SECTION 25120
EQUIPMENT ROOMS AND SERVICE ENTRANCES

PART 1 - GENERAL

1.1 SUMMARY

A. Scope

1. This section includes the minimum requirements for equipment and materials at the Main Distribution Frame (MDF) and at the Building Entrance.

2. Minimum composition requirements and installation methods for the following:
   a) Building Entrance Terminals
   b) Surge Protection Modules
   c) Floor Mounted Distribution Frames
   d) Wall Mounted Distribution Frames
   e) Steel Ladder Racking
   f) Grounding and Bonding
   g) Backboards
   h) Frame Mounted Termination Blocks
   i) Frame Mounted Ring
   j) UTP Cross Connects
   k) Utility Coordination

3. Related Sections include the following:
   a) 17150 Backbone Cabling Requirements
   b) 17110 Telecommunication Room Requirements

1.2 QUALITY ASSURANCE

A. All methods of construction that are not specifically described or indicated in the Contract Documents shall be subject to the control and approval of the Network & Telecommunication Department. Equipment and materials shall be of the quality and manufacture indicated. The equipment specified is based on the acceptable manufacturers listed. Where "approved equal" is stated, equipment shall be equivalent in every way to that of the equipment specified, and subject to approval.

B. Materials and work specified herein shall comply with the applicable requirements of:

   1. ANSI/TIA/EIA – 568-B Commercial Building Telecommunications Cabling Standard
2. ANSI/TIA/EIA - 569-A Commercial Building Standard for Telecommunications Pathway and Spaces
3. EIA/TIA - 606-A Administration Standard for the Telecommunications Infrastructure of Commercial Buildings
4. EIA/TIA-607 Commercial Building Grounding and Bonding requirements for Telecommunications
5. NFPA 70 - 2002, including:
   a) NEC - Article 770
   b) NEC - Article 800
6. Underwriters Laboratory
7. NEMA -250
9. BICSI Telecommunications Distribution Design Manual (9th edition)
10. BICSI Customer Owned Outside Plant Design Manual (2nd edition)
13. ADA - Americans with Disabilities Act

1.3 SUBMITTALS
A. Provide product data for the following:
   1. Building Entrance Terminals
   2. Surge Protection Modules
   3. Distribution Frames
   4. Steel Ladder Racking
   5. Termination Blocks

PART 2 - PRODUCTS
2.1 BUILDING ENTRANCE TERMINALS
A. Building Entrance Terminal shall protect up to 100 lines (pairs)
B. Dimensions shall be 4.0"W x 2.0' H x 3.95" D.
C. Input stub (tip) cable shall be 26AWG shielded cable. Contractor shall field verify actual stub length in field.
D. Input stub shall serve as internal fuse link.
E. Input stub shall be equipped with a heavy duty strain relief and encapsulated cable connector.
F. Output stub cable shall be 24 AWG shield cable. Contractor shall field verify actual stub length in field.
G. Shall be wall or frame mountable.
H. Shall accommodate industry standard 5 pin protection modules.
I. Plastic components shall meet or exceed specifications set for in U.L. 497.

2.2 SURGE PROTECTION MODULES
A. Shall be 5 pin, 3 element gas type protection modules.
B. Module shall provide true balanced operation.
C. Over voltage on either side shall cause the entire tube to ionize to provide a simultaneous path to ground for both sides of the circuit.
D. Shall be UL 497 listed.
E. Ground pin shall be tin.
F. Tip and Ring pins shall be gold alloy.
G. The module color shall be black.
H. The module color shall be green for spare pair modules.
I. The nominal DC Breakdown shall be 350V @ 100V/\mu sec.
J. The impulse breakdown voltage shall be 700A @ 100V/\mu sec and 150A @1KV/\mu sec.
K. The DC holding current shall be 135V for <150ms.
L. The Surge life (min. operations) shall be as follows:
   1. @ 10A, 10 x 1000\mu sec >3000
   2. @ 100A, 10 x 1000\mu sec >300
   3. @ 10kA, 8 x 20\mu sec >10
   4. @ 20kA, 8 x 20\mu sec >1
   5. @ 65Arms, 11 cycles, 130A total >1
   6. @ 10Arms, 1sec, 20 A total >10
M. The capacitance shall be <1pf for 1 Vrms @ 1Khz, 50 DCV.
N. The insulation Resistance shall be >100M ohms @ 50 VDC.
O. The fail safe operation shall be as follows:
   1. @ 1.0 A <50 sec
   2. @ 5.0 A <15 sec
   3. @ 20 A <10 sec
   4. @ 60 A <3 sec
P. The current limiters shall be as follows:
   1. hold current (ma) @ 20 C = 145
2. \( R \text{ min} / \text{max ohms} = 3 \div 6. \)

2.3 FLOOR MOUNTED FRAMES FOR PROTECTION TERMINALS
A. Provide 84"H Frames suitable for single side mounting of Protection Terminals.
B. Overall width of frame shall be 35.5" and Depth shall be 15".
C. Frame shall be supplied with 12" cable runway support, junctioning bolts, aluminum bond bars, grounding screws and screw for installing the blocks.
D. The frame shall support three (3) Protector modules. Each module shall support eight (8) Protection Terminals for a total of 2400 Pairs per frame.
E. Rack shall have 6" vertical channel to feed cables to blocks.
F. Lowest installed block shall be 6" A.F.F.

2.4 FLOOR MOUNTED DISTRIBUTION FRAMES
A. Provide 84"H Frames suitable for single side mounting of 110D Termination Blocks.
B. Frame shall be configured to support either 3600 on 12 110D blocks or 4500 pairs on 15 110D blocks as per drawings.
C. Overall width of frame shall be 37.5" and Depth shall be 16.13".
D. Frame shall be supplied with 12" cable runway support, junctioning bolts, bond bars, grounding screws and screw for installing the blocks.
E. The frame shall be divided into two modules. The top module shall support 6 110D block and the bottom module shall support 9 110D block.
F. Lowest installed block shall be 18" A.F.F.
G. Rack shall have 6" vertical channel to feed cables to blocks.

2.5 STEEL LADDER RACKING
A. Provide ladder rack in CER as shown on drawings for backbone cable support.
B. Include connecting and support hardware to suit installation. Including but not limited to, racks runway mount plates, wall angle support brackets, butt splice swivels, connection junctions and grounding kit.
C. Rack shall be a solid side bar nominally 3/8" thick by 1 ½" high with rungs 9" on center.
D. Finish shall be telco gray.
E. 13/32" holes shall be provided in solid bar for seismic applications.
F. Rungs shall be welded to stringer.
2.6 COMPUTER FLOOR BASES
   A. Shall be adjustable in 2" increments from 8-12" or 16"-24" as required for
      installation environment.
   B. Shall include all mounting hardware.

2.7 GROUNDING AND BONDING
   A. Provide a #6 AWG wire suitable for grounding application.

2.8 BACKBOARDS
   A. Shall be 4 x 8 x ¾” BCX, fire rated plywood.
   B. Shall be painted – gray, acrylic, interior, fire retardant paint.

2.9 WALL MOUNTED DISTRIBUTING "D" RINGS
   A. Contractor shall install open ended distribution rings for wall mounted cross-
      connect fields above all wall mounted blocks. Two rings per vertical row.
   B. Design Make:
      1. Allen Tel 8" D rings (mfg # GB13C)

2.10 TERMINATION BLOCKS ON FRAME
   A. Shall be 110D style blocks.
   B. Shall be 300 pair blocks.
      • Provide connecting clip, designation strip, plastic covers and retaining clip
         necessary to terminate cables.

2.11 UTP CROSS CONNECTS
   A. Cross connect wire shall be of same gauge (22AWG and 24 AWG) as the feed
      cable to which it is being connected to, typically cross connect wire will be 24
      AWG single twisted pair and dual twisted pair wire as required for circuit being
      connected.
   B. Cross connect wire colors shall be:
      1. White-Blue for voice circuits
      2. White-Orange for Ethernet

PART 3 - EXECUTION

3.1 BUILDING ENTRANCE TERMINALS
   A. Shall be frame mounted.
   B. Field verify actual length required for the input and output stubs.
C. If scope of work does not include splicing of the tip cable to the feed cable, provide clear labeling at the splice end of the tip cable referencing; rack, row and block information. Coordinate with Network & Telecommunications Department.

D. Terminate output stub to appropriate block on distribution frame. Coordinate with Network & Telecommunications Department.

E. Install # 6 Grounding wire as straight as possible from terminal to Grounding Bar.

3.2 SURGE PROTECTION MODULES
A. Contractor shall fully protect all pairs entering a building.
B. Include unit cost per module in bill of materials.

3.3 FLOOR MOUNTED DISTRIBUTION FRAMES
A. Install frames as indicated on drawings.
B. Install as per manufacturers instructions.

3.4 COMPUTER FLOOR BASES
A. Install as per manufacturers instructions.

3.5 STEEL LADDER RACKING
A. Install all ladder rack and associated mounting hardware in a manner that will allow it to support its maximum rated load.
B. Secure ladder rack to rack when the ladder rack and the top of the rack are at the same height and as additionally required by drawings and field conditions.
C. Install as per manufacturer instructions.

3.6 GROUNDING AND BONDING
A. If required, install grounding bar as per the drawings and connect a #4 or #6 copper ground cable to the electrical service ground or independently driven ground rod.
B. If there is no electrical service ground available, install a ½" diameter, 5 ft. grounding rod at least 6 ft. away from other existing electrodes. Installation of any grounding rod shall be in compliance with NEC Section 800 and its subsections and ANSI TIA/EIA 607.
C. Bond equipment to grounding bar as required with #6 AWG copper ground cable.

3.7 BACKBOARDS
A. Linear wall space used for anchoring equipment shall be lined for the full closet width with fire treated BCX grade exterior plywood 3/4" and 8' high.
B. Plywood for mounting termination equipment on shall be installed vertically side by side a minimum of 0" above finished floor. Mounting of plywood shall be sufficient to support the equipment.
C. Plywood for supporting riser cables shall be installed vertically resting directly on the finished floor. Anchoring and mounting techniques of plywood used to support backbone riser cables shall be sufficient to support a minimum of 1500 pounds of weight.
D. In no cases shall the heads of mounting screws protrude past the face of the plywood.

3.8 TERMINATION BLOCKS ON FRAME
A. Install color Designation strips as follows:

<table>
<thead>
<tr>
<th>Description</th>
<th>Color</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common Equipment - PBX, : Muxes</td>
<td>Yellow</td>
</tr>
<tr>
<td>Back Bone Cable</td>
<td>Orange/Yellow</td>
</tr>
<tr>
<td>Back Bone Cable</td>
<td>Black/White</td>
</tr>
<tr>
<td>Horizontal Wiring</td>
<td>Blue</td>
</tr>
<tr>
<td>Inter-building Campus Backbone ( Buried Cable)</td>
<td>Black</td>
</tr>
</tbody>
</table>

B. Install Red Insulator Clips on all special circuits in the MDF.

3.9 GROUNDING AND BONDING
A. Provide pre-drilled tin plated copper bus bar, with standard NEMA bolt hole sizing and spacing for connectors being used, in all communication equipment rooms.
B. All connectors and clamps shall be mechanical type and made of silicon bronze.
C. Terminals shall be solderless compression type, copper long-barrel NEMA two bolt.
D. Provide #6 AWG conductor from the bus bar to the electrical system equipment ground.
E. Bond the ground bar in the main communication equipment room to dedicated communications equipment panel board where applicable.
F. Bond metallic equipment racks to the ground bar.
G. Bond the shield of shielded cable to the ground bar in communications rooms and spaces.

END OF SECTION