1.0 GENERAL

1.1 Related UBC Guidelines

.1 Section 07 00 10 Building Envelope – General Requirements
.2 Section 07 25 00 Weather Barriers
.3 Section 0740 00 Cladding
.4 Section 08 00 10 Openings – General Requirements
.5 Section 08 80 00 Glazing
.6 UBC LEED Implementation Guide
.7 UBC Energy Modelling Guidelines
.8 Owner's Project Requirements
.9 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. AAMA/WDMA/CSA 101/I.S.2/A440-17, NAFS—North American Fenestration Standard/Specification for windows, doors and skylights (NAFS-08).
3. CSA A440S1-09, Canadian Supplement to AAMA/WDMA/CSA 101/I.S.2/A440-17, NAFS – North American Fenestration Standard/Specification for Windows, Doors, and Skylights.

1.3 Description

1. Section includes exterior aluminum and fibreglass fixed and operable windows.

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 Electrical Consultant.
   .3 UBC IT Services, including security requirements.
   .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 Shop drawings *(including all enclosure interface details)* sealed and signed by a professional engineer registered in the Province of British Columbia
.4 Manufacturer performance test data to confirm performance criteria.
.5 Maintenance Data
   .1 As-installed hardware.
   .2 Source for replacement parts.
   .3 Maintenance instructions

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 to submit a Letter of Assurance. 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.

2.0 DESIGN AND PERFORMANCE REQUIREMENTS

2.1 Design Requirements

.1 Requirements are applicable to exterior aluminum and fibreglass fixed and operable window framing systems. Window systems to incorporate a thermal break.

.2 In addition to any other applicable codes, standards and project requirements, exterior systems to meet or exceed the following minimum requirements:

.3 Before installation 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.

.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 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 Window actuator systems shall not be tied to the fire alarm system as per TG section 28 31 00.

2.2 Performance Requirements

.1 Products shall conform to Performance Class CW PG40 on the basis of prior testing..

.2 Required Water Penetration Test Pressure to be determined using CSA A440S1 methods and rounded up to nearest NAFS water penetration resistance test pressure and specified in Pascals separately from Performance Grade. Pass at minimum 390 Pa test pressure.

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

.4 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.

.5 Windows reachable from grade to have a forced entry resistance of ASTM F 588 Grade 20. This is greater than the minimum NAFS requirement of Grade 10.

.6 Windows in laboratory spaces to be openable only with a controlled tool, for use only in the event of mechanical system shut-down/failure.

.7 Design Service Life Expectancy: 50-year for exterior, 25-year for interiors

3.0 MATERIALS

3.1 Product Selection

.1 Kawneer "AA 6400" or equivalent for aluminum window systems.
.2 Cascadia Universal Series or equivalen for fiberglass windows.
.3 Provide a variance request for review and approval if proposing an equivalent. The variance request should note all design and performance evaluations made.
.4 PVC or vinyl-framed window systems are not acceptable for the academic and core components of mixed-use buildings.

3.2 Finishes

.1 Finishing products (aluminum):
  .1 Light and neutral Colours: Thermosetting enamel coating or thermosetting fluoropolymer 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, AAMA Class II.
.2 Finishing products (fibreglass):
  .1 Fibreglass window finishes to meet AAMA 625 - Performance Requirements and Test Procedures for Superior Performance Organic Coatings on Fiber Reinforced Thermoset Profiles.

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