PART 1: GENERAL

1.01 SCOPE OF WORK
A. Work covered by this Section shall consist of furnishing labor, equipment, supplies, materials, and testing unless otherwise specified, and in performing the following operations recognized as necessary for the installation, termination, and labeling of grounding and bonding infrastructure as described on the Drawings and/or required by these specifications.
B. Listed manufacturers and products are preferred. UNM approved equal products are also acceptable.

1.02 RELATED SECTIONS
A. Division 27, Section 270528 Pathways for Communications Systems.
B. Division 27, Section 270543 Underground Ducts and Raceways for Communications Systems.
C. Division 27, Section 271116 Communications Cabinets, Racks, Frames, and Enclosures.
D. Division 27, Section 271119 Communications Termination Blocks and Patch Panels.
E. Division 27, Section 271123 Communications Cable Management and Ladder Rack.

PART 2: PRODUCTS

2.01 GROUNDING BUSBARS
A. Telecommunications Main Grounding Busbar (TMGB)
   1. Predrilled, copper, non-anodized. Chatsworth #10622-012 ground busbar with Chatsworth #10622-000 busbar insulators.

B. Telecommunications Grounding Busbar (TGB)
   1. Predrilled, copper, non-anodized. Chatsworth #10622-012 ground busbar with Chatsworth #10622-000 busbar insulators.

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 separate section for each conductor equal to Burndy “QPX”, OZ/Gedney “XTP” or “PMX” or Penn-Union “VX” or copper compression type with two (2) indents equal to Burndy, T&B or Blackburn.

B. Grounding conductor terminations (lugs) shall be single barrel, mechanical screw type, copper alloy with machined contact surfaces equal to OZ type “SL”, T&B, or Burndy or copper compression type with two (2) indents equal to Burndy, T&B or Blackburn.

2.03 BONDING CONDUCTORS

A. Cable Tray Bonding Conductor
   1. Green #8 AWG insulated bonding jumper (12” max) with appropriate lugs or manufactured braided copper grounding jumper equal to B-Line #CAM-GJ, T&B #BD12, OZ/Gedney type “FB” or Mono-Systems.

B. Equipment Frame Bonding Conductor
   1. Panduit #TRGK672 Telecommunications Rack Grounding Kit.

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 size as the TBB.

D. Telecommunications Bonding Backbone (TBB)
   1. Green insulated copper conductor, minimum size of No. 6 AWG. The TBB shall be sized at 2 kcmil per linear foot of conductor length up to a maximum size of 3/0 AWG. Insulation shall meet fire ratings of its pathway.

| Table 1 |
|---------------------|---------------------|
| Sizing of the TBB   | TBB Size (AWG)      |
| TBB length (ft)     |                    |
| < 13                | 6                   |
| 14-20               | 4                   |
| 21-26               | 3                   |
| 27-33               | 2                   |
| 34-41               | 1                   |
| 42-52               | 1/0                 |
| 53-66               | 2/0                 |
| > 66                | 3/0                 |

PART 3: EXECUTION

3.01 TELECOMMUNICATIONS INSTALLATION
A. Bond and ground all conduits, cable trays, racks and other infrastructure as per the NEC and TIA 607A to the main building ground.
   1. Clean Surfaces
      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 by means of fittings designed so as to make such removal unnecessary.

B. Installation of the TMGB
   1. Install the TMGB at the bottom of plywood backboard near the outside plant entrance conduits in the “BDF”.
   2. TMGB shall be installed so that the BC for telecommunications is as short and straight as possible.
   3. Green insulated conductor shall be installed exposed.
   4. Connection at TMGB from main electrical service ground shall be thermoweld type. Ground resistance shall not exceed 2 ohms, unless approved by UNM.
   5. Busbar shall be predrilled for future connections.
   6. Provide label - “Do Not Disconnect” on connection to main electrical service ground.

C. Installation of the TGB
   1. Install the TGB at the bottom of plywood backboard near the copper riser terminations in each “IDF”.
   2. TGB shall be installed so that the TBB for telecommunications is as short and straight as possible.
   3. Green insulated conductors shall be installed exposed.
   4. Busbar shall be predrilled for future connections.

D. Installation of the TBB
   1. Install Green insulated copper grounding conductor (refer to 2.03.D for conductor size) from the TMGB to each TGB.
   2. Conductors shall be installed in continuous 3/4” PVC conduit.
   3. Paint all conduit fittings, junction boxes and covers “GREEN”.

E. Installation of Grounding Conductor Joints/Splices
   1. Install mechanical type, copper alloy, with a minimum of two bolts and a separate section for each conductor or copper compression type with two (2) indents.
   2. Install manufactured insulating cover or heavy tape insulation over joints/splices.

F. Grounding of Cable Tray
   1. Install Green #8 AWG bonding jumper (12” max) with appropriate lugs at each cable tray joint or install manufactured braided copper grounding jumper equal to B-Line #CAM-GJ, T&B #BD12, OZ/Gedney type “FB” or Mono-Systems. In lieu of...
bonding jumpers, approved grounding type connectors to connect sections of cable tray will be permitted.

2. Install Green #8 AWG grounding conductor with appropriate lugs from side of cable tray down to TMGB or TGB. Drill and tap side of cable tray (for appropriate size bolt, ¼” x 20 min.), making sure that bolt does not extend into wire management part of tray.

G. Grounding of Equipment Frame
1. Install Panduit Telecommunications Rack Grounding Kit from equipment frame to grounded cable tray, TMGB, or TGB.

H. Grounding of Telecommunications Ductbank
1. Provide a continuous #4/0 bare stranded drawn copper conductor within the concrete at the bottom of all ductbanks. Terminate to bonding ribbon in telecommunications manholes.

I. Grounding of Telecommunications Manholes and Handholes
1. Provide bonding jumper to reinforcing steel in each section.
2. Install a bonding ribbon horizontally around the top of each manhole and attach to all cable racks and metallic hardware within the manhole. Continue installation vertically between bonding clamps so both 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 manhole.)
3. Provide a ground rod near the center of each manhole and handhole. Bond to the bonding ribbon in manholes.
   a. Precast manholes having reinforcing steel bonded together does not require an additional ground rod.