.1 General Design Requirements

.1 Window assemblies shall be designed using rainscreen principles; pressure equalized, with internal drainage and ventilation capabilities. Storefront glazing assemblies are not acceptable products for exterior exposure.

.2 Glazing shall be designed to limit unwanted solar heat gain into occupied spaces, and shall manage visible light transmittance in coordination with mechanical and electrical systems.

.3 Specify at a minimum, the following performance criteria for all window and curtainwall assemblies :

- .1 Energy Performance: (maximum assembly U-Value)
- .2 Solar Heat Gain Coefficient: (NFRC assembly rating)
- .3 Visible Light Transmittance: (NFRC rating)
- .4 Air Tightness Rating: Fixed
- .5 Air Tightness Rating: Operable (A)
- .6 Water Tightness Rating: (B)
- .7 Wind Load Resistance Rating: (C)
- .8 Forced Entry Resistance: (F)
- .9 Sound Attenuation:

.4 Minimum Energy Performance:

.1 Low-Rise Residential Buildings:

.1 Exceed by 10% the performance standards specified by the Energy Star Qualifying Criteria for Windows Sold in Canada.

.2 Mid & High-Rise Residential, and Commercial Buildings (minimum code compliance with ASHRAE 90.1 – 2004)

.1 Comply with BSR/ASHRAE/USGBC/IESNA Standard 189.1 – Standard for the Design of High Performance Green Buildings Except Low Rise Residential Buildings. A general summary of the required performance is as follows:

- .1 Maximum Assembly U-Value:
  - .1 Non-metal framing: U- 1.42 W/m^2 °K
  - .2 Metal frame curtainwall / storefront: U- 2.00 W/m^2 °K
  - .3 Metal framing: all other: U- 2.57 W/m^2 °K
- .2 U-Values to be published values provided by manufacturer based upon the NFRC ratings which consider all components within the fenestration area as defined by ASHRAE.
- .3 Maximum Assembly Solar Heat Gain Coefficient (SHGC)
  - .1 Nonresidential: 0.35 (all exposures)
  - .2 Residential: 0.40 (all exposures)
- .4 SHGC values to be published values provided by manufacturer based upon the NFRC ratings which consider all components within the fenestration area as defined by ASHRAE. ASHRAE alternative compliance of compliance using C.O.G. SHGC values are acceptable.

.2 Finish

.1 Aluminum:
  .1 Clear Anodized typical for new construction
  .2 Bronze Anodized or other finish to match existing where necessary.
  .3 Provide physical samples to FMGT for approval during design stage.
.2 Composite: Light Colors Only

.3 Hardware

.1 Hardware: Premium hardware as recommended by manufacturer for compatibility.
.2 Latching/locking devices shall be cam handle type (rotor operators, push bars are not acceptable).
.3 Hardware finish: To complement frames or match/complement existing in-situ products. Provide samples to FMGT for approval during design stage.
.4 Opening restrictors shall be installed to limit window *opening* as follows:
  .1 Typical: 150mm
  .2 Residential Units: 100mm.
.5 Opening operation
  .1 Residential units in dorms: awning or casement opening, unless approved otherwise.
.6 Screens shall not be provided, except some ground floor rooms, reviewed on a case by case basis.

.7 Operable windows in laboratories and other specialty spaces are to be installed with specialized hardware to suit opening only during a mechanical system failure or shutdown.

.4 Approved Products:

.1	Curtain Wall:	Kawneer 1600 system with AA900 IsoWeb Rainscreen Vent Operables (casement or awning only)
.2	Punched Windows:	Kawneer 5500 or 5525 IsoWeb Rainscreen windows with AA900 IsoWeb Rainscreen Vent Operables (casement or awning only)

.5 Quality Assurance

.1 Testing and Verification of Performance: In accordance with Section 1.2 – Quality Assurance & Quality Control:

  .1 In-Plant Testing

    .1 Manufacturer to test minimum 5% of windows (minimum 2) prior to shipments to site. Verification letter shall accompany shipments.

  .2 Field Testing – Water Penetration

    .1 Preferred: ASTM E1105 by using AAMA 502-02 Test Method B.

    .2 Contractor to provide full wall assembly detailing in area of all tests (for a minimum distance of 600mm beyond rough opening). Where stucco is the exterior finish, plywood may be used as a temporary cladding for the test, otherwise the specified cladding is to be in place at the time of testing.

.3 Test a minimum of 5% (minimum 2) of the total quantity of windows. One of the 5% shall be a mock-up test completed prior to installation of additional windows on site.

.4 For each testing failure, the original specimen plus an additional shall be re-tested at no cost to the Owner. The costs to repair, replace, or adjust the assemblies prior to re-testing shall be at no cost to the Owner.

.5 All modifications required to pass field tests must be performed on all other affected or similar assemblies.

.1 General Design Considerations

.1 Building entrances shall typically be aluminum, or wood when required to match an existing condition. Use steel exterior doors at locations with low public traffic (utility rooms, service access etc.). Exterior metal doors and frames shall be thermally broken wherever possible.

.2 Wood doors are typical for all interior locations. Use steel doors alternatively in high traffic applications, to satisfy required fire resistance ratings, for security purposes, or to match an existing condition.

.3 Typical door sizes
- .1 Typical thickness: 44 mm.
- .2 Minimum stile and top rail width: 125mm aluminum; 150mm wood doors.
- .3 Bottom rail: min 250mm
- .4 Minimum width: 900 mm single and 1800 mm double doors.
- .5 Mechanical rooms: minimum width 1200 mm, single or double doors. Double doors shall have the active leaf 900 (or 915) mm wide.

.4 Interior doors and windows used with modular wall partitions are desirable in office and meeting room locations to minimize the impacts of churn.

.5 The University encourages the use of glass panels in interior doors, to provide natural light in corridors. Frameless glass doors shall be avoided.

.6 All fasteners within secured areas shall be tamper resistant torx (or pin-in-torx, or torx TR).

.7 Interior door locations shall provide adequate clearance behind the door opened at 90^0 and the adjacent wall. The clearance between the edge of hinge side frame and adjacent wall:
- .1 100 mm – typical at offices, classrooms, labs, etc.
- .2 650 mm – typical at filing rooms, lunchrooms, office supply storage, etc.

.8 Shop drilling and notching shall be specified wherever possible.

.2 Quality Assurance

.1 Exposed exterior doors, particularly glazed assemblies within curtain wall or window wall assemblies shall specify required performance criteria as outlined in Section 8.1.

.2 Provide requirements for third party testing and verification of performance criteria as outlined in Sections 1.2 and 8.1.

.3 Wood Doors

.1 Faces (rated and non-rated assemblies):
- .1 Type 1: Hardwood veneer; solid core, rotary cut sound birch or maple.
  Finish: clear factory coating, satin sheen.
  Application: Typical; General offices, Classrooms.
- .2 Type 2: Hardboard, solid core, painted.
  Application: Residences, other locations as approved by FMGT.

.3 Core: Solid wood or composite core (mineral core is not acceptable).

.4 Steel Doors

.1 Use hollow core, welded assemblies (pressed seams not acceptable)

.2 Thickness of materials (minimum / mm):

.1	Face sheet – interior doors typical	1.2 (18 gauge)
.2	Face sheet - exterior doors	1.6 (16 gauge)
.3	Top and Bottom Channels	1.2 (18 gauge)

.5 Frames

.1 Use steel frames for typical interior doors and windows

.1 All frames to be welded pressed steel. Knock-down steel frames are not acceptable.

.2 Throat size to suit GWB wall construction for wrap around assembly.

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.1 General

.1 Use one manufacturer's products for related items.

.2 Aluminum store front doors must use the hardware indicated below, including FBB/NRP leaf hinges (continuous or pivots not acceptable).

.3 Products: to simplify maintenance and minimize parts stock, the following are University standards for all new and existing buildings, including Student Residences suites. ALL PRODUCTS LISTED BELOW SHALL BE AS SPECIFIED (NO SUBSTITUTIONS).

.2 Locksets, Locks and Latches

.1 Finish

.1 TYPICAL: satin chromium (# 626).

.2 Where necessary to match existing: oil rubbed bronze (#613).

.2 Electric hardware is preferred over electric strikes.

.3 Locksets - Keyed:

- Schlage 'ND' series - 6-pin cylinder - Rhodes lever handle (handle types other than lever are acceptable only when matching existing style takes priority, on a case by case basis).
- Key schedule and Keyway to be supplied by UVIC.

.4 Locksets – Key Pad: Schlage AD200CY70-PRK-RHO-626-PD with key override.

- This item shall be installed at User's request with cost to the department (not the project).

.5 Deadbolts: Schlage B600 series (installed 150 mm o/c above locksets)

.6 Special function locksets may be used only with the FMGT Executive Director approval.

.3 Exit Devices

.1 Panic Hardware:

- Von Duprin "33/35" or "98/99" series.
- Cylinder dogging is required unless using for EL hardware.
- Interior doors (lecture halls and corridor doors): where vertical rod is required use surface mounted less bottom rod application.
- Exterior doors (store front aluminum doors): where vertical rod is required internal rods are acceptable, top and bottom rods are required.

.4 Door Closers and Accessories:

.1 Door closers: shall be surface mounted (not recessed), heavy-duty, made by a manufacturer having service facilities in British Columbia, time adjusted for wheelchair entry at regular speed.

.1 Acceptable product: LCN 4041 series, adjusted to level 3 for interior doors and level 5 for exterior doors with "back check selector valve" set on for all parallel arm applications.

.2 Provide thru-bolt connection for closers used with particleboard filled doors (ie. typical solid core).

.2 Astragal: MUST be installed (on keyed side of door) at all double doors with <u>one leaf fixed</u>, as required to provide security and maintain the alignment of the door leaves and door hardware.

.3 Co-ordinator: None

.5 Automatic Door Operators:

.1 Automatic Openers shall be established in consultation with FMCA Locksmith and as follows:

- Product: Horton 7100 series, or pre-approved equal.
- Interior and exterior activation pads shall be hardwired.

.2 Electric power transfers: Von Duprin EPT 2 or EPT 10 as required

.3 Battery operated activators are not acceptable.

.4 Where possible, avoid mounting automatic door actuators (buttons) on the door frame. Provide in locations that suit ease of access and safe approach to the door such as an adjacent wall.

.6 Hardware Schedule:

Note: Schlage Vandlgard locksets are to be used used on all new buildings. Lockset type at additions and renovations must be confirmed with the FMCA Locksmith, on a case by case basis.

.1 Exterior Doors
- Lockset: "Night Entry" - except for exit only doors (i.e. if a key is used to open a door, the door must automatically relock when the user removes the key)
- Panic hardware in public areas
- Door closers: LCN 4041
- Hinges: FBB/NRP (Butt hinges only)

.2 Service rooms (Janitor, Mechanical, Electrical, Communications, Elevator Machine Rooms, etc.)
- Lockset: Schlage ND80PD/RHO or ND96PD/RHO (Vandlgard). Use PLY on exterior applications.
- Door closers: LCN 4041

.3 Washrooms (single user – without door opener)
- Lockset: Schlage ND73PD/RHO or ND97PD/RHO (Vandlgard)
- Door closer: LCN 4041
- Accessible washrooms require a delayed action closer

.4 Washrooms (single user – with door opener)
- Auto door opener: Horton 7100 Series
- Lockset: Schlage ND10S/RHO
- Deadbolt: Schlage B660P – installed 150mm o/c above lockset
- Electric Hardware: provide as required

.5 Washrooms (multiple users)
- Deadbolt: Schlage B663
- Door closer: LCN 4041 delayed action
- Push-Pull door hardware

.6 Offices
- Lockset: Schlage ND53PD/RHO or ND92PD/RHO (Vandlgard)
- Door closer: LCN 4041, only where required by Code

.7 Classrooms
- Lockset: Schlage ND70PD/RHO or ND94PD/RHO (Vandlgard)
- Door closer: LCN 4041, only where required by Code

.8 Classrooms (with card access)
- Lockset: Schlage ND80PD/RHO or ND96PD/RHO (Vandlgard)
- Door closer: LCN 4041

.9 Labs
- Lockset: Schlage ND60PD/RHO or ND93PD/RHO (Vandlgard) OR ND80PD/RHO or ND96PD/RHO (Vandlgard)
- Door closer: LCN 4041, only where required by Code.

.10 Student Residence Rooms
- Locksets: Schlage ND73PD/RHO or ND97PD/RHO (Vandlgard)
- Door closer: LCN 4041 - mounted on hallway side of door.

.11 Stairwell - Coordinate with BCBC exiting requirements:
- Doors with regular hardware: “Classroom” setup (can be left locked or unlocked using a key).
- Doors with card access: fail-secure “Storeroom” setup.
- Stairwell - Coordinate with BCBC exiting requirements:

.12 Padlocks – Schlage KS23D2300.

.7 Keys

.1 Doors, padlocks and cabinet locks shall be keyed as directed. Keying shall be to the University of Victoria grandmaster and master key system, using a Schlage quad/numerical keyway. All cylinders must be construction keyed.

.2 Construction Master Keying Systems may be required on new and large projects, as designated by the FMGT Executive Director. Such systems shall be established in consultation with the FMCA Locksmith.

.3 For projects with **under 50 locksets**: cylinders and keys are Not In Contract (installed by FMCA).

Provide sufficient notice to FMCA Locksmith for acquisition of materials.

.4 For projects with **over 50 locksets**: Hardware supplier to supply all cylinders and keys as per UVic’s Keying Schedule. Allow for:
- 15 copies of Grandmaster key
- 10 copies of each Master key
- 10 copies of Construction master key
- 4 extractor keys
- 8 keys per cylinder
- 200 key blanks
- 20 additional cylinders (10 standard cyls, 5 mortise cyls, 5 rim cyls.)
- All keys and key blanks stamped “**DO NOT DUPLICATE**”

.5 Hardware, cylinders and the 10 construction keys to be shipped to the site contractor for installation.

.6 All keys (grandmasters, masters, change keys, extractors and key blanks) shall be shipped by registered mail or courier directly from the manufacturer to the UVic Carpenters Shop.

.7 Construction plugs are removed by FMCA after Substantial Performance has been granted.

.8 Door Hardware and Keying Schedules Review Process

.1 Door Hardware Schedule

.1 Door Hardware Schedule must be submitted to FMCA Locksmith for review prior to tender. Corrections and changes will be noted and returned for updating.

.2 The final Hardware Schedule must be resubmitted and approved by FMCA Locksmith before ordering any materials.

.2 Keying Schedule: UVic FMCA shall provide a Keying Schedule after the final Hardware Schedule approval.