Section D7030
IT Equipment Rooms

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D7030 - Introduction

This section outlines standards and requirements for IT Equipment Rooms in all campus projects.

D7030.11 – IT Equipment Room Scope of Work

1. Provide all services, labor, materials, tools, and equipment required for the complete and proper installation within the Telecommunications Rooms (TRs) and Equipment Rooms (ERs) as called for in these specifications and related drawings.
2. This section includes minimum requirements and installation methods for the following:
    a. Equipment Racks and Cable Routing Hardware
    b. Copper Termination Equipment
    c. Fiber Termination Equipment
    d. Grounding and Bonding

D7030.121 –IT/Communication Design Requirements

1. If any DAS equipment is to be located within the TRs and ERs, the space and environmental requirements for these rooms will be revised to accommodate this additional equipment without impacting the OIT equipment in these rooms. The TR and ER room designs shall be coordinated between the telecommunications low-voltage consultant and the DAS consultant.
2. The hardware layout in the racks shall follow the UCB standard format from top to bottom and left to right as shown in the typical rack layout drawings later in this section.
    a. Refer to Appendix **D7030.1211** for Standard OIT room Layout Details.
3. Each relay rack shall have a maximum of (6) 48 port patch panels with 10 percent growth.
4. For OIT Architectural Design Requirements Refer to A0020 OIT standard section.

D7030.21 – IT Equipment Room Materials

1. Refer to Appendix **D7030.211** for IT Equip. Room Materials.
2. D7030.212 - Equipment and Materials Minimum Requirements

a. Floor-Mount Equipment Rack
    i. Standard 19” rack mounting space
    ii. 84” high with 44 rack spaces (1 rack space = 1-¾”)
    iii. EIA-310-D standard 5/8” 5/8” 1/2” hole pattern
    iv. EIA channel width of 3” with double-sided 12/24 tapped screw holes
    v. Lightweight high strength aluminum construction with clear finish
    vi. 15” deep base with four (4) ¾” bolt down holes and equipped with hardware for permanent mounting on concrete floor
    vii. Rack installation kit
    viii. Dust covers for the base of all racks.
    ix. 1000 lb standard for the Main Distribution Frame (MDF) and Intermediate Distribution Frame (IDF) in the TRs and ERs, or 1500 lb for data centers, as required.
b. Vertical Rack Cable Management (for new installations)
    i. 84” high x 10” wide on both sides.
    ii. Slack Loop Storage Organizer, Extended (2”) Mounting Bracket
    iii. Cable Retainer Cover
c. Rack Cable Management and Accessories
    i. Interbay Cable Organizer
    ii. Screw-Mount, Reusable Cable Ties
    iii. Cable Runway Rack Elevation Kit – Cable Runway Support (stiff leg)
    iv. Rack to Runway Mounting Plate – (stiff leg)
d. Power Strips
    i. Standard 19” rack-mount power strip with 10 outlets and 10’ cord
e. Ladder Cable Runway
    i. Tube steel painted Gray with cross members welded at 12” intervals: 6”, 12”, 18” and 24” wide with lengths as required.
    ii. Alternate Space Cable Runway for over Equipment Racks – Gray 12”W x 1.5”H x 8.73’L with cable capacity 629.
    iii. Cable Runway Radius Drops for cross members and stringers: 6”, 12”, 18” and 24” wide.
    iv. Include support kits, brackets, splice kits, end caps, etc. as required for complete installation.
f. ½ D-Rings and D-Rings wall-mount nominal 2” 4” or 6” as required.
g. Velcro cable ties for cable routing and management as required. Various lengths to ensure a minimum 2” overlap when wrapped around the cable.

3. D7030.213 - Copper Termination Equipment
    a. Category 3 – For Renovations Match Existing and for Additions use 66-type connecting blocks and brackets:
        i. 66 block punch down 66M1-50 style
        ii. 89 bracket
        iii. 66M cover
        iv. Bridge clips
    b. Patch Panel: 24-port or 48-Port Rack Mount Panel – Unloaded for station cabling.
    c. Patch Panel Pre-loaded: 24-port Panel – Preloaded for backbone cabling.
    d. Building Entrance Protector – Cat 3: 66 block punch to 66 block punch with 5 pin heat coil input.
    e. Building Entrance Protector Gas Tube and 4 ohm with 5 pin Heat Coils
    f. Building Entrance Protector – 4 pair Cat 6: 110 termination
    g. Solid State Protector Modules: 18V, 27V, or 65V (for PoE)
4. D7030.214 - Fiber Termination Equipment
    a. Rack-Mount Fiber Termination Shelves

i. 4U Fixed Shelf for Backbone Cable
ii. 1U Sliding Shelf for Combination Station and Backbone Cable

b. Fiber Termination Panels for Rack-Mount Shelves
i. LC Duplex Adapter Panel for Singlemode Fiber
ii. LC Duplex Adapter Panel for Multimode 62.5/125 Fiber
iii. LC-APC Duplex Adapter Panel for Singlemode with Angled Polished Connector

c. Splice Kits and Wallets as required for fiber termination
d. Wall Mount Fiber enclosure (for repair and special approved projects only, approved in writing by OIT).

5. D7030.215 - Copper Patch Cords – supplied by OIT
6. D7030.216 - Grounding and Bonding
   a. #4 and #6 AWG wire suitable for grounding application.
   b. All connectors and clamps shall be mechanical type made of silicon bronze.
   c. Terminals shall be solderless compression type, copper long-barrel NEMA two bolt.
   d. Telecommunications Bonding Backbone (TBB): Minimum No. 6 AWG insulated copper conductor.
   e. Telecommunications Grounding Busbar (TGB): Minimum 6 mm thick x 50 mm wide predrilled copper busbar with standard NEMA bolt hole sizing and spacing
   f. All grounding equipment shall be UL listed for that purpose.

D7030.31 – IT Equipment Room Execution

1. D7030.311 - Equipment Racks and Cable Routing Hardware In IT/Telecommunications Rooms
   a. The Telecommunications Rooms (TRs) and Equipment Rooms (ERs) may be equipped with some existing hardware, such as plywood backboards, grounding bus bars, equipment racks, ladder cable runway, horizontal and vertical cable management, and copper and fiber termination equipment. Existing hardware already in place will be shown on the project drawings.
   b. Install new equipment racks with all related mounting hardware, vertical and horizontal cable management and power strips in the TRs and ERs as required for project and as shown on drawings. Letter designation for racks and equipment shall be placed as shown in the rack layout at the end of this Section and in the panel details at the end of Section D7050 . All equipment racks shall be securely anchored to the concrete floor using minimum 3/8" hardware or as specified by rack manufacturer.
   c. Install new ladder cable runway with all related mounting hardware for cable routing in the TRs and ERs as required for project and as shown on drawings. All ladder cable runway shall be securely anchored to the walls with support kits and brackets as specified by manufacturer. Secure equipment racks to ladder cable runway with all-thread covered with EMT conduit sleeve.
   d. Install plywood backboard on the walls in the TRs and ERs as required for the project and as shown on drawings. All plywood backboard shall be securely anchored to the walls and shall meet the requirements in the OIT Architectural Electrical Plumbing and HVAC Design Requirements document.
   e. Install D-rings on plywood backboard for cable routing in the TRs and ERs as required for the project and as shown on drawings.
   f. A small drip loop on the horizontal cable is required for trouble shooting and tracing patch cords.
   g. Refer to the drawing attached at the end of this section for patch cord routing.
   h. All patch cords and horizontal cables leaving the equipment racks shall have Velcro cable ties placed on the bundle every 8 to 12 inches within the ER and TR's. The Velcro cable ties shall overlap a minimum of 2" to allow for more cable to be added in the future.
2. D7030.312 - Copper Termination Equipment

a. Refer to Appendix **D7030.3121** for Back of Patch Panel Service Loop Detail.
b. Some copper termination equipment may already be in place in existing TRs and ERs and will be shown on the project drawings.
c. Mount new 66M1-50 blocks on 89B brackets for backbone and horizontal telephone cables directly on plywood backboard in the TRs and ERs as required for the project and as shown on drawings. Add bridge clips, cross-connects, and patch cords for all voice installs in IDF TRs prior to final testing for projects and after testing for daily installs, and place new clear covers after cable termination and labeling.
d. Mount new unloaded patch panels for horizontal cables in the floor-mounted equipment racks in the TRs and ERs as required for the project and as shown on drawings.
e. Label all copper terminations according to UCB campus standards. A one-page Copper Termination sheet, with backbone cable numbering for each TR and ER, will be provided by UCB OIT. All labels shall be supplied and installed by the Contractor.

3. D7030.313 - Fiber Termination Equipment
   a. Some fiber termination equipment may already be in place in existing TRs and ERs and will be shown on the project drawings.
   b. Mount new fiber termination shelves with associated splice kits and wallets, adapter panels, and couplings, in the floor-mounted equipment racks in the TRs and ERs as required for the project and as shown on drawings.
   c. Mount new LIUs with associated splice kits and wallets, adapter panels, and couplings, on the walls in the TRs and ERs as required for the project and as shown on drawings.
   d. Label all fiber enclosures according to UCB campus standards. Fiber schematic sheets and Fiber Termination labels will be provided by UCB OIT and installed by the Contractor.
   e. Ensure dust covers are in place on all couplings prior to final acceptance.
4. D7030.314 - Copper Patch Cords – supplied by OIT
   a. Refer to Appendix **D7030.3141** for Patch Cord routing Details.
5. D7030.35 - Grounding and Bonding
   a. Mount new TGBs on plywood backboard in TRs as shown on project drawings. The location for the TGBs shall be coordinated with UCB OIT.
   b. Mount new TMGB on plywood backboard in main ER as shown on project drawings. The location for the TMGB shall be coordinated with UCB OIT.
   c. Install new TBB from the TMGB in the ER to the TGBs in the TRs as shown on project drawings. Connect the TBB to the TMGB and TGBs in accordance with TIA-607 and NEC. All grounding conductors leaving the ER and TRs shall be in a separate conduit from all communication cabling.
   d. Bond all metallic surfaces of new racks, ladder cable runway, and equipment in the TRs and ERs to the TGB or TMGB in the same room with #6 AWG grounding wire as straight as possible.
   e. Bond all metallic raceways (conduit, cable tray, etc.) entering the TRs and ERs to the TGB or TMGB in the same room with #6 AWG grounding wire as straight as possible.
   f. All grounding items shall be installed in complete compliance with UCB Electrical standards (or Construction Specifications Institute for Electrical) and NEC.

D7030.41 – Data Equipment

1. D7030.51 - DATA COMMUNICATIONS EQUIPMENT
   a. Each project supplies funds for all required data communications equipment.
   b. The data communications equipment is designed, provided, installed, and configured by UCB OIT.
   c. The data communications equipment consists of routers, firewalls, and switches.
   d. All access points and connecting patch cords are supplied by OIT and installed by the contractor.

Appendices

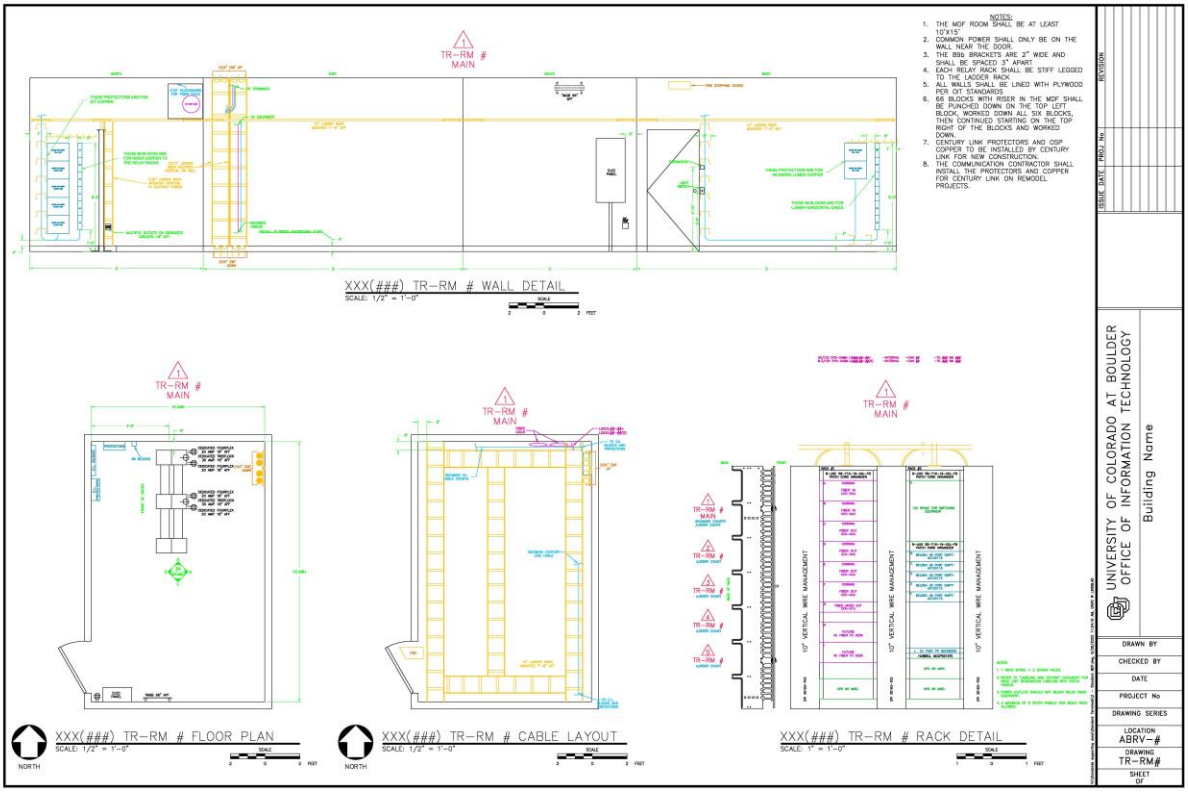
D7030.211 - IT Equipment Room Materials.

Pre-Approved Equipment Schedule

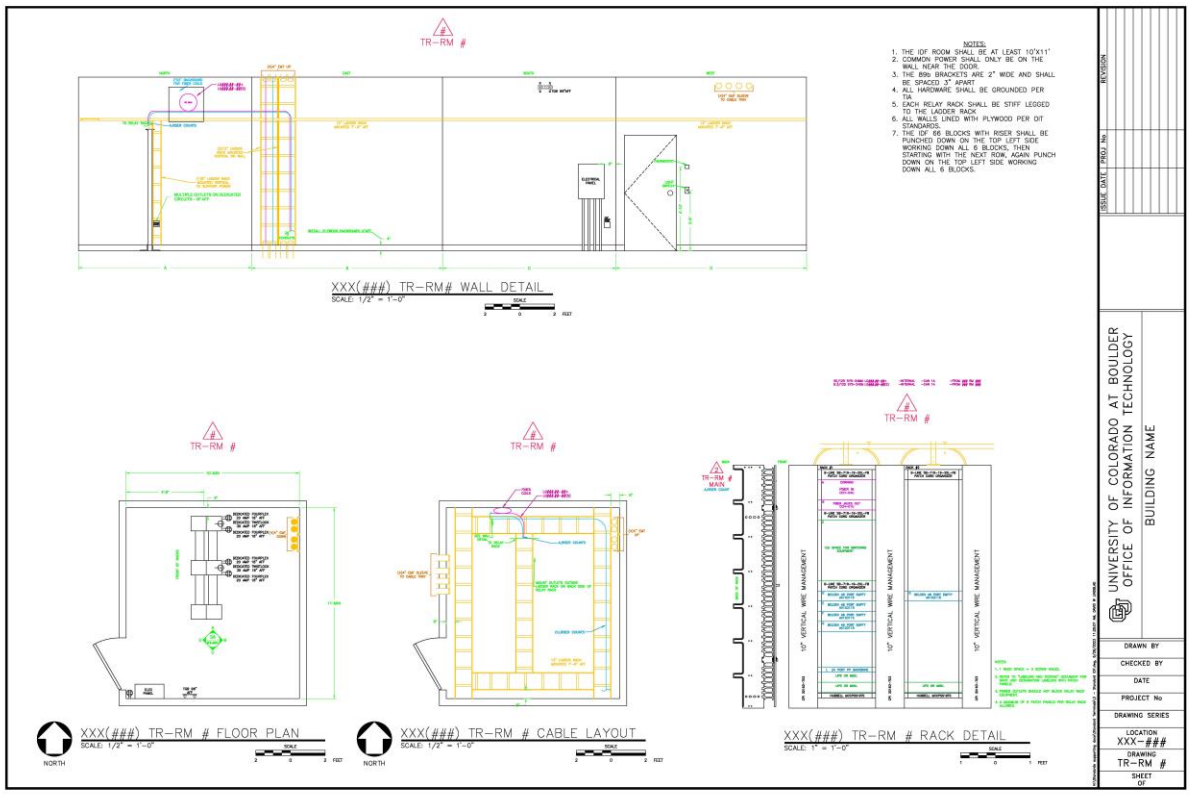
Line	Description	Manufacturer	Part Number
1	Floor-Mount Equipment Rack – 19" 1000 lb	CPI	55053-503
2	Floor-Mount Equipment Rack – 19" 1500 lb	CPI	46353-503
3	Floor-Mount Equipment Rack - installation kit	CPI	40604-001
4	Dust Covers for floor racks	CPI	41050-119
5	Vertical Rack Cable management 84"H x 10"W	CPI	30163-703
6	Patch Cord Organizer	B-Line	SB-719-19-2XL FB
7	Screw-Mount, Reusable Cable Ties	Hubbell	MCCMV9BS10
8	Power Strip for 19" racks	Hubbell	MCCPSS19TS
9	Ladder Cable Runway 6" wide	CPI	10250-106
10	Ladder Cable Runway 12" wide	CPI	10250-112
11	Ladder Cable Runway 18" wide	CPI	10250-118
12	Ladder Cable Runway 24" wide	CPI	10250-124
13	Cable Runway Radius Drop 5" wide	CPI	12100-106
14	Cable Runway Radius Drop 11" wide	CPI	12100-112
15	Cable Runway Radius Drop 17" wide	CPI	12100-118
16	Triangle Support Bracket - 6" wide	CPI	11312-106
17	Triangle Support Bracket – Steel - 12" wide	CPI	11312-112
18	Triangle Support Bracket – Steel - 18" wide	CPI	11312-118
19	Alternate Space Cable Runway, over Equipment Racks-Gray	CPI	31472-112
20	Cable Runway Rack Elevation Kit – (stiff leg)	CPI	10506-106
21	Rack to Runway Mounting Plate – (stiff leg)	CPI	10595-112
22	66 block 66M1-50 style	Hubbell	HPW66M150
23	89 bracket	Hubbell	HPW89B
24	66M cover	Hubbell	HPW66MCVR
25	Bridge clips	Siemon	SA1-SS-1000
26	24 Port 1U Modular Patch Panel for horizontal cables KeyConnect – Empty / Unloaded	Belden	AX103114
27	48 Port 2U Modular Patch Panel for horizontal cables KeyConnect – Empty / Unloaded	Belden	AX103115
28	24 Port 1U Patch Panel for backbone cables REVConnect – Pre-Loaded	Belden	RVACPF1U24BK
29	Building Ent. Protector – 66/66 – Porta System product	Tii	24100-66-M66C
30	Gas Tube Heat Coils – Porta System product	Tii	195BCXN-230
31	Cat 6 Ent. Protector – PoE - Porta System product	Tii	606-65 with LVP65
32	TGB – Grounding Busbar	CPI	13622-010
		CommScope part #	Corning part #
33	4U Fiber Shelf	SD-4U (Uniprise) Mat. ID = 760231464	CCH-04U
34	1U Fiber Shelf –	SD-1U-UP-FX Mat. ID = 760234738	CCH-01U
35	Replacement Front Panel for existing 600B 1U Shelves	600G2-1U-IP-UP Mat. ID = 760101741	
36	Wall Mount enclosure 4 Panels (LIU)	200A LIU Mat ID = 105535926	WCH-04P

37	LC Duplex Adapter Panel for Singlemode Fiber – Loaded	PNL-BK-012-SFA-LC02-BL-SHUTTERED Mat ID = 760067165	CCH-CP12-A9
38	LC Duplex Adapter Panel for Multimode 62.5/125 Fiber – Loaded	PNL-BK-012-MFA-LC02-BG-SHUTTERED Mat ID = 760067157	CCH-CP12-A8
39	LC Duplex Adapter Panel – Unloaded	PNL-BK-012-EMT-LC02 Mat ID = 760067199	
40	LC-APC Duplex Low Profile Shuttered Adapter for Singlemode Fiber – Green	AFA-LC02-GR/LP-SHUTTERED Mat ID = 760056036	CCH-CP12-B3
41	Splice trays for use in Fiber Shelf	RS-2AF-16SF Mat ID = 760039867	M67-078
42	Splice Wallet for use in 4U Fiber Shelf - accepts 3 splice trays	SW-03 Mat ID = 760057059	
43	Fusion Splice Wallet Kit with 6 splice trays for use in 4U Fiber Shelf	SW-6AF-16SF Mat ID = 760031054	
44	Splice Tray, mass Fusion Splices or Heat-Shrink		M67-076
45	Wall mount Splice Trays		M67-110

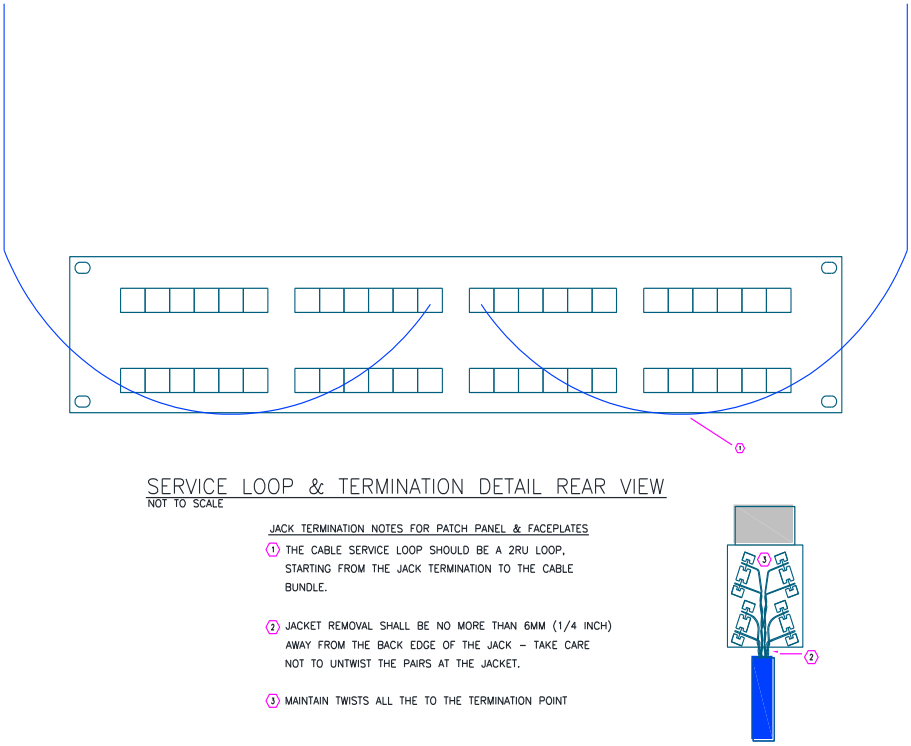
D7030.1211 for Standard OIT room Layout Details.
Standard MDF room layout.



Standard IDF room Layout

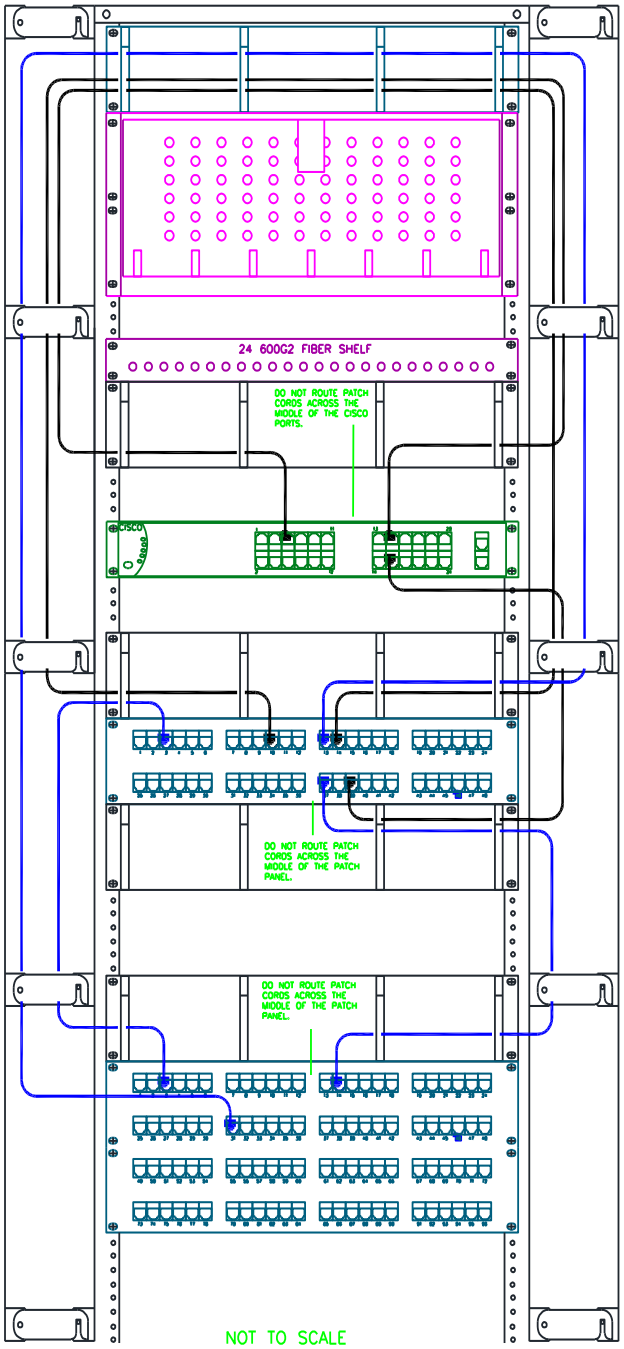


D7030.3121 - Back of Patch Panel Service Loop Detail.

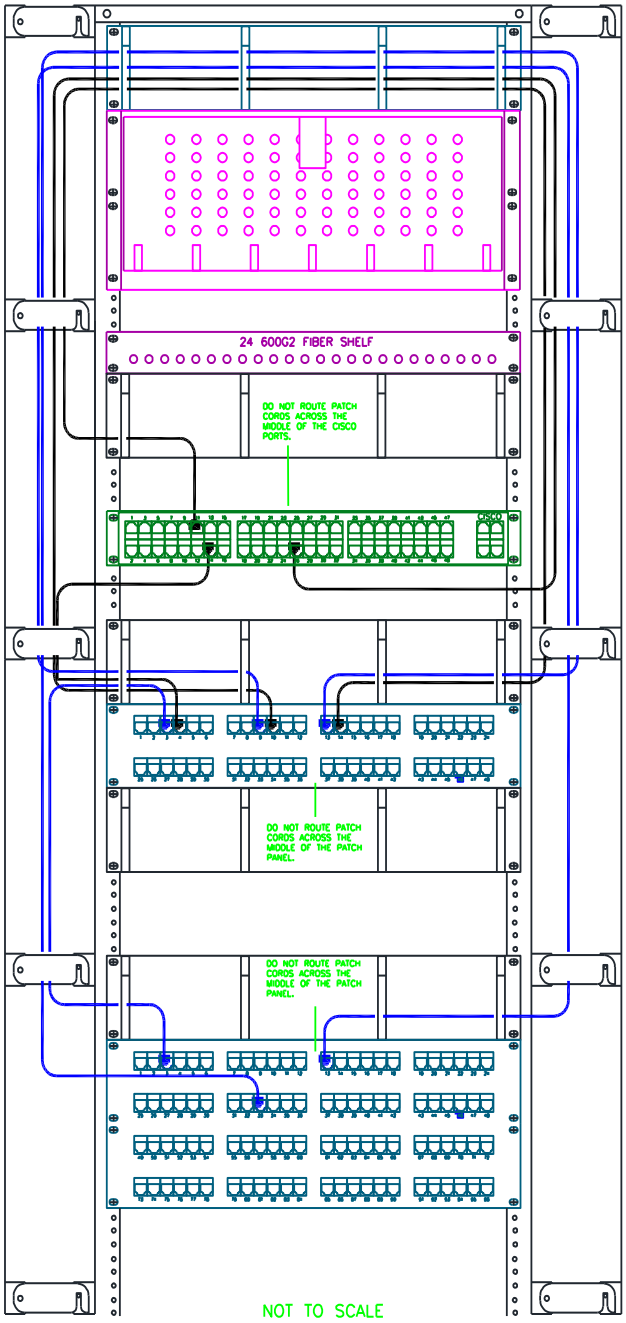


D7030.3141 - Patch Cord routing Details.

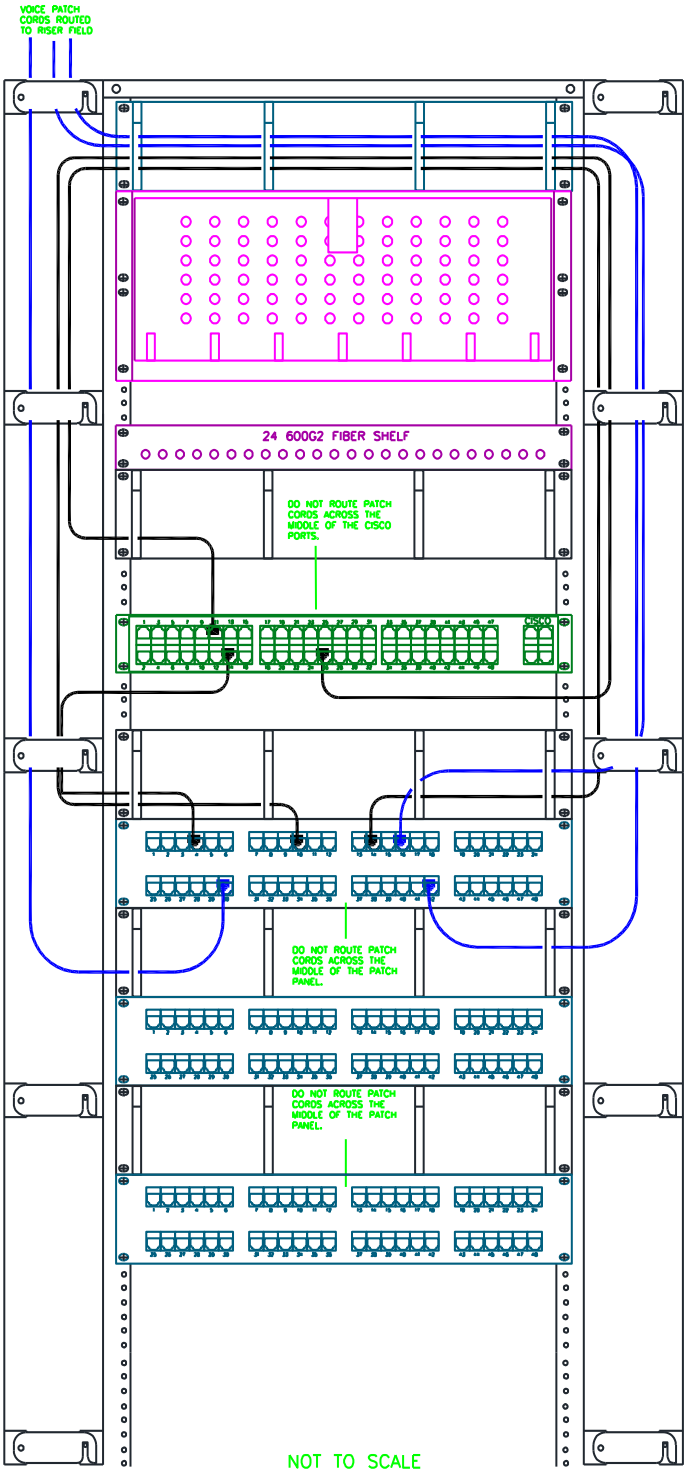
Patch Cord Routing 24 Port Equip and 96 Voice Patch Panel Detail


24 600G2 FIBER SHELF
DO NOT ROUTE PATCH CORDS ACROSS THE MIDDLE OF THE CISCO PORTS.
CISCO
DO NOT ROUTE PATCH CORDS ACROSS THE MIDDLE OF THE PATCH PANEL.
DO NOT ROUTE PATCH CORDS ACROSS THE MIDDLE OF THE PATCH PANEL.
NOT TO SCALE

Patch Cord Routing 48 Port Equip and 96 Voice Patch Panel Detail



Patch Cord Routing 48 Port Equip and Voice to Wall Field Detail


VOICE PATCH CORDS ROUTED TO RISER FIELD
24 600G2 FIBER SHELF
DO NOT ROUTE PATCH CORDS ACROSS THE MIDDLE OF THE CISCO PORTS.
DO NOT ROUTE PATCH CORDS ACROSS THE MIDDLE OF THE PATCH PANEL.
DO NOT ROUTE PATCH CORDS ACROSS THE MIDDLE OF THE PATCH PANEL.
NOT TO SCALE