant manufacturer and acceptable to the material or finish manufacturers for surfaces adjacent to sealed areas free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way and formulated to promote optimum adhesion of sealants with joint substrates.

## **PART 3 - EXECUTION**

### **3.1 EXAMINATION**

- .1 Examine joints for compliance with requirements for joint configuration, installation tolerances and other conditions affecting joint sealant performance. Ensure joints are suitable to accept and receive sealants.
- .2 Verify that joint surfaces are clean, sound, free of defects and that dimensions are within the sealant manufacturer's size requirements.
- .3 Proceed with installation only after unsatisfactory conditions have been corrected. Commencement of work implies acceptance of surfaces and conditions.
- .4 Do not apply sealant to masonry until mortar has cured.
- .5 Before any sealing work is commenced, test materials for indications of staining or poor adhesion.
- .6 Notify the Consultant in writing of any conditions which would be detrimental to the installation. Commencement of work implies acceptance of previously completed work.

### **3.2 PREPARATION**

- .1 Use masking tape where required to prevent contact of sealant with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.
- .2 Clean joints and spaces which are to be sealed and ensure they are dry and free of dust, loose mortar, oil, grease, oxidation, coatings, form release agents, sealers and other foreign material.
- .3 Clean porous surfaces such as concrete, masonry or stone by wire brushing, grinding or blast cleaning, mechanical abrading or combination of these methods as required to obtain clean and sound surfaces.
- .4 Remove laitance by grinding or mechanical abrading.
- .5 Remove oils by sandblast cleaning.
- .6 Remove loose particles present or resulting from grinding, abrading or sandblast cleaning by thorough brushing.
- .7 Clean ferrous metals of rust, mill scale and foreign materials by wire brushing, grinding or sanding.
- .8 Wipe non-porous surfaces such as metal and glass to be sealed, except pre-coated metals, with cellulose sponges or clean rags soaked with solvent recommended by manufacturer and

wipe dry with clean cloth. Where joints are to be sealed with silicone based sealants clean joint with methyl-ethyl-ketone (MEK) or xylol. Do not allow solvent to air-dry without wiping. Clean pre-coated metals with solutions or compounds which will not injure finish and which are compatible with joint primer and sealant. Check ferrous metal surfaces are painted before applying sealant.

- .9 Examine joint sizes and where depth of joint exceed required depth of sealant correct to achieve proper following width/depth ratio:
  - .1 Maintain 2:1 width/depth ratio: minimum joint size to be 6 mm (1/4") x 6 mm (1/4"), maximum depth of sealant to be 13 mm (1/2").
- .10 Install joint backing material to achieve correct, uniform joint profile and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
- .11 Do not leave gap between ends of sealant backing; do not stretch, twist, puncture, or tear sealant backings; remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.
- .12 Where joint design or depth of joint prevents use of joint backing material, apply bond breaker tape to prevent 3-sided adhesion.
- .13 Do not stretch, twist, puncture or tear joint backing. Butt joint backing at intersections. Install bond breaker tape at back of joint where joint backing is not required or cannot be installed.
- .14 On horizontal traffic surfaces, support joint filler against vertical movement which might result from traffic loads, including foot traffic.
- .15 Where surfaces adjacent to joints are likely to become coated with sealant during application, mask them prior to priming and sealing.
- .16 Do not exceed shelf life and pot life of materials and installation times, as stated by the manufacturer.
- .17 Be familiar with work life of sealant to be used. Do not mix multiple component materials until required for use.
- .18 Use materials as received from the manufacturer, without additions, deletions and adulterations of materials.
- .19 Mix multiple component sealants and bulks sealants using mechanical mixer capable of mixing without mixing air into material, in accordance with the manufacturer's directions and recommendations. Continue mixing until material is homogeneously blended, uniform in colour and free from streaks of unmixed material. Install compound prior to start of hardening or curing cycle.
- .20 Seal joints in surfaces to be painted before surfaces are painted. Where surfaces to be sealed are prime painted in shop before sealing, check to make sure the prime paint is compatible with primer and sealant. If they are incompatible, inform the Consultant and change primer and sealant to compatible types approved by the Consultant.
- .21 Where irregular surface or sensitive joint border exists, apply masking tape at edge of joint to ensure joint neatness and protection.
- .22 Prime sides of joints for type of surface being sealed prior to application of joint backing, bond breaker or sealant as recommended by sealant manufacturer.

### **3.3 APPLICATION**

- .1 Apply in accordance with the manufacturer's directions and recommendations unless more stringent requirements apply.

- .2 Apply sealant by proven techniques using hand operated guns or pressure equipment fitted with suitable nozzle size and equipment approved by sealant manufacturer.
- .3 Force sealant into joint and against sides of joints to obtain uniform adhesion. Use sufficient pressure to completely fill all voids in joint regardless of variation in joint widths and to proper joint depth as prepared. Ensure full firm contact with interfaces of joint. Superficial pointing with skin bead is not acceptable.
- .4 Finish face of compound to form smooth, uniform beads. At recesses in angular surfaces, finish compound with flat face, flush with face of materials at each side. At recesses in flush surfaces, finish compound with concave face flush with face of materials at each side.
- .5 Compound may be tooled, provided such tooling does not damage seal or tear compound. Avoid pulling of sealant from sides.
- .6 Tool surfaces as soon as possible after sealant application or before any skin formation has occurred, particularly when using silicone sealants.
- .7 Ensure joint surfaces are straight, neatly finished, free from ridges, wrinkles, sags, dirt, stains, air pockets and embedded foreign matter or other defacement and be uniform in colour, free from marbling and/or colour streaking due to improper mixing or use of out of shelf life Products.
- .8 Do not use solvent curing sealants indoors.

### **3.4 SEALANT LOCATIONS**

- .1 Use 1 of the sealants specified for each type in locations indicated in the sealant schedules below. Ensure the sealant chosen for each location is recommended by the manufacturer for use for the conditions encountered.
- .2 Joint designation and application in the following tables and the fact that Drawings do not show all locations to be sealed does not limit the Contractor's responsibility under this Section to seal all locations (except those indicated in other Sections of work) required to create and ensure continuous enclosure.
- .3 Firestopping and Smoke Seal: Sealants part of firestopping systems and smoke seals provided within fire rated assemblies shall be part of the work of Section 07 84 10 and shall be carried out under supervision of those performing the work under this Section.

### **3.5 FIELD QUALITY CONTROL**

- .1 An independent inspection and testing company may be appointed and paid for by the Owner to carry out inspection and testing as directed by the Consultant.
- .2 Inspect joints for complete fill, for absence of voids and for joint configuration complying with requirements specified herein. Record results in a manner acceptable to the Consultant.
- .3 Tests may include sampling of installed Product where adhesion, cohesion or reversion failure is suspected.
- .4 Where work or materials fail to meet requirements specified herein, as indicated by the test results, pay the costs of additional inspection and testing required for new replacement work or materials.
- .5 Manufacturer's Services:
  - .1 Confirm in writing that the manufacturer's representative will be on site throughout the construction period work to inspect the application of sealant and surface preparation.
  - .2 Consult with the manufacturer's technical representative about the following items:

- .1 weather conditions under which work will be done.
- .2 anticipated frequency of joint movement.
- .3 shape factor of the joint.
- .4 durometer hardness, slump and curing characteristics of materials specified.
- .5 joint characteristics as built.
- .6 installation procedures to be adopted.
- .7 mixing procedures to be adopted.
- .8 conditions under which the Work will be done, in order that any alternative recommendations may be made should adverse conditions exist.

**3.6 CLEANING**

- .1 Immediately clean adjacent surfaces which have been soiled and leave work in neat, clean condition. Remove excess materials, compounds smears or other soiling resulting from application of sealants. Use recommended cleaners and solvents. Leave finished work in neat, clean condition with no evidence of spillovers onto adjacent surfaces.

**3.7 PROTECTION**

- .1 Provide approved, non-staining means of protection for completed joint sealant installations where required to protect work from mechanical, thermal, chemical and other damage by construction operations and traffic.
- .2 Maintain protection securely in place until completion of Work. Remove protection when so directed by the Consultant.
- .3 Repair damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

**END OF SECTION**

## PART 1 - GENERAL

### 1.1 PRICING

- .1 All costs associated with the work required by and associated with this Section shall be included as part of the Contract Price and in the price listed in item #1 of the Bid Form.

### 1.2 GENERAL INSTRUCTIONS

- .1 Read and conform to:
  - .1 The General Conditions and Supplementary Conditions of the Contract as amended in the Contract Documents.
  - .2 Division 01 requirements and any additional documents referred to therein.

### 1.3 SUMMARY

- .1 Work Included: Provide unit skylights including but not limited to following:
  - .1 Unit skylights and associated glazing.
  - .2 Auxiliary materials required for a complete installation.
- .2 Related Requirements: Specifications throughout the entirety of Divisions of this Project are directly applicable to this Section, and this Section is directly applicable to them.

### 1.4 REFERENCES

- .1 Reference Standards: Unless otherwise stipulated by a specific publication date in this Section or the Ontario Building Code, the latest published editions of reference standards in force as of the Bid Closing Deadline for the Project, including adopted amendments, are applicable.

### 1.5 ADMINISTRATIVE REQUIREMENTS

- .1 Sequencing: Coordinate installation with other related Sections.
- .2 Pre-Installation Meetings:
  - .1 Prior to starting work of this Section, convene a pre-installation meeting at Project site to review Project requirements and site conditions with pertinent parties. Conform to requirements of Section 01 31 00.
  - .2 Pre-construction Site Meeting:
    - .1 Prior to start of work, arrange for Project site meeting of parties associated with work of this Section, including non-exhaustively Subcontractor performing work of trade involved, testing company's representative and Contractor's consultants of applicable discipline. Consultant may attend.
    - .2 Review Contract Documents to permit compliance with intent of this Section for work included under this trade, and ensure complete understanding of requirements and responsibilities relative to:
      - .1 work included,
      - .2 materials to be used,
      - .3 storage and handling of materials,

- .4 installation of materials,
  - .5 sequence and quality control,
  - .6 Project staffing,
  - .7 restrictions on areas of work and other matters affecting construction.
- .3 In particular ensure Division 3 requirements for concrete are compatible with requirements of this Section. Ensure following meet acceptable criteria to ensure proper performance floor covering work:
  - .1 floor flatness and floor levelness requirements for flooring installation and their acceptability by flooring manufacturer;
  - .2 surface texture of finished floor required for flooring installation;
  - .3 acceptable approaches to remediation of high moisture and high pH floors;
  - .4 adhesive application and floor covering installation. Scheduling:
- .4 Prior to commencing work of this Section arrange for the manufacturer's technical representative to review with Contractor and Consultant, procedures to be adopted and conditions under which work is to be performed. Inspect surfaces to determine adequacy of existing and proposed conditions.
- .5 Cooperate fully with other Subcontractors on The Work and promptly proceed with work of this Section as rapidly as job conditions permit.
- .6 Supply items to be built-in in ample time to be incorporated into work of other Subcontractors, together with measurements and other information required for location thereof.
- .7 Ensure work which may create dust does not proceed during work related to painting and final finishing.

#### 1.6 SUBMITTALS

- .1 Product Data:
  - .1 Submit manufacturer's literature, data sheets for each type of material provided under this Section for Project.
  - .2 Data sheets shall provide all required information. Submit 3 copies of detailed instructions for maintaining, preserving and keeping materials in clean and safe conditions and give adequate warning of maintenance practices or materials detrimental to specified materials. Submit manufacturer's installation instructions.
- .2 Safety Data Sheets (SDS): Submit SDS for inclusion in Operation and Maintenance Manual specified in Section 01 78 00, for adhesives, sealants and any other material designated by Consultant.
- .3 Shop Drawings: Submit Shop Drawings indicating material layouts, details of construction, connections, and relationship with adjacent construction. As a minimum indicate following:
  - .1 Include plans, elevations, sections and details as applicable.
  - .2 Air Barrier Interface Detailing: Indicate details of air barrier, waterproofing and vapour retarder interface materials, accessories, fastening, seals, and relationship to The Work as necessary to coordinate The Work with other building trades.

- .3 Manufacturer's literature must clearly indicate intended plane of primary air and water resistance for skylight system.
- .4 Indicate field-measured dimensions on Shop Drawings.
- .5 Delegated Design Submittals:
  - .1 Engineering design completion of unit skylights work is delegated to Contractor based on structural design criteria indicated in Contract Documents.
  - .2 Submit Shop Drawings for work of this Section that bear the stamp of a Professional Engineer registered in Province of the Work.
  - .3 Submit copy of structural calculations upon request by Consultant.
- .6 Samples: Submit one 300 mm (12 inch) length of each type of skylight frame with portion of acrylic ~~dome~~pyramid.
- .7 Embodied Carbon / Environmental Product Declarations (EPDs): When available, submit product-specific or industry-wide regional (i.e., North American) EPDs conforming to ISO 14025 or other recognized environmental Product declaration framework meeting following criteria:
  - .1 EPD Scope: must cover Cradle-to-Gate (A1 to A3) as a minimum.
  - .2 EPD Impact Categories: must report Global Warming Potential (GWP) in form of unit of kgCO<sub>2</sub>e/declared unit as a minimum.
  - .3 Product Options: Give preference to Products with compliant documentation when choice is at Contractor's option.
- .8 Material Ingredient Disclosure: When available, submit documentation disclosing chemical inventory of materials to at least 0.1% (1000ppm) meeting following criteria:
  - .1 Standard: Health Product Declaration (HPD) Open Standard, Cradle to Cradle v2 (Basic level) or Cradle to Cradle v3 (Bronze level), International Living Future Institute (ILFI) Declare, or other approved material ingredient declaration framework.
  - .2 Product Options: Give preference to Products with compliant documentation when choice is at Contractor's option.
- .9 Low-Emitting Materials: For applicable Products specified or used for activities of this Section (i.e., site-applied coatings, adhesives, and sealants), submit certifications from third-party organizations indicating compliance with following:
  - .1 VOC Emissions: California Department of Public Health (CDPH) Standard Method v1.2–2017, using applicable exposure scenario.
  - .2 VOC Content: SCAQMD Rule 1113 (for paints and coatings) and SCAQMD Rule 1168 (for adhesives and sealants).

## 1.7 QUALITY ASSURANCE

- .1 Qualifications:
  - .1 Manufacturers: Provide Products for Work of this Section by manufacturer with minimum 10 years' experience in the manufacture of such materials.
  - .2 Installers: Provide work of this Section executed by competent installers with minimum 5 years' experience in the application of Products, systems and assemblies specified and with approval and training of the Product manufacturers.

- .2 Licensed Professionals: Employ a professional structural engineer registered in the province of Ontario, carrying minimum of \$2,000,000.00 professional liability insurance to:
  - .1 design the components of the work of this Section requiring structural performance and their attachments to building's structure,
  - .2 be responsible for full assemblies and connections,
  - .3 be responsible for determining sizes, yield strengths, gauge thicknesses and joint spacing to allow thermal movement and loading of components in accordance with applicable codes and regulations,
  - .4 be responsible for production and review of Shop Drawings,
  - .5 inspect the work of this Section during fabrication and erection,
  - .6 stamp and sign each shop drawing,
  - .7 Provide site administration and inspection of this part of the Work.
  - .8 Submit certificate validating seismic assessment and field review of this part of the Work.
- .3 Mock-ups:
  - .1 Provide Mock-ups in locations designated by Consultant and as required to demonstrate quality of workmanship.
  - .2 Maintain Mock-ups during construction in an undisturbed condition as a standard for judging completed work.
- .4 Single Source Responsibility: Ensure primary materials provided in this Section are obtained from 1 source by a single manufacturer and secondary materials are obtained from sources recommended by primary materials manufacturers.

#### **1.8 DELIVERY, STORAGE AND HANDLING**

- .1 Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
- .2 Sequence deliveries to avoid delays and minimize on site storage.
- .3 Store materials protected from exposure to harmful weather conditions and at temperature and humidity conditions recommended by manufacturer.
- .4 Wrap protective heavy paper or apply strippable sprayed plastic to prevent any marring, scratching or damage to plastic and metal during handling and after installation.

#### **1.9 WARRANTY**

- .1 Warrant work of this Section for period of 5 years from Substantial Performance of the Work against defects and/or deficiencies in accordance with General Conditions of the Contract. Promptly correct any defects or deficiencies which become apparent within warranty period, to satisfaction of Consultant and at no expense to Owner. Defects include but are not limited to; buckling, opening of seams, bond failure and extensive colour fading.

### **PART 2 - PRODUCTS**

#### **2.1 MANUFACTURERS**

- .1 Products of following manufacturers may be acceptable subject to conformance to requirements of Drawings, Schedules and Specifications:



- .1 A. I. A. Industries, Inc.
- .2 Arc-O-Lite Skylights;
- .3 Artistic Skylights;
- .4 Kingspan / CPI International;
- .5 Velux International
- .2 Comparable Products from manufacturers listed herein offering functionally and aesthetically equivalent products in Consultant's opinion, and subject to Consultant's review, will be considered provided they meet the requirements of this Specification.

## 2.2 REGULATORY REQUIREMENTS

- .1 Conform to OBC requirements to support snow load and wind load for location of project as minimum comply with loads specified herein.

## 2.3 PERFORMANCE / DESIGN CRITERIA

- .1 Comply with AAMA/WDMA/CSA101/I.S.2/A440 (NAFS) or NFRC 400.
- .2 Provision For Thermal Movement:
  - .1 Unit skylights must be designed to accommodate expansion and contraction of component materials caused by exterior metal surface temperatures ranging from 35 deg C (-31 deg F) to 85 deg C (185 deg F) without buckling, excessive stress on glass, joint seal failure, excessive stress on structural elements, damaging loads on fasteners, performance reduction, or other detrimental effects.
- .3 Structural Design:
  - .1 Wind Loads: Design unit skylights to withstand wind loads based on Limit States Design and 1 in 50-year return period in accordance with requirements of the Applicable Building Code for geographical location of the Project.
  - .2 Snow Loads: Design unit skylights to withstand snow loads based on Limit States Design and in accordance with requirements of the Applicable Building Code for geographical location of the Project, but not less than 2.4 kPa (50 psf).
  - .3 Deflection: Limit deflection to L/180 or 25 mm (1 inch), whichever is less.
  - .4 Air infiltration through skylight: must not exceed ~~0.3-0.5~~ L/s-m<sup>2</sup> (~~0.060.1~~ cfm/ft<sup>2</sup>) of fixed wall area plus permissible allowance specified for operable windows and doors within test area when tested in accordance with ASTM E283 at static air pressure difference of 300 Pa (~6.26 psf)
  - .5 Water Penetration: There must be no uncontrolled water penetration when skylight system is tested per ASTM E331 at 20% of maximum inward and outward acting design wind pressure, but not less than 300 Pa (6.26 psf) or greater than 720 Pa (15.03 psf) or equivalent to ASTM E547.
  - .6 Provisions must be made for water entering system from the exterior to be drained back to exterior.
  - .7 Maximum Water penetration: No uncontrolled water penetrating assemblies or water appearing on assemblies' normally exposed interior surfaces from sources other than condensation. Water leakage does not include water controlled by flashing and gutters or water that is drained to exterior.

- .8 Solar Heat Gain Coefficient (SHG): Not more than 0.5
- .9 VLT: 48%
- .10 U-Value (imperial): Not more than 0.7

#### 2.4 PYRAMIDAL RECTANGULAR CURB MOUNT SKYLIGHTS

- .1 Frame Composition: Corrosion-resistant extruded aluminum base frame, 6063-T5 alloy, with 76 mm (3 inches) aluminum mounting flange, heliarc welded corners, and 51 mm (2 inches) thermal insulation with rigid vinyl thermal break. Provide 8-degree sloped condensation gutter and co-extruded rubber draft seal.
- .2 Material: 6063-T5 aluminum alloy, heliarc welded corners.
- .3 Glazing: Sealed double acrylic ~~domepyramids~~.
- .4 Curb: Minimum ~~100 mm (4 inch) 38 mm (1-1/2 in) high, mill finish aluminum, two-piece construction; as indicated on Drawings.~~
- .5 Outer and inner wall: 1.27 mm (0.050 in).
- .6 Insulation: 50 mm (2 in) thick fiberglass
- .7 Mounting Flange: 75 mm (3 in) aluminum mounting flange.
- .8 Size: Refer to Drawings.
- .9 Basis-of-Design: "~~Model P-PVCCM Aluminum Base Frame -- Model FF~~" by Artistic Skylight Domes.

#### 2.5 MATERIALS

- .1 Aluminum: Aluminum Sections: ASTM B209M, size accurately formed as shown on Drawings, extruded aluminum alloy AA-6063-T5 for all aluminum except surfaces receiving anodizing which shall be AA-6061-T6. Surfaces shall be free from defects impairing appearance, strength and durability.
- .2 Frame: Extruded aluminum, perimeter curb frame with thermal break, continuous extruded aluminum intermediate support frame with integral sloped condensation gutter, extruded aluminum retainer straps, extruded aluminum ~~domepyramid~~ retaining frame screw attached to curb frame and integrally fitted with ~~domepyramid~~ compression gasket. Provide holes for positive non-plugging drainage of condensation gutter. Include curb frame splice and expansion joint cover.
- .3 Gaskets: extruded resilient vinyl or neoprene.
- .4 Integral Glazing Gaskets: Continuous EPDM, Santoprene silicone, butyl rubber or neoprene designed specifically for use in aluminum frame section and held under constant pressure. Seal end-to-end joints by fusion.
- .5 Seals: closed cell neoprene sponge, compressible, with full recovery after 50% compression.
- .6 Screws: Stainless Steel.
- .7 Isolation coating: Alkali resistant bituminous paint or epoxy coating.

#### 2.6 AUXILIARY MATERIALS

- .1 Bituminous Coating: SSPC-Paint 12, solvent-type, bituminous mastic, nominally free of sulfur and containing no asbestos fibers, formulated for 15-mil dry film thickness per coating.

- .2 Elastomeric Sealant: ASTM C 920; Type S; Grade NS; Class 25; and Uses NT, G, A, and (as applicable to joint substrates indicated) O; recommended by unit skylight manufacturer and compatible with joint surfaces.
- .3 Elastomeric Sealant: ASTM C920; Type S; Grade NS; Class 25; and Uses NT, G, A, and (as applicable to joint substrates indicated) O; recommended by unit skylight manufacturer and compatible with joint surfaces.
- .4 Fasteners: stainless steel or cadmium-plated steel. Ensure exposed fasteners match the adjacent aluminum colour.
- .5 Gaskets: Continuous co-extruded vinyl, neoprene, EPDM, or Santoprene rubber under constant pressure.
- .6 Weep Holes: Provide condensation management system with weep holes to ensure proper drainage.

## 2.7 FABRICATION

- .1 Fit and assemble Work in shop. Execute Work in accordance with details and reviewed Shop Drawings.
- .2 Fabricate extruded aluminum square frame from alloy AA-6063-T5 free from defects impairing appearance, strength.
- .3 Fabricate Work square, true, straight, plumb and level, accurately to size detailed and free from distortion, waves, twists, buckles or other defects detrimental to appearance or performance.
- .4 Provide method of securing edge of flexible flaps for air seal continuity to building air/vapour barrier.
- .5 Equip curb with an integral metal cap flashing of same thickness and material as curb, fully welded at corners for absolute weather tightness. Ensure insulation on exterior of curb is rigid polyurethane or glass fibre board minimum 50 mm (2") in thickness.

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- .1 Site Verification of Conditions: Verify actual site dimensions and location of adjacent materials prior to commencing work. Notify Consultant in writing of any conditions which would be detrimental to the installation. Commencement of work implies acceptance of previously completed work.

### 3.2 INSTALLATION

- .1 Installation, generally: Install work of this Section in strict accordance with manufacturer's written installation instructions and reviewed Shop Drawings. Supplement manufacturer's installation instructions with additional installation requirements specified in this Section to produce specified work results.
- .2 Install unit skylights in accordance with the construction details provided in the CRCA's "Canadian Roofing Reference Manual", CSA A440 and AAMA 1607.
- .3 Where metal surfaces of units will contact incompatible metal or corrosive substrates, including wood, apply bituminous coating on concealed metal surfaces, or provide other permanent separation recommended in writing by unit skylight manufacturer.
- .4 Anchor unit skylights securely to supporting substrates.

- .5 Set unit skylight flanges in thick bed of roofing cement to form a seal, unless otherwise indicated.
- .6 Where cap flashing is indicated, install to produce waterproof overlap with roofing or roof flashing. Seal with thick bead of mastic sealant except where overlap is indicated to be left open for ventilation.

### 3.3 FIELD QUALITY CONTROL

- .1 Water Leakage Testing: After installation is complete and sealants and glazing compounds have cured nominally, but before interior finishes are installed, test each skylight unit for water leaks in accordance with AAMA 501.2.
- .2 Work will be considered defective if it does not pass tests and inspections.
- .3 Additional testing and inspections, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
- .4 Prepare test and inspection reports.

### 3.4 CLEANING

- .1 Remove protective materials from ~~dome~~pyramid. Wash with mild soap and water solution. Rinse clean.

**END OF SECTION**