Note to the Designer/Architect/Engineer/Installer: These Specifications are basic minimum criteria to be met in preparing the final project specifications for this section, which is the responsibility of the Designer

York University Building Standards

1.0. GENERAL

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1.0. GENERAL

1.1 Overview

.1 All UIT Standards are based on BICSI Industry Standards.

.2 Communication/Cabling Contractors are responsible for labeling all terminations in accordance with UIT-Infrastructure Standards. Any deviations will be corrected at the Contractors’ expense. Detailed requirements are specified in section 27 05 53.

.3 The General or Communication/Cabling Contractor will be responsible for informing UIT-Project Coordinator of any company being sub-contracted as part of the project and the names of the technicians on site. It is preferable to leverage UIT’s vendor of record as the Cabling Contractor.

.4 The General or Communication/Cabling Contractor will be responsible for the coordination of furring, patching, fire stopping and labelling as required for the completion of work.

.5 The General or Communication/Cabling Contractor will secure all Communication Rooms and areas they are working in when vacating the space for any length of time, or at the end of the workday.

.6 The General and Communication/Cabling Contractor is responsible for maintaining a clean work environment and ensuring any materials being used do not obstruct any traffic paths.

.7 The General or Communication/Cabling Contractor is responsible for clearing all dust and debris from the Communication Rooms and workspaces.

.8 The General or Communication/Cabling Contractor is responsible for the protection of any installed or operating equipment during construction. This includes measures to control dust, heat/cooling of the environment to acceptable operating temperatures, and physical security of equipment on the work site. This also includes maintaining stable electrical power service to operating equipment.

.8 The General Contractor and Communication/Cabling Contractor are responsible for ensuring all sub-contractors are adhering to all Health and Safety Codes, UIT Standards and York University Standards.
1.2 **Horizontal Cables**

1.2.1 All horizontal cables feed directly from a Communication Room to a faceplate or termination box for termination. No intermediate splices or junctions are permitted.

1.2.2 All horizontal cables must be less than 90 meters in length (from network switch port to termination jack).

1.3 **Faceplate Terminations**

1.3.1 Faceplate or termination boxes must be used to house horizontal terminations in work areas. No termination should be without a housing.

1.3.2 Horizontal terminations must be labelled with a wraparound label on the cable and a faceplate/box label on the jack. See section 27 05 53 *Identification for Communications Systems* for labelling details.

1.3.3 Termination jacks must be of the same category rating as the cable being terminated.

1.4 **Communications Room Terminations – Patch panels**

1.4.1 Cable numbers are assigned by UIT starting at 01-01. Always use UIT provided numbers for reference to horizontal cable numbers.

1.4.2 Horizontal cables entering the communications room must be bundled into the cable manager from the top of the equipment rack. Each switch rack can accommodate up to 384 cables. Cables are broken out into bundles of 48 for each patch panel and terminated to the patch panel in sequential order.

1.4.3 Cable bundles of 48 must have a service loop of at least 2 m separated from the main trunk of cable and must be gathered to one side of the patch panel to allow the patch panel to fold out for servicing.

1.4.4 Each horizontal cable must be labelled with a wraparound label before termination. Patch panel ports must be labelled from the front side.

1.4.5 All horizontal cables in the work area are to be terminated in patch panels regardless of the intended service type. Horizontal cable numbers correspond to the patch panel number and jack number on which they
terminate in the format “PP-NN” (where PP is the patch panel number, NN is the jack number)

.6 Spacing of patch panels in a rack is laid out in the rack template spreadsheet Patch Panel Rack Template.xls. Use the most current version available. Patch panels must be clearly labelled with incrementing 2 digit numbers from the top to bottom starting at 01. Patch panel ports must be clearly labelled. Starting at 01 and in a sequence corresponding with the switch port layout typically with odd numbers on top, even on the bottom. Customized layouts may be provided for some projects.

.7 Patch cords should be customized lengths that connect sequential switch ports to sequential horizontal ports on a 1 to 1 basis. Non-network horizontal ports should not be patched to the switch port, the corresponding switch port should be left empty. Patch cords must be routed from the switch port, via the vertical cable management trough down to the corresponding patch panel location. Patch panel locations should correspond to the same layout pattern as the switch ports with a slack loop of approximately 30cm. Typically a 7’ patch cord will fit for 1 to 1 patching. Patch cords for horizontal cables 01-24 should go to the left VCM and 25-48 should go to the right VCM trough.

.8 Longer patch cords are used to route special services to aggregation switch ports or other services.

.9 Patch cords are not labelled.

1.5 Communications Room Terminations – MDF (existing buildings only)

.1 Cable numbers are assigned by UIT on the architectural drawings starting at 0001. Always use 4-digit numbers for reference to horizontal cable numbers.

.2 Horizontal cables entering the communications room must be routed to the back of the MDF bump-out wall and must be terminated on the back of the horizontal MDF field in sequential order.

.3 Each horizontal cable must be labelled with a wraparound label before termination. The front of the MDF must be labelled with blue designation strips.
1.6 Pathways

.1 Pathways consist of bundles of one or more cables running from the communication room along cable trays, J-hooks or conduits through the building space to deliver communication services to all required work areas.

.2 All new pathway locations must be cleared with the building owner (or contractor) and UIT-Project Coordinator. All pathways must provide a path that is less than 90 meters to the work area (from network switch port to termination jack).

.3 Work area cables will preferably be dropped through an interior wall utilizing dedicated conduits or pathways and terminating at an information outlet/faceplate.

.4 Adhere to fire stopping regulations for pathways as required by fire codes and building codes.

.5 Pathways must be kept clear of any materials or other equipment.

.6 Pathways must be accessible after construction is completed to allow maintenance and addition of new cables.

.7 Pathways will be routed to avoid electrical interference.

.8 All major cable pathways must be documented on architectural floor plans.

1.7 Conduit

.1 All conduit installations should be designed and built with a post-construction maximum fill of 50%.

.2 No section of conduit should be longer than 30 meters or contain more than two 90-degree bends.

.3 All materials purchased by the General or Communication/Cabling Contractor will be stored by them at their trailer or site office.

.4 A pull or splice box should be provided if there are more than two 90-degree bends, a reverse bend in the run or the length is over 30 meters.

.5 Conduits should terminate in a separate electrical box or equivalent and should not be incorporated with any electrical faceplates.
.6 A pull cord of suitable size and construction will be installed in the conduit run and made to run freely through the pathway.

.7 The pull cord will be secured to an accessible anchor point at both ends.

.8 Pull cords must be installed regardless of whether there is cable pulled in the conduit or not.

.9 To ensure 40% conduit fill maximums are adhered to, all cabling will follow calculations provided by Belden's “Conduit Capacity Calculator” available at: https://tools.belden.com/conduit-capacity-calculator/

1.8 Ceilings

.1 During the design phase, UIT-Project Coordinator should be consulted to discuss the type of ceiling and materials that will be installed in all spaces. The type of materials does affect the wiring infrastructure.

.2 Obstructing access to cables trays, J-hooks, AV equipment or Wireless Access Points must be avoided.

.5.2 Hard Ceilings

.1 Access hatches must be incorporated into solid-ceiling designs.

.2 Access hatches to spaces above the ceiling must be placed at least every five meters.

.3 Cable pathways through hard-ceiling areas may be constructed utilizing zoned-conduit runs accessible at common-distribution points.

.5.3 Ceiling Tiles

.1 If installing a removable ceiling (tiles), J-hooks should be placed every two meters for cable pathways.

.2 Pathways will be installed with a minimum of 7.6 cm of clear vertical space above the ceiling tiles to ensure accessibility and adequate clearance for pulling additional cables. Cases where this clearance is not available, should be treated as hard-ceiling spaces.

.5.4 Open Ceiling

.1 For open mechanical ceilings, cable trays are required.

.2 There should be a minimum of 30 cm of vertical space above the tray.
.3 All applicable codes will be followed for the installation of cable trays.
.4 Cable trays must be installed in accessible areas to facilitate maintenance and the addition of future cables. A minimum of 46 cm clearance should exist on at least one side.

1.9 Drawings
.1 Drawings indicate the location of the cable terminations using the appropriate communications symbols. If there is a conflict on site, then the Contractor will contact the UIT-Project Coordinator for verification prior to proceeding with cable installations.
.2 The horizontal termination points that are fed from each Communication Room will be defined per-floor on each drawing by UIT.
.3 Cable numbering assignments will be defined on each drawing by UIT and will be provided to the Contractor to follow during installation, termination and labeling.
.4 Contractors will install all cabling infrastructure per the drawings provided and will not omit or add any cables unless first reviewed and approved by the UIT-Project Coordinator.

2.0. PRODUCTS
2.1. Cable Trays
.1 All cable trays will be a minimum of 45.72 cm wide.
.2 The recommended standard for cable trays for horizontal pathways outside of the Communication Room is Homaco TRC-512 and associated hardware.

2.2. Voice and Data Cables
.1 Indoor voice and data cabling will be CAT6A for all new build as specified below. Determination of the appropriate standard will be confirmed with UIT for all existing builds. Specifications of cables are as follows:
   a. Belden 10GXS13 Category 6A UTP, CMR-rated or CMP-rated as required by code, colour white. Associated jacks, connectors, patch panels and faceplates shall be Category 6A, manufactured by Belden - 10GX series.
i. 10GXS13 White - 10GXS Category 6A, 4-pair, 23AWG, Plenum - CMP Nonbonded Pair
ii. Belden 10GX REVConnect Patch Panel (Preloaded)”, part number RVAPPF2U48WH
iii. Belden RJ45 jacks with RevConnect backs and KeyConnect mounting RVAMJKUEW-B24 or RVAMJKUEW-S1
iv. CA21109007 - 10GX Modular Cords White 7 Foot Patch Cord
v. CA21109010 - 10GX Modular Cords White 10 Foot Patch Cord


.2 Other locations may require gel-filled outdoor cables and/or armored cables. These exceptions will be specified in detail within the planning documents.

2.3. **Patch Cables**

.1 All work-area patch cables will be 3 meters long (10’), Belden CAT6A 10GX series, colour white or Belden/NORDX CAT6, 4 pair, 2400 service, Colour Blue to match the installed horizontal cables.

.2 Typical communications room patch panel cables will be 2.1 meter long (7’) Belden CAT6A 10GX series, colour white. Custom lengths may be required for some patches.

3.0. **EXECUTION**

.1 All materials purchased by the Contractor will be stored by the Contractor at their site or trailer.

.2 The Contractor will be responsible for the purchase of all materials for the project and for the delivery and inventory of all materials for the project unless otherwise agreed.

.3 All horizontal cables must be installed by a BELDEN certified installer and tested to meet Belden certification.
.4 In accordance with Belden Industry specification standards, at no time will network cables be painted. If this is done, the cables will be replaced at the Contractors’ expense.

.5 If, during the cable’s installation or testing stage, it is determined that they have been damaged, the Contractor will replace the cable, patch cord, pigtail or other wiring infrastructure-related material at the expense of the Contractor.

.6 Adhere to manufacturer-published specifications for pulling tension, minimum-bend radii and sidewall pressure when installing cables.

.7 Maximum length of cables shall not exceed 90 m (from network switch port to termination jack).

.8 The resultant cable installation shall be Belden certified and warranted.

.9 Cables shall be bundled and terminated on 48-port patch panels in communication rooms unless otherwise specifically noted. Installation in buildings built before 2018 may terminate on Gigabix MDF frames (requires review and approval of UIT Project Coordinator.)

.10 If cables are specifically noted not to be terminated, a minimum of 5 m slack should be left in the communications room; leave appropriate slack at or nearby outlet as directed.

End of Section 27 15 00