

1.0 **GENERAL**

1.1 **Related Work and UBC Guidelines**

- .1 Division 09 and related sections therein
- .2 Section 10 14 00 Room Numbering
- .3 Section 10 14 05 Sign Standards and Guidelines and UBC Interior Signage Guidelines
- .4 Section 14 20 00 Elevators for elevator machine room and closet design guidelines
- .5 Section 26 05 02 Installation Methods and Requirements – for electrical bike charging stations in bicycle rooms.
- .6 Section 26 05 00 Electrical – General Requirements for electrical service rooms and closet design guidelines.
- .7 Section 26 51 00 Interior Building Lighting for lighting controls in custodial and interior waste management rooms
- .8 Section 27 05 05 Communication Rooms Design Guidelines.
- .9 Division 27 for Audio Visual Technical Guidelines
- .10 UBC Learning Space Design Guidelines

1.2 **Related External Documents**

1. American Association of College Facilities Management.
2. Acoustical Report prepared by the Acoustical Consultant on a project.

1.3 **Description**

1. Section includes special requirements in for various types of rooms/spaces.

1.4 **Coordination**

2. The Guidelines apply to all work completed within buildings on both UBC Vancouver and UBC Okanagan campuses unless stated otherwise.
3. In instances where conflicts are found between these guidelines and provincial regulations or codes, please notify the UBCV Technical Review Team Architect and UBCO Facilities Management.
4. 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.
5. The Coordinating Registered Professional (CRP) is required to coordinate these requirements with other disciplines.

2.0 **DESIGN REQUIREMENTS**

2.1 **Main Entrances**

- .1 Hand sanitizing units are to be provided for all main entrances. Units are to be free- standing within 6 feet of entranceway.
 - .1 Required product (PURELL® LTX™ or TFX™ Dispenser Floor Stand SKU:2424DX) or wall mounted (PURELL® FMX-12™ Dispenser Push-Style Dispenser for PURELL® Hand Sanitizer SKU:5120-06).

2.2 **Kitchen and Lounges**

- .1 Provide space between the countertop and over counter cabinets to mount paper towel dispenser and soap dispenser.

- .2 All kitchens and lounges to have paper towel dispensers installed to conform to the UBC standard:

Kimberley Clarke Professional
Type: 09990
Color: Black/Smoke
Unit Size: 12.63" x 16.13" x 10.2"

This allows for the use of generic paper refills and universal keys so all paper towel dispensers use the same key. The top of the dispenser height is not to exceed 5.5 feet for access to the key on top of the lid.

- .3 All kitchens and lounges to have hand soap dispensers installed to conform to the UBC standard:

Purell FMX 20 (SKU 5234-06)
2000 ml Purell Healthy Soap SKU 5572-02
Color: Graphite/Metallic

This allows for the use of universal keys so all soap dispensers at UBC use the same key.

2.3 Washrooms

- .1 "Airport style" washroom design without the use of doors is preferable and promotes the use of hand dryers over paper towels.
- .2 Hardwired hand dryers are required in washrooms. UBC is in the process of phasing out paper towel use in washrooms.
- .3 Refer to Section 10 28 00 and consult with UBC Facilities Custodial Services for locations where paper towel dispensers are proposed.
- .4 Floor drains are required, see Division 22 Section 22 05 00 Plumbing - General Requirements.
- .5 For plumbing fixtures, see Division 22 Section 22 40 00 Plumbing Fixtures, Section 2.0.

2.4 Showers

- .1 Shower stalls shall be white durable plastic tub/shower surround and substrate shall be cementitious board, mineral fiber board or masonry. Floors to have waterproof membrane and slope to drain. Shower stall to have 100mm curb, except in accessible shower stalls. Where possible make single stalls accessible.
- .2 For floor drain requirements, see Division 22 Section 22 05 00 Plumbing - General Requirements.

2.5 Custodial Rooms

- .1 **General Requirements:**
- .1 Custodial rooms must be designed for ONLY custodial staff use. These spaces CANNOT be shared or be made to do double duty with any other operation in the building, because the already minimal space is then reduced to a dysfunctional level and their security access becomes compromised by other trades.
- .2 Motion detector or similar energy saving on/off light switches shall be installed in all custodial rooms.

- .3 Splash guards must be tiled and extend at least 2 feet above the janitor sink and 1 foot from the edge of the janitor sink laterally. Splash guard must be non-permeable and rust resistant, and colour should match to the extent possible the FRP panels required in 1.13.1.4.
 - .4 In custodial rooms or closets only, provide fiberglass reinforced plastic (FRP) panels to a height of 1200mm (48") from finished floor level. FRP panels to be Class C, white or grey in colour. This requirement is in addition to the tiled splash guard at the mop sink as per 1.13.3.
 - .5 All custodial rooms shall be designed for detergent mixing stations and require 3/4" hot and cold backflow preventers installed above the mop sink. Refer to Section 22 11 18 for more information.
 - .6 Floor Finishes - exposed concrete with non-porous sealer is preferred. If not possible to provide, vinyl or elastomeric flooring would be acceptable.
- .2 Main Floor Custodial Room in Loading Bay – Space Allocation**
- .1 400 square feet per major building is required. Room is to be located very close to a loading bay.
 - .2 Dimensions: 20 feet by 20 feet
 - .3 Door width: 48 inches; in-swinging with door stop. Door to be hollow metal body construction to allow for pallet delivery and mitigate damage.
 - .4 Electrical: two – one rated at 15 amps, one rated at 20 amps with 110 volt duplex receptacle outlets. 500 lux maintained lighting levels.
 - .5 Plumbing: Floor drain in centre; floor mounted custodial mop sink c/w 150mm curb with notched front for easy tilting to empty mop bucket, with stainless steel splash guard shield on wall.
 - .6 Shelving: 16 inches deep; adjustable height; two rows at 36 inches, 48 inches on the longest wall.
 - .7 Mop hanger: Continental # 515; steel with rubber cam, grips 7/8" to 1 1/4" diameter handles; three mop hangers to be located 70 inches over the floor mounted custodial sink.
 - .8 Typical supplies and equipment to be stored would consist of: paper supplies, 20 + gallons of chemicals, pails, brooms, mop & bucket, floor pads and scrubbing brushes, safety signs, wet/dry vacuums, extension cords, chalk, small liners, large liners, dust mops, vacuums, buffing machines, burnisher, stripping/finishing supplies, custodial cart, carpet cleaning, autoscrubber, and miscellaneous cleaning items.
- .3 Standard Custodial Room (Typical for all other floors)**
- .1 120 square feet required per floor. It will serve the needs of the assigned area for each custodian (approximately 25,000 to 30,000 square feet of building area).
 - .2 Dimensions: 10 feet by 12 feet
 - .3 Door width: 36 inches; in-swinging with door stop.

- .4 Electrical: one – rated 15 amps, 110 volt duplex receptacle outlet.
- .5 Plumbing: Floor drain in centre; floor mounted custodial mop sink c/w 150mm curb with notched front for easy tilting to empty mop bucket, with stainless steel splash guard shield on wall.
- .6 Mop hanger: Continental # 515; steel with rubber cam, grips 7/8 to 1 ¼” diameter handles; three mop hangers to be located 70 inches over the floor mounted custodial sink.
- .7 Shelving: Heavy duty steel shelving; 16 inches deep; adjustable height; two rows at 36 inches, 48 inches; on longest wall.
<https://www.homedepot.ca/en/home/p.48-inch-w-5-level-heavy-duty-steel-shelving-unit-in-black.1000674332.html>
- .8 Typical supplies and equipment to be stored would consist of: paper supplies, wet/dry vacuums, buffing machine, autoscrubber, canister vacuum, pacer 30” vacuum, custodial cart, mop & bucket, up to 20 gallons of chemicals in 1 gallon containers, brooms, wet mops, and cleaning supplies.

2.6 Interior Waste & Recycling Room in Loading Bay – Space Allocation

.1 General Requirements:

- .1 Secure and externally accessible storage room, located near service entry to the building that can accommodate short term storage of waste materials (e.g. garbage, recyclables, and confidential shredding material and special wastes). The minimum dimensions for the storage room are to be 22’-0” x 22’-0”. Consult UBC Waste Management and Custodial Services to confirm storage specifications for recycling and waste.
- .2 Waste and recycling room must be designed for ONLY waste management and custodial staff use. These spaces CANNOT be shared or be made to do double duty with any other operation in the building.
- .3 Motion detector or similar energy saving on/off light switches shall be installed in this room.
- .4 Door to waste and recycling room to swing out.
- .5 The floor in the waste room shall be coated with durable industrial grade non-slip coating. (Floor finish to be as per TG Section 09 67 00, item 2.1.1)
- .6 Room to be plumbed with a floor drain and a hose bib.

2.7 Electrical Rooms

- .1 The preferred location for Main Electrical Rooms is on North or East exterior building wall (for cooling and to allow for direct ventilation). Main Electrical Rooms, Local Electrical Rooms and Electrical Closets are considered Restricted Access Service Rooms/Closets. These rooms/closets are to be designed for housing electrical distribution equipment, electrical metering equipment, life safety equipment, lighting control equipment only.
- .2 Main Electrical Rooms, Local Electrical Rooms and Electrical Closets are not to be used as conduits (pass through/feed through) for other building systems serving other areas such system include HVAC, communications and security.

- .3 All electrical distribution equipment, electrical metering equipment, life safety control equipment, Transfer Switches, lighting control equipment including panelboards are to be located in Main Electrical Rooms, Local Electrical Rooms and Electrical Closets. Electrical distribution equipment, electrical metering equipment, life safety equipment, lighting control equipment including panelboards shall not be installed in any other room including Communication Rooms, Custodial Rooms, Laboratories, Audio Visual Service Rooms, Classrooms, Lecture Theatres, Offices or Corridors. Mechanical Rooms may contain Motor Control Centres, Variable Speed Drives, Distribution Centres and Panelboards for mechanical loads.
- .4 All Electrical Rooms and Closets shall be designed and located in the building so that direct access is from a common or non-secure area such as a public corridor. Electrical Rooms and Closets shall not be located behind other rooms that might have specialized or secure locks installed; for example, a custodial room, server room, machine shops, etc.
- .5 All Electrical Rooms and Closets shall be designed so that no equipment will be installed above a door or behind an inward opening door swing.
- .6 All Electrical Rooms and Closets shall have 1.2 m horizontal by floor to ceiling vertical, of open wall space to allow for installation of future equipment.
- .7 All Electrical Rooms shall be located and constructed to allow for replacement of installed equipment. All possible challenges must be considered such as structural loading, size of doorways and access corridors and exterior access.
- .8 All Electrical Rooms and Closets housing transformers shall be insulated to prevent sound transmission to adjoining spaces.
- .9 Pressurized/unpressurized piping systems are not permitted to enter electrical rooms. The only exception is sprinkler system branch lines and fan coil lines that serve the electrical room.
- .10 Refer to Section 09 67 00 Fluid-Applied Flooring for floor finish type in the main electrical room. On upper floors of a building where electrical closets are accessed from a public corridor, it will be acceptable to have polished concrete or resilient flooring in electrical closets to match the use of these finishes when used in public corridors.
- .11 User owned electrical equipment that is not part of base building electrical shall not be installed in any electrical room. This includes but is not limited to distributions, transformers and UPS systems.

2.8 Mechanical Rooms

- .1 Refer to Section 09 67 00 Fluid-Applied Flooring for floor finish and cove base type plus height in mechanical rooms.

2.9 Elevator Machine Rooms

- .1 Elevator Machine Rooms shall contain: elevator controllers, elevator power disconnects, elevator cab lighting disconnects, communication demarcation, fire alarm system interface relays and any other equipment directly related to elevator operation. Elevator Machine Rooms are required when a machine is hoistway mounted.

- .2 Systems or equipment not directly related to elevator operation shall not be installed within Elevator Machine Rooms.
- .3 Elevator Machine Rooms shall be constructed so that ceiling mounted lighting, smoke detectors and other equipment can be safely accessed for maintenance and replacement.
- .4 Minimum size of Elevator Machine Rooms shall allow for replacement of controllers from at least 3 non-proprietary manufacturers. At no times shall the Elevator Machine Room be smaller than 1.5 m deep by 2.2 m wide by 2.4 m high.
- .5 Elevator machine rooms and closets shall be designed to have adequate space to safely maintain and replace any and all equipment safely. The ability for a worker to access ceiling mounted equipment from a step-ladder is required. No equipment, other than what is required by applicable codes and standards shall be installed in an elevator Machine Room or Closet. No equipment shall be mounted above 2 m unless required by applicable codes or standards.

2.10 Communications Rooms

- .1 A Communications Room is a service room designed to safely house telecommunications equipment. It is also used to mount and terminate voice, data, RF, and when approved by UBC IT – security cables security cables and their associated terminating and distribution systems.
- .2 Communications room construction shall meet all applicable building, fire, electrical and safety codes and regulations as stated by UBC. No fire separation or resistance rating is required on the walls or ceilings provided the walls are constructed of 16mm Type X GWB on both sides of stud walls. Hub Rooms shall be constructed to meet a 1 hour fire separation. A smoke detector, connected to the fire alarm system, shall be installed in all communications rooms.
- .3 Each campus building will contain a Main Communications Room and possibly many Local Communications Rooms. The Main Communications Room may be used as a floor serving facility in addition to a Local Communications Room serving facility. No other building systems are to be installed in the Main Communications Room.
- .4 Local Communications Rooms or Closets are used as a floor serving facility for mounting and terminating approved communications cabling and hardware only. No other building systems are to be installed in the Local Communications Room.
- .5 Details of communications systems function and installation are handled by Division 27.
- .6 False ceilings are not permitted in communication rooms.
- .7 Communications Rooms and Closets have special requirements addressed in Division 27 of the Technical Guidelines, Section 27 05 05 Communication Rooms Design Guidelines. They shall only contain approved equipment and systems as indicated in Division 27.
- .8 All Communications Rooms shall be designed and located in the building so that direct access is from a common or non-secure area. Communications Rooms are not to be located behind other rooms that might have specialized or secure locks installed; for example, a custodial room.

2.11 AV and Equipment Rooms

- .1 AV rooms to be used as theatre projection rooms have special requirements. The UBC AV group shall be consulted in these situations.

2.12 Biohazard Labs

- .1 Please contact UBC Safety and Risk Services if special facilities are to be designed. For any assistance with coordination, the Facilities Transition Team can be contacted.
- .2 For floor drains, see Division 22 Section 22 05 00 Plumbing - General Requirements.

2.13 Radioisotope Labs

- .1 Please contact UBC Safety and Risk Services if special facilities are to be designed. For any assistance with coordination, the Facilities Transition Team can be contacted.
- .2 For floor drains, see Division 22 Section 22 05 00 Plumbing - General Requirements.

2.14 Animal Care Facilities

- .1 Design and construction to be completed in accordance with the latest CCAC guidelines.

2.15 Central Receiving & Campus Mail Rooms (UBC Okanagan Only)

.1 Central Receiving

.1 CRMS and Residences

1. All UBC Okanagan central receiving rooms for Canada Post and/or courier deliveries must be designed to be secure at all times, with access to mail and packages restricted to receiving room staff. This is especially important as these rooms sometimes receive deliveries of research materials classified as dangerous goods.
2. Central receiving rooms cannot be made to do double-duty with other campus or residences services.

.2 Campus Mailrooms

.1 General Requirements

1. Mailrooms must be designed for CRMS use only. These spaces cannot be shared or made to do double duty with any other operation in the building because the already minimal space is then reduced to a dysfunctional level and their security access is compromised by other users of the space.
2. Mailroom can be located within a business workroom, provided that it is a separate room, with a door, used only for mail (no photocopier can be located in mailroom).
3. Must be a minimum of one mailroom per floor for every floor containing a business workroom.

.2 Mailrooms for all buildings

1. Minimum 49 square feet required per mailroom (minimum 6.5 feet width or length).
2. Minimum door width: 30 inches, out-swinging.
3. Doors to the mailroom must be openable with SALTO access only.

4. Must have at least one Mailserter per mailroom (similar to U-line Mail-Sorter Model H-8349: dimensions: 60 x 30 x 72-80 inches).

2.16 Bicycle Rooms

- .1 Coordinate design requirements with Section 26 05 02 , Installation Methods and requirements, 2.0.2.17 for electrical bike charging stations in bike rooms.
- .2 Due to increased fire risk associated with such charging stations, CRP to coordinate any fire-suppression or fire-rating requirements for bike rooms with UBC Safety and Risk Services.

2.17 Classrooms

- .1 Design requirements are to be as per the UBC Learning Space Design Guidelines.
- .2 Refer to Audio Visual Services, UBC IT, for sound, video and control systems guidelines. Provide for adaptability due to technological changes.
- .3 Demonstrate active and passive acoustic strategies.
- .4 Coordinate with the **Acoustical Design Standard for UBC Classrooms** requirements as noted in 2.18 below.

2.18 Acoustical Design Standard for UBC Classrooms

.1 Scope

This standard pertains to the design of acoustical environments in spaces for teaching and learning ('classrooms') at UBC, and to related non-acoustical issues. It is relevant to the design of the geometry of the spaces, their bounding surfaces, their internal surface finishes, their contents, their mechanical, electrical and other systems, and their audio-visual systems. This standard specifies acoustical performance criteria that must be met to ensure high quality acoustical environments.

.2 Classroom Categories & Acoustical Criteria

- .1 This standard considers six (6) categories of classrooms, as follows:
 - .1 **Type 1:** Theatre/Large Classroom (75 to 500 seats, rectangular / non-rectangular geometry, with a speech-reinforcement system)
 - Reverberation Time (s) in the range 0.75 to 0.85 s
 - Maximum noise level = NC 30
 - .2 **Type 2:** Classrooms (30 to 120 seats, rectangular geometry, no speech-reinforcement system)
 - Reverberation Time (s) in the range 0.45 to 0.60 s;
 - Maximum noise level = NC 30
 - .3 **Type 3:** Seminar Rooms (8 to 40 seats, rectangular geometry, no speech-reinforcement system)
 - Reverberation Time (s) in the range 0.35 to 0.50 s;
 - Maximum noise level = NC 30

- .4 **Type 4:** Informal Learning Space Collaboration/Learn Labs (capacity for 2 to 100, open areas in building designed for quiet study, individual or study work, group study, collaborative work, etc.
 - Reverberation Time (s) in the range 0.45 to 0.60 s;
 - Maximum noise level = NC 35
- .5 **Type 5:** Collaboration/Learn Labs (capacity for 2 to 100, rectangular geometry, no speech-reinforcement system)
 - Reverberation Time (s) in the range 0.45 to 0.60 s;
 - Maximum noise level = NC 35
- .6 **Type 6:** Critical Classrooms (e.g., for distance learning, conferencing and /or media capture).
 - Reverberation Time (s) in the range 0.45 to 0.55 s;
 - Maximum noise level = NC 25.
- .2 Reverberation-time criteria (RT60) refer to the average values of RT60 over the octave band frequency spectrum between 250 Hz and 4000 Hz in the unoccupied condition, which will also be the testing conditions.
- .3 Noise Criteria (NC) levels refer to the unoccupied classroom (i.e., excluding student-activity noise) with mechanical services (e.g., the HVAC system) in typical operation, with normal activity occurring outside the classroom, and the classroom doors and windows closed.
- .4 For all room categories, it is critical that there is adequate sound isolation between the rooms and adjacent spaces. The adjacent spaces may include, but are not limited to, projection booths, other learning spaces, meeting rooms, washrooms, and corridors.
 - .1 All perimeter walls should achieve a Sound Transmission Class (STC) rating of STC 55.
 - .2 Doors should be solid core with acoustic seals to provide the noted STC rating above.
 - .3 Noise isolation to rooms above and below should be a minimum STC rating of 50.
 - .4 Alternative criteria may be acceptable subject to the building type (i.e., administrative spaces); liaise with UBC representative.
- .5 Sound Transmission Class (STC) is a single number method of rating how wall partitions, floors and ceilings reduce sound transmission.
- .6 Classroom equipment (projectors, computers, AV furniture ventilation fans, etc.) should be chosen to meet these criteria.
- .3 **Objectives**
 - .1 This standard presents acoustical performance criteria that will ensure that the acoustical environments in UBC classrooms are of high quality for the majority of instructors and students.

- .2 It ensures that excellent verbal communication is possible between students and teachers. This is achieved by ensuring, at all seats, sufficiently high speech levels and sufficiently low noise levels, as well as appropriate reverberation.
- .3 Spaces with acoustical environments that do not meet these criteria would be expected to present barriers to teaching and learning.
- .4 **Design Constraints**
 - .1 The development of these acoustical standards was based on the following assumptions, and took into account the following constraints, in part imposed by current UBC policy:
 - .1 Classrooms are minimum 70 % occupied when used for teaching and learning;
 - .2 new UBC classrooms will normally have resilient flooring with plastic seating but could have carpets/carpet tile, upholstered seating and/or sound-absorptive wall treatments;
 - .3 many UBC classrooms have ceiling absorption – often form all or part of a suspended acoustical ceiling – to control the classroom reverberation, in-class student-activity noise and impact noise from spaces above the classroom;
 - .4 Given the above, the main source of sound absorption is the occupants of the classroom. Classrooms need to be designed to have optimal acoustic properties with minimum 70% occupancy, resilient flooring, plastic seating and T-bar ceilings.
- .5 **Controlling Classroom Sound**
 - .1 Acoustical design is a complex inter-disciplinary task that must be considered in the design or renovation of all classrooms.
 - .2 An acoustical consultant must be involved at the inception of all projects. The acoustical consultant should work closely with UBC Facilities Planning Learning Spaces, UBC IT Audio Visual, the Project Architect and other Consultants designing building systems.
 - .3 Coordinate with other UBC Technical Guideline sections relating to Acoustics:
 - .1 Section 08 00 10, Openings- General requirements, 1.3.7, for sound attenuation rating requirements.
 - .2 Section 09 00 10 – Finishes- General Requirements, section 1.3 Acoustic Requirements
 - .3 Section 09 00 10 – Finishes – General Requirements, 2.2.11 Flooring Materials and Design Requirements for lecture theatres and areas with fixed seating.
 - .4 Section 09 00 10 – Finishes – General Requirements, 5.1.5 Ceiling Materials to coordinate for noise and sound reduction requirements.
 - .5 Section 09 51 00 Acoustical Ceilings, section 2.0 for ceiling materials requirements.
 - .4 Controlling and optimizing the acoustical conditions in a classroom, or other rooms for speech, involves three fundamental considerations:
 - .1 Promoting high speech levels by:

- .1 Avoid excessive volume due to high and vaulted ceilings.
- .2 Use geometries that direct sound to the back of the room.
- .3 Avoid long and wide rooms.

- .2 Use speech-reinforcement system Control background noise (NC) by:
 - .1 Avoid open-plan design.
 - .2 Control the noise and vibration of mechanical services.
 - .3 Choose quiet equipment for use in the classroom, or enclose them in properly designed enclosures.
 - .4 Impact noise due to student activity.
 - .5 Provide adequate sound isolation; in critical cases, this might require the use of non-openable windows, entrance vestibules and quality door seals.

- .3 Optimizing reverberation (RT60) by:
 - .1 Apply appropriate sound-absorptive materials to the room surfaces.
 - .2 Avoid applying sound absorption to surfaces that can provide strong early reflections. This may be the front of a lecture theatre, or the central portion of a meeting room, for example.

.6 Verification and Commissioning

- .1 During the design process, a representative set of rooms should be modelled to ensure they meet the required acoustic properties outlined above and test results are to be provided to verify rooms meet UBC Acoustic Criteria.
- .2 Commissioning is to be done by an independent third party acoustic commissioner retained by the Owner's Representative to ensure rooms meet the design requirements.
- .3 The list of rooms to be included in the commissioning and verification report shall be selected and approved by UBC Facilities Planning, noting that site conditions may require alternative rooms to be tested.
- .4 Upon completion of construction and mechanical system balancing, commissioner to perform acoustic verification for the selected rooms. Commissioner to carry all costs of acoustic verification and provide verification report upon completion.
- .5 Allow for testing and verification of acoustic parameters by commissioner. Verification report to include the ambient noise level due to HVAC systems, in terms of NC, measured and calculated in accordance with ANSI S12.2 "Room Noise Criteria"; and the reverberation time, in terms of RT60, measured in accordance with ISO 3382 (Part 1, or Part 2, as relevant to the space-type).
- .6 Allow time and material for full participation in the commissioning process in line with the commissioning plan at no additional cost to the project.
- .7 Acoustic commissioning to be coordinated with the Cx Authority and Facilities Transition Team.

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