

1 General

1.1 GENERAL REQUIREMENTS

- .1 Supply and install a complete telecommunications cabling system based on a physical star wiring topology that is designed in accordance with and supported by a 25 year manufacturer backed warranty and certification as specified herein.
- .2 Structured cabling system to be standards compliant based upon a structured cabling system and should be composed of the following interdependent sub-systems:
 - .1 Cross-connect System.
 - .2 Horizontal cabling system.
 - .3 Telecommunications outlet/connector associated cords and adapters.
 - .4 Patch panels.
 - .5 Patch Cords.

1.2 DESCRIPTION OF THE WORK

- .1 Data cabling system for the building as indicated herein and which generally includes but is not limited to: cabling terminations, cross connects, horizontal cabling, cable management, patch cables, etc.
- .2 It is the intent of this specification to modify the existing communications system wiring to accommodate the architectural floor plan revisions as indicated in the contract documents.

1.3 REFERENCE STANDARDS

- .1 CAN/CSA Standards
 - .1 CAN/CSA T527-94 (Reaffirmed 1999) Grounding & Bonding for Telecommunications in Commercial Buildings.
 - .2 CAN/CSA T528-93 (Reaffirmed 1997) Design Guidelines for Administration of Telecommunications Infrastructure in Commercial Buildings.
 - .3 CAN/CSA T529-95 (Reaffirmed 2000) Telecommunications Cabling Systems in Commercial Buildings.
 - .1 CAN/CSA T530-99. Commercial Building Standard for Telecommunications Pathways and Spaces.
 - .4 C22-1-15 Canadian Electrical Code
- .2 ANSI/TIA/EIA Standards
 - .1 ANSI/TIA/EIA-568-C.0, Generic Telecommunications Cabling for Customer Premises.
 - .2 ANSI/TIA/EIA-568-C.1, Commercial Building Telecommunications Cabling Standard.
 - .3 ANSI/TIA/EIA-568-C.2, Balanced Twisted-Pair Telecommunication Cabling and Components Standard.
 - .4 ANSI/TIA-569-B - Commercial Building Standard for Telecommunications Pathways and Spaces.

- .5 ANSI/TIA/EIA-606-A - Administration Standard for Commercial Telecommunications Infrastructure.
- .6 ANSI-J-STD-607-A - Commercial Building Grounding (Earthing) and Bonding Requirements for Telecommunications.
- .3 BICSI Standards
 - .1 BICSI/TDMM – Telecommunications Distribution Methods Manual. (12th. Edition)
 - .2 Information Transport Systems Installation Methods Manual (6th. Edition).

1.4 SCOPE OF WORK

- .1 Provide a complete structured cabling system to carry voice and data, as indicated on the drawings. System components include but may not be limited to the following:
 - .1 Equipment racks.
 - .2 Category 6 Modular Patch Panels.
 - .3 Category 6 Patch cords.
 - .4 Category 6 UTP wiring.
 - .5 Horizontal and vertical cable management.
 - .6 Information outlets and faceplates.
 - .7 Conduit system.
 - .8 Grounding and bonding system.
 - .9 Identification of all network components, terminations, information outlets, etc.
 - .10 Complete project documentation and as built drawings.

1.5 STRUCTURED WIRING SYSTEM CONTRACTOR QUALIFICATIONS.

- .1 The Structured Wiring System contractor must be an authorized installation agent for that particular manufacturer's solution and provide that manufacturer's system warranty upon project completion. Provide a certificate from the manufacturer confirming this.
- .2 The Structured Wiring System contractor shall be a current member of BICSI "Building Industry Consulting Services International". Provide a certificate from BICSI in the Company name confirming proof of membership.
- .3 The Structured Wiring System contractor must provide an RCDD "Registered Communications Distribution Designer" as Communications System Project Manager for the duration of the project. Provide a certificate confirming that the individual proposed for this project has successfully completed BICSI's registration and examination requirements and is in good standing.
- .4 Provide the following documentation:
 - .1 BICSI Certificate indicating that the proposed Communications System Project Manager has achieved the professional designation of Registered Communications Distribution Designer.
 - .2 The proposed Communications System Project Manager BICSI membership certificate.
 - .3 Structured Wiring System installation contractor BICSI membership certificate.

- .4 Certificate from the manufacturer indicating that the Structured Wiring System installation contractor is an authorized installation agent for that product.

1.6 PRODUCT DATA

- .1 Submit product data indicating system components, mounting method, grounding and special attachments.

1.7 RECORD DATA

- .1 The Vendor will provide an end user's manual describing the essential system elements, as well as the end user's responsibility for maintaining the integrity of the cabling system over time. This Manual must include, as a minimum, guidelines for system expansion and modification as well as labelling, test results, and record keeping.
- .2 Record on one (1) set of white print drawings all of the cable locations and all approved changes and other details. Show all cable runs by the labelled numbering system. Supply a complete, current and accurate set of record drawings and floor plans at job completion.
- .3 Furnish manufacturer's certificate or letter confirming that entire installation as it pertains to each system has been installed to manufacturer's instructions.

1.8 IDENTIFICATION

- .1 Telecommunication Spaces
 - .1 All telecommunications spaces within a building shall be uniquely identified as part of a complete administration system. The TR, ER or MTR shall be identified by the room designation assigned by the architectural design. The assigned number shall be used within the administration system identifier and shall be a "lamicoid" type plate minimum (50mm H) X (300mm L) as shown below and secured to the exterior of the door frame entering that space.
EXAMPLE: TR-234
 - .2 All telecommunications equipment racks within the telecommunications space require a unique component identifier as part of the administration system by a "lamicoid" nameplate, minimum (50mm H) X (600mm L) as shown below and secured to the upper horizontal rail of the equipment rack.
EXAMPLE: TR-234 RACK 1
 - .3 All termination hardware within the telecommunications space requires a unique component identifier as part of the administration system. Identifiers must be self-adhesive thermal transfer type and placed appropriately to indicate all ports.
- .2 Horizontal Distribution
 - .1 All horizontal cabling shall be uniquely identified with a wrap type self-laminating adhesive label with mechanically generated (not hand written) identifier.

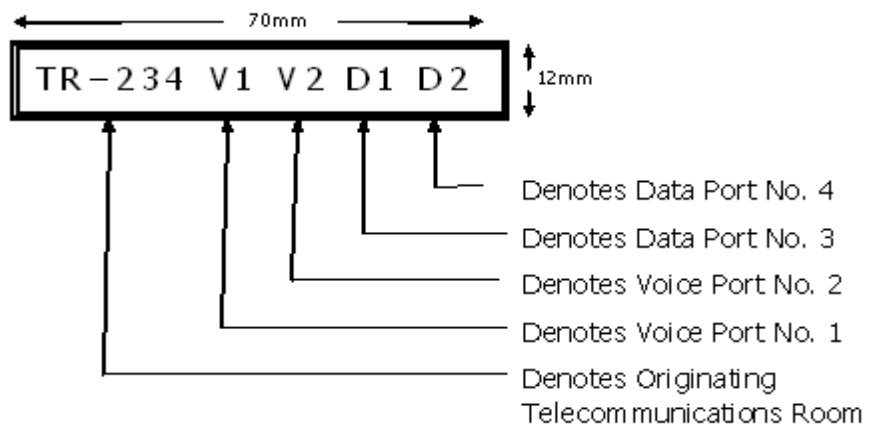
- .2 Horizontal cable identifiers shall denote basic information transport system application and originating telecommunications space termination equipment port as shown;

EXAMPLE: D-024

D = DATA

V = VOICE

- .3 All telecommunications outlet faceplates shall be standard six port configuration.
- .4 All telecommunications outlet locations require a unique component identifier as part of the administration system by a "lamicoid" nameplate, minimum 120mm H X 70mm L and secured to the wall-space centered and above (min. 12mm) the telecommunications outlet faceplate. Telecommunications work area outlet identifiers must denote basic information transport system application, originating telecommunications space and termination equipment port as shown:



2 Products

2.1 GENERAL

- .1 All products installed in this system must be part of a complete end to end solution by a single manufacturer. Approved cable partners for that particular solution will be acceptable provided appropriate documentation is submitted at the time of shop drawing submittal and a warranty level is provided in conformance with this specification.

2.2 HORIZONTAL CABLING SYSTEM

- .1 Cable
- .1 All copper horizontal UTP cabling (shall meet or exceed all applicable EIA/TIA 568 standards (including all addendums and technical service bulletins) for Category 6 performance.
- .2 Cabling shall be Category 6 UTP 4-pair, 23AWG solid; CMP rated cable.
- .3 Each horizontal cable shall extend from the ER/TR to the telecommunications outlet in the WA without a splice.
- .4 The maximum length of each cable run must not exceed 90 m.
- .5 Horizontal UTP cabling shall terminate on rack mounted patch panels.

- .2 Patch Panels
 - .1 48 port (2U) 8 position modular patch panels.
 - .2 E1A-310-D 482 mm (19") Mount Compliant.
 - .3 Wiring Configuration T568A (ISDN).
 - .4 Connectors shall be coloured as follows:
 - .1 Grey for voice.
 - .2 Blue for data.
 - .5 Category 6 Compliant.
 - .6 Complete with modular connectors colour coded to match active ports in all unused ports of each patch panel. (Fully populated).
- .3 Faceplates and Connectors
 - .1 Work Area Faceplates
 - .1 Work area faceplates shall house all category 6 cable connectors.
 - .2 Faceplates shall be a 2- gang, 6-port configuration mounted on dual-gang electrical box with 2-gang mud ring. The colour to be coordinated.
 - .3 Blank inserts shall be provided for all unused ports.
 - .2 Insert and Connectors
 - .1 Category 6 inserts shall be 8-pin RJ45 type. The cable terminations are to be configured for T568A wire map. Colours shall be consistent for all telecommunications outlets.
 - .2 Category 6 inserts must accept RJ11 plugs.
 - .3 All inserts and connectors must be securely fastened to the faceplate.
 - .4 Outlet boxes in common walls shall not be installed back to back and must provide a minimum 103mm (4 inch) lateral clearance.
- .4 Workstation Copper Patch Cords
 - .1 Work area connecting cords shall be factory-terminated, T568A pin assignment, Category 6, with 8-pin RJ45 plug at each end.
 - .2 Use manufacturer factory built and tested connectorized cords.
 - .3 Provide 3m patch cords.
 - .4 Provide sufficient quantity of line cords for total number of horizontal data cables installed.
- .5 Telecommunications Rooms Patch Cords
 - .1 Telecommunications Room connecting cords shall be factory-terminated, T568A pin assignment, Category 6, with 8-pin RJ45 plug at each end.
 - .2 Use manufacturer factory built and tested connectorized cords.
 - .3 Provide 1.5m patch cords.
 - .4 Provide sufficient quantity of patch cords for crossing over all horizontal data and backbone cables in telecommunications rooms.
- .6 Performance Requirements
 - .1 Cable performance shall at minimum meet ANSI/TIA 568 (latest edition). Standards for the noted cable and cable category. All cables to meet best practice industry performance and construction requirements.

- .2 Data Horizontal cabling shall have the following characteristics:
 - .1 Cable shall meet or exceed Category 6 requirements as per standards.
 - .2 Conductors are twisted in pairs, each individual twisted pair includes a metallic foil shield and is protected by a flame-retardant PVC jacket.
 - .3 ULC and CSA rated as CMP/FT6.
 - .4 Insulation: colour coding as per standards
 - .5 Jacket: printed at intervals stating cable code, AWG, manufacturer and length markings.
- .3 Data Termination shall have the following characteristics:
 - .1 All jack shall meet or exceed the requirements of ANS/TIA-568-C.2 Category 6, IEEE 802.3an-2006, and ISO 110801 Class EA channel standards
 - .2 All data jacks and data patch panels shall meet CAT6 requirements.
3.1.3.3 8-wire, RJ45
 - .3 Patch panels shall be modular 1U 24-port patch panels.

3 Execution

3.1 INSTALLATION

- .1 The minimum warranty requirement will be 25 years for the network passive components. Upon completion of the project, a certification certificate stating the warranty of the system must be supplied to the end user.
- .2 Provide a complete structured cabling system for voice, data, including all components and wiring as indicated.
- .3 When installing each information outlet, provide sufficient cable slack at the outlet box to permit the removal of the coverplate.
- .4 Install cables within 750 mm above suspended ceilings.
- .5 Provide identification as specified.
- .6 Provide a slack loop of three (3) meters within each telecommunication room for all installed cables. The purpose of this service loop is to allow any future re-configuration and / or upgrade of these telecommunications rooms.
- .7 Provide a 1.5 meter slack loop above each structured cabling outlet in the accessible ceiling space.
- .8 Permanently identify voice and data horizontal cabling at each end. The identification must be mechanically generated, not hand written. Indicate the originating Telecommunications Room (TR) and the consecutively numbered jack for voice and data. This labeling is to be identical on the originating end and in the outlet box. This same information is to appear on the patch panel and outlet jack location.

- .9 Fully populate all unused ports in each patch panel with modular connectors, colour coded to match the active ports.
- .10 Provide conduit, pull boxes as indicated or as required by relevant codes.
- .11 Install conduit sleeves in walls as indicated.
- .12 Install horizontal cabling in the existing cable tray system. Install J-Hooks between cable tray and conduit stubs in partitions. Install horizontal cables in wall sleeves as indicated.
- .19 Provide a record drawing of each floor plan detailing all structured wiring cables and jacks.
- .20 Cables shall be tested in accordance with the latest approved testing procedures with Level IV field test instruments. Perform an Category 6A permanent link test of each installed cable to 500 MHz performance parameters. Submit test results for review. All cords tested must meet or exceed the minimum transmission requirements as per Category 6 requirements and of the system manufacturer.
- .21 Provide complete system documentation at completion of the work, c/w a hard copy of the following:
 - .1 Cable test reports.
 - .2 Record floor plan drawings in AutoCad format, indicating all communications racks, information outlet location and numerical identification.
 - .3 Record drawings of the front elevation of each communication rack, detailing the location, size and description of all equipment.
- .22 The AutoCAD floor plan drawings indicating all communications racks, information outlet location and numerical identification are to be laminated and wall mounted in each telecommunications room.

END OF SECTION