1.1 **GENERAL**

1.2 Related SFU Technical Requirements

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

1.3 Co-ordination Requirements

   .1 Coordinate design with BEP

1.4 Description

   .1 Exterior Aluminum fixed and operable window framing system.

1.5 Performance Standards

   .1 BC Building Code, including accessibility requirements.
   .2 AAMA/WDMA/CSA 101/I.S.2/A440-08, 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/A440-08, NAFS –

1.6 Performance Requirements

   .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 Products shall conform to Performance Class CW PG40 on the basis of prior testing.
      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. Air infiltration/exfiltration
      levels to be A3 for operable products and Fixed for non-operable products.

      .2 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.

      .3 Window systems to incorporate a thermal break.

   .3 Engineering Design

      .1 Wind Loads: *design assemblies to withstand* 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 As required to meet project structural design criteria.
      .3 As required to meet the requirement of BC Building Code.
      .4 Based on CAN3-S157 and allowable deflection of 1/175.

      .2 Seismic design to meet all of the requirements for:

         .1 BC building code latest edition.
.3 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.

.4 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.

.5 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.

.6 The connection of the window framing 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 window to the structure or structural support.

.7 The glazing trade's engineer will take responsibility of ensuring skylight assemblies (including glass portion) are designed to meet code requirements and will sign off on final assembly.

.8 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.

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

1.7 Quality Control and Assurance

.1 Submittals
  .1 Shop drawings (including all enclosure interface details) sealed and signed by Engineer see 1.6.2.1.
  .2 Manufacturer performance test data to confirm performance criteria.
  .3 Samples, including finishes for selection.
  .4 Maintenance Data
    .1 As-installed hardware.
    .2 Source for replacement parts.
    .3 Maintenance instructions.

.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.

.3 Quality Control

.1 SFU Facilities 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 SFU. 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.

2.1 MATERIALS

2.2 Prescriptive Requirements

.1 Windows in Laboratory spaces to be open-able only with a controlled tool, for use only in the event of Mechanical System shut-down/failure.

.2 Components

.1 Preference shall be Kawneer "Isoport 516" or approved equals.
.2 Where permitted by code fiberglass windows are permitted
.3 Windows manufactured of PVC are not acceptable for academic uses.

.3 Finishes

.1 Finishing products (aluminum):
  .1 Thermosetting enamel coating meeting the requirements of AAMA 603.8:
  .2 Thermosetting fluropolymer two coat meeting the requirements of AAMA 605.2:
  .3 Clear anodized coating, AAMA Class II.

.4 Execution

.1 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.

***END OF SECTION***