

1.0 **GENERAL**

1.1 **DOCUMENTS**

- .1 This section of the Specification forms part of the Contract Documents and is to be read, interpreted, and coordinated with all other parts.

1.2 **SUMMARY**

- .1 Section Includes:

- 1.0 GENERAL
- 1.1 DOCUMENTS
- 1.2 SUMMARY
- 1.3 COMMUNICATION ROOM DETERMINATION
- 1.4 COMMUNICATION ROOM RESTRICTIONS
- 1.5 COMMUNICATION ROOM LAYOUT
- 2.0 DOORS
- 2.1 KEYING
- 2.2 FLOORING
- 2.3 PAINTING AND FINISHING SCHEDULE
- 2.4 SIGNAGE
- 2.5 SMOKE DETECTOR, HEAT DETECTOR, SPRINKLER SYSTEM
- 2.6 BACK-UP POWER AND POWER OUTLETS
- 2.7 FIRE-RATED DOOR GRILLS
- 2.8 EQUIPMENT CABINETS
- 2.9 HORIZONTAL CABLE
- 2.10 LABELING
- 2.11 ENTRANCE CABLE PROTECTORS

1.3 **COMMUNICATION ROOM DETERMINATION**

- .1 A Communications room is a service room designed to safely and securely house telecommunications equipment, and mounting and terminating of approved voice and data cables and their associated terminating and distribution equipment. A Communications room will not be used to house, or as a pass-through for, any components or systems that are not specifically related to the function of the communications room or stated as acceptable by UBC IT. This restriction includes, but is not limited to, electrical conduits and junction boxes, mechanical ducts and lines, plumbing connections and lines.
- .2 Number of and placement of Communication rooms will be based on the use of the 90-meter rule in a 360-degree coverage pattern where it allows the concentration of horizontal cable runs to common locations. This provides for cost effective network equipment utilization. A UBC Information Technology Representative will review the proposed placement at the conceptual design phase for approval. Minimizing the quantity of communications rooms and consolidating the network equipment are essential.
- .3 Communications designers are to draw a scaled circle on all electrical building floor plans indicating the 90-meter point from the serving communications room, taking in to account any riser distance needed for communications rooms that are not on the same floor. The intent is quickly identifying any outlets that exceed the 90-meter distance limitation.

- .4 Each Campus building will contain one Main Communications Room (MCR) and, as determined by the size of the building, may also contain one or more Local Communications Rooms (LCR).
- .5 The MCR will be used to mount UBC IT telecommunications equipment and terminations common to the entire building. Usually, the MCR room also provides as a floor serving facility for mounting and terminating of UBC IT Communications cabling and hardware. This room requires a minimum one-hour fire rating and is usually located in the basement..
- .6 LCRs serve a floor or several floors and are used to mount and terminate approved Communications cabling, hardware and equipment.
- .7 Installation details of a given communication system in a Communications room shall be verified with the UBC Information Technology Representative on site prior to time of installation.
- .8 Each Communications room shall have some form of environmental control provided regardless of whether the building as a whole is so equipped.
- .9 All Communications rooms shall be designed and placed so that direct access is from a common or non-secure area. Communications rooms are not to be placed behind other rooms that might have specialized or secure locks installed, for example a janitors' room or electrical room.

1.4 **COMMUNICATION ROOM RESTRICTIONS**

- .1 The minimum size of a communications room is determined by the expected cabinet quantity and associated cabinet clearances. The preferred shape of a communications room is square. For example, a room expecting to house a single cabinet would respect the 1.5m cabinet clearance front and 1m cabinet clearance rear to arrive at a depth of approximately 3.5m. As the preferred shape is square the resulting room will be 3.5m x 3.5m or 12.25m². Additional cabinets will require additional space. Any architectural or mechanical assets located inside a communications room must not subtract or disrupt the intent of the clear working space of the communications room. See section 2.8 of this document. A Communications room will not be used to house, or as a pass-through for, any components or systems that are not specifically related to the function of the communications room or stated as acceptable by UBC IT. This restriction includes, but is not limited to, electrical conduits and junction boxes, mechanical ducts and lines, plumbing connections and lines.
- .2 Communications rooms shall only contain Communications wiring, terminations and distribution equipment. UBC Information Technology must approve all security equipment installations before design. All other building systems equipment is not approved for installation in Communications rooms, for example AV equipment, BMS equipment, Clock equipment, Fire Alarm panels, Cellular systems.
- .3 Occupants or end users of the building are not allowed to install or house any equipment in the communications rooms.
- .4 Other utilities shall not use the Communications Room space for pathways of ducts and pipes, other than those needed directly for environmental control of the Communication room. Creating a drywall box around utilities to affect a separation to the communications room is not acceptable. Other utilities will not pass through communications rooms space as measured from slab to slab for floor to ceiling and not within the perimeter walls of the room.

- .5 All supporting infrastructure (i.e.- electrical conduits) will be routed following building lines and utilize the corners of the room for vertical travel. This will allow for the largest uninterrupted space on the plywood back board walls, which is integral to the communications installation.
- .6 Communications rooms should not be located below rooms that are designed for wet usage i.e. – laundry, washroom, kitchen. If this is unavoidable, then a waterproof membrane system with floor drain must be utilized to prevent water escape to the comm room below.

1.5 **COMMUNICATION ROOM LAYOUT**

- .1 Penetrations through walls, floors and ceilings shall be fire-stopped using products as outlined in the UBC Guidelines Section 27 05 07 Fire-Stopping if applicable.
- .2 All walls shall be lined with rigidly installed 20 mm (3/4"), G1S (good one side) plywood, with the good side facing out. The plywood must be painted with two coats of light-colored Intumescent paint applied to all sides. If Treated Fire Rated Plywood is used, then the paint is not required to be intumescent. The full 8' length of plywood shall extend up from approximately 150mm height AFF. The plywood shall be professionally installed and fitted to the walls of the room. A poor-quality fitting and installation will not be accepted. Piecemeal installation of plywood will not be accepted, full length pieces must be used where they can. All plywood edges will be installed flush to each other to avoid ridges where the sheets meet. "Smash pins" are not an acceptable method of attachment as they are not flush with the finished plywood surface.
- .3 Install a drip tray(s) for any fluid carrying piping or sprinkler heads that are located above equipment racks.
- .4 The only access from adjacent ceiling spaces shall be by cable tray or conduit to allow connection to the horizontal and backbone pathways, HVAC supply lines and condensate drains specifically for conditioning of the communications room, sprinkler supply lines for protection of the communications room.
- .5 All power receptacles shall be centered at 300 mm AFF, or match mounting height of existing receptacles.
- .6 The lighting fixtures shall be mounted a minimum of 2900 mm AFF and positioned so that the majority of the light emitted falls on the front and rear of the equipment cabinets/ racks. Avoid placing the lights directly above the equipment cabinet / rack row.
- .7 Unless specified to the contrary, a minimum of one equipment cabinet shall be supplied and installed in each active Communications room (not required for designated pass thru rooms). Exact placement and proposed layout of the equipment racks and required cable mangers shall be reviewed by UBC Information Technology Representative and must observe the required clearances around the cabinet.
- .8 UBC Information Technology Representatives will consult with the contractor regarding the final location of UTP/STP, coax, and fibre optic, terminating and distribution equipment at the time of installation.

- .9 A Flex or basket type cable tray shall be provided around the perimeter of the room and shall be attached to the Communications cable tray infrastructure as per standard drawing ITSTD-05. The tray shall be mounted @~2700 mm AFF. When used, wall-mounted tray brackets shall be securely bolted through the plywood into the wall structure behind it.
- .10 All conduit terminating in the ceiling space shall protrude into Communications rooms between a distance of 25 mm to 100 mm. The conduit stubs must be higher than the cable tray. Preferably installed with a small downward kick bend to assist in the waterfall of the cables in to the cable tray. *Any conduit protrusions that are more than 600mm above the cable tray must have additional cable supports installed, either additional plywood or cable tray. Adding a 90 deg bend and extending the conduit down to the cable tray should be avoided, however extending conduits straight down without bends to the tray level is acceptable.*
- .11 All conduit entry in to communications rooms will be above or below the installed plywood sheathing. Conduits should not penetrate directly through the plywood sheathing unless approved by UBC Information Technology.
- .12 The use of a pull pit in the Main Communications Room is not acceptable.
- .13 Communications rooms should not have drop ceilings or finished ceilings installed. The room is intended to be open / unfinished ceiling for easy access to pathways.

2.0 **DOORS**

- .1 The supply of finish hardware on all new doors and frames are indicated on Architectural drawings and schedules. Retrofit existing hardware where directed on drawings. As a minimum, all existing doors shall be fitted with new accessible locksets.
- .2 Provide pressed steel frames and hollow metal doors C/W fire-rated door grilles.

2.1 **KEYING**

- .1 All Communication Rooms shall be “storehouse” keyed to the restricted access, ABLOY lock & key assemblies, as supplied and installed by the UBC Locksmith. The Contractor shall coordinate and arrange for installation of Communication Room locksets, prior to the installation of network equipment.

2.2 **FLOORING**

- .1 New Communication Room floor coverings shall be linoleum composite sheeting i.e. “Marmolium” as noted on drawings. Vinyl tiles are not acceptable. Sealed concrete is not acceptable. Epoxy seal floor finish is acceptable in a gray colour.
- .2 Re-use of existing flooring where applicable, shall be at the discretion of the UBC Information Technology Representative.

2.3 **PAINTING AND FINISHING SCHEDULE**

- .1 All plywood wall sheathing shall be treated with Intumescent paint if fire resistant plywood is not installed. Refer to MPI #64 listing and reference INT. 6.4S.

2.4 **SIGNAGE**

- .1 Provide room signage for all new or renovated Communications Rooms, closets or ancillary rooms created as part of the Communications infrastructure where these are accessed from a public corridor or where necessary to facilitate way-finding as per

current Campus Community Planning Standards.

- .2 Remove and replace existing signage where this can be incorporated in the new work.
- .3 Communications spaces must not be referred to as Electrical rooms as this implies a different level of safety requirements and access controls.

2.5 SMOKE DETECTOR, HEAT DETECTOR, SPRINKLER SYSTEM

- .1 Sprinkler heads shall be high temperature type. For existing sprinkler system inside communications room area, replace existing sprinkler head with high temperature type.
- .2 Provide cage to sprinkler heads for mechanical protection.
- .3 Install a drip tray(s) for any fluid carrying piping or sprinkler heads that are located above equipment racks.

2.6 BACK-UP POWER AND POWER OUTLETS

- .1 The Contractor shall provide power to MCR and LCR from both stand-by generator power supply panel, if the building is so equipped, and standard building power.
- .2 The Contractor shall provide a minimum of (1) 30A 120 V AC circuit (non-switchable) outlet. This circuit is to appear in (1) double gang simplex electrical outlet located on the wall directly behind or beside the IT equipment cabinet in the MCR and each LCR. (Refer to Drawing ITSTD-4 & 11) The outlet receptacle is to be a NEMA L5-30R twist lock. If standby generator exists in the building, then a second 30A 120V AC circuit (non switchable) outlet will be installed beside the above indicated outlet using the same format box/ plug combination and location. The intent is to have (2) L5-30R outlets in the room near the equipment rack, one on generator, one on standard building power. This requirement repeats for each active network equipment rack in the room, for example if a room has 2 active network equipment racks then there will be (2) sets of (2) L5-30R outlets. Each L5-30R outlet will be labelled to indicate if it is supplied by Generator or regular power including the breaker panel and breaker position.
- .3 The Contractor shall provide (2) dedicated 15A, 120V AC (non-switchable) circuits. These circuits are to appear in double gang duplex convenience outlets located at not more than 2000mm intervals around perimeter walls of MCR and each LCR. Convenience outlets shall be identified and marked. These outlets are to be supplied from standard building power. (Refer to Drawing ITSTD-04 & 11) These outlets must be labelled with the breaker panel and breaker position. [Conduit routing for these outlets must not vertically cross the plywood backboards except in the corners of the rooms.](#)

2.7 FIRE-RATED DOOR GRILLS

- .1 Only when requested by UBC IT.

2.8 EQUIPMENT CABINETS

- .1 Equipment cabinets will be per approved manufacturers and associated part numbers supplied and detailed in Section 27 05 08.
- .2 Each equipment cabinet shall be plumbed and leveled, and solidly bolted to the floor with bolts, washers and brackets. Bonding of rack to ground per Section 27 05 26
- .3 Equipment cabinets shall be seismically restrained, as shown on ITSTD-36 and per UBC Campus Community Planning Standards.

- .4 Where two or more cabinets are mounted side by side; the racks shall be bolted together with the indicated vertical wire managers between the racks (if requested) or as directed by UBC IT. Provide side panels, front and rear doors, and cabinet top only when requested by UBC IT. See ITSTD-15.
- .5 Provide 1.5 meters access clearance in the front and 1-meter access clearance in the rear and one side of an equipment cabinet. Where several rows of racks are located side by side, the row spacing shall be a minimum of 1.5 meters. A minimum clearance of 150 mm shall be maintained between one side of an equipment cabinets and the wall. [See ITSTD-4.](#)
- .6 Typical equipment cabinet data port capacity is 432 horizontal cables when the UPS is installed in the same cabinet. If the UPS is not present then the typical data port capacity is 576 horizontal cables.

2.9 HORIZONTAL CABLE

- .1 In a communications room, horizontal cables shall be bundled separately from entrance and riser cables.
- .2 A minimum of 5 meters slack shall be left on all unterminated cables in the communication room.

2.10 LABELING

- .1 Each MCR and LCR is identified with a unique terminal room number supplied by the UBC Information Technology Representative. (Refer to Section 27 05 53 and ITSTD32)

2.11 ENTRANCE CABLE PROTECTORS

- .1 Always leave space for location of entrance facility terminations and protectors in the main communications room of a building as per drawing ITSTD-06 and always co-ordinate this layout with the UBC Information Technology Representative. (Refer to Section 27 05 06)

2.12 COMMUNICATIONS ROOM VENTILATION

- .1 Each MCR and LCR is to be provided with a means of ventilation (heat abatement) sufficient to maintain an average ambient air temperature range of 20 C to 23 C, as measured at the midpoint of the front face of the installed equipment racks. This temperature range is to be maintained on a 24 hour a day by 365 day per year basis. Modulation of the communications room temperature or ventilation airflow (supply/exhaust) via in-building BMS systems is not allowed.
- .2 Where a centralized source of chilled water/fluid exists or will be provided within the building, each MCR/LCR should be provided with its own ceiling-mounted fan-coil unit, with wall-mounted thermostat for full local temperature control.
- .3 If no centralized source of chilled/fluid exists, a package precision-cooling chiller unit such as those from American Power Conversion (Network Air CM series or equivalent) or Liebert (Datamate, Minimate or equivalent) should be provided. [Split systems are acceptable however each condensate drain must be professionally planned and installed.](#)
- .4 If there is mechanical room space available adjacent to the communications room, it is preferable to mount fan-coil or package chiller units within the mechanical room (and duct the supply and return thru wall penetrations) to avoid running water/glycol pipes within the communications room envelope.

- .5 Wherever possible, ventilation system supply/return air ducting is to be placed such that chilled supply air is directed to the front of installed equipment racks, and return/exhaust intakes are above the rear of the equipment racks. Ducting must be routed so as not to interfere with access to cable tray and equipment racks or any other installed communications infrastructure within the room.
- .6 Power supply to communications room ventilation systems should be provided with redundant power feed sourced from standby power systems where available.
- .7 Humidity inside the communications room must be maintained within the range of 20 % RH to 80% RH. Tighter control is not required unless specifically requested for by Information Technology, or where special circumstances mandate it.
- .8 Air filtration is to be provided at all air handling and mechanical ventilation plants servicing the communications room. Dry, replaceable type filter media is required.

2.13 **LIGHTING**

- .1 Each MCR and LCR is to be provided with energy efficient direct [source LED type, daylight temperature](#) lighting, so as to illuminate both the front and back areas of all equipment racks as well as interior walls where equipment is mounted.
- .2 Illumination levels are to be according to WSBC or similar Industry standards for safety and comfort.
- .3 On/off control of the lighting within the room must be dedicated for that room and located within the room.

END OF SECTION 27 05 05