1.0 GENERAL

1.1 Related Work and UBC Guidelines

.1 Division 03 and relevant TG sections therein
.2 Division 04 and relevant TG sections therein
.3 Division 06 and relevant TG sections therein
.4 Division 07 and relevant TG sections therein
.5 Section 08 and relevant TG sections therein
.6 Division 09 and relevant sections therein
.7 Divisions 20, 22, 23, 25, 26, 27 and 28
.8 UBC LEED Implementation Guide
.9 UBC Energy Modelling Guidelines
.10 Owner's Project Requirements
.11 UBC Bird-Friendly Design Guidelines
.12 UBC Resilience-Based Design Guide for Nonstructural Systems

1.2 Related External Documents

1. Latest edition of the British Columbia Building Code (BCBC).
2. CAN/CSA-A440.2-09/A440.3-09 - Fenestration energy performance/User guide to CSA A440.2-09, Fenestration energy performance.
3. CAN/CSA-A440.4 "Window and Door Installation"

1.3 Description

1. General design and performance requirements for doors, windows and curtainwall systems.

1.4 Coordination

1. 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.
2. 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.
3. The Coordinating Registered Professional (CRP) is required to coordinate these requirements with other disciplines.
4. Input from a Building Envelope (BE) consultant is required in the design development process. The BE consultant is to review all BE details, and review comments are to be incorporated prior to tender and Building Permit issuances.
5. Input from the structural consultant is required during the design process. The structural consultant is to review and provide all base building structural requirements.
6. Provide window, curtain wall and door hardware schedules for review by UBC Access and Security and Locksmith Shop prior to tender and Building Permit.

1.5 Submittals

.1 Refer to specific submittal requirements in sections 08 11 00 Metal Doors and Frames, 08 41 13 aluminum-Framed Entrances and Storefronts, 08 44 13 Glazed aluminum Curtain Walls and 08 50 00 Windows.

2.0 DESIGN AND PERFORMANCE REQUIREMENTS

2.1 Design Requirements – Windows and Curtain Wall Systems

.1 All seals between frame and glazing to be made with compressed gaskets.
.2 Frames to be glazed with internal or external removable stops or using tamper proof fasteners where security is required. Glazing to be designed to enable glass replacement without deconstruction of adjoining assemblies.

.3 Window and curtain wall installations need to accommodate building movements including inter-storey drift during seismic loading.
.4 Sound transmission ratings for windows to be selected based upon Acoustical Report where available for a project. For learning spaces acoustical requirements, refer to Section 10 00 10 Special Room Requirements.
.5 While operable windows are encouraged, operable windows are not to be provided in laboratories or spaces where pressure differentials need to be maintained. This will allow negative pressures to be maintained relative to adjacent spaces and to prevent draft conditions.
.6 Windows in laboratory spaces to be openable only with a controlled tool, for use only in the event of a mechanical system shut-down/failure.
.7 Hardware and seals of operable units should be designed so that hardware can be adjusted and seals maintained or replaced over the life of the window to maintain air and weather tightness. Proprietary hardware should not be provided.
.8 Frames need to be supplied with receiving surfaces for sealing to air and vapour barrier materials, insulation, and cladding of exterior wall assemblies.
.9 Coordinate fritting requirements with the UBC Brid-friendly Design Guidelines. Frit placement within insulated glazed units should not conflict with the low-e coating location as per Section 08 80 00 Glazing.
.10 Make provision for window washing on the exterior with the use of a genie lift or boom lift. Coordinate sidewalk width, manlift and other smaller vehicular loading requirements on sidewalks with the civil engineer, after consultation with the UBCV Technical Review Team Architect or UBCO Facilities Management.

2.2 Design Requirements – Doors
This Section applies to doors in Sections 08 11 00 Metal Doors and Frames, 08 41 13 Aluminum-Framed Entrances and Storefronts and 08 44 13 Glazed Aluminum Curtain Walls.

.1 Water tightness rating for exterior exposed doors to be selected based upon exposure to elements related to location on the facade and site conditions per AAMA/WDMS/CSA 101/I.S.2/ A440-17.
.2 Maximum exterior and interior door height to be 2,134 mm (7'-0"). Door above this height will require a variance.
.3 Exterior doors:
  .1 Install all exterior doors not able to meet required water tightness performance in protected locations under the cover of an overhang with an overhang ratio (horizontal projection of overhang to overhang to height above door sill) appropriate for the door type. All measurements are taken from the exterior edge of the door threshold.
  .2 Overhang projection outward from plane of door:
    .1 Out-swing door:..... 1:4 min
    .2 Sliding door: ..... 1:4 min
    .3 In-swing:..... 1:2 min
    .4 Double swing:..... 1:2 min
    .5 Double slider: ..... 1:2 min
    .6 Wood door:..... 1:2 min
    .7 Outswing Press steel door: ..... 1:2 min
  .3 Overhang projection to jamb in plane of door 1:4 minimum.
  .4 Any door with less than a 1:2 overhang ratio (Out-swing door and sliding doors in table above) must also meet the minimum water penetration test resistance requirements for windows located in the wall at that location, and be verified through field testing.
  .5 Exceptions to the above rules may also be made for outward opening or sliding doors that can resist water penetration in the lab and in the field at pressures in excess of 500 Pa with multi point locking system.

.4 Frames to be glazed with internal removable stops or using tamper proof fasteners where security is required.
.5 Where fire-rated doors are required, use hollow metal, thermally broken doors. At other locations, it is acceptable to use wide stile thermally broken aluminum doors or fiberglass doors with pressed metal frames.
.6 All doors with glazed assemblies (floor to door height or floor to ceiling height) to be tempered glass.
.7 Where panels of vision or opaque glass is located in a required fire separation, use fire-rated safety glass such as Firelite, not wired glass.
.8 Use of floor checks, pivots, concealed closers and/or concealed panic devices is not permitted. Coordinate with Section 08 71 00 Door Hardware.
.9 Glazed doors must have stiles and rails. Refer to Section 08 11 00 Metal Doors and Frames.
.10 Frameless glass doors are not recommended for use. Maintenance considerations are to be evaluated when proposing the use of frameless glass doors.
.11 Service room door swings should be as noted in Sections 10 00 10 Special Room Requirements, 20 00 05 Mechanical – General Requirements and 27 05 05 Communications Rooms Design Guidelines. Acoustic seal to be provided for doors to these rooms.
.12 Any exterior or interior vestibule doors that swing over walk-off mats must have sufficient clearance underneath to clear the mats without having to make special provisions in the mats such as cutaways.
.13 Door sub sill pans need to be integrated with terminations of roofing membranes.
.14 Check roof overflow scuppers for height relative to door sills at roof level. Overflow scuppers should be below door threshold waterproofing height.
.15 Sill accessories and flashing material shall be connected with waterproof joints or shall be under laid with continuous secondary waterproofing. Joints shall remain waterproof while accommodating thermal movement for the life of the installation.

2.3 Performance Requirements

1. Refer to individual sections in Division 8.

3.0 MATERIALS

1. Refer to individual sections in Division 8.

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

1.0 GENERAL

1.1 Related Work and UBC Guidelines

.1 Section 03 33 00 Architectural Concrete
.2 Section 07 00 10 Building Envelope – General Requirements
.3 Section 07 25 00 Weather Barriers
.4 Section 07 40 00 Cladding
.5 Section 08 00 10 Openings – General Requirements
.6 Section 09 90 00 Painting and Coating
.7 Divisions 26 and 28
.8 Section 27 05 05 Communication Rooms Design Guidelines

1.2 Related External Documents

1. Latest edition of the British Columbia Building Code (BCBC), including accessibility requirements.
2. Canadian Steel Door Manufacturers Association (CSDMA), Recommended Specifications for Commercial Steel Doors and Frames.
3. Fire-Rated Door Assemblies: CAN/ULC-S104-10 - Standard Method for Fire Tests of Door Assemblies; CAN/ULC-S105-09 - Standard Specification for Fire Door Frames Meeting the Performance Required by CAN4-S104; labeled and listed by ULC, cUL, Warnock Hersey, or other testing agency.
4. NFPA 80 for installation of fire rated doors and frames.

1.3 Description

1. Section includes hollow metal doors (HMD), insulated metal doors (IMD) and pressed steel frames (PSF).

1.4 Coordination

1. The Guidelines apply to all work completed within buildings on both the 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.
5. Provide door and door hardware schedules for review by UBC Access and Security and Locksmith Shop prior to tender and Building Permit.
6. Genie or manlift access requirements will need to be coordinated if only providing single exterior doors due to security reasons. Review with UBC Access and Security.

1.5 Submittals

1. Design phase:
   .1 Submit required documents to consultants in accordance with Section 013300 Submittal Procedures
   .2 For Construction Office projects only, provide paint colour samples for review.

2. Handover – O&M submittals:
   .1 Provide final reviewed door shop drawings and colour specifications for painted doors.
   .2 Provide door hardware list and location.
   .3 Provide manufacturer installation instructions and test data, for fire rated doors.

2.0 DESIGN AND PERFORMANCE REQUIREMENTS

2.1 Design Requirements

.1 Standard and minimum door size shall be 915 mm wide x 2,134 mm high x 44 mm thick (3'-0" x 7'-0" x 1 3/4").
.2 Maximum door height: 2,134 mm (7'-0"). A variance will need to be granted for over-height doors.
.3 All materials should be shop fabricated and finished, with no field cutting of materials allowed.
.4 Glazed doors must have stiles and rails. No glazed doors with only top and bottom rails or patch hardware. Stile width of glazed doors shall be 127 mm (5") x 45mm (1 ¾") minimum to accept surface-mounted panic hardware and mortise locksets.
.5 Doors must have mid-rails if equipped with panic hardware and exit devices.
.6 Avoid exterior double doors where security is a requirement. Exterior exit doors with panic hardware or 'pass out' locksets must be singles with in their own frames.
.7 Provide lockable removable mullions at double doors where extra width is required such as for genie or manlift access into the interior, moving equipment and supplies, etc.
.8 Where single entrance doors are ganged together, in such instances, ensure width of doors can accommodate the passage of a genie or manlift access into the interior, moving equipment and supplies, etc.
.9 Frames to be fully-welded. A variance will need to be granted for knock-down frames.
.10 For security reasons from within a building, provide for EXIT alarms on certain Exit-Only doors.
.11 Provide electrical pathways to mid hinge, strike and header of frames for future electrification of openings. Must include pull string to each pathway
.12 Provide back boxes for electrical wire or conduits.
.13 Standard procedures to be followed for concealed door frames within the drywall assembly such as EzyJamb door frames are as follows:
    .1 Concealed door frames shall not be used for exterior doors.
    .2 As cracks develop quite often on drywall assembly over the door frames, use concealed door frames for rooms that do not require frequent usage. Since wear and tear on the drywall installation is minimized, this in turn reduces cracking.
    .3 Door type and height should be considered when considering the use of concealed door frames. Follow manufacturer's installation requirements for jamb installation, fastening and hinge type.

2.2 Performance Requirements

.1 Doors shall be designed to have a 25-year service life.

3.0 MATERIALS

3.1 Product Selection

.1 Interior Doors: *shall be* 18 gauge (1.2 mm), galv. to ZF075 wiped zinc coating, honeycomb structural core.
.2 Exterior Doors: shall be 18 gauge (*1.2* mm), galv. to Z275 (G90) zinc coating, insulated polyurethane insulation core.
.3 Interior Frames: shall be 16 gauge (*1.6* mm), galv. to ZF075 wiped zinc coating; galvanizing on anchors to match frames.
.4 Exterior Frames: shall be16 gauge (1.6 mm), galv. to Z275 (G90) zinc coating, galvanizing on anchors to match frames.
.5 Finishes: All new doors scheduled to be painted are to be hollow metal. Finish paint coat must be applied before final hardware install.

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

1.0 GENERAL

1.1 Related Work and UBC Guidelines

.1 Section 08 11 00 Metal Doors and Frames
.2 Section 08 71 00 Door Hardware
.3 Section 09 21 16 Gypsum Board Assemblies
.4 Divisions 26 and 28
.5 Section 27 05 05 Communication Rooms Design Guidelines

1.2 Related External Documents

1. Latest edition of the British Columbia Building Code (BCBC), including accessibility requirements.
2. CAN/CSA-0132.2 Wood Doors.
3. CAN 3-0188.1 Particle Cores.
4. WDMA I.S.6A-13 - Industry Standard for Interior Architectural Stile and Rail Doors.
5. NFPA 80 for installation of fire-rated doors and frames.

1.3 Description

1. Work includes interior wood doors.

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.
5. This section applies to interior wood doors only. Exterior wood doors are not allowed on UBC's campuses.
6. Provide door and door hardware schedules for review by UBC Access and Security and Locksmith Shop at the Construction Documents phase, prior to tender and Building Permit.
7. If only providing single doors into learning spaces, CRP to coordinate manlift/genie lift access requirements with the Facilities Technical Review team.

1.5 Submittals

1. Design phase:
   .1 Submit required documents to consultants in accordance with Section 013300 Submittal Procedures
   .2 For Construction Office projects only, provide a list of all proposed materials for review and color samples for selection plus final approval. Submit 8"x12" top corner sample of each type of door proposed for acceptance of construction and veneer.
2. Handover – O&M submittals:
   .1 Provide a list of installed door types and color samples.
   .2 Provide final reviewed shop drawings.
   .3 Provide manufacturer installation instructions and test data, for fire rated doors.

1.2 Quality Control and Assurance

.1 Quality Assurance
   .1 Comply with WDMA I.S.6A-13 - Industry Standard for Interior Architectural Stile and Rail Doors.
.2 Quality Control
   .1 CRP to ensure function and performance are clearly defined based on use.

2.0 DESIGN AND PERFORMANCE REQUIREMENTS

2.1 Design Requirements

.1 Standard and minimum door size: 915 mm wide x 2,134 mm high x 44 mm thick (3'-0" x 7'-0" x 1 ¾ ").

.2 Maximum door height: 2,134 mm (7'-0"). A variance will need to be granted for over-height doors.

.3 All doors to be solid core.

.4 Wood door with a mineral core are only acceptable for use where an interior fire-rated door is required.

.5 Provide solid wood backing for all hardware installation.

.6 Seal hinge gains, top and bottom of doors before installation.

.7 Glazed doors shall have stile width of 127 mm (5") minimum for hardware installation.

.8 Avoid adhesives, preservatives, hardeners, and synthesizing agents and finish coatings that contain formaldehyde and high V.O.C. content.

.9 Where lightweight interior doors are required, fiberglass doors may be used. Doors are to have a minimum exterior wall thickness of 2 mm, and to have a structurally solid and integrated frame.

2.2 Performance Requirements

.1 Performance duty level to be as per current edition of the North American architectural Woodwork Standards (NAAWS). Architect to ensure the appropriate duty level is specified for the intended usage.

3.0 MATERIALS

3.1 Product Selection

.1 Endangered wood species must not be used in the manufacturing of wood doors. Acceptable species:

- .1 Veneer shall be Birch, Oak, or Maple.
- .2 Trim shall be Birch, Oak or maple.

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

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*****

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 084433 Sloped Curtain Wall Glazing
.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".
4. AAMA/ WDMA/ CSA 101/ I.S.2/ A440-17.
5. NFRC 100 "Procedure for Determining Fenestration Product U-Factors"
6. AAMA 501 "Methods for Tests for Exterior Walls"
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. Work includes exterior aluminum curtain wall framing system complete with doors and windows within the system.

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 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

.6 Warranty information as per 1.6.5.

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 provide test chambers and ensure adequate power and water supply.
- .4 Water testing to ASTM E.1105.

.4 Mock-up test procedures
- .1 On major new projects and renewals utilizing a customized curtain wall 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:
  - .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 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 – Vertical Curtain Wall System

.1 Requirements are applicable to exterior aluminum curtain wall type framing system including doors and windows within the system.

.2 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.

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

.1 Environmental Separation

.1 Rating for windows to be selected based upon exposure to elements related to location on the façade and site conditions. Use the CSA A440 S1 Canadian supplement to AAMA/WDMA/CSA 101/I.S.2/ A440. Pass test at minimum 500 Pa.

.2 Glazing as part of curtain-wall system to conform to 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

.2 Engineering Design

.2 Wind Loads: Assemblies shall be reinforced where required, capable of withstanding local positive and negative wind pressures.

.3 Minimum 25 psf (1.2 kPa) inward and 25 psf (1.2 kPa) outward acting normal to the plane of the wall.

.4 Based on CAN3-S157 and allowable deflection of 1/175.

.3 Systems 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 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 Fasteners:

.2 Exposed fasteners and anchors: aluminum, 300 series stainless steel, or nickel-plated brass.

.3 Concealed fasteners and anchors: aluminum, cadmium plated steel, zinc plated steel, or stainless steel.

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

.7 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.

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

2.2 Performance Requirements

.1 Service Life Expectancy: 25-years.

.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 Components
- .1 Kawneer 1600 UT
  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 Door
- .1 Refer to Section 08 41 13 Aluminum-Framed Entrance and Storefronts.

.3 Operable Vents
- .1 Kawneer Glassvent UT
  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.

.4 Finishes
- .1 Finishing products:
  - .2 Light and Neutral Colours: Thermosetting fluoropolymer two coat meeting the requirements of AAMA 2604.
  - .3 Dark Exterior Colours: Thermosetting enamel coating or thermosetting fluoropolymer two coat meeting the requirements of AAMA 2605.
  - .4 Clear anodized coating, AAMA Class II.
  - .5 Champagne, bronze or black coloured anodized coating to conform to AAMA Class I

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

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*****

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*****

1.0 GENERAL

1.1 Overview

.1 Buildings shall be designed to be card access. UBC's Okanagan campus uses Salto Access Control System and Locksets to support the campus's ongoing strategy to increase safety and security to the University community. The guidelines herein have been created by UBC Okanagan Campus Security to clarify the design and installation process of Salto systems on the UBC Okanagan campus.

.2 The guidelines are in place to increase cooperation between all parties involved, whether they are UBC related or not (e.g. hardware consultants, contractors, locksmiths, electricians, information technology).

.3 Security systems to be installed as part of newly constructed buildings or as part of renovations within existing buildings shall always reflect the intent of Salto Access Control System and Locksets standards and guidelines.

.4 Campus Security is the UBC group solely responsible for the consultation, design installation, verification, maintenance, and management of all electronic security on campus.

.5 Any and all proposed changes to these standards shall be subject to approval in writing by Campus Security Okanagan prior to implementation.

1.2 Related UBC guidelines

.1 Section 28 16 00 Intrusion Detection
.2 Section 28 13 00 Access Control
.3 Section 28 20 00 Electronic Surveillance
.4 Section 27 05 08 Cable Infrastructure Design Guidelines,
.5 Section 27 05 05 Communication Rooms Design Guidelines, sub section 1.4
.6 Section 28 31 00 Fire Detection and Alarm
.7 Section 14 20 00 Elevators
.8 Section 08 71 00 Door Hardware

1.3 Coordination Requirements

.1 UBC O Campus Security
.2 UBC O Campus Planning and Development
.3 UBC O Information Technology
.4 UBC O Facilities Management for Electrical Technical Support (or electrical contractor)
.5 Special consideration must be given to the security/access control industry as being technology based. Industry advancements have an evolutionary effect on the design and manufacturing of security equipment. It is therefore critically important that Salto Access Control System and Locksets remains flexible in its implementation of UBC standards and guidelines.
.6 This document must be read, interpreted and coordinated with all other related Sections to deliver a complete electronic security system.
.7 The Salto Access Control System and Locksets Guidelines and others mentioned herein prescribe minimum acceptable standards for all equipment and procedures relating to Salto Access Control System and Locksets.

1.4 Scope of Work

.1 Section refers to those portions of the work that are unique to the complete installation of a Salto locksets, and including all necessary preparatory work to doors and all electrical, data. The data sheets (submittal) must be referenced and interpreted simultaneously with all sections pertinent to the works described herein.

1.5 Codes And Regulation

.1 All work shall be installed in accordance with the requirements of local and applicable provincial and federal regulations. Any work shown on the drawings or described in the specifications which is at variance with the regulations shall be changed to comply with the requisite authority at no cost to the Owner.

1.6 Performance Standards

.1 CSA for Heavy Duty
.2 All hardware to be Grade 1

1.7 Submittals

.1 Shop drawings (i.e. the Salto Data Sheets) shall be submitted for Salto, and non-salto hardware specifications shall be submitted upon request.
.2 Door schedule
.3 Sequence of Operation is to be submitted for review by Campus Security (Locksmith Contractor Included).
.4 List of any removed Salto hardware, including the location from which the hardware was removed as well as the location to which the hardware was relocated (if applicable), Hardware that is removed without being relocated should be returned to UBC as directed in section 3 – Execution.
.5 Testing and Commissioning schedule is required for all electrified hardware.
.6 As-Built drawings are required including the door hardware system wiring diagram, shop drawings of the electrified door hardware components, supplier and installer contact information (“Lockmaster” or other approved Salto Certified Locksmith), and warranty information for the installer and extended manufacturer warranties.
.7 Requests for product substitutions must be made to the UBC Project Manager prior to closing of the Contract tender submission for review by Campus Security and Facilities Management.

1.8 Contractor and/or Consultant Responsibilities

.1 The contractor and/or consultant has the responsibility to ensure that all provisions of these Standards are met and to specifically advise the University in writing of any contemplated exceptions and obtain approval from UBC Project Manager with review from Campus Security and Facilities Management for all contemplated changes.

1.9 Terminology

.1 The following specific terminology is referenced in the Salto Access Control System and Locksets Guidelines, and appendix 1: Salto Data Sheets

.2 (Personal Identification Number) or just ta PIN to gain access (commonly used at entrances of Student Housing buildings.

.3 Salto Access Control System
The Salto system is an integrated, Campus-wide access control system that provides a flexible and rigorously monitored tool to control access to and from academic, administrative and residential spaces throughout UBC Okanagan.

.4 IP Door Controller
is an on-line IP door controller that can have 1 - 2 wall reader connected and has 2 control relay outputs with the SALTO Virtual Network (SVN) capabilities. Provides full on-line features via the networked Ethernet such as door monitoring status and remotely controlling door unlock/lock modes.

.5 Networked Electronic Escutheons (SALTO Xs4-60)
The SALTO XS4-60 wide body version for ANSI mortise locks is specially designed to be compatible with most ANSI mortise locks and tubular latches. It is specially designed for use on busy, high traffic doors that need additional strength.

.6 Networked Electronic Escutheons (SALTO Xs4-60) with Keypad
The XS4 electronic lock with keypad is a product that increases security and control as it offers the choice of two forms of authentication to grant access. End users can use a credential, a credential and PIN

.7 Mortise Case
The XS4 ANSI mortise lock is specially designed for doors that need an ANSI mortise lock ANSI in line with an A 156.13. Grade 1 mortise lock.

.8 Access Card/Fob
As provided by the UBC Campus Security, a proximity credential presented at a card reader by an authorized user to grant access.

.9 Salto Card Reader
An access card recognition device, typically proximity type that allows for the entry of an authorized card holder.

.10 Card Reader Door
A “controlled door” that includes a Salto card reader for authorized entry and unlocking.

.11 Electronic Locking Hardware
Access control door hardware, typically “handset” or “panic” type aesthetically identical to regular hardware and whose locking function is controlled electro-mechanically by on-line “hotspot”.

.12 Electric Strike
An access control door strike designed as a replacement for a regular strike plate that is controlled electro-mechanically.

2.0 MATERIALS

2.1 Prescriptive Requirements

.1 This hardware should be hard specified. All other hardware needs to be identified as a potential alternative and submitted with costing for evaluation by Campus Security or approval and change to ensure compatibility with Salto, or otherwise.

2.2 Salto Hardware

.1 **Mortise Locks**

.1 Salto Stand Alone Lockset A9650 (mechanical, electrical rooms, electrical closets, storage, waste, custodial etc.) Battery operated. Does not required data or power supply. Dimensions: 290mm x 67mm x 20mm. Colour: Satin. Please contact Campus Security for the most up-to-date specifications. Includes A9658A621M38 Lockset C/W LA1T1570A21IM8 Mortise Case/Deadbolt.

.2 Salto Stand Alone Lockset with mechanical privacy (Accessible Public washrooms, individual offices). Battery operated. Does not required data or power supply. Dimensions: Dimensions: 290mm x 67mm x 20mm. Colour: Satin. Please contact Campus Security for the most up-to-date specifications.

.3 Salto Mortise Case: The XS4 ANSI mortise lock is specially designed for doors that need an ANSI mortise lock ANSI in line with an A 156.13 Grade 1 mortise lock. Please contact Campus Security for the most up-to-date specifications. Includes A9650A00IM38 lockset c/w LA1T0570A21IM8 Mortise Case.

.4 Salto Mortise Cylinder or approved alternative. Please contact Campus Security for the most up-to-date specifications.

.5 Wire-free, stand-alone electronic cylinders designed for doors where fitting an electronic escutcheon is not possible. In addition to use on doors, other applications including cupboards or boxes can be controlled protected by SALTO GEO electronic camlocks and padlocks against theft or unauthorized use. Housing Dimensions: 43 x Ø38 mm 1-11/16" x Ø1-1/2"

.2 **Card Reader(s):**

.1 Salto Wall Reader: The wall readers read encrypted data contained on the carrier and communicate it to the door controller. They also allow for updating of the carrier via SALTO Virtual Network technology making it possible to cancel lost or stolen cards remotely. Dimensions: 83mm x 83mm x 16mm. Please contact Campus Security for the most up-to-date specifications.

.3 **IP Door Controller(s)**

.1 Salto CU50ENSVN Motherboard or approved alternative, 2 Amp Power supply in metal enclosure keyed to Salto service key, WRM9001 reader, WRMKP Key pad and WRMBH2 Dual mounting base (Commonly used on primary entrances of buildings). Power requirements 1p, 15amp dedicated circuit. Data line back to UBCO data room. Please contact Campus Security for the most up-to-date specifications.

2.3 Non-Salto Hardware

.1 Exit Devices –Von Duprin 98/99 Series or approved equivalent

.2 Privacy Sets –Schlage ND40-RHO (accessible washrooms, and single washrooms in office space) or approved equivalent

.3 Passage Sets – Non/Salto - Schlage ND10 (non-controlled passage doors) or approved equivalent

.4 Door Closers – LCN 4040XP or approved equivalent

3.0 EXECUTION

3.1 Prescriptive Requirements

.1 All doors on campus, both exterior and interior, will have Salto hardware and/or IP door controlled (hotspot, electric strike, “online”).

.2 **Interior doors** will generally have standalone (battery) hardware installed (A9650). This includes; academic space, administrative, office, washrooms, commercial/leased, etc. Other Salto solutions will be considered if A9650 cannot be installed due to door limitations (ex; gates).

.3 **Exterior doors** will either be classified as “Hotspots” or IP controlled. Areas where compliance with building code or other regulatory requirements may prohibit the installation of Salto hardware must be identified on shop drawings and communicated to the project manager and Campus Security to consider Salto or other solutions. Exit only doors must be considered for Salto, and must be identified on shop drawings as well.

.4 **All other points of entry** into a building shall be secured by Salto product.

.5 Only Salto-certified locksmiths approved by UBC shall install permanent cylinders to ensure precise coordination of lock cylinder locations with the User’s requirements.

.6 All locks and cylinders shall be supplied with temporary construction cylinders. The Contractor is to supply and install temporary construction cylinders complete with keys for all construction locks; until UBC-approved Salto-certified locksmiths can supply and install permanent Salto hardware on the UBC key system. Upon changeover, temporary construction cylinders shall be returned to the distributor.

.7 The Division 08 Subcontractor is responsible for the installation of all door hardware, electrified door hardware control panels, power supplies, low voltage cables, and low voltage raceways. The Division 08 subcontractor is also responsible for all 110 volt supply raceways, wiring, and dedicated circuit breakers unless they are specifically indicated on the electrical design drawings as being done by Division 26 (example: power supply required as part of a design build electrified door hardware system installation). All electrified openings must have a dedicated power supply circuit, and the circuit number shall be identified on the door

hardware power supply. Stand-alone units are battery operated and do not require data or power supply.

3.2 Disposition of removed Salto Hardware

.1 In the event that existing Salto hardware is removed without being relocated, please return it to the Campus Security Office.

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

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
.3 Section 0841 13 Aluminum Entrances and Storefronts
.4 Section 08 44 14 Glazed Aluminum Curtain Wall
.5 Section 08 50 00 Windows
.6 UBC Bird Friendly Design Guidelines
.7 UBC LEED Implementation Guide
.8 UBC Energy Modelling Guidelines
.9 Owner's Project Requirements
.10 UBC Resilience-Based Design Guide for Nonstructural Systems

1.2 Related External Documents

1. Latest edition of the British Columbia Building Code (BCBC).
2. British Columbia Energy Efficiency Act.
3. National Energy Code for Buildings (NECB).
4. ANSI/ASHRAE 90.1.
5. CAN/CGSB-12 Series Standards: glass types; performance.
6. CAN/CGSB-12.20: Structural Design for Buildings.
7. IGMAC Insulating Glass Manufacturers of Canada guidelines.
8. IGMA TM-3000-90, TB-3001 and TM-1300 guidelines.
9. Glazing Contractors' Association of British Columbia (GCABC) Manual.
10. ANSI/ASTM E330, Test Method for Structural Performance of Exterior Windows, Curtainwalls and Doors by Uniform Static Air Pressure Difference.

1.3 Description

1. Section includes glass and glazing.

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 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
.6 Warranties
  .1 10-year warranty for IGU's.

1.6 Quality Control and Assurance

.1 Quality Assurance
  .1 Work shall be performed by a qualified glazing contractor with minimum five (5) years experience, with adequate facilities and skilled personnel suitable for this work.
.2 Quality Control
  .1 Drawings indicate minimum thicknesses and other requirements such as coatings, tempering and other requirements
  .2 Final thickness, safety glazing, heat strengthening, and other performance requirements to meet codes and standards, Owner's Project Requirements, and required structural performance are the responsibility of the Contractor based on location and intended use.
  .3 Structural performance requirements of exterior glazing, as well as exterior and interior structural glazing including anchorage and fasteners, to be designed and certified by a Professional Structural Engineer registered in the Province of British Columbia who is to also submit a Letter of Assurance.

2.0 DESIGN AND PERFORMANCE REQUIREMENTS

2.1 Design Requirements

.1 Exterior glazing at a minimum shall be insulated sealed double-glazed units to meet as a minimum to meet fenestration overall thermal transmittance 1.9 W/m2K. Design to maximize energy performance as established by the Owners Project Requirements (OPR), including orientation and expected functional use of space where installed.
.2 Consideration to be given to access for glass cleaning including the structural capacity of floors to support appropriate man-lifts. The use of monorail systems for interior glass cleaning is not allowed.
.3 For design of interior full-height glazing with butt-glazed joints near an interior walking surface, ensure the deflection is not thicker than the thickness of the glass. This eliminates the possibility of someone leaning against the glass panels and causing it to deflect and preventing movement of glazing panels.

2.2 Performance Requirements

.1 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."
.2 The overall thermal transmittance of fenestration and doors that are not within the scope of the standards listed shall be determined from:
  .1 Calculations carried out using the procedures described in the "ASHRAE Handbook – Fundamentals," or
  .2 laboratory tests performed in accordance with ASTM C1363, "Standard Test Method for Thermal Performance of Building Materials and Envelope Assemblies by Means of a Hot Box Apparatus," using an indoor air temperature of 21±1°Candan outdoor air temperature of–18±1°C measured at the mid-height of the fenestration or door.
.3 Any staining of glass or other surfaces by alkaline materials prior to installation will be cause for rejection.

.4 Installation of glazing to conform with IGMA TM-3000-90, TB-3001 and TM-1300.

3.0 MATERIALS

3.1 Product Selection

.1 Locally produced materials should be used whenever possible. Consideration to be given to the local availability of replacement glass when specifying glazing.

.2 Manufacturer of IGU, must be IGMA certified.

.3 Glass spacer type: thermally improved as required to meet specified energy performance requirements. Non-thermally broken aluminum spacers shall not be used.

.4 Allowable glass types with applications (no tempered glass on buildings except where required to be safety glass in doors and sidelights:

- .1 Exterior glazing - simple building form and small units – annealed or heat strengthened glass.
- .2 Exterior glazing - complex building, solar shading, reflective glass, large glazing units - heat strengthened glass to reduce risk of breakage due to thermal stress.
- .3 Exterior glazing -all buildings- low-E coating on #2 surface of the insulated glazing unit (IGU). If triple-glazed units are considered for use on a project, project team to consult with the UBCV Technical Review Team Architect/UBCO Facilities Management and the C&CP Green Buildings Manager and to confirm final location of low-e coating and ceramic fritting. A variance will need to be granted if the low e-coating is in a different location from the #2 surface.
- .4 Exterior glazing- appropriate bird friendly design includes ceramic fritting. Acid-etched glass applications would need to be reviewed at the design stage. Consult with the UBC Technical Team Architect if acid-etched glass is proposed. Film application is not acceptable since the IGU warranty is voided as per current industry standards.
- .5 Spandrel glass - heat strengthened glass.
- .6 Skylight, canopy and overhead glass – fully tempered, laminated (minimum PVB interlayer 1.5mm).
- .7 Skylight glazing - glazing to be minimum double-glazed heat strengthened glass. Inboard pane to be laminated glass with a minimum PVB film thickness of 1.5 mm. Insulated glass units to have a soft coat metallic low-e coating on surface #2. Low-e coating shall have edge deletion with warm edge spacer and argon- filled.
- .8 Guardrail glass - Heat-strengthened and laminated glass or tempered and laminated glass.
- .9 Safety glass in doors and sidelights: fully tempered.
- .10 Safety glass in fire rated doors and sidelights and in all applications subject to human impact: non-wired fire-rated tempered glass or intumescent glass. Fire-rated glass installations to be certified and permanently labelled by the manufacturer.
- .11 Clearstory and atrium vertical glazing over occupied space: heat strengthened laminated glass with a minimum 1.5 mm PVB interlayer.
- .12 Heat soak testing required to reduce nickel sulphide impurities in spandrel glass or IGUs where heat development is a concern.

.5 Any staining of glass or other surfaces by alkaline materials is cause for rejection.

4.0 LESSONS LEARNED AND COMMON MISSES ON UBC PROJECTS

Items in this section are lessons learned, and may be code or industry best practices which have been missed on past projects. If not applicable to a project, a variance is not required.

.1 Item 2.1.3 notes that interior full-height, butt-jointed glazing should have restricted deflection. This requirement has come about due to complaints from user groups in buildings with examples of full-height glazing installations in research labs and boardrooms. Users have complained about the movement noted in the glass and as a consequence not feeling safe when walking past such glass walls. It is not possible to address this issue during the O&M phase without removal and replacement of the glass walls. Design teams are to ensure that glazing specifications and shop drawings adequately address this issue.

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