

RFT 20-120 Mechanical Upgrades and Washroom Renovation – Pauline Johnson PS

The following, issued by the Halton District School Board May 5, 2020, shall be incorporated in the specifications and shall form part of the proposal document for the above.

The following has been attached to provide additional information in response to questions asked.

ATTACHED:

- Addendum – as issued by Grguric Architects Incorporated (6 pages)
- Split HVAC Systems – as issued by the Halton District school Board (7 pages)

RECEIPT OF ADDENDA MUST BE ACKNOWLEDGED ON THE FORM OF TENDER.

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END OF ADDENDUM 1**

PART 1 - GENERAL

1.1. SCOPE OF WORK

- 1.1.1. Provide split type air to air heat pumps as detailed on drawings and as specified herein.

1.2. DESIGN REQUIREMENTS

- 1.2.1. Air-source type heat pump system allowing cooling and heating with a minimum system efficiency of 13 SEER.
- 1.2.2. System components
- 1.2.2.1. Outdoor condensing unit(s).
- 1.2.2.2. Indoor evaporator unit(s).
- 1.2.2.3. Controller to be suitable for integration into a central DDC type BAS system.
- 1.2.2.4. Interconnecting refrigerant piping.
- 1.2.2.5. Condensate drainage to drain by built-in condensate drain pump.
- 1.2.3. Design requirements are based on Part 2 specified requirements of products.

1.3. RELATED WORKS

- 1.3.1. Section 15010 - Mechanical Work General Instructions.
- 1.3.2. Section 15050 - Basic Mechanical Materials and Methods.

1.4. REFERENCE DOCUMENTS

- 1.4.1. Standards and codes to be latest editions adopted by and enforced by local governing authorities.
- 1.4.2. The units shall be listed by Electrical Testing Laboratories (ETL) and bear the ETL label.
- 1.4.3. The units shall conform to ANSI/UL STD. 1995 and certified to CAN/CSA C22.2 No. 236- 05.
- 1.4.4. The units shall be rated in accordance with ARI Standard 210/240 and bear the ARI label.
- 1.4.5. ANSI B16.22 Wrought Copper and Copper Alloy Solder Joint Pressure Fittings.
- 1.4.6. ASME B16.29-2017 Wrought Copper and Wrought Copper Alloy Solder Joint Drainage Fittings – DWV.
- 1.4.7. ARI 760 Performance Rating of Solenoid Valves for Use with Volatile Refrigerants.
- 1.4.8. ASHRAE Standard 15 Safety Standard for Refrigeration Systems.
- 1.4.9. ASHRAE Standard 17 Method of Testing Capacity of Thermostatic Refrigerant Expansion Valves.
- 1.4.10. ASHRAE Standard 90.1 Energy Standard for Buildings Except Low-Rise Residential Buildings.
- 1.4.11. ANSI B16.18 Cast Copper Alloy Solder Joint Pressure Fittings.
- 1.4.12. ANSI B16.22 Wrought Copper and Copper Alloy Solder Joint Pressure Fittings.

- 1.4.13. ASTM B32 Standard Specification for Solder Metal.
- 1.4.14. ASTM B88 Standard Specification for Seamless Copper Water Tube.
- 1.4.15. ASTM B280 Standard Specification for Seamless Copper Tube for Air Conditioning and Refrigeration Field Service.
- 1.4.16. ASTM B306 Standard Specification for Copper Drainage Tube (DWV).
- 1.5. **TRAINING**
 - 1.5.1. Training is to be a full review of all components including but not limited to a full operation and maintenance demonstration, with abnormal events.
 - 1.5.2. Include for 3 training sessions of maximum 7 hours duration per session for 10 persons per session.
 - 1.5.3. Refer to Section 15010 for additional general requirements.
- 1.6. **WARRANTY**
 - 1.6.1. The units shall have a manufacturer's parts and defects warranty for a period five (5) year from date of installation. The compressor shall have a warranty of seven (7) years from date of installation. If, during this period, any part should fail to function properly due to defects in workmanship or material, it shall be replaced or repaired at the discretion of the manufacturer. This warranty does not include labor.
 - 1.6.2. Manufacturer shall have over thirty (30) years of continuous experience in the Canadian market.
- 1.7. **DELIVERY, STORAGE AND HANDLING**
 - 1.7.1. Handle and store products in accordance with manufacturer's instructions, in locations approved by the owner. Include one copy of these instructions with product at time of shipment.
- 1.8. **SUBMITTALS**
 - 1.8.1. Refer to submittal requirements in Section 15010.
 - 1.8.2. Product Data
 - 1.8.2.1. Submit manufacturer's Product data indicating:
 - 1. technical data, supplemented by bulletins, component illustrations, detailed views, technical descriptions of items, and parts lists;
 - 2. performance criteria, compliance with appropriate reference documents; characteristics, limitations, and troubleshooting protocol;
 - 3. product transportation, storage, handling, and installation requirements;
 - 4. product identification in accordance with owner's requirements.
 - 1.8.3. Shop Drawings
 - 1.8.3.1. Submit shop drawings/product data sheets for products. Include following:
 - 1. capacity and ratings;

2. dimensions;
3. mounting details to suit locations shown, indicating methods and hardware to be used;
4. control components and control wiring schematic.

1.9. **QUALITY ASSURANCE**

1.9.1. Manufacturers Qualifications

- 1.9.1.1. Manufacturer shall be ISO 9000, 9001 or 9002 certified. Manufacturer of product shall have produced similar product for a minimum period of five years. When requested by Consultant, an acceptable list of installations with similar product shall be provided demonstrating compliance with this requirement.
- 1.9.1.2. Manufacturers are to be current members of Air-Conditioning, Heating and Refrigeration Institute (AHRI), and products are to be in accordance with requirements of standards listed previously.
- 1.9.1.3. Where manufacturers provide after installation on-Site inspection of product installations, include for manufacturer's authorized representative to perform on-Site inspection and certificate of approvals.

1.9.2. Installers Qualifications

- 1.9.2.1. Installers for work to be performed by or work under licensed Mechanical Contractor.
- 1.9.2.2. Installers of equipment, systems and associated work are to be fully qualified and experienced installers of respective products and work in which they are installing.
- 1.9.2.3. Where manufacturers provide training sessions to installers and certificates upon successful completion, installers to have obtained such certificates and submit copies with shop drawings.

1.9.3. Regulatory Requirements

- 1.9.3.1. Products and work to comply with applicable local governing authority regulations, bylaws and directives.
- 1.9.3.2. Include for required inspections and certificate of approvals of installation work from local governing authorities.

PART 2 - PRODUCTS

2.1. **OUTDOOR CONDENSING UNIT**

2.1.1. Cabinet

- 2.1.1.1. The casing shall be constructed from galvanized steel plate and finished with ivory colour (Munsell 3Y 7.8/1.1) acrylic paint.
- 2.1.1.2. The fan grille shall be ABS plastic.
- 2.1.1.3. Mounting feet shall be provided and shall be welded to the base of the cabinet and be of sufficient size to afford reliable equipment mount and stability.
- 2.1.1.4. Easy access shall be afforded to all serviceable parts by means of removable panel sections.
- 2.1.1.5. Cabinet mounting and construction shall be sufficient to withstand 250 KmH(155 MPH) wind speed conditions for use in Hurricane condition areas. Mounting, base support, and other installation to meet

Hurricane Code Conditions shall be by others.

2.1.1.6. Built-in base pan heater to prevent ice in drain pan.

2.1.2. Compressor

2.1.2.1. The compressor shall be DC twin-rotor rotary type with variable compressor speed inverter technology.

2.1.2.2. The compressor shall be driven by inverter circuit to control compressor speed. The compressor speed shall dynamically vary to match the room load for significantly increasing the efficiency of the system which shall result in significant energy savings.

2.1.2.3. To prevent liquid from accumulating in the compressor during the off cycle, a minimal amount of current shall be automatically, intermittently applied to the compressor motor windings to maintain sufficient heat to vaporize any refrigerant at low outdoor ambient temperature. No crankcase heater is to be used.

2.1.2.4. The outdoor unit shall have an accumulator and high pressure safety switch. The compressor shall be mounted to avoid the transmission of vibration.

2.1.3. Fan

2.1.3.1. The unit shall be furnished with 2 DC fan motors.

2.1.3.2. The fan blade(s) shall be of aerodynamic design for quiet operation, and the fan motor bearings shall be permanently lubricated.

2.1.3.3. The outdoor unit shall have horizontal discharge airflow. The fan shall be mounted in front of the coil, pulling air across it from the rear and dispelling it through the front. The fan shall be provided with a raised guard to prevent external contact with moving parts.

2.1.4. Coil

2.1.4.1. The L shaped condenser coil shall be of copper tubing with flat aluminum fins to reduce debris build up and allow maximum airflow. The coil shall be protected with an integral metal guard.

2.1.4.2. Refrigerant flow from the condenser shall be controlled by means of an electronic linear expansion valve (LEV) metering device. The LEV shall be control by a microprocessor controlled step motor.

2.1.4.3. All refrigerant lines between outdoor and indoor units shall be of annealed, refrigeration grade copper tubing, ACR Type, meeting ASTM B280 requirements, individually insulated in twin-tube, flexible, closed-cell, CFC-free (ozone depletion potential of zero), elastomeric material for the insulation of refrigerant pipes and tubes with thermal conductivity equal to or better than 0.27 BTU-inch/hour per Sq Ft / °F, a water vapor transmission equal to or better than 0.08 Perm-inch and superior fire ratings such that insulation will not contribute significantly to fire and up to 1" thick insulation shall have a - Flame-Spread Index of less than 25 and a Smoke-development Index of less than 50 as tested by ASTM E 84 and CAN / ULC S-102.

2.2. **INDOOR EVAPORATOR UNIT(S)**

2.2.1. The indoor unit shall be factory assembled, wired and tested.

2.2.2. Contained within the unit shall be all factory wiring, internal piping, internal diagnostic control circuit board and fan motor for maintenance.

- 2.2.3. Indoor unit shall have capabilities to be installed at a maximum height of 30 m (100 ft.) above or below the outdoor unit.
- 2.2.4. Total capacity of connected indoor units can be 50 - 150% of system capacity.
- 2.2.5. Return air shall be filtered by means of an easily removed washable filter with a MERV rating of 1-4.
- 2.2.6. The evaporator coil shall be of nonferrous construction with smooth plate fins on copper tubing. The tubing shall have inner grooves for high efficiency heat exchange. All tube joints shall be brazed with phos-copper or silver alloy. Further, the coil shall be pressure tested at the factory.
- 2.2.7. The indoor fan shall be statically and dynamically balanced to run on a single motor with permanently lubricated bearings
- 2.2.8. A manual adjustable guide vane shall be provided with the ability to change the airflow from side to side (left to right).
- 2.2.9. A motorized air sweep louver shall provide an automatic change in airflow by directing the air up and down to provide uniform air distribution.
- 2.2.10. A condensate pan and drain shall be provided under the coil.
- 2.2.11. All units equipped with condensate drain pump capable of up to 33' maximum discharge. Model: Sauermann Si-10
- 2.2.12. The electrical power of the unit shall be 208 volts or 230 volts, 1 phase, 60 hertz. The system shall be capable of satisfactory operation within voltage limits of 198 volts to 253 volts. The power to the indoor unit shall be supplied from the outdoor unit, using the Mitsubishi Electric A-Control system. For A-Control, a three (3) conductor AWG-14/3 wire with ground shall provide power feed and bi-directional control transmission between the outdoor and indoor units.
- 2.2.13. Exposed Evaporators
 - 2.2.13.1. Wall Hung (3 ton cooling and 37.5 MBH Heating capacity) in Classroom JK-1 and JK-2, one each.
- 2.2.14. CONTROLLER
 - 2.2.14.1. Provide Mitsubishi accessory part# PACUS444CN-1 with each system.
 - 2.2.14.2. The above accessory shall allow monitoring and control of the indoor evaporator units and integration of the split system with the building automation system.
- 2.3. **REFRIGERANT PIPING, VALVES AND ACCESSORIES**
 - 2.3.1. Refrigerant Piping
 - 2.3.1.1. Copper refrigerant tube, ASTM B280, cleaned, dehydrated and sealed, marked ACR on hard temper straight lengths. Coils shall be tagged ASTM B280 by the manufacturer.
 - 2.3.2. Soldering
 - 2.3.2.1. Solder joints: Wrought copper fittings, ANSI B16.22.
 - 2.3.2.2. Solder, refrigerant tubing: Cadmium free, AWS A5.8, 45 percent silver brazing alloy, Class Bag-5.
 - 2.3.2.3. Solder, water and drain: 95-5 tin-antimony, ASTM B32 (95TA).

- 2.3.3. Refrigeration Valves
 - 2.3.3.1. Stop Valves: Brass or bronze alloy, packless, or packed type with gas tight cap, frost proof, backseating.
 - 2.3.3.2. Pressure Relief Valves: Forged brass with nonferrous, corrosion resistant internal working parts of high strength, cast iron bodies conforming to ASTM A126, Grade B. Set valves in accordance with ASHRAE Standard 15.
 - 2.3.3.3. Solenoid Valves: ARI 760, UL-listed, two-position, direct acting or pilot- operated, moisture and vapor-proof type of corrosion resisting materials, designed for intended service, and solder-end connections. Fitted with suitable NEMA 250 enclosure of type required by location.
 - 2.3.3.4. Thermostatic Expansion Valves: Brass body with stainless-steel or non- corrosive non- ferrous internal parts, diaphragm and spring-loaded (direct- operated) type with sensing bulb and distributor having side connection for hot-gas bypass and external equalizer. Size and operating characteristics as recommended by manufacturer of evaporator and factory set for superheat requirements. Solder-end connections. Testing and rating in accordance with ASHRAE Standard 17.
 - 2.3.3.5. Check Valves: Brass or bronze alloy with swing or lift type, with tight closing resilient seals for silent operation; designed for low pressure drop, and with solder-end connections. Direction of flow shall be legibly and permanently indicated on the valve body.
- 2.3.4. Refrigeration Accessories
 - 2.3.4.1. Strainers: Designed to permit removing screen without removing strainer from piping system, and provided with screens 80 to 100 mesh in liquid lines up to 30 mm (1-1/8 inch), 60 mesh in liquid lines over 30 mm (1-1/8 inch), and 40 mesh in suction lines. Provide strainers in liquid line serving each thermostatic expansion valve, and in suction line serving each refrigerant compressor not equipped with integral strainer.
 - 2.3.4.2. Refrigerant Moisture/Liquid Indicators: Double-ported type having heavy sight glasses sealed into forged bronze body and incorporating means of indicating refrigerant charge and moisture indication. Provide screwed brass seal caps.
 - 2.3.4.3. Refrigerant Filter-Dryers: ULC listed, angle or in-line type, as shown on drawings. Conform to ASHRAE Standard 63. Heavy gage steel shell protected with corrosion-resistant paint; perforated baffle plates to prevent desiccant bypass. Size as recommended by manufacturer for service and capacity of system with connection not less than the line size in which installed. Filter driers with replaceable filters shall be furnished with one spare element of each type and size.
 - 2.3.4.4. Flexible Metal Hose: Seamless bronze corrugated hose, covered with bronze wire braid, with standard copper tube ends.
 - 2.3.4.5. Oil Separators: Provide for condensing units, where determined as necessary by the equipment manufacturer. All welded steel construction with capacity to eliminate a minimum of 95 percent of the oil from the hot gas flowing through it. Provide manufacturer's published ratings for minimum and maximum refrigeration tonnage corresponding to this oil separating efficiency. Conform to ASHRAE Standard 69. Separator shall be equipped with a float valve to prevent return of the hot gas to crankcase, and shall have isolating stop valves so it can be opened and services without pumping out any other part of the system. ASME construction or ULC listed.
- 2.3.5. Refer also to requirements of Section 15187– "Refrigerant Piping, Valves and Accessories".

2.4. **CONDENSATE DRAINAGE LOOP**

2.4.1. Connect all evaporators to the condensate drainage loop. Direct drainage to open- gap funnel floor drain, in accordance with code requirements.

2.4.2. Insulate all horizontal sections of the condensate drainage loop.

2.4.3. Gravity Drainage Sections

2.4.3.1. Copper piping, Type DWV to:

1. ASTM B306-81 for copper tube;
2. CSA B158.1-1976 for cast brass fittings;
3. ANSI B16.29-1973 for wrought copper fittings;
4. Solder: tin-lead, 50:50, to ASTM B32-76, type 50A;
5. ASTM B88-83.

2.4.4. Pumped Drainage Sections

2.4.4.1. Pipe: Copper tube, ASTM B88, Type K or L, drawn.

2.4.5. Fittings for Copper Tube

2.4.5.1. Wrought copper or bronze castings conforming to ANSI B16.18 and B16.22. Unions shall be bronze, MSS SP-72, SP-110. Solder or braze joints.

2.4.5.2. Adapters: Provide adapters for joining screwed pipe to copper tubing.

2.4.5.3. Solder: ASTM B32 Composition Sb5. Provide non-corrosive flux.

PART 3 - EXECUTION

3.1. **INSTALLATION**

3.1.1. Provide split system equipment consisting of an exterior condensing unit and an indoor evaporator.

3.1.2. Secure condensing unit in place, level and plumb, on vibration isolation pads on a concrete housekeeping pad (on grade) or on pressure treated wooden sleepers (roof top).

3.1.3. Where applicable, anchor equipment in accordance applicable local governing codes requirements for seismic control and restraints. Provide flexible connections in all piping connections to equipment.

3.1.4. Install loose control components and perform required control wiring (except building automation system connections) between condensing unit and evaporator in conduit in accordance with manufacturer's control wiring schematic and wiring standards of electrical work.

3.1.5. Refer to Section 15050- "Basic Mechanical Materials and Methods" for equipment/system manufacturer certification requirements.

3.1.6. Refer to Section 15050- "Basic Mechanical Materials and Methods" for equipment/system start-up requirements.

END OF SECTION

ARCHITECTURAL

Question 1 Can you provide a spec for aluminum sliding window and glass.

Response 1 See attached Specification Section 08520 Aluminum Windows (5 pages).

End of Addendum

PART 1 - GENERAL

1.1 Related Work

1. Sealants: : Section 07900

1.2 Design Requirements

1. This specification section is based on following aluminum glazing type:
 - .1 Aluminum Framed Horizontal Sliding Unit, heavy duty thermally broken, mechanically double operating with concealed tamperproof fasteners.
 - .1 Basis of Design: Alumicor DuraSlide 600 Series,
2. Design all framing and glazing to withstand design loads as per the Ontario Building Code and regulations of authorities having jurisdiction.
3. Design and locate all sealants, gaskets, air/vapour seals, thermal barriers and separations, drainage slots and holes, as shown or specified or as required to obtain design requirements. Ensure all components and assemblies exterior to air barrier drain to building exterior.
4. Provide aluminum closer angles and trims to suit.
5. Curtain Wall:
 - .1 Design curtain wall framing to provide free and noiseless movement of all components due to structural erection or dead loads, without buckling of any component and/or transmitting of stress to any other member.
 - .2 Design curtain wall glazing system and framing to prevent thermal shock and pressure fracture damage to glass.
 - .3 Design pressure plates and glass retainers to place uniform pressure on glass, to prevent any distortion of glass.
 - .4 Heavy duty institutional application aluminum door package, thermally broken with insulated sealed units at exterior locations. E.g. Kawneer 350 Medium, or Alumicor Canadiana 400b or equal by other approved aluminum window manufacturers.
 - .5 Doors to be thermally broken and to have insulated sealed units at exterior location only.
6. Interior Aluminum Screens are non-thermally broken, 45 mm x minimum 100 mm aluminum frame, 6.4 mm single glazed; eg. Alumicor 800 Series with Canadiana Entrance Doors or Kawneer Trifab 400 with standard entrances.

1.3 Shop Drawings

1. Submit shop drawings in accordance with Section 01340 and to be prepared and stamped by a Professional Engineer licensed to design structures in the Province of Ontario.
2. Clearly indicate materials and large scale details for head, jamb and sill, profiles of components, elevations of unit, fully dimensioned layouts positioning brackets and

anchorage details, glazing details, and location of isolation coating, description of related components and exposed finishes and fasteners.

1.4 Certificates

1. Submit manufacturer's certificate, certifying compliance with specification requirements, for:
 - .1 windows.
 - .2 finishes.
 - .3 insect screens.
 - .4 infiltration/exfiltration rates.
 - .5 thermal transfer resistance of frames.
 - .6 locking hardware.

1.5 Performance

1. In addition to all requirements of these specifications, the design of glazing shall take into consideration the characteristics of the mullions and effects of the connection and sealants at the frame junctions. Provide thermal breaks between exterior and interior components and sufficient metal on interior side of glass.
2. Fenestration shall meet CAN/CSA – A440 windows:
 - .1 Air Leakage: A3
 - .2 Water Leakage: B7
 - .3 Wind Load Resistance: C5
 - .4 Condensation Resistance: fixed frame: 53 minimum
glass: 53 minimum
 - .5 Window shall also meet the requirements for blocked operation, ease of operation, sash strength, stiffness and resistance to forced entry.
3. Submit manufacturer's certificate, certifying compliance with the above-noted requirements.

1.6 Quality Assurance

1. All design, fabrication and installation of this work to be carried out by qualified workers and trades experienced in the application and erection of the products, systems and assemblies specified.
2. Make provisions to drain to the exterior face any water entering in at joints and any condensation occurring within curtain wall construction while maintaining air seal between interior and exterior. Drain holes shall adequately drain all water.
3. At design conditions, no water penetration to interior side of assembly shall occur.
5. Formed aluminum components shall be sheet of alloy and temper suitable for their purpose and finish.

1.7 Warranty

1. Provide written warranty stating that aluminum windows are guaranteed against leakage, defects and malfunction under normal usage for a period of ten (10) years from the date of completion.

1.8 Maintenance Material

1. Provide data for maintenance and cleaning in accordance with general conditions.

PART 2 – PRODUCTS

2.1 Manufacturers

1. Equivalent Manufacturers for the work of this sections:
 - .1 Kawneer Company Canada
 - .2 Alumicor Limited
 - .3 Oldcastle Glass
 - .4 Sherwood Windows Ltd.
2. Refer to requirements for equivalent products in section 01030.

2.2 Materials

1. Extrusions shall be 6063 T54 alloy and temper.
2. Formed aluminum components shall be sheet of alloy and temper suitable for their purpose and finish.
3. Fasteners shall be 300 series stainless steel or 400 series stainless steel cadmium plated and of sufficient size and quantity to perform their intended function.
4. Weathering and glazing gaskets shall be extruded, black, closed cell or dense elastomer of durometer appropriate to the function.
5. Glazing tapes shall be macro-polyisobutylene, highly adhesive and elastic with built in shim.
6. Exterior Sills: extruded aluminum, minimum 3 mm thick, complete with joint covers, jamb drip deflectors, chairs, anchors, anchoring devices. All lower level sills to have exterior corners rounded to 6mm radius.
7. Sealants: in accordance with Section 07900, paragraph 2.1.3. Color to match window frame.
8. Foam Sealants: Urethane expanding foam sealant.
9. Bedding Compound: to CGSB 19-GP-14M.
10. Isolation Coating: alkali resistant bituminous paint.

2.3 Finish

1. Exposed aluminum sections shall be given an anodic oxide treatment in accordance with Aluminum Association specification AA-M12C22A31. Kawneer #17 Clear.

2.4 Fabrication

1. Fabricate framing from extrusions of size and shape shown on shop drawings. Interior and exterior extruded aluminum framing sections shall be integrated with a glass reinforced nylon thermal break to form a rigid composite assembly without the use of fasteners or other thermal bridging elements.
2. Composite frame assembly shall have a minimum of 1100 lbf/4 in. (4815N/ 100 mm) resistance to shear between the aluminum and the thermal break materials.
3. Dry shrinkage of the thermal break shall not exceed 0.10% of the framing member length.
4. Fixed framing shall be designed for screw spline corner construction. 518 ISOPORT frameless vent operating sash extrusions shall be tubular with mitred, clip, adhesive, stake joint construction.
5. All framing joints shall be accurately machined, assembled, and sealed to provide neat weathertight connections. Coupling mullions shall be designed to provide a functional split to permit modular construction and allow for thermal expansion. Glass stops shall be lock-in screwless type.
6. All glazing pockets shall be vented, pressure equalized and drained to the exterior.
7. Elastomeric air seal gasket shall be installed around the full perimeter of glass and sealed at corners with silicone sealant. Air seal gasket must provide adhesion with silicone sealant.

2.5 Isolation Coating

1. Isolate aluminum from following components, by means of isolation coating:
 - .1 Dissimilar metals except stainless steel, zinc, or white bronze or small area.
 - .2 Concrete, mortar and masonry.
 - .3 Wood.

2.6 Glazing

1. Prepare windows to receive 6 mm thick glazed insulating glass
2. Exterior Tempered Safety Glass: exterior lite 6 mm tempered grey float glass, inner lite 6 mm clear tempered float glass conforming to CAN/CGSB-12.3. All units to receive Low Emissivity coating on inner pane (3rd surface).
3. Low E Glass: to CAN/CGSB-12.4; tempered clear, sputtered coating; eg. AGC Glass Comfort TI-PB; PPG Sungate 100

PART 3 - EXECUTION

3.1 Preparation

1. Protect adjacent surfaces from damage resulting from work under this specification.

3.2 Installation

1. Install the windows in accordance with the manufacturer's instructions. Install the windows plumb, level and true relative to building structure. Do not exceed 3mm in 3050 mm (1/8" in 10'0") variation from plumb and level. Foam insulate between the frame members and the window opening using a single component polyurethane foam, insulating sealant.

3.3 Sill Installation

1. Install metal sills with uniform wash to exterior, level in length, straight in alignment with plumb upstands and faces.

3.4 Caulking

1. Seal joints between frame members and other non-operating components with sealant to provide weathertight seal at outside.
2. Seal joints between windows and windowsills with sealant. Bed sill expansion joint cover plates and drip reflectors in bedding compound. Caulk between sill upstand and window-frame. Caulk butt joints in continuous sills.

3.5 Clean Up

1. Clean glass at the factory. Final cleaning of glass to remove job site soiling shall be the responsibility of the owner. Leave all surfaces reasonably clean, free from sealants, caulking or other foreign material. Remove all surplus materials and debris resulting from the work of this Trade.

3.6 Protection and Cleaning

1. Aluminum shall be isolated from concrete, mortar, plaster or dissimilar metals with bituminous paint or epoxy solution. Framing shall be protected from other building materials during and after installation until acceptance.

End of Section