1.0 **GENERAL**

1.1 **Related UBC Guidelines**

.1 Section 07 00 10 Building Envelope – General Requirements
.2 Section 08 00 10 Openings – General Requirements

1.2 **Co-ordination Requirements**

.1 Coordinate design with Building Envelope Consultant.
.2 Coordinate design with Division 26 Electrical Consultant.
.3 Coordinate design with Divisions 27 and 28 IT Services, including for Secure Access requirements.

1.3 **Description**

.1 Exterior aluminum curtain wall type framing system; doors and windows within system.
.2 Use Kawneer 1600 UT as base of design for curtainwall that is fully exposed to the elements.

1.4 **Performance Standards**

.1 BC Building Code, including Accessibility requirements.
.2 CAN/CSA-A440.2 "Energy Evaluation of Windows and Doors."
.3 CAN/CSA-A440.4 "Window and Door Installation."
.4 ASTM E283, "Test Method for Rate of Air Leakage through Exterior Windows, Curtain Walls and Doors."
.5 ASTM E330, "Structural Performance of Exterior Windows, Curtain walls and Doors by Uniform Static Air Pressure Difference."
.6 ASTM E331, "Test Method for Water Penetration of Exterior Windows, Curtain Walls and Doors by Uniform Static Air Pressure Differential."

1.5 **System Selection**

.1 It is requested that self-draining curtain wall systems be selected for installation on exposed walls with no overhangs. Particular attention should be given to the storm-facing east and south-facing walls.

1.6 **Performance Requirements**

.1 **Vertical Glazing**

.1 In addition to any other applicable Codes, Standards and Project Requirements, exterior systems to meet or exceed the following minimum requirements:

.2 **Environmental Separation**

.1 Water Tightness rating for windows to be selected based upon exposure to elements related to location on the façade and site conditions. Use the NAFS Canadian supplement

.2 Air Infiltration to be determined in accordance with the requirements in ASHRAE 90.1 2010 paragraph 5.4.3.2

.3 Operable Windows as part of curtain-wall system to conform to NAFS, including the following ratings:
.1 Water Tightness: see 1.6.1.1.1 above.
.2 Air Infiltration: see 1.6.1.1.2 above.
.3 Wind Load Resistance shall meet ASTM E330
.4 Resistance to Forced Entry shall be F20 (windows reachable from grade).
.5 Hardware to include multi-point locking with centre locking handle

.3 Systems to utilize exterior rain screen deterrents, interior air seal barriers, and cavities pressure equalized to the exterior to minimize water infiltration into the internal areas of the system, assembled and installed to provide control and drainage to the exterior of any water which enters the pressure equalized cavities.

.4 Exterior systems to incorporate a thermal break.

.5 Engineering Design

.1 Wind Loads: Assemblies shall be reinforced where required, capable of withstanding local positive and negative wind pressures.
   .1 Minimum 25 psf (1.2 kPa) inward and 25 psf (1.2 kPa) outward acting normal to the plane of the wall.
   .2 Based on CAN3-S157 and allowable deflection of 1/175.

.2 System to provide for expansion and contraction within system components caused by a cycling temperature range of 100 degrees C over a 12 hour period without causing detrimental effect to system components.

.3 The system capable of withstanding a metal surface temperature range of 180° F (100° C) without buckling, failure of joint seals, undue stress on structural elements, damaging loads on fasteners, reduction of performance, stress on glass, or other detrimental effects.

.4 Assemblies to support design loads and accommodate structural deflection and long term creep movements and drift as shown on the Structural Drawings without stress on glass, buckling, failure of joint seals, undue stress on structural elements, damaging loads on fasteners, reduction of performance, or other detrimental effects caused by structural movement.

.5 The connection of the curtain wall to the structure of the building to be detailed in such a way that only horizontal and vertical forces are transmitted. No bending moments to be applied by the curtain wall to the structure or structural support.

.6 Operable windows which are within 3.6 m (12') from grade to meet ASTM F 588 Grade 20 minimum for forced entry resistance.

.7 Fasteners:
   .1 Exposed fasteners and anchors: aluminum, 300 series stainless steel, or nickel-plated brass.
   .2 Concealed fasteners and anchors: aluminum, cadmium plated steel, zinc plated steel, or stainless steel.
   .3 Concealed anchors: aluminum, or carbon steel painted after fabrication with zinc chromate or other primers not containing lead.
.6 Environmental

.1 Service Life Expectancy: 50-Year for exterior, 25-Year for interiors

.7 Coordination

.1 For security reasons from within a building, EXIT alarms may be required on certain Exit-Only doors.

.2 Skylights and Glass Roofs Over Conditioned Space

.1 Use SSG system with no cap on purlins.

.2 Rain screen rafters and purlin gutter system.

.3 Minimum slope 20 degrees, maximum slope 45 degrees.

.4 Integral purlin to rafter condensation gutter with water tight evaporation tray along skylight sill.

.5 Glazing to be double glazed heat strengthened glass. Inboard pane to be laminated glass with a minimum PVB film thickness of 1.5 mm.

.6 Basis of design: Kawneer 2000 series.

.7 T-bar skylight – not allowed over habitable space, however can be used as canopy over exterior space.

1.7 Quality Control and Assurance

.1 Submittals

.1 Shop drawings sealed and signed by Engineer see 1.7.2.1.

.2 Shop drawings to be submitted to UBC records.

.3 Manufacturer performance test data to confirm performance criteria.

.4 Samples, including finishes for selection.

.2 Quality Assurance

.1 All structural performance requirements of this section including anchorage and fasteners to be designed and certified by a professional engineer registered in the Province of British Columbia, to also carry out periodic site reviews during construction and at completion, and submit reports and letters of assurances for professional design, field review and building code and project criteria compliance. Costs to be included in the contract price.

.2 Laboratory testing: Curtain wall manufacturer to provide as a minimum a certified copy of test report verifying compliance with the project specifications.

.3 Quality Control

.1 UBC will appoint and pay for an independent inspection agency to conduct field testing for water penetration, air leakage and pressure equalization.

.2 Initial field test at any given location shall be paid by UBC. Cost of re-testing to verify corrected work shall be paid by Contractor.
.3 Contractor is responsible to provide test chambers and ensure adequate power and water supply.

.4 Mock-up test procedures

.1 On major project, curtain wall subcontractor is required to arrange for a representative mock-up to be tested in an accredited lab. Test procedures to include the following:

.1 Preload, static pressure air infiltration, static pressure water infiltration, dynamic pressure water infiltration, structural service loads, inter-story drift test, inter-story vertical movement, condensation Resistance / thermal cycling, structural ultimate loads.

.5 Warranties

.1 5-Year.

2.0 MATERIALS

2.7 Prescriptive Requirements

.5 Components

.1 Preferred framing type shall be Kawneer 1600 UT (or equivalent).

.6 Door

.1 Refer to Section 08 41 13 Aluminum-Framed Entrance and Storefronts.

.7 Finishes

.1 Finishing products:

.2 Thermosetting enamel coating meeting the requirements of AAMA 603.8:

.3 Thermosetting fluropolymer two coat meeting the requirements of AAMA 605.2:

.4 Clear anodized coating, AAMA Class II.

.8 Execution

.1 Before installation

.2 At exterior locations, ensure that a peel and stick air barrier membrane (or equivalent) is installed to drain to exterior, over the entire perimeter of the opening over which the framing system is to be installed.

***END OF SECTION***