

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 DESCRIPTION OF WORK
 - 1.4 REFERENCE
 - 1.5 STATUTORY AUTHORITY – ELECTRICAL SAFETY
 - 2.0 PRODUCTS
 - 2.1 COMPONENTS
 - 3.0 EXECUTION
 - 3.1 INSTALLATION

1.3 **DESCRIPTION OF WORK**

- .1 Grounding and bonding practices at UBC shall comply with all applicable codes.
- .2 All new Communications metallic raceway shall be bonded to the Telecommunications Main Grounding Busbar (TMGB) in Main Communications Room or Telecommunications Grounding Busbar (TGB) in Local Communications Rooms.
- .3 In existing buildings, bond all existing Communications metallic raceway to be reused or modified to the nearest TMGB or TGB.
- .4 All power, service, and communications grounds shall be bonded. Bonding conductors shall be as short as possible and routed with a minimum of bends. All bends made on the conductor shall be sweeping bends.
- .5 Where practicable, all bonding conductors shall be installed without a splice. Where a splice is necessary, it should be accessible and located in a communications space. Conductors shall be spliced using irreversible compression-type connectors, exothermic welding, or equivalent. All joints shall be adequately supported and protected.
- .6 Bonding connections shall be made with bolts, crimp connectors, clamps, or lugs specifically designed for the purpose.
- .7 The following bonding conductors shall be connected to the TMGB
 - .1 The metallic jacket of all entrance cable,
 - .2 Cable protectors.
- .8 The following ground conductors shall be connected to the nearest TGB:
 - .1 All Communications metallic raceways,

- .2 The metallic jacket of shielded Intra or Inter -building backbone cable.
- .3 Equipment racks.
- .4 The shields of all FTP / STP communications cables where they appear in all communications rooms/ closets/ remote cabinets or consolidation points. The field ends of these cables are not to be bonded to ground.
- .9 The Communication grounding and bonding shall be independent from the building ground system except for a single connection between the to the main Electrical room ground busbar.

(Refer to Standard Drawings ITSTD-16, ITSTD-17)

1.4 **REFERENCE**

- .1 Canadian Electrical Code, Part 1.

1.5 **STATUTORY AUTHORITY – ELECTRICAL SAFETY**

- .1 Current Canadian Electrical Code, Part 1.
- .2 Current B.C. Electrical Code Regulation.

2.0 **PRODUCTS**

2.1 **COMPONENTS**

- .1 Main Communications Room: Copper busbar – (TMGB), c/w two (2) 50 mm insulated standoffs, with a minimum dimension of 100 mm wide X 300 mm long X 6 mm thick.
- .2 Local Communications Room: Copper busbar (TGB), c/w two (2) 50 mm insulated standoffs, with a minimum dimension of 50 mm wide X 300 mm long X 6 mm thick.
- .3 Cabinet bonding will be achieved with the use of a vertical bonding strip mounted on the front rail between equipment and cabinet rail.

Panduit RGS134-1Y or equivalent.
- .4 All busbars shall be pre-drilled with standard NEMA 10-32 bolt hole. Allow space for the connectors used.
- .5 Bonding conductor shall be green PVC jacketed, stranded copper, soft conductor, unless otherwise noted. (bare #6 AWG. in cable tray) Unless installed in conduit system, bonding conductor jacket shall be minimum CMR rated.
- .6 All bonding conductors and connectors shall be approved as defined in CSA C22.1.
- .7 Bonding conductors shall be identified on both ends of the conductors, with data plate cable marker complete with double straps, to indicate where the destination end of the conductor is located, such as 'Comm. Rm. 011' or ' Cable tray in Rm. 123'.

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- .8 All FTP /STP communications cables will have appropriate matching connecting hardware (patch panels, jacks) that preserve the bonding continuity from the cable shield through to the bonding conductor of the rack / cabinet/ closet/ remote cabinet / or consolidation point.

3.0 **EXECUTION**

3.1 **INSTALLATION**

- .1 Install a complete, permanent, and continuous bonding and grounding system for Communications infrastructure and, equipment, including all necessary conductors, connectors and accessories, as indicated in IT drawings and this document, and to conform to requirements of Provincial Electrical Inspection Department and Canadian Electrical Code.
- .2 Install connectors in accordance with manufacturer's instructions.
- .3 The TMGB shall be connected to the building main Electrical ground busbar with a # 1/0 AWG green PVC jacketed stranded copper conductor.
- .4 All TGB's shall be connected to the TMGB with a #2 AWG green PVC jacketed stranded copper conductor installed in conduit.
- .5 Label conduit every 3 M with the description: "Communication Ground Only".
- .6 Bonding conductors placed in metallic conduits longer than one meter must be bonded to each end of the conduit with the appropriate bonding bushing.
- .7 Where the Communication rooms are stacked then the bonding conductor shall be a common riser bonding conductor for connection to the stacked Communication rooms.
- .8 In all cases the bonding conductors shall always be larger to smaller gauge from the building main Electrical busbar out to the last TGB.
- .9 Where Communication rooms are not stacked then install a separate bonding conductor from the MCR to LCR.
- .10 Bonding conductors shall be fixed to the walls and neatly formed around the perimeter of rooms.
- .11 A bonding busbar shall be placed in the center of the terminal wall in each Communication room, centered @ 250 mm AFF and mounted to the wall with insulating stand-offs. The location of the bus bar must not interfere with wall space designated for vertical riser cables or be mounted above or behind riser conduits and sleeves.
- .12 A lug shall be crimped to each end of the bonding conductor. Bonding conductors shall be bolted on the appropriate ground busbar with a 6 mm copper alloy bolt and nut.
- .13 Leave 6 spare connectors in the Main Communication room and 4 spare connectors in each Local Communication room.

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- .14 Prior to attaching a lug to a painted or galvanized surface, the paint shall be scraped off to bare metal, to provide maximum contact. Flat washers and lock washers shall be used with the bolts.
 - .15 Install a bare #6 AWG copper stranded conductor, in the entire length of surface raceway or cable tray and bond to the telecommunications grounding system.
 - .16 The cable tray bonding conductor shall be bonded to cable tray by a bonding clamp at each straight length of tray regardless of length and each elbow and T-fittings.
 - .17 All splices of bonding conductors shall be outside of the cable trays.
 - .18 Conduits for individual outlet shall be bonded using a #12 AWG stranded insulated copper conductor from the conduit bonding bushing to the cable tray bonding conductor.
 - .19 The metallic jacket of all inter-building cable shall be bonded with a #6 AWG green PVC jacketed stranded copper conductor at the jacket opening at both ends of the cable, using a bonding clamp designed for the cable used.
 - .20 The metallic jacket of metallic shielded intra-building backbone cable shall be bonded with a #6 AWG green TW jacketed stranded copper conductor at the jacket opening, using a bonding clamp designed for the cable used.
 - .21 Cable protectors shall be bonded with a #6 AWG green TW jacketed stranded copper bonding conductor.
 - .22 Communication equipment shall be bonded through power receptacle's ground conductor
 - .23 Equipment Racks and metal items in the Communication rooms shall be bonded to the appropriate ground busbar. Power panels and outlets in Communication rooms will be bonded to their supply side only.
 - .24 All Communication conduit and tray leaving the Communication room shall be bonded at the supply side only.
 - .25 There shall be no interconnecting bond wires between local Communication rooms on the same floor level.
 - .26 All Communication outlet boxes and conduits shall be bonded via the communications bonding infrastructure.
 - .27 Install #12 AWG insulated stranded copper bonding conductor to Wiremold surface raceway and bond to the building and telecommunications grounding systems for joint-use power and Communications applications. Bond to telecommunications grounding system if the raceway is dedicated only for Communications use.
 - .28 Protect exposed bonding conductors from mechanical damage.

END OF SECTION 27 05 26