SPECIFICATION STANDARD
Grounding and Bonding for Communication Systems
27 05 26

PART 1: GENERAL

1.01 SCOPE OF WORK

A. The Design Team and/or Contractor are held responsible to be familiar with the provisions contained herein and with other Sections of this Specification as applicable to the completion of the installation. The approved vendor, designated agent, or employee is held responsible to be familiar with the provisions contained herein and is assumed to possess the knowledge, manpower, and materials necessary for the completion of the installation.

B. Work covered by this Section shall consist of furnishing labor, equipment, supplies, materials, and testing otherwise specified, and performing the following operations recognized as necessary for the installation, termination, and labeling of ground and bonding infrastructure as described on the Drawing and /or required by these specifications.

C. Listed manufacturers and products are required. UNM IT Networks approved equivalent products and systems are also acceptable with the prior written approval of submittals.

1.02 RELATED SECTIONS

A. Division 26 Electrical Division
B. Division 27 Communicants Systems.
C. Division 28 Electronic Safety and Security

PART 2: PRODUCTS

2.01 GROUNDING BUSBARS

A. Telecommunications Grounding Main Grounding Busbar (TMGB).
   1. Predrilled, copper, non-anodized BICSI/TIA/EIA/ANSI approved (4”W **x** 1/4”H **x** 12”L) ground bus bar with insulators and standoffs. (Chatsworth 40153-012 or UNM IT approved equivalent)

B. Telecommunications Grounding Busbar (TGB)
   1. Predrilled, copper, non-anodized BICSI/TIA/EIA/ANSI approved (2”W **x** 1/4”H **x** 12”L) ground bus bar with insulators and standoffs. (Chatsworth 13622-012 or UNM IT approved equivalent)

2.02 GROUNDING JOINTS AND SPLICES

A. Grounding conductor joints/ splices shall be mechanical type, copper alloy, with a minimum of two bolts and a spade section for each conductor.

B. Grounding conductor terminations (lugs) shall be a single barrel, mechanical screw type, copper alloy with machined contact surfaces.

2.03 BONDING CONDUCTORS

A. Cable Tray Bonding Conductor.

1. Green # 6 AWG insulated bonding jumper with appropriate lugs or manufactured braided copper grounding jumper.

B. Equipment Fame Bonding Conductor.

1. Chatsworth TRGK672 Telecommunications Rack Grounding Kit or UNM IT approved equivalent.

C. Bonding Conductor (BC)

1. Green insulated copper bonding conductor, size as required by NEC.
2. The BC shall be, as a minimum the same as the TBB.

D. Telecommunications Bonding Backbone (TBB)

1. Green insulated copper conductor, a minimum size of #6 AWG. The TBB shall be sized at 2 kcmil per linear foot of conductor length up to a maximum size of 3/) AWG Insulation shall meet fire ratings of its pathway, or be in conduit.

SEE TABLE 1 BELOW

TABLE 1					
Sizing of Telecommunication Bonding Backbone (TBB)					
TBB length FT	Grounding Conductor Size (AWG)	DC Resistance Per 100 Ft (Copper Conductor)	Short-Time Rating (A)		
< 13 Ft	6	0.0491	621		
14 - 20 Ft	4	0.0308	988		

21 -26 Ft	3	0.0245	1245		
27 - 33 Ft	2	0.194	1571		
34 - 41 Ft	1	0.0154	1981		
42 - 52 Ft	1/O	0.0122	2499		
53 - 66 Ft	2/O	0.00967	3150		
> 66 FT	3/O	0.00766	3972		
	4/O	0.00608	5008		
	kcmil				
	250	0.00515	5917		
	300	0.00429	7101		
	350	0.00367	8284		
	400	0.00321	9467		
	500	0.00258	11834		
	AWG = American Wire Gauge				
	DC = Direct Current				
	kcmil = Thousand circular mils				

PART 3: EXECUTION

3.01 TELECOMMUNICATIONS INSTALLATION

A. Bonding and grounding all conduits, cable trays, enclosures, cables, protectors, and other conductive infrastructure as per the requirements of the NEC and TIA 607 to main building ground.
   1. Nonconductive coatings (such as paint, lacquer, and enamel) on equipment to be grounded shall be removed from threads and other contact surfaces to ensure good electrical continuity or be connected utilizing fittings designed to make such removal unnecessary.

B. Installation of the TMGB in ER/TR.
   1. Install the TMGB at the bottom of the plywood backboard near the outside plant entrance conduits within the UNM IT Room.
   2. TMGB shall be installed so that the BC is as short and straight as possible, with the proper bend radius.
   3. The BC shall be a green insulated conductor installed exposed per Table 1.

4. Connection at TMGB from the main electrical service ground shall be installed to meet NEC 250.94 and TIA/EIA requirements type. Ground resistance shall not exceed 2 ohms unless approved by UNM IT.
5. Busbar shall be predrilled for future connections. (Chatsworth 40153-012 or UNM IT approved equivalent)
6. Provide a label (Do Not Disconnect) on the connection to the main electrical service ground.

C. Installation of TGB in TR.
1. Install the TGB at the bottom of the plywood backboard near the copper riser terminations within the UNM IT Telecommunications Space.
2. TGB shall be installed so that the TBB for telecommunications is as short and straight as possible, with the proper bend radius.
3. The BC shall be Green insulated conductor sized from Table 1.
4. Busbar shall be predrilled for future connections. (Chatsworth 13622-012 or UNM IT approved equivalent)

D. Installation of the TBB.
1. Installation mechanical type, copper alloy, with a minimum of two bolts and separate sections for each conductor or copper compression type with two (2) indents

E. Installation of Grounding Conductor Joints/Splices.
1. Install manufactured insulating cover or heavy tape insulation over joints/splices.

F. Grounding of Cable Tray/Ladder Rack/Basket Tray
1. Install Green #6 AWG bonding jumper (12 inches max) with appropriate lugs at each cable tray joint or install a manufactured braid copper grounding jumper. In place of bonding jumpers, use manufactures approved grounding type connectors to connect sections of cable trays will be permitted.
2. Install Green #6 AWG grounding conductor with appropriate lugs from the side of the cable tray down to TMGB or TGB. Drill the side of the cable tray and install a ¼” fine thread appropriate length bolt, making sure that the bolt does extend into the wire management part of the tray.

G. Ground of Equipment Frame.
1. Install Telecommunications Rack Grounding Kit approved by UNM IT, from equipment frame to ground cable tray, TMGB or TGB.

H. Grounding of Telecommunications Duct banks.

1. Provide a continuous # 4/0 bare-stranded copper conductor within the concrete at the bottom of all Duct banks. Terminate the bonding ribbon in telecommunications maintenance holes.

I. Grounding of Telecommunications Maintenance Holes and Handholes.

1. Provide bonding jumper to reinforcing steel in each section.
2. Install a bonding ribbon horizontally around the bottom of each maintenance hole and attached it to all the cable racks and metallic hardware within the maintenance hole. Continue installation vertically between the bonding clamps so both the top and bottom halves are bonded together on each side. (The bonding ribbon will be used to bond and ground all future splice cases and hardware placed within the maintenance hole).
3. Provide a ground rod near a corner within 6” of the corner in each maintenance hole and handhole. Bond to the ribbon in the maintenance hole.

END OF SECTION