DIVISION 27
Appendices A-E

Technology Systems
Design and Installation Guidelines
for Architects and Engineers

Pinellas County
Business Technology Services

Published November 18, 2022

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APPENDIX A: Abbreviations

1.4 ABBREVIATIONS

ABV CLG	Above Ceiling
AC	Alternating Current
ACD	Automatic Core Detection
ADA	American Disabilities Act
AFF	Above Finished Floor
AFG	Above Finished Grade
AMP	Ampere/Amplifier
ANSI	American National Standards Institute
AOC	Administrative Office of the Courts
APC	Angled Polished Connectors (Angle physical contact connector)
APWA	American Public Works Association
ASTM	American Society for Testing and Materials
AVS	Audio Visual System
AWG	Average Wire Gauge
A&E	Architect & Engineer
BC	Bare Copper or Bonding Conductor
BCC	Pinellas County Florida Board of County Commissioners
BICSI	Building Industry Consultant Services International
BTS	Pinellas County Business Technology Services
CCTV	Closed Circuit Television
CATV	Community antenna television
cd	Candle (Unit – measurement of light)
CEA	Consumer Electronics Association
CLG	Ceiling
COAX	Coaxial Cable
CO	Certificate of Occupancy
COOPM	Customer Owned Outside Plant Manual
CPU	Central Processing Unit
CTS	Certified Technology Specialist
DA	Data Center
dBmV	Decibels/measurements
DC	Direct Current
DEG	Degree
DBPR	Department of Business and Professional Regulation
DOCSIS	Data Over Cable Service Interface Specification
DSP	Digital Signal Processors
DX	Direct Expansion
EIA	Electronic Industry Alliance
EMC	Electromagnetic compatibility

EMI	Electromagnetic Interference
EMT	Electrical Metallic Tubing
EOR	Engineer of Record
ER	Equipment Room
FCC	Federal Communications Commission
FODC	Fiber Optics Distribution Center
FOCIS	Fiber Optic Connector Intermateability Standard
FT./ft.	Feet
FTP	Foiled Twisted Pair
GND	Ground
HDPE	High Density Polyethylene
HTAP	Crimp or Compression type connectors
IDC	Insulation Displacement Connector
IDF	Intermediate Distribution Frame (Telecom Room)
IEEE	Institute of Electrical and Electronics Engineers
IMC	Intermediate Metallic Conduit
IP	Internet Protocol
ISP	Internet
JB	Junction Box
Kg	Kilogram
KVA	Kilo-Volt-Amps
kW	Kilowatts
LBS	Pounds
LED	Light Emitting Diode
LFV	Least Favorable Viewer
LM	Linear Meter
MATV	Master Antenna Television
MAX	Maximum
MCBN	Mesh Common Bonding Network
MDF	Main Distribution Frame (Main Telecom Room)
MEP	Mechanical, Electrical, and Plumbing
MIC	Microphone
MIN	Minimum
MM/mm	Millimeter
MTD	Mounted
MTG	Mounting
MTR	
NRTL	Nationally Recognized Testing Laboratory
NEC	National Electrical Code
NECA	National Electrical Contractors Association
NEMA	National Electrical Manufacturers Association
NFPA	National Fire Protection Association

NOC	Network Operations Center
NIC	Not in Contract
NRTL	Nationally Recognized Testing Laboratory
NVP	Nominal Velocity of Propagation
OFE	Owner furnished equipment
OFSTP	Optical Fiber System Test Procedure
OHM	Unit of Electrical Resistance (Ω)
OSHA	Occupational Safety and Health Administration
OTDR	Optical Time Domain Reflectometer
PB	Pull box
PC	Personal Computer
PCSO	Pinellas County Sherriff's Office
PDU	Power Distribution Units
PCF/pcf	Per Cubic Foot
PIE	St. Petersburg - Clearwater International Airport
POP	Point of Presence
PS-SCS	Pathways and Spaces for Structured Cabling System
PWR	Power
PVC	Polyvinyl chloride
PVDF	Polyvinylidene fluoride
RCDD	Registered Communications Distribution Designer
RF	Radio Frequency
RFI	Radio Frequency Interference
RMC	Rigid Metal Conduit
RU	Rack Units
SCS	Structured Cabling System
ScTP	Screened Twisted Pair
SOW	Scope of Work
Sq. Ft.	Square Feet/Foot
TEF	Telecommunications Entrance Facility
TAPS	Compression Tap Connector
TBB	Telecommunications Bonding Backbone
TCO	Temporary Certificate of Occupancy
TDMM	Telecommunications Distribution Method Manual
TGB	Telecommunications Grounding Busbar
TIA	Telecommunications Industry Association
TMGB	Telecommunications Main Grounding Busbar
TR	Telecommunications Room
TRR	Test Result Report
TSER	Telecommunication Services Entrance Room
TSP	Telephone
TTB	Telephone Terminal Board

TVSP	Television
UL	Underwriter Laboratories
UPC	Ultra-Physical Contact Connector
UPS	Uninterrupted Power Supply
UTP	Uniform Twisted Pair
UV	Ultraviolet
V	Volt
VAC	Volts Alternating Current
VAV	Variable Air Volume
VCT	Vinyl Composition Tile
W	Watts
WAP	Wireless Access Points
WP	Weatherproof

APPENDIX B: Substitution Request Form

SUBSTITUTION REQUEST FORM

Substitution Request Number: _____

PROJECT: _____ DATE: _____

SPECIFICATION SECTION: _____ ITEM(S): _____

SPECIFIED MANUFACTURER:_____

SPECIFIED MODEL NO: _____

PROPOSED MANUFACTURER: _____

PROPOSED MODEL NO: _____

REASON(S) FOR NOT PROVIDING SPECIFIED ITEM: _____

Attach product description, drawings, photographs, performance and test data, samples, and other information necessary for side-by-side evaluation. Fill in all blanks.

Provide substantiated reason for requested substitution. _____

_____

Does the requested substitution affect dimensions, locations, or configurations?

No:____ Yes:____

Explain (attach drawings if necessary): _____

_____

What are the differences between the specified item and the requested item?

_____

_____

Will the Contractor pay for any changes to the building design, including engineering and detailing costs caused by the approval?

No:____ Yes:____

Explain (if No, and describe modifications required to install or accommodate the requested change):

_____

_____

_____

Will approval affect the work of other trades, including the Construction schedule?

No:____ Yes:____

Explain (if Yes):_____

_____

_____

Manufacturer's guarantees of the proposed and specified items are:

Same:____ Different:____

Explain (if Different):_____

_____

_____

Does the proposed item meet all applicable codes, ordinances, and regulations for this specific application?

No:____ Yes:____

Explain (if No):_____

_____

_____

Has proposed item been used locally in similar applications?

No:____ Yes:____

Explain (give nearest location):_____

_____

_____

Will maintenance and service parts be locally available for the requested item?

No:____ Yes:____

Explain (if No, give nearest location):_____

_____

_____

Will the requested item require waiving of any qualifications or other requirements?

No:____ Yes:____

Explain (if Yes):_____

_____

_____

Are there any license fees or royalties associated with the requested substitution?

No:____ Yes:____

Explain (if Yes):_____

_____

_____

If approved, will the Owner receive a credit for the proposed alternate material?

No:____ Yes:____

Explain (if No):_____

_____

Does the proposed alternate material meet the same applicable standards (ASTM, ANSI, UL, FS) as the specified item?

No:____ Yes:____

Explain (if No, attach drawings if necessary):_____

_____

_____

Identify the recycled materials or components or features that lead to the claims to being "Green":

_____

_____

_____

Has the required line-by-line comparison been included?

No:____ Yes:____

Explain (if No):_____

_____

_____

The undersigned agrees to pay for the Designer's review time and for changes to the building design, including review, re-design, engineering, drawings, and other costs caused by the requested substitution.

Signature: _____

Print Name: _____

Return form to Department of Admin Services (DAS) Project Manager.

APPENDIX C Network Configuration IP Request Form

Fill in this form and return to Department of Admin Services (DAS) Project Manager.

PROJECT NAME	
DATE	
SUBCONTRACTOR	
TRADE	
HVAC / VRF / LIGHTING	
DEVICE CHARACTERISTICS	DEVICE INFORMATION
Device name	
Device description	
Device location (campus, building, floor, room) if known	
Manufacturer	
Part number	
Firmware version	
Is a fixed address required? Or can device work with a dynamic address (DHCP)?	
Does device require an address from a DNS server?	
Does device support Layer 3 traffic (IP)?	
Does device need access to the internet?	
Does device need remote access from outside network?	
Number of physical network ports per device?	
Does device require IPv6 to work or IPv4?	
Does device support SNMP?	
Does device need specific TCP ports open? Please list.	
Is this device connecting to existing network devices? (yes/no) If yes, list server/client application(s).	
If yes to above, please describe to what device, located where.	

APPENDIX D: TG106 Premises Cable Conduit Fill Quick Reference

TECHNICAL GUIDELINE

July 23, 2020
TG106 Rev.1

SUPERIOR ESSEX

Premises Cable Conduit Fill Quick Reference

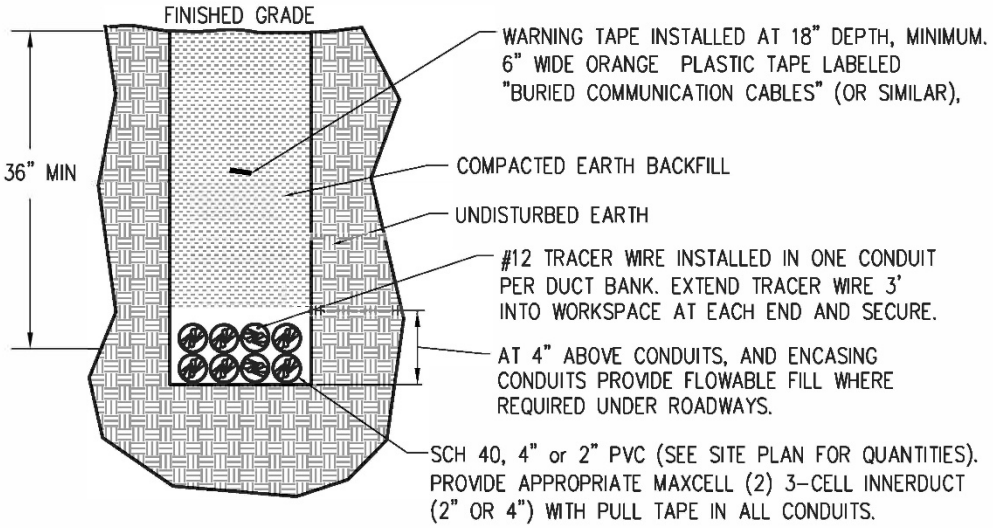
This information is intended as a guideline. Because conduit sizes may vary by manufacturer, please verify all dimensions prior to using this reference chart. This guideline is based on National Electrical Code (USA) recommendations for conduit fill of runs with no more than two 90° bends. For assistance in calculating conduit fill, refer to the "Resources" area of our site for the Technical Guideline, "How to Calculate Conduit Fill." Use only approved lubricants.

Conduit Trade Size Designator* English (Metric)	½ (16)	¾ (21)	1 (27)	1¼ (35)	1½ (41)	2 (53)	2½ (63)	3 (78)	3½ (91)	4 (103)	5 (129)
Conduit Internal Diameter in (mm)	0.62 (15.7)	0.82 (20.9)	1.05 (26.6)	1.38 (35.1)	1.61 (40.9)	2.07 (52.5)	2.47 (62.7)	3.07 (77.9)	3.55 (90.1)	4.03 (102.3)	5.05 (128.2)
Conduit Cross-Sectional Area in² (mm²)	0.30 (195)	0.53 (345)	0.87 (559)	1.51 (973)	2.05 (1,322)	3.39 (2,177)	4.82 (3,106)	7.45 (4,794)	9.96 (6,413)	12.83 (8,268)	20.15 (12,984)
Cable Nominal Diameter in (mm)	Number of Cables at Maximum Recommended Conduit Fill (1 Cable @ 53% Maximum, 2 Cables @ 31% Maximum, 3 or More Cables @ 40% Maximum)										
0.10 (2.5)	15	26	44	76	103	171	262	376	504	649	1020
0.13 (3.3)	9	15	26	45	61	101	155	223	298	384	603
0.15 (3.8)	6	11	19	33	46	76	116	167	224	288	453
0.18 (4.6)	4	8	13	23	32	52	80	116	155	200	314
0.20 (5.1)	3	6	11	19	25	42	65	94	126	162	255
0.21 (5.3)	3	6	10	17	23	38	59	85	114	147	231
0.22 (5.6)	3	5	9	15	21	35	54	77	104	134	210
0.23 (5.8)	2	5	8	14	19	32	49	71	95	122	192
0.24 (6.1)	2	4	7	13	18	29	45	65	87	112	177
0.25 (6.4)	1	4	7	12	16	27	41	60	80	103	163
0.26 (6.6)	1	3	6	11	15	25	38	55	74	96	150
0.27 (6.9)	1	3	6	10	14	23	35	51	69	89	139
0.28 (7.1)	1	3	5	9	13	21	33	48	64	82	130
0.29 (7.4)	1	3	5	9	12	20	31	44	59	77	121
0.30 (7.6)	1	2	4	8	11	19	29	41	56	72	113
0.31 (7.9)	1	2	4	7	10	17	27	39	52	67	106
0.32 (8.1)	1	2	4	7	10	16	25	36	49	63	99
0.33 (8.4)	1	1	4	6	9	15	24	34	46	59	93
0.34 (8.6)	1	1	3	6	8	14	22	32	43	56	88
0.35 (8.9)	1	1	3	6	8	13	21	30	41	53	83
0.40 (10.2)	1	1	2	4	6	10	16	23	31	40	63
0.45 (11.4)	1	1	1	3	5	8	12	18	24	32	50
0.50 (12.7)	0	1	1	3	4	6	10	15	20	25	40
0.55 (14.0)	0	1	1	1	3	5	8	12	16	21	33
0.60 (15.2)	0	0	1	1	2	4	7	10	14	18	28
0.65 (16.5)	0	0	1	1	1	4	6	8	11	15	24
0.70 (17.8)	0	0	1	1	1	3	5	7	10	13	20
0.75 (19.1)	0	0	1	1	1	3	4	6	8	11	18
0.80 (20.3)	0	0	0	1	1	2	4	5	7	10	15
0.85 (21.6)	0	0	0	1	1	1	3	5	6	8	14
0.90 (22.9)	0	0	0	1	1	1	3	4	6	8	12
0.95 (24.1)	0	0	0	1	1	1	2	4	5	7	11
1.00 (25.4)	0	0	0	1	1	1	2	3	5	6	10

*Identifier only; not an actual dimension

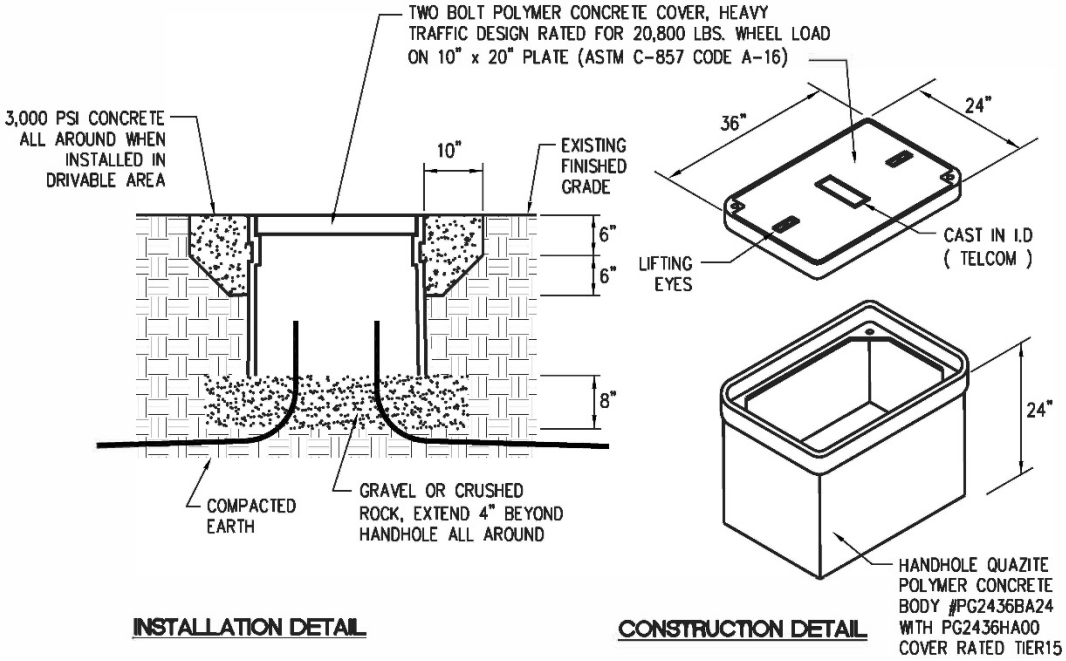
APPENDIX E: All Drawings

Duct bank Trenching/Boring



01 DUCT BANK TRENCHING / BORING DETAIL
NO SCALE

Technology Handhole (HH)

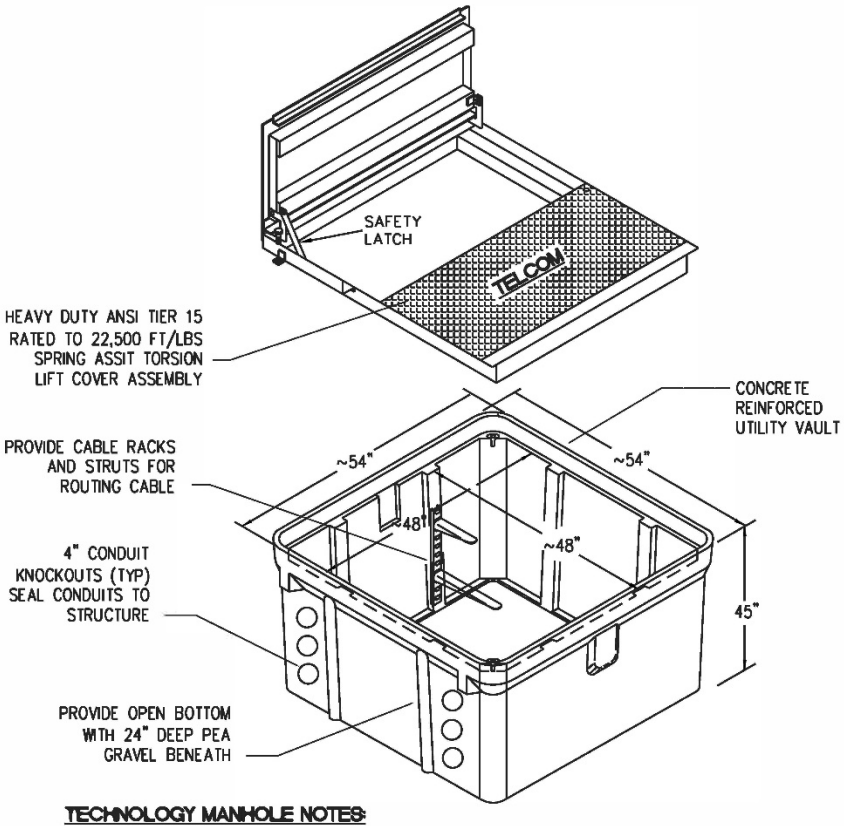


TECHNOLOGY HANDHOLE NOTES:

1. HANDHOLE WITH COVER (LOGO=TELCOM) SHALL BE QUAZITE OR EQUAL. INSTALL IN ACCORDANCE WITH THE MANUFACTURER'S PRINTED INSTRUCTIONS AND THESE REQUIREMENTS.
2. TERMINATE CONDUITS ENTERING HANDHOLE WITH END BELL (CARLON E997). CONSTRUCT CONDUIT RISE TO ENTER BOX FROM SIDE WITH 22-1/2" SWEEP ELBOWS.

02 TECHNOLOGY HANDHOLE (HH) DETAIL

NO SCALE

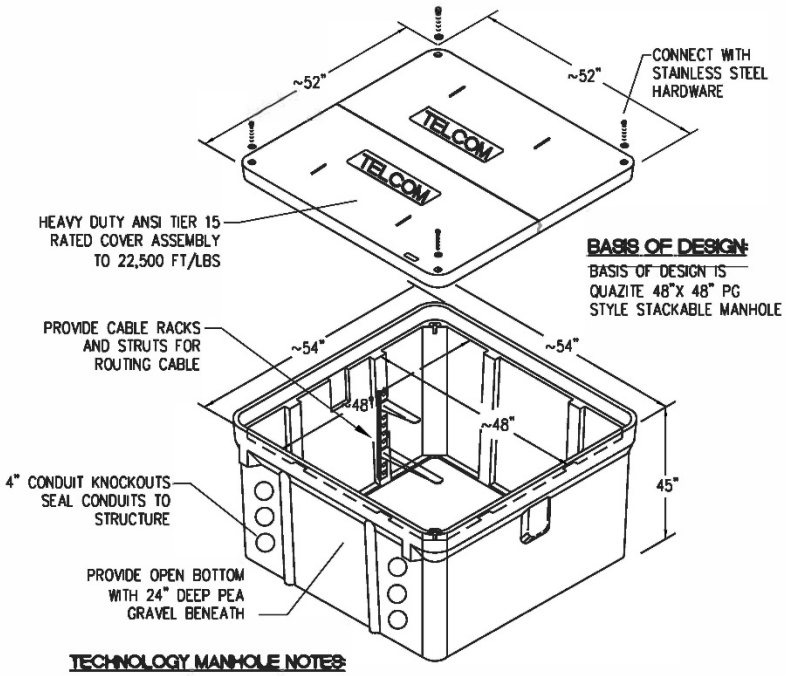


TECHNOLOGY MANHOLE NOTES:

1. INSTALL IN ACCORDANCE WITH THE MANUFACTURER'S PRINTED INSTRUCTIONS AND THESE REQUIREMENTS.
2. TERMINATE CONDUITS ENTERING MANHOLE WITH END BELL. CONSTRUCT CONDUIT RISE TO ENTER BOX FROM SIDE WITH 22-1/2" SWEEP ELBOWS.
3. PROTECT ALL CABLES INSIDE MANHOLE WITH TEFLON (OR WEATHER RESISTANT NYLON) SPIRAL WRAPPING, DIAMETER AS REQUIRED. INSTALL SPIRAL WRAPPING BUTTED (NO GAPS). EXTEND INTO CONDUIT 1" BOTH ENDS.
4. ALL CABLES SHALL BE PROPERTY ROUTED AND SECURED AGAINST THE SIDES OF ALL COMMUNICATIONS MANHOLES USING PROPER SUPPORTS AS REQUIRED.
5. PENETRATE CONDUITS NEAR THE CORNERS OF THE MANHOLE, NOT AT THE CENTER.

03 TECHNOLOGY MANHOLE (MH)-METAL LID, SPRING LOADED

NO SCALE



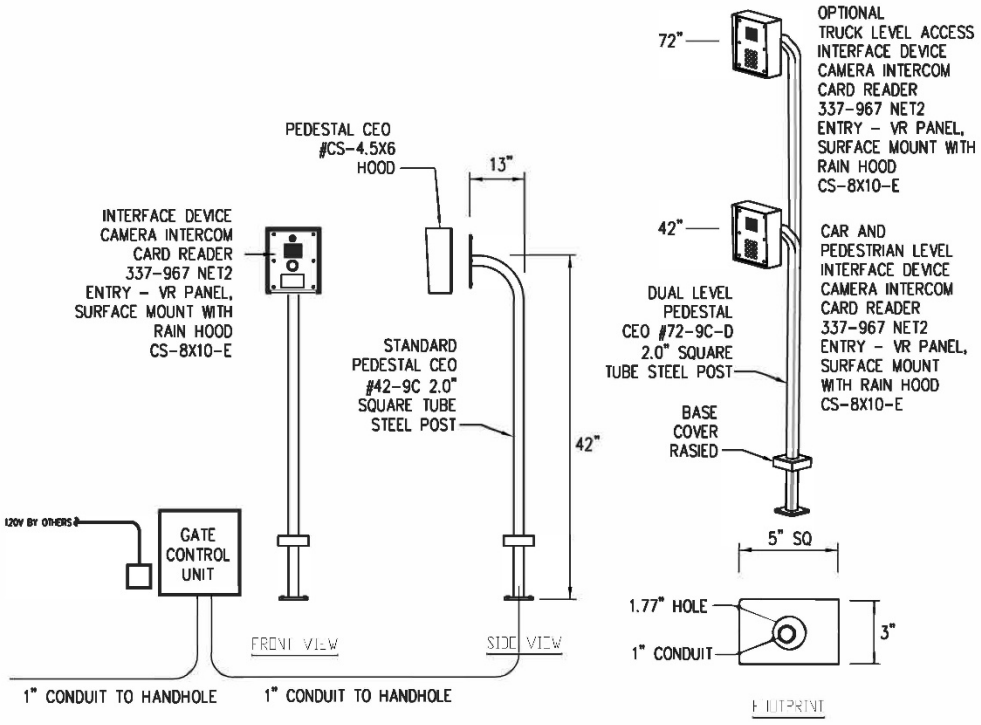
TECHNOLOGY MANHOLE NOTES:

1. INSTALL IN ACCORDANCE WITH THE MANUFACTURER'S PRINTED INSTRUCTIONS AND THESE REQUIREMENTS.
2. TERMINATE CONDUITS ENTERING MANHOLE WITH END BELL. CONSTRUCT CONDUIT RISE TO ENTER BOX FROM SIDE WITH 22-1/2" SWEEP ELBOWS.
3. PROTECT ALL CABLES INSIDE MANHOLE WITH TEFLON (OR WEATHER RESISTANT NYLON) SPIRAL WRAPPING, DIAMETER AS REQUIRED. INSTALL SPIRAL WRAPPING BUTTED (NO GAPS). EXTEND INTO CONDUIT 1" BOTH ENDS.
4. ALL CABLES SHALL BE PROPERTY ROUTED AND SECURED AGAINST THE SIDES OF ALL COMMUNICATIONS MANHOLES USING PROPER SUPPORTS AS REQUIRED.
5. PENETRATE CONDUITS NEAR THE CORNERS OF THE MANHOLE, NOT AT THE CENTER.

04 TECHNOLOGY MANHOLE (MH)-STANDARD

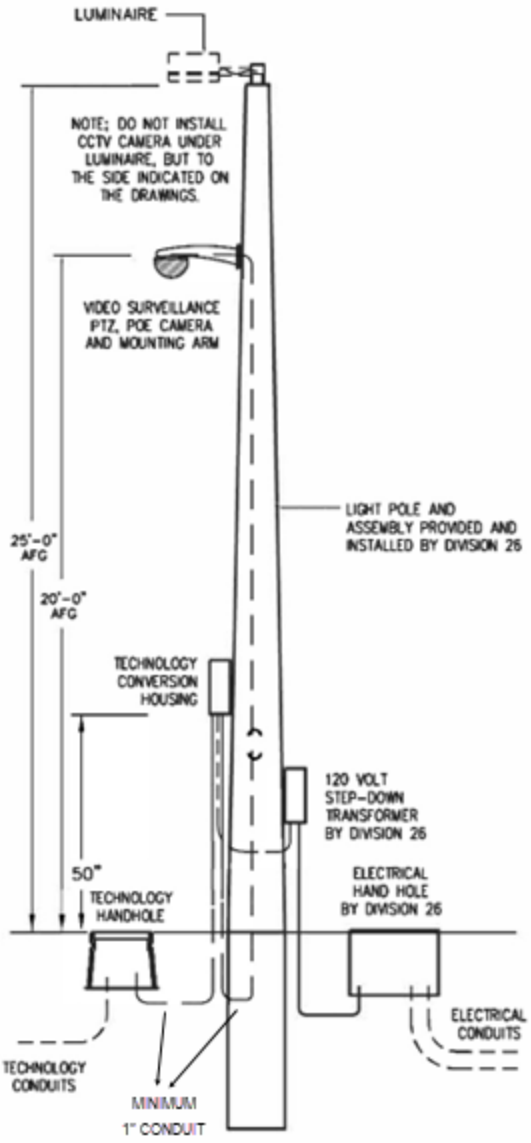
NO SCALE

Entry Gate Pedestal

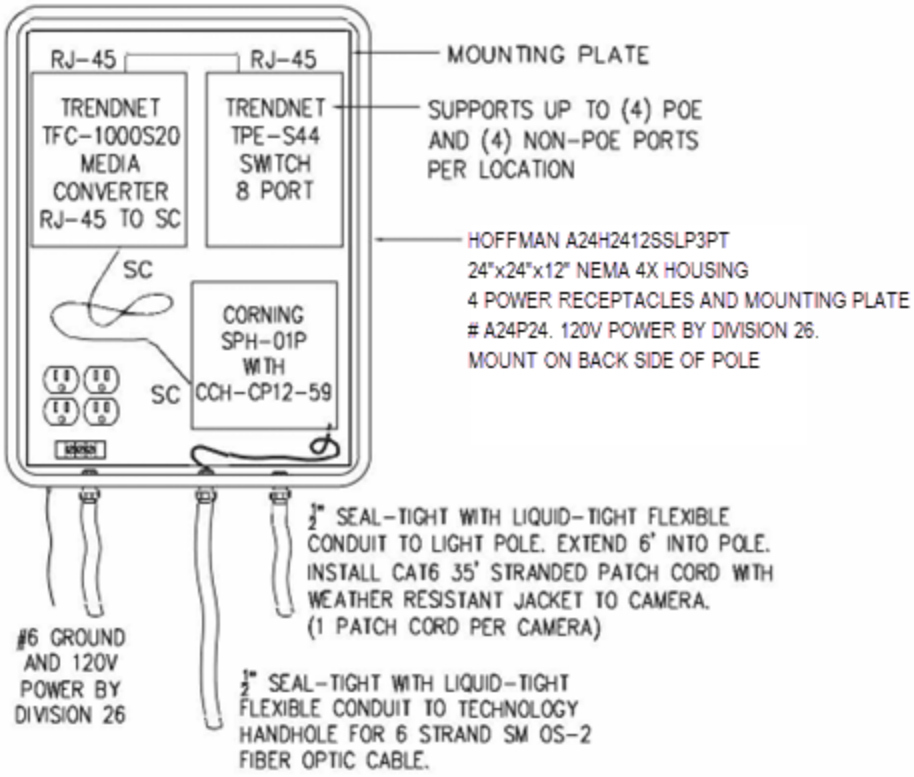


05 ENTRY GATE PEDESTAL DETAIL
NO SCALE

CCTV Light Pole Mounting

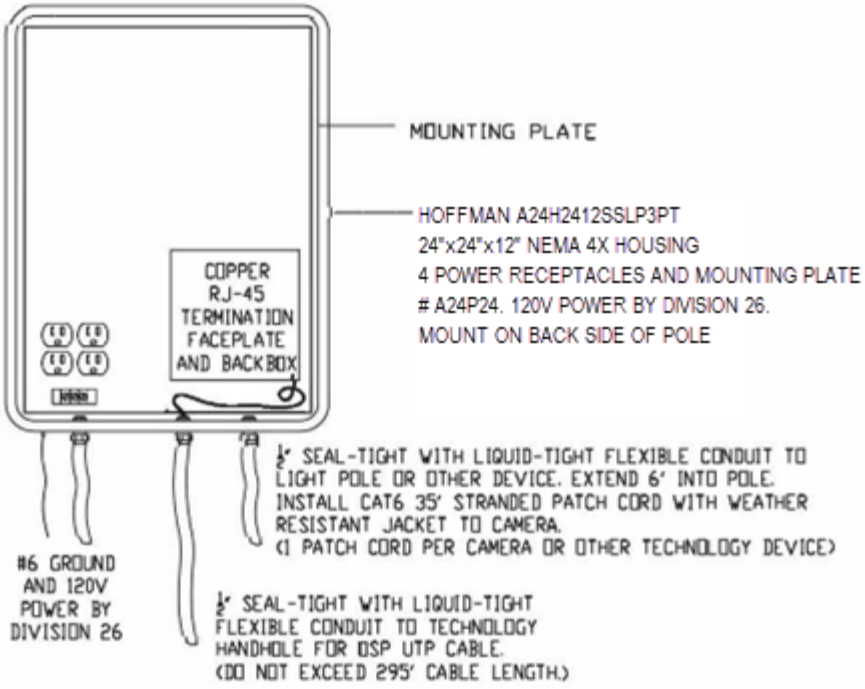


06 CCTV LIGHT POLE MOUNTING DETAIL
NO SCALE



07 TECHNOLOGY CONVERSION HOUSING-FIBER WITH MEDIA CONVERTER INSTALLATION

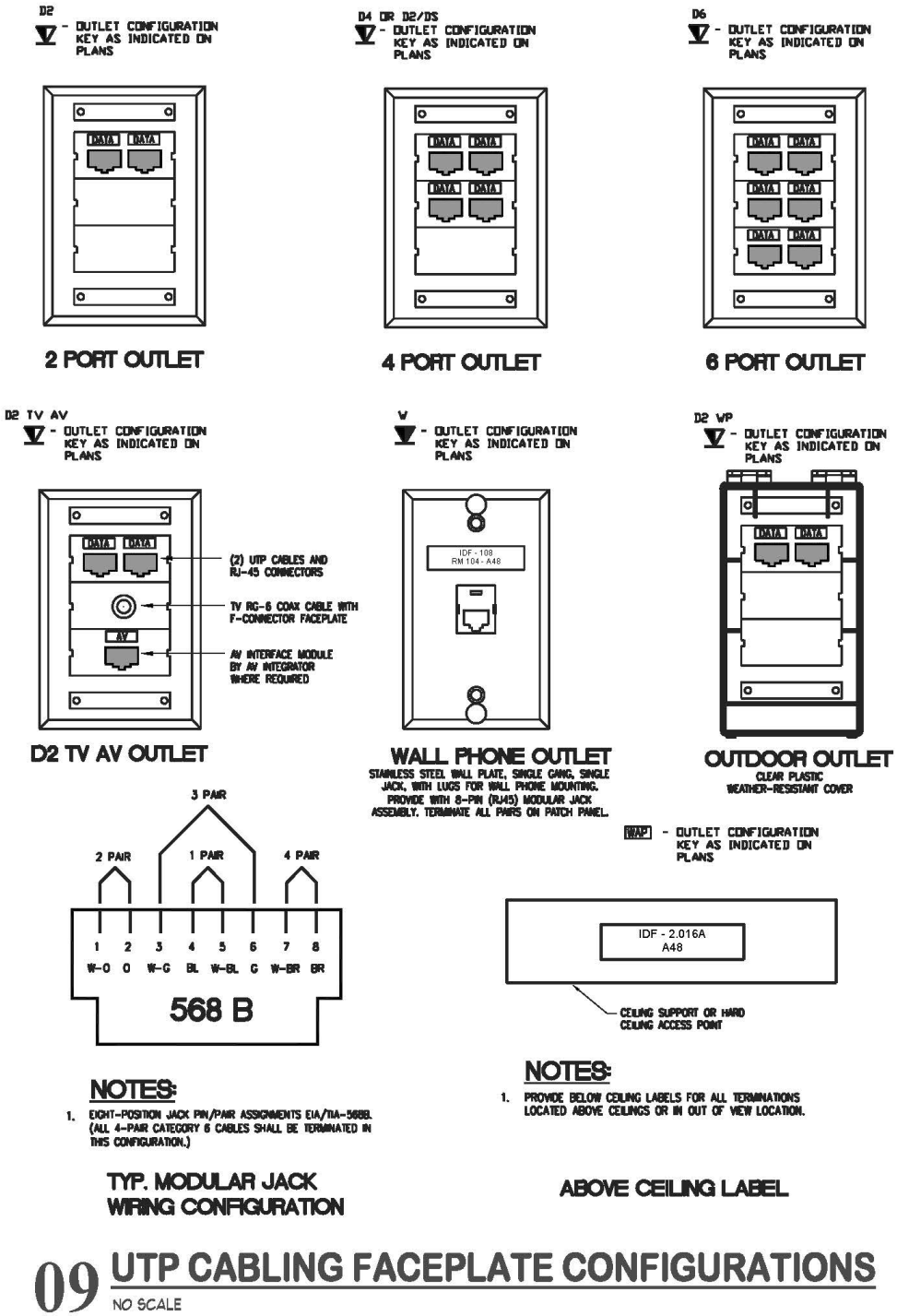
NO SCALE



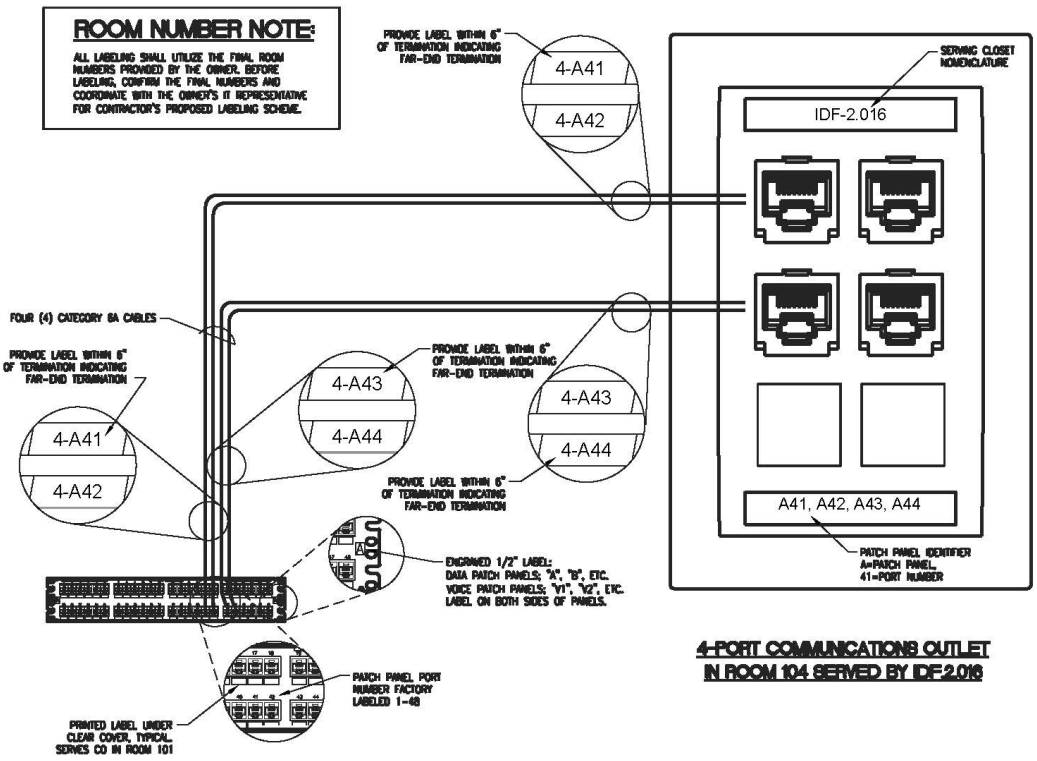
08 TECHNOLOGY CONVERSION HOUSING - COPPER INSTALLATION

NO SCALE

UTP Cabling Faceplate Configurations



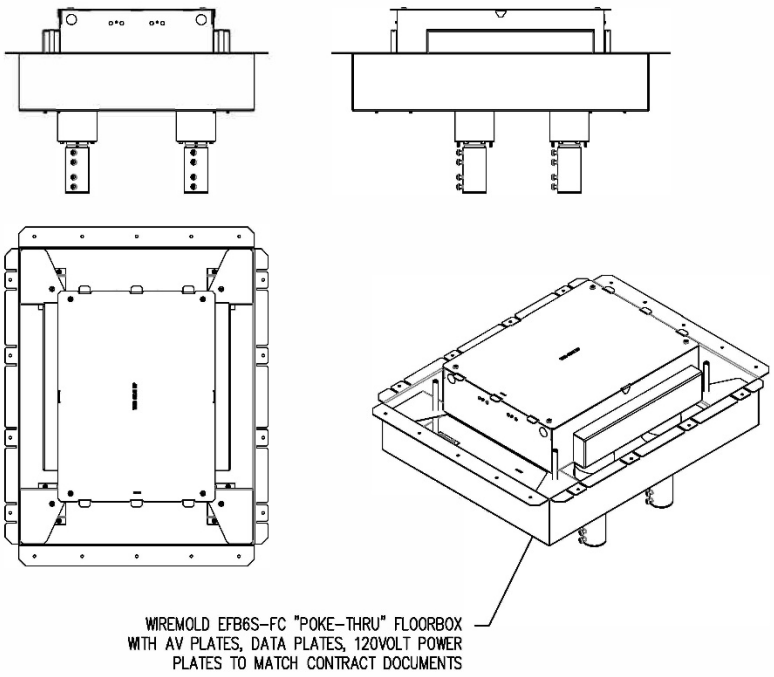
UTP Labeling from Closet to Communications Outlet

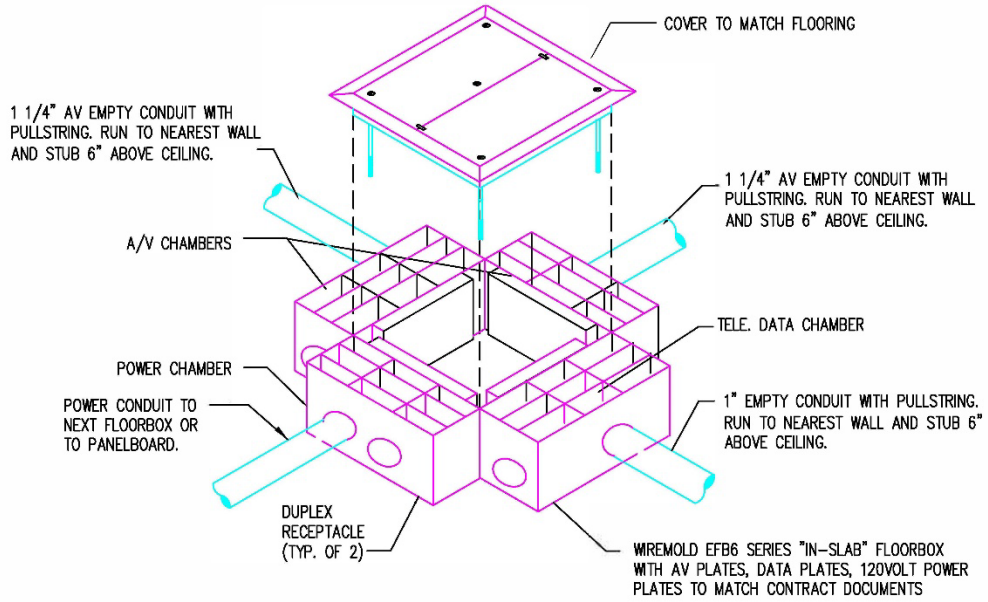


10 UTP LABLING FROM CLOSET TO COMMUNICATIONS OUTLET

NO SCALE

Power / Comm / AV Floor Box

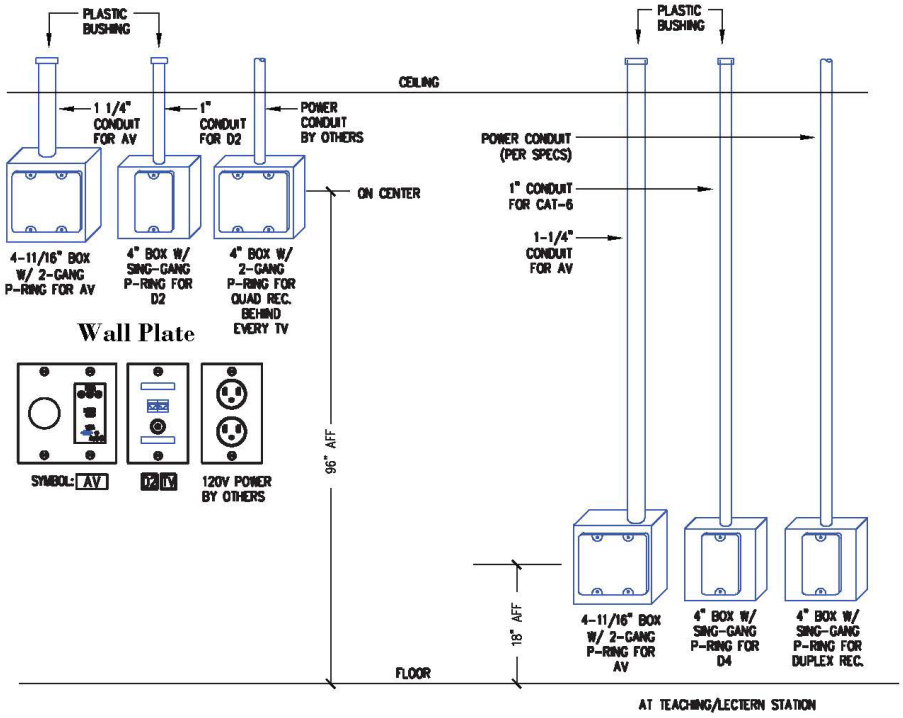




11 POWER / COMM / AV FLOOR BOX

NO SCALE

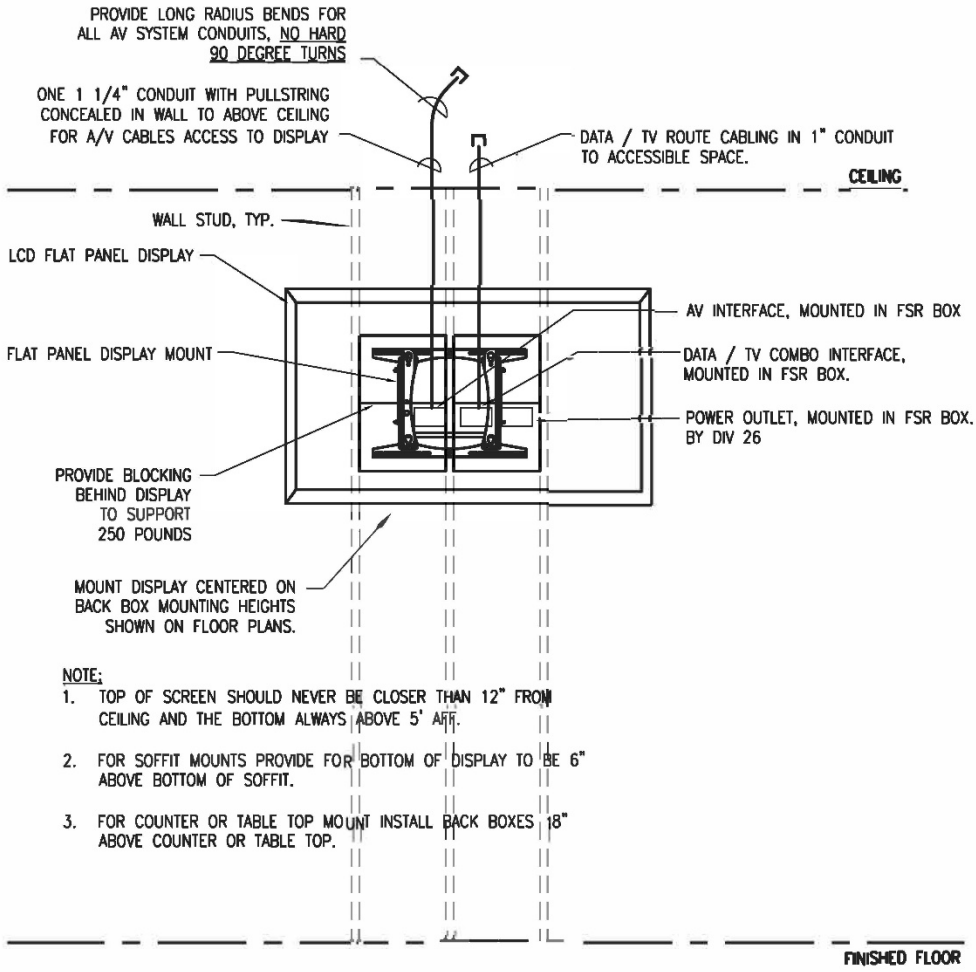
AV Wall Data, AV, Power Rough-in Plan



12 AV WALL DATA, AV, POWER ROUGH-IN PLAN

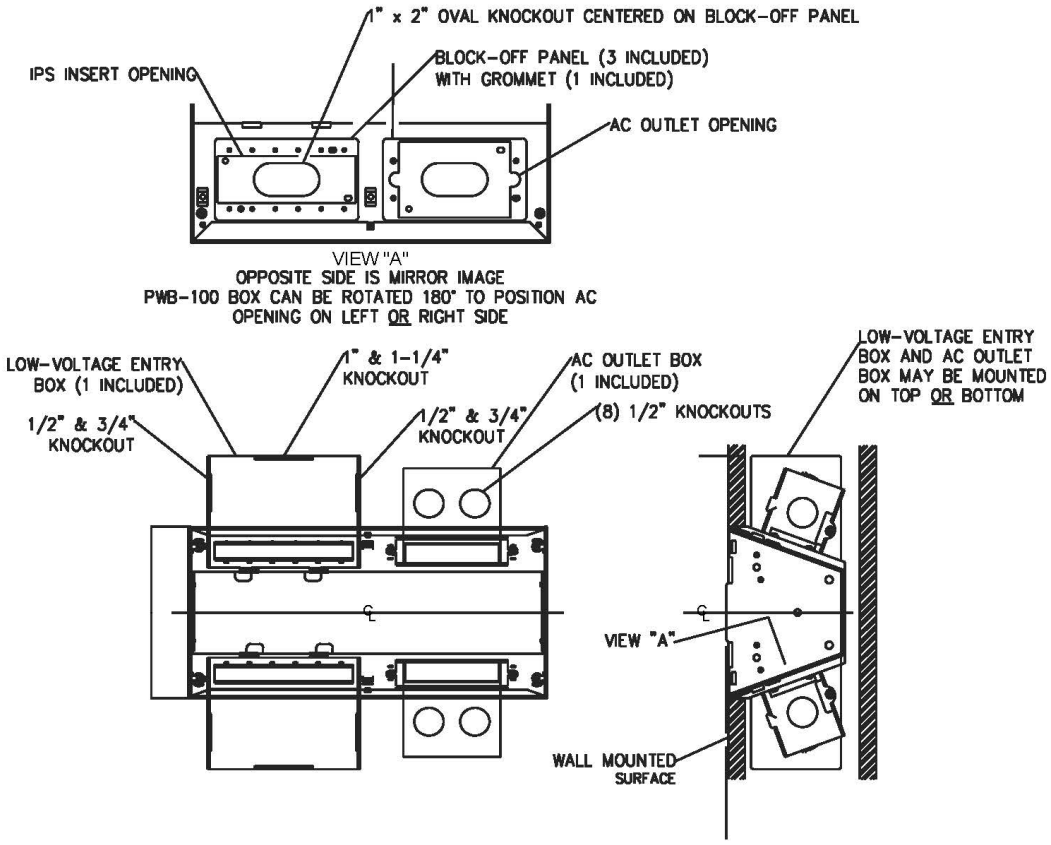
NO SCALE

TV/AV Display Standard Wall Mount



13 TV / AV DISPLAY STANDARD WALL MOUNT
NO SCALE

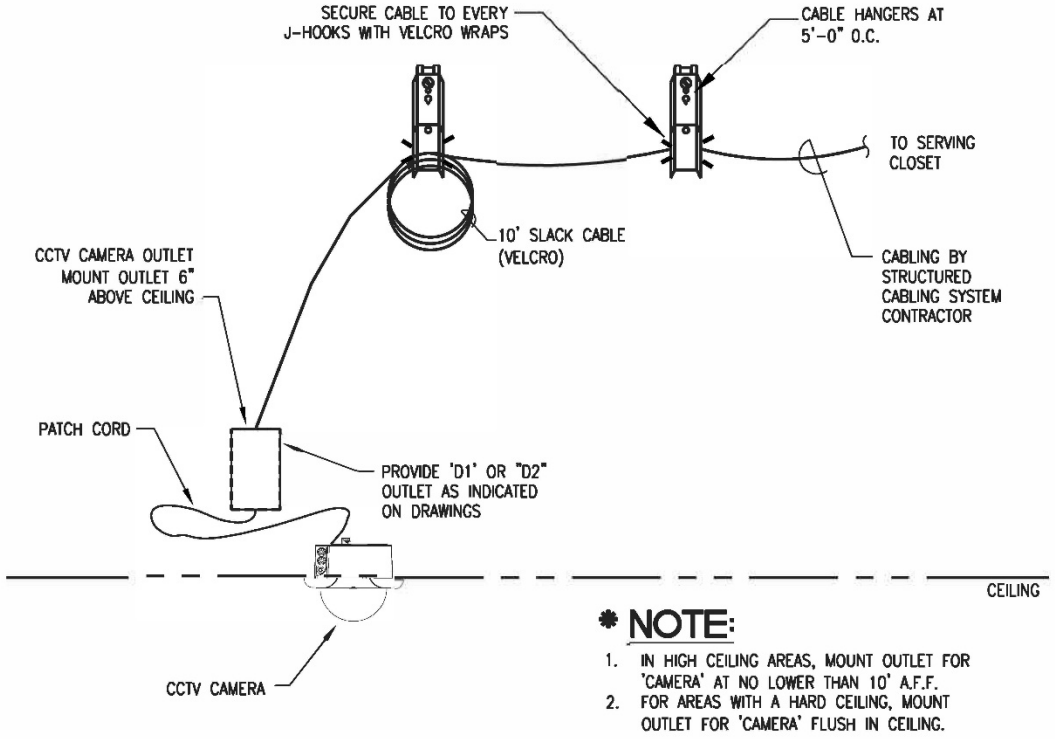
Recessed FSR PWB-100 Wall Box



14 RECESSED FSR PWB-100 WALL BOX DETAIL

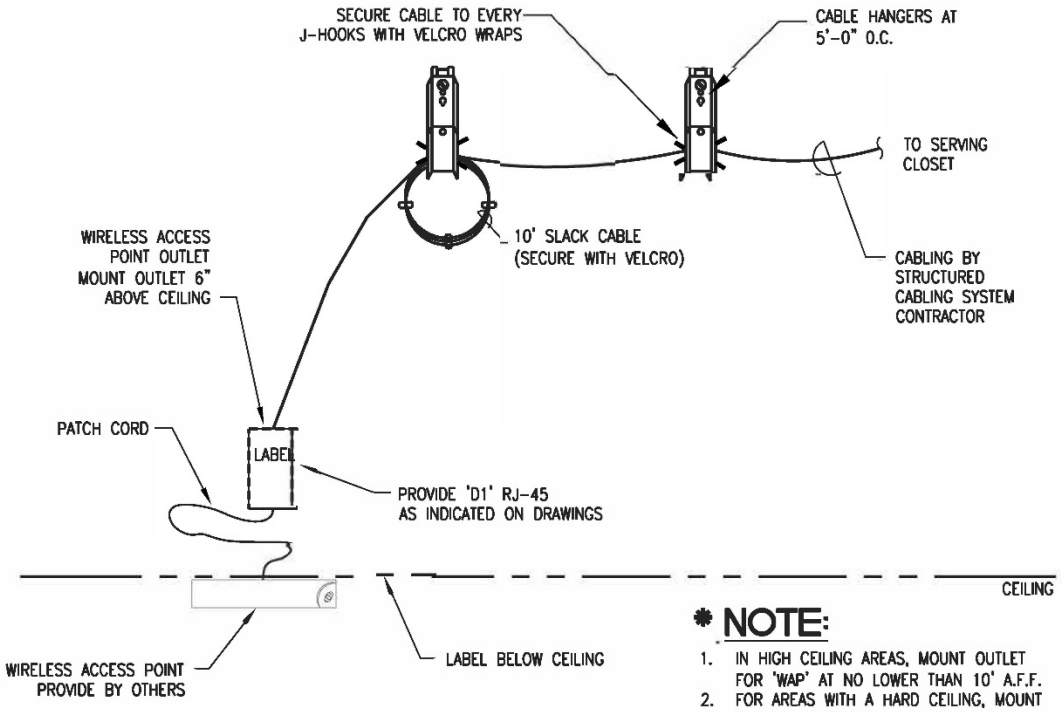
NO SCALE

Surveillance Camera Ceiling Mount



15 SURVEILLANCE CAMERA CEILING MOUNT
NO SCALE

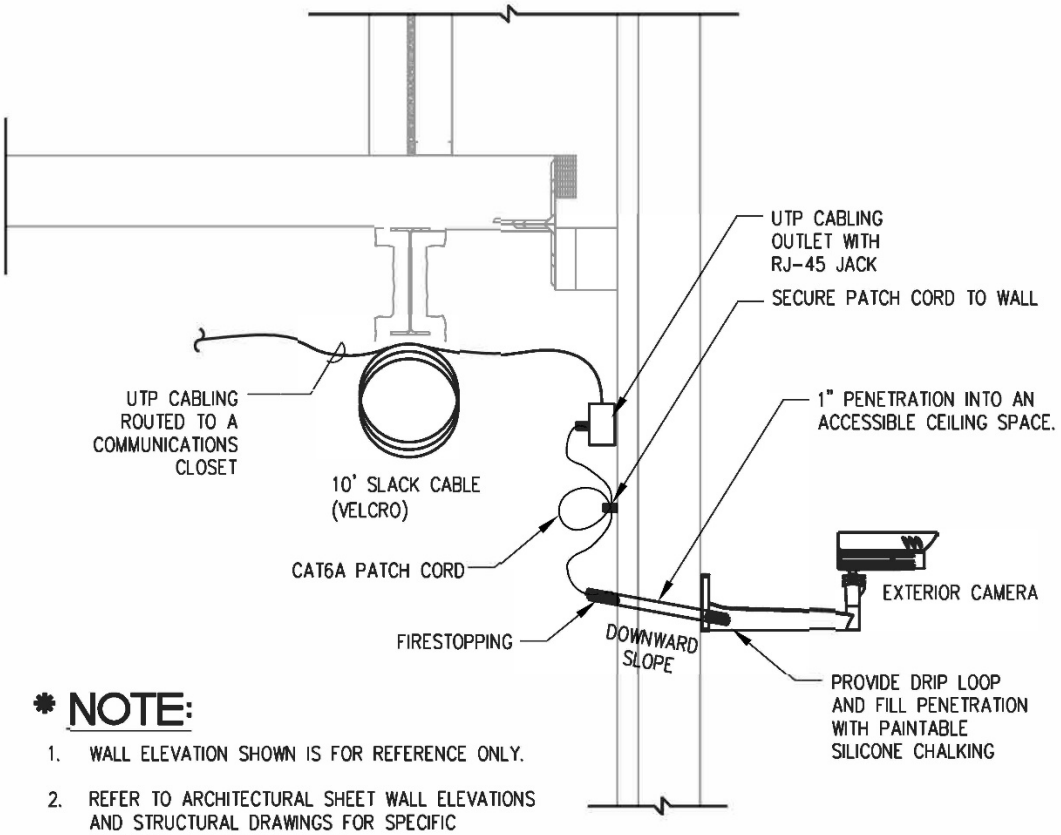
Wireless Access Point Ceiling Mount



16 WIRELESS ACCESS POINT CEILING MOUNT

NO SCALE

CCTV Camera on Outdoor/Exterior Wall



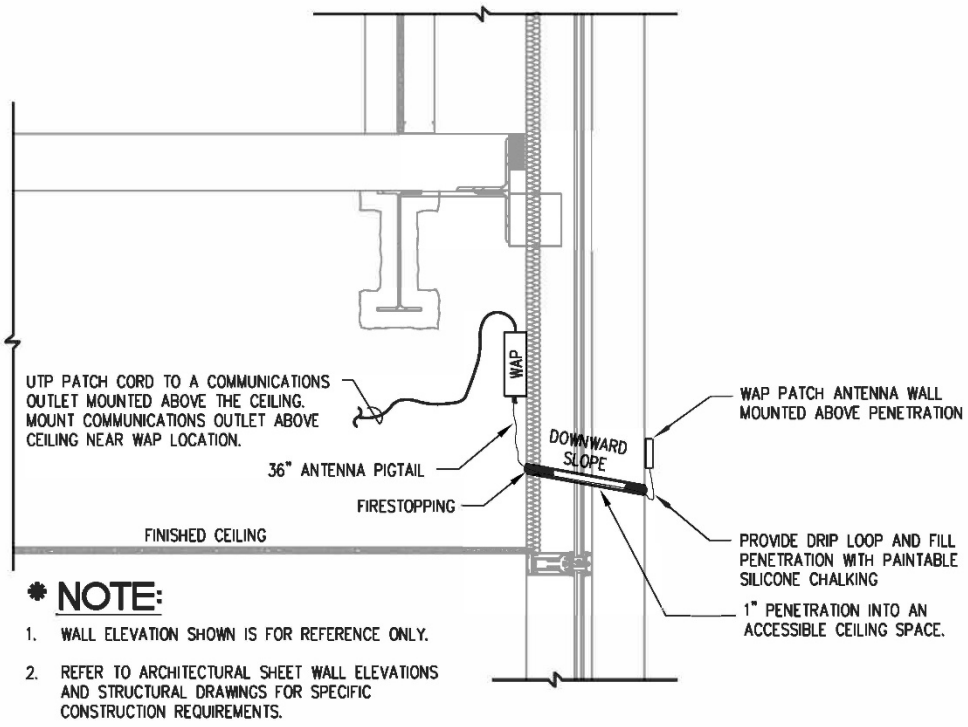
*** NOTE:**

1. WALL ELEVATION SHOWN IS FOR REFERENCE ONLY.
2. REFER TO ARCHITECTURAL SHEET WALL ELEVATIONS AND STRUCTURAL DRAWINGS FOR SPECIFIC CONSTRUCTION REQUIREMENTS.

17 CCTV CAMERA ON OUTDOOR / EXTERIOR WALL

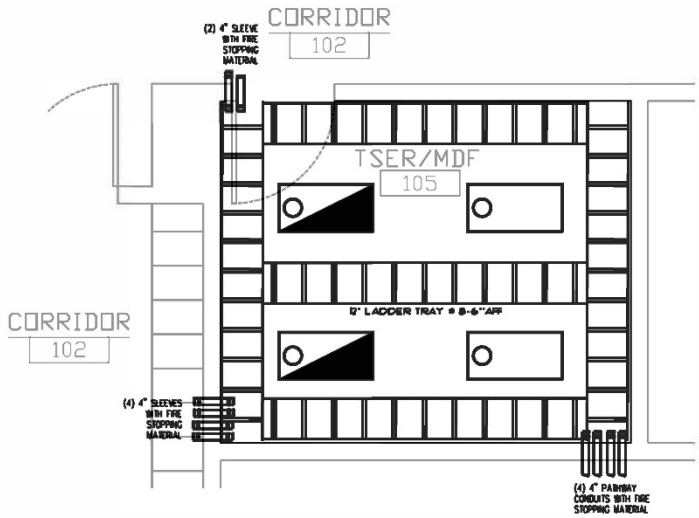
NO SCALE

WAP Antenna on Outdoor/Exterior Wall

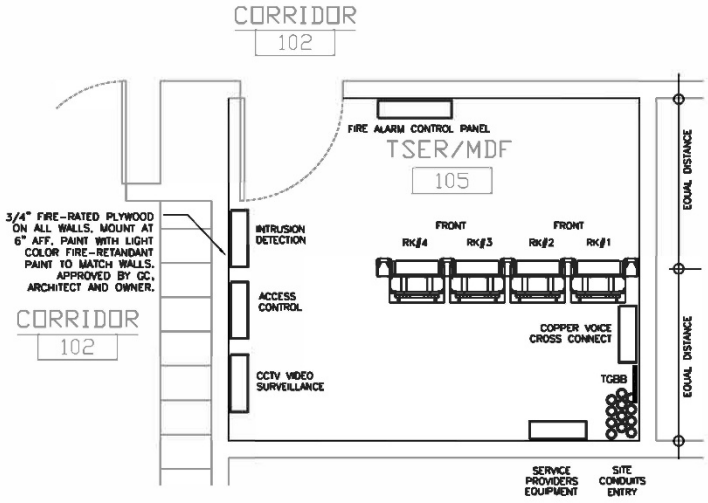


18 WAP ANTENNA ON OUTDOOR / EXTERIOR WALL
NO SCALE

TSER/MDF Layout

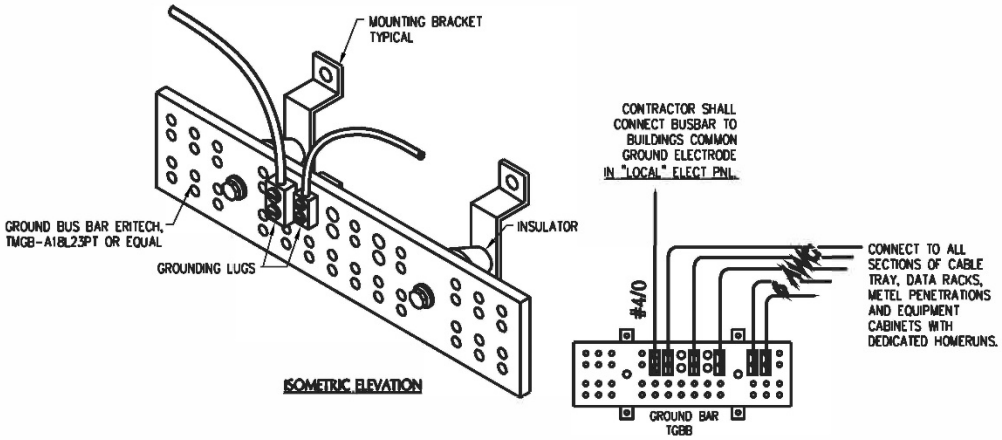


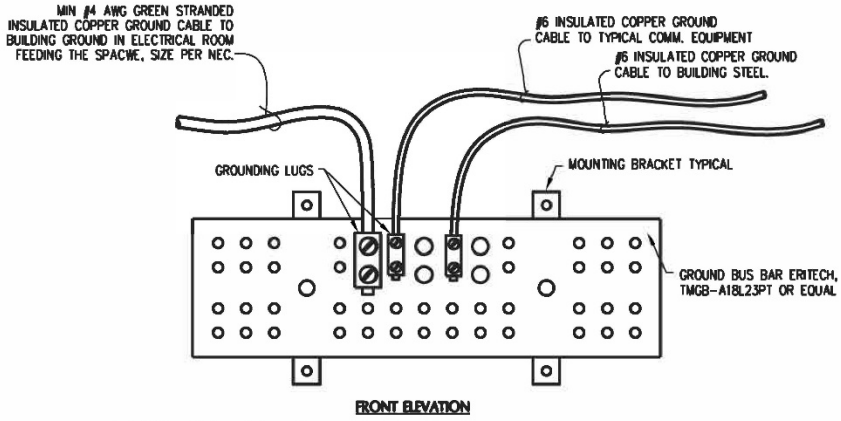
19B TSER/MDF OVERHEAD LAYOUT
NOT TO SCALE



19A TSER/MDF LAYOUT DETAILS
NOT TO SCALE NOTE: ROOM SIZE IS 12' X 10', 120 SQ FT

19 TSER / MDF LAYOUT
NO SCALE





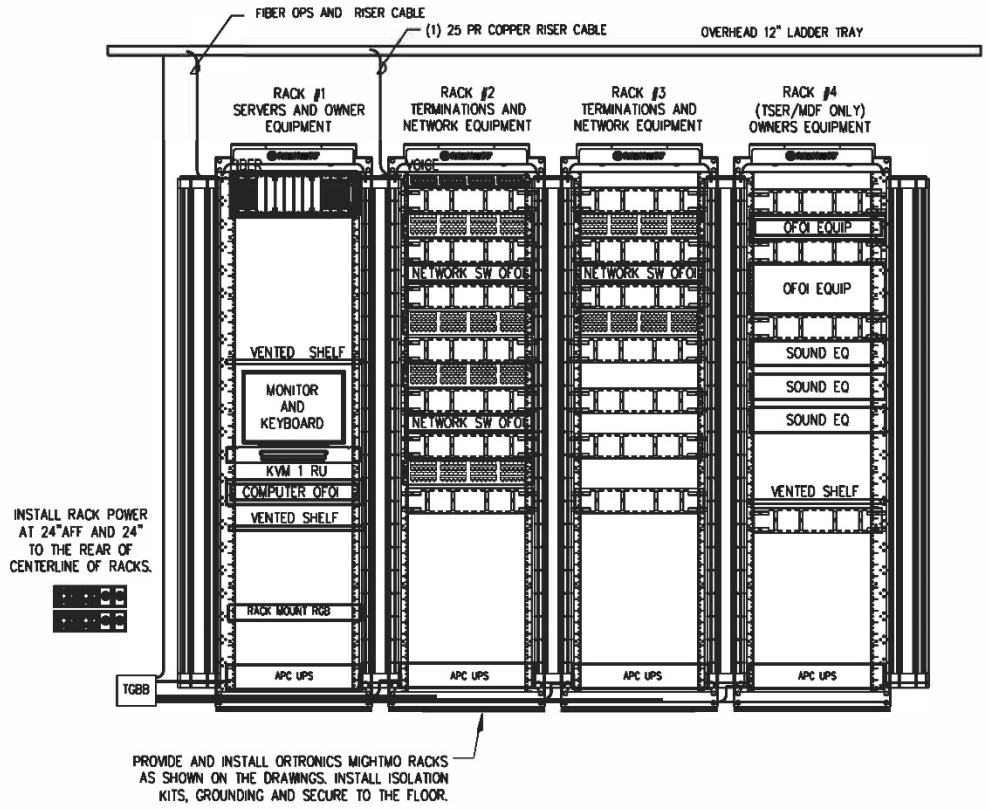
GROUNDING NOTES:

1. ALL GROUND CONNECTIONS SHALL BE MADE WITH HEAVY DUTY 2 HOLE COMPRESSION LUGS WITH STAINLESS STEEL HEX HEAD CAP SCREWS WITH SS LOCKING NUTS (TWO SCREWS AND NUTS PER 2 HOLE LUG).
2. PROVIDE GROUNDING BUSBARS IN ALL COMMUNICATION CLOSETS AND DATA CENTER. GROUND MAIN BUSBAR TO BUILDING MAIN ELECTRICAL SERVICE GROUND WITH INSULATED (GREEN) COPPER GROUNDING CONDUCTOR (SIZE PER NEC) AND #6 BETWEEN BUSBARS IN THAT PARTICULAR SPACE. RUN CONDUCTOR FROM BUSBAR LOCATION TO BUILDING SERVICE GROUND IN EMT CONDUIT. PROVIDE INSULATED GROUNDING BUSHING - MALLEABLE IRON, AT CONDUIT ENDS AND GROUND PER NEC. GROUNDING TO BUILDING STRUCTURE, CONDUITS OR UTILITY PIPING IN LIEU OF BONDING TO BUILDING MAIN ELECTRICAL SERVICE GROUND IS NOT ACCEPTABLE.
3. GROUND ALL COMMUNICATION RACK/CABINET WITH #6 AWG INSULATED (GREEN) COPPER GROUNDING CONDUCTOR TO MAIN GROUNDING BUSBAR. GROUND RACKS INDIVIDUALLY TO BUSBAR (DO NOT LOOP GROUNDS). ROUTE CONDUCTOR ALONG RACK REAR AND IN CABLE RUNWAY TO GROUNDING BUSBAR.
4. GROUND EACH CONDUIT AND CONDUIT SUPPORTS STRUTS IN ALL COMMUNICATIONS ROOMS WITH #6 AWG INSULATED (GREEN) COPPER GROUNDING CONDUCTOR TO GROUNDING BUSBAR. ROUTE CONDUCTOR IN CABLE RUNWAY TO GROUNDING BUSBAR. ALL CONDUITS SHALL HAVE A BARE EQUIPMENT GROUND WIRE, CONTINUOUS FROM ALL EQUIPMENT CONNECTIONS, AND BONDED AT ALL BOXES, RUN TO THE FEED PANEL, AND SUBSEQUENTLY TO THE BUILDING EQUIPMENT GROUND.
5. GROUND CABLE RUNWAY WITH #6 AWG INSULATED (GREEN) COPPER GROUNDING CONDUCTOR TO GROUNDING BUSBAR. ROUTE CONDUCTOR IN CABLE RUNWAY TO GROUNDING BUSBAR.

20 TGBB COMMUNICATIONS GROUNDING DETAIL

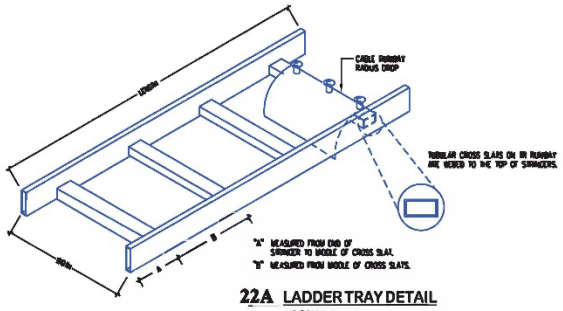
NO SCALE

Telecom 2-Post Rack Layout

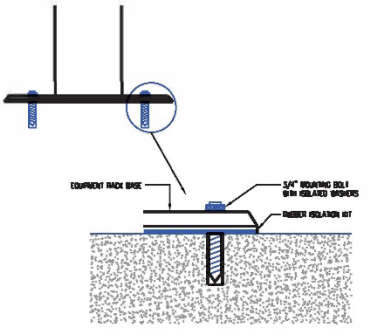


21 TELECOM 2-POST RACK LAYOUT
NO SCALE

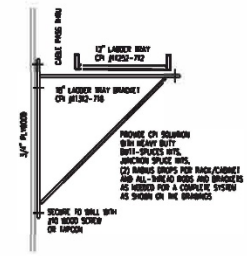
Rack Floor Mounting



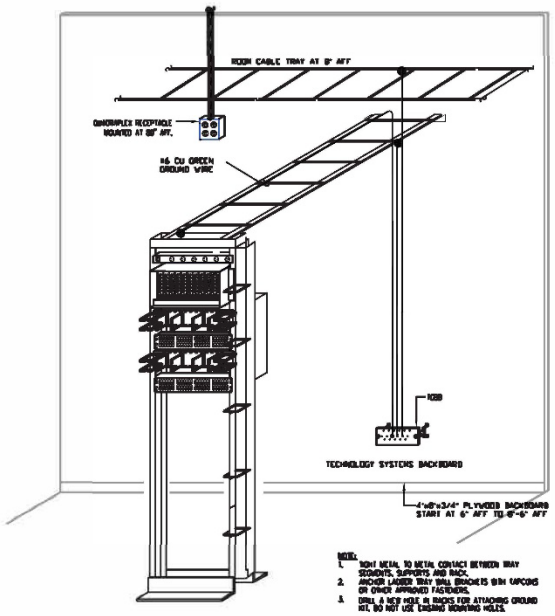
22A LADDER TRAY DETAIL
NO SCALE



22B RACK FLOOR MOUNTING DETAIL
NO SCALE



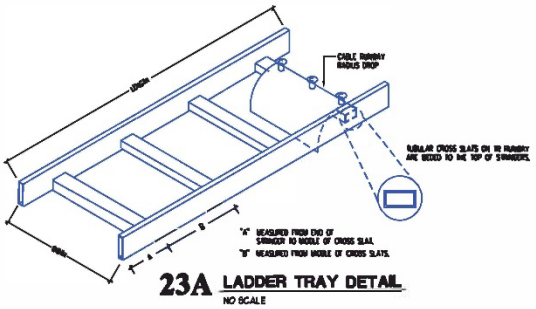
22C WALL BRACKET DETAIL
NO SCALE



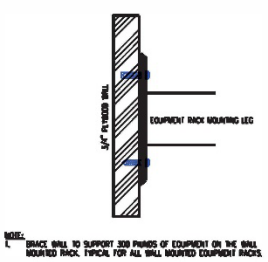
22A TYPICAL TECHNOLOGY 2-RAIL RACK
NO SCALE

22 RACK FLOOR MOUNTING
NO SCALE

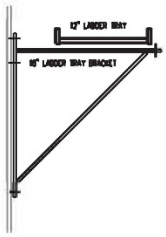
Ladder Rack / Rack Wall Mount Detail



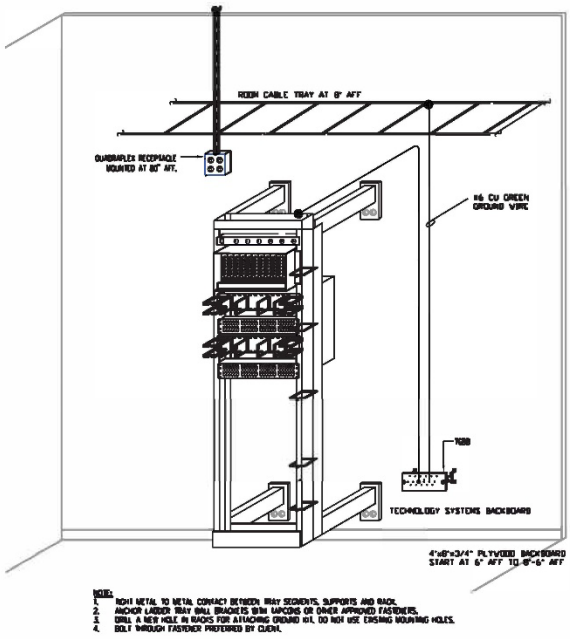
23A LADDER TRAY DETAIL
NO SCALE



23B RACK MOUNTING DETAIL
NO SCALE



23C WALL BRACKET DETAIL
NO SCALE



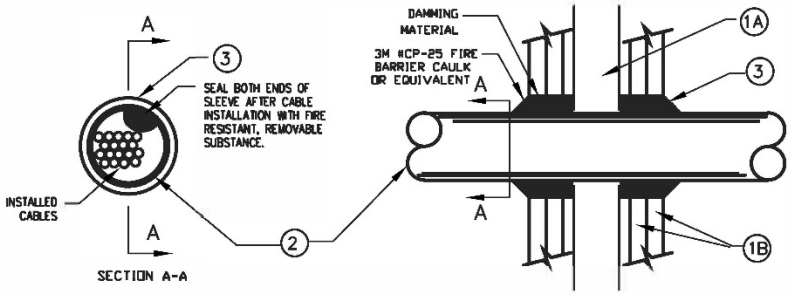
23 LADDER RACK / RACK WALL MOUNT DETAIL
NO SCALE

Firestop Sleeve Assembly

SYSTEM NO. WL1001

PROVIDE AT FIRE RATED WALL OR FLOOR PENETRATIONS.

(FORMALLY SYSTEM NO. 87)
F RATINGS - 1, 2, 3 AND 4 HR (SEE ITEMS 2 AND 3)
T RATING - 1, 1, 2, 3 AND 4 HR (SEE ITEM 3)



1. WALL ASSEMBLY - THE 1, 2, 3 OR 4 HR. FIRE-RATED GYPSUM WALLBOARD/STUD WALL ASSEMBLY SHALL BE CONSTRUCTED OF THE MATERIALS AND IN THE MANNER DESCRIBED IN THE INDIVIDUAL U300 OR U400 SERIES WALL OR PARTITION DESIGNS IN THE UL FIRE RESISTANCE DIRECTORY AND SHALL INCLUDE THE FOLLOWING CONSTRUCTION FEATURES:

   A. STUDS - WALL FRAMING MAY CONSIST OF EITHER WOOD STUDS (MAX 2 HR. FIRE RATED ASSEMBLIES) OR STEEL CHANNEL STUDS. WOOD STUDS TO CONSIST OF NOM 2 BY 4 IN. LUMBER SPACED 16 IN. OC WITH NOM 2 BY 4 IN. LUMBER END PLATES AND CROSS BRACES. STEEL STUDS TO BE MIN 3-5/8 IN. WIDE BY 1-3/8 IN. DEEP CHANNELS SPACED MAX 24 IN. OC.

   B. WALLBOARD, GYPSUM* - NOM 1/2 OR 5/8 IN. THICK, 4 FT. WIDE WITH SQUARE OR TAPERED EDGES. THE GYPSUM WALLBOARD TYPE, THICKNESS, NUMBER OF LAYERS, FASTENER TYPE AND SHEET ORIENTATION SHALL BE AS SPECIFIED IN THE INDIVIDUAL U300 OR U400 SERIES DESIGN IN THE UL FIRE RESISTANCE DIRECTORY. MAX DIAM OF OPENING IS 13-1/2 IN.

2. PIPE AND CONDUIT - NOM 12 IN. DIAM (OR SMALLER) SCHEDULE 10 (OR HEAVIER) STEEL PIPE, NOM 6 IN. DIAM (OR SMALLER) STEEL CONDUIT, NOM 4 IN. DIAM (OR SMALLER) STEEL ELECTRICAL METALLIC TUBING OR TYPE L OR (OR HEAVIER) COPPER TUBING OR NOM 1 IN. DIAM (OR SMALLER) FLEXIBLE STEEL CONDUIT. WHEN COPPER PIPE OR FLEXIBLE STEEL CONDUIT IS USED, MAX F RATING OF FIRESTOP SYSTEM (ITEM 3) IS 2 H. STEEL PIPES OR CONDUITS LARGER THAN NOM 4 IN. DIAM MAY ONLY BE USED IN WALLS CONSTRUCTED USING STEEL CHANNEL STUDS. A MAX OF ONE PIPE OR CONDUIT IS PERMITTED IN THE FIRESTOP SYSTEM. PIPE OR CONDUIT TO BE INSTALLED NEAR CENTER OF STUD CAVITY WIDTH AND TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF WALL ASSEMBLY.

3. FILL, VOID OR CAVITY MATERIAL* - CAULK - CAULK FILL MATERIAL INSTALLED TO COMPLETELY FILL ANNULAR SPACE BETWEEN PIPE OR CONDUIT AND GYPSUM WALLBOARD AND WITH A MIN 1/4 IN. DIAM BEAD OF CAULK APPLIED TO PERIMETER OF PIPE OR CONDUIT AT ITS EGRESS FROM THE WALL. CAULK INSTALLED SYMMETRICALLY ON BOTH SIDES OF WALL ASSEMBLY. THE HOURLY F RATING OF THE FIRESTOP SYSTEM IS DEPENDENT UPON THE HOURLY FIRE RATING OF THE WALL ASSEMBLY IN WHICH IT IS INSTALLED, AS SHOWN IN THE FOLLOWING TABLE. THE HOURLY T RATING OF THE FIRESTOP SYSTEM IS DEPENDENT UPON THE TYPE OR SIZE OF THE PIPE OR CONDUIT AND THE HOURLY FIRE RATING OF THE WALL ASSEMBLY IN WHICH IT IS INSTALLED, AS TABULATED BELOW.

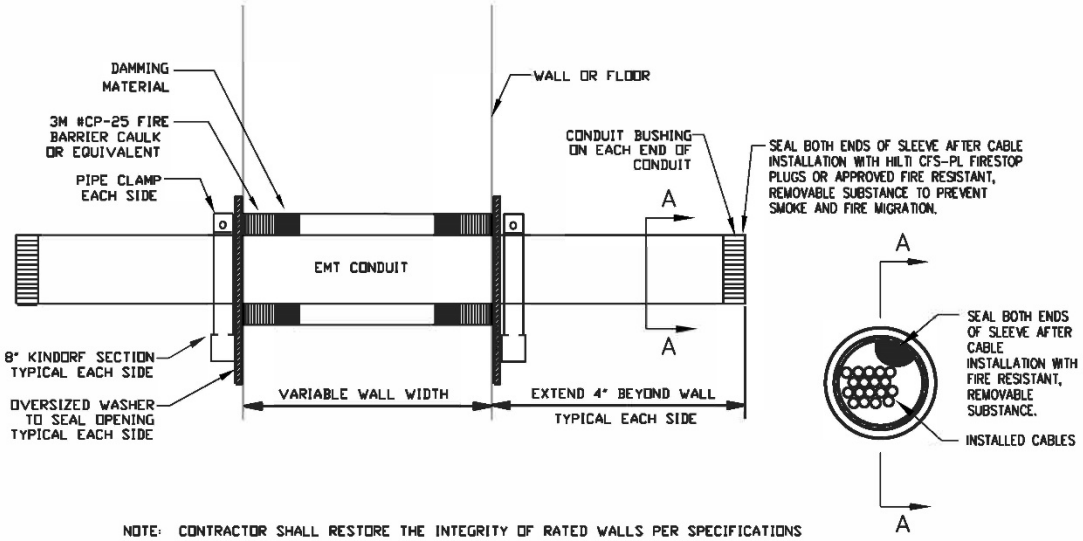
MAX PIPE OR CONDUIT DIAM, IN.	ANNULAR SPACE IN.	F RATING HR	T RATING HR
1	0 TO 3/16	1 OR 2	0+, 1 OR 2
1	1/4 TO 1/2	3 OR 4	3 OR 4
4	0 TO 1/4	1 OR 2	0
6	1/4 TO 1/2	3 OR 4	0
12	3/16 TO 3/8	1 OR 2	0

+ WHEN COPPER PIPE IS USED, T RATING IS 0 H.
MINNESOTA MINING & MFG CO. - TYPES CP-25 S/L, SP-25 N/S, CP-25 WB, CP-25 WB+

*BEARING THE UL CLASSIFICATION MARKING

24 FIRESTOP SLEEVE ASSEMBLY
NO SCALE

Firestop Sleeve Standard



NOTE: CONTRACTOR SHALL RESTORE THE INTEGRITY OF RATED WALLS PER SPECIFICATIONS PROVIDE AT SMOKE RATED WALL PENETRATIONS.

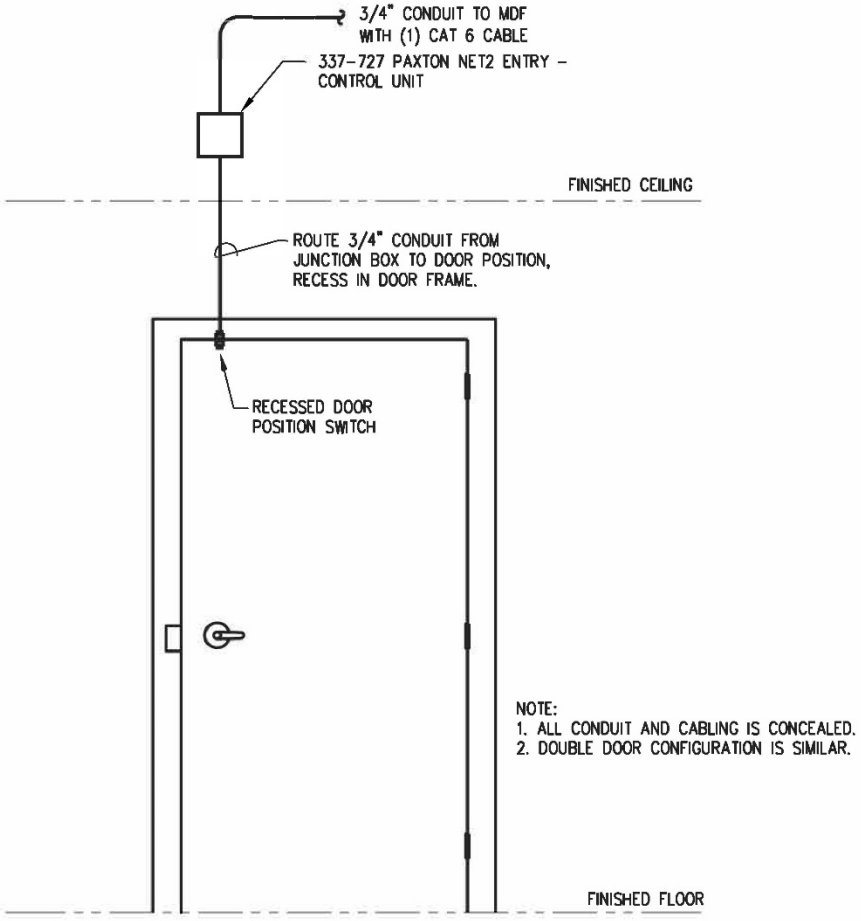
TABLE FOR CAT. 6A CABLES (OD.23")

# OF CABLES	SLEEVE SIZE
1-6	1"
5-7	1"1/4"
6-10	1 1/2"
9-15	1 3/4"
14-18	2"
17-28	2 1/2"
25-41	3"
40-70	4"

25 FIRESTOP SLEEVE STANDARD

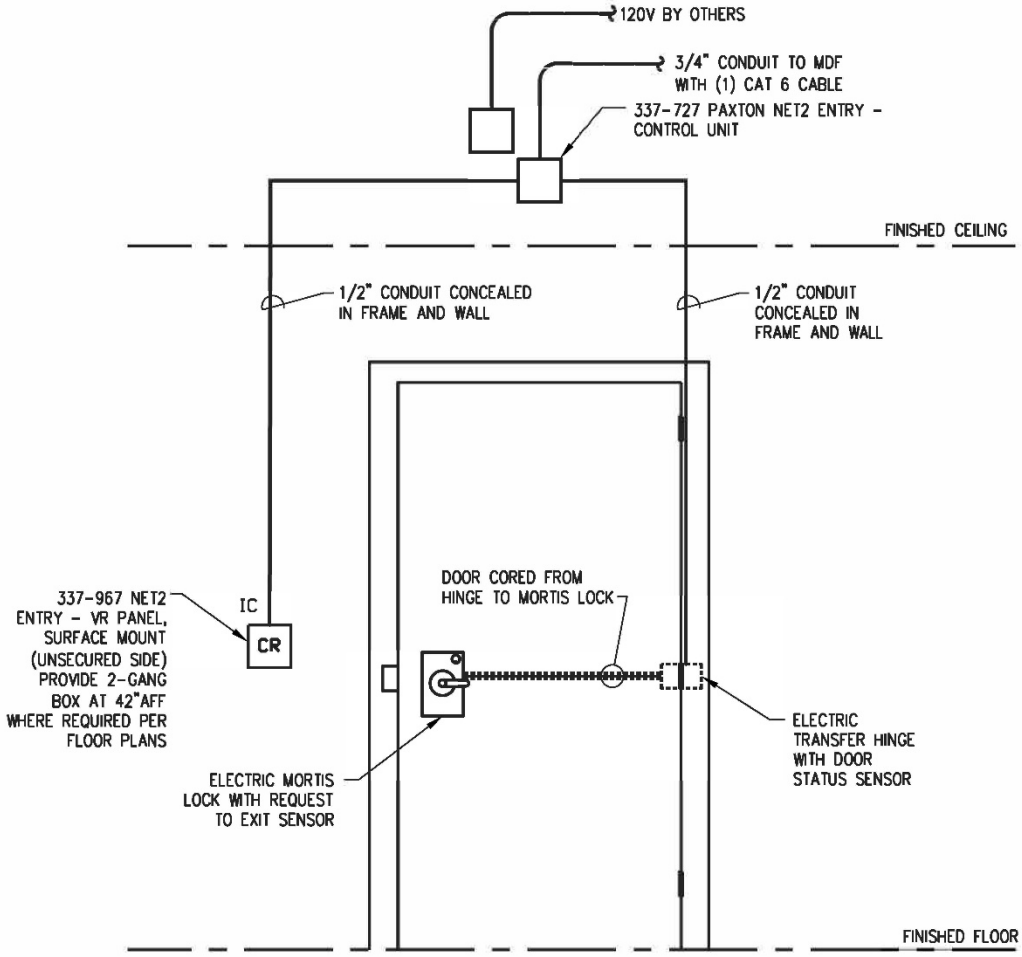
NO SCALE

Single Door with Contacts



26 SINGLE DOOR WITH DOOR CONTACTS
NO SCALE

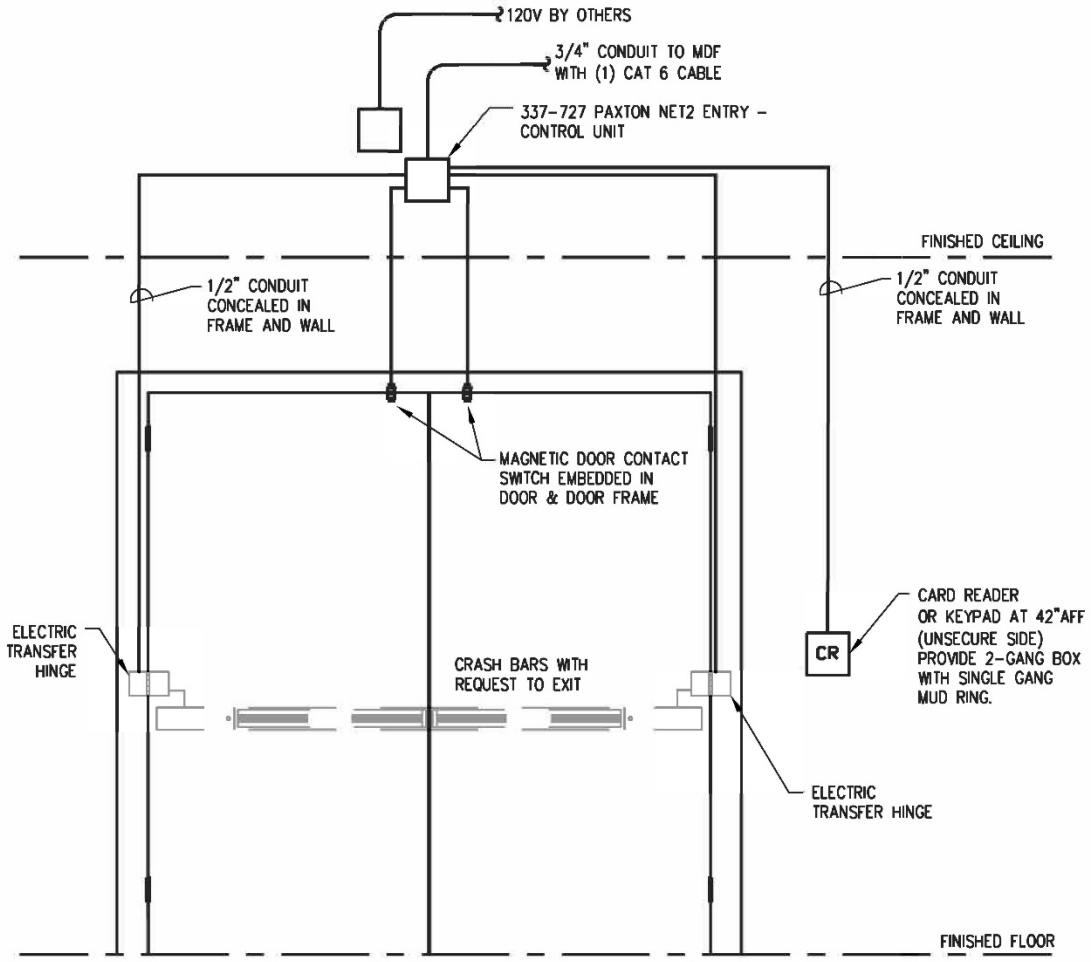
Single Door with Intercom Camera Card Reader/Keypad



27 SINGLE DOOR WITH INTERCOM CAMERA CARD READER/KEYPAD

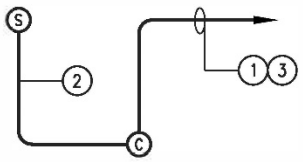
NO SCALE

Double Door with Card Reader/Keypad

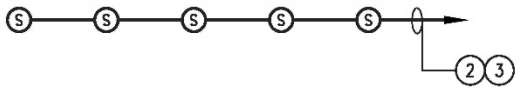


28 DOUBLE DOOR WITH CARD READER/KEYPAD
NO SCALE

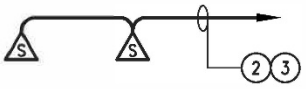
TYPICAL OPEN AREA



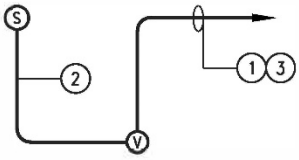
TYPICAL CORRIDOR



TYPICAL OUTDOOR SPEAKERS/HORNS



TYPICAL OFFICES + DORMS



INTERCOM NOTES:

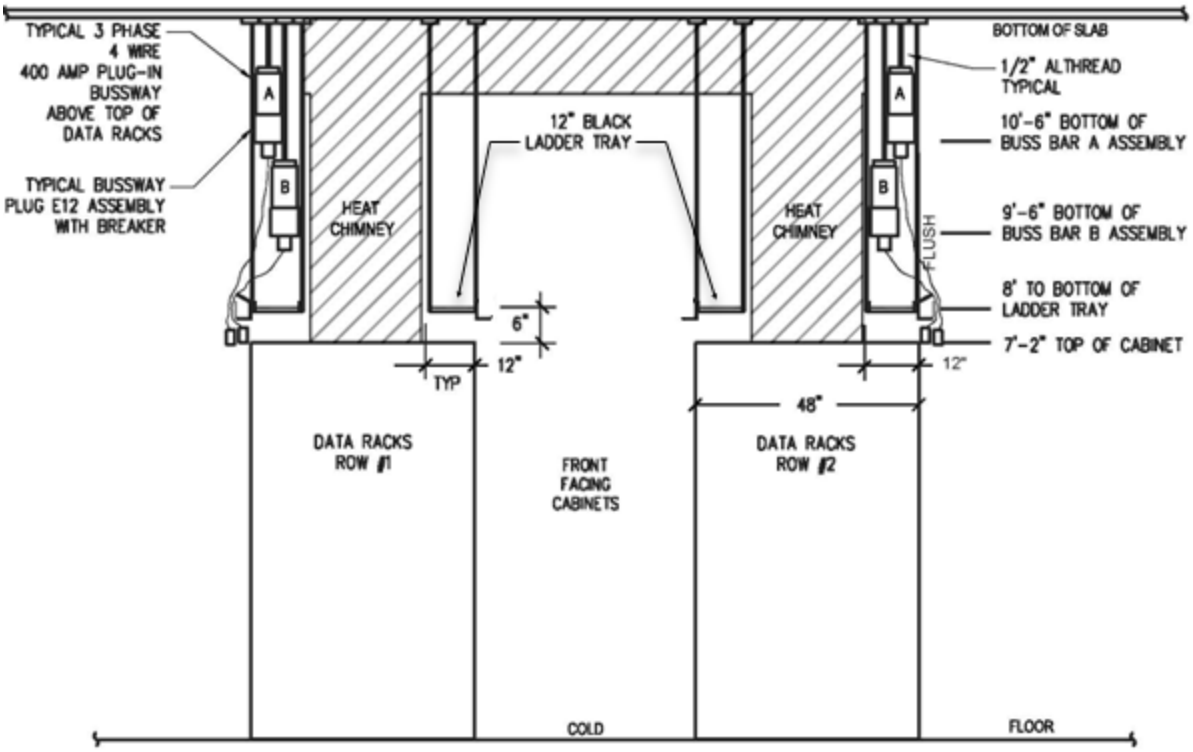
1. MAX. FIVE (5) SPEAKERS PER CIRCUIT (WITH OR WITHOUT VOLUME CONTROLS).
2. MAX. ONE (1) CALL-BUTTON PER CIRCUIT.
3. MAX. TWO (2) EXTERIOR HORNS/SPEAKERS PER CIRCUIT.

INTERCOM WIRING Ⓧ:

1. WEST PENN 355 CABLE - (4) 22 AWG STRANDED W/ 2 SHIELDED, 2 UNSHIELDED
2. WEST PENN 291 CABLE - (2) 22 AWG STRANDED W/ SHIELD
3. EACH OFFICE, AREA, SPACE, ROOM, OUTDOOR SPEAKER GROUP, OR CORRIDOR SPEAKER GROUP SHALL BE HOMERUN TO INTERCOM WALL-FIELD IN NEAREST IDF/MDF ROOM. DAISY-CHAINING OF INTERCOM FEEDERS WILL NOT BE ACCEPTED.

29 INTERCOM WIRING TYPICAL
NO SCALE

Data Center Cabinet Section



30 DATA CENTER CABINET SECTION
NO SCALE

Data Center Pre-Manufactured Cable Assembly

PRE-MANUFACTURED OPTICAL FIBER CABLE ASSEMBLY

PRE-MANUFACTURED CATAGORY 6A CABLE ASSEMBLY

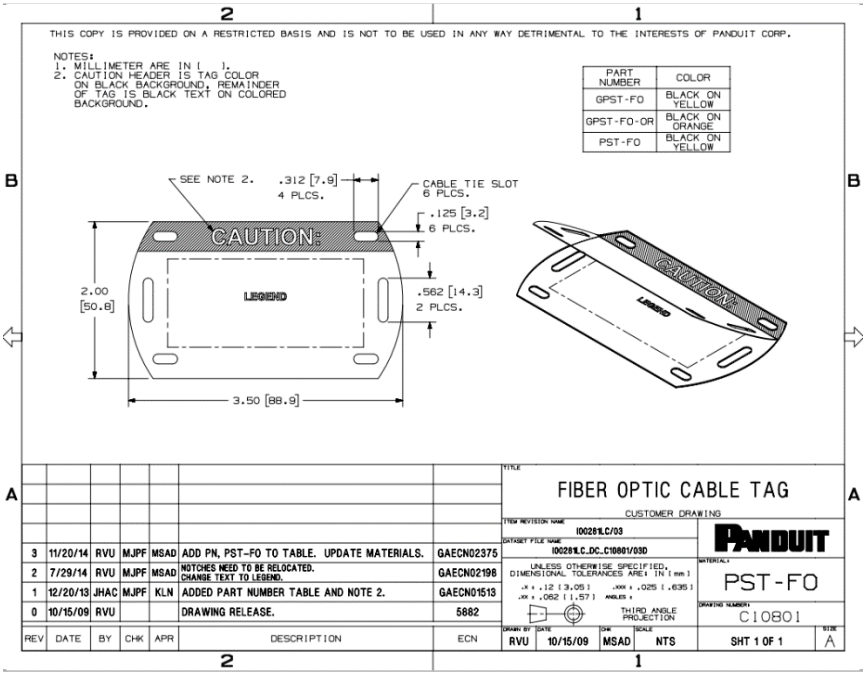
PINELLAS COUNTY PCJ DATA CENTER
Pre-Manufactured Cable Assembly Length Matrix
OCI ASSOCIATES

Description	Quantity	Length
12 STRAND MM-OS-4 OPTICAL FIBER ASSEMBLY	0	14'-0"
12 STRAND MM-OS-4 OPTICAL FIBER ASSEMBLY	0	17'-0"
12 STRAND MM-OS-4 OPTICAL FIBER ASSEMBLY	0	20'-0"
12 STRAND MM-OS-4 OPTICAL FIBER ASSEMBLY	0	23'-0"
12 STRAND MM-OS-4 OPTICAL FIBER ASSEMBLY	0	26'-0"
12 STRAND MM-OS-4 OPTICAL FIBER ASSEMBLY	0	30'-0"
12 STRAND MM-OS-4 OPTICAL FIBER ASSEMBLY	0	33'-0"
12 STRAND MM-OS-4 OPTICAL FIBER ASSEMBLY	0	36'-0"
12 STRAND MM-OS-4 OPTICAL FIBER ASSEMBLY	0	39'-0"
12 STRAND MM-OS-4 OPTICAL FIBER ASSEMBLY	0	42'-0"
24 RJ-45 CAT-6A UTP ASSEMBLY	0	17'-0"
24 RJ-45 CAT-6A UTP ASSEMBLY	0	20'-0"
24 RJ-45 CAT-6A UTP ASSEMBLY	0	23'-0"
24 RJ-45 CAT-6A UTP ASSEMBLY	0	26'-0"
24 RJ-45 CAT-6A UTP ASSEMBLY	0	26'-0"
24 RJ-45 CAT-6A UTP ASSEMBLY	0	33'-0"
24 RJ-45 CAT-6A UTP ASSEMBLY	0	36'-0"
24 RJ-45 CAT-6A UTP ASSEMBLY	0	39'-0"
24 RJ-45 CAT-6A UTP ASSEMBLY	0	42'-0"
24 RJ-45 CAT-6A UTP ASSEMBLY	0	45'-0"

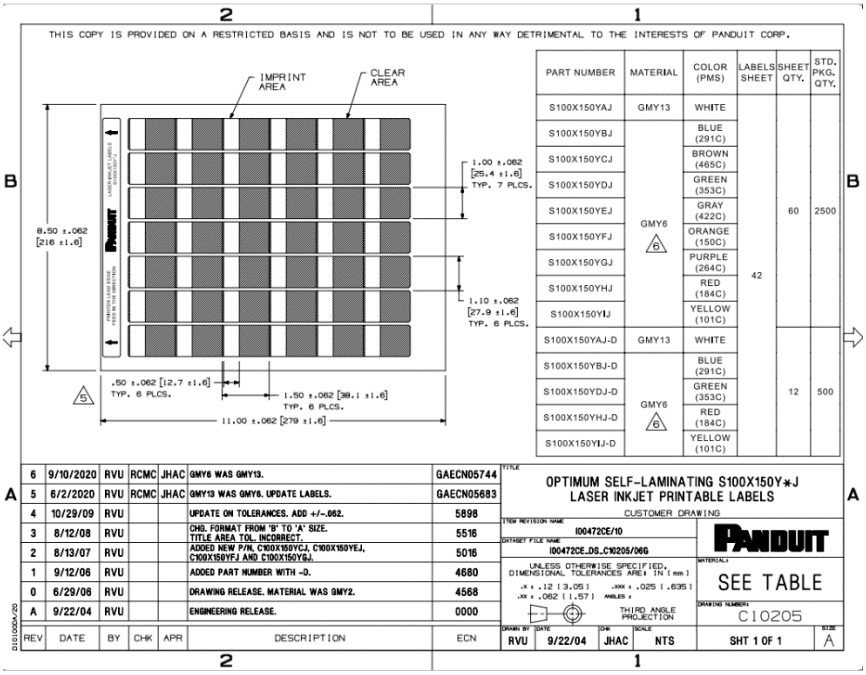
31 DATA CENTER PRE-MANUFACTURED CABLE ASSEMBLY

NO SCALE

Labeling Diagrams



FIBER OPTIC CABLE TAG



INSIDE CABLE WRAP AROUND LABELS