Appendix E
Rev. 08.13.2018
Kim-Young

VA

U.S. Department of Veterans Affairs

Office of Information and Technology

IT Operations and Services

| Solution Delivery

COMMUNITY BASED OUTPATIENT CLINIC (CBOC)
INSIDE PLANT
INFORMATION TRANSPORT SYSTEMS SPECIFICATIONS

DEVELOPED BY:

DATA CENTER ENGINEERING

DATA CENTER & CLOUD ENGINEERING

Department of Veterans Affairs

IT Operations and Services
Solution Delivery

PROJECT:
CBOC ITS SPECIFICATIONS

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SHEET TITLE
COVER PAGE

COVER
SHEET: 1 OF 15

FRONT MATTER

PURPOSE:

THIS DRAWING SET REPRESENTS THE COMPUTING AND PASSIVE INFRASTRUCTURE DESIGN AND RACK ELEVATIONS FOR A GENERIC HEALHCARE FACILITY EQUIPMENT ROOM (ER) AND A GENERIC TELECOMMUNICATION ROOM (TR). UNLESS NOTED OTHERWISE, ACTIVE EQUIPMENT WILL BE FURNISHED AND INSTALLED BY VA OR VA CONTRACTORS. THE STRUCTURED CABLING PLANT INSTALLERS WILL FURNISH AND INSTALL PASSIVE CABLE PLANT INFRASTRUCTURE INCLUDING HORIZONTAL CABLE MANAGERS, UTP AND FO HORIZONTAL CABLE, PATCH PANELS, PATHWAY RACKS, FIBER DISTRIBUTION CABINETS AND FIBER CASSETTES. + vertical cable managers + Contractor to provide racks & UPSs

DESIGN OBJECTIVES

1. MODULARITY: THIS DESIGN IS HIGHLY MODULAR.

2. FLEXIBLE: THIS DESIGN IS FLEXIBLE TO ACCOMMODATE CHANGES TO FLOOR PLANS.

3. CABLE PLANT: UTP CATEGORY 6A CABLE PLANT WILL SUPPORT 10 GIGABIT ETHERNET. Cat6

FIBER PLANT WILL UTILIZE LASER ENHANCED OM4 40 GbE RATED 50/125 MULTIMODE. single mode w/ LC-LC connectors

THIS DRAWING IS SCALED TO 11X17 FORMAT.

DRAWING TYPE DEFINITIONS

T0 - Campus or Site Plans - Exterior Pathways and Inter-Building Backbones

T1 - Layout of complete building per floor - Serving Zone Boundaries, Backbone Systems, and Horizontal Pathways

T2 - Serving Zones Drawings - Drop Locations and Cable ID's

T3 - Communication Equipment Rooms - Plan Views - Tech and AMEP /Elevations - Racks and Walls Elevations

T4 - Typical Detail Drawings - Faceplate Labeling, Firestopping, ADA, Safety, DOT, etc...

T5 - Schedules (Cabling and Equipment Spreadsheets) for cutovers

Standard or Document Description

ANSI/TIA-606-C, Administration Standard for Telecommunications Infrastructure

ANSI/TIA-606-B-1, Administration Standard for Telecommunications Infrastructure Addendum 1- Automated Infrastructure Management Systems - Addendum to ANSI/TIA-606-B

ANSI/TIA-607-C, Generic Telecommunications Bonding and Grounding (Earthing) for Customer Premises

ANSI/TIA-607-C-1, Generic Telecommunications Bonding and Grounding (Earthing) for Customer Premises - Addendum to TIA-607-C

ANSI/TIA-942-A, Telecommunications Infrastructure Standard for Data Centers

ANSI/TIA-942-A-1, Telecommunications Infrastructure Standard for Data Centers Addendum 1- Cabling Guidelines for Data Center Fabrics - Addendum to TIA-942-A

ANSI/TIA-1179, Healthcare Facility Telecommunications Infrastructure

BICSI 002, Data Center Design and Implementation Best Practices

BICSI ITSIMM, Information Technology Systems Installation Methods Manual (ITSIMM) - 7th Edition

BICSI/NECA 568, Standard for Installing Commercial Building Telecommunications Cabling

BICSI/NECA 607 Standard for Telecommunications Bonding and Grounding Planning and Installation Methods for Commercial Buildings 2011

CSI MASTERFORMAT ™ 2004 EDITION NUMBERS & TITLES Construction Specifications Institute (CSI)

NFPA 70, National Electrical Code

NFPA 75, Standard for the Fire Protection of Information Technology Equipment

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SHEET TITLE: FRONT MATTER

FRONT MATTER

SHEET: 2 OF 15

T2 SYMBOLS

- DATA
- W — WALL PHONE
- FLOOR MOUNT
- F — FIRE ALARM PANEL
- E — EMERGENCY PHONE
- D — SECURITY OR FIRE ALARM DIALERS
- DATA / TELEPHONE
- TELEPHONE
- CR — SECURITY SYSTEM CARD READER
- CC — CLOSED CIRCUIT SURVEILLANCE CAMERA OUTLET
- MD — MOTION DETECTOR

T3 SYMBOLS

- TWIST LOCK RECEPTACLE
- T — THERMOSTAT
- QUADRUPLEX OUTLET
- 110 RECEPTACLE
- TGB — TELECOMMUNICATIONS GROUNDING BUSBAR
- STRIP LIGHT
- SERVICE PANEL
- HORIZONTAL SLEEVE (SIZE AS INDICATED)
- CONDUIT (SIZE AS INDICATED)
- VERTICAL SLEEVE (SIZE AS INDICATED)
- CABLE RACEWAY
- TELECOMMUNICATIONS OUTLET

T4 SYMBOLS

CHATSWORTH SERVER RACK, 24"WIDE X 47.5" DEEP - see sheet #4

PERFORATED FLOOR TILE - solid floor required

OR-60401015

OR-MZLCQ24-50E

OR-MM6HM61RU

FC01U-P

zPDU (R1F)

L21-30

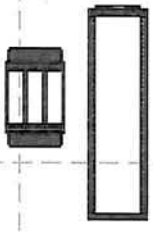
L21-20

IEC 320-C19

IEC 320-C20

IEC 320-C13

IEC 320-C14



OR-MM20730-W, 30" DEEP CHANNEL 7'H, 45RU, ORTRONICS MM20 CHANNEL RACK

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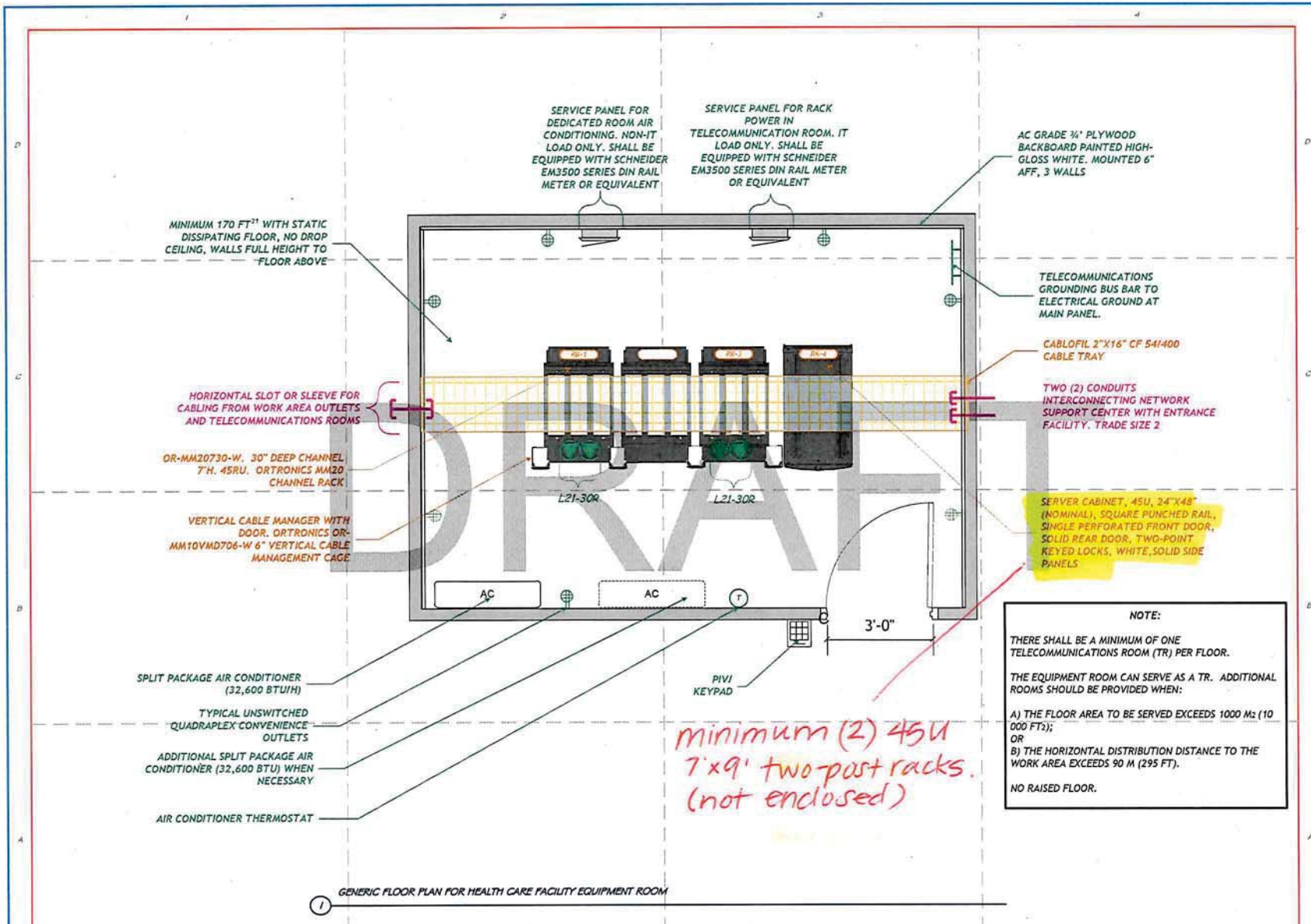
SHEET TITLE
SYMBOLS

SYMBOLS

SHEET: 3 OF 15



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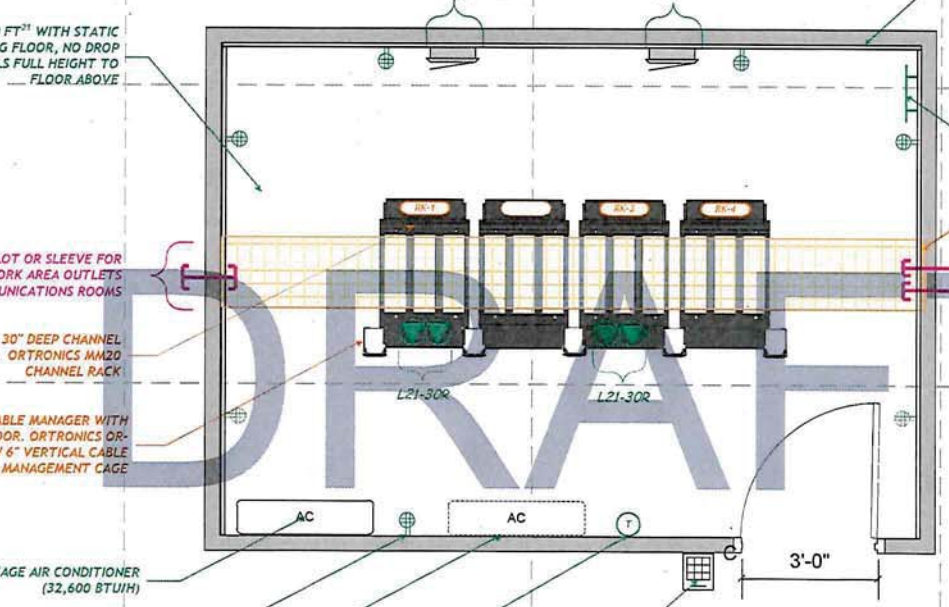
SHEET TITLE

EQUIPMENT ROOM

T3- GENERIC HEALTH CARE FACILITY EQUIPMENT ROOM

SHEET: 4 OF 15



1 GENERIC FLOOR PLAN FOR HEALTH CARE FACILITY TELECOMMUNICATIONS ROOMS

NOTE:

THERE SHALL BE A MINIMUM OF ONE TELECOMMUNICATIONS ROOM (TR) PER FLOOR.

THE EQUIPMENT ROOM CAN SERVE AS A TR. ADDITIONAL ROOMS SHOULD BE PROVIDED WHEN:

A) THE FLOOR AREA TO BE SERVED EXCEEDS 1000 M2 (10 000 FT2);
OR
B) THE HORIZONTAL DISTRIBUTION DISTANCE TO THE WORK AREA EXCEEDS 90 M (295 FT).

NO RAISED FLOOR.

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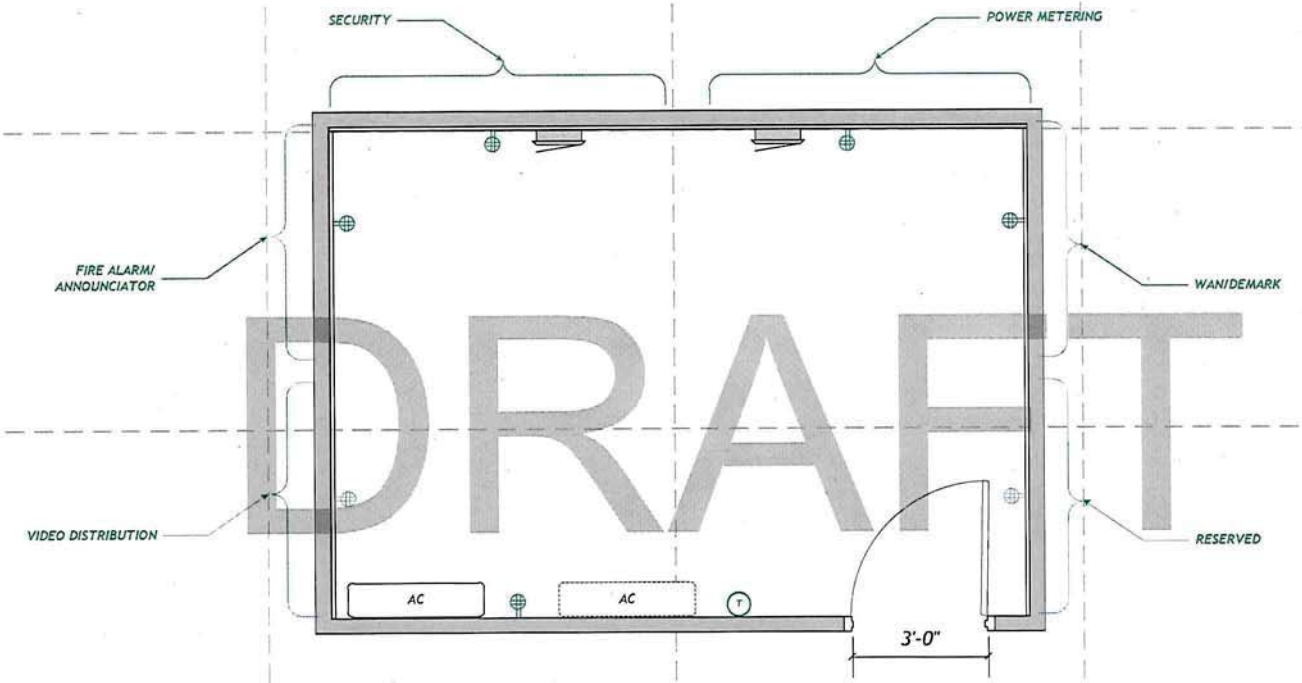
SHEET TITLE
TELECOMMUNICATIONS ROOM

T3-GENERIC HEALTH CARE FACILITY TR

SHEET: 5 OF 15



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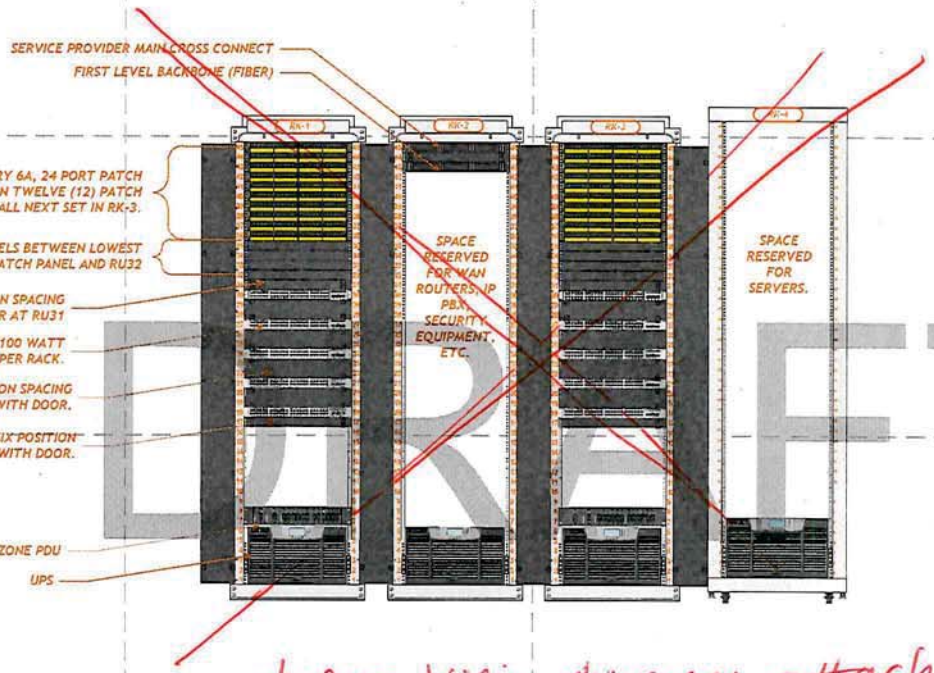
SHEET TITLE

TYPICAL BACKBOARD
ELEVATION

T3 - TYPICAL BACKBOARD
ELEVATION

SHEET: 6 OF 15



*See Visio diagram attached

1 TYPICAL RACK ELEVATION FOR HEALTH CARE FACILITY TELECOMMUNICATIONS ROOMS

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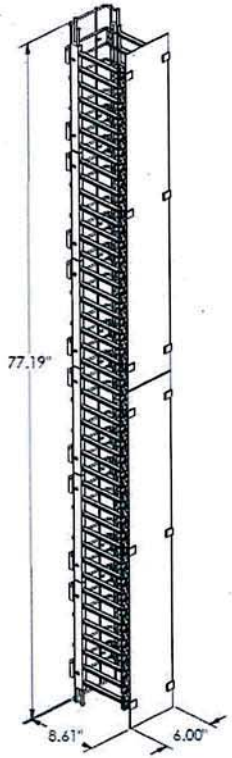
SHEET TITLE
TYPICAL RACK ELEVATION

T3 - TYPICAL RACK ELEVATION
SHEET: 7 OF 15

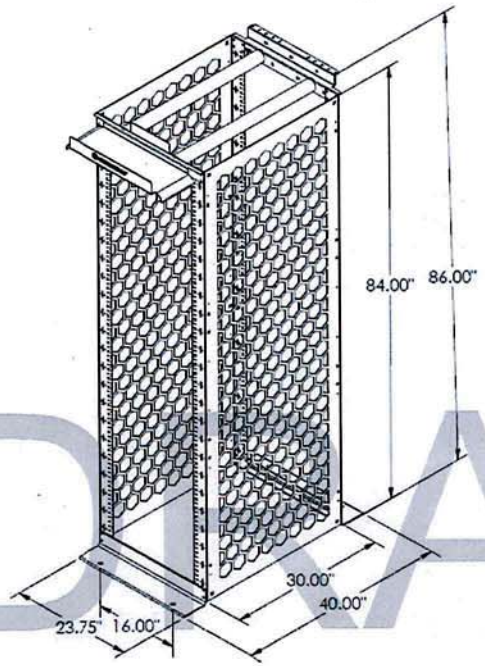


P/N: OR-MM20VMD706 (OR EQUIVALENT)

MM20 VERTICAL CABLE MANAGEMENT "CAGE", WITH DOOR, 6" X 8.61" X 7' , BLACK

CAPACITY: 350 CATEGORY 6 PATCH CORDS OR 245 CATEGORY 6A PATCH CORDS

6 — 6" WIDE VERTICAL CABLE MANAGEMENT



P/N: OR-MM2073038-W (OR EQUIVALENT)

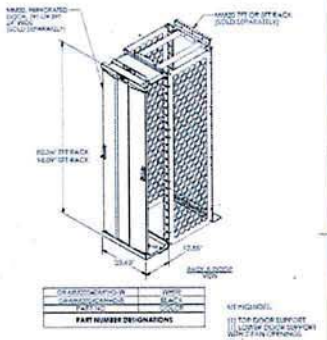
MIGHTY MO 20 CABLE MANAGEMENT RACK
30" CHANNEL DEPTH, 7' HIGH, WHITE FINISH OR EQUIVALENT

DIMENSIONS:
USABLE HEIGHT: 45RU
DEPTH (US): 30
HEIGHT (US): 7'
WIDTH (US): 23.75"
STATIC LOAD CAPACITY: 2000 LBS

SQUARE HOLE

5 — TYPICAL RACK DIMENSIONS AND SPECIFICATIONS

NTS

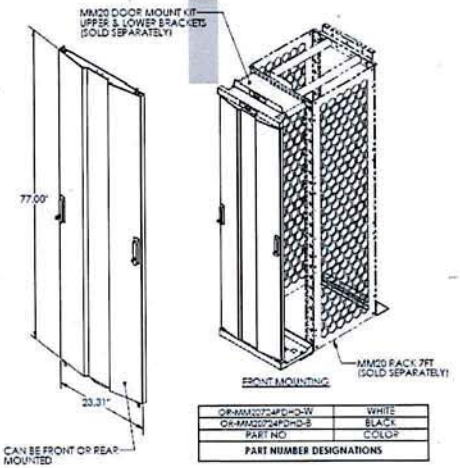


OR-MM20PDUMB1D2W-W	WHITE
OR-MM20PDUMB1D2W-B	BLACK
PART NO.	COLOR
PART NUMBER DESIGNATIONS	

3 — PDU MOUNTING BRACKET KIT (TWO KITS PER RACK)
P/N: OR-MM20PDUMB1D2W-W

4 — SECURITY DOOR FRONT MOUNTING HARDWARE (OR-MM2024DMFHD-W)

2 — SECURITY DOOR REAR MOUNTING HARDWARE (OR-MM2024DMRHD-W)



OR-MM20724PSHD-W	WHITE
OR-MM20724PDHD-B	BLACK
PART NO.	COLOR
PART NUMBER DESIGNATIONS	

1 — FRONT AND REAR HEAVY DUTY PERFORATED SECURITY DOOR (OR-MM20724PDHD-W)

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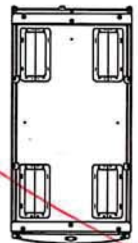
SHEET TITLE

TYPICAL RACK PARTS LIST

T4 - TYPICAL RACK DETAIL

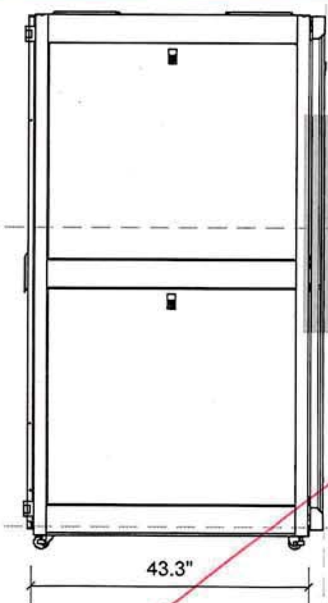
SHEET: 8 OF 15

* open 2-post racks
(see page 4)



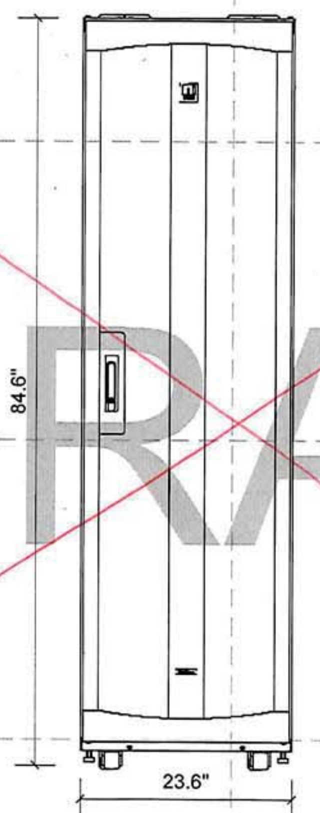
4 TYPICAL ENCLOSURE TOP VIEW WITH FOUR (4) BRUSHED GROMMET CABLE OPENINGS

NTS



3 TYPICAL ENCLOSURE SIDE VIEW

NTS



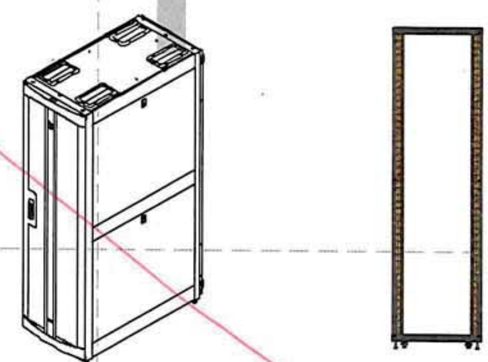
2 TYPICAL ENCLOSURE FRONT

NTS

CP3210245 F-Series TeraFrame Gen 3 Cabinet System with accessories installed
Configuration includes the following components:

Item Number	Description (Qty)
FF1N-113C-E42-B	F-Series TeraFrame Gen 3 Cabinet System, 45 RMU, 84.6 in. (2149mm) H x 23.6" (600mm) W x 43.30" (1100mm) D Square-Punched Rails, 2-Pair, Single, Perforated Metal Front Door, Two Point, Keyed Swing Handle Lock, Double Perforated Metal Rear Door, Two Point, Keyed Swing Handle Latch, Server Top Panel, 2 Solid Side Panel, Glacier White, 6-Slide Frame
024-739003-E63	Frame, 6 Slide, 23.6" (600 mm) W x 43.3" (1100 mm) D x 45 RMU, Glacier White (1)
024-739060-E03	Door, TeraFrame, Front, Asssembly, 23.6" (600 mm) W x 45 RMU, Glacier White (1)
024-739064-703	Lock Kit, 2-Point, Keyed, Front Door, 45 RMU (1)
024-739050-E03	Double Door Assembly, 23.6" (600 mm) W x 45 RMU, Glacier White (1)
024-739054-703	Lock Kit, 2-Point Latching, Keyed, Perforated Door, 45 RMU (1)
024-739140-E12	Top Panel, 2-Piece, Brush, 23.6" (600 mm) W x 43.3" (1100 mm) D, Glacier White
024-739046-E63	Side Panel, 6 SLIDE, 43.3" (1100 mm) D x 45 RMU, Glacier White (2)
024-739200-002	Kit,Common Parts Parts,Teraframe,UL,White (1)
024-739110-701	PDU Bracket, Assembly, Standard, 0.7" (17 mm) W x 3.9" (100 mm) D x 2.4" (60 mm), Black (1)
39110-C01	PDU Bracket, Assembly, Standard, 0.7" (17 mm) W x 3.9" (100 mm) D x 2.4" (60 mm), Black (1)
024-739240-003	Kit, Packaging, 600 W x 1075-1200D x 42U - 48U (1)
024-739029-001	Caster Kit, Two Swivel, Two Fixed, 1.6" (41 mm) W x 2" (51 mm) D x 2" (41 mm) H
39085-E03	Air Dam, 6 SLIDE, 23.6" (600 mm) W x 45 RMU, Glacier White (1)
39137-703	Baying Seal Kit, 45U (2)
39132-E00	Bottom Panel, With Brush, 23.6" (600 mm) W x 39.4" - 47.2" (1000 - 1200 mm) D, Glacier White (1)
31920-E03	Finger Cable Manager no Cover (2)
UL2416	This Cabinet and any included accessories are UL Listed under the NWIN category per the UL2416 Standard. UL file number E227626. Note, the UL Listing only applies to cabinets manufactured in the United States.

(VENDOR TO PROVIDE 45 RU OF PLENAFILL BLANKING PANEL PER ENCLOSURE)



1 TYPICAL ENCLOSURE SPECIFICATION

NTS

DRAFT

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TYPICAL ENCLOSURE PARTS LIST

T4 - TYPICAL CABINET DETAIL

SHEET: 9 OF 15

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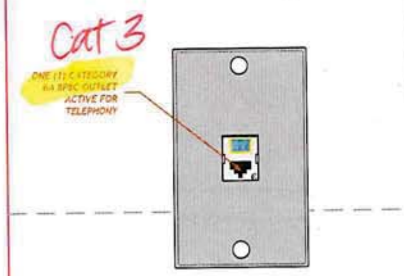
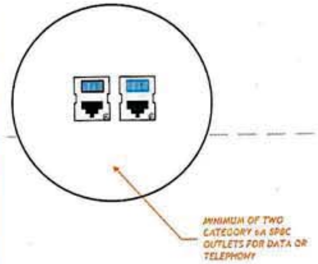


(3) TYPICAL WALL MOUNT PHONE OUTLET
NTS



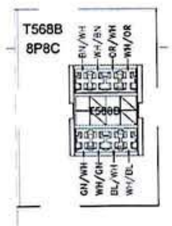
(1) TYPICAL WORK FLOOR MOUNT OUTLET
NTS

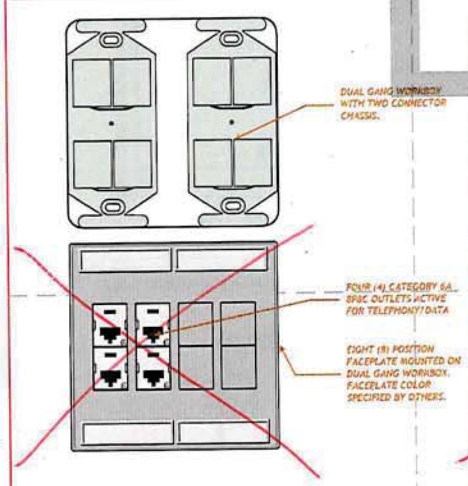
NOTES:

TYPICAL WORK AREA OUTLET FACEPLATE WILL BE INSTALLED WITH CATEGORY 6A COMPONENT-COMPLIANT 8P8C MEDIA INTERFACE CONNECTORS (RJ45). EACH CONNECTOR WILL BE TERMINATED TO HIGH QUALITY CATEGORY 6A HORIZONTAL CABLING WHICH WILL TERMINATE IN THE TELECOMMUNICATIONS ROOM AS SPECIFIED ELSEWHERE IN THIS DESIGN PACKAGE.
ALL HORIZONTAL UTP SHALL BE CATEGORY 6A AND TERMINATED TO T568B.

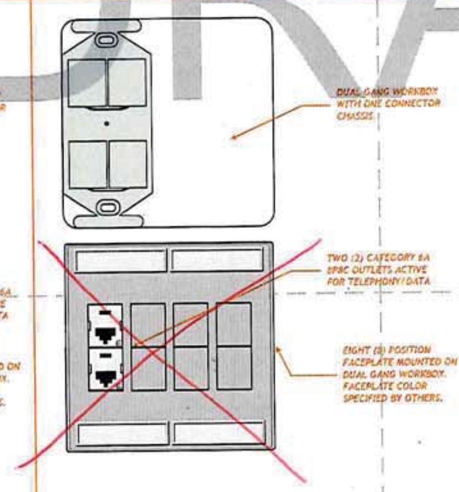
TYPICAL FACEPLATE WILL BE INSTALLED WITH TWO (2) RJ45s. HIGH DENSITY FACEPLATES WILL BE ISNTALLED WITH FOUR (4) RJ45s.

Cat 6
4 (B/G/W/blank)
Cat 6





(4) TYPICAL HIGH DENSITY WALL MOUNTED WORK AREA OUTLET CONFIGURATION



(2) STANDARD DENSITY WALL MOUNTED WORK AREA OUTLET CONFIGURATION

ALL LABELING SHALL BE ANSI/TIA/EIA/606C COMPLIANT. BLACK LETTERING ON WHITE FIELD. MACHINE PRINTED. FURTHER GUIDANCE ON ADMINISTRATION MAY BE SPECIFIED IN OTHER SECTIONS OF THIS DESIGN PACKAGE.

Building - IDF - patchpanel - jack
→ Example of Labeling.

all wall plates:

G B
W X

- Blue
- Green
- White
- Blank.

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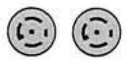
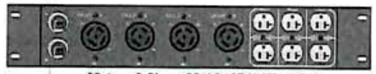
T4 - TYPICAL WORK AREA OUTLETS

SHEET: 10 OF 15

30 Amp 3-Phase PDU BASE UNIT - FRONT
(ZONIT ZON-C-ZPDU1)
REQUIRES TWO 30 AMP 3-PHASE (WYE) CIRCUITS WITH L21-30R RECEPTACLES
(OR EQUIVALENT)



PDU INPUTS REQUIRE TWO L21-30Rs



30 Amp 3-Phase PDU BASE UNIT - REAR
FOUR (4) L21-20R
SIX (6) NEMA 5-15/20 T-SLOT
(OR EQUIVALENT)

NOTE: The correct specification for the PDU is to feed it with a two power sources. Power inputs should originate from two independent power sources. Each input will use identical specs: WYE (5-wire) configured, 208V, 30A, three-phase, terminating in a NEMA L21-30R locking receptacle. The neutral conductor should be upsized one gauge to match the upsized neutral conductors in the PDU units. The neutral "upsizing" should ideally be continued in the power distribution system back to the UPS or transformer winding pole. This increases the efficiency of the power distribution system and suppresses harmonics in the system.

(5) TYPICAL MAIN PDU UNIT WITH REAR DETAIL AND ADAPTORS REQUIRED FOR VERTICAL PDU

APC AP7900 Rack PDU, Switched, 1U, 15A, 100/120V, (8)5-15 APC Switched Rack PDU , Input: 120V (OR EQUIVALENT)

(4) 110 Volt PDU FOR PLACEMENT AS NEEDED

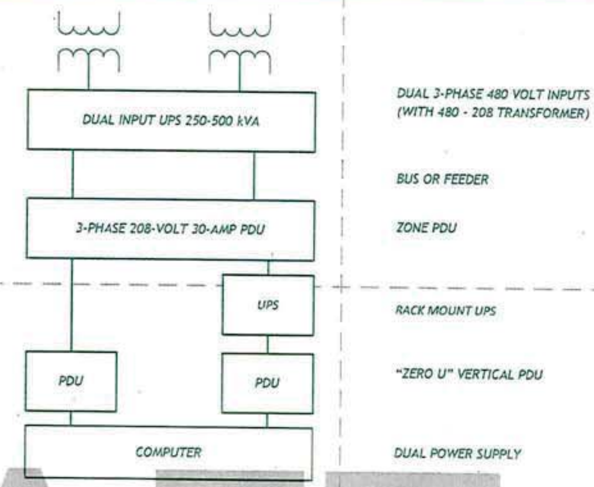
* must include NIC card:
APC SMARTUPS X 2200 VA LCD 100-127V w/ NIC (model SMT2200RM2UC)

APC AP8961 Rack PDU 2G,Switched, Zero U,5.7kW, 200/208V,(21)C13 & (3)C19, 6' cord

REQUIRES ONE (1) L21-20R

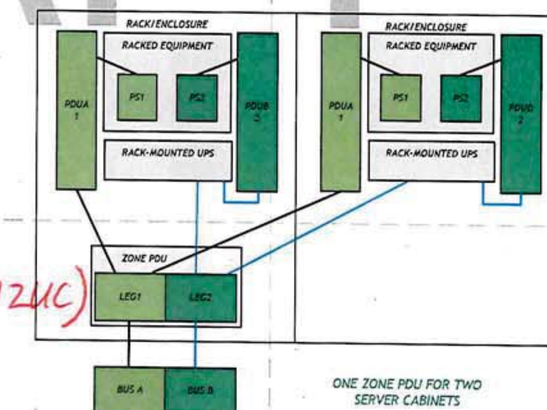
Needed ?

(3) 208 VOLT PDU FOR EQUIPMENT POWER - TO BE ENERGIZED BY ZONE PDU



(2) NOTIONAL POWER SCHEMATIC FOR INFORMATION ONLY - NOT FOR CONSTRUCTION

NOTE: THIS DESIGN PROVIDES DIVERSE POWER INPUTS FOR ACTIVE EQUIPMENT BY SPLITTING THE SOURCE POWER ACROSS TWO INPUTS ON THE ZONE PDU. EACH INPUT WILL SUPPORT TWO EQUIPMENT-FACING PDUs. EACH SERVER CABINET WILL CONTAIN A MINIMUM OF TWO EQUIPMENT-FACING PDUs - EACH WILL BE ENERGIZED BY SEPARATE ZONE PDU INPUTS.



ONE ZONE PDU FOR TWO SERVER CABINETS

(1) POWER SCHEMATIC FOR POWER RACK- LEVEL REDUNDANCY

DRAFT

Department of Veterans Affairs

IT Operations and Services Solution Delivery

PROJECT: CBOC ITS SPECIFICATIONS

PROJECT No: N/A

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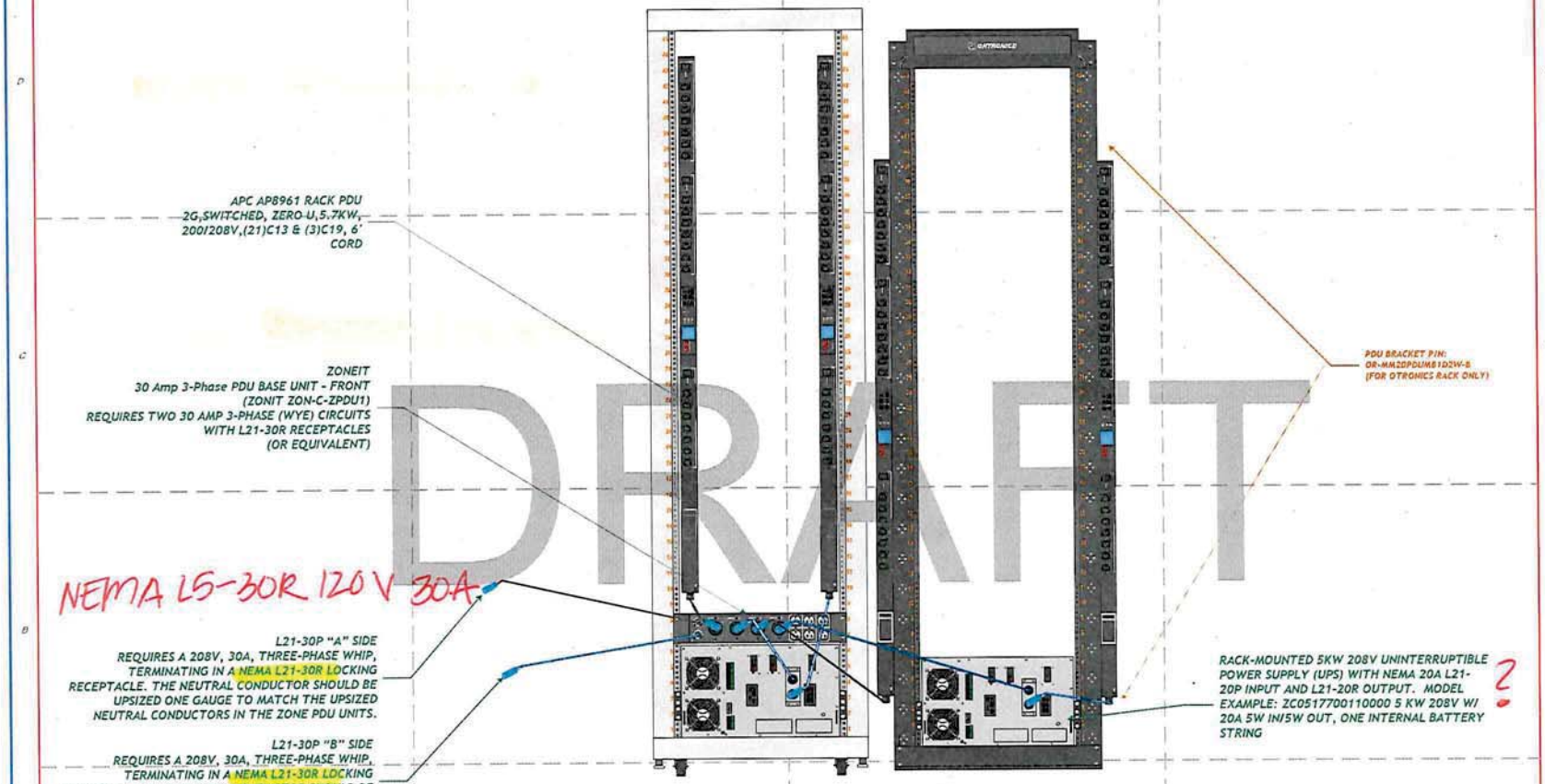
SHEET TITLE
TYPICAL POWER DISTRIBUTION

T4 - TYPICAL RACK POWER DISTRIBUTION

SHEET: 11 OF 15



DRAFT

1 POWER SCHEMATIC RACKS - REAR VIEW

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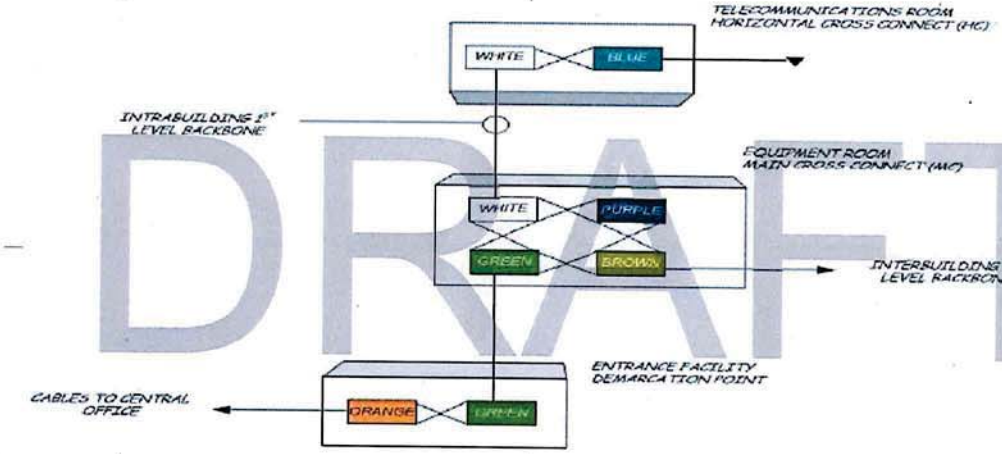
POWER DISTRIBUTION

T4 - POWER DISTRIBUTION

SHEET: 12 OF 15



1 PATCH PANEL LABEL FIELD COLOR CODING

2.

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T5 - COLOR CODING

SHEET: 13 OF 15

- **RACK** = RK1 THROUGH RK4, LABELED LEFT TO RIGHT WHEN LOOKING AT THE FRONT OF THE RACK. APPLIES TO RACKS AND CABINETS.
- **UTP PATCH PANEL** = CPL-RACK NAME-01 THROUGH 45. EXAMPLE: CPL-RK1-01 FOR THE PANEL LOCATED IN RACK UNIT #1 IN RACK #1.
- **UTP PATCH PANEL POSITION** = PANEL ID.01 THROUGH 24. EXAMPLE CPL-RK1-01.01
- **FIBER DISTRIBUTION PANEL** = FPL-RACK NAME-01 THROUGH 45. EXAMPLE: FPL-RK1-01 FOR THE PANEL IN RACK UNIT #1 RACK #1.
- **FIBER DISTRIBUTION CASSETTE** = FCS-RACK NAME-01 THROUGH 45.1 THROUGH 3. EXAMPLE: FCS-RK1-01.1 FOR THE CASSETTE IN POSITION #1 IN PANEL LOCATED IN RACK UNIT #1 IN RACK #1.
- **UTP PATCH CORDS** = CCA[SOURCE.PORT]/[DESTINATION.PORT]. EXAMPLE CCA[CPL-RK1-01.01]/[CPL-RK2-02.02] AS A PATCH CORD CONNECTING PORT #1 IN THE COPPER PATCH PANEL LOCATED IN RACK #1, RACK UNIT #1 WITH PORT 2 LOCATED IN RACK 2, RACK UNIT #2.
- **FIBER PATCH CORDS** = FCA[SOURCE.PORT]/[DESTINATION.PORT]. EXAMPLE FCA[FDP-RK1-01.01.01]/[FDP-RK2-02.02.02] AS A PATCH CORD CONNECTING PORT #1 IN THE FIBER PATCH PANEL LOCATED IN RACK #1, RACK UNIT #1 WITH PORT 2 LOCATED IN RACK 2, RACK UNIT #2.
- **FACEPLATE** = TR ROOM NUMBER-PATCH PANEL ID.PORT. EXAMPLE. 1A-CPL-RK1-01.1 FOR TELECOMMUNICATIONS ROOM 1, UTP PANEL IN RACK #1, RACK UNIT #1, PORT POSITION #1.

1 EXAMPLE INSIDE PLANT ADMINISTRATION

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SHEET TITLE

T5 - CBOC ITS NAMING STANDARDS

SHEET: 14 OF 15

TELECOMMUNICATIONS MEDIA AND INTERFACES SPECIFICATION

ID	PRIMARY ATTRIBUTE	SECONDARY ATTRIBUTE	SPECIFICATION
1	COPPER PATCH PANELS	PERFORMANCE CATEGORY	CATEGORY 6A (10 GBE)
		POSITION COUNT	24 (4 SIX-PORT MODULES)
		FORM FACTOR	ANGLED
		SIZE	ONE RACK UNIT
		COLOR CODING	BLACK
2	FIBER DISTRIBUTION CASSETTES	CASSETTE CAPACITY	24 STRAND (TWO 12-STRAND MULTI-FIBER PUSH ON (MPO))
		CASSETTE USER INTERFACES	LC QUAD CONNECTORS
		CASSETTE BACKBONE INTERFACES	MPO
		PERFORMANCE CHARACTERISTICS	OM4 LASER ENHANCED 40 GBE 50/125 MULTIMODE
		FORM FACTOR	ONE (1) RU
3	UTP (HORIZONTAL AND FIRST LEVEL BACKBONE)	PERFORMANCE CATEGORY	CATEGORY 6A (10 GBE)
		PERFORMANCE SPECIFICATIONS	MEETS OR EXCEEDS TIA-EIA-568-C.2-10, TSB-155.
		JACKET COLOR	BLUE (HORIZONTAL), WHITE (1ST LEVEL BACKBONE)
		SIZE	ONE RACK UNIT
		COLOR CODING	BLACK
4	FIBER (HORIZONTAL AND FIRST LEVEL BACKBONE)	PERFORMANCE CATEGORY	OM4 LASER ENHANCED TO 40 GIGABIT ETHERNET (GBE
		PERFORMANCE SPECIFICATIONS	LASER OPTIMIZED 50/125 MM FIBERS WITH EFFECTIVE MODAL BANDWIDTH OF AT LEAST 4,700 MHZ-KM AT 850 NM
		MODE	MULTIMODE
			AQUA
		MEDIA CONNECTOR	PRE-TERMINATED WITH MPO, TYPE A
		STRAND COUNT	12
		BUNDLING	LOOSE TUBE
5	UTP PATCH CORDS	PERFORMANCE CATEGORY	CATEGORY 6A, 26-GAUGE, STRANDED
		PERFORMANCE SPECIFICATIONS	CENTER TUNED TO HORIZONTAL MEDIA
		JACKET COLOR	BLUE
		TERMINATION METHOD	FACTORY PRE-TERMINATED
6	FIBER PATCH CORDS	PERFORMANCE CATEGORY	OM4 LASER ENHANCED TO 40 GIGABIT ETHERNET (GBE
		PERFORMANCE SPECIFICATIONS	OM4
		MODE	MULTIMODE
		JACKET COLOR	AQUA
		MEDIA CONNECTOR	PRE-TERMINATED WITH DUPLEX LC

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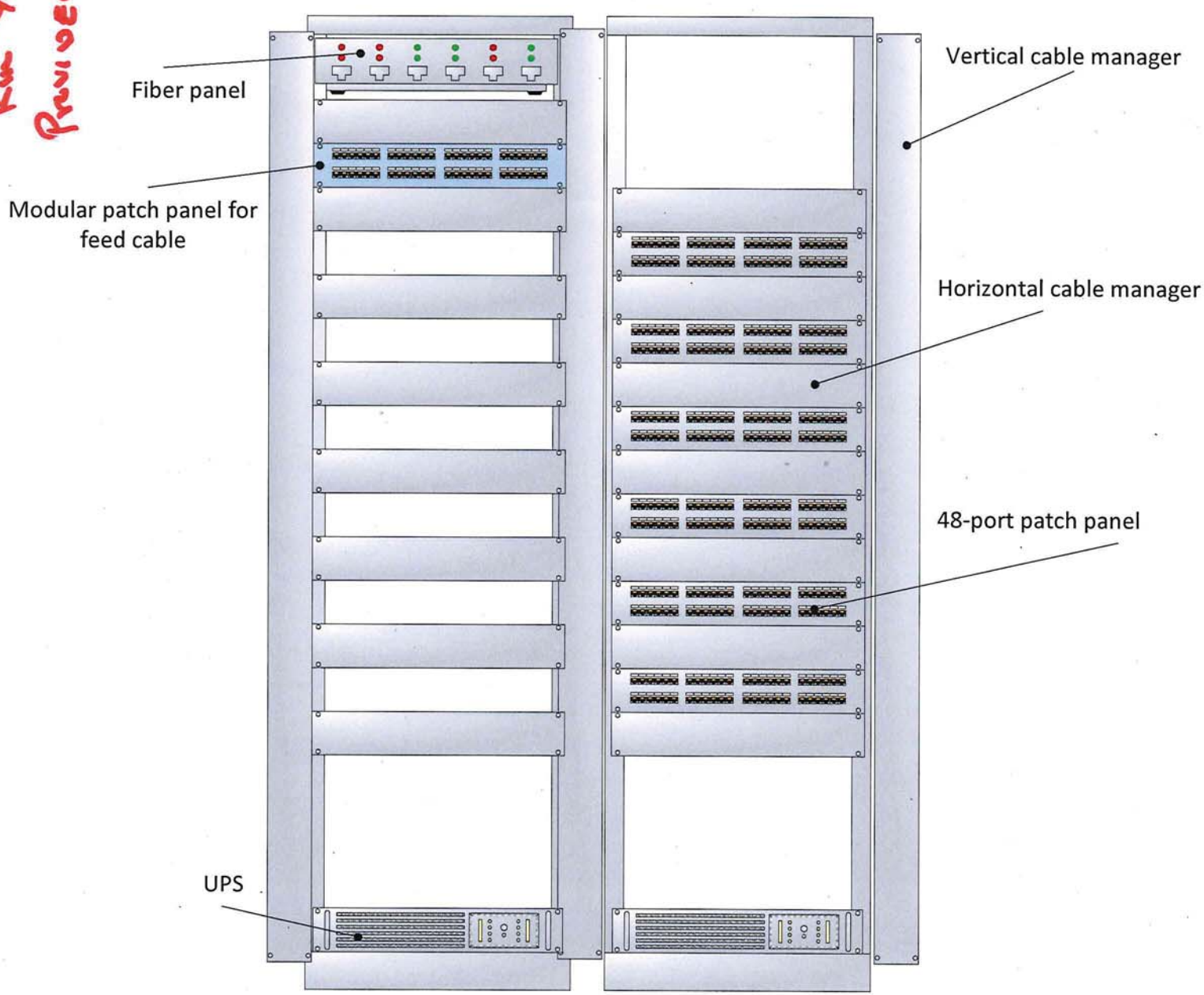
SHEET TITLE

T5 - SPECIFICATIONS

VASD OIT Email
- 08.13.2018
Kim Yuntz Dec.
Provided

VISIO DIAGRAM.

CONTRACTOR PROVIDED COMPONENTS



VASD OIT 6TH - 08.13.18 Kim Young Provided Doc.

VA OIT Standards and Criteria

VA Engineering and all contractors will ensure that all construction projects at any VA facility will adhere to the standards and criteria as defined by the Office of Information Technology (OIT) in this document.

A. CABLE REQUIREMENTS

1. The cabling contractor shall be responsible for all parts and labor required to completely install, test, and turnover the new cable infrastructure.
2. No cable shall terminate on equipment located in the interstitial.
3. Fiber
    a. All installations will be direct connections from the new IDF to the existing fiber rack in room BB102A.
    b. The use of single mode fiber optic cable is required regardless of distance. The minimum pull shall be 24 strands of 8-micron yellow cable.
    c. Contractor will terminate at both ends with LC-LC connectors unless otherwise directed by a designated OIT representative.
4. Voice feed cable
    a. Quantity of CAT 3 cable pairs will be determined by an OIT representative prior to installation. A minimum of 50 telephone feed cable pairs will be pulled to the new IDF.
    b. Installations in existing buildings located at the primary Medical Center
        i. Cable must be terminated on 110 blocks at the MDF in room B165.
        ii. In new IDF, cable must be terminated on modular patch panels on the rack, one pair per jack. Pairs 24 and 25 will be a single two pair jack.
    c. Installations in new buildings constructed on the primary Medical Center campus
        i. Cable must be terminated on 110 blocks at the MDF in room B165.
        ii. In the new building, terminate cable at ground floor IDF and branch cables evenly to all other IDFs.
        iii. All cables run outside of a building must have gas tube protection at each end to protect it from the environmental elements.
    d. Installations in buildings other than on the primary Medical Center campus
        i. Contractor must provide feed cable from the MPOE to the primary ground floor IDF. Feed cable must be integrated into the network service provider (telco) provided equipment.
        ii. In new IDF, cable must be terminated on modular patch panels on the rack, one pair per jack. Pairs 24 and 25 will be a single two pair jack.
5. Workstation requirements
    a. Copper cable runs must not exceed a distance of 100 meters (~328 feet).
    b. Cable shall be CAT 6, four pair, 100 ohm UTP. Superior Essex or equivalent brand will be used unless otherwise specified by an OIT representative.
6. All cable runs shall follow the cable trays that are above the drop ceilings.
7. Cables shall not be attached to removable ceiling grid supports or laid directly on the ceiling grid. Cables shall not be attached to or supported by fire sprinkler heads, delivery systems or any environmental sensor in the ceiling air space.
8. All cable runs inside walls will be pulled by the contractor and shall be enclosed in Electrical Metallic Tubing (EMT) and single gang boxes.
9. The cabling contractor will be responsible for ensuring that the fire-rated structures (core walls) retain their existing fire-rating by installing proper sleeves and fire stops at all the accesses from the core area once the cabling effort has been completed.
10. All previously abandoned voice and/or data cable in the construction area shall be removed completely from end to end by the contractor once verified by VA OIT representative.

B. JACK CONFIGURATIONS

1. Data drops will be in a three jack configuration on a four port faceplate.
2. All drops shall be wired to a T568a standard.
3. Faceplates will be labeled in accordance with VA specifications
    a. Numbering convention
        1. Building number (where applicable)
        2. Floor, to include wing designation if applicable
        3. Panel
    b. Jacks are to be labeled as building – IDF – patch panel (alphanumeric) – jack port number. For example, building 1, IDF room number B116, patch panel C, jack location 07 is to be identified as 1-B116-C-07.
    c. Prior to labeling, contractor shall obtain approval from OIT representative to ensure proposed numbering scheme meets OIT standards.
4. Contractor will terminate the station side with Panduit gray, blue, and white jacks, and terminate the IDF end with the corresponding gray, blue, or white RJ45 port on the patch panel.
5. Each station will be tested and certified with full documentation provided to the VA representative.
6. Contractor will provide "as built" documentation identifying all jack locations and their associated labels.
7. There will be a minimum of one triple data drop location installed on every wall in all rooms.

C. WIRELESS NETWORKS

1. Areas with an existing wireless network
    a. OIT is to be notified prior to the start of construction to allow for the removal of all wireless access points (WAPs).
    b. Contractor will install new green CAT 6 cable to each WAP and terminate in the new IDF if a new data closet is included in construction.
    c. Contractor will reinstall WAPs in their original locations.
2. Wireless network installation in new buildings
    a. VA private wireless network
        i. All new construction must include cabling for the VA wireless network using green CAT 6 cable.
        ii. VA Engineering or contractor must provide CAD drawings for OIT to design the wireless network.
        iii. OIT will provide the WAPs and associated hardware.
        iv. Contractor will install WAPs in all locations identified on the diagram provided by OIT.
    b. Guest (public) wireless network
        i. New construction must also include cabling for the guest wireless network separate from the VA network.
        ii. OIT has no involvement with or responsibility for the public network. All cabling, hardware, network equipment, and transport circuits are to be provided by VA Engineering or their designated contractor.
        iii. All components of the guest network are required to reside outside of OIT rooms.

D. ELECTRICAL REQUIREMENTS

1. The cabling contractor is responsible for grounding and bonding the entire infrastructure provided in the project.
    a. Use #6 grounding conductors and two-hole irreversible compression connectors to bond racks to the room's telecommunications grounding bus-bar (TGB).
    b. The contractor shall provide and install the proper grounding kits for the voice terminations and patch panels as required by manufacturer.
    c. The contractor shall ground and bond the telecommunications rack.
    d. Contractor is also responsible to ensure grounding bus bar is properly grounded per NEC section 606.
2. A dedicated NEMA L5-30R 120V 30A electrical circuit shall be mounted directly above each rack. The two 120V 30A circuits will have a dedicated uninterruptible power supply (UPS) plugged into the outlets. The equipment rack will require two 6 Ft multiple outlet power strips mounted at the back of the rack. Each individual power strip will be plugged into a separate UPS.
3. Each receptacle must be powered by a separate electrical panel.
4. A minimum of one electrical receptacle connected to E-power in all locations within the Medical Center campus or where otherwise available is required.
5. The National Electrical Code (NEC) will be adhered to for all installations in addition to any site-specific requirements.

E. DATA CLOSETS

1. Contractor will extend the telco circuit to the MDF or IDF as applicable.
2. Physical Requirements
    a. IT closets shall house nothing other than IT equipment.
    b. Space must be a minimum of 120 sq. ft.
    c. The IT closet is required to be enclosed with a hard lid ceiling.
    d. Doors need to be fire rated in accordance with specifications required by VA Engineering management.
    e. The closet requires a dedicated Environmental Control Unit (air conditioning) not part of the facility system.
    f. In addition to the quantity of 4-inch conduit stubs contractor requires to terminate all cables in the IDF, two empty 4-inch conduit stubs must be made available for future expansion.
    g. Conduits shall lead to the nearest accessible drop ceiling location, preferably in a hallway.
    h. Data and phone closets are to be cleaned of all dust and debris from racks, walls, and floor.
3. Racks
    a. Two 45U 7' x 19" two-post racks will be provided and installed by the contractor
    b. Minimum three feet of clearance is required on all sides of racks, also accounting for the 26" depth of the UPS.
    c. Cable managers will be provided by the contractor
        a. Vertical cable management will be provided on both ends of each rack (including between racks) from the floor to top of rack.
        b. Racks shall be separated only by vertical cable managers.
        c. Horizontal cable management will be placed between each patch panel with a corresponding number of panels installed on the second rack.

d. Cable management will include ladder racks above the racks and on both sides of racks, extending to the wall where cables enter the closet.
e. Racks must be securely mounted to the floor.

4. Patch Panels
   a. Fiber panel must be mounted in the highest position on the rack that does not hold the patch panels.
   b. A modular patch panel for feed cable termination will be installed directly under the fiber panel, separated only by a horizontal cable manager.
   c. Contractor will provide and install a minimum of six 48-port patch panels in the second rack.
   d. Jacks on the patch panels are to be labeled according to the numbering scheme stated above and corresponding to the faceplates to which they are connected.
   e. Standard rack layout depicting contractor responsibilities is diagramed below.
5. UPS
   a. Two uninterruptible power supply (UPS) units will be provided by and installed in each IT closet by the contractor.
   b. One UPS will be installed in each rack.
   c. UPS must be in the bottom position of the rack.
   d. The model to be installed will be a rack mountable APC SMART-UPS X 2200VA LCD 100-127V with NIC (model SMT2200RM2UC) or equivalent.
   e. UPS must also include the compatible network management card (model AP9630).

F. VA (NON-IT) PROVIDED SYSTEMS

1. A scramble pad compatible with the existing VA access control system must be installed on all IT closet doors.
2. A security camera monitored by VA Police must be placed in the vicinity of the IT closet to record video footage of all who enter and exit the room.
3. Wireless temperature sensor will be installed as part of the existing VA Engineering monitoring system.