

PART 1 - GENERAL

<u>1.1 REFERENCES</u>	.1	American National Standards Institute
	.1	ANSI J-STD-607-A-2002, Joint Standard - Commercial Building Grounding (Earthing) and Bonding Requirements for Telecommunications.
	.2	Telecommunications Industries Association (TIA)/Electronic Industries Alliance (EIA)
	.1	TIA/EIA-606-2002, Administration Standard for the Commercial Telecommunications Infrastructure.
	.3	U.S. Department of Labor/Occupational Safety and Health Administration (OSHA)
	.1	Nationally Recognized Testing Laboratory (NRTL).
<u>1.2 SYSTEM DESCRIPTION</u>	.1	Telecommunications grounding and bonding system consist of grounding busbars, bonding backbones, and other bonding conductors.
	.2	Provides ground reference for telecommunications systems within building and bonding to it of telecommunications rooms.
	.3	Metallic pathways, cable shields, conductors, and hardware within telecommunications spaces are bonded to telecommunications grounding and bonding system.
<u>1.3 QUALITY ASSURANCE</u>	.1	Health and Safety Requirements: do construction occupational health and safety in accordance with Section 01 35 29.06 - Health and Safety Requirements.
<u>1.4 DELIVERY, STORAGE AND HANDLING</u>	.1	Waste Management and Disposal:
	.2	Separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

PART 2 - PRODUCTS

<u>2.1 TELECOMMUNICATIONS GROUNDING BUSBAR (TGB)</u>	.1	Predrilled copper busbar, approved by NRTL, electrotin plated with holes 8 mm diameter for use with standard-sized lugs to: ANSI J-STD-607-A.
	.2	Dimensions 6 mm thick, 50 mm wide, 600 mm long to: ANSI J-STD-607-A.
<u>2.2 BONDING CONDUCTOR FOR TELECOMMUNICATIONS</u>	.1	3/0 AWG copper conductor, green insulated marked to: ANSI J-STD-607-A.

- 2.3 TELECOMMUNICATIONS BONDING BACKBONE (TBB) .1 3/0 AWG copper conductor, green insulated marked to: ANSI J-STD-607-A.
- 2.4 GROUNDING EQUALIZER (GE) .1 3/0 AWG copper conductor, green insulated marked to: ANSI J-STD-607-A.
- 2.5 WARNING LABELS .1 Non-metallic warning labels in English and French to: ANSI J-STD-607-A.
- .2 Identify labels with wording "If this connector is loose or must be removed, please call the building telecommunications manager".

PART 3 - EXECUTION

- 3.1 TELECOMMUNICATIONS GROUNDING BUSBAR (TGB) .1 Install TGB in main terminal/equipment room and each telecommunications room.
- .2 Install 6 AWG copper bonding conductor from TGB to enclosure of serving electrical power panel (panelboard).
- 3.2 BONDING CONDUCTORS GENERAL .1 When placed in ferrous metallic conduit or EMT longer than 1 m, bond to each end of conduit or EMT using grounding bushing 6 AWG copper conductor.
- 3.3 BONDING CONDUCTOR FOR TELECOMMUNICATIONS .1 Install bonding conductor for telecommunications from TMGB to service equipment (power) ground.
- .2 Use exothermic welding or approved 2 hole compression lugs for connection to TMGB.
- 3.4 TELECOMMUNICATIONS BONDING BACKBONE (TBB) .1 Install TBBs from TMGB to each TGB as indicated.
- .2 Use exothermic welding or approved 2 hole compression lugs for connection to TMGB and TGBs.
- 3.5 GROUNDING EQUALIZER (GE) .1 Install GE between TBBs in multi-storey building by bonding TGBs with GE on top floor and every third floor in between top and bottom floors.
- 3.6 BONDING TO TGB .1 Bond metallic raceways in telecommunications room to TGB using 6 AWG green insulated copper conductor.

3.6 BONDING TO TGB
(Cont'd)

- .2 For cables within telecommunications room having shield or metallic member, bond shield or metallic member to TGB using 6 AWG green insulated copper conductor.
- .3 Bond equipment rack located in telecommunications room to TGB using 6 AWG green insulated copper conductor.

3.7 LABELLING

- .1 Apply warning labels to telecommunications bonding and grounding conductors.
- .2 Apply additional administrative labels to: TIA/EIA-606.

PART 1 - GENERAL

- | | | |
|--|----|--|
| <u>1.1 RELATED REQUIREMENTS</u> | .1 | Section 26 05 34 - Conduits, Conduit Fastenings and Conduit Fittings. |
| <u>1.2 REFERENCES</u> | .1 | Canada Green Building Council (CaGBC)
.1 LEED Canada-CI Version 1.0-2007, LEED (Leadership in Energy and Environmental Design): Green Building Rating System for Commercial Interiors. |
| <u>1.3 ACTION AND INFORMATIONAL SUBMITTALS</u> | .1 | Submit in accordance with Section 01 33 00 - Submittal Procedures. |
| | .2 | Product Data:
.1 Submit manufacturer's instructions, printed product literature and data sheets for communication raceway systems and include product characteristics, performance criteria, physical size, finish and limitations. |
| <u>1.4 DELIVERY, STORAGE AND HANDLING</u> | .1 | Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions. |
| | .2 | Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address. |
| | .3 | Storage and Handling Requirements:
.1 Store materials indoors in dry location and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.
.2 Store and protect communication raceway systems from nicks, scratches, and blemishes.
.3 Replace defective or damaged materials with new. |
| | .4 | Packaging Waste Management: remove for reuse and return of pallets, crates, padding, and packaging materials as specified in Construction Waste Management Plan in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal. |

PART 2 - PRODUCTS

- | | | |
|-------------------------------|----|---|
| <u>2.1 SYSTEM DESCRIPTION</u> | .1 | Empty telecommunications raceways system consists of outlet boxes, conduits, cable trays, pull boxes, sleeves and caps, fish wires, service fittings. |
| | .2 | Cable tray distribution system. |
| <u>2.2 MATERIAL</u> | .1 | Conduits: EMT type, in accordance with Section 26 05 34 - Conduits, Conduit Fastenings and Conduit Fittings. |

**2.3 CONSOLIDATION
BOX**

- .1 Plenum rated zone cabling box with plenum rated foam kit included. The foam kits shall be utilized to fill unused cable space of two rectangular openings. The two rectangular openings shall be in the form of two metallic extensions on either side of the enclosure for the sole purpose of cable drops to the work areas.
- .2 The consolidation box shall be UL and CSA approved for its application.
- .3 The plenum rated box shall be of aluminum construction and manufactured by an established production facility that has existing models market ready in compliance with these specifications.
- .4 The volume of the box for cable entry, termination, egress as well as wire management shall have the minimum dimensions: 610 mm long, 610 mm wide and 250 mm deep.
- .5 The box shall have mounting hardware at four corners of the box for direct connection of box to underside of concrete slab above a T-bar ceiling in a plenum space.
- .6 Mounting hardware shall be compatible with aluminum chassis of consolidation box such that there shall be no possibility of galvanic reaction between dissimilar metals.
- .7 The access cover to the plenum rated box shall be hinged on both sides of the door opening with heavy duty mechanisms.
- .8 The access cover shall have two heavy duty keyed locks and corresponding latching mechanisms. The lock and latch shall be heavy duty and secured with positive latching in a consistent manner such that the keyed and turning operation is consistent amongst all boxes that will be specified under this contract. The boxes associated with each floor shall be keyed distinct from boxes on other floors. There shall be a keyed locking mechanism on each side of the door opening. The locks and keys themselves shall be substantive in nature to ensure that the keys are large enough to permit easy handling of the key.
- .9 The box must be capable of accepting 5 rack units.
- .10 Rack units and category 6 modules shall be specified and supplied as part of SSC/GMCS cabling contract.
- .11 Three rack units shall be supplied with each box. Each rack unit shall be complete with fourteen category 6 modules with IDC contact design to eliminate the need to strip individual conductors and to eliminate requirement of a punch down tool required.
- .12 The rack assemblies shall be mounted on the hinged door such that upon opening of the door the rack assemblies are brought down out of the box interior for easy access. The racks shall be mounted such that they stand off from the door assembly permitting adequate cable bending radius for IDC terminations at rear of category 5e modules. The racks shall also be arranged such that they are not on the same plane but rather staggered in an organized and logical manner to permit efficient, cable management and an optimal termination environment.
- .13 There shall be a voice rack with blue jacks, a data rack with red jacks and an auxiliary rack with yellow jacks.
- .14 Each category 6 module shall be 8 positions, 8 wire universal module, the termination cap shall be colour coded for T568A.
- .15 Clear termination cap shall provide strain relief, control cable bend radius and secure wire in place.

2.3 CONSOLIDATION
BOX
(Cont'd)

- .16 Individual modules shall be capable of being removed from the rack and terminated and then reinstated in the respective rack position.

2.4 LADDER TRAYS

- .1 Ladder trays are required to assist in routing cables within the Telecom Room as shown on drawings. Rack rungs shall be on 150mm space. Racks shall have low profile sides. All hardware must be OEM. Wall height of cable tray shall be 150 mm.
- .2 Ladder racks shall be installed a minimum of 2.6 m above finished floor.
- .3 Ladder trays are to be securely attached to the ceiling slab. No other equipment is to be supported from ladder trays.
- .4 Ladder tray shall be mounted with all sections on the same horizontal plane. All intersections of trays shall have curved mating at all intersections such that cables can be routed unobstructed from one section of the tray to another and with no sharp bends or surfaces.
- .5 Ladder rungs at 150 mm spacing shall be such that the all edges of each rung are curved and smooth such that vertical cable drops between rungs are not subjected to sharp bends or edges.
- .6 Ladder rungs shall be a minimum of 50 mm wide per rung.
- .7 Ladder tray widths shall be 300 mm and 600 mm as per drawings.
- .8 Horizontal Tee sections shall be supplied as per layout and width requirements.
- .9 Horizontal elbows with appropriate 90 degree bends shall be supplied as required.
- .10 Horizontal crosses shall be supplied as per layout requirements.
- .11 90 degree vertical outside elbows shall be supplied to be mounted over each vertical wire manager of the 483 mm rack assemblies. The 90 degree vertical elbows shall be 300 mm in width and mounted in the 600 mm ladder tray that runs directly above the 483 mm racks such that the 600 mm ladder tray run above the rack is continuous. There shall be three 90 degree vertical elbows for each of the two 483 mm racks. Each vertical elbow shall be aligned with the respective vertical wire managers at each end and center of the two 483 mm racks.
- .12 Where there are any areas of the ladder tray with sharp edges they shall be grommited with materials specifically designed for ladder trays. Where applicable all grommited materials shall be supplied by the ladder tray manufacturer of a supplier recommended by the ladder tray manufacturer.
- .13 Waterfalls shall be provided for all vertical cable drop locations from the cable tray for all cables dropping to racks and BIX mount fields to ensure smooth radii bend of all cables such that pinching of cables is avoided. A minimum of 14 waterfalls shall be supplied and installed.

PART 3 - EXECUTION

- 3.1 EXAMINATION** .1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for communication raceway systems installation in accordance with manufacturer's written instructions.
- .1 Visually inspect substrate in presence of Departmental Representative.
 - .2 Inform Departmental Representative of unacceptable conditions immediately upon discovery.
 - .3 Proceed with installation only after unacceptable conditions have been remedied and after receipt of written approval to proceed from Departmental Representative.
- 3.2 INSTALLATION** .1 Install empty raceway system, including underfloor overhead distribution system, fish wire, terminal cabinets, outlet boxes, floor boxes, pull boxes, cover plates, conduit, sleeves and caps, cable tray, service poles, miscellaneous and positioning material to constitute complete system.
- .2 Install consolidation boxes as shown on contract drawings and details.
 - .3 Install boxes directly to the underside of the concrete slab but in no case above 150 mm above the T-Bar ceiling.
 - .4 Coordinate location of the consolidation boxes with the T-Bar location to ensure that the door can be fully open without interference from the T-Bar.
 - .5 Typically one 63 mm EMT conduits terminate into each and every consolidation box (reference drawing details for conduit entry locations). This conduit originates from the Telecom room.
 - .6 All boxes shall be reviewed by the Engineer for compliance with the specifications and for quality assurance.
 - .7 Remove peripheral excessive sheet metal around consolidation box housing prior to mounting in ceiling. The contractor shall ensure that there are no sharp or abrasive edges as a result of the removal of the excessive sheet metal.
- 3.3 CLEANING** .1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.
- .1 Leave Work area clean at end of each day.
 - .2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning.
 - .3 Waste Management: separate waste materials for reuse and recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.
 - .1 Remove recycling containers and bins from site and dispose of materials at appropriate facility.
- 3.4 PROTECTION** .1 Protect installed products and components from damage during construction.
- .2 Repair damage to adjacent materials caused by pathways for communications systems installation.