Section 27 0100

Voice Communications Systems

Part 1 - Telephone Systems Cabling

1.1 - General

1. Introduction - Cabling requirements for voice communications systems (non-Voice over IP systems).

1.2 - Telephone System Backbone Cabling

A. Provide, General Cable or Essex cables. Each cable shall have unshielded twisted pair 24 AWG solid copper conductors and meet or exceed the electrical specifications for Category 3 cables detailed in the ANSI-EIA/TIA 568-C.2 Balanced Twisted-Pair Telecommunications Cabling and Components Standards for premises wiring. The cable shall be riser rated and have 200 pairs of conductors.

1.3 - Telephone System External Cabling - Add/Alternate Bid Item

A. Air Core Cable. Provide General Cable, Essex air core telephone cable suitable for direct-burial or in-duct applications.
   1. Cable shall have 22 AWG solid annealed copper conductors.
   2. Sheath shall consist of a 0.008" corrugated aluminum shield, with a 0.006" corrugated steel shield and a black polyethylene jacket.
   3. Jacket shall be sequentially printed with a footage marker at regular intervals.
   4. A non-gel, paper-based flooding compound shall be applied over the core and to all surfaces of the aluminum and steel shields to resist moisture entry and to inhibit corrosion.
   5. Provide printed length markings on the cable jacket every two feet.
   6. Provide 400 pairs of conductors and be pulled from the Dabney Hall Telephone Switch Room to the BDF.
   7. Verify with Caltech if this project is to use a cable of reduced pair count, as Caltech often uses a 200 pair cable for smaller projects.

B. Provide a 400 pair external telephone cable running from the Building Distribution Frame to the campus telephone connection point in the Main Telephone Room in Dabney Building. Terminate both ends of this cable on 66 blocks fitted in an 89D bracket fixed to the Telephone Termination Backboard.

C. Label each block with all the feeder/external pair numbers.

D. Provide a Siemon 66-block System Backboard between the feeder and external termination frames to route jumpers and cross-connects.

E. Provide option pricing for this scope of work as part of bid process.

1.4 - Telephone System Termination

A. Frames Provide Backboards of Allen Tel GB183B1 manufacture containing 89D type stand-off brackets.

B. Provide Allen Tel GB198A Patch management backboard mushrooms to be used for cable management. Provide two management backboards for every single installed Backboard GB183B1. Installed location to be determined by Caltech Telephone Shop since final positioning is determined after Backboard installation.
C. Provide wall mounted Field-Terminated M Series S66 Blocks Siemon Co. (S66M-50) for proper cross-connect wire management.
D. Allentel backboards. Allentel backboards will be utilized to support 66 block installation.
E. Rack-mounted Termination Patch Panel. Provide a RJ-45 Patch Panel with individual RJ-45 connectors to terminate the telephone backbone cable pairs. All pairs will be terminated on each RJ-45 connector using the USOC termination scheme. Each patch panel shall be suitable for rack mounting in a 19" rack. Provide Panduit Data-Patch Angled Patch Panels which utilize 110 style termination on the back (24 position Panduit DPA245E88TGY or DPA24688TGY; 48 position Panduit DPA48688TGY or DPA485E88TG, depending on application).

1.5 - Feeder Telephone Cabling

A. Provide telephone feeder cables running from the Building Distribution Frame to wall-mounted Intermediate Distribution Frames (IDFs) in each of the Communications Rooms. Refer to drawing for cable quantities and routing information.
B. Installation Methods
C. BDF 66 blocks to IDF 66 blocks.
D. Terminate the Building Distribution Frame end of each feeder cable on 66 blocks fitted in an 89-D bracket fixed to a Telephone Termination Backboard in the BDF. Terminate all pairs of each feeder cable.
E. Terminate the Intermediate Distribution Frame end of each feeder cable on 66 blocks fitted in an 89D bracket on the wall of each Communications Room. Terminate all pairs of each feeder cable.
F. Label each block with all the feeder/external pair numbers.
G. BDF 66 blocks to IDF Angled Patch Panels.
H. Terminate the Building Distribution Frame end of each feeder cable on 66 blocks fitted in an 89-D bracket fixed to a Telephone Termination Backboard in the BDF. Terminate all pairs of each feeder cable.
I. Terminate the Intermediate Distribution Frame end of the feeder cable on the Angled Patch Panel located in the network rack. Telephone Patch Panel to be located above patch panels providing horizontal cable distribution.
J. Label each block with all the feeder/external pair numbers and label angled patch panel in rack as to source.
K. Provide a Siemon 66-block System Backboard between the feeder and external termination frames to route jumpers and cross-connects.

1.6 - Telephone System External and Backbone Cabling Testing

A. Test each Telephone System Backbone and External Cable and its associated patch frame connectors. Carry out the following tests on every pair of every telephone system feeder and external cable:
   1. Continuity
   2. Resistance
   3. Polarity/Wiremap

1.7 - Telephone System Termination Frames - Labeling

A. Termination Frame Labels. Provide a full complement of preprinted cross-connect frame labels, allowing each pair of each telephone system distribution and feeder cable to be clearly identified. Provide a jumpering schedule at each Telephone Backboard that identifies which feeder telephone pairs are jumpered to which distribution cable pairs served by that backboard.

B. Backboard Label. Provide a 18''W x 10"H engraved label having 1.5" black letters on white background reading: "All Cross Connects to be patched on Rack #1". This label is to be placed at every M-66 block backboard location at 8'-0" AFF in all Communications Rooms.

C. Angled patch panels are to be labeled to identify source.

1.8 - Telephone System Cross Connects

A. Provide Category 5/6 patch panels for cross-connecting all riser cables from the wall mounted 66-blocks. Terminate all pairs so as to match the exact number of pairs as the riser cable entering the Communications Room. Label all connectors with their respective cable pair range.

B. Provide Category 3 25-pair cables to achieve all cross connects from the wall mounted 66 blocks to the rack mounted Category 5 patch panels. Refer to construction drawings for additional information.

End Section