U.S. Department of Veterans Affairs

Office of Information and Technology

IT Operations and Services | Solution Delivery

Generic Extra Small (~780ft^2) Data Center Design Package For Main Computer Rooms (MCRs) and Other Campus Support Centers (CSCs)

Design Package Developed By:

Data Center and Infrastructure Engineering

Department of Veterans Affairs

IT Operations and Services
Solution Delivery

EDICT

Enterprise Data Center and Infrastructure Engineering

PROJECT:

Generic Extra Small Data Center Design Package For MCRs and Other CSCs

MARK	DATE	DESCRIPTION

ISSUE:

DRAWING No:	
FILE:	Generic Extra Small Data Center Design Package 1.vsd
DESIGNED BY:	KEVIN GRZELKA, CTDC
CHECKED BY:	MICHAEL JULIAN, RCDD KELLY BATES, DCIE
DOC VERSION No:	1.0
PRINT DATE:	Sep 21, 2021
ISSUE DATE:	Jun 25, 2021

SHEET TITLE

TITLE

LEGEND

ELECTRICAL

- # — DETAIL NUMBER
- # TYP — DETAIL NUMBER TYPICAL THROUGHOUT THIS SHEET
- BONDING BUSBAR
- OR — WIRE MESH CABLE TRAY SIZE COMMENSURATE WITH REQUIREMENTS
- ELECTRICAL SERVICE PANEL
- OVERHEAD POWER DROP CORD WITH L21-20 RECEPTACLE
- OVERHEAD POWER DROP CORD WITH L21-30 RECEPTACLE
- J — POWER JUNCTION BOX FOR 60A CONNECTION
- POWER BUSWAY TAP WITH SINGLE BREAKER 3' DROP CORD WITH L21-20R FOR STANDARD-DENSITY CABINETS
- POWER BUSWAY TAP WITH DUAL BREAKER AND TWO 3' DROP CORDS WITH L21-20R FOR HIGH DENSITY CABINETS
- TYPICAL UNSWITCHED 110 VOLT, 20 AMP DUPLEX CONVENIENCE OUTLET
- MOTION SENSOR LIGHT SWITCH
- M — CEILING MOUNTED MOTION SENSOR (LOCATIONS AS REQUIRED FOR FULL ROOM COVERAGE)
- PIV ENABLED TWO-FACTOR AUTHENTICATION KEYPAD
- FIXED CAMERA, PAN/TILT/ZOOM, PASSIVE INFRARED CAMERA - DUAL TECHNOLOGY"
- LED LIGHTING
- POWER BUSWAY WITH METERED HEADEND FOR A SIDE POWER DISTRIBUTION
- POWER BUSWAY WITH METERED HEADEND FOR B SIDE POWER DISTRIBUTION
- MODULAR UPS CABINET (POWER MODULES, BATTERIES, POWER PANELS)

TELECOMMUNICATIONS

- # — DETAIL NUMBER
- # TYP — DETAIL NUMBER TYPICAL THROUGHOUT THIS SHEET
- OR — WIRE MESH CABLE TRAY SIZE COMMENSURATE WITH REQUIREMENTS
- CONDUIT WITH BUSHING FIRESTOP AND INNERDUCT FOR FIBER
- SLEEVE WITH BUSHING FIRESTOP AND INNERDUCT FOR FIBER
- SLEEVE OR CONDUIT WITH BUSHING FIRESTOP AND INNERDUCT FOR FIBER
- TELECOMMUNICATIONS CHANNEL RACK, 19" RAILS, #12-24 TAPPED EIA HOLE PATTERN, 30" DEEP CHANNEL MINIMUM, 7' HIGH, 45RU, WHITE
- VERTICAL CABLE MANAGER WITH DOOR, 6" WIDE MINIMUM
- SERVER CABINET, 45U, 24"X48" (NOMINAL), SQUARE PUNCHED RAIL, SINGLE PERFORATED FRONT DOOR, SOLID REAR DOOR (VERTICAL EXHAUST DUCT IMPLEMENTATION), DOUBLE PERFORATED REAR DOOR (NO VED), TWO-POINT KEYED LOCKS, WHITE,SOLID SIDE PANELS
- TELECOMMUNICATIONS CABINET, 7' HIGH, 45U, 40"X48" (NOMINAL), SQUARE PUNCHED RAIL, SINGLE PERFORATED FRONT DOOR, SOLID REAR DOOR (VERTICAL EXHAUST DUCT IMPLEMENTATION), TWO-POINT KEYED LOCKS, WHITE,SOLID SIDE PANELS

ARCHITECTURAL

- DEMO WALL
- NEW WALL
- 4'X 8' AC GRADE ¾" TRADE SIZE PLYWOOD BACKBOARD PAINTED HIGH-GLOSS WHITE WITH TWO COATS OF FIRE RESISTANT PAINT FOR SERVICE PROVIDER / SECURITY / VIDEO / ET CETERA
- 3 FT WIDE, 8 FT HIGH DOOR, FIRE RESISTANT TO ¾ HOUR OR MORE PER AHJ
- 6 FT WIDE, 8 FT HIGH DOOR, NO CENTER MULLION, FIRE RESISTANT TO ¾ HOUR OR MORE PER AHJ

MECHANICAL

- STANDARD 25% OPEN PERFORATED FLOOR TILE
- COLD AISLE CONTAINMENT (PVC CURTAIN)
- RETURN AIR DUCT
- CRAC — COMPUTER ROOM AIR CONDITIONER (SEE COMPUTATIONAL FLUID DYNAMICS REPORT FOR SIZING)
- REQUIRED CLEARANCE AROUND CRACS
- AC — SPLIT PACKAGE AIR CONDITIONER OR EQUIVALENT 24/7 SUPPLY AIR TO REJECT 5KW (17,000 BTU PER TELECOMMUNICATIONS RACK)
- AC — ADDITIONAL SPLIT PACKAGE AIR CONDITIONER OR LARGER UNIT TO REJECT HEAT FROM ADDITIONAL RACKS (17,000 BTU PER TELECOMMUNICATIONS RACK)

NOTES

ELECTRICAL

1. MINIMUM TWO 110V 20A CONVENIENCE BUILDING POWER OUTLETS PER WALL; PLACEMENT DETERMINED BY OTHERS.
2. PRIMARY BONDING BUSBAR PLACEMENT DETERMINED BY OTHERS
3. SECONDARY BONDING BUSBAR PLACEMENT DETERMINED BY OTHERS
4. SERVICE PANEL FOR DEDICATED ROOM AIR CONDITIONING. NON-IT LOAD ONLY. SHALL BE EQUIPPED WITH POWER METER; MONITORED SOLUTION PREFERRED. PLACEMENT PER OTHERS
5. SERVICE PANEL FOR RACK POWER. IT LOAD ONLY. SHALL BE EQUIPPED WITH POWER METER; MONITORED SOLUTION PREFERRED. PLACEMENT PER OTHERS
6. 20 AMP 208 VOLT THREE-PHASE TWIST LOCK RECEPTACLE (L21-20R);8.5 FT AFF {WYE (5-WIRE)} COORDINATE INSTALLATION LOCATION WITH TELECOMMUNICATIONS CONTRACTOR
7. 30 AMP 208 VOLT THREE-PHASE TWIST LOCK RECEPTACLE (L21-30R);8.5 FT AFF {WYE (5-WIRE)} COORDINATE INSTALLATION LOCATION WITH TELECOMMUNICATIONS CONTRACTOR
8. POWER BUS BAR (VOLTAGE AND AMPERAGE SUFFICIENT TO SUPPORT TEN [10] SINGLE BREAKER 208V, 20 AMP, L21-20R BUSWAY TAPS) FED FROM A SIDE SOURCE
9. POWER BUS BAR (VOLTAGE AND AMPERAGE SUFFICIENT TO SUPPORT TEN [10] SINGLE BREAKER 208V, 20 AMP, L21-20R BUSWAY TAPS) FED FROM B SIDE SOURCE
10. POWER BUS BAR (VOLTAGE AND AMPERAGE SUFFICIENT TO SUPPORT FIVE [5] SINGLE BREAKER 208V, 20 AMP, L21-20R BUSWAY TAPS) FED FROM A SIDE SOURCE
11. POWER BUS BAR (VOLTAGE AND AMPERAGE SUFFICIENT TO SUPPORT FIVE [5] 208V, 20 AMP, L21-20R BUSWAY TAPS) FED FROM B SIDE SOURCE
12. BLUE CABLE PATH FOR A-SIDE UPS
13. YELLOW CABLE PATH FOR B-SIDE UPS

LIGHTING:
1. LED LIGHTING PLACED IN AISLES DIRECTLY IN FRONT OF AND BEHIND CABINET ROWS
2. LIGHTING OPERATED BY MOTION SENSOR PER CABINET ROW OR SECTION
3. 500 LUX IN THE HORIZONTAL PLANE AND 200 LUX IN THE VERTICAL PLANE REQUIRED MEASURED AT 3 FT AFF IN FRONT OF AND BEHIND EQUIPMENT CABINETS

TELECOMMUNICATIONS

1. SERVICE PROVIDER ENTRANCE POINT
2. SERVICE BACKBONE (ENTRANCE ROOM-MAIN COMPUTER ROOM)
3. MAIN CROSS CONNECT (CAMPUS/BUILDING DISTRIBUTOR) – BACKBONE CABLING (MCR-TELECOMMUNCIATIONS ROOMS)
4. ENTRANCE ROOM (TR) INTERCONNECT
5. HORIZONTAL DISTRIBUTION TO WORK AREA OUTLETS (WAO)
6. ADDITIONAL CABINETS OR TELECOMMUNICATIONS RACKS TO MEET REQUIREMENTS.
7. HORIZONTAL DISTRIBUTION AREA – SIDE A
8. HORIZONTAL DISTRIBUTION AREA – SIDE B
9. MAIN DISTRIBUTION AREA – SIDE A
10. MAIN DISTRIBUTION AREA – SIDE B
11. STANDARD DENSITY CABINET SUPPORTING 5KW REDUNDANT
12. HIGH DENSITY CABINET SUPPORTING 10KW REDUNDANT
13. 40" TELECOMMUNICATIONS CABINET WITH HORIZONTAL CABLE CUTOUTS AND APPROPRIATE CABLE MANAGEMENT ACCESSORIES, SUPPORTING 5KW REDUNDANT
14. WIRE MESH CABLE TRAY MINIMUM OF 6"X 12" WITH SECOND LEVEL OF FIBER CHANNEL PATHWAY (4" X 4")
15. BLUE CABLE TRAY PATH FOR CABLES TO THE A-SIDE MDA/HDA
16. YELLOW CABLE TRAY PATH FOR CABLES TO THE B-SIDE MDA/HDA
17. TELECOMMUNICATIONS CHANNEL RACK

ARCHITECTURAL

FLOORPLANS ARE NOT TO SCALE
DOCUMENTS ARE NOT TO BE USED FOR CONSTRUCTION

MECHANICAL

CHANGES TO DESIGN WILL REQUIRE A NEW COMPUTATIONAL FLUID DYNAMICS (CFD) ANALYSIS TO BE PERFORMED

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ENTERPRISE DATA CENTER AND INFRASTRUCTURE ENGINEERING

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LEGEND

SHEET: 2 OF 32

GENERIC TELECOMMUNICATIONS MEDIA AND INTERFACE SPECIFICATIONS FOR TELECOMMUNICATION SPACES

ID	PRIMARY ATTRIBUTE	SECONDARY ATTRIBUTE	SPECIFICATION
1	COPPER PATCH PANELS	PERFORMANCE CATEGORY	CATEGORY 6A (10 GBE)
		POSITION COUNT	48
		FORM FACTOR	ANGLED
		SIZE	ONE RACK UNIT
		JACK COLOR CODING	A-SIDE BLUE / B-SIDE YELLOW
2	FIBER DISTRIBUTION PANELS	CASSETTE CAPACITY	12 CASSETTES OR 6 DOUBLE CASSETTES
		CASSETTE USER INTERFACES	LC DUPLEX CONNECTORS
		CASSETTE BACKBONE INTERFACES	MPO-12
		PERFORMANCE CHARACTERISTICS	OM4 LASER ENHANCED 40 GBE 50/125 MULTIMODE / OS1 9/125 SINGLE MODE
		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)
4	FIBER (HORIZONTAL AND FIRST LEVEL BACKBONE)	PERFORMANCE CATEGORY	OM4 LASER ENHANCED TO 40 GIGABIT ETHERNET (GBE) / OS1 / OS2
		PERFORMANCE SPECIFICATIONS	LASER OPTIMIZED 50/125 MM FIBERS WITH AT LEAST 4,700 MHZ-KM AT 850 NM / OS1 9/125 SM FIBERS (INTRA-BUILDING) / OS2 9/125 SM (INTER-BUILDING)
		MODE	MULTIMODE/SINGLE MODE (DISTRIBUTION TO TRs ONLY)
		JACKET COLOR	AQUA (OM4) / YELLOW (OS1/2)
		MEDIA CONNECTOR	PRE-TERMINATED WITH MPO, TYPE A
		STRAND COUNT	12 OR 24
		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 / OS1 / OS2
		PERFORMANCE SPECIFICATIONS	LASER OPTIMIZED 50/125 MM FIBERS WITH AT LEAST 4,700 MHZ-KM AT 850 NM / OS1 9/125 SM FIBERS (INTRA-BUILDING) / OS2 9/125 SM (INTER-BUILDING)
		MODE	MULTIMODE/SINGLE MODE (PATCH CORD TO TRs ONLY)
		JACKET COLOR	AQUA (OM4) / YELLOW (OS1/2)
		MEDIA CONNECTOR	PRE-TERMINATED WITH DUPLEX LC

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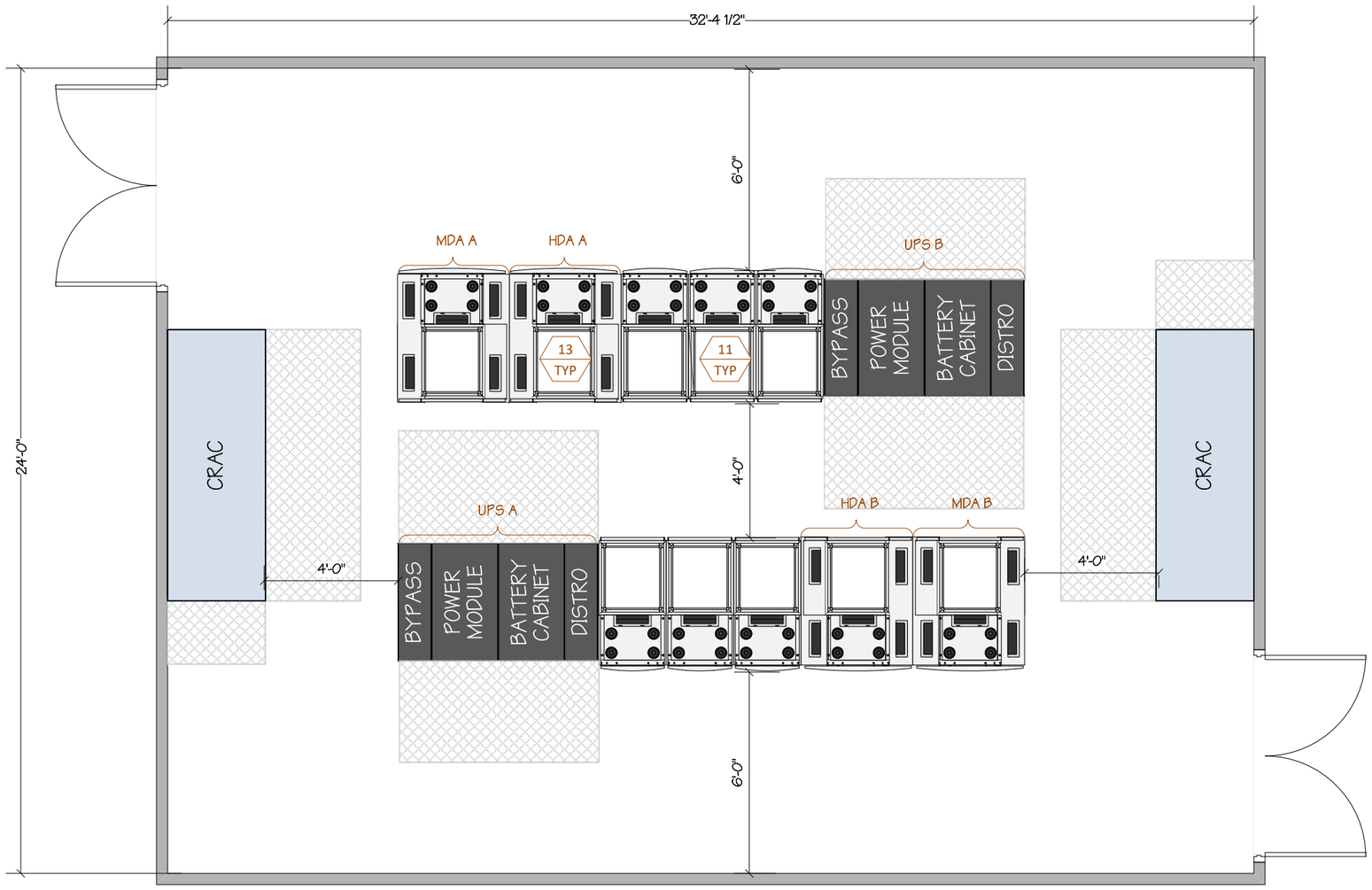
SPECIFICATIONS



~775 FT^2

1 GENERIC FLOOR PLAN FOR EXTRA SMALL DATA CENTERS – SQUARE VERSION

Department of Veterans Affairs

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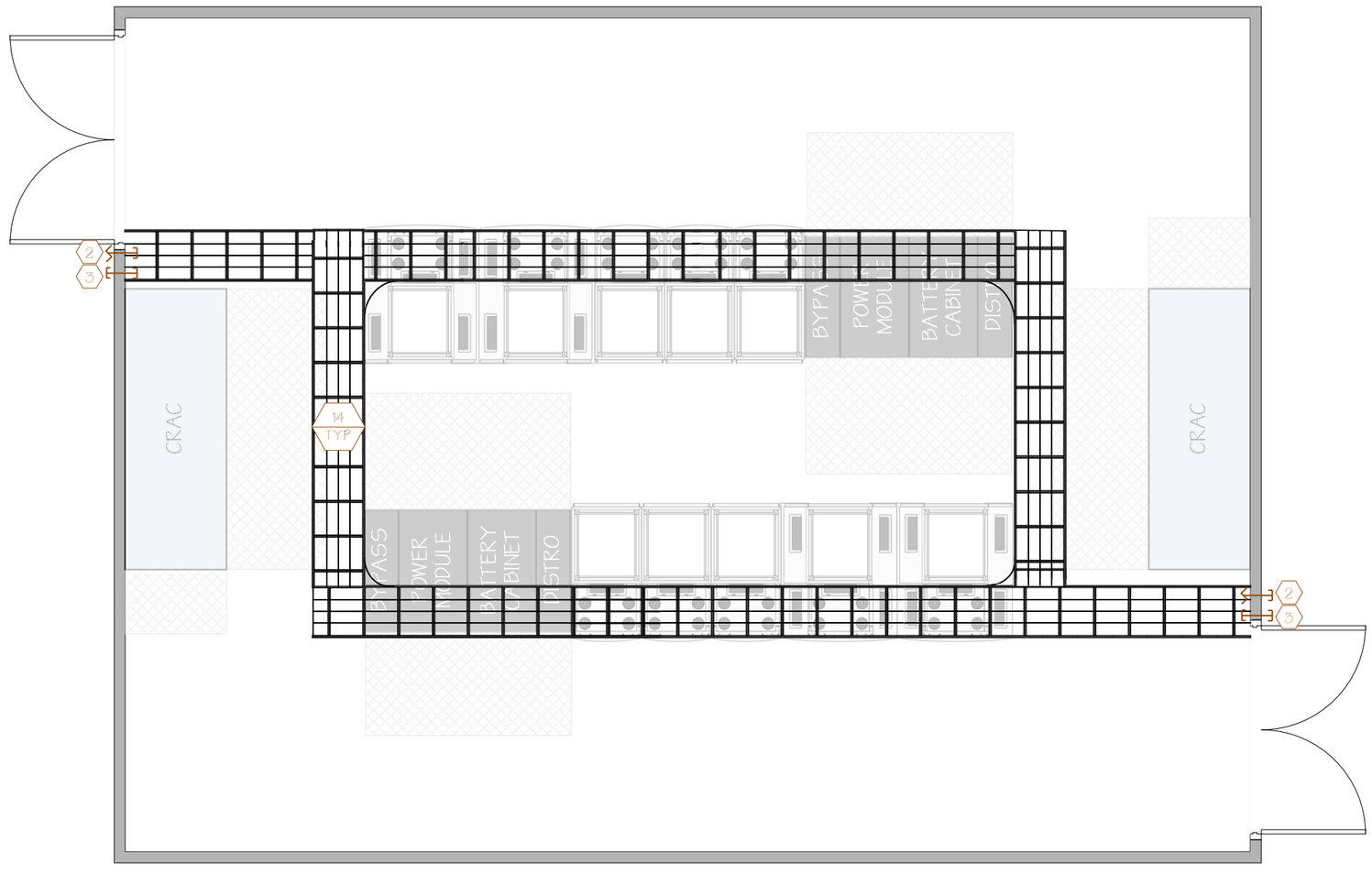
EXTRA SMALL DATA CENTER - SQUARE



1 DATA CABLE TRAY LAYOUT – SQUARE VERSION

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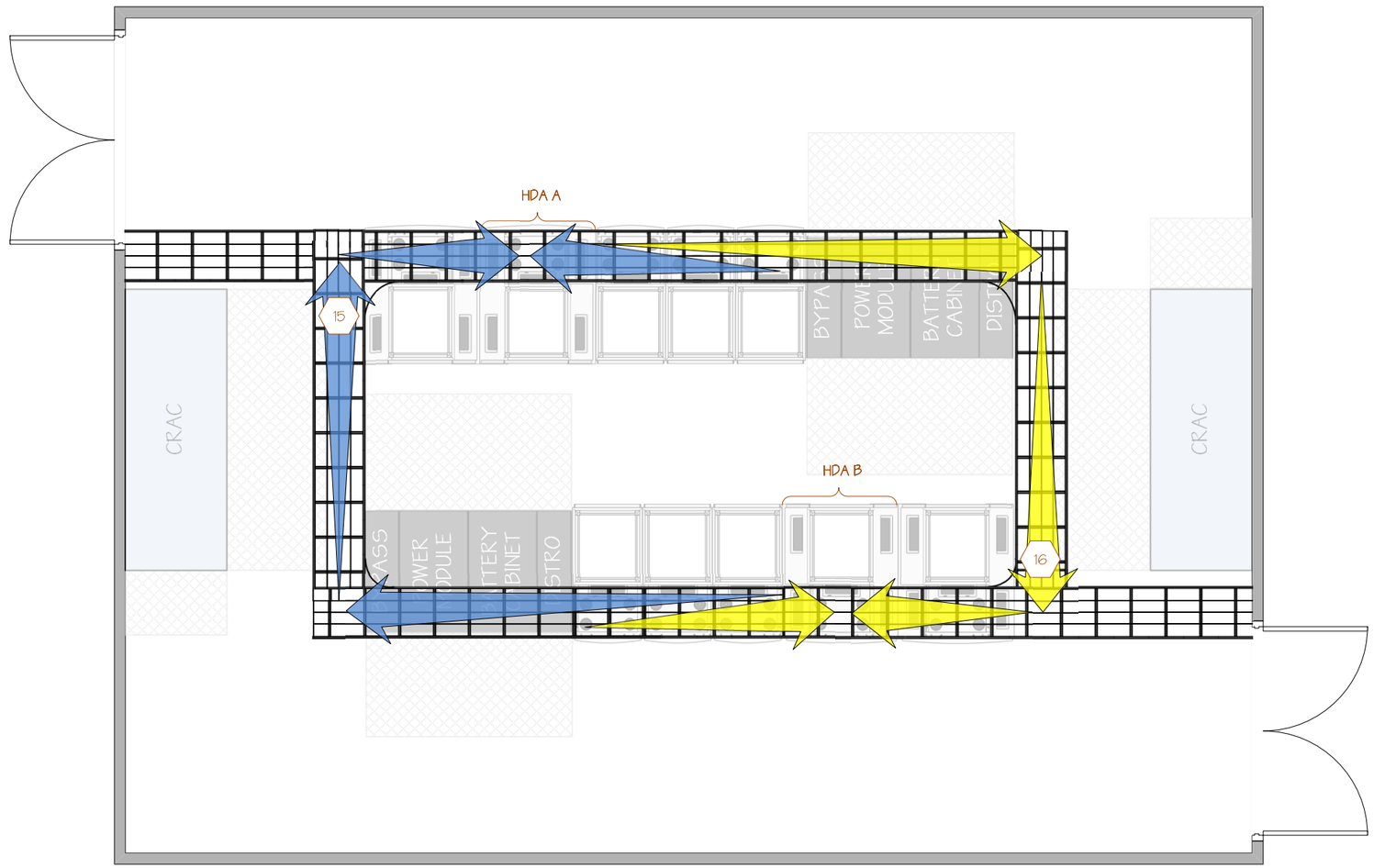
DATA CABLE TRAY LAYOUT - SQUARE

SHEET: 5 OF 32



1 DIVERSE ROUTING FOR CABLES FROM CABINETS TO HORIZONTAL DISTRIBUTION AREAS – SQUARE VERSION

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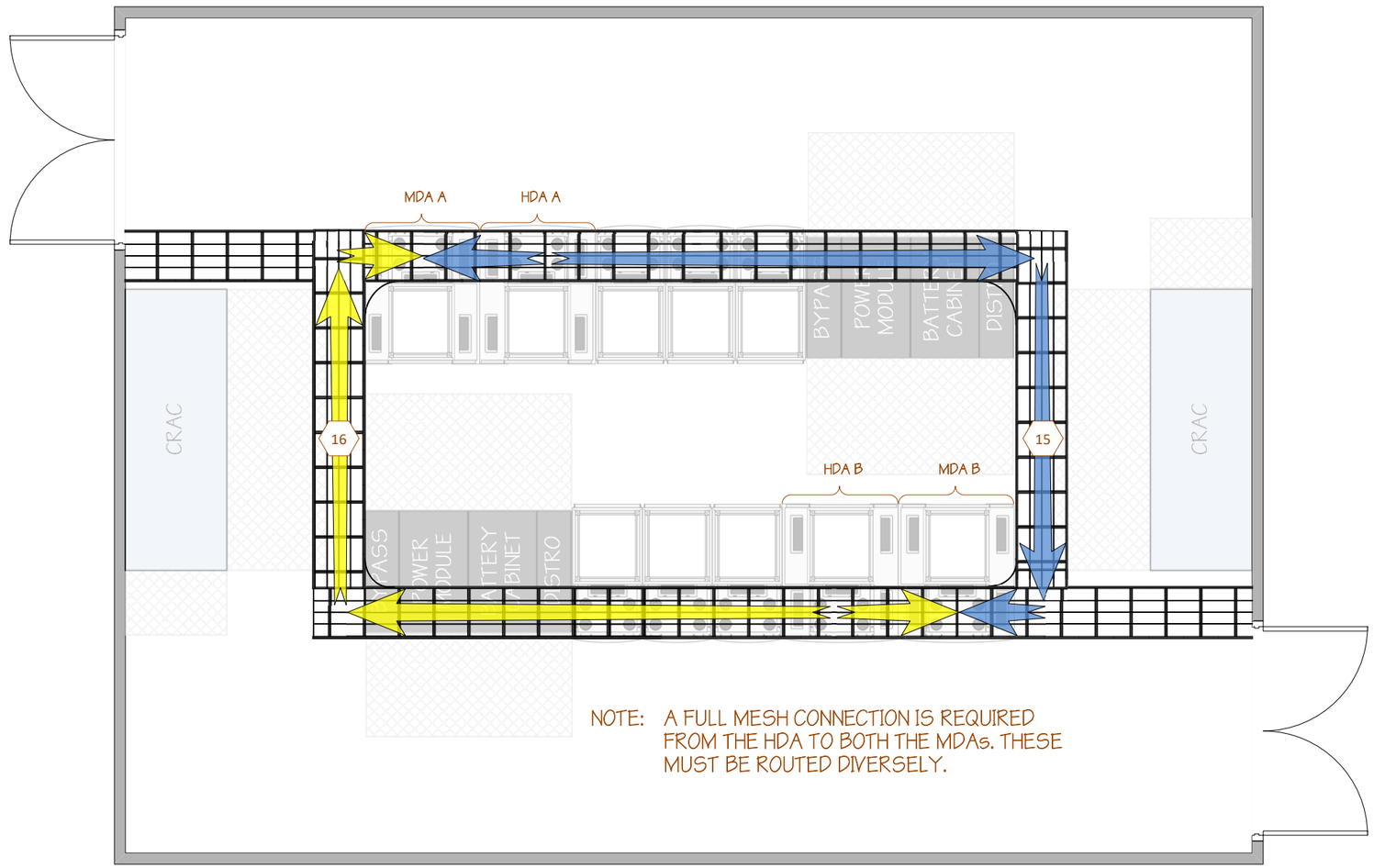
CABINETS TO HDA CABLE ROUTING - SQUARE

SHEET: 6 OF 32



1 DIVERSE ROUTING FOR CABLES FROM HORIZONTAL DISTRIBUTION AREAS TO MAIN DISTRIBUTION AREAS – SQUARE VERSION

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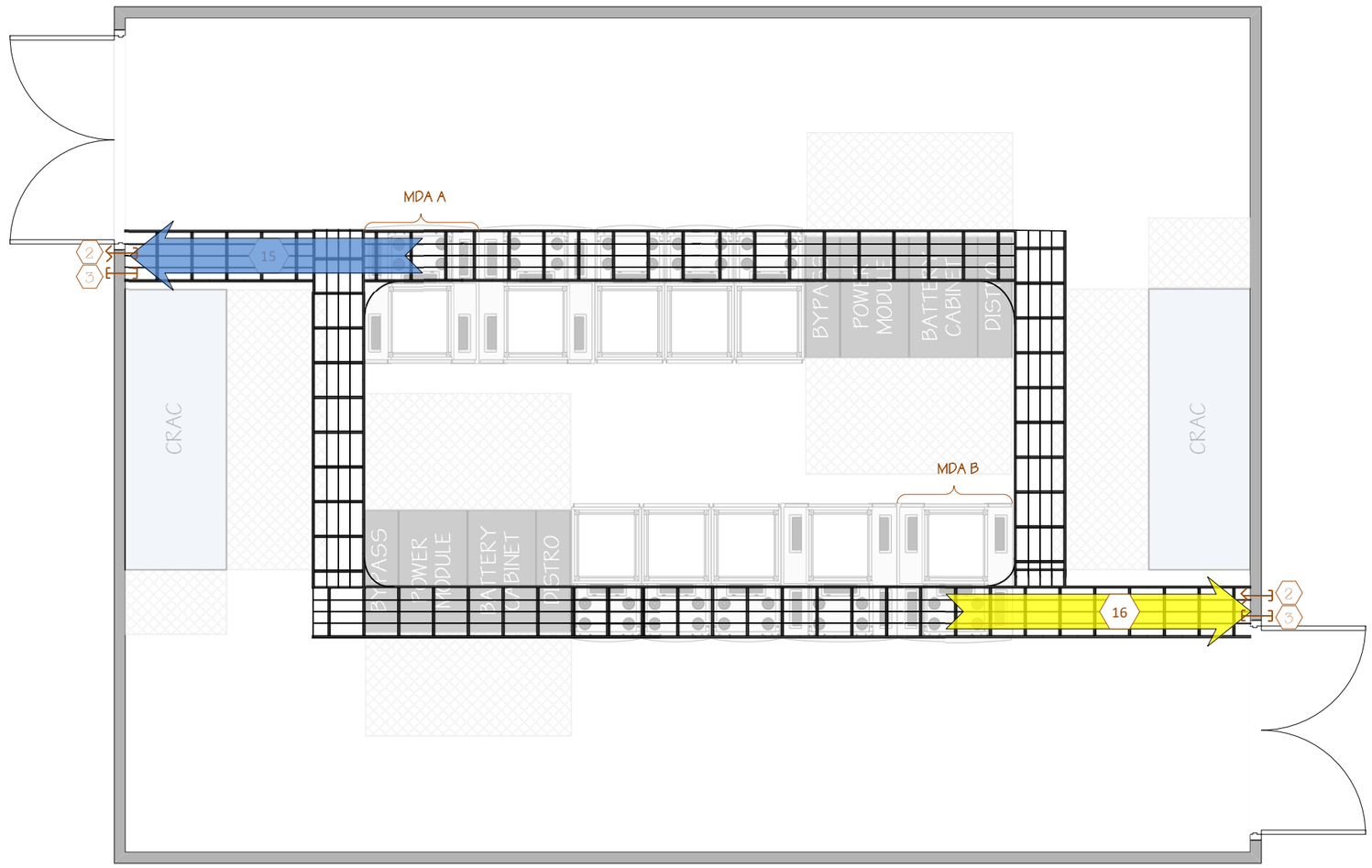
HDA/MDA CABLE ROUTING - SQUARE

SHEET: 7 OF 32



1 DIVERSE ROUTING FOR CABLES FROM MAIN DISTRIBUTION AREAS TO TELECOMMUNICATIONS ROOMS – SQUARE VERSION

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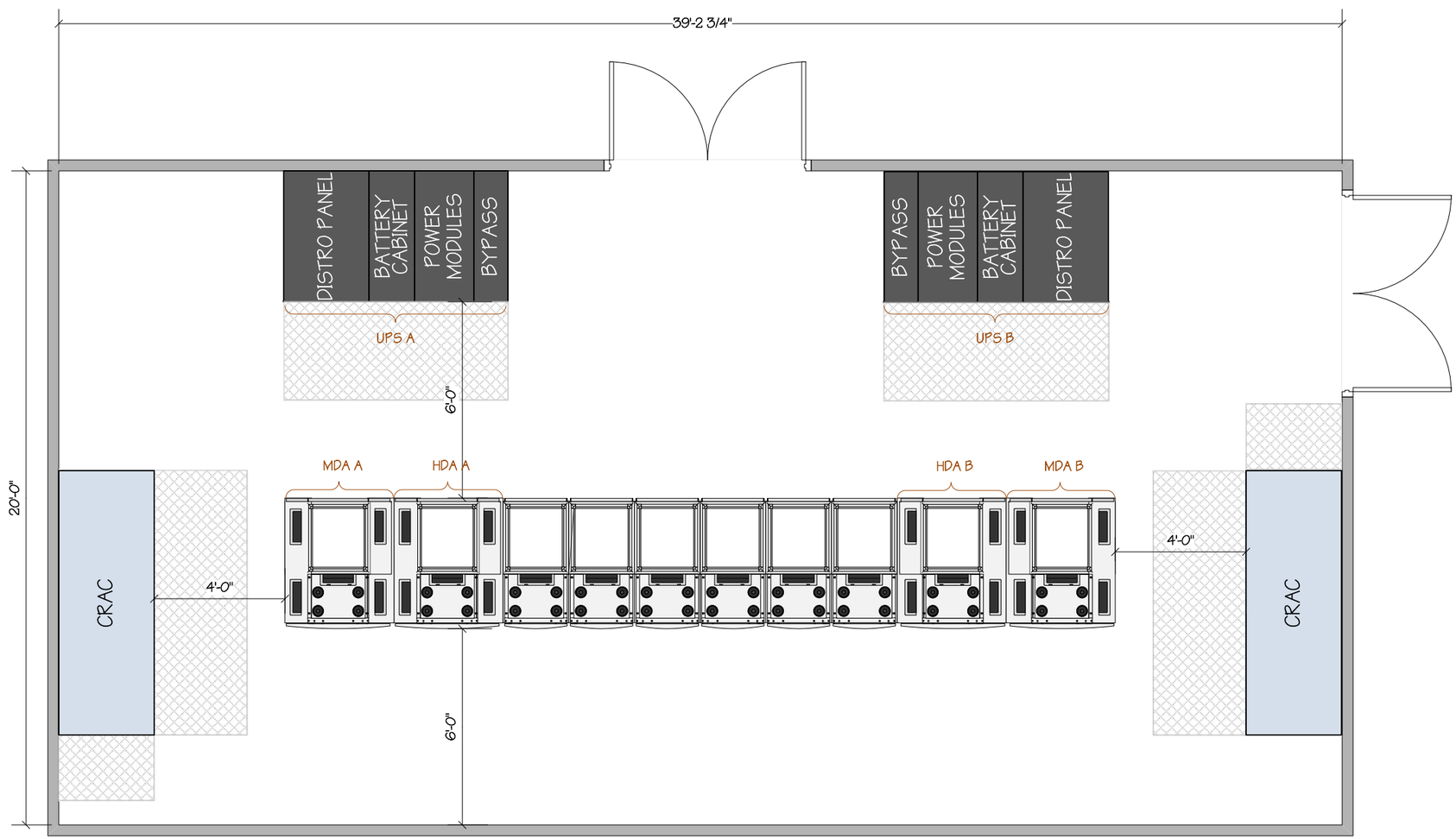
MDA TO TR CABLE ROUTING - SQUARE

SHEET: 8 OF 32



~785 FT²

1 GENERIC FLOOR PLAN FOR EXTRA SMALL DATA CENTERS – RECTANGLE VERSION

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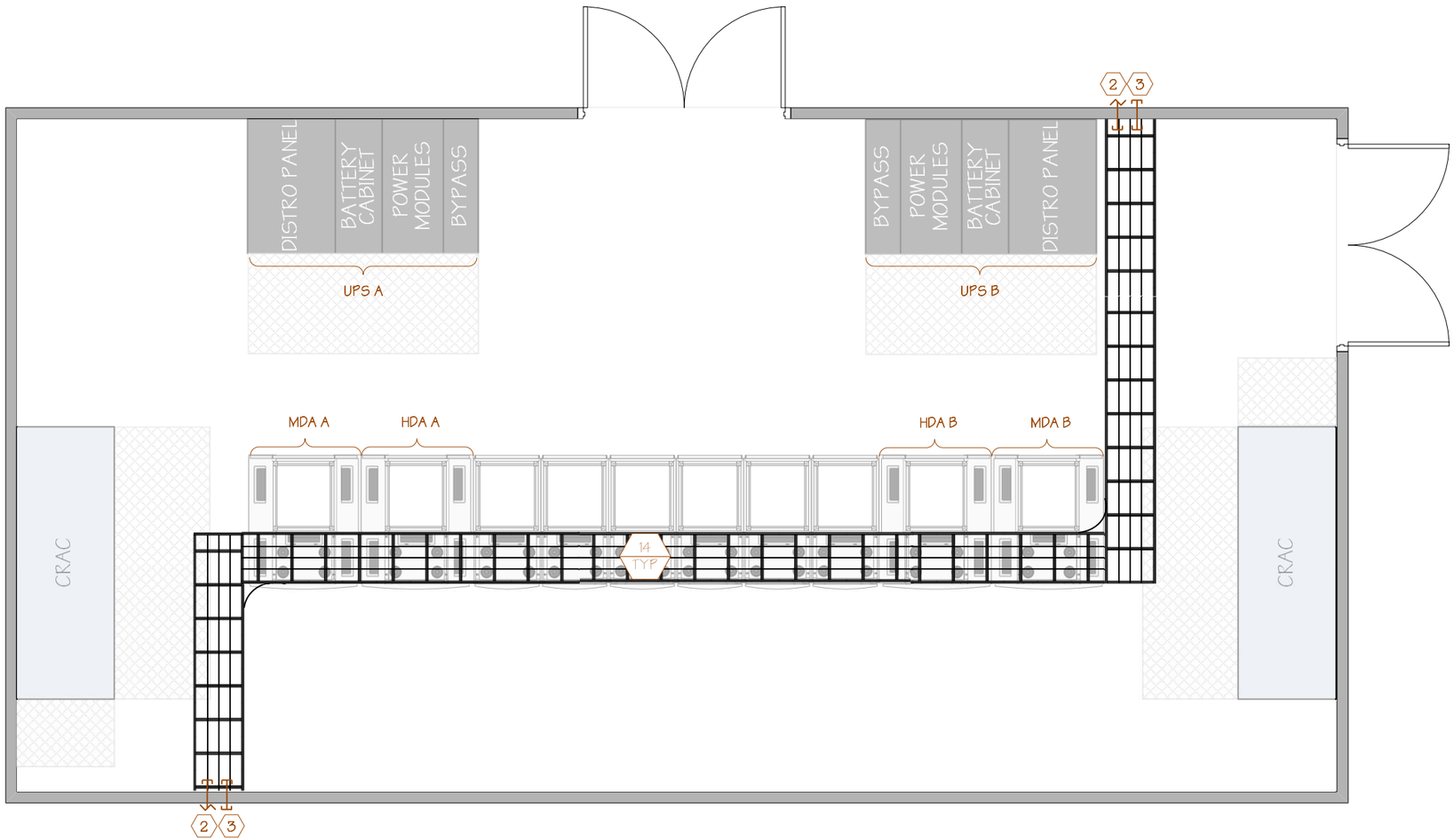
EXTRA SMALL DATA CENTER - RECTANGLE

SHEET: 9 OF 32



1 DATA CABLE TRAY LAYOUT – RECTANGLE VERSION

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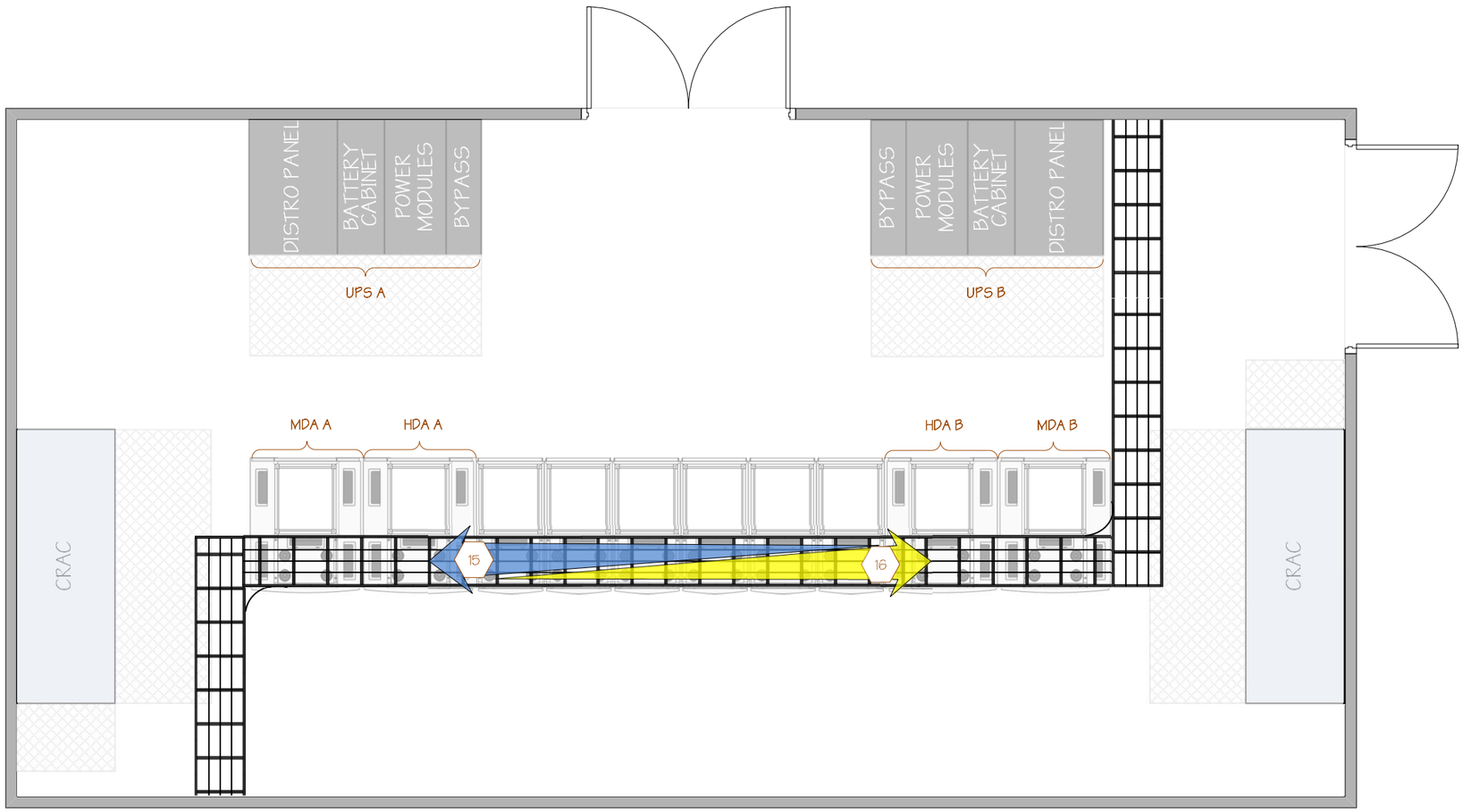
DATA CABLE TRAY LAYOUT - RECTANGLE

SHEET: 10 OF 32



1 DIVERSE ROUTING FOR CABLES FROM CABINETS TO HORIZONTAL DISTRIBUTION AREAS – RECTANGLE VERSION

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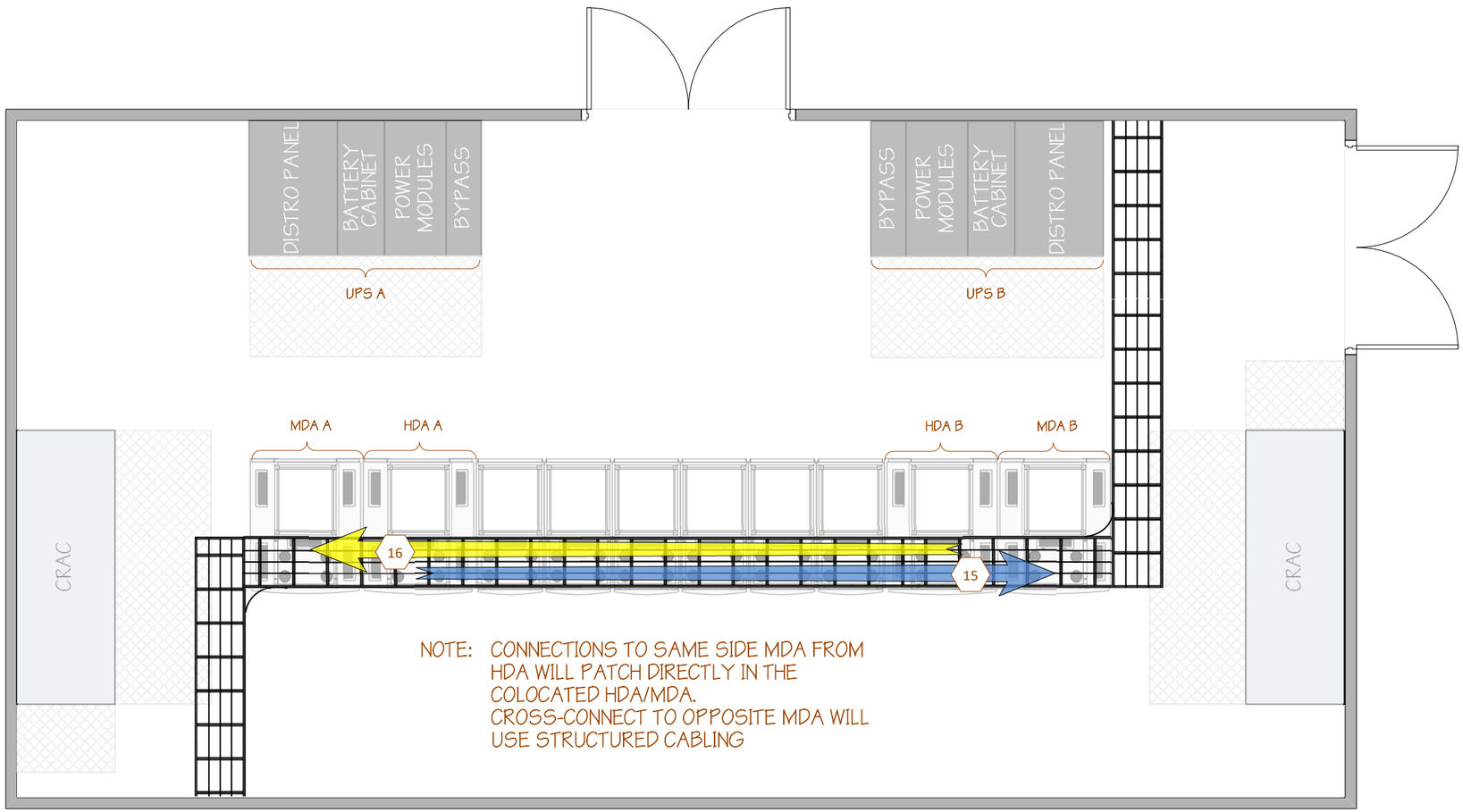
CABINETS TO HDA CABLE ROUTING - RECTANGLE

SHEET: 11 OF 32



1 DIVERSE ROUTING FOR CABLES FROM HORIZONTAL DISTRIBUTION AREAS TO MAIN DISTRIBUTION AREAS – RECTANGLE VERSION

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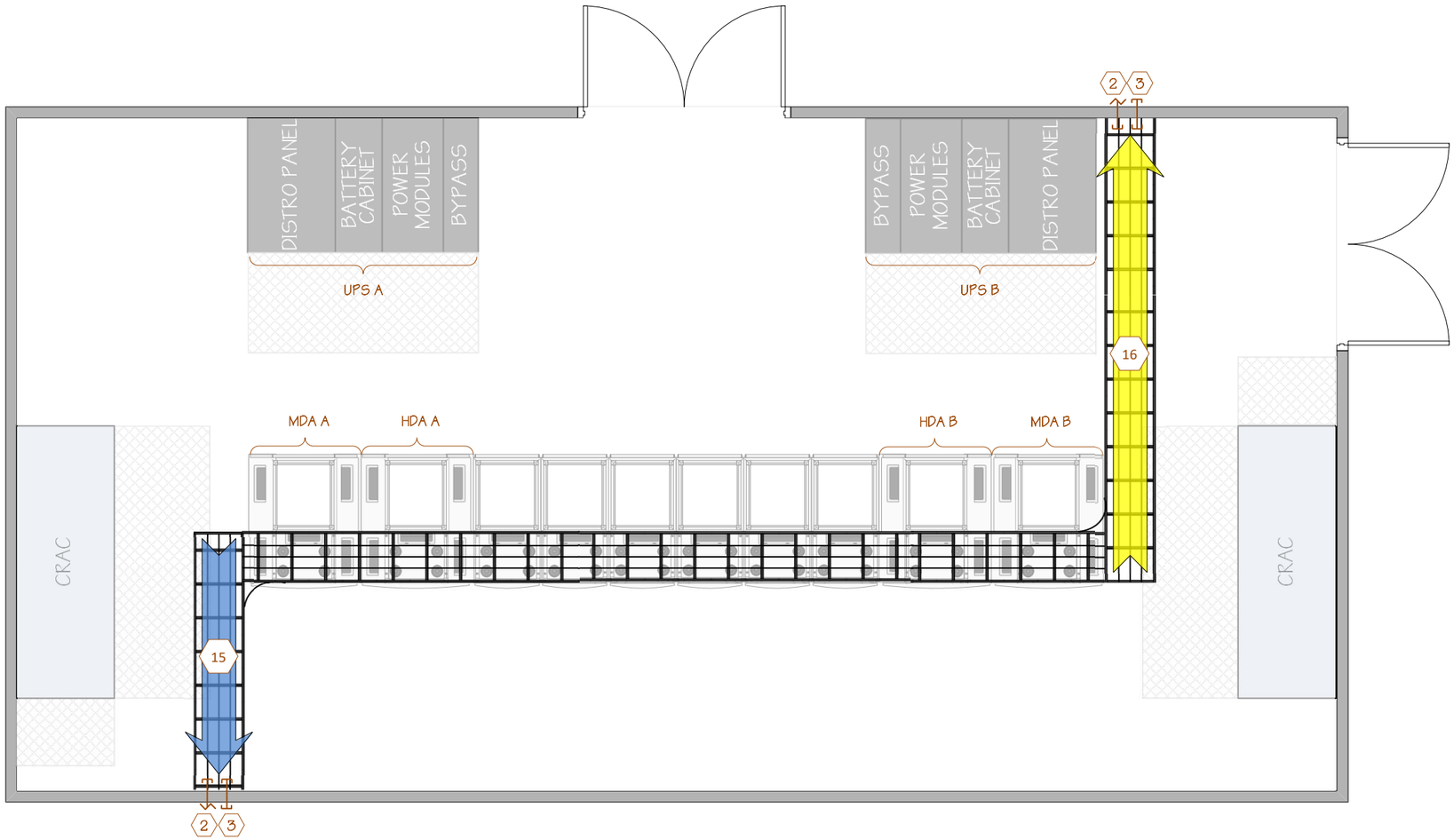
HDA/MDA CABLE ROUTING - RECTANGLE

SHEET: 12 OF 32



1 DIVERSE ROUTING FOR CABLES FROM MAIN DISTRIBUTION AREAS TO TELECOMMUNICATIONS ROOMS – RECTANGLE VERSION

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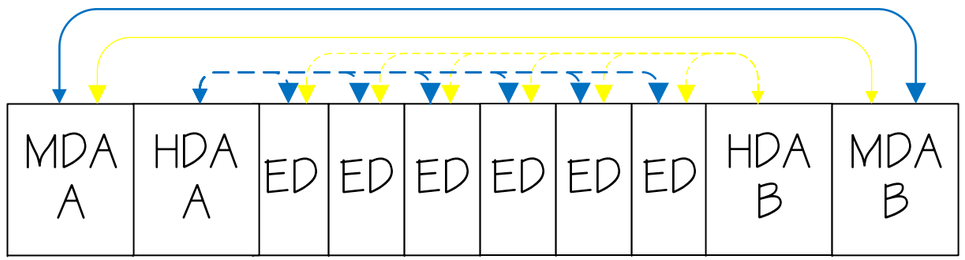


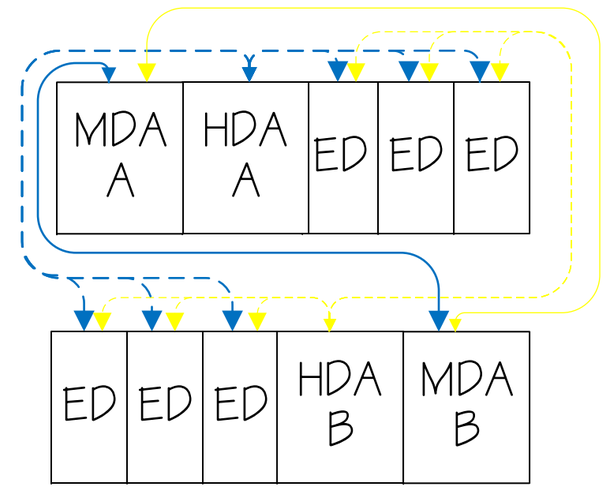
HORIZONTAL DISTRIBUTION – EQUIPMENT DISTRIBUTOR/HORIZONTAL DISTRIBUTION AREA

12 DUPLEX LC OM4/24 CAT 6A – A-SIDE
12 DUPLEX LC OM4/24 CAT 6A – B-SIDE

BACKBONE DISTRIBUTION – MAIN DISTRIBUTION AREA TO MAIN DISTRIBUTION AREA

24 DUPLEX LC OM4 – A-SIDE
24 DUPLEX LC OM4 – B-SIDE

2 STRUCTURED CABLING DIVERSE ROUTING – RECTANGLE VERSION



HORIZONTAL DISTRIBUTION – EQUIPMENT DISTRIBUTOR/ HORIZONTAL DISTRIBUTION AREA

12 DUPLEX LC OM4/24 CAT 6A – A-SIDE
12 DUPLEX LC OM4/24 CAT 6A – B-SIDE

BACKBONE DISTRIBUTION – MAIN DISTRIBUTION AREA TO MAIN DISTRIBUTION AREA

24 DUPLEX LC OM4 – A-SIDE
24 DUPLEX LC OM4 – B-SIDE

1 STRUCTURED CABLING DIVERSE ROUTING – SQUARE VERSION

Department of Veterans Affairs

IT Operations and Services
Solution Delivery

EDICT

Enterprise Data Center and Infrastructure Engineering

PROJECT:

Generic Extra Small Data Center Design Package For MCRs and Other CSCs

MARK	DATE	DESCRIPTION

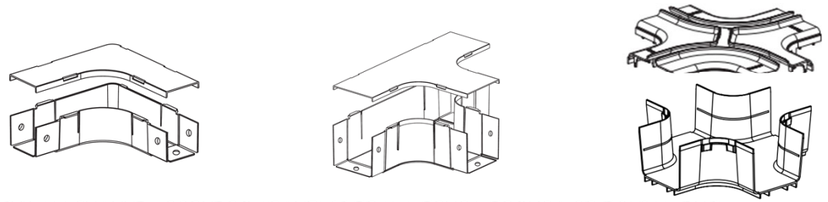
ISSUE:

DRAWING No:	
FILE:	Generic Extra Small Data Center Design Package 1.rvt
DESIGNED BY:	KEVIN GRZELKA, CTDC
CHECKED BY:	MICHAEL JULIAN, RCDD KELLY BATES, DCIE
DOC VERSION No:	1.0
PRINT DATE:	Sep 21, 2021
ISSUE DATE:	Jun 25, 2021

SHEET TITLE

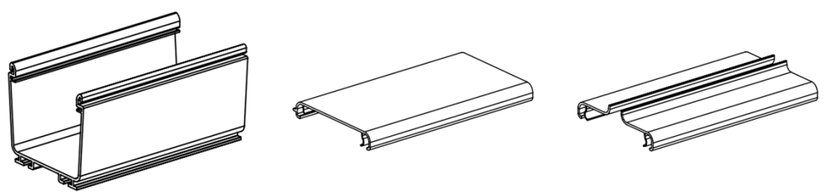
COMPUTER ROOM DIVERSE ROUTING

SHEET: 14 OF 32

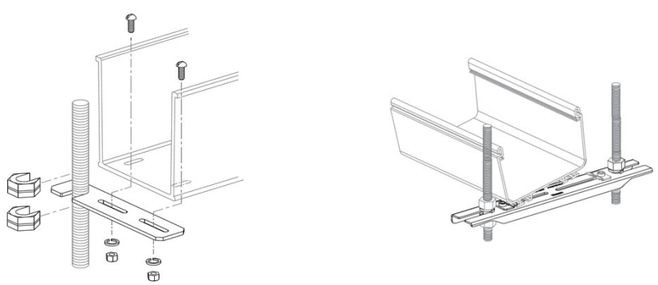


FIBER PATHWAY CHANNEL CORNERS (PANDUIT FR4X4/FRHC4/FRSHC4 OR EQUIVALENT):
- RIGHT ANGLE CORNER
- TEE CONER
- FOUR WAY CROSSING
- SPLIT OR SOLID COVERS

FIBER PATHWAY BEND RADIUS SPILLWAYS (PANDUIT FRVT4X4/FRTR4X4 OR EQUIVALENT):
- VERTICAL TEE
- TRUMPET SPILLWAY
- BEND RADIUS SPILLWAYS REQUIRED AT EVERY RACK LOCATION

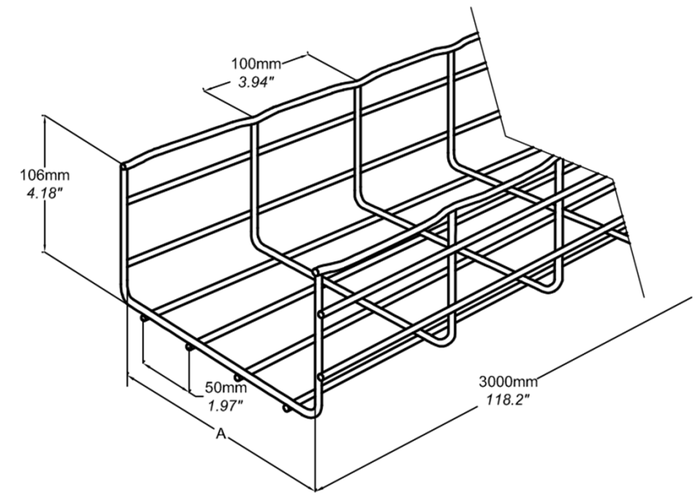


FIBER PATHWAY CHANNEL AND COVERS (PANDUIT FR4X4/FRHC4/FRSHC4 OR EQUIVALENT):
- 4X4" CHANNEL RUNNER
- SOLID COVER
- SPLIT HINGED COVER



FIBER PATHWAY MOUNTING BRACKET (PANDUIT FRGTRBE/FRGTRBN OR EQUIVALENT):
- BRACKET TO MOUNT TO EXISTING THREADED ROD OR
- BRACKET TO MOUNT TO NEW THREADED ROD

2 PROPOSED FIBER PATHWAY AND DETAILS



PROPOSED CABLE TRAY:
- CABLOFIL CF105/300
- 4" DEEP X 12" WIDE MINIMUM (2"X18" OR 6"X8" ACCEPTABLE)
- WHITE POWERCOAT
- TRAY INSERT

MAX. CAPACITY (40% FILL):
- 199 CATEGORY 6A UTP (0.35 OD)
- 271 CATEGORY 6A UTP (0.30 OD)

MAXIMUM PLANNED UTP CABLE FILL:
- 144 CABLES AT .35 OD CMP

MAXIMUM LOAD:
- 11.15 LBS PER FOOT

MAXIMUM ANTICIPATED LOAD:
- ~6.48 LBS PER FOOT

LOAD CAPACITY IN LBS/FT PER SPAN:
- 5: 142
- 6: 126.8*
- 7: 93.1
- 8: 89.2
- * RECOMMENDED MAX UNSUPPORTED SPAN

1 CABLE TRAY CAPACITY PLANNING

Department of Veterans Affairs

IT Operations and Services
Solution Delivery

EDICT

ENTERPRISE DATA CENTER AND INFRASTRUCTURE ENGINEERING

PROJECT:

GENERIC EXTRA SMALL DATA CENTER DESIGN PACKAGE FOR MCRS AND OTHER CSCS

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ISSUE:

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FILE:	Generic Extra Small Data Center Design Package 1v3d
DESIGNED BY:	KEVIN GRZELKA, CTDC
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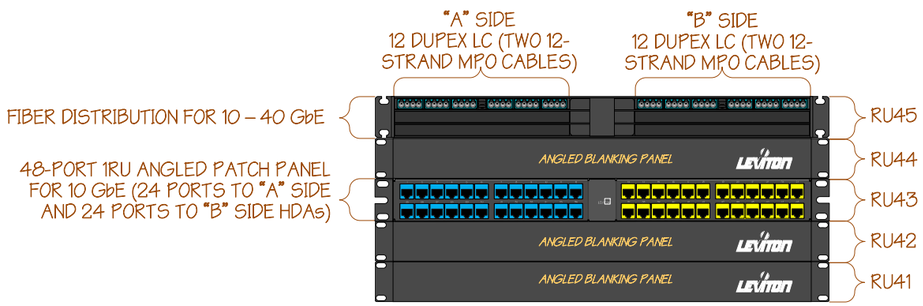
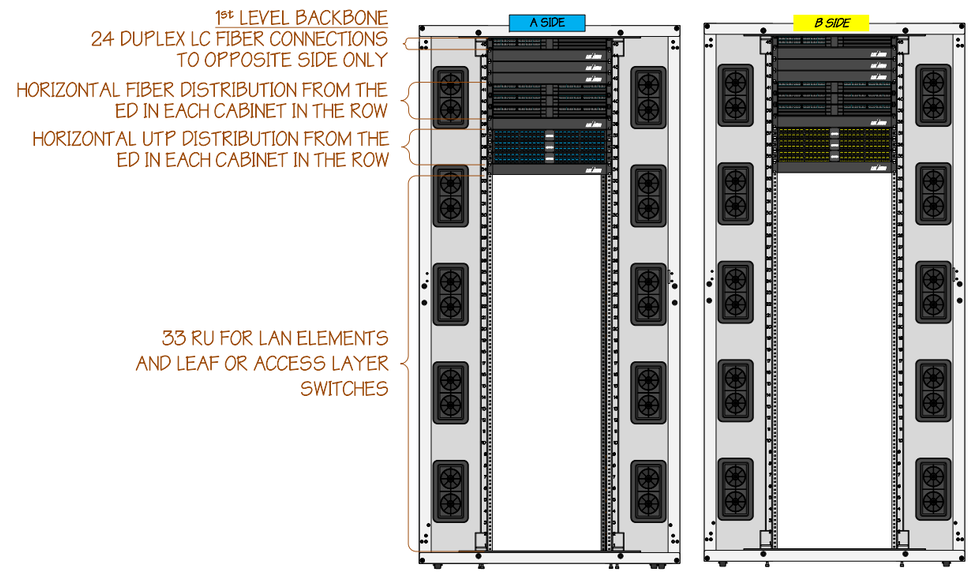
SHEET TITLE

PATHWAY DETAILS

SHEET: 15 OF 32



2 STANDARD DENSITY EQUIPMENT DISTRIBUTOR ELEVATION FOR CABINETS



1 TYPICAL END OF ROW HORIZONTAL DISTRIBUTION AREA

Department of Veterans Affairs

IT Operations and Services
Solution Delivery

EDICT

ENTERPRISE DATA CENTER AND INFRASTRUCTURE ENGINEERING

PROJECT:

GENERIC EXTRA SMALL DATA CENTER DESIGN PACKAGE FOR MCRs AND OTHER CSCs

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FILE:	Generic Extra Small Data Center Design Package 1v1a1
DESIGNED BY:	KEVIN GRZELKA, CTDC
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DOC VERSION No:	1.0
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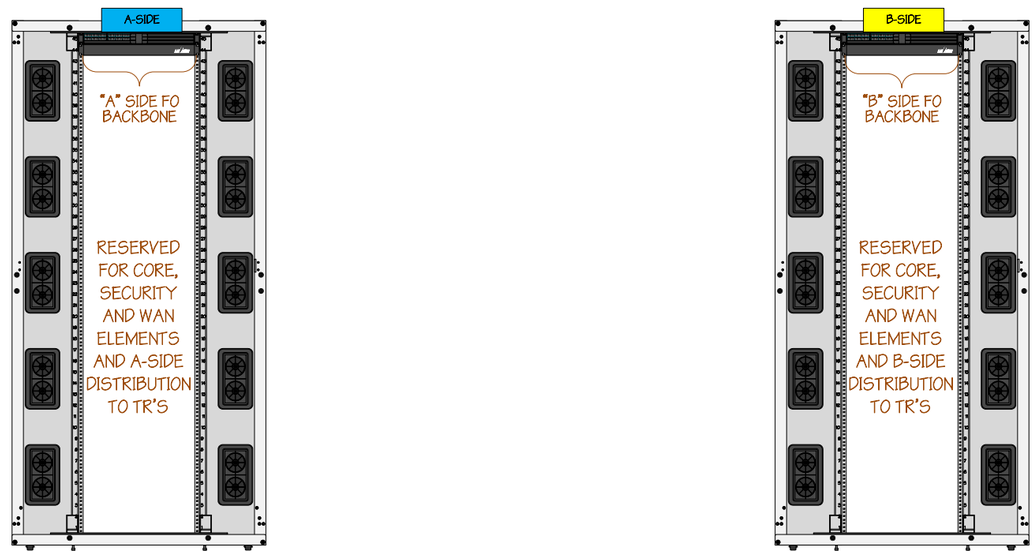
SHEET TITLE

EQUIPMENT AND HORIZONTAL DISTRIBUTORS

SHEET: 16 OF 32



1 MAIN DISTRIBUTION AREA (A & B SIDES)

Department of Veterans Affairs

IT Operations and Services
Solution Delivery

EDICT

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Generic Extra Small Data Center Design Package For MCRs and Other CSCs

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FILE:	Generic Extra Small Data Center Design Package 1v4d
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SHEET TITLE

MAIN DISTRIBUTION AREA

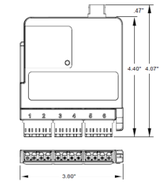
SHEET: 17 OF 32

RECOMMENDED UTP MEDIA: ATLAS-X1 COPPER TRUNKS
CAT 6A UTP CMP CABLE ASSEMBLY
BUNDLE OF 6 BLUE CABLES
BERK-TEK - LANMARK-10G2 (UTP) BRANDED CABLE
TIA/EIA WIRING T568B
TESTED TO TIA 568-C.2
TERMINATION: ATLAS-X1 E2XHD CONNECTION

RECOMMENDED A SIDE JACK COLOR: BLUE

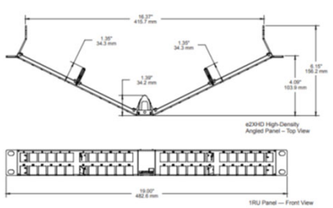
RECOMMENDED B SIDE JACK COLOR: YELLOW

3 UTP MEDIA



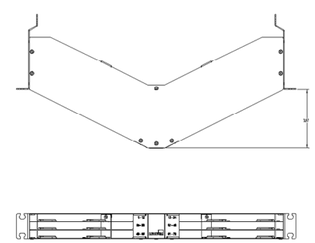
RECOMMENDED CASSETTE: LEVITON HDX ENTERPRISE MTP
FIBER TYPE: OM4/OS1
FIBER COUNT: 12-FIBER
CONNECTOR (FRONT): LC
CONNECTOR (REAR): MPO
POLARITY: TYPE A

4 FIBER CASSETTE



RECOMMENDED UTP PATCH PANEL:
LEVITON e2XHD-BLK HIGH-DENSITY ANGLED
48 POSITION
ONE (1) RACK UNIT PER PANEL

2 UTP PATCH PANEL



RECOMMENDED FIBER DISTRIBUTION CABINET:
LEVITON ANGLED OPT-X UHDX
144 FIBER
ONE (1) RACK UNIT

1 FIBER DISTRIBUTION CABINET

Department of Veterans Affairs

IT Operations and Services
Solution Delivery

EDICT

Enterprise Data Center and Infrastructure Engineering

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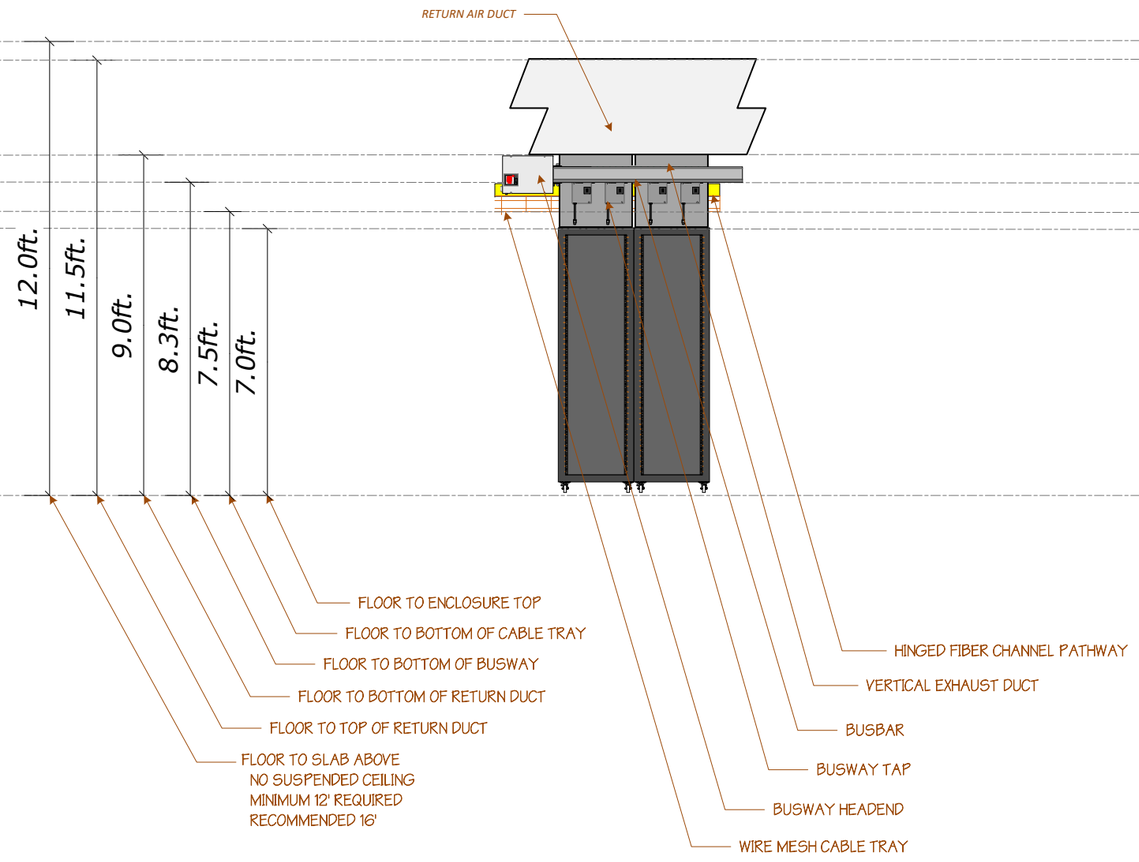
SHEET TITLE

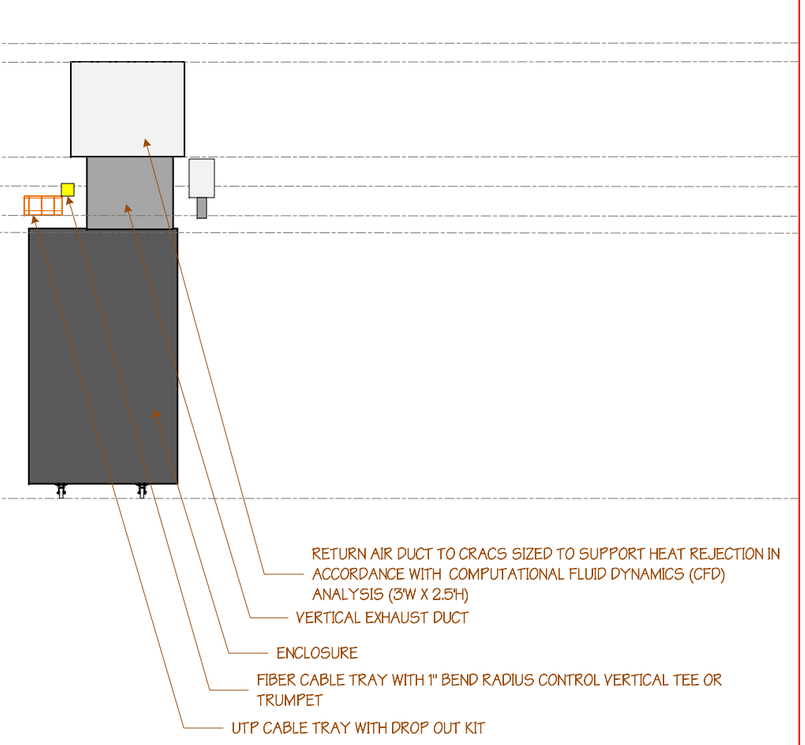
MEDIA DETAIL

SHEET: 18 OF 32



NOTE: HEIGHTS ANNOTATED ARE NOTIONAL. ACTUAL ELEVATIONS TO BE DETERMINED BY OTHERS

2 REAR ELEVATION ENCLOSURES
NTS



1 SIDE ELEVATION ENCLOSURE
NTS

Department of Veterans Affairs

IT Operations and Services
Solution Delivery

EDICT

ENTERPRISE DATA CENTER AND INFRASTRUCTURE ENGINEERING

PROJECT:

GENERIC EXTRA SMALL DATA CENTER DESIGN PACKAGE FOR MCRS AND OTHER CSCS

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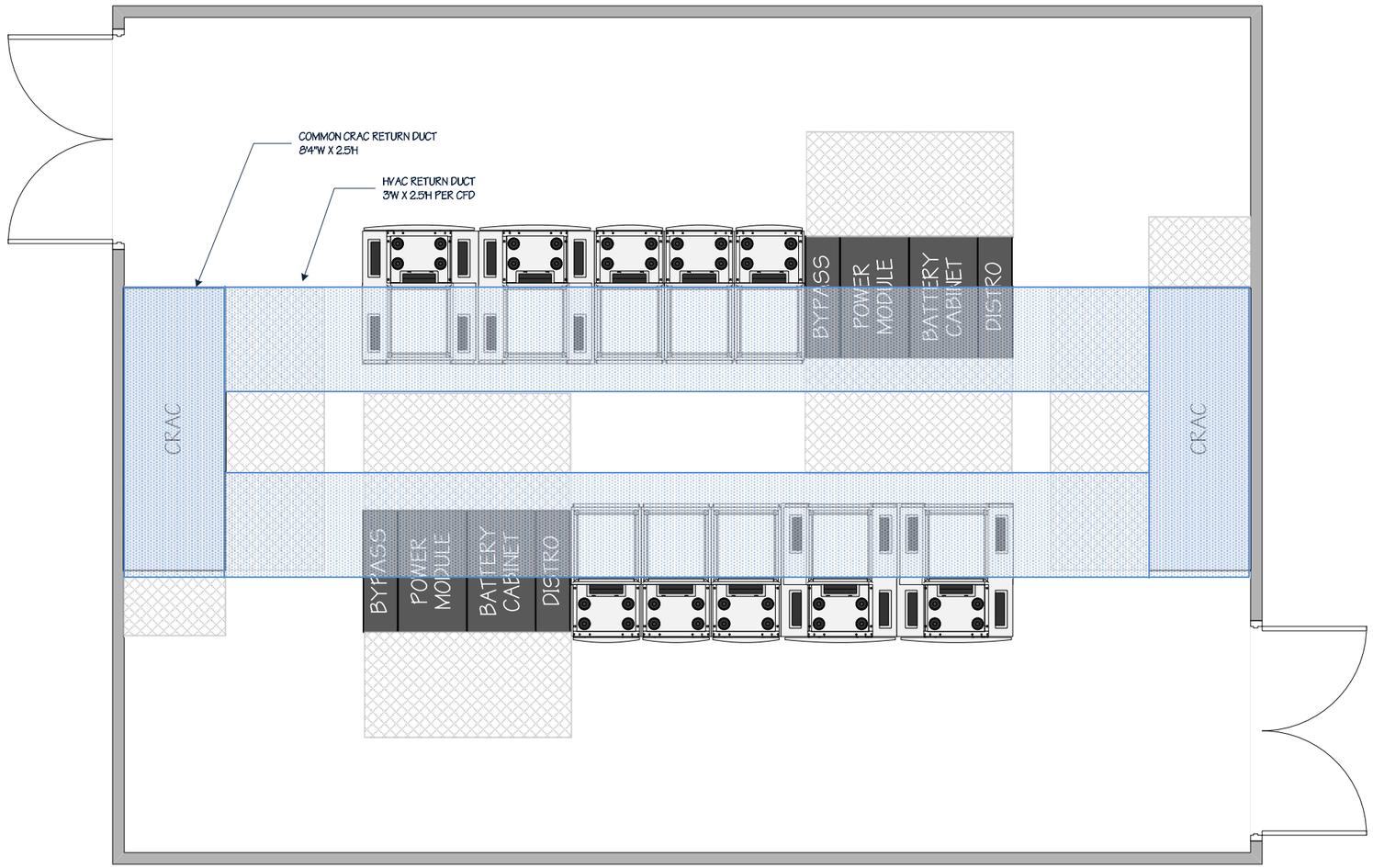
SHEET TITLE

TYPICAL ELEVATION

SHEET: 19 OF 32



1 GENERIC FLOOR PLAN FOR SMALL DATA CENTERS – HVAC DUCT PLAN (SQUARE VERSION)

Department of Veterans Affairs

IT Operations and Services
Solution Delivery

EDICT

ENTERPRISE DATA CENTER AND INFRASTRUCTURE ENGINEERING

PROJECT:

GENERIC EXTRA SMALL DATA CENTER DESIGN PACKAGE FOR MCRs AND OTHER CSCs

MARK	DATE	DESCRIPTION

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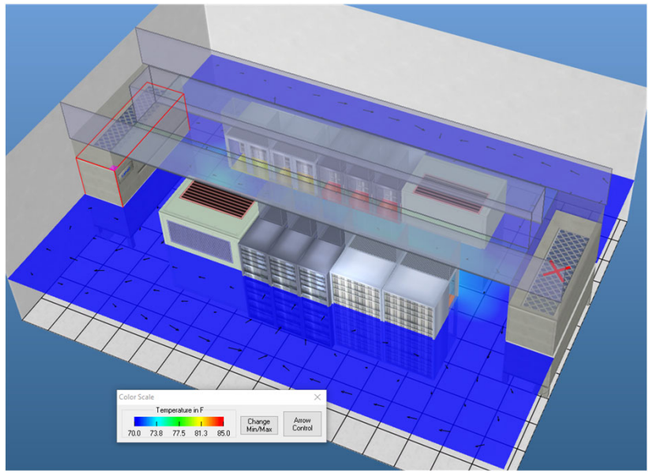
DESIGNED BY:	KEVIN GRZELKA, CTDC
CHECKED BY:	MICHAEL JULIAN, RCDD KELLY BATES, DCIE
DOC VERSION No:	1.0
PRINT DATE:	Sep 21, 2021
ISSUE DATE:	Jun 25, 2021

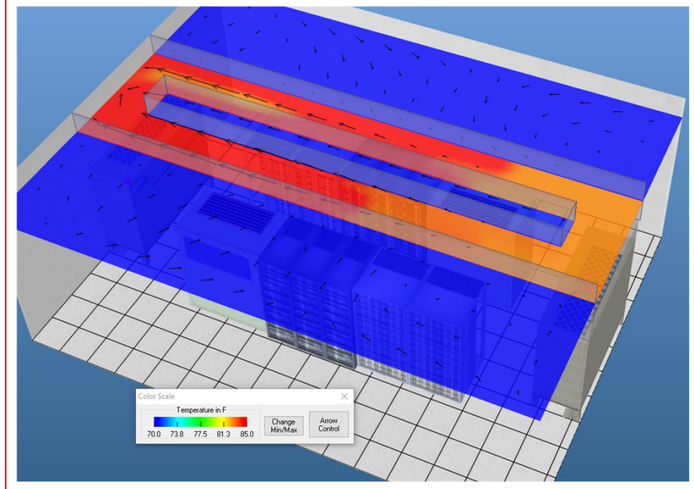
SHEET TITLE

HVAC DUCTS- SQUARE

SHEET: 20 OF 32



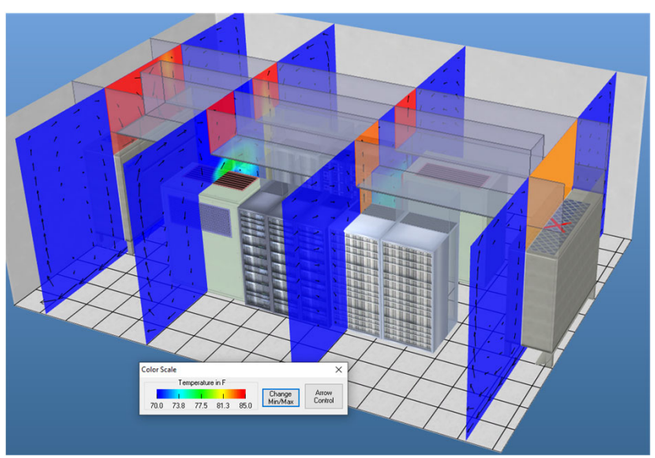
4 TEMPERATURE BILLBOARD 4FT ABOVE FLOOR – ONE CRAC FAILED



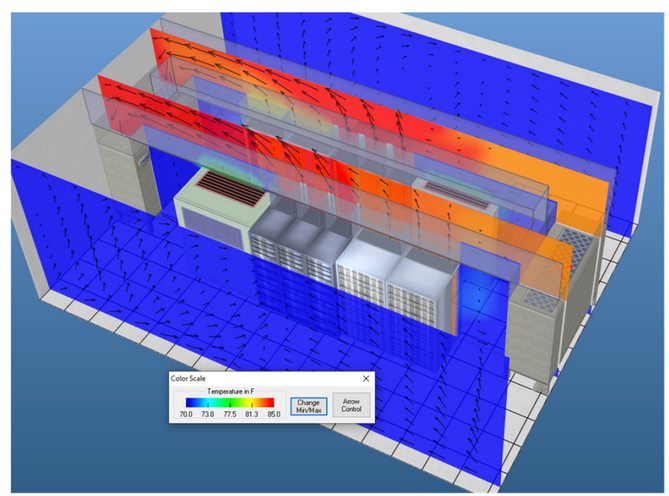
5 TEMPERATURE BILLBOARD 10.5FT ABOVE FLOOR – ONE CRAC FAILED

Item	Value
Net Floor Area	732 sq ft
Heat Load Density	62.1 W/sq ft
Total Heat Load	45.5 kW
Total Airflow Demand	7,497 CFM
Total Airflow Supplied	8,000 CFM

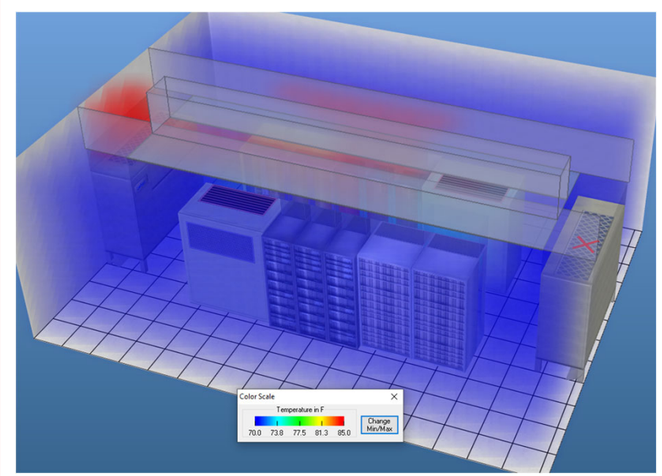
6 TOTAL HEATLOAD AND AIRFLOW



3 TEMPERATURE BILLBOARD Y AXIS – ONE CRAC FAILED



2 TEMPERATURE BILLBOARD X AXIS – ONE CRAC FAILED



1 TEMPERATURE FOG – ONE CRAC FAILED

Department of Veterans Affairs

IT Operations and Services
Solution Delivery

EDICT

ENTERPRISE DATA CENTER AND INFRASTRUCTURE ENGINEERING

PROJECT:

GENERIC EXTRA SMALL DATA CENTER DESIGN PACKAGE FOR MCRs AND OTHER CSCs

MARK	DATE	DESCRIPTION

ISSUE:

DRAWING No:

FILE: Generic Extra Small Data Center Design Package 1.vsd

DESIGNED BY: KEVIN GRZELKA, CTDC

CHECKED BY: MICHAEL JULIAN, RCDD
KELLY BATES, DCIE

DOC VERSION No: 1.0

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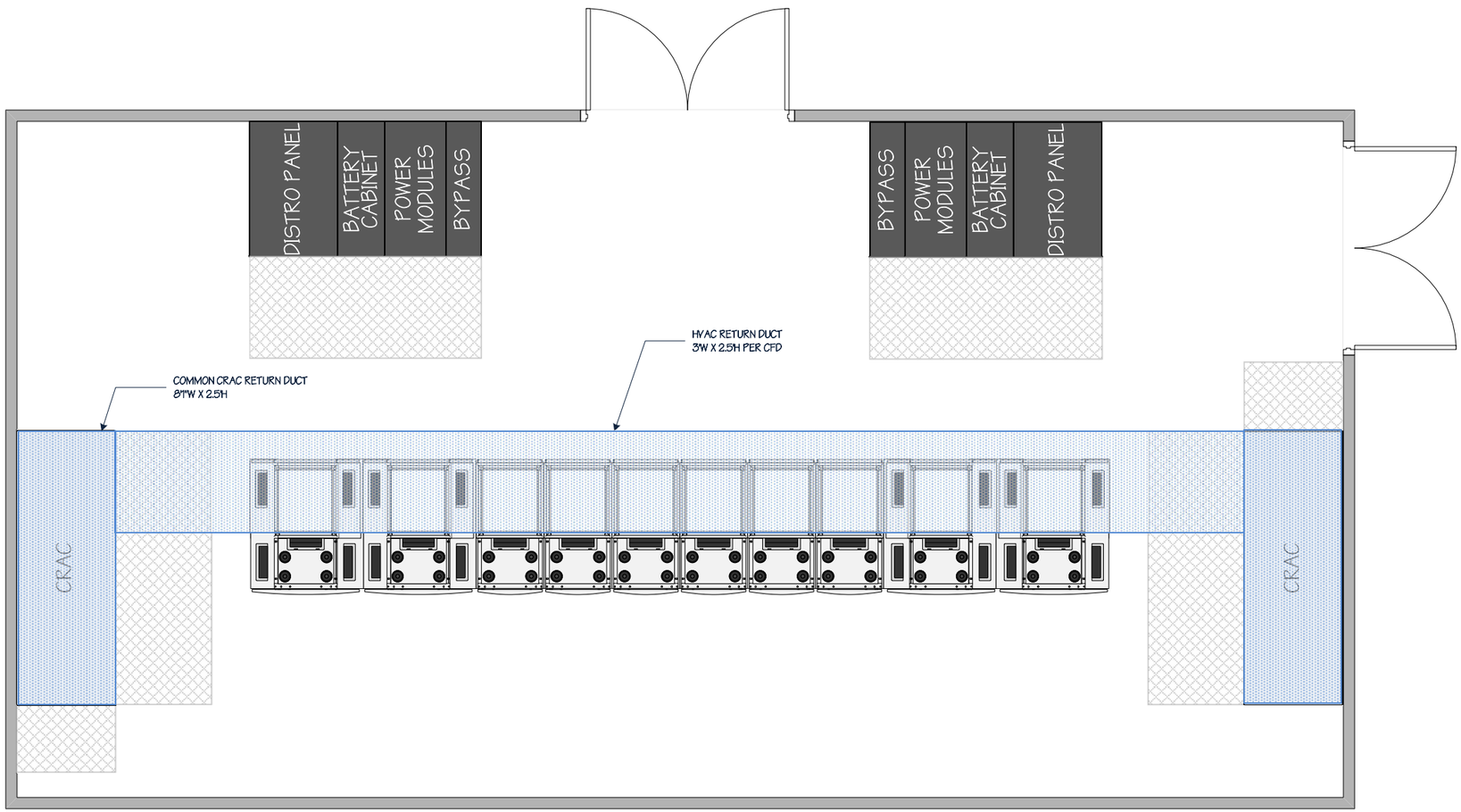
SHEET TITLE

COMPUTATIONAL FLUID DYNAMICS - SQUARE



1 GENERIC FLOOR PLAN FOR SMALL DATA CENTERS – HVAC DUCT PLAN (RECTANGLE VERSION)

Department of Veterans Affairs

IT Operations and Services
Solution Delivery

EDICT

ENTERPRISE DATA CENTER AND INFRASTRUCTURE ENGINEERING

PROJECT:

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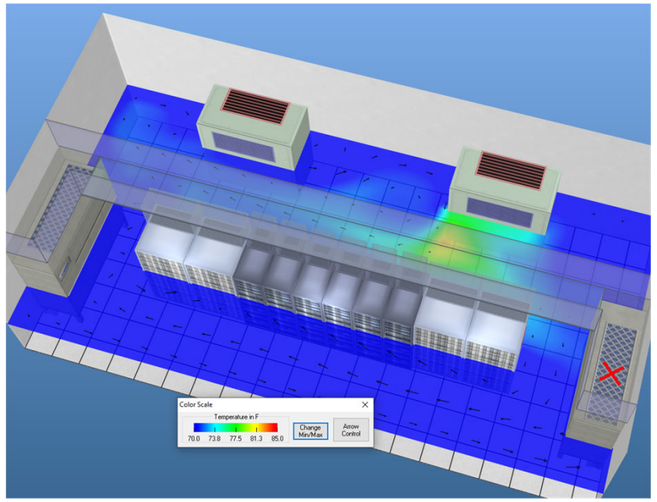
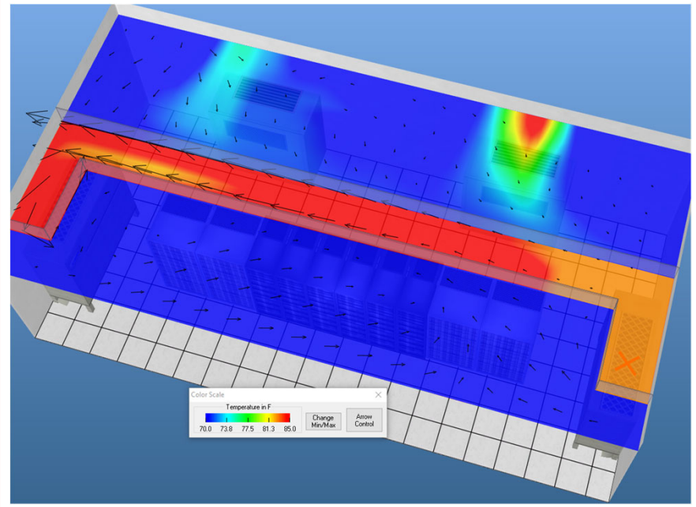
SHEET TITLE

HVAC DUCTS - RECTANGLE

SHEET: 22 OF 32



4 TEMPERATURE BILLBOARD 4FT ABOVE FLOOR – ONE CRAC FAILED



5 TEMPERATURE BILLBOARD 10.5FT ABOVE FLOOR – ONE CRAC FAILED

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Total Airflow Demand	7,497 CFM
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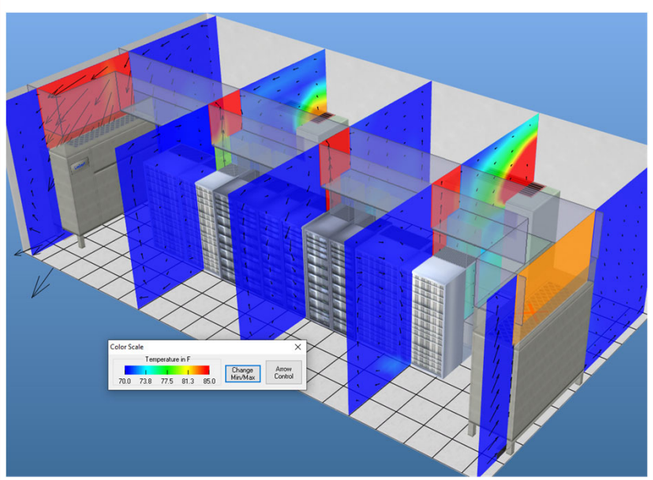
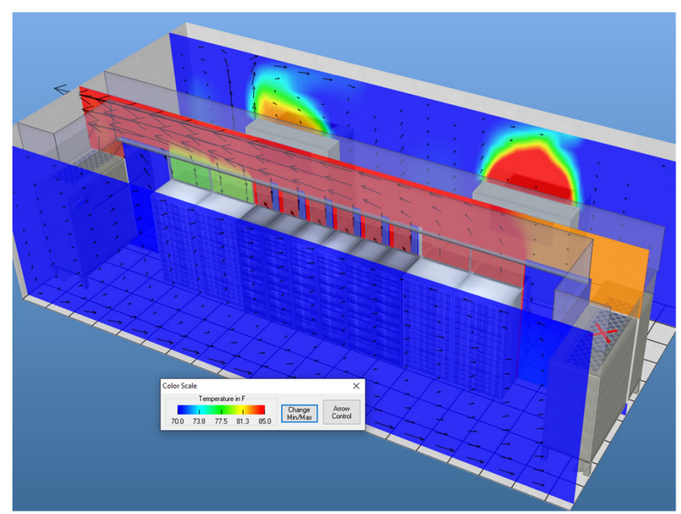
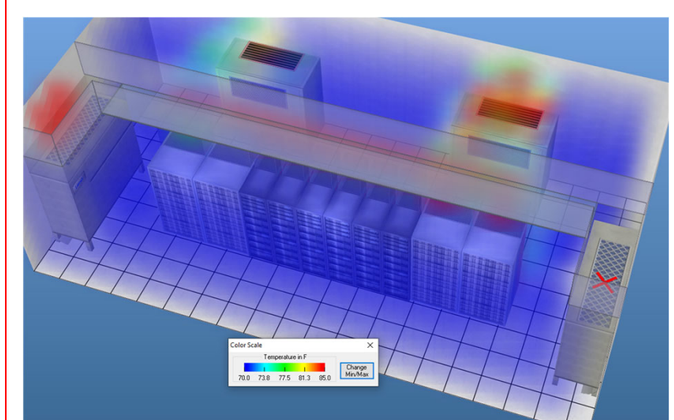


3 TEMPERATURE BILLBOARD Y AXIS – ONE CRAC FAILED



2 TEMPERATURE BILLBOARD X AXIS – ONE CRAC FAILED



1 TEMPERATURE FOG – ONE CRAC FAILED

Department of Veterans Affairs

IT Operations and Services
Solution Delivery

EDICT

ENTERPRISE DATA CENTER AND INFRASTRUCTURE ENGINEERING

PROJECT:

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DESIGNED BY: KEVIN GRZELKA, CTDC

CHECKED BY: MICHAEL JULIAN, RCDD
KELLY BATES, DCIE

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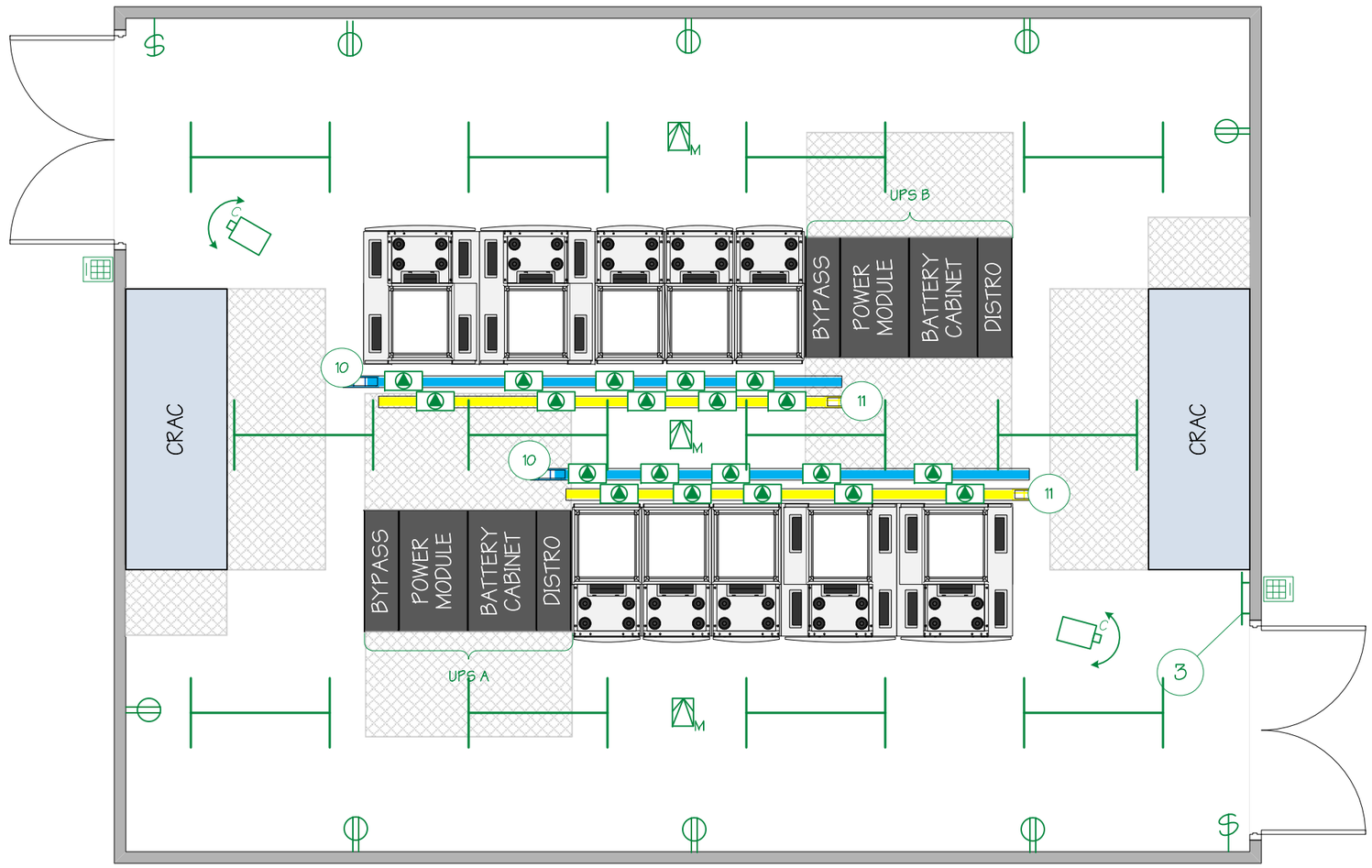
COMPUTATIONAL FLUID DYNAMICS - RECTANGLE



1 GENERIC FLOOR PLAN FOR SMALL DATA CENTERS – POWER PLAN (72.9W/FT^2)

Department of Veterans Affairs

IT Operations and Services
Solution Delivery

EDICT

ENTERPRISE DATA CENTER AND INFRASTRUCTURE ENGINEERING

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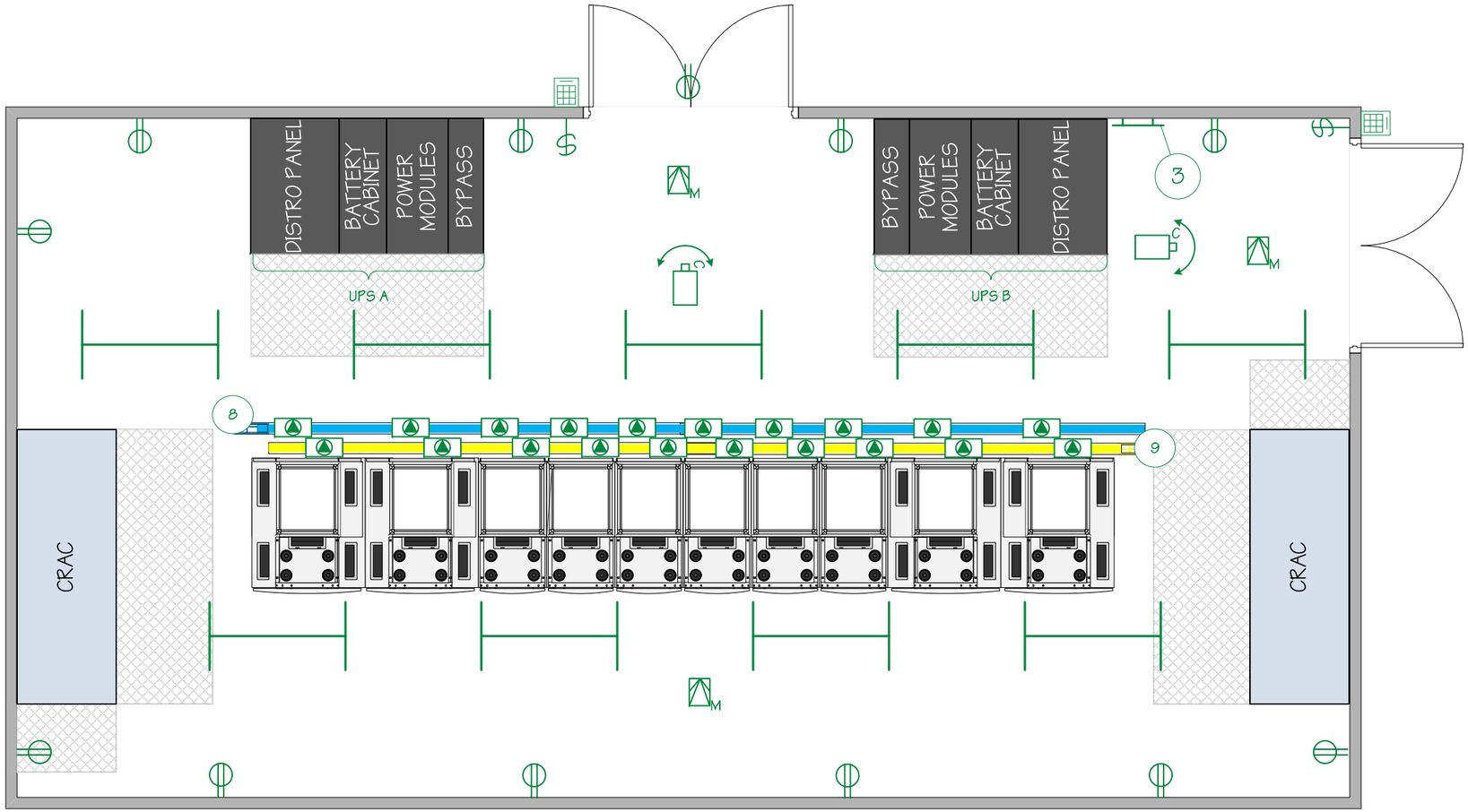
SHEET TITLE

POWER PLAN - SQUARE

SHEET: 24 OF 32



1 GENERIC FLOOR PLAN FOR SMALL DATA CENTERS – POWER PLAN (72.9W/FT^2)

Department of Veterans Affairs

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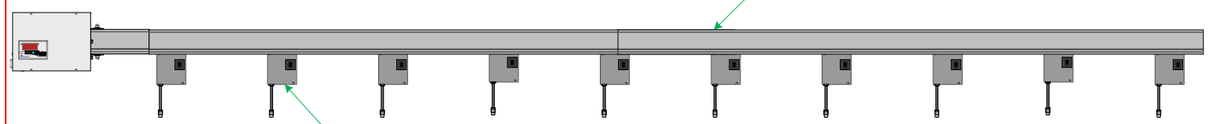
SHEET TITLE

POWER PLAN - RECTANGLE

POWER FEED UNIT
WITH CURRENT MONITOR TO SUPPORT
POWER REQUIREMENT FOR EACH ROW.
POWER CALCULATIONS TO BE PERFORMED
BY OTHERS.

208V 3 PHASE POWER BUS BAR

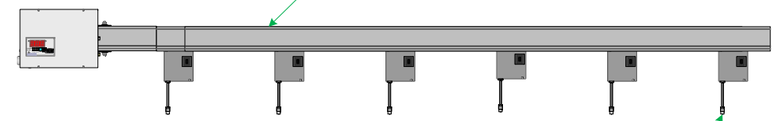


POWER BUSWAY TAP WITH SINGLE BREAKER 3' DROP
CORD (WITH STRAIN RELIEF)
WITH L21-20R FOR STANDARD-DENSITY CABINETS. TEN
(10) PER ROW BUSWAY.

3 TYPICAL POWER BUSWAY COMPONENTS (RECTANGLE DESIGN)

POWER FEED UNIT
WITH CURRENT MONITOR TO SUPPORT
POWER REQUIREMENT FOR EACH ROW.
POWER CALCULATIONS TO BE PERFORMED
BY OTHERS.

208V 3 PHASE POWER BUS BAR



POWER BUSWAY TAP WITH SINGLE BREAKER 3' DROP
CORD (WITH STRAIN RELIEF)
WITH L21-20R FOR STANDARD-DENSITY CABINETS. FIVE
(5) PER ROW BUSWAY.

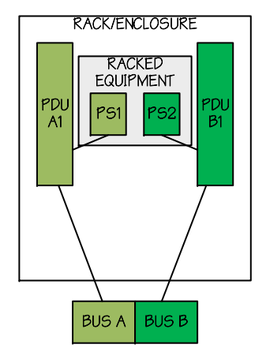
4 TYPICAL POWER BUSWAY COMPONENTS (SQUARE DESIGN)

CHATSWORTH ECONNECT PDU; VERTICAL; MONITORED; L21-20 PLUG; THREE PHASE; 120/208V INPUT; 20A; (30) C13 (6) C19 OUTLETS; 208V OUTPUT; 3 X 2P 20A HYDRAULIC MAGNETIC BREAKERS; LCD; ETHERNET, USB, AND ENVIRONMENTAL SENSOR PORTS; IP AND SERIAL MONITORING; IP CONSOLIDATION (PDU LINKING); TOOL-LESS MOUNTING; 70.5"H (1791 MM) X 2.2"W (56 MM) X 2.2"D (56 MM)

REQUIRES ONE L21-20R

2 208 VOLT RACK PDU FOR EQUIPMENT POWER

THIS DESIGN PROVIDES DIVERSE POWER INPUTS FOR ACTIVE EQUIPMENT BY SPLITTING THE SOURCE POWER ACROSS TWO BUSWAYS. EACH SERVER CABINET WILL CONTAIN A MINIMUM OF TWO EQUIPMENT-FACING ZERO U VERTICAL RACK PDUS – EACH WILL BE ENERGIZED BY SEPARATE BUSWAY TAP INPUTS ON DISPARATE BUSWAYS.



STANDARD DENSITY – ONE
L21-20 DROP PER BUSWAY

1 POWER SCHEMATIC FOR POWER RACK- LEVEL REDUNDANCY

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EDICT

ENTERPRISE DATA CENTER AND INFRASTRUCTURE ENGINEERING

PROJECT:

GENERIC EXTRA SMALL DATA CENTER DESIGN PACKAGE FOR MCRS AND OTHER CSCS

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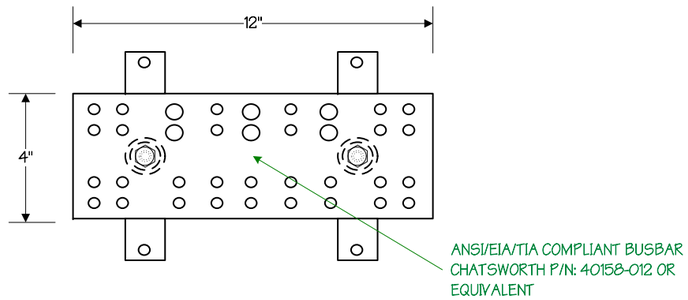
SHEET TITLE

POWER DISTRIBUTION DETAILS

SHEET: 26 OF 32

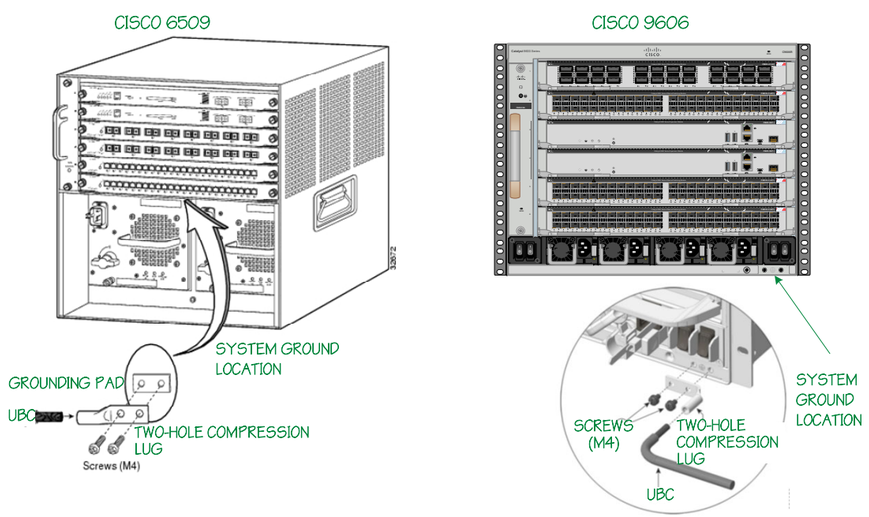
NOTES: ALL GROUNDING SHALL BE DONE IN ACCORDANCE WITH ANSI/TIA-607-D "COMMERCIAL BUILDING GROUNDING (EARTHING) AND BONDING REQUIREMENTS FOR TELECOMMUNICATIONS", NFPA 70, AND IN COMPLIANCE WITH LOCAL CODES.

ALL EQUIPMENT SHALL BE GROUNDED PER MANUFACTURER'S INSTRUCTIONS.

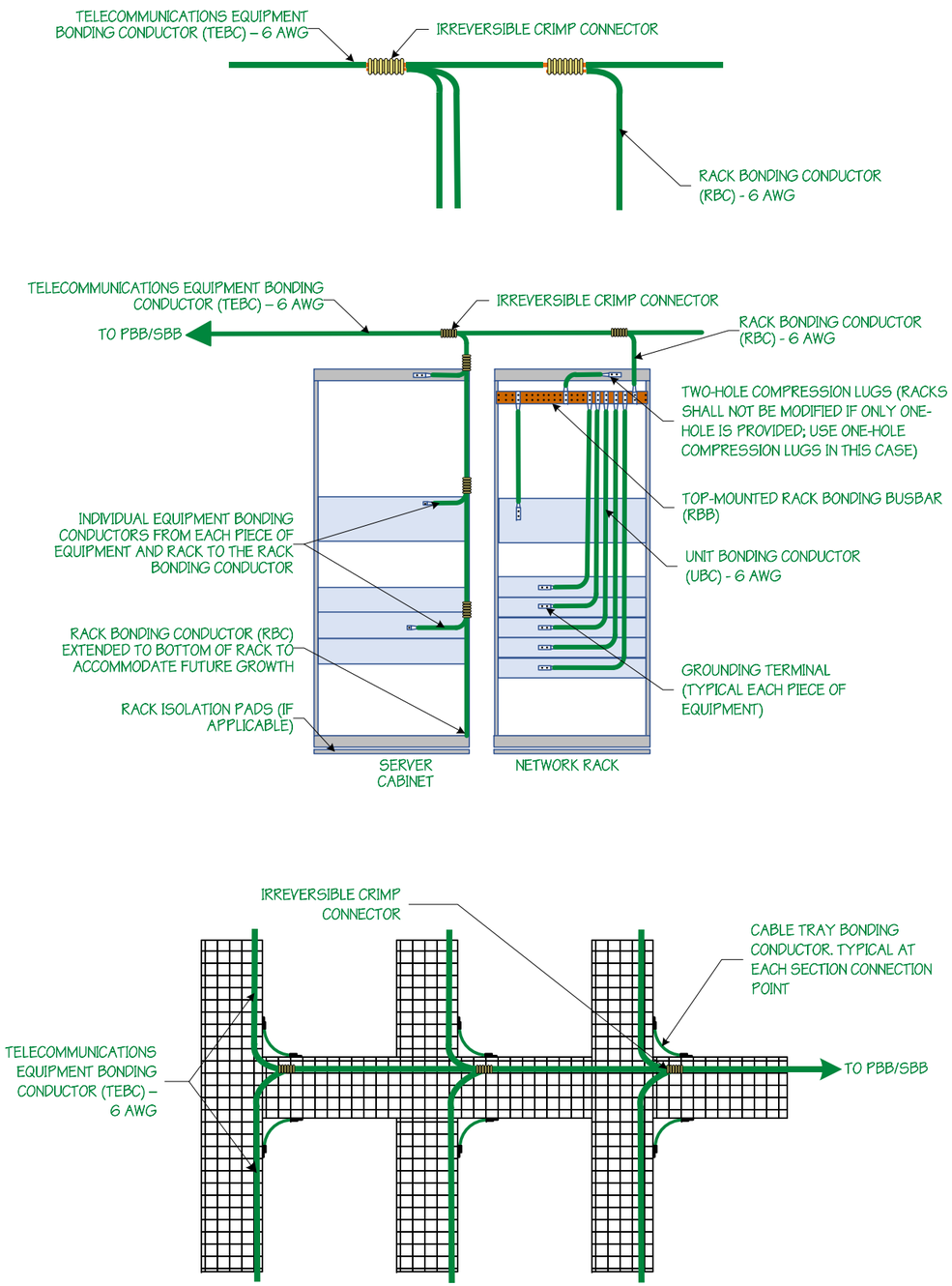


3 TELECOMMUNICATIONS SECONDARY BONDING BUSBAR (SBB)

NETWORK EQUIPMENT MUST BE GROUNDED. NEVER DEFEAT THE GROUND CONDUCTOR OR OPERATE THE EQUIPMENT IN THE ABSENCE OF A SUITABLY INSTALLED GROUND CONDUCTOR. THESE DEVICES WILL BE BONDED TO THE RACK BONDING BUSBAR (RBB) IN THE SAME RACK. EACH DEVICE WILL HAVE A DEDICATED UNIT BONDING CONDUCTOR (UBC). THE UBC WILL NOT BE SHARED.



2 EARTHING EXAMPLE (CISCO 6509/9606)
Ref: CISCO PRODUCT INSTALLATION GUIDE



1 PATHWAY, RACK, BONDING CONDUCTOR JOIN REQUIREMENTS

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BONDING

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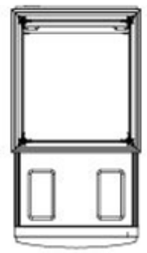
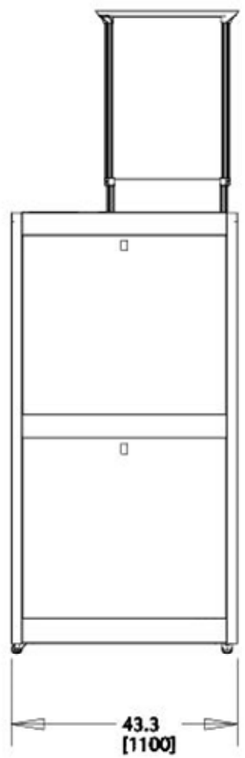
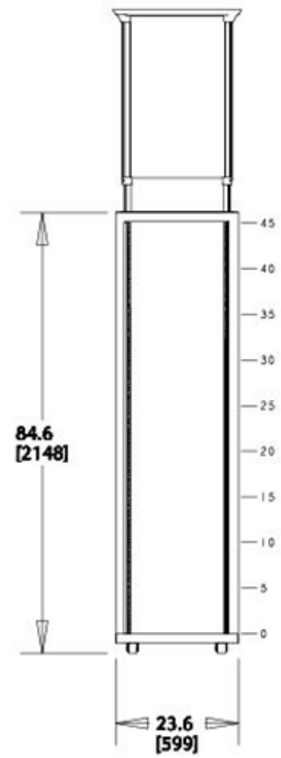


4 TYPICAL ENCLOSURE TOP VIEW WITH VERTICAL EXHAUST DUCT (VED)
NTS



3 TYPICAL ENCLOSURE SIDE VIEW WITH VERTICAL EXHAUST DUCT (VED)
NTS

NOTE: SERVER CABINETS MAY ONLY HOUSE SERVER AND STORAGE EQUIPMENT AND SUPPORTING PATCH PANELS. SERVER CABINETS MAY NOT HOUSE TELECOMMUNICATIONS (NETWORK) EQUIPMENT



2 TYPICAL ENCLOSURE FRONT WITH VERTICAL EXHAUST DUCT (VED)
NTS

CP3203504 F-Series TeraFrame Gen 3 Cabinet System with accessories installed
Configuration includes the following components:

Item Number Description (Qty)
FF1N-111C-E52-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, Single Solid Metal Rear Door, Two Point, Keyed Swing Handle Latch, Vertical Exhaust Duct System 14-20" (356-508mm), 2 Solid Side Panel, Glacier White, 6-Slide Frame (1)

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, Assembly, 23.6'' (600 mm) W x 45 RMU, Glacier White (1)

024-739064-703 Lock Kit, 2-Point, Keyed, Front Door, 45 RMU (1)

024-739070-E03 Door, Solid, Rear, Assembly, 23.6'' (600 mm) W x 45 RMU, Glacier White (1)

024-739074-703 Lock Kit, 2-Point, Keyed, Solid Door, 45 RMU (1)

024-739191-E12 Vertical Exhaust Duct Kit, 20"H-34"H (508 mm-863 mm), TeraFrame, Cable Port, 23.6'' (600 mm) W x 43.3'' (1100 mm) Glacier White (1)

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)

024-739107-E00 Air Director, Glacier White (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

024-735077-002 F-Series TeraFrame Cabinet with Caster Packaging, 600-700mm X 1025-1200mm D X 36-45U H (1)

39085-E03 Air Dam, 6 SLIDE, 23.6'' (600 mm) W x 45 RMU, Glacier White (1)

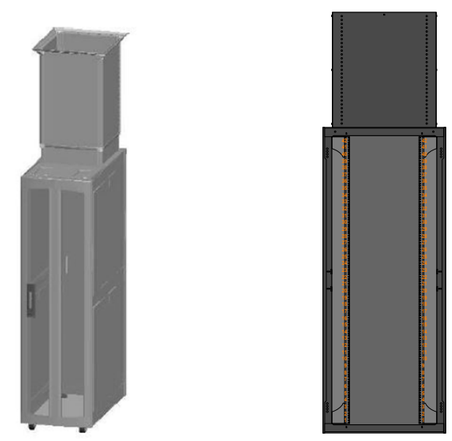
39137-703 Baying Seal Kit, 45U (2)

39132-E00 Bottom Panel with Brushes (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

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Solution Delivery

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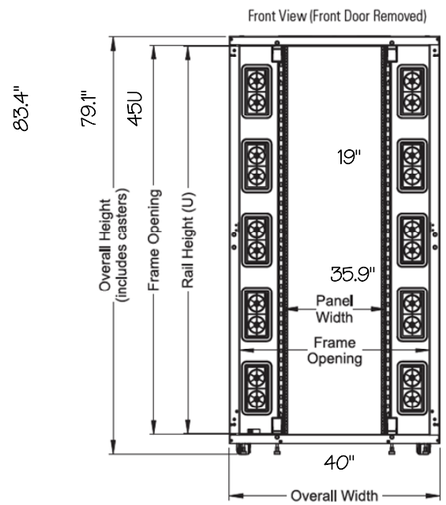
TYPICAL CABINET DETAIL

SHEET: 28 OF 32

NOTE: NETWORK CABINETS ARE PURPOSE BUILT TO PROVIDE AMPLE ROOM FOR CABLING NEEDS OF THE HORIZONTAL DISTRIBUTION AREA AND THE MAIN DISTRIBUTION AREA AND MAY BE USED IN LIEU OF TELECOMMUNICATION CHANNEL RACKS FOR THIS PURPOSE. TELECOMMUNICATION CABINETS MAY NOT BE USED IN TELECOMMUNICATION ROOMS.



3 TYPICAL NETWORK CABINET FRONT VIEW DIMENSIONS

2 TYPICAL NETWORK CABINET ISOMETRIC VIEW WITH DOUBLE DOORS AND VERTICAL EXHAUST DUCT (VED)

SIDE PANEL WITH BRUSH SEALED CABLE OPENINGS (CHATSWORTH 39043-E63)

SIDE PANEL WITH BRUSH SEALED CABLE OPENINGS FEATURE MULTIPLE BRUSH SEALED CABLE OPENINGS THAT ALLOW CABLES TO ENTER THE SIDE OF THE CABINET WHILE CONTAINING EXHAUST AIR WITHIN EACH CABINET

- TWO-PIECE DESIGN WITH TOP AND BOTTOM HALVES FOR EASIER HANDLING
- EIGHT CABLE OPENINGS PER SIDE, FOUR PER HALF-HEIGHT PANEL, ONE PER CORNER, ARE 4.5"W x 9"D WITHOUT COVER
- BRUSH COVER OVER CABLE OPENINGS PROTECTS CABLES AS THEY PASS THROUGH THE SIDE PANEL AND PROVIDES A 3.9"W X8.8"D PASS THROUGH AREA FOR CABLES
- TOOL-LESS REMOVAL, DROP IN DESIGN WITH INTEGRATED LOCKING SPRING LATCH SECURES THE SIDE PANEL TO THE CABINET FRAME
- INTEGRATED GROUNDING TABS TO ELECTRICALLY BOND THE SIDE PANEL TO THE CABINET FRAME

4 SIDE PANELS (CHATSWORTH 39043-E63)

N H W D - R F R L - C T S - E

1. Height

U	in	mm	
42	78.1	1984	C
43	79.9	2029	D
44	81.6	2073	E
45	83.4	2117	F
46	85.1	2162	G
47	86.9	2206	H
48	88.6	2251	J
49	90.4	2295	K
50	92.1	2340	L
51	93.9	2384	M
52	95.6	2429	N

Height includes transport casters.

2. Width

in	mm	Included Air Manager	
31.5	800	No Air Manager	0
31.5	800	Front Air Dams	7
31.5	800	Side Intake Duct	1
40.0	1016	No Air Manager	6
40.0	1016	Front Air Dams	8
40.0	1016	Side Intake Duct	5

40.0"W (1016 mm) cabinets are only available 44.3"D (1100 mm) or deeper.

3. Depth

Depth in	Depth mm	With Doors in	With Doors mm	
39.4	1000	43.3	1100	J
40.4	1025	44.3	1125	K
41.3	1050	45.3	1150	L
42.3	1075	46.3	1175	M
43.3	1100	47.3	1200	N
44.3	1125	48.2	1225	P
45.3	1150	49.2	1250	R
46.3	1175	50.2	1275	T
47.2	1200	51.2	1300	U

Frame Depth does not include doors. Front door adds 2.4" (61 mm). Rear door adds 1.5" (38 mm). See Dimensional Drawing.

4. Equipment Mounting Rail Style

Square-Punched, 2-Pair	1
Tapped, #12-24, 2-pairs	2

5. Front Door

None	0
Perforated Metal, matches F-Series TeraFrame Gen 3 Cabinet	1
Perforated Metal, matches GF-Series GlobalFrame Gen 2 Cabinet	2

Single door on the 31.5"W (800 mm) cabinet. Double door on the 40.0"W (1016 mm) cabinet.

6. Rear Door

0	None
3	Double, Perforated Metal
4	Solid Metal with Perforated Insert
5	Solid Metal

Use Double Perforated Metal door with Standard Top panel. Use Solid Metal With Perforated Insert with Vertical Exhaust Duct and Side Intake Duct. Use Solid Metal door with Vertical Exhaust Duct and Air Dams. Solid Metal with Perforated Insert and Solid Metal doors are single doors on the 31.5"W (800 mm) cabinet and double doors on the 40.0"W (1016 mm) cabinet.

7. Latch/Locks Kits

C	Two-Point, Keyed Lock
E	Two-Point, Keyed/Combination Lock
N	None

There is a single-Point latch on front door that matches GF-Series GlobalFrame Gen 2 Cabinet

8. Color

C	Black
E	Glacier White

9. Top Panel Style

4	Standard Top
5	Vertical Exhaust Duct, 20"-34"H (508-863 mm)
6	Vertical Exhaust Duct, 34"-60"H (863-1523 mm)
7	Vertical Exhaust Duct, 14"-20"H (356-508 mm)

Options 5, 6, & 7 are for cabinets that are 41.3"D (1050 mm) or deeper. Use Solid Metal Rear Door or Solid Metal with Perforated Insert Rear Door with Vertical Exhaust Duct. Vertical Exhaust Duct includes a Bottom Panel.

10. Side Panel Style

0	None
1	Solid, 1 each
2	Solid, 2 each

Include side panels on all cabinets with Front Air Dams or Side Intake Duct Air Managers.

SIDE PANELS WITH BRUSH SEALED CABLE OPENINGS ARE MANDATORY AND MUST BE ORDERED SEPARATELY

SIZED PER REQUIREMENT

11. Cable Entry Cover

0	Plastic Grommet
1	Brush Sealed

1 TYPICAL NETWORK CABINET CONFIGURATION - CHATSWORTH NF8N-115C-E52-1

Department of Veterans Affairs

IT Operations and Services Solution Delivery

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SHEET TITLE

TYPICAL NETWORK CABINET DETAIL

SHEET: 29 OF 32

Cable Lashing Manager

Cable Lashing Manager creates a simple vertical pathway for multiple cable bundles and has multiple attachment points for securing cables using CPI Saf-T-Grip® Straps or zip ties. Use to support network cables along the sides of the cabinet.

- Attaches to the frame, adjusts in depth independent of the equipment mounting rails
- Two sizes: Slim and Wide
- Slim manager is 5"W (130 mm) and has three vertical columns of attachment points for 1.5" (38 mm) diameter cable bundles, 5 in² (3200 mm²) cable fill area
- Wide manager is 9.8"W (250 mm) and has five vertical columns of attachment points for 1.5" (38 mm) diameter cable bundles, 9.8 in² (6320 mm²) cable fill area
- Includes: Bracket and installation hardware, order Saf-T-Grips or cable ties separately
- Material: Steel; Select part number to match usable height and color of the cabinet

Part Number		Height (U)	Shipping Weight lb (kg)
Slim	Wide		
5.1"W (130 mm)	9.8"W (250 mm)		
39380-X00	39381-X00	42	19 (8.9)
39380-X01	39381-X01	43	20 (9.1)
39380-X02	39381-X02	44	20 (9.1)
39380-X03	39381-X03	45	21 (9.5)
39380-X04	39381-X03	46	21 (9.5)

3 TYPICAL CABLE LASHING MANAGER

Telescoping Cable Manager

Telescoping Cable Manager attaches to the sides of the front and rear equipment mounting rail providing a front-to-rear or vertical pathway for cables along the side of equipment.

- Attaches to and adjusts in depth with mounting rails, fully compatible with Front Air Dams and Side Intake Duct
- Five smooth, plastic L-shaped spools support cables
- Spools on 31.5"W (800 mm) model are 2.5"H x 2.6"D (64 mm x 66 mm)
- Spools on 40.0"W (1016 mm) model are 3.3"H x 6.8"D (84 mm x 173 mm)
- Spools rotate and lock in 90-degree increments and can be adjusted to manage horizontal or vertical cable runs
- Includes: cable manager, five cable spools, hardware
- Material: Steel manager, plastic spools
- Select part number to match the color of the cabinet

Part Number - Cabinet Width		Frame Depth in (mm)	Shipping Weight lb (kg)
31.5" (800 mm)	40.0" (1016 mm)		
39377-X01	39377-X02	Any	5 (2.3)

X=color; C=Black, E=Glacier White. Shipping Weights are for 1016 mm kits.

2 TYPICAL TELESCOPING CABLE MANAGER

Full Height Dual PDU Bracket

Full Height Dual PDU Bracket supports two vertical PDUs side-by-side and has multiple slots for CPI Saf-T-Grip® Straps or tie wraps to secure cords to the bracket.

- Attaches to the frame, adjusts in depth independent of the mounting rails
- Available in two widths: Dual and Wide
- Dual bracket is 4.8"W (121 mm) and supports two PDUs up to 2.2"W (56 mm) side-by-side
- Dual bracket supports most eConnect PDUs and power strips side-by-side
- Wide bracket is 5.8"W (147 mm) and supports two PDUs up to 2.7"W (69 mm) side-by-side
- Wide bracket is required to mount two 6-breaker eConnect PDUs (series P/N PX-3XXXX) side-by-side
- Tool-less mounting on 28" (711 mm), 61.25" (1556 mm) or 64.75" (1645 mm) centers
- Includes: brackets, installation hardware, order Saf-T-Grips or cable ties separately
- Material: Steel; Select part number to match the usable height and color of the cabinet

Part Number		Height (U)	Shipping Weight lb (kg)
Dual	Wide		
4.8"W (121mm)	5.8"W (147 mm)		
39086-X00	39221-X00	42	10 (4.5)
39086-X01	39221-X01	43	10 (4.5)
39086-X02	39221-X02	44	11 (5.0)
39086-X03	39221-X03	45	11 (5.0)

1 TYPICAL PDU BRACKET

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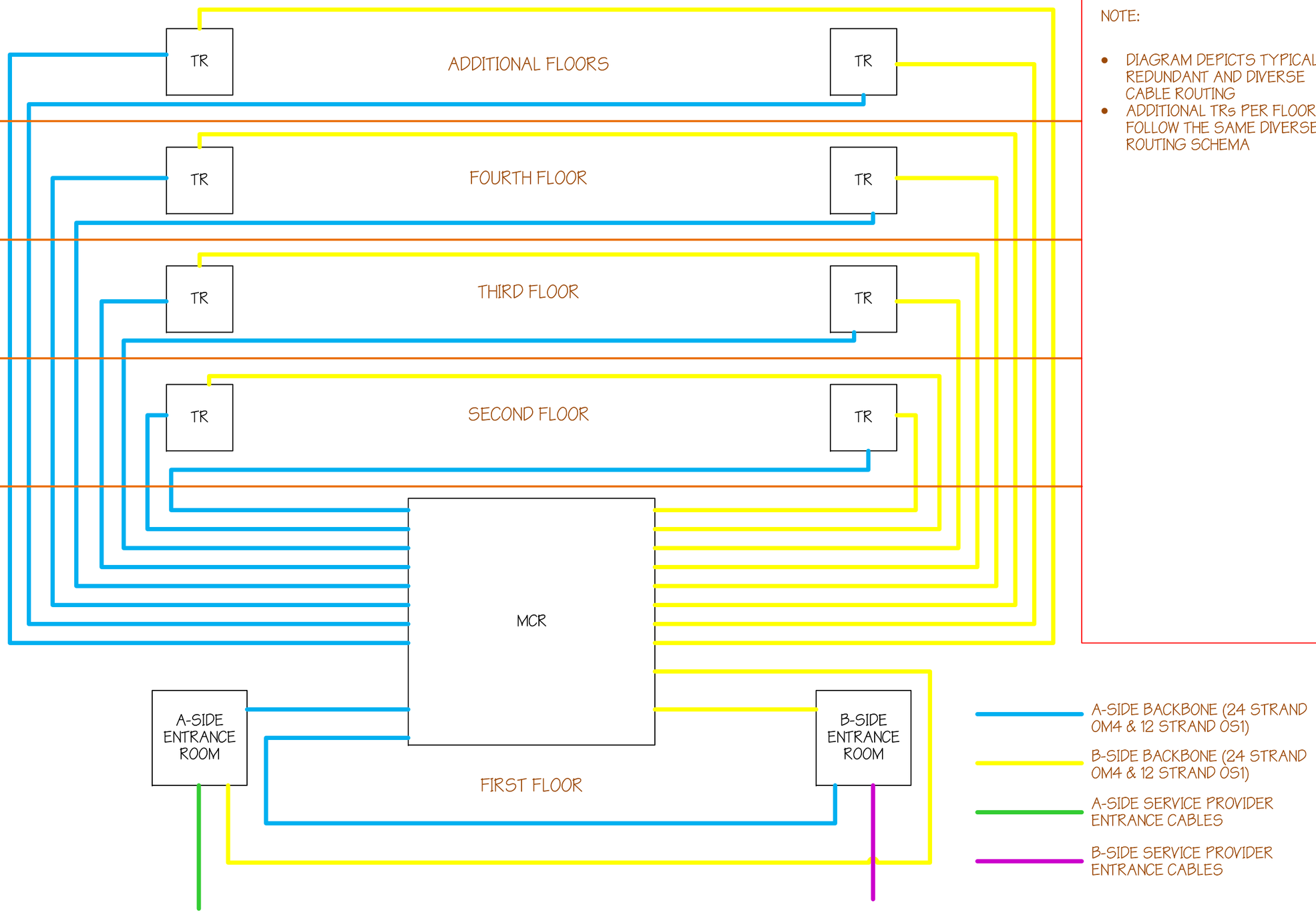
TYPICAL NETWORK CABIINET ACCESSORIES



1 BACKBONE CABLE ROUTING (REDUNDANT AND DIVERSE)

NOTE:

- DIAGRAM DEPICTS TYPICAL REDUNDANT AND DIVERSE CABLE ROUTING
- ADDITIONAL TRs PER FLOOR FOLLOW THE SAME DIVERSE ROUTING SCHEMA

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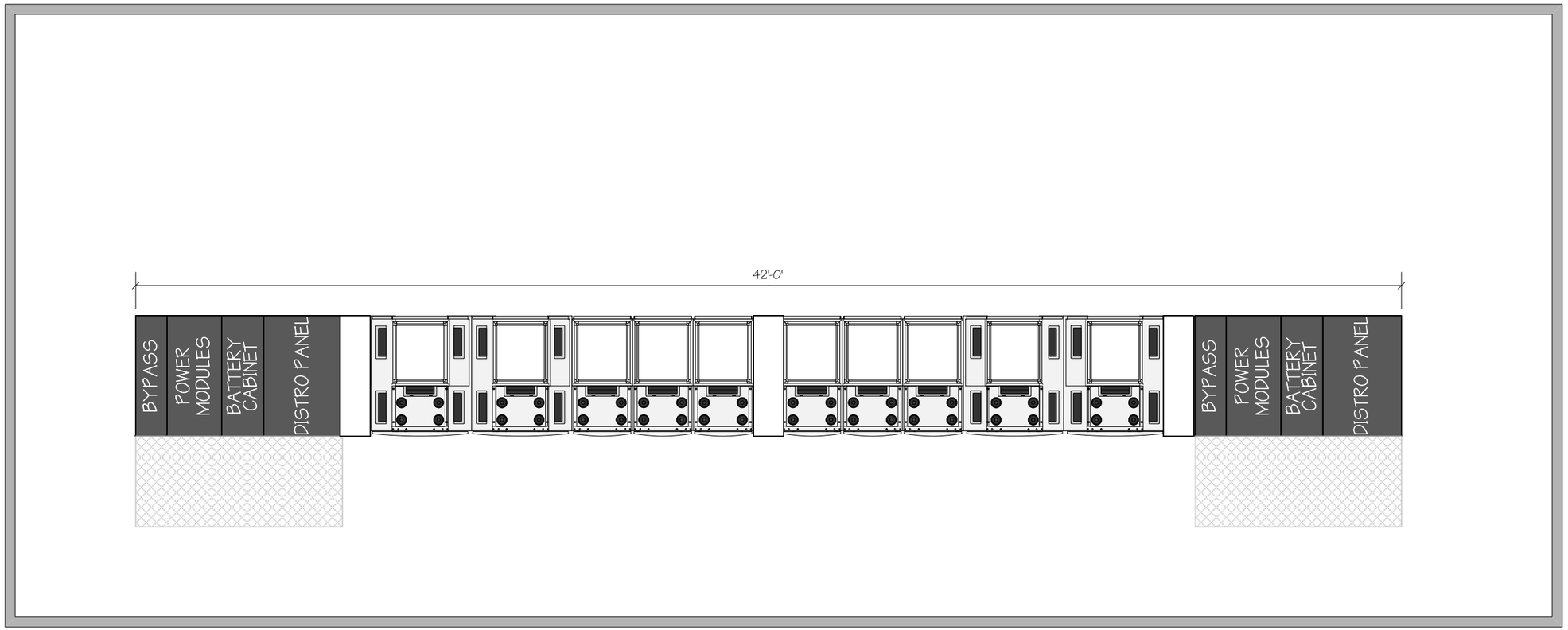
BUILDING TELECOM CABLE ROUTING



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Long Extra Small

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