

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 084413 Aluminum Curtain Wall*
- .6 *Section 08 80 00 Glazing*
- .7 *Division 28 for Access and Security requirements*
- .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".AAMA/ WDMA/ CSA 101/ I.S.2/ A440-17*
- 4. *CAN/CGSB-12.20 "Structural Design of Glass for Buildings."*
- 5. *NFRC 100 "Procedure for Determining Fenestration Product U-Factors"*
- 6. *AAMA 501.2 Quality Assurance and Water Field Check of Installed Storefronts, Curtain Walls and Sloped Glazing Systems*
- 7. *"ASTM E283, "Test Method for Rate of Air Leakage through Exterior Windows, Curtain Walls and Doors."*
- 8. *ASTM E330, "Structural Performance of Exterior Windows, Curtain walls and Doors by Uniform Static Air Pressure Difference."*
- 9. *ASTM E331, "Test Method for Water Penetration of Exterior Windows, Curtain Walls and Doors by Uniform Static Air Pressure Differential."*
- 10. *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 aluminum-framed glazed skylights.*

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 Transition 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 Shop drawings (including all enclosure interface details) sealed and signed by a professional Engineer.
- .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 Installer Qualifications: Installer must have successfully installed the same or similar systems required for the project and other projects of similar size and scope.
- .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 and to provide a Letter of Assurance. 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.
 - .2 Initial field test at any given location shall be paid by UBC. Number of test locations to be confirmed by the project design team and UBC. Cost of re-testing to verify corrected work shall be paid by Contractor.
 - .3 Contractor is responsible to ensure adequate power and water supply .
 - .4 Water testing to AAMA 501.2. Field water tests of Sloped Glazing Systems.
 - .5
- .4 Mock-up test procedures
 - .1 On major new projects and renewals utilizing a customized sloped glazing system, curtain wall subcontractor is required to arrange for a representative performance mock-up (PMU) to be tested in an accredited lab. Test procedures to include the following:
 - .2 Preload, static pressure air infiltration, static pressure water infiltration, dynamic pressure water infiltration, structural service loads, condensation Resistance / thermal cycling, structural ultimate loads.
- .5 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 sealed unit warranty

2.0 DESIGN AND PERFORMANCE REQUIREMENTS

2.1 Design Requirements – Sloped Curtain Wall Glazing System

- .1 The aluminum framed curtain wall skylight shall be stick-built, exterior glazed two-sided pressure cap system.
- .2 Use SSG system with no pressure cap on purlins to reduce trapped water.
- .3 Minimum slope 20 degrees, maximum slope 45 degrees.
- .4 Refer to Section 08 80 00 Glazing for skylight glazing design and performance requirements.

- .5 Provide rainscreen extrusions designed to control water that penetrates past the exterior glazing seal. All functions, overlaps and joints must allow water to flow freely. All materials are to be installed in a shingled fashion without water ponding over any sealed joints.
- .6 Provide an effective air barrier at the shoulder of the system.
- .7 Provide continuous air barrier around the perimeter of the frame.
- .8 Provide drainage of curtain wall skylight to the exterior or the exterior wall rainscreen.
- .9 Any moisture in the curtain wall skylight is to be wept to the exterior without compromising the air barrier of the system.
- .10 T-bar skylight – not allowed over occupied space requiring environmental separation, however can be used as an exterior canopy system.
- .11 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.
- .12 Environmental Separation
 - .1 Glazing as part of curtain-wall system to conform to NAFS, including the following ratings:
 - .1 Water Tightness: Pass minimum 700 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
 - .3 Wind Load Resistance shall meet ASTM E330
- .13 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.
 - .2 Wind Loads: Assemblies shall be reinforced where required, capable of withstanding local positive and negative wind pressures.
 - .1 Minimum 40 psf (1.9 kPa) inward and 40 psf (1.9 kPa) outward acting normal to the plane of the wall.
 - .2 Based on CAN3-S157 and allowable deflection of 1/175.
- .14 Fasteners:
 - .1 Exposed fasteners and anchors: aluminum, 300 series stainless steel
 - .2 Concealed fasteners and anchors: aluminum, stainless steel.
 - .3 Concealed anchors: aluminum, or carbon steel painted after fabrication with zinc chromate or other primers not containing lead.

2.2 Performance Requirements

- .1 Service Life Expectancy: 25+/-years

3.0 MATERIALS

3.1 Product Selection

- .1 Pressure Plate Skylight System
 - .1 Kawneer 2000 Skylight
 - .2 Columbia Glazing Systems - SPM Series
Or equivalent as approved by consultant. Provide a variance request for review and approval if proposing an equivalent. The variance request should note all design and performance evaluations made.

- .2 *Finishes*
 - .1 *Light and Neutral Colours: 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.*
 - .4 *Champagne, bronze or black coloured anodized coating to conform to AAMA Class I.*

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