1.0 *GENERAL*

1.1 *Related Work and UBC Guidelines*

.1 Section 07 00 10 Building Envelope – General Requirements
.2 Section 07 25 00 Weather Barriers
.3 Section 07 40 00 Cladding
.4 Section 08 00 10 Openings – General Requirements
.5 Section 08 44 13 Glazed Aluminum Curtain Wall
.6 Section 08 80 00 Glazing
.7 Divisions 26, 27 and 28
.8 UBC LEED Implementation Guide
.9 UBC Energy Modelling Guidelines
.10 Owner's Project Requirements
.11 UBC Resilience-Based Design Guide for Nonstructural Systems

1.2 *Related External Documents*

1. *Latest edition of the British Columbia Building Code (BCBC) including accessibility requirements.*
2. *CAN/CSA-A440.2 "Fenestration Energy Performance"*
3. *CAN/CSA-A440.4 "Window and Door Installation".*
4. *NFRC 100 "Procedure for Determining Fenestration Product U-Factors"*
5. *AAMA 501 "Methods for Tests for Exterior Walls"*
6. *ASTM E283, "Test Method for Rate of Air Leakage through Exterior Windows, Curtain Walls and Doors."*
7. *ASTM E330, "Structural Performance of Exterior Windows, Curtain walls and Doors by Uniform Static Air Pressure Difference."*
8. *ASTM E331, "Test Method for Water Penetration of Exterior Windows, Curtain Walls and Doors by Uniform Static Air Pressure Differential."*
9. *ASTM-E1105 "Standard Test Method for Field Determination of Water Penetration of Installed Exterior Windows, Curtain Walls and Doors by Uniform or Cyclic Static Air Pressure Difference."*

1.3 *Description*

1. *Section includes exterior aluminum storefront framing systems and entrance doors.*
2. *Only use storefront in protected areas under overhangs or canopies or in the interior. In all other exterior locations, a curtain wall system is required.*

1.4 *Coordination*

1. *The Guidelines apply to all work completed within buildings on both UBC Vancouver and UBC Okanagan campuses unless stated otherwise.*
2. *In instances where conflicts are found between these guidelines and provincial regulations or codes, please notify the UBCV Technical Review Team Architect or UBCO Facilities Management.*
3. *These guidelines are intended to be read by design consultants and their content integrated into construction drawings and specifications. Construction documents are not to reference the technical guidelines directly.*
4. *The Coordinating Registered Professional (CRP) is required to coordinate these requirements with other disciplines, including:*
   .1 Building Envelope Consultant.
   .2 Code Consultant.
   .3 Structural Consultant
   .4 Energy Modeler

1.5 *Submittals*

.1 Submit required documents to consultants in accordance with Section 013300 Submittal Procedures

.2 O&M Submittals
- *.1 Manufacturers Safety Data sheet (MSD) for all toxic or potentially toxic materials.*
- *.2 Environmental Product Declaration (EPD)*
- *.3 .*

.3 Shop drawings (including all enclosure interface details) sealed and signed by a professional engineer registered in the Province of BC.

.4 Manufacturer performance test data to confirm performance criteria.

.5 Maintenance Data
- *.1 As-installed hardware.*
- *.2 Source for replacement parts.*
- *.3 Maintenance instructions*

.6 Warranties as per 1.6.3.

1.6 *Quality Control and Assurance*

.1 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 and Letters of Assurance.*
- *.2 Costs to be included in the contract price.*

.2 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 where required.*
- *.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 Water testing to ASTM E.1105 and air leakage testing at NAFS test pressure.*
- *.5 When entrance system is in well protected locations, water testing is not necessary.*

.3 Warranties
- *.1 Manufacturer shall review, verify and provide written acceptance to verify compliance for installation and provide warranty as follows:*
- *.2 2-year parts and labour warranty.*
- *.3 5-year water penetration.*
- *.4 10-year insulated glazing unit (IGU or sealed unit) warranty*

2.0 *DESIGN AND PERFORMANCE REQUIREMENTS*

2.1 *Design Requirements*

.1 Due to extensive failures of face-sealed storefront glazing on exposed walls of many of UBC's recent projects, storefront glazing will be used for interior applications only. Self-draining curtain wall systems shall be selected for installation within exterior walls.

.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. Pass test at minimum 500 Pa.*
- *.2 Glazing as part of curtain-wall system to conform to NAFS, including the following ratings:*
  - *.1 Water Tightness: Pass minimum 500 Pa test pressure*

.2 Air Infiltration: Air infiltration/exfiltration levels to be A3 for operable products 0.5 L/sm2 and fixed 0.2 L/sm2 at 75Pa.

.2 The overall thermal transmittance of fenestration and doors shall be determined for the reference sizes listed in accordance with:

.1 CSAA440.2/A440.3,"Fenestration energy performance/User guide to CSA A440.2:19, Fenestration energy performance

.2 NFRC100,"Procedure for Determining Fenestration Product U-factors.

.3 The minimum overall thermal transmittance U-Factor shall be 1.9 W/m2K

.4 Wind Load Resistance shall meet ASTM E330

.5 Resistance to Forced Entry shall be F20 (windows reachable from grade).

.6 Hardware to include multi-point locking with centre locking handle.

.3 System to utilize exterior rain screen deterrents, interior air seal barriers, and pressure-equalized cavities to minimize water infiltration into the internal areas of the system, while providing moisture control and drainage to the exterior.

.4 Structural Design:

.1 Curtain wall assemblies to support design loads and accommodate structural deflection, long term creep movements and drift as shown on the structural drawings without stress on glass or reduction in performance, or other detrimental effects caused by structural movement.

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

.6 At exterior locations, ensure that a waterproofed sill pan 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.

.7 Fasteners

.1 Exposed fasteners and anchors: aluminum, 300 series stainless steel,

.2 Concealed fasteners and anchors: aluminum, or 300 series stainless steel.

.3 Concealed anchors: aluminum, or carbon steel painted after fabrication with zinc chromate or other primers not containing lead.

.8 Use of floor checks, pivots, concealed closers, in-floor power operators and/or concealed exit devices is not permitted.

.9 Install overhead stops, wall stops, or floor stops where required to prevent damage from door contacting wall, another door, and provide controlled swing/stop.

2.2 *Performance Requirements*

.1 Life Expectancy: 25-Year for exterior installations, 25-Year for interior installations.

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

3.0 ***MATERIALS***

3.1 *Product Selection*

.1 Preferred Systems:

.1 Framing shall be Kawneer 1600UT curtain wall or Kawneer AA 6400 -refer to sections 08 44 13 and 08 50 00

.2 Kawneer 451 storefront section approved equivalent is acceptable when not used for environmental separation of the building envelope.

.3 Doors: Kawneer 350T/ 500T Insulpour medium/ wide stile (or equivalent), maximum height 2,134 mm (7'-0"), maximum width 1,220 mm (4'-0").

3.2 ***Finishes***

.1 Finishing products:

.1 Light and Neutral Colours: Thermosetting fluropolymer two coat meeting the requirements of AAMA 2604.

.2 Dark Exterior colours: Thermosetting enamel coating or thermosetting fluoropolymer two coat meeting the requirements of AAMA 2605.

.3 Clear anodized coating to conform to AAMA Class II.

.4 Champagne, bronze or black coloured anodized coating to conform to AAMA Class I.

******END OF SECTION******