



Mechanical Engineering  
Electrical Engineering  
Technology Engineering  
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## Electrical Addendum #1

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<b>Date:</b>	November 8, 2022	<b>From:</b>	Tyler Squire
<b>To:</b>	Marilee Vicencio	<b>Email:</b>	Tyler.squire@speceng.com
<b>Company:</b>	VCBO Architecture	<b>Phone:</b>	801-401-8472
<b>Job No:</b>	220431	<b>Re:</b>	
<b>Cc:</b>			

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This Addendum shall be considered part of the Contract Documents and Project Manual for the above mentioned project as though it had been issued at the same time and shall be incorporated integrally therewith. Where provisions of the following supplementary data differ from those of the original Contract Documents and Project Manual, the Addendum shall govern and take precedence.

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### Electrical Addendum

#### Drawings

1. EE001-Sheet Index, Abbreviations, and General Notes
  - a. Removed the TA sheets from the Electrical Sheet Index.
2. EE003-Telecom Schedules and Notes
  - a. Revised/ Added data device information to the Equipment/Cable List schedule. See attached sheet.
  - b. Removed Abbreviations and Definitions as they are shown on the EE001 sheet and supersede what was shown before. See attached sheet.
3. EE004-Audio Visual Schedules and Notes
  - a. Revised/ Added AV device information to the AV Raceway Systems schedule. See attached sheet.
  - b. Removed Abbreviations and Definitions as they are shown on the EE001 sheet and supersede what was shown before. See attached sheet.
4. EP105-Level 5 Power Plan



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- a. Updated poke-thru layout and circuiting in Communication Room 526.
  - b. Added Keynotes 6, 7 and 8.
5. EP601-Equipment and Panel Schedules
  - a. Updated panel schedules.
6. EL105-Level 5 Lighting Plan
  - a. Added light fixtures and lighting controls to Storage 515.
7. EL601-Interior Lighting Fixture Schedule
  - a. Added T24 to the fixture schedule.
8. ET105-Level 5 Telecom Plan
  - a. Updated sheet keynotes. See attached sheet.
  - b. Revised/added/deleted data devices, power, and floor boxes. Removed j-hook pathways. Updated conduit pathways. See attached sheet.
9. ET401-Enlarged Telecom Plans
  - a. Revised detail A5. Removed AV cabinet. See attached sheet.
10. ET501-Telecom Equipment Rack Elevations
  - a. Revised Data Drop Schedule. See attached sheet.
  - b. Revised/Added number of new SPP1 and blank panels in existing equipment rack A-1. Revised layout of new equipment cabinet and 2-post racks. See attached sheet.
  - c. Changed detail number. See attached sheet.
11. ET502-Telecom Details
  - a. Revised/added detail C5 to reflect a 2-port furniture data outlet detail. See attached sheet.
  - b. Added details A6 (1-port wall data outlet detail) and B6 (3-port wall data outlet detail. See attached sheet.
12. ET503-Telecom Equipment Rack Grounding Detail



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- a. Changed detail number. See attached sheet.

#### 13. ET601-Telecom Riser Diagrams

- a. Updated detail C1 name. See attached sheet.
- b. Updated Telecom Cable Riser Diagram detail A2. See attached sheet.
- c. Revised Telecom Conduit Riser Diagram detail A4.

#### 14. EJ105-Level 5 AV Rough-In Plan

- a. Updated sheet keynotes. See attached sheet.
- b. Changed location of AV equipment racks to within rooms 523 and 526. See attached sheet.
- c. Changed symbol of monitor array and added monitors in Collab. Rooms and open office 530. See attached sheet.

#### 15. EJ601-AV Rough-In Schedules

- a. Added raceway risers A1 and B1 for Collab. Rooms and Open Office 530. See attached sheet.
- b. Modified raceway risers C4 and D3. See attached sheet.

#### 16. TA001-Sheet Index, Abbreviations and General Notes

- a. Revised/ Added AV device information to the Audio and Video System Equipment List. See attached sheet.

#### 17. TA601-Audio Visual System Riser Diagrams

- a. Revised/ Added system riser diagrams. See attached sheet.

### Specifications

#### 1. 27 4113-Audio Systems

- a. Added section. See attached.



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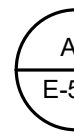
































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










































Attachments <EE003, EE004, ET105, ET401, ET501, ET502, ET503, ET601, EJ105, EJ601, TA001, TA601, 27  
4113>



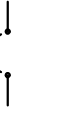


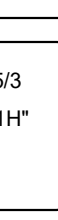
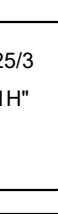












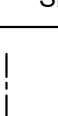



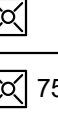








## SYMBOLS LEGEND

SYMBOL	DESCRIPTION
REFERENCE AND LINE SYMBOLS	
	DETAIL INDICATOR: A5 INDICATES DETAIL NUMBER, E-501 INDICATES DRAWING SHEET WHERE DETAIL IS SHOWN.
	ELEVATION OR SECTION INDICATOR, EXTERIOR: A5 INDICATES ELEVATION OR SECTION NUMBER, E-201 INDICATES DRAWING SHEET WHERE ELEVATION OR SECTION IS SHOWN.
	ELEVATION OR SECTION INDICATOR, INTERIOR: A5 INDICATES ELEVATION OR SECTION NUMBER, E-201 INDICATES DRAWING SHEET WHERE ELEVATION OR SECTION IS SHOWN.
	ROOM IDENTIFIER WITH ROOM NAME AND NUMBER.
	KEYNOTE INDICATOR.
	REVISION INDICATOR.
	EQUIPMENT INDICATOR.
	MECHANICAL EQUIPMENT INDICATOR: "X-X" INDICATES EQUIPMENT MARK SHOWN ON EQUIPMENT SCHEDULE. "XMDP" IDENTIFIES PANEL EQUIPMENT IS CIRCUITED TO. REFER TO EQUIPMENT SCHEDULE FOR ADDITIONAL INFORMATION.
	BREAK, STRAIGHT: TO BREAK PARTS OF DRAWING
	BREAK, ROUND
	NEW LINE: MEDIUM LINE.
	HIDDEN FEATURES LINE: HIDDEN, THIN LINE
	EXISTING TO REMAIN LINE: THIN LINE.
	DEMOLITION LINE: DASHED, MEDIUM LINE
WIRING METHODS	
	WIRING.
	WIRING TURNED UP OR TOWARDS OBSERVER.
	WIRING TURNED DOWN OR AWAY FROM OBSERVER.
	SINGLE BRANCH CIRCUIT HOME RUN TO PANELBOARD WITH DEDICATED NEUTRAL CONDUCTOR. LETTER AND NUMBER NOTATION IDENTIFY PANEL AND CIRCUIT NUMBER.
	BRANCH CIRCUIT HOME RUN TO PANELBOARD: NUMBER OF ARROWS INDICATES NUMBER OF CIRCUITS. LETTER AND NUMBER NOTATIONS IDENTIFY PANEL AND CIRCUIT NUMBERS.
	BRANCH CIRCUIT HOME RUN TO PANELBOARD: NUMBER OF ARROWS INDICATES NUMBER OF CIRCUITS. LETTER AND NUMBER NOTATIONS IDENTIFY PANEL AND CIRCUIT NUMBERS. NUMBER IN BOX REFERS TO THE CONDUCTOR AND CONDUIT SCHEDULE.
	LOW VOLTAGE WIRING: DIVIDE, MEDIUM LINE.
	CONDUIT STUB. DIMENSION RECORD DRAWINGS AND MARK.
	CONDUCTOR & CONDUIT ("CC") SCHEDULE INDICATOR. REFER TO ONE-LINE DIAGRAM.
	ADA ACCESS PUSH PLATE
	JUNCTION BOX.
	JUNCTION BOX, CEILING.
	JUNCTION BOX, SYSTEMS FURNITURE COMMUNICATION CONNECTION.
	JUNCTION BOX, SYSTEMS FURNITURE POWER CONNECTION.
	CABLE TRAY ABOVE ACCESSIBLE CEILING. "A" DENOTES CABLE TRAY WIDTH, "B" DENOTES CABLETRAY DEPTH. +/C-D" DENOTES CABLE TRAY ELEVATION ABOVE OR BELOW FINISHED SURFACE.
	LADDER RACK.
	CABLE J-HOOKS ABOVE ACCESSIBLE CEILING.
	MECHANICAL EQUIPMENT CONNECTION. REFER TO EQUIPMENT SCHEDULE FOR REQUIREMENTS.
	GROUND BUSBAR. REFER TO GROUNDING RISER DIAGRAM FOR ADDITIONAL INFORMATION.

## SYMBOLS LEGEND

SYMBOL	DESCRIPTION
WIRING DEVICES	
	RECEPTACLE, DUPLEX: NEMA 5-20R.
	RECEPTACLE, DUPLEX, ABOVE COUNTER: NEMA 5-20R.
	RECEPTACLE, DUPLEX, CEILING: NEMA 5-20R.
	RECEPTACLE, DUPLEX WITH GROUND FAULT CIRCUIT INTERRUPTER, DRINKING FOUNTAIN: CONCEAL WATER COOLER RECEPTACLE BEHIND WATER COOLER. SEE MECHANICAL/PLUMBING SHOP DRAWINGS FOR INSTALLATION REQUIREMENTS.
	RECEPTACLE, DUPLEX WITH GROUND FAULT CIRCUIT INTERRUPTER, WET LABEL, "WEATHERPROOF IN USE": NEMA 5-20R.
	RECEPTACLE, DUPLEX ON EMERGENCY POWER: NEMA 5-20R.
	RECEPTACLE, DUPLEX, CONNECTED TO UPS: NEMA 5-20R.
	RECEPTACLE, DUPLEX WITH GROUND FAULT CIRCUIT INTERRUPTER: NEMA 5-20R.
	RECEPTACLE, DUPLEX, RECESSED: NEMA 5-20R.
	RECEPTACLE, QUADRAPLEX: NEMA 5-20R.
	RECEPTACLE, QUADRAPLEX ON EMERGENCY POWER: NEMA 5-20R.
	RECEPTACLE, QUADRAPLEX, CONNECTED TO UPS: NEMA 5-20R.
	RECEPTACLE, QUADRAPLEX WITH GROUND FAULT CIRCUIT INTERRUPTER: NEMA 5-20R.
	RECEPTACLE, SPECIAL PURPOSE. PROVIDE RECEPTACLE TO MATCH EQUIPMENT PLUG.
	RECEPTACLE, SPECIAL PURPOSE ON EMERGENCY POWER. PROVIDE RECEPTACLE TO MATCH EQUIPMENT PLUG.
	MULTI-OUTLET ASSEMBLY: NEMA 5-20R.
	DROP CORD. SEE DETAIL.
	FLUSH FLOOR BOX. "IF" SHOWN ON DRAWINGS. REFER TO WIRING DEVICE SCHEDULE IN THE ELECTRICAL SPECIFICATIONS FOR CONFIGURATION AND DEVICES.
	FLUSH FIRE RATED POKE THRU. "IF" SHOWN ON DRAWINGS. REFER TO WIRING DEVICE SCHEDULE IN THE ELECTRICAL SPECIFICATIONS FOR CONFIGURATION AND DEVICES.
	SWITCH, DIMMER.
	SWITCH, SINGLE POLE ("x" INDICATES FIXTURES CONTROLLED).
	SWITCH, THREE-WAY ("x" INDICATES FIXTURES CONTROLLED).
	SWITCH, FOUR-WAY ("x" INDICATES FIXTURES CONTROLLED).
	SWITCH, TIMER OPERATED.
	RECEPTACLE, DUPLEX WITH GROUND FAULT CIRCUIT INTERRUPTER, CONNECTED TO UPS: NEMA 5-20R.
	RECEPTACLE, SINGLE PLEX, WITH USB OUTLET
LIGHTING	
	FIXTURE IDENTIFICATION: (W-3) INDICATES FIXTURE TYPE AS SCHEDULED.
	FIXTURE IDENTIFICATION: EMERGENCY LIGHTING FIXTURE WITH BATTERY PACK AND/OR GENERATOR AND/OR CENTRALIZED INVERTER AND/OR CENTRALIZED UPS CONNECTION AS INDICATED IN PLANS. (W-3E) INDICATES FIXTURE TYPE AS SCHEDULED.
	EMERGENCY.
	EGRESS DIRECTION ARROW (EXIT SIGNS).
	EXIT SIGN: SINGLE FACE, CEILING MOUNTED
	EXIT SIGN: SINGLE FACE, WALL MOUNTED
	EXIT SIGN: DOUBLE FACE, CEILING MOUNTED
	EXIT SIGN: DOUBLE FACE, WALL MOUNTED
LIGHTING CONTROL	
	OCCUPANCY SENSOR, DUAL TECHNOLOGY, OMNI-DIRECTIONAL, CEILING.
	OCCUPANCY SENSOR, DUAL TECHNOLOGY, WALL.
	PHOTOCELL.
	PHOTOCELL, WALL MOUNTED.
	VACANCY SENSOR, DUAL TECHNOLOGY, OMNI-DIRECTIONAL, CEILING.
	VACANCY SENSOR, DUAL TECHNOLOGY, WALL.
	SWITCH/OCCUPANCY SENSOR COMBO, DUAL TECHNOLOGY, WALL.
	SWITCH/VACANCY SENSOR COMBO, DUAL TECHNOLOGY, WALL.
	DIMMER SWITCH/OCCUPANCY SENSOR COMBO, DUAL TECHNOLOGY, WALL.
	DIMMER SWITCH/VACANCY SENSOR COMBO, DUAL TECHNOLOGY, WALL.
	LOW VOLTAGE DIGITAL LIGHTING CONTROL SWITCH: LETTER "a,b" INDICATES ZONING WHERE SHOWN (REFER TO PLANS, SCHEDULES, AND DETAILS FOR EXACT BUTTON CONFIGURATION AND PROGRAMMING REQUIREMENTS)
	DIGITAL LIGHTING ROOM CONTROLLER
	DIGITAL LIGHTING DIMMING CONTROLLER
	LIGHTING EMERGENCY TRANSFER DEVICE
	LIGHTING SPACE CONTROL TYPE. X INDICATES TYPE. SEE SCHEDULE / DIAGRAM.

## SYMBOLS LEGEND

SYMBOL	DESCRIPTION
<b>ELECTRICAL POWER AND DISTRIBUTION</b>	
	CIRCUIT BREAKER, MOLDED CASE (ONE-LINE DIAGRAM).
	MOTOR.
	TRANSFORMER (ONE-LINE DIAGRAM).
	PANELBOARD WITH MAIN LUGS ONLY. BUS SIZE AND PHASE AS SHOWN (ONE-LINE DIAGRAM).
	PANELBOARD WITH MAIN CIRCUIT BREAKER. SIZE AND PHASE AS SHOWN (ONE-LINE DIAGRAM).
	PANELBOARD WITH MAIN AND SUB FEED CIRCUIT BREAKER (ONE-LINE DIAGRAM).
<b>FIRE ALARM</b>	
	FIRE ALARM ANNUNCIATOR PANEL.
	FIRE ALARM CONTROL PANEL, SEMI-RECESSED.
	CONTROL MODULE.
	MONITOR MODULE.
	FIRE ALARM MANUAL PULL STATION.
	SHUT DOWN RELAY. INSTALL RELAY IN CONTROL CIRCUIT OF EQUIPMENT TO BE CONTROLLED IN THE EVENT OF A FIRE.
	MAGNETIC DOOR HOLDER.
	DETECTOR, SMOKE.
	DETECTOR, SMOKE, WALL MOUNTED.
	DETECTOR, SMOKE, DUCT WITH HOUSING AND SAMPLING TUBE.
	SMOKE DAMPER. 120V POWER FROM ELECTRICAL SYSTEM.
	COMBINATION FIRE/SMOKE DAMPER. 120V POWER FROM ELECTRICAL SYSTEM.
	DETECTOR, HEAT.
	DETECTOR, CARBON MONOXIDE.
	STROBE, WALL MOUNTED.
	STROBE, WALL MOUNTED. SUBSCRIPT INDICATES CANDELA RATING.
	ALARM, HORN/SPEAKER, WALL MOUNTED, WEATHERPROOF.
	ALARM, HORN/STROBE, WALL MOUNTED, ONE ASSEMBLY.
	ALARM, HORN/STROBE, WALL MOUNTED, ONE ASSEMBLY. SUBSCRIPT INDICATES CANDELA RATING.
	SPEAKER, WALL MOUNTED, EVACUATION, COMBINATION STROBE.
	SPEAKER, WALL MOUNTED, EVACUATION, COMBINATION STROBE. SUBSCRIPT INDICATES CANDELA RATING.
	SPEAKER/STROBE, CEILING MOUNTED, ONE ASSEMBLY.
	SPEAKER/STROBE, CEILING MOUNTED. SUBSCRIPT INDICATES CANDELA RATING.
	ALARM, STROBE, CEILING MOUNTED. SUBSCRIPT INDICATES CANDELA RATING.

## SYMBOLS LEGEND

SYMBOL	DESCRIPTION
<b>ELECTRICAL POWER AND DISTRIBUTION</b>	
	PANELBOARD WITH SUB FEED LUGS (ONE-LINE DIAGRAM).
	PANELBOARD WITH CIRCUIT BREAKER AND SUB FEED LUGS (ONE-LINE DIAGRAM).
	EARTH GROUND (ONE-LINE DIAGRAM).
	SERVICE ENTRANCE SURGE PROTECTION (ONE-LINE DIAGRAM).
	GENERATOR, POWER (ONE-LINE DIAGRAM).
	METER.
	VARIABLE FREQUENCY MOTOR CONTROLLER (ONE-LINE DIAGRAM).
	DISCONNECT SWITCH, FUSED.
	DISCONNECT SWITCH, UNFUSED.
	STARTER, COMBINATION WITH DISCONNECT SWITCH.
	STARTER OR MOTOR CONTROLLER.
	PUSHBUTTON.
	PUSHBUTTONS, MOTOR CONTROL.
	PANELBOARD CABINET, FLUSH MOUNTED.
	PANELBOARD CABINET, SURFACE MOUNTED, 1 SECTION.
	PANELBOARD CABINET, SURFACE MOUNTED, 2 SECTION.
	DISTRIBUTION PANEL OR SWITCHBOARD.
	SWITCH, TOGGLE MOTOR STARTER WITH OVERLOAD PROTECTION.
	TRANSFORMER (SEE ONE-LINE FOR SIZE)
<b>CCTV</b>	
	CCTV CAMERA/ENCLOSURE WITH LENS, TYPICAL. SEE SCHEDULE.
<b>SECURITY</b>	
	CARD ACCESS DOOR TYPE #1 OR AS NOTED. SEE SCHEDULE.
	CARD READER.

## ABBREVIATIONS

NOTE: ALL ABBREVIATIONS MAY NOT BE USED.	
1P	SINGLE-PHASE
1WAY	ONE-WAY
2/C	TWO-CONDUCTOR
2WAY	TWO-WAY
3	THREE
3WAY	THREE-WAY
4	FOUR
4OUT	QUADRUPLE RECEPTACLE OUTLET
4PDT	FOUR-POLE DOUBLE THROW
4PST	FOUR-POLE SINGLE THROW
4W	FOUR-WIRE
4WAY	FOUR-WAY
AB	Above COUNTER
AC	ARMORED CABLE
ADA	AMERICANS WITH DISABILITIES ACT
ADJ	ADJACENT
AFJ	ABOVE FINISHED FLOOR
AFB	ABOVE FINISHED GRADE
AFIC	AMPLIFIER/INTERFERENCE CAPACITY
ALUM	ALUMINUM
AMP	AMPERE
ANN	ANNUNCIATOR
AP	ACCESS POINT (WIRELESS DATA)
AR	AS REQUIRED
ASC	AMPS SHORT CIRCUIT
ATS	AUTOMATIC TRANSFER SWITCH
AV	AUDIO VISUAL
AWG	AMERICAN WIRE GAGE
BB	BUCK-BUSTO TRANSFORMER
BFMR	BEFORE FINISHED FLOOR
BFG	BEFORE FINISHED GRADE
C	CEILING MOUNTED
CAT	CATEGORY
CATV	COMMUNITY ANTENNA TELEVISION
CB	CIRCUIT BREAKER
CCBA	CUSTOM COLOR AS SELECTED BY ARCHITECT
CCVCI	CLOSED CIRCUIT TELEVISION CONTROL CENTER FURNISHED BY CONTRACTOR INSTALLED
CFBFI	CONTRACTOR FURNISHED/ BY CONTRACTOR INSTALLED
CFBFI	CONTRACTOR FURNISHED/ BY CONTRACTOR INSTALLED
CFBFI	CUSTOM FINISH AS SELECTED BY ARCHITECT
CKT	CIRCUIT
CM	CONSTRUCTION MANAGER CONDUIT
CND	CONVENIENCE OUTLET
CO	CONTRACTING OFFICERS REPRESENTATIVE
CP	CONTROL PANEL
CT	CURRENT TRANSFORMER
CU	CABLE TELEVISION
CU	COPPER
dB	UNIT OF SOUND LEVEL
dBPT	DOUBLE POLE, DOUBLE THROW
DS	DISCONNECT SWITCH
EN	ENHANCED
EA	EACH
EM	EMERGENCY
EMT	ELECTRICAL METALLIC TUBING
ENT	ELECTRIC NONMETALLIC TUBING
EPO	EMERGENCY POWER OFF
EQUIP	EQUIPMENT
ER	EQUIPMENT ROOM
EX	EXPOSED
FM	FURNITURE MOUNTED
FA	FIRE ALARM
FCP	FIRE ALARM CONTROL PANEL
FF	FIRE LOAD AREA
FMC	FLEXIBLE METAL CONDUIT
FOB	FREIGHT ON BOARD
FPP	FIBER PATCH PANEL
FVR	FULL VOLTAGE NON-REVERSING
FN	FULL VOLTAGE REVERSING
GEN	GENERATOR
IGFI	GROUND FAULT INTERRUPTER
GP	GROUND FAULT PROTECTION
GI	GIGA HERTZ
GND	GROUND
HD	HIGH DENSITY
HID	HIGH INTENSITY DISCHARGE HID HAND-OFF-AUTOMATIC
HP	HORSE POWER
HPF	HIGH-PASS FILTER
HPS	HIGH PRESSURE SODIUM
HV	HIGH VOLTAGE
HWM	HORIZONTAL WIRE MANAGEMENT
HZ	HERTZ
IO	INPUT/OUTPUT
IG	INSULATED
IMC	INTERMEDIATE METAL CONDUIT
IMIS	INSULATED ISOLATED
IR	INFRARED
J-BOX	JUNCTION BOX
KV	KILOVOLT
KVA	KILOVOLT AMPERE
KVAR	KILOVOLT AMPERE REACTIVE
KW	KILOWATT
KWH	KILOWATT HOUR
LED	LIGHT EMITTING DIODE
LFMC	LIQUID TIGHT FLEXIBLE METAL CONDUIT
LFNC	LIQUID TIGHT FLEXIBLE NONMETALLIC CONDUIT
LPS	LOW PRESSURE SODIUM
LRA	LOCKED ROTOR AMPS
LTG	LIGHTING
LV	LOW VOLTAGE
MATV	MASTER ANTENNA TELEVISION SYSTEM
MAX	MAXIMUM
MC	METAL CLAD
MCA	MINIMUM CIRCUIT BREAKER
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MCP	MOTOR CIRCUIT PROTECTION
MDD	MAIN DISTRIBUTION PANEL
MG	MOTOR GENERATOR
MIN	MINIMUM
MM	MINOR
ML	MAIN LUGS ONLY
MLO	MAXIMUM OVERCURRENT PROTECTION
MNS	MANUAL TRANSFER SWITCH
NTA	NOT APPLICABLE
NC	NORMALLY CLOSED
NEC	NATIONAL ELECTRICAL CODE
NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
NFC	NATIONAL FIRE CODE
NPFA	NATIONAL FIRE PROTECTION ASSOCIATION
NOT	NOT IN CONTRACT
NL	NIGHT LIGHT
NO	NORMALLY OPEN
NTS	NOT TO SCALE
OC	ON CENTER
OCP	OVER CURRENT PROTECTION
OEO	OWNER ELECTRONICS
OFI	OWNER FURNISHED/ BY CONTRACTOR INSTALLED
OFI	OWNER FURNISHED/OWNER INSTALLED
OP	OBTAIN FROM PLANS
OH DR	OVERHEAD (COILING) DOOR OVERLOAD
PH	PUSHBUTTON
PF	POWER FACTOR
PB	PHASE
PML	PANEL
PNN	PLENUM
PAIR	PAIR
PS	POWER SUPPLY
PT	POTENTIAL TRANSFORMER
PZ	PANTRY/200MM
QTY	QUANTITY
RT	REMOVE
RMC	REFLECTED CEILING PLAN
RMC	RIGID METAL CONDUIT
RNC	RIGID NONMETAL CONDUIT
RPM	REVOLUTIONS PER MINUTE
RPP	RISER PATCH PANEL
RR	REMOVE AND RELOCATE
SC	SCAFFOLD
SCBA	SHORT CIRCUIT AMPS
SCF	STANDARD COLOR AS SELECTED BY ARCHITECT
SQ	SQUARE FOOT (FEET)
SPB	STANDARD FINISH AS SELECTED BY ARCHITECT
SFPA	SURGE PROTECTIVE DEVICE
SPDT	SINGLE POLE, DOUBLE THROW
SPEC	SPECIFICATION
SP	STATION PATCH PANEL
SP	SINGLE POLE, SINGLE THROW
ST	SINGLE THROW
SWBD	SWITCHBOARD
SWGR	SWITCHGEAR
TL	TWIST LOCK
TP	TELEPHONE POLE
TP	TWISTED PAIR
TR	TELECOMMUNICATIONS ROOM
TB	TELEPHONE TERMINAL BOARD
TV	TELEVISION
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSOR
TY	TYPICAL
UP	UNDERFLOOR
UGND	UNDERGROUND
UN	UNINTERRUPTIBLE POWER SUPPLY
V	VOLTS
VA	VOLT AMPERE
VLF	VARIABLE FREQUENCY MOTOR CONTROLLER
VWM	VERTICAL WIRE MANAGEMENT
WTH	WITH
WO	

## DEFINITIONS

NOTE: ALL DEFINITIONS MAY NOT BE USED.

INDICATED. THE TERM "INDICATED" REFERS TO GRAPHIC REPRESENTATIONS, NOTES, OR SCHEDULES ON THE DRAWINGS, OTHER PARAGRAPHS OR SCHEDULES IN THE SPECIFICATIONS, AND SIMILAR REQUIREMENTS IN THE CONTRACT DOCUMENTS. DIMENSIONS ARE TO BE SHOWN "AS SHOWN" UNLESS "SCHEDULED" AND "SPECIFIED" ARE USED. IT IS TO HELP THE READER LOCATE THE REFERENCE, NO LIMITATION ON LOCATION IS INTENDED.

DIRECTED. TERMS SUCH AS "DIRECTED," "REQUESTED," "AUTHORIZED," "SELECTED," "APPROVED," "REQUIRED," AND "PERMITTED" MEAN "DIRECTED BY THE PROJECT ENGINEER." WHEN USED BY THE PROJECT ENGINEER OR PHRASED AS "BY THE PROJECT ENGINEER," THE PROJECT ENGINEER'S INTENT IS APPROVED. THE TERM "APPROVED" WHERE USED IN CONJUNCTION WITH THE ENGINEER'S ACTION ON THE CONTRACTOR'S SUBMITTALS, APPLICATIONS, AND REQUESTS, IS LIMITED TO THE ENGINEER'S DUTIES AND RESPONSIBILITIES AS STATED IN GENERAL AND SUPPLEMENTARY CONDITIONS.

FURNISH. THE TERM "FURNISH" IS USED TO MEAN "SUPPLY AND DELIVER TO THE PROJECT SITE, READY FOR UNLOADING, UNPACKING, ASSEMBLY, INSTALLATION, AND SIMILAR OPERATIONS."

INSTALL. THE TERM "INSTALL" IS USED TO DESCRIBE OPERATIONS AT PROJECT SITE INCLUDING THE ACTUAL "UNLOADING, UNPACKING, ASSEMBLY, ERECTION, PLACING, ANCHORING, APPLYING, WORKING TO DIMENSION, FINISHING, CLEANING, PROTECTING, AND SIMILAR OPERATIONS."

PROVIDE. THE TERM "PROVIDE" MEANS "TO FURNISH AND INSTALL, COMPLETE AND READY FOR THE INTENDED USE."

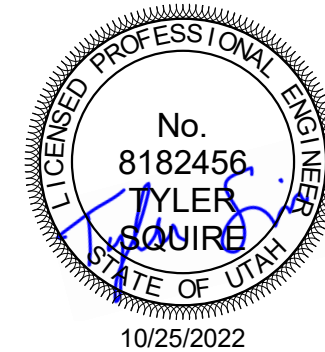
INSTALLER. AN "INSTALLER" IS THE CONTRACTOR OR AN ENTITY ENGAGED BY THE CONTRACTOR, EITHER AS AN EMPLOYEE, SUBCONTRACTOR, OR SUB-SUBCONTRACTOR, FOR PERFORMANCE OF A PARTICULAR CONSTRUCTION OPERATION. WHEN INCLUDING THE CONTRACTOR, THE CONTRACTOR IS NECESSARILY LIMITED TO ALL SYSTEMS WHICH UTILIZE VOLTAGES OF LESS THAN 71 VOLTS AC OR 120 VOLTS DC, INCLUDING ALL SYSTEMS OF SIGNALING, SECURITY SYSTEMS, VOICE AND DATA CABLEING SYSTEMS, ETC.

## GENERAL ELECTRICAL NOTES

1. **CLARIFICATION METHODS:** AT THE TIME OF BIDDING, BIDDERS SHALL FAMILIARIZE THEMSELVES WITH THE DRAWINGS AND SPECIFICATIONS. ANY QUESTIONS, MISUNDERSTANDINGS AND OMISSIONS, DELETIONS, DISCONTINUED PRODUCTS, CATALOG NUMBER DISCREPANCIES, DISCREPANCIES BETWEEN THE EQUIPMENT SUPPLIED AND THE INTENT OR FUNCTION OF THE EQUIPMENT, ETC. SHALL BE SUBMITTED TO THE ARCHITECT PRIOR TO THE OPENING FOR CLARIFICATION PRIOR TO ISSUANCE OF THE FINAL ADDENDUM AND BIDDING OF THE PROJECT. WHERE DISCREPANCIES OR MULTIPLE INTERPRETATIONS OCCUR, THE MOST STRINGENT (WHICH IS GENERALLY RECOGNIZED AS THE MOST COSTLY) THAT MEETS THE INTENT OF THE DOCUMENTS SHALL BE ENFORCED.
  2. **OWNER FURNISHED ITEMS:** THE OWNER WILL FURNISH MATERIALS AND EQUIPMENT AS INDICATED IN THE CONTRACT DOCUMENTS TO BE INCORPORATED INTO THE WORK. THESE ITEMS ARE ASSIGNED TO THE INSTALLER AND COSTS FOR UNLOADING, HANDLING, STORAGE, IF REQUIRED, AND INSTALLATION ARE INCLUDED IN THE CONTRACT SUM.
    - A. THE INSTALLER'S RESPONSIBILITIES ARE THE SAME AS IF THE INSTALLER FURNISHED THE MATERIALS OR EQUIPMENT.
    - B. THE OWNER WILL ARRANGE AND PAY FOR DELIVERY OF OWNER FURNISHED ITEMS FREIGHT ON BOARD JOBSITE TO THE INSTALLER WILL INSPECT DELIVERIES FOR DAMAGE. IF OWNER FURNISHED ITEMS ARE RECEIVED DEFECTIVE OR MISSING, THE INSTALLER MUST REPORT TO THE TRANSPORT COMPANY AND THE OWNER WILL ARRANGE FOR REPLACEMENT. THE OWNER WILL ALSO ARRANGE FOR MANUFACTURER'S WARRANTIES AND BONDS TO THE INSTALLER.
    - C. THE INSTALLER IS RESPONSIBLE FOR DESIGNATING THE DELIVERY DATES OF OWNER FURNISHED ITEMS AND FOR RECEIVING, UNLOADING AND HANDLING OWNER FURNISHED ITEMS AT THE SITE. THE INSTALLER IS RESPONSIBLE FOR PROTECTING AND HANDLING THESE ITEMS FROM DAMAGE, INCLUDING DAMAGE FROM EXPOSURE TO THE ELEMENTS, AND TO REPAIR OR REPLACE ITEMS DAMAGED AS A RESULT OF HIS OPERATIONS.
- EXPOSED STRUCTURE AREAS (EXCLUDING MECHANICAL, ELECTRICAL, AND COMMUNICATIONS AREAS):** THE CONTRACTOR SHALL PROTECT ALL EXPOSED STRUCTURE WHEREVER POSSIBLE IN EXPOSED STRUCTURE CEILING AREAS, ROUTE ROUGHWAYS IN CONCEALED AREAS WHEREVER POSSIBLE. REFER ALL WORK TO THE ARCHITECT FOR REVIEW AND APPROVAL OF THE METHOD, WHICH CANNOT COMPLY WITH THESE REQUIREMENTS TO THE ARCHITECT.
4. **SUBMITTALS:** PROVIDE ORIGINAL ELECTRONIC PDF FORMAT, BOUND, BOOKMARKED (EACH SECTION AND PRODUCT), AND HIGHLIGHTED. JOB NAME AND SUBCONTRACTOR SHALL BE ON THE FRONT COVER. PREPARE INDEX OF EQUIPMENT SUBMITTED IN EACH TAB.
  5. **REFLECTED CEILING PLANS:** COORDINATE THE LOCATION OF LIGHT FIXTURES WITH THE ARCHITECTURAL REFLECTED CEILING PLANS. REFER ALL SUBMITTALS TO THE ARCHITECT FOR REVIEW AND APPROVAL.
- ALL WORK SHALL BE DONE ACCORDING TO THE CURRENT NATIONAL ELECTRIC CODE (NEC), NFPA 70, AND THE LOCAL CODES AND FINAL APPROVAL IS SUBJECT TO THE ON SITE FIELD INSPECTION OF THE A.H.U.**

## ELECTRICAL SHEET INDEX

EE001	SHEET INDEX, ABBREVIATIONS, AND GENERAL NOTES
EE003	TELECOM SCHEDULES AND NOTES
EE004	AUDIO VISUAL SCHEDULES AND NOTES
EE501	ELECTRICAL DETAILS
EE701	TYPICAL MOUNTING HEIGHT DETAILS
ED106	LEVEL 5 ELECTRICAL DEMOLITION PLAN
ED206	LEVEL 5 CEILING DEMOLITION PLAN
EP105	LEVEL 5 POWER PLAN
EP601	EQUIPMENT AND PANEL SCHEDULES
EL105	LEVEL 5 LIGHTING PLAN
EL601	INTERIOR LIGHTING FIXTURE SCHEDULE
EL602	LIGHTING CONTROL SCHEDULES
ET106	LEVEL 5 TELECOM PLAN
ET401	ENLARGED TELECOM PLANS
ET501	TELECOM EQUIPMENT RACK ELEVATIONS
ET302	TELECOM DETAILS
ET303	TELECOM EQUIPMENT RACK GROUNDING DETAIL
ET601	TELECOM RISER DIAGRAMS
ET105	LEVEL 5 AUXILIARY PLAN
EJ105	LEVEL 5 AV ROUGH-IN PLAN
FR601	AV ROUGH-IN SCHEDULES



REV	DATE	DESCRIPTION
1	11/07/2022	ADD #01

VCBO NUMBER: 22015  
CLIENT NUMBER: 00000  
DATE: 2022 10 25



CLINIC/HOSPITAL - CABLE/OUTLET COLOR SCHEDULE

COLOR	TYPE
BLUE	DATA
BLUE	IP SECURITY CAMERAS
YELLOW	WIRELESS

COPPER PATCH CORD SCHEDULE

(CATEGORY 6A F/UTP CABLES W/RJ-45 CONNECTORS)

LENGTH (FEET)	COLOR	QUANTITY	UNIT COST (EACH)
5'	BLUE	20% OF TOTAL PORTS IN TDR'S	
7'	BLUE	60% OF TOTAL PORTS IN TDR'S	
10'	BLUE	20% OF TOTAL PORTS IN TDR'S	

WIRELESS PATCH CORD PATCH CORD SCHEDULE

(CATEGORY 6A F/UTP W RJ/45 CONNECTORS)

LENGTH (METER)	COLOR	QUANTITY	UNIT COST (EACH)
7'	YELLOW	100% OF TOTAL PORTS IN TDR'S	

EQUIPMENT/CABLE LIST

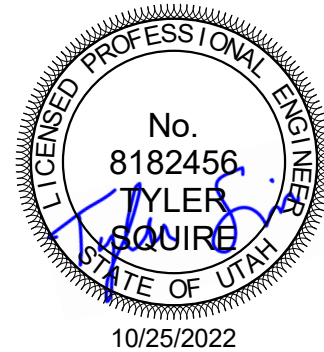
THE ITEMS INDICATED BELOW SHALL NOT BE CONSTRUED AS A "BILL OF MATERIALS". THIS LIST IDENTIFIES ITEMS OF SIGNIFICANCE USED DURING THE DESIGN OF THE CABLING INSTALLATION. WHERE THE ITEMS INDICATED ARE ONE PORTION OF AN ASSEMBLY, THE ENTIRE ASSEMBLY SHALL BE PROVIDED UNLESS SPECIFIED OTHERWISE. PROVIDE ALL MISCELLANEOUS HARDWARE AND SUPPORTS WHICH MAY NOT BE LISTED HERE. FOR A COMPLETE INSTALLATION, COMPARE CATALOG NUMBERS WITH DESCRIPTIONS AND NOTIFY ENGINEER OF DISCREPANCIES PRIOR TO BID. IF CATALOG NUMBERS DO NOT MATCH DESCRIPTIONS, THE DESCRIPTIONS TAKE PRECEDENCE. PROVIDE COMPLETE SUBMITTAL FOR APPROVAL PRIOR TO PURCHASING ANY EQUIPMENT OR CABLE. REFER TO SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

SYMBOL	ITEM DESCRIPTION	ACCEPTABLE TYPES
	STATION CABLE, DATA - CATEGORY 6A FUTP RISER, BLUE, DATA	SIEMON 9A6R4-A5-06-R1A
	STATION CABLE, DATA - CATEGORY 6A FUTP RISER, YELLOW, WIRELESS DATA	SIEMON 9A6R4-A5-05-R1A
	DATA OUTLET, SINGLE GANG FACEPLATE, WHITE, 4 POSITION	SIEMON 10GMX-FFS04-02
	CATEGORY 6A JACK - DATA, BLUE	SIEMON Z6A-S06
▽	BLANK INSERT, WHITE	SIEMON MX-BL-02
	DATA OUTLET, SINGLE GANG FACEPLATE, WHITE, 4 POSITION	SIEMON 10GMA-FFS04-02
▽	CATEGORY 6A JACK - DATA, BLUE	SIEMON Z6A-S06
	BLANK INSERT, WHITE	SIEMON MX-BL-02
F	DATA OUTLET, FURNITURE FACEPLATE, BLACK, 4 POSITION	SIEMON MX-UMA-01
▽	CATEGORY 6A JACK - DATA, BLUE	SIEMON Z6A-S06
	BLANK MODULE, BLACK	SIEMON MX-BL-01
3	DATA OUTLET, SINGLE GANG FACEPLATE, WHITE, 4 POSITION	SIEMON 10GMA-FFS04-02
↓	CATEGORY 6A JACK - DATA, BLUE	SIEMON Z6A-S06
	BLANK INSERT, WHITE	SIEMON MX-BL-02
↓	DATA OUTLET, SINGLE GANG FACEPLATE, WHITE, 4 POSITION	SIEMON 10GMA-FFS04-02
	CATEGORY 6A JACK - DATA, BLUE	SIEMON Z6A-S06
⏏	DATA OUTLET, SURFACE MOUNT BOX, WHITE, 2 POSITION	SIEMON MX-SMZ2-02
⏏	CATEGORY 6A JACK - DATA, YELLOW	SIEMON Z6A-S05
SPPT	48 PORT, 1RU JANGLE PATCH PANEL WITH OUTLETS	SIEMON Z6AS-PA-48
HWM2	HORIZONTAL WIRE MANAGERS, FRONT ONLY, 2RU, BLACK	PANDUIT NONHAEF2
VWM	VERTICAL WIRE MANAGERS, 10" WIDTH, DOUBLE SIDED, BLACK, 7"	CHATSORTH 40096-703
	EQUIPMENT RACK 19" x 7", 45 RU, BLACK	CHATSORTH 55053-703
	DATA CENTER CABINET, 45RU x 600mm x 1200mm, BLACK	DCE E4562120122001S
	CABLE RUNWAY - 24", BLACK WITH ALL REQUIRED MOUNTING ACCESSORIES	CHATSORTH 10250-724
	CABLE RUNWAY - 18", BLACK WITH ALL REQUIRED MOUNTING ACCESSORIES	CHATSORTH 10250-718
	BUTT SPLICE KIT, BLACK	CHATSORTH 11301-701
	JUNCTION SPLICE KIT, BLACK	CHATSORTH 11302-701
	FOOT KIT, BLACK	CHATSORTH 11309-701
	6" CHANNEL RACK TO RUNWAY, BLACK	CHATSORTH 12409-724
	TRIANGLE BRACKETS, BLACK	CHATSORTH 11746-724
	END CLOSING KIT, CABLE RUNWAY, BLACK	CHATSORTH 11700-724
	WALL ANGLE SUPPORT KIT, CABLE RUNWAY, BLACK	CHATSORTH 11421-724
	CABLE RUNWAY ELEVATION KIT, 6"	CHATSORTH 10506-706
	CABLE RUNWAY RADIUS DROP	CHATSORTH 12100-712

NOTE: ALL RACKS, LADDER, PATCH PANELS AND ACCESSORIES SHALL BE BLACK IN COLOR.

GENERAL PROJECT NOTES

- UNLESS OTHERWISE NOTED, INSTALL ALL CABLE INSIDE RACEWAY SYSTEMS. WHERE RACEWAY SYSTEMS HAVE NOT BEEN PROVIDED OR SPECIFIED, INSTALL CABLE THROUGH THE SPECIFIED "CADDY" CLIPS AT THE MINIMUM INTERVALS IDENTIFIED IN THE SPECIFICATIONS. SUPPORT "CADDY" CLIPS DIRECTLY FROM THE BUILDING STRUCTURE, NOT FROM OTHER BUILDING SYSTEM SUPPORT WIRES OR CABLE.
- PROVIDE PLENUM RATED CABLE IN ALL AIR PLENUMS. IF A PLENUM RATED CABLE IS NOT SPECIFIED, PROVIDE THE PLENUM RATED EQUIVALENT TO THE SPECIFIED CABLE.
- LABEL ALL CABLE INSTALLED UNDER THIS CONTRACT REGARDLESS OF LENGTH.
- THE EQUIPMENT LABELING IDENTIFIED ON DETAILS IN THESE DRAWINGS ARE EXAMPLES ONLY OF THE ACTUAL LABELING WHICH IS REQUIRED AS PART OF THIS CONTRACT. PRIOR TO FABRICATION, SUBMIT THE NOMENCLATURE FOR ALL LABELS TO THE OWNER FOR REVIEW. THIS REQUIREMENT INCLUDES BUT IS NOT LIMITED TO ALL CABLE LABELING, AND ALL EQUIPMENT LABELING.  
  
IF OUTLET IS TERMINATED IN CEILING SPACE, LABEL THE T-BAR GRID WITH THE OUTLET NUMBER FOR EASY LOCATION AND IDENTIFICATION.
- GROUND ALL EQUIPMENT RACKS INSTALLED UNDER THIS CONTRACT IN COMPLIANCE WITH THE CONTRACT DOCUMENTS.
- FOR EVERY CABLE PULL SPECIFIED, COIL 15' OF EXCESS CABLE AT THE STATION END FOR FUTURE USE. NEATLY COIL 15' ABOVE THE CEILING OR BELOW FLOOR WHERE APPLICABLE.
- PROVIDE THE QUANTITY OF PATCH PANELS REQUIRED +20% FOR THE TOTAL DATA OUTLETS SHOWN ON FLOOR PLANS FOR THE PARTICULAR LEVEL.
- RACK SPACE ALLOCATION SHOULD BE FOLLOWED PER DRAWINGS. IF YOU HAVE A SYSTEM THAT HAS NOT RACK ALLOCATION PLEASE CALL BOE SAUSEDO AT 801-707-3805.
- COORDINATE WITH ALL SUBS TO ENSURE THAT ALL CABLES ARE PROTECTED FROM ANY DIRECT PAINT, OR INCIDENTAL OVERSPRAY.
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REV	DATE	DESCRIPTION
1	11/07/2022	ADD #01

VCBO NUMBER:	22015
CLIENT NUMBER:	00000
DATE:	2022 10 25













CLASSIC AIR - VCT 5TH FLOOR REMODEL

INTERMOUNTAIN HEALTHCARE  
VALLEY CENTER TOWER - 5373 SOUTH GREEN STREET  
MURRAY, UTAH  
BID SET

TELECOM SCHEDULES  
AND NOTES

EE003



AV RACEWAY SYSTEMS SCHEDULE			
SYMBOL	DESCRIPTION	MOUNTING	SPECIAL INSTRUCTIONS
	JUNCTION BOX FOR TOUCH PANEL, 4-11/16" BOX WITH A 2-GANG MUD RING, MAXIMUM DEPTH FOR STUD SPACE	FLUSH IN THE WALL AT ELECTRICAL SWITCH HEIGHT	
	CONDUIT, 3/4" MINIMUM EMT	CONCEALED BEHIND FINISHED SURFACES, UNLESS NOTED OTHERWISE	REFER TO RISER DIAGRAMS FOR EXACT SIZES & QUANTITIES
 	JUNCTION BOX, 4-11/16" BOX W/ 1-GANG MUD RING, MINIMUM 3" DEEP	FLUSH IN THE WALL AT ELECTRICAL OUTLET HEIGHT	
	JUNCTION BOX, 4-11/16" BOX W/ 2-GANG MUD RING, MINIMUM 3" DEEP	FLUSH IN THE WALL AT ELECTRICAL OUTLET HEIGHT	
	POKE THROUGH, 6"	FLUSH IN FLOOR	SEE POWER PLANS FOR EXACT MAKE/MODEL
	JUNCTION BOX FOR LARGE SCREEN MONITOR, WITH TRIM RING AND COVER: FSR PBW-100	FLUSH IN THE WALL, COORDINATE MOUNTING HEIGHT WITH THE ELEVATION SHOWN IN THE ARCHITECTURAL DRAWINGS	
	FLAT PANEL MONITOR JUNCTION BOX, CHIEF PAC 526FCW	FLUSH IN THE WALL AT APPROXIMATELY 48" AFF TO CENTER TO BOX	PROVIDE STRUCTURAL BACKING, AND COORDINATE EXACT ELEVATION WITH OWNER
 	FLAT PANEL MONITOR JUNCTION BOX, CHIEF PAC 526FCW	FLUSH IN THE WALL AT APPROXIMATELY 48" AFF TO CENTER OF BOX	PROVIDE STRUCTURAL BACKING, AND COORDINATE EXACT ELEVATION WITH OWNER
	PTZ CAMERA LOCATION JUNCTION BOX, 4-11/16" BOX W/ 2-GANG MUD RING, MINIMUM 3" DEEP	FLUSH IN THE WALL AT 14" ABOVE MONITOR BACK BOX	ALIGN CENTER OF MONITOR AND CAMERA JUNCTION BOXES
	SPEAKER LOCATION	FLUSH IN FINISHED CEILING	EXISTING
	CEILING MOUNTED MICROPHONE	FLUSH IN FINISHED CEILING	FURNISHED AND INSTALLED BY AV INSTALLER
	EQUIPMENT RACK	CREDENZA MOUNTED	FURNISHED AND INSTALLED BY AV INSTALLER
	14.5" SQUARE JUNCTION BOX	FLUSH IN WALL BEHIND EQUIPMENT RACK AT AT ELECTRICAL OUTLET HEIGHT	

1. INSTALL ALL CONDUIT IN A CONCEALED FASHION. SURFACE MOUNTED CONDUIT WILL NOT BE ACCEPTED. CONDUITS AND BOXES ABOVE CEILING HEIGHT MAY BE INSTALLED EXPOSED AND PAINTED TO MATCH SURROUNDING EQUIPMENT.

2. MAINTAIN MAXIMUM SEPARATION BETWEEN A/V SYSTEM CONDUIT AND ALL POWER CONDUIT. MINIMUM SEPARATION REQUIREMENTS IS 24".

3. INSTALL NYLON PULL STRINGS IN ALL AV SYSTEM CONDUIT.

4. INSTALL ALL EQUIPMENT IN COMPLIANCE WITH THE MANUFACTURER'S WRITTEN INSTRUCTIONS, SEISMIC CODES, AND INDUSTRY WIDE ACCEPTED RIGGING PRACTICES. SUPPORT EQUIPMENT WEIGHT FROM STRUCTURE. DURING THE SUBMITTAL PROCESS, PROVIDE SHOP DRAWINGS WHICH DETAIL PROPOSED MOUNTING FOR ALL SUCH EQUIPMENT.

5. IF THE BOXES, ENCLOSURES, & CABINETS SPECIFIED ARE NOT PROVIDED FROM THE MANUFACTURER WITH THE REQUIRED KNOCK OUTS FOR THE SPECIFIED CONDUIT, FIELD CUT ALL REQUIRED KNOCK OUTS TO TERMINATE THE QUANTITY AND SIZES OF THE SPECIFIED CONDUITS.

6. ALL ROUGH-IN SHALL BE IN COMPLIANCE WITH ANSI/TIA/EIA 569-B WHICH INCLUDES, BUT IS NOT LIMITED TO, ALL CONDUITS HAVING NO MORE THAN TWO 90 DEGREE BENDS.

7. ALL CONDUIT FOR AV ROUGH-IN SHALL BE EMT.

8. ALL CONNECTION PANELS SHALL BE WITHIN 12" OF POWER AND DATA OUTLETS. NOTIFY ENGINEER IF DISCREPANCY IS FOUND.

9. ALL AV CONDUITS SHALL BE INSTALLED USING SHORTEST RUNS POSSIBLE. THERE SHOULD BE NO UNNECESSARY BENDS IN CONDUIT RUNS.

10. CONDUITS AND JUNCTION BOXES SHOWN NO RISER DIAGRAMS ARE TYPICAL FOR EACH DEVICE IN ROOM.

11. COVER ALL JUNCTION BOXES WITH A BLANK NYLON COVER PLATE.

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NOTE: ALL DEFINITIONS MAY NOT BE USED.

INDICATED: THE TERM "INDICATED" REFERS TO GRAPHIC REPRESENTATIONS, NOTES, OR SCHEDULES ON THE DRAWINGS, OTHER PARAGRAPHS OR SCHEDULES IN THE SPECIFICATIONS, AND SIMILAR REQUIREMENTS IN THE CONTRACT DOCUMENTS. WHERE TERMS SUCH AS "SHOWN", "NOTED", "SCHEDULED", AND "SPECIFIED" ARE USED, IT IS TO HELP THE READER LOCATE THE REFERENCE. NO LIMITATION ON LOCATION IS INTENDED.

DIRECTED: TERMS SUCH AS "DIRECTED", "REQUESTED", "AUTHORIZED", "SELECTED", "APPROVED", "REQUIRED", AND "PERMITTED" MEAN "DIRECTED BY THE ENGINEER", "REQUESTED BY THE ENGINEER", AND SIMILAR PHRASES.

APPROVE: THE TERM "APPROVED", WHERE USED IN CONJUNCTION WITH THE ENGINEER'S ACTION ON THE CONTRACTOR'S SUBMITTALS, APPLICATIONS, AND REQUESTS, IS LIMITED TO THE ENGINEER'S DUTIES AND RESPONSIBILITIES AS STATED IN GENERAL AND SUPPLEMENTARY CONDITIONS.

FURNISH: THE TERM "FURNISH" IS USED TO MEAN "SUPPLY AND DELIVER TO THE PROJECT SITE, READY FOR UNLOADING, UNPACKING, ASSEMBLY, INSTALLATION, AND SIMILAR OPERATIONS."

INSTALL: THE TERM "INSTALL" IS USED TO DESCRIBE OPERATIONS AT PROJECT SITE INCLUDING THE ACTUAL "UNLOADING, UNPACKING, ASSEMBLY, ERECTION, PLACING, ANCHORING, APPLYING, WORKING TO DIMENSION, FINISHING, CURING, PROTECTING, CLEANING, AND SIMILAR OPERATIONS."

PROVIDE: THE TERM "PROVIDE" MEANS "TO FURNISH AND INSTALL, COMPLETE AND READY FOR THE INTENDED USE."

INSTALLER: AN "INSTALLER" IS THE CONTRACTOR OR AN ENTITY ENGAGED BY THE CONTRACTOR, EITHER AS AN EMPLOYEE, SUBCONTRACTOR, OR SUB-SUBCONTRACTOR, FOR PERFORMANCE OF A PARTICULAR CONSTRUCTION ACTIVITY, INCLUDING INSTALLATION, ERECTION, APPLICATION, AND SIMILAR OPERATIONS. INSTALLERS ARE REQUIRED TO BE EXPERIENCED IN THE OPERATIONS THEY ARE ENGAGED TO PERFORM.

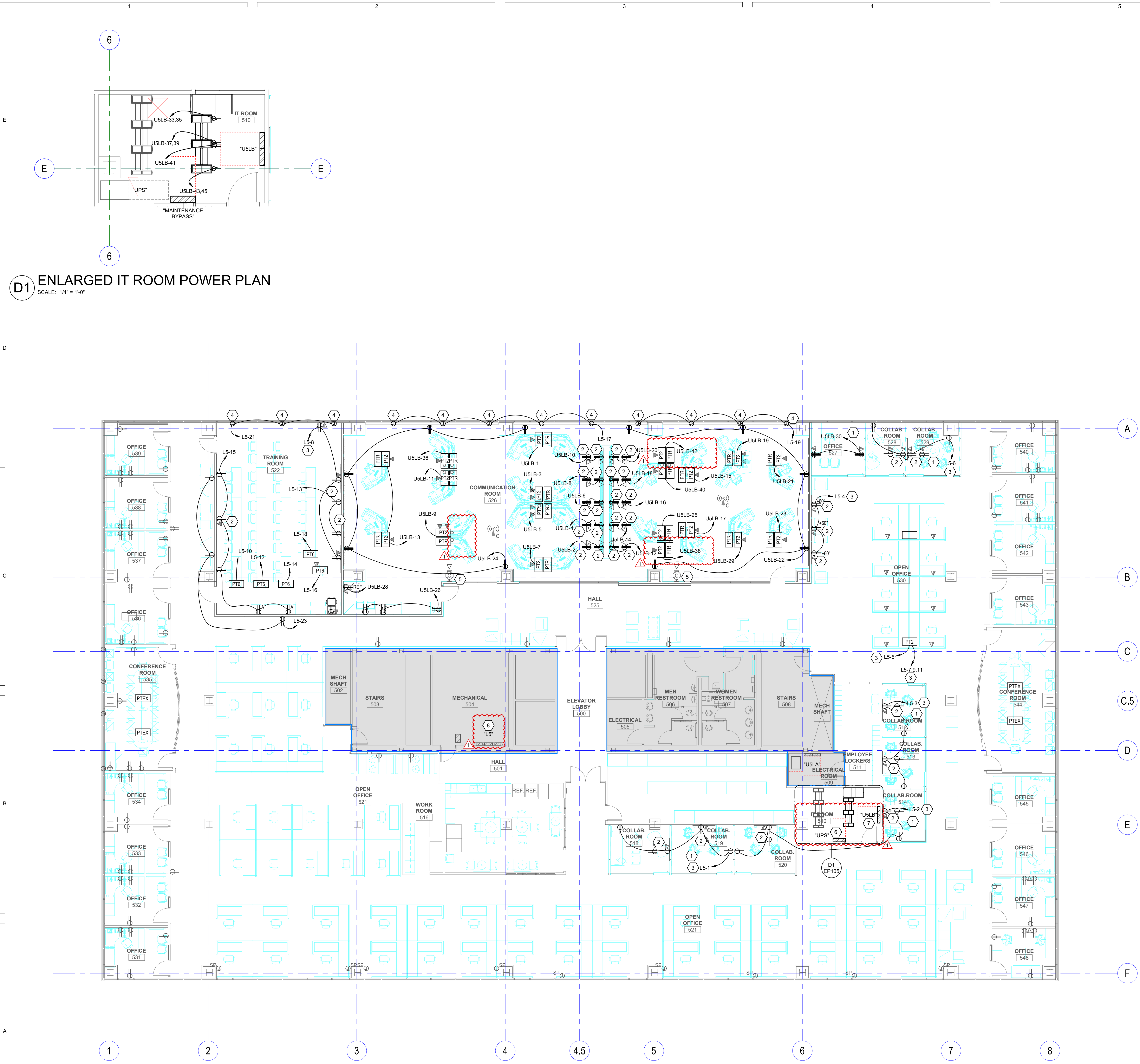
TECHNOLOGY SYSTEMS: THE TERM "TECHNOLOGY SYSTEMS" IS USED TO DESCRIBE ALL LOW VOLTAGE SYSTEMS GENERALLY REFERRED TO AS "SPECIAL SYSTEMS". THESE SYSTEMS INCLUDE BUT ARE NOT NECESSARILY LIMITED TO ALL SYSTEMS WHICH UTILIZE VOLTAGES OF LESS THAN 71 VOLTS SUCH AS SOUND SYSTEMS, VIDEO SYSTEMS, TV SYSTEMS, SECURITY SYSTEMS, VOICE AND DATA CABLING SYSTEMS, ETC. .

ABBREVIATIONS

NOTE: ALL ABBREVIATIONS MAY NOT BE USED.

"A"	AMP OR AMPS	"IG"	INSULATED GROUND
"ADJ"	ADJACENT	"IMC"	INTERMEDIATE METAL CND
"AFF"	ABOVE FINISHED FLOOR	"INIS"	INSULATED/ISOLATED
"AL"	ALUMINUM	"KVA"	KILO VOLT AMPERES
"CND"	CONDUIT	"KW"	KILOWATTS
"CB", "CBB"	CIRCUIT BREAKER	"LFMC"	LIQUID TIGHT FLEXIBLE METAL CONDUIT
"CKT"	CIRCUIT		
"CO"	CONVENIENCE OUTLET	"LFNC"	LIQUID TIGHT FLEXIBLE NONMETALLIC CONDUIT
"C.O.R."	CONTRACTING OFFICER'S REPRESENTATIVE	"MCA"	MINIMUM CIRCUIT AMPS
"CU"	COPPER	"MLO"	MAIN LUGS ONLY
"EA"	EACH	"NC"	NORMALLY CLOSED
"ELEC"	ELECTRICAL	"N.I.C."	NOT IN CONTRACT
"EM"	EMERGENCY	"NO"	NORMALLY OPEN
"EMT"	ELECTRICAL METALLIC TUBING	"OC"	ON CENTER
"ENT"	ELECTRICAL NONMETALLIC TUBING	"OCP"	OVER CURRENT PROTECTION
"EQUIP"	EQUIPMENT	"QTY"	QUANTITY
"EX"	EXISTING	"R"	REMOVE
"FA"	FIRE ALARM	"RMC"	RIGID METAL CONDUIT
"FACP"	FIRE ALARM CONTROL PANEL	"RNC"	RIGID NONMETALLIC CONDUIT
"FLA"	FULL LOAD AMPS	"RR"	REMOVE AND RELOCATE
"FMC"	FLEXIBLE METAL CONDUIT	"TYP"	TYPICAL
"F.O.B."	FREIGHT ON BOARD	"UF"	UNDER FLOOR
"GFI"	GROUND FAULT INTERRUPTER	"UG"	UNDER GROUND
"GR"	GROUND	"W"	WITH
"HOA"	HAND-OFF-AUTO	"WP"	WEATHER PROOF
"HP"	HORSE POWER	"XFMR"	TRANSFORMER





**A1** LEVEL 5 POWER PLAN  
SCALE: 1/8" = 1'-0"

**GENERAL SHEET NOTES**

**SHEET KEYNOTES**

1 RECEPTACLES AND ELECTRICAL DEVICES IN OFFICES AND CONFERENCE ROOMS IN THIS AREA WILL BE MOUNTED IN FULL HEIGHT DEMOUNTABLE PARTITIONS. RUN CIRCUITS TO JUNCTION BOXES MOUNTED TO FLOOR DECK ABOVE, AND CONNECT TO PARTITION WHIPS AS REQUIRED. COORDINATE EXACT REQUIREMENTS AND FINAL CONNECTIONS WITH PARTITION INSTALLERS PRIOR TO ROUGH-IN.

2 PROVIDE POWER AND DATA FOR AV MONITOR. COORDINATE EXACT LOCATION WITH ARCHITECT AND AV INSTALLER PRIOR TO ROUGH-IN.

3 FIELD VERIFY AVAILABLE CIRCUIT BREAKERS AFTER DEMOLITION HAS BEEN COMPLETED. PROVIDE UPDATED TYPEWRITTEN PANEL SCHEDULES AT THE COMPLETION OF THE PROJECT.

4 PROVIDE ELECTRICAL CONNECTIONS TO MOTORIZED SHADES. PROVIDE WIRING AND CONTROLS PER THE MANUFACTURER'S WRITTEN INSTRUCTIONS. PROVIDE AND INSTALL CONTROL SWITCH IN LOCATION APPROVED BY THE ARCHITECT. RUN ALL CONTROL WIRING BACK TO NEAREST DATA ROOM. COORDINATE EXACT LOCATIONS AND REQUIREMENTS WITH ARCHITECT AND SHADE INSTALLERS PRIOR TO ROUGH-IN.

5 PROVIDE POE WALL CLOCK IN LOCATIONS AND QUANTITIES SHOWN ON ARCHITECTURAL ELEVATIONS. PROVIDE MCMASTER-CARR 1091N11 OR SUBMIT EQUIVALENT FOR ARCHITECTURAL APPROVAL PRIOR TO FINAL ADDENDUM.

6 OWNER FURNISHED UPS AND MAINTENANCE BYPASS PANEL. EQUIPMENT IS TO BE INSTALLED BY THE CONTRACTOR IN THE LOCATIONS SHOWN. COORDINATE WITH OWNER'S IT TEAM FOR ROUGH-IN AND INSTALLATION REQUIREMENTS. FEED UPS AND MAINTENANCE BYPASS WITH 4 #1, #6 GR IN 1.5" CND FROM PANEL L5. PROVIDE TWO NEW 100A/3P CIRCUIT BREAKERS (ONE EACH FOR UPS AND MAINTENANCE BYPASS).

7 NEW 120/208V, 42 CIRCUIT, 100A PANELBOARD WITH 100A MAIN BREAKER. FEED PANEL WITH 4 #1, #6 GR IN 1.5" CND FROM UPS VIA MAINTENANCE BYPASS.

8 EXISTING PANEL TO REMAIN.

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TYLER SQUIRE  
STATE OF UTAH  
10/25/2022

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REV	DATE	DESCRIPTION
1	11/07/2022	ADD #01

**VCBO NUMBER:** 22015  
**CLIENT NUMBER:** 00000  
**DATE:** 2022.10.25

**CLASSIC AIR - VCT 5TH FLOOR REMODEL**  
INTERMOUNTAIN HEALTHCARE  
VALLEY CENTER TOWER - 5373 SOUTH GREEN STREET  
MURRAY, UTAH  
BID SET

**LEVEL 5 POWER PLAN**  
**EP105**



## FLOORBOX SCHEDULE

## ABBREVIATIONS

COMPARTMENT GANG	RATINGS	USE	CONNECTION
- NOT APPLICABLE A/V - AV CONNECTIONS, REFER TO AV DRAWINGS/SPECIFICATIONS D - DATA RECEPTACLE DR - DUPLEX RECEPTACLE QR - QUADRAPLEX RECEPTACLE	2H - 2-HOUR FIRE RATED, UL LISTED	CF - CONCRETE FLOOR	C1 - RECESSED CABLE CONNECTIONS BELOW FLOOR WITH HINGED LID FOR ACCESS THAT CAN BE CLOSED WHILE IN USE.
		FINISH AL - ALUMINUM	

## NOTES:

- 1 PROVIDE ALL REQUIRED HARDWARE FOR COMPLETE INSTALLATION.
- 2 INCLUDE SEPARATION BARRIER BETWEEN SYSTEMS AND POWER.

## COVER

- CV1 - FLANGED WITH CARPET INSERT FOR CARPET AREAS, FLANGELESS FLUSH GRAY BRUSHED ALUMINUM LID

ID	DESCRIPTION	DIMENSIONS		COMPARTMENTS								RATINGS	USE	CONNECTION	COVER	FINISH	MANUFACTURER 1	PART #	MANUFACTURER 2	PART #	NOTE S
		LENGTH	WIDTH	DEPTH	GANG 1	GANG 2	GANG 3	GANG 4	GANG 5	GANG 6	GANG 7	GANG 8									
PT2	COMMUNICATION ROOM POWER AND DATA POKE-THRU. PROVIDE TWO 4-JACK KEYSTONE MOUNTING PLATES.	-	6"	18"	DR	DR	DR	DR	DR	DR	DR	DR	2H	CF	C1	CV1	AL	HUBBELL	S1R6P TFIT-S 1R6SP W-S1R 6SP2- NS614 W-S1R 6CVRX XX	WIREMOL D	-
PT6	6" POWER, DATA & AV POKE-THRU	-	6"	18"	DR	DR	DR	DR	DR	DR	DR	DR	2H	CF	C1	CV1	AL	HUBBELL	S1R6P TFIT-S 1R6SP W-S1R 6SP2- NS614 W-S1R 6CVRX XX	WIREMOL D	-
PTR	COMMUNICATION ROOM RADIO CABLING POKE-THRU. FURNITURE FEED COVER. NO POWER REQUIRED.	-	6"	18"	-	-	-	-	-	-	-	-	2H	CF	C1	CV1	AL	HUBBELL	S1R6P TFIT-S 1R6SP W-S1R 6SP2- NS614 W-S1R 6CVRX XX	WIREMOL D	-

## EQUIPMENT SCHEDULE

EQUIPMENT SCHEDULE KEY E - DIVISION 26 Q - FURNISHED WITH EQUIPMENT + - COORDINATE WITH THE DIVISION 23 TEMPERATURE CONTROL INSTALLER ** - AUTOMATIC CONTROL WIRING BY DIVISION 23										NOTES: 1. NEMA 3R 2. TOGGLE SWITCH W/ THERMAL OVERLOAD 3. PROVIDE FUSED DISCONNECT ELEVATOR POWER MODULE WITH SHUNT TRIP. 4. CONTRACTOR TO PERFORM FINAL CONNECTION TO LINE VOLTAGE THERMOSTATS. 5. TOGGLE SWITCH W/BACNET INTERFACE 6. INDOOR UNITS FED FROM OUTDOOR UNIT. PROVIDE DISCONNECTS FOR BOTH. 7. PROVIDE SWITCH WITH BACNET MS/TP CAPABILITY. 8. PROVIDE LABEL ON DISCONNECT "DISCONNECT OUTDOOR UNIT PRIOR TO INDOOR." 9. LINE VOLTAGE THERMOSTAT ON WALL. 10. PROVIDE EXPLOSION PROOF DEVICES AND WIRING METHODS. 11. PROVIDE DUAL-REDUNDANT 100% RATED VFD'S FOR AIR HANDLER. 12. PROVIDE MANUAL STARTER WITH THERMAL OVERLOAD AND RELAY FOR ATC/BAS CONTROL.										GENERAL NOTES: 1. WHERE DISCONNECTS, STARTERS, OR VFDs ARE BEING PROVIDED BY ELECTRICAL CONTRACTOR, LOCATE EQUIPMENT IN ACCESSIBLE LOCATION, SUCH THAT IT IS WITHIN SITE OF THE MECHANICAL EQUIPMENT IT IS SERVING, AND COMPLIES WITH N.E.C. REQUIRED CLEARANCES.									
MARK	QTY	ITEM DESCRIPTION	LOAD DATA						WIRE AND CONDUIT SIZE	OVERCURRENT PROTECTION			DISCONNECT			STARTER					NOTES	MARK							
			HP	KW	MCA	FLA	VOLT	PH		Hz	FURN BY	DEVICE	LOCATION	FURN BY	DEVICE	LOCATION	FURN BY	DEVICE	SIZES	SELECTOR SWITCH			PILOT LAMP	NORMALLY OPEN CONTACT	NORMALLY CLOSED CONTACT	PHASE FAILURE RELAY			

NEW PANEL: "U5LB"																								
VOLTS/PHASE/WIRE:					PANEL SIZE & TYPE:					MAIN SIZE AND TYPE:					FED FROM:		CABINET:		LOCATION:		NOTES:			
120/208V, 3 PH 4 WIRE					22" W x 6" D, BOLT-ON					225 AMPERE MAIN LUGS							SURFACE		IT ROOM 510					
ACCESSORIES:										PANEL DIRECTORY, IDENTIFICATION, GROUNDING BAR										A/C RATING: 0				
CKT NO	AMP	POLE	BKR	LTG	PWR	CO	DESCRIPTION	A	B	C	DESCRIPTION	CO	PWR	LTG	BKR	POLE	AMP	CKT NO						
1	20	1			0.0	0.0	0.4	PWR: COMMUNICATION ROOM...	0.4	1.0		PWR: COMMUNICATION ROOM 526...	0.0	1.0	0.0		1	20	2					
3	20	1			0.0	0.0	0.4	PWR: COMMUNICATION ROOM...		0.4	1.0	PWR: COMMUNICATION ROOM 526...	0.0	1.0	0.0		1	20	4					
5	20	1			0.0	0.0	0.4	PWR: COMMUNICATION ROOM...			0.4	1.0	PWR: COMMUNICATION ROOM 526...	0.0	1.0	0.0		1	20	6				
7	20	1			0.0	0.0	0.4	PWR: COMMUNICATION ROOM...	0.4	1.0		PWR: COMMUNICATION ROOM 526...	0.0	1.0	0.0		1	20	8					
9	20	1			0.0	0.0	0.4	PWR: COMMUNICATION ROOM...		0.4	1.0	PWR: COMMUNICATION ROOM 526...	0.0	1.0	0.0		1	20	10					
11	20	1			0.0	0.0	0.4	PWR: COMMUNICATION ROOM...	0.4	1.0		PWR: COMMUNICATION ROOM 526...	0.0	1.0	0.0		1	20	12					
13	20	1			0.0	0.0	0.4	PWR: COMMUNICATION ROOM...		0.4	1.0	PWR: COMMUNICATION ROOM 526...	0.0	1.0	0.0		1	20	14					
15	20	1			0.0	0.0	0.4	PWR: COMMUNICATION ROOM...	0.4	1.0		PWR: COMMUNICATION ROOM 526...	0.0	1.0	0.0		1	20	16					
17	20	1			0.0	0.0	0.4	PWR: COMMUNICATION ROOM...			0.4	1.0	PWR: COMMUNICATION ROOM 526...	0.0	1.0	0.0		1	20	18				
19	20	1			0.0	0.0	0.4	PWR: COMMUNICATION ROOM...	0.4	1.0		PWR: COMMUNICATION ROOM 526...	0.0	1.0	0.0		1	20	20					
21	20	1			0.0	0.0	0.4	PWR: COMMUNICATION ROOM...		0.4	0.9	CO: COMMUNICATION ROOM 526...	0.9	0.0	0.0		1	20	22					
23	20	1			0.0	0.0	0.4	PWR: COMMUNICATION ROOM...			0.4	0.9	CO: COMMUNICATION ROOM 526...	0.9	0.0	0.0		1	20	24				
25	20	1			0.0	0.0	0.4	PWR: COMMUNICATION ROOM...	0.4	0.4		CO: COMMUNICATION ROOM 526...	0.4	0.0	0.0		1	20	26					
27	20	1	--	--	--	--	SPARE		0.0	0.8		PWR: COMMUNICATION ROOM 526...	0.0	0.8	0.0		1	20	28					
29	20	1			0.0	0.0	0.4	PWR: COMMUNICATION ROOM...		0.4	0.5	CO: OFFICE 527	0.5	0.0	0.0		1	20	30					
31	20	1	--	--	--	--	SPARE					SPARE	--	--	--		1	20	32					
33	20	2			0.0	2.1	0.0	PWR: IT ROOM 510		1.0	0.0	SPARE	--	--	--		1	20	34					
35	--	--	--	--	--	--	--	--		1.0	0.2	PWR: COMMUNICATION ROOM 526...	0.2	0.0	0.0		1	20	36					
37	20	2			0.0	2.1	0.0	PWR: IT ROOM 510	1.0	0.4		PWR: COMMUNICATION ROOM 526...	0.4	0.0	0.0		1	20	38					
39	--	--	--	--	--	--	--	--		1.0	0.2	PWR: COMMUNICATION ROOM 526...	0.2	0.0	0.0		1	20	40					
41	20	1			0.0	0.0	0.2	CO: IT ROOM 510		0.2	0.4	PWR: COMMUNICATION ROOM 526...	0.4	0.0	0.0		1	20	42					
43	20	2			0.0	2.1	0.0	PWR: IT ROOM 510	1.0	0.0		SPARE	--	--	--		1	20	44					
45	--	--	--	--	--	--	--	--		1.0	0.0	SPARE	--	--	--		1	20	46					
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57	20	1	--	--	--	--	SPARE		0.0	0.0		SPARE	--	--	--		1	20	58					
59	20	1	--	--	--	--	SPARE		0.0	0.0		SPARE	--	--	--		1	20	60					
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63	20	1	--	--	--	--	SPARE		0.0	0.0		SPARE	--	--	--		1	20	64					
65	20	1	--	--	--	--	SPARE		0.0	0.0		SPARE	--	--	--		1	20	66					
67	20	1	--	--	--	--	SPARE		0.0	0.0		SPARE	--	--	--		1	20	68					
69	20	1	--	--	--	--	SPARE		0.0	0.0		SPARE	--	--	--		1	20	70					
71	20	1	--	--	--	--	SPARE		0.0	0.0		SPARE	--	--	--		1	20	72					
73	20	1	--	--	--	--	SPARE		0.0	0.0		SPARE	--	--	--		1	20	74					
75	20	1	--	--	--	--	SPARE		0.0	0.0		SPARE	--	--	--		1	20	76					
77	20	1	--	--	--	--	SPARE		0.0	0.0		SPARE	--	--	--		1	20	78					
79	20	1	--	--	--	--	SPARE		0.0	0.0		SPARE	--	--	--		1	20	80					
81	20	1	--	--	--	--	SPARE		0.0	0.0		SPARE	--	--	--		1	20	82					
83	20	1	--	--	--	--	SPARE					SPARE	--	--	--		1	20	84					
TOTALS:								CONNECTED KVA PER PHASE			9	9	8	CONNECTED TOTAL KVA =			26							
								CONNECTED AMP PER PHASE			72	79	67	AVERAGE CONNECTED AMP PER PHASE =			76							
NEC DIVERSIFIED LOAD CALCULATIONS																								
LIGHTING & CONTINUOUS LOADS:										- 100% CONNECTED LOAD PLUS 25%										DIVERSIFIED TOTAL KVA = 26				
RECEPTACLES: 9.0 kVA @ 100% = 9.0 kVA										- FIRST 10kVA @ 100%, REMAINDER @ 50%										AVERAGE AMP PER PHASE = 72				
ALL OTHER LOADS @ 100% = 17.0 kVA										- MOTOR TOTALS INCLUDED IN ALL OTHER LOADS WITH LARGEST MOTOR CALCULATED @ 125% PER NEC														
BKR: GF-AFCI, GF3=30mA GFCI CAPABLE OF BEING LOCKED OUT IN OPEN POSITION, IG=ISOLATED GROUND, AF=AFCI, ST=SHUNT TRIP, RED=PROVIDE RED COLORED BREAKER, AF=ARC FAULT CURRENT INTERRUPTER, GA=COMBINATION OF GROUND FAULT AND ARC FAULT CIRCUIT INTERRUPTER, GS=COMBINATION OF SHUNT TRIP WITH GFCI																								





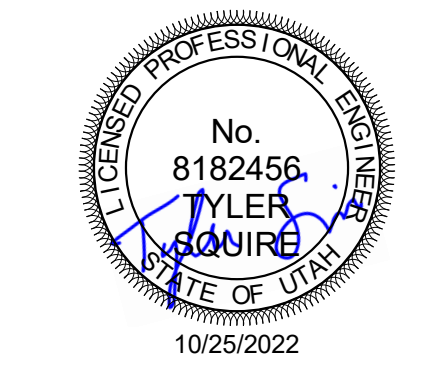
**A1** LEVEL 5 LIGHTING PLAN  
SCALE: 1/8" = 1'-0"

**GENERAL SHEET NOTES**

1 DEVICES MARKED 'R' ARE RELOCATED EXISTING DEVICES AS INDICATED. REFER TO DEMOLITION PLANS FOR MORE INFORMATION. EXTEND CIRCUITING AS REQUIRED.

**SHEET KEYNOTES**

1 LIGHT SWITCH TO BE MOUNTED IN FULL HEIGHT DEMOUNTABLE PARTITION. COORDINATE TERMINATION AND CONNECTIONS TO ROOM CONTROLLERS WITH PARTITION INSTALLERS PRIOR TO ROUGH-IN.

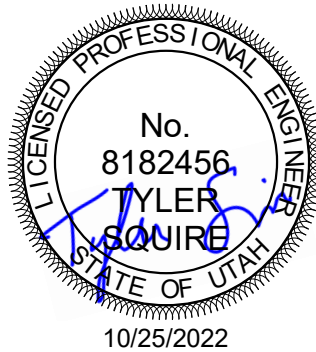
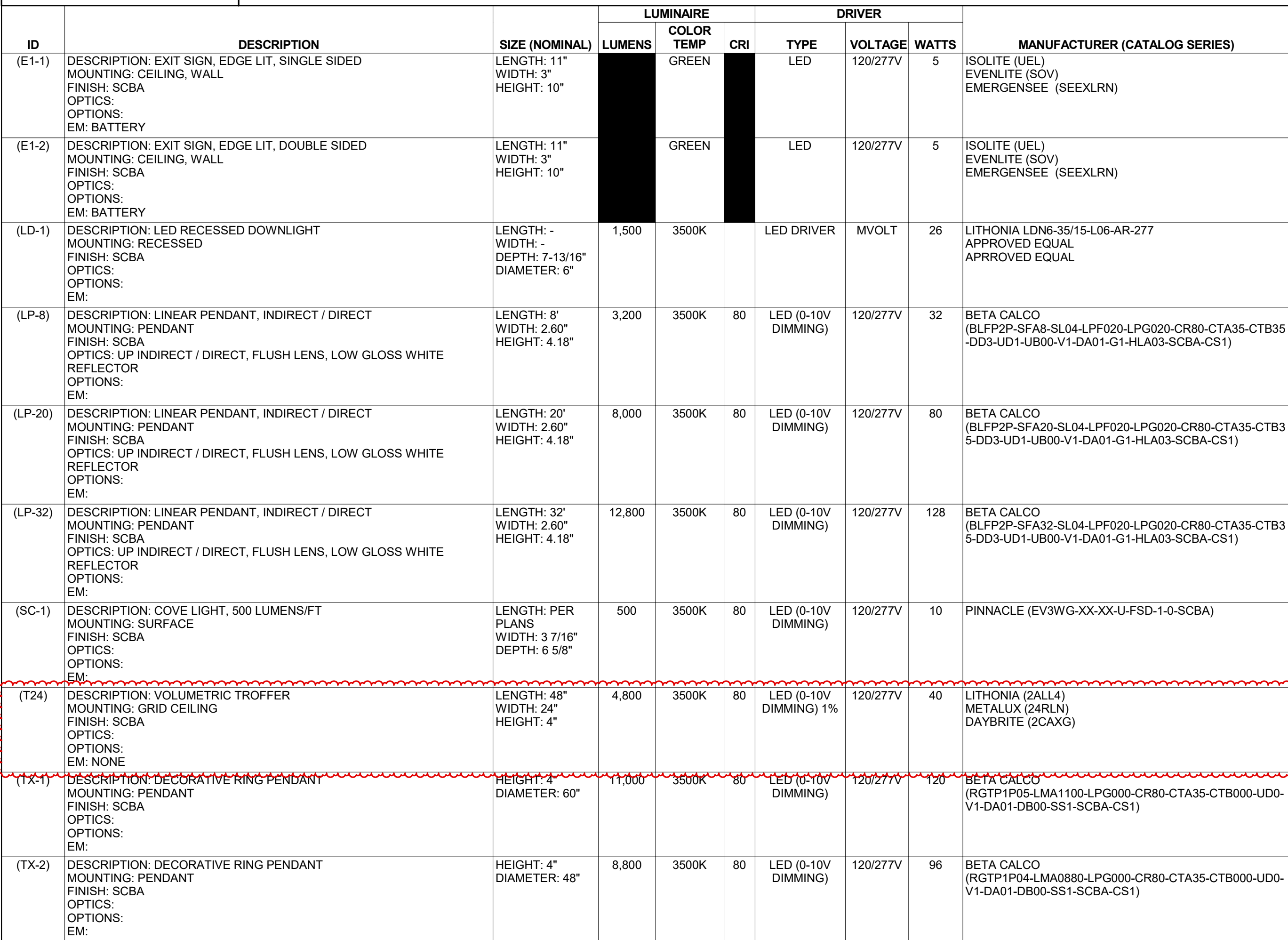


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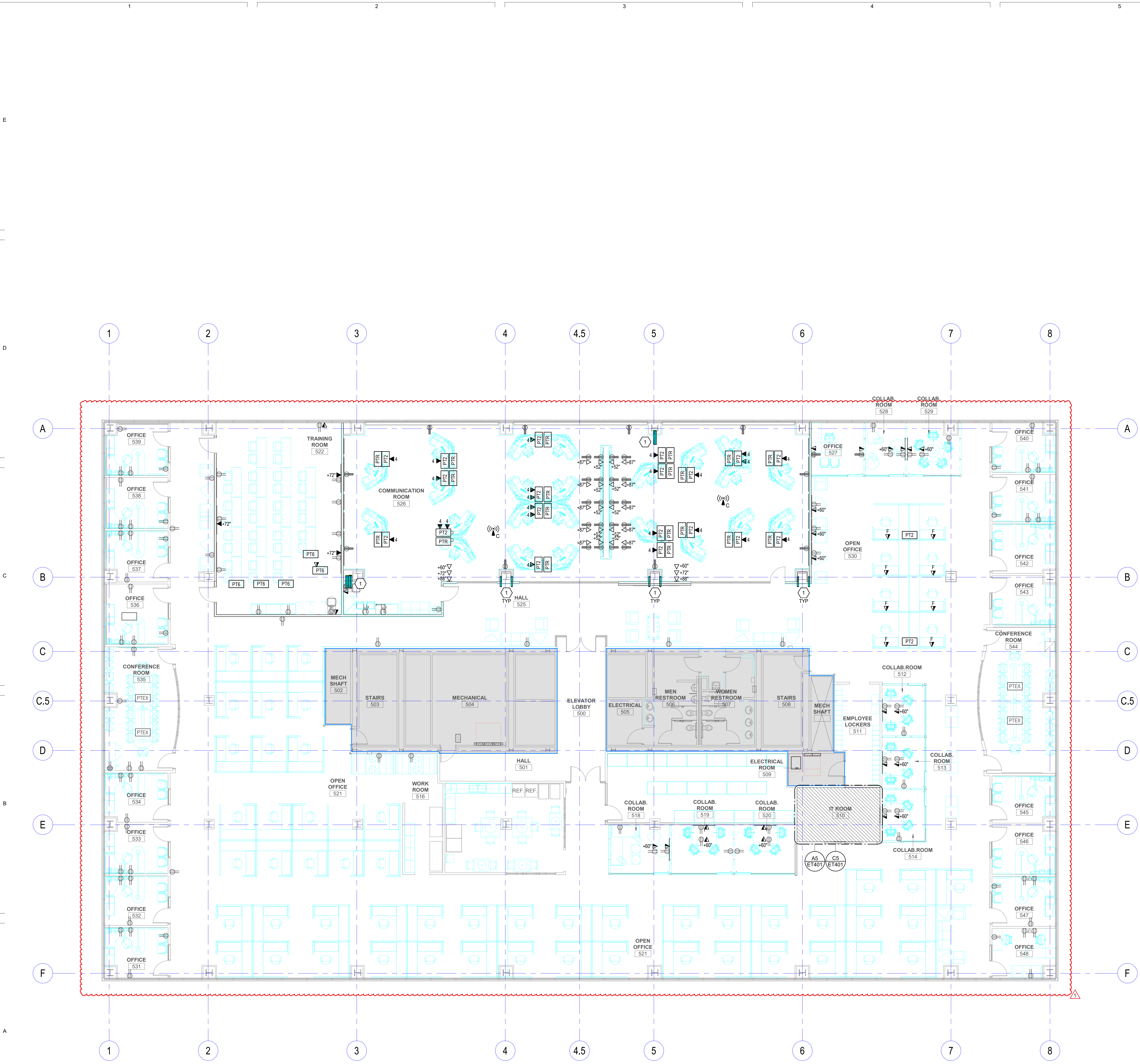
**CLASSIC AIR - VCT 5TH FLOOR REMODEL**  
INTERMOUNTAIN HEALTHCARE  
VALLEY CENTER TOWER - 5373 SOUTH GREEN STREET  
MURRAY, UTAH  
BID SET

	GENERAL NOTES
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VCBO NUMBER: 22015  
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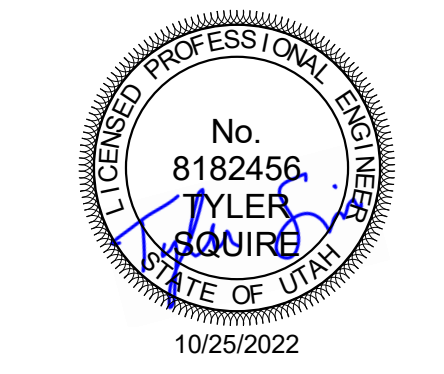
**A1** LEVEL 5 TELECOM PLAN  
SCALE: 1/8" = 1'-0"

**GENERAL SHEET NOTES**

1. CONTRACTOR IS TO FOLLOW ALL EXISTING CABLE TRAY PATHWAYS. IF NO EXISTING PATHWAY IS AVAILABLE CONTRACTOR IS TO INSTALL J-HOOKS MOUNTED DIRECTLY TO THE STRUCTURE.

**SHEET KEYNOTES**

1. 3" CONDUIT ARE FOR DATA CABLES ONLY AND ARE TO REMAIN FREE OF ALL OTHER CABLE TYPES.

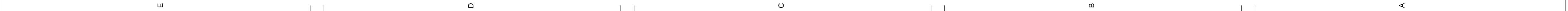
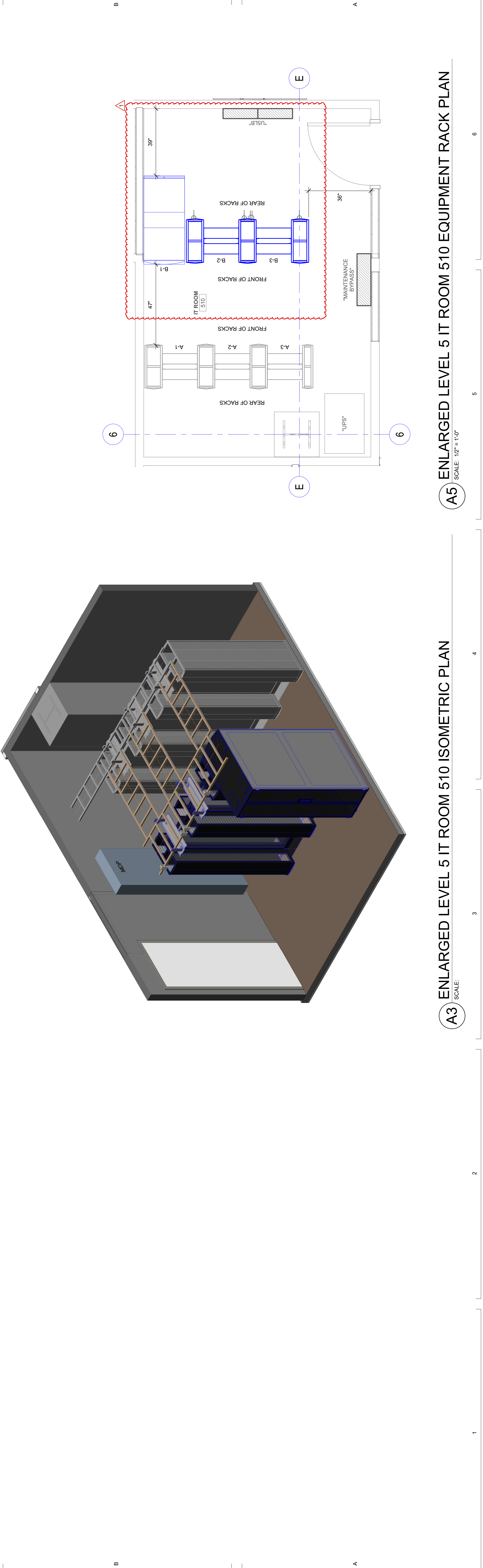
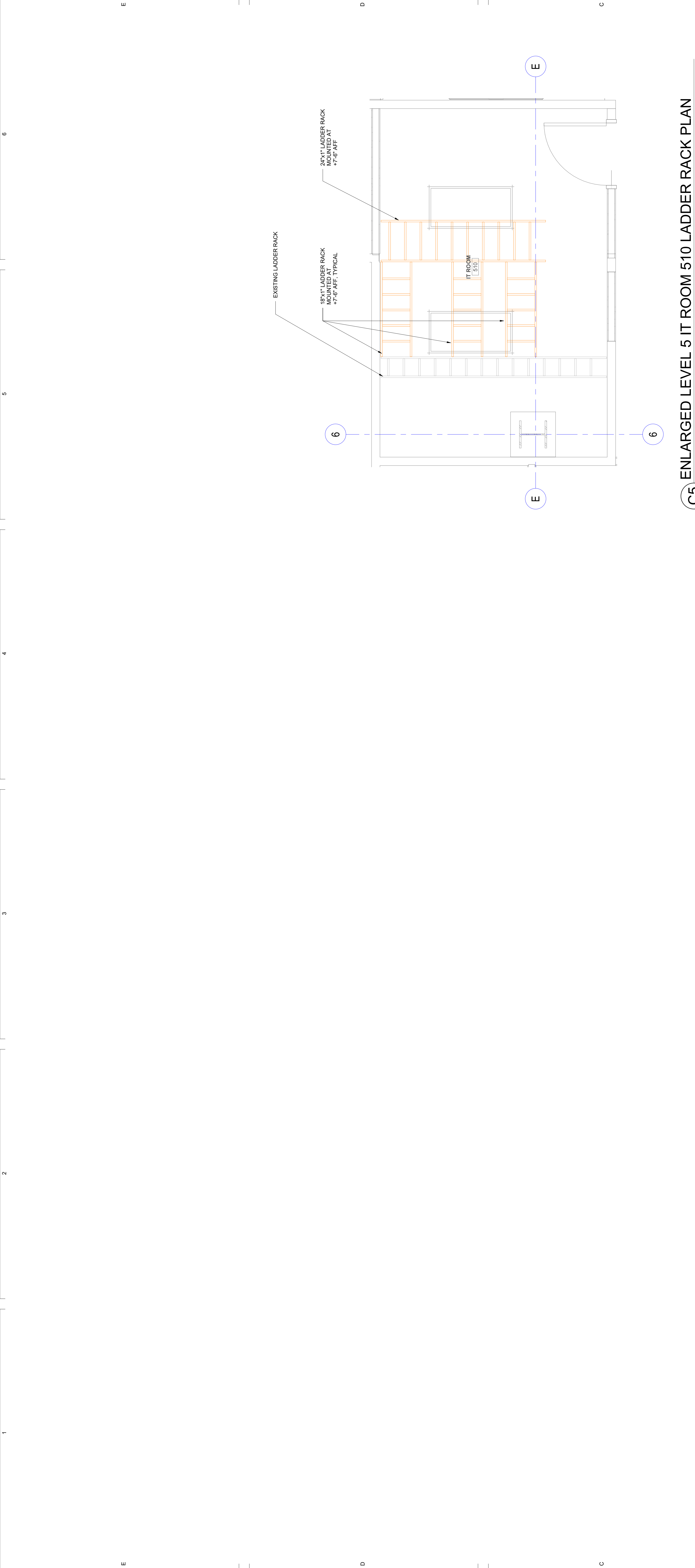


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**CLASSIC AIR - VCT 5TH FLOOR REMODEL**  
INTERMOUNTAIN HEALTHCARE  
VALLEY CENTER TOWER - 5373 SOUTH GREEN STREET  
MURRAY, UTAH  
BID SET









6

5

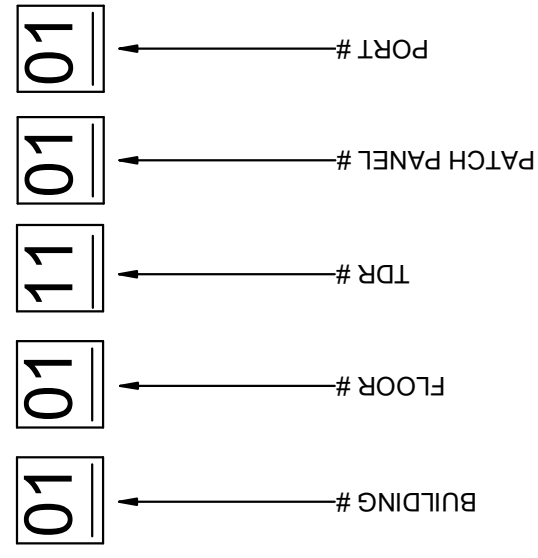
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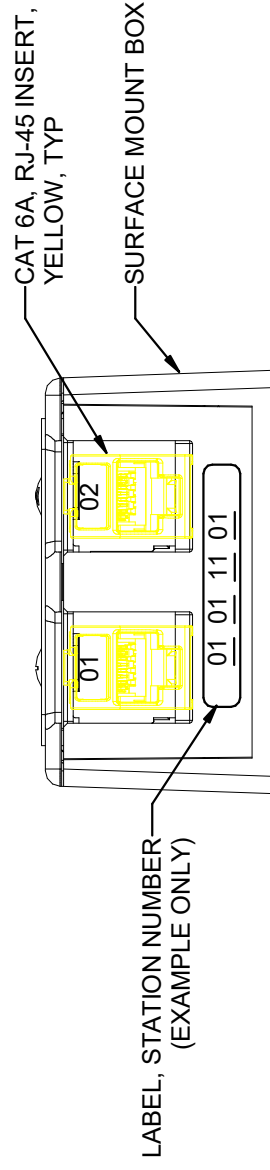
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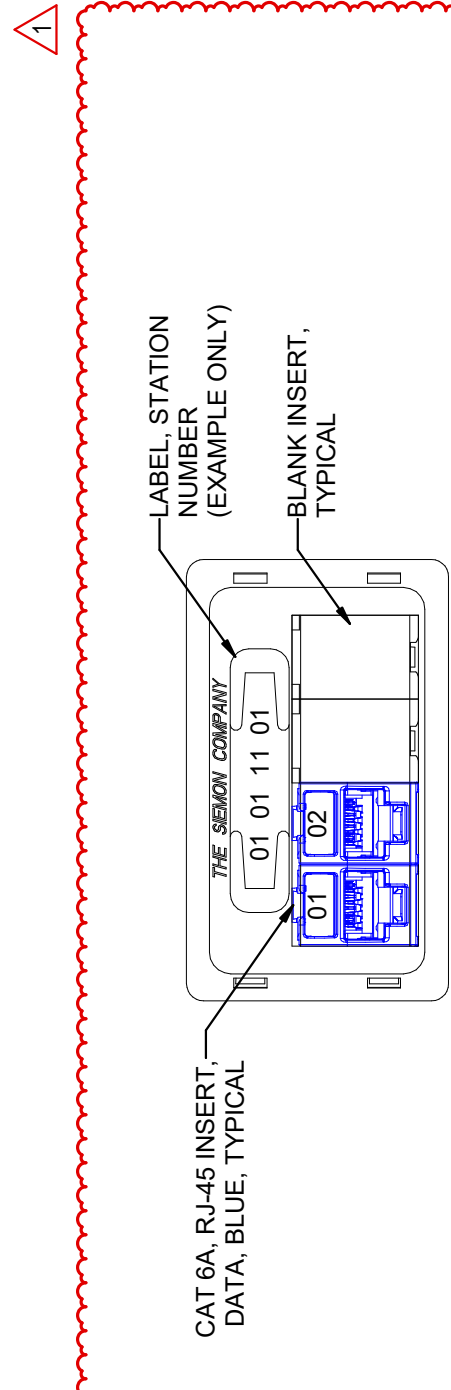
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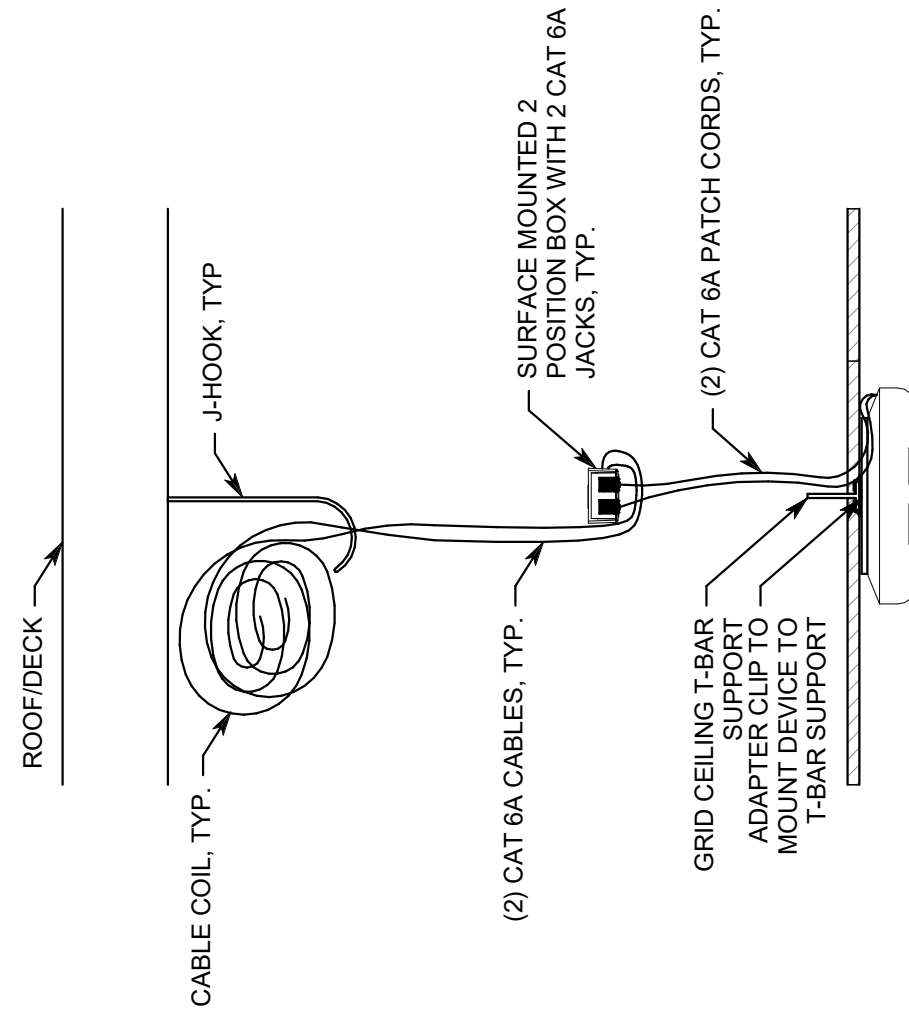
**E5** TYPICAL CABLE ID EXAMPLE DETAIL  
SCALE: NTS



**D5** TYPICAL 2-PORT WIRELESS ACCESS POINT  
SCALE: NTS

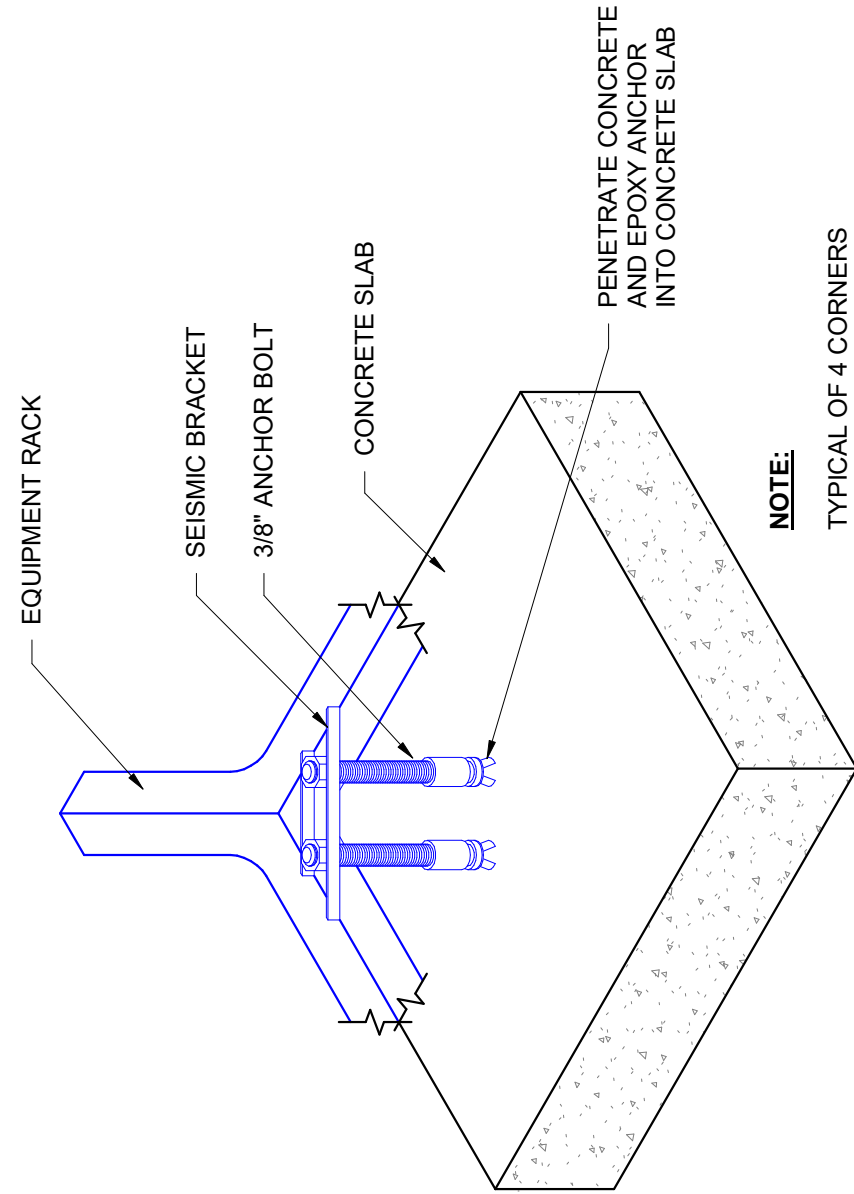


**C5** TYPICAL 2-PORT FURNITURE DATA OUTLET  
SCALE: NTS

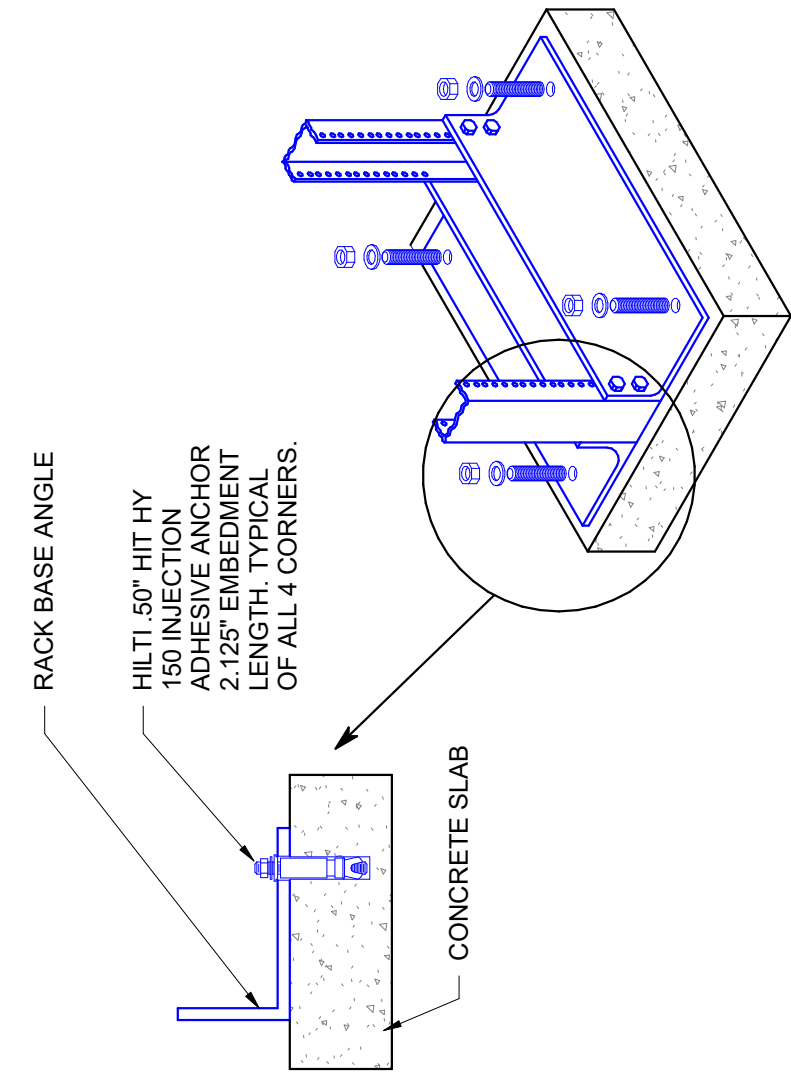


**T-BAR MOUNT**

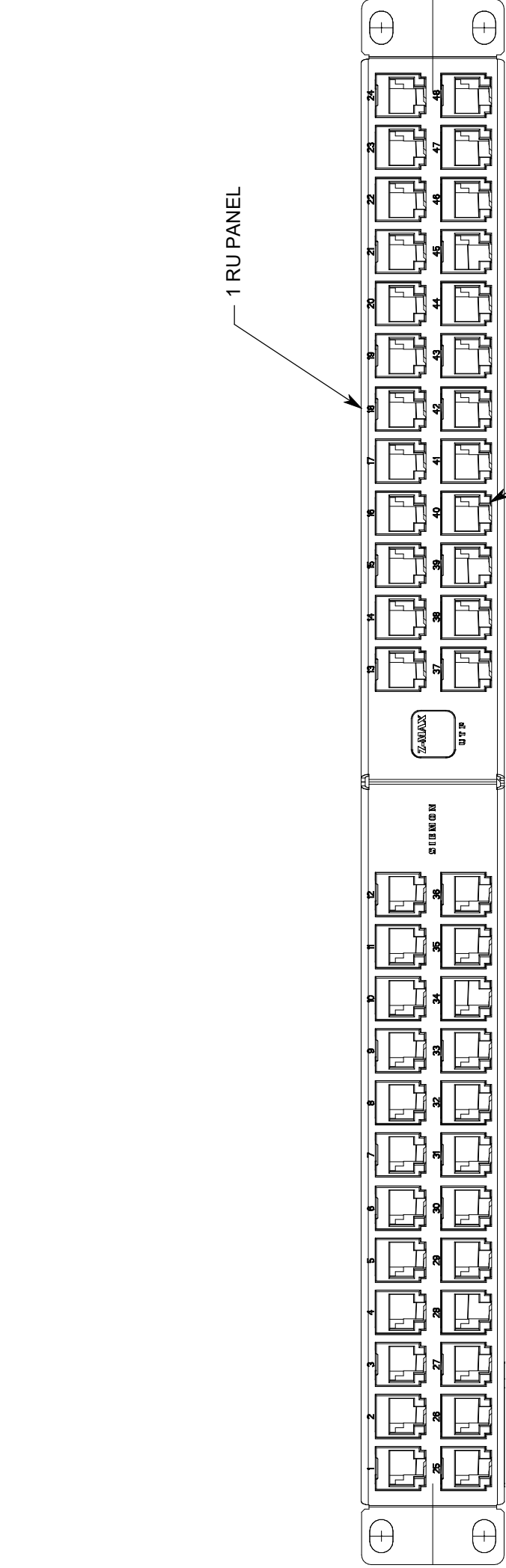
**B3** WIRELESS ACCESS POINT MOUNTING DETAIL (T-BAR)  
SCALE: NTS



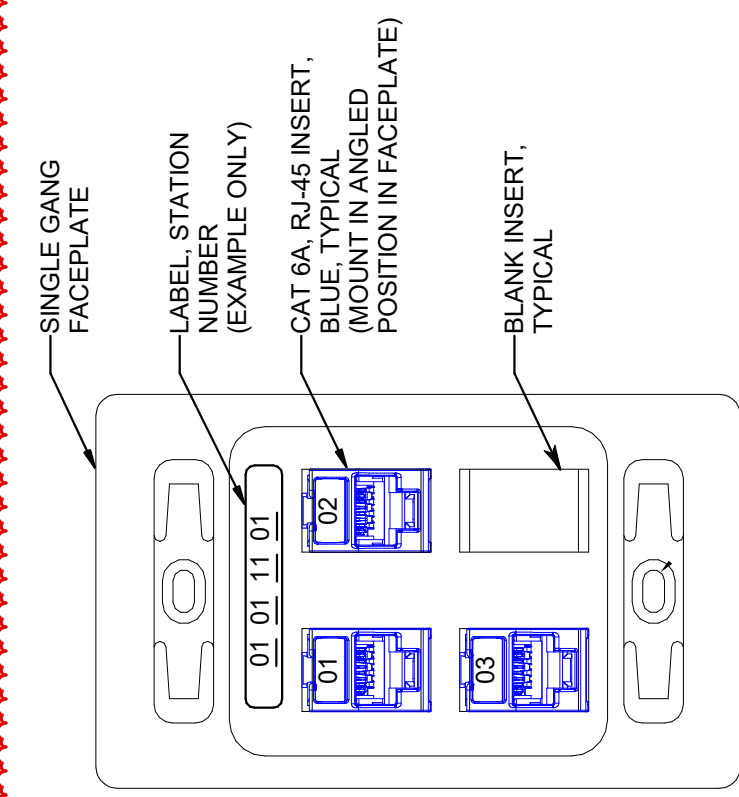
**A2** TYPICAL EQUIPMENT CABINET SUPPORT DETAIL  
SCALE: NTS



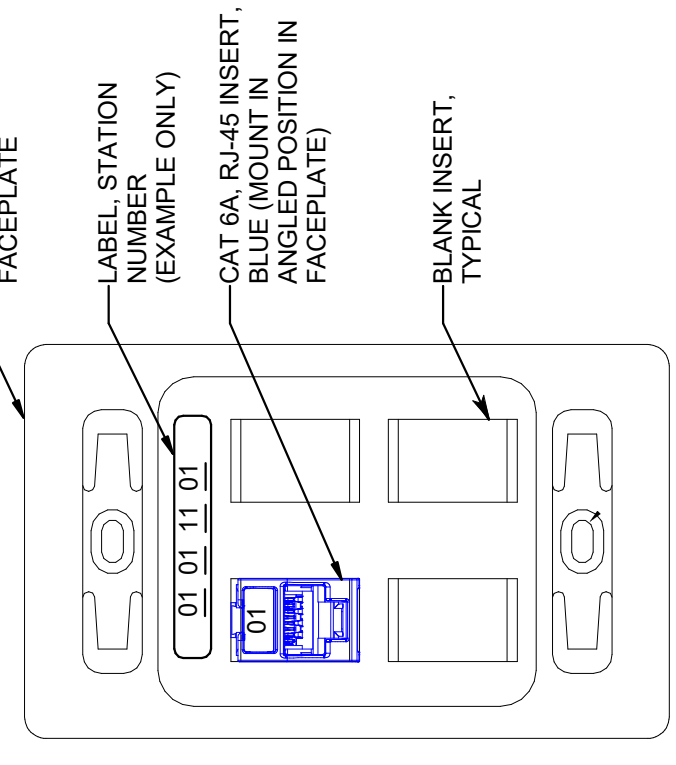
**A1** TYPICAL EQUIPMENT RACK SUPPORT DETAIL  
SCALE: 1/8" = 1'-0"



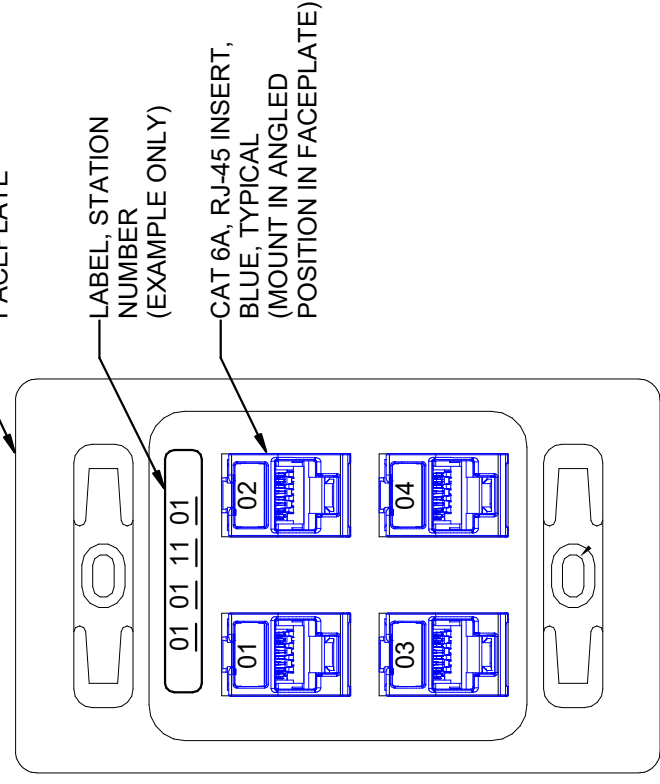
**A3** STATION PATCH PANEL (SPP1) DETAIL, TDR  
SCALE: NTS



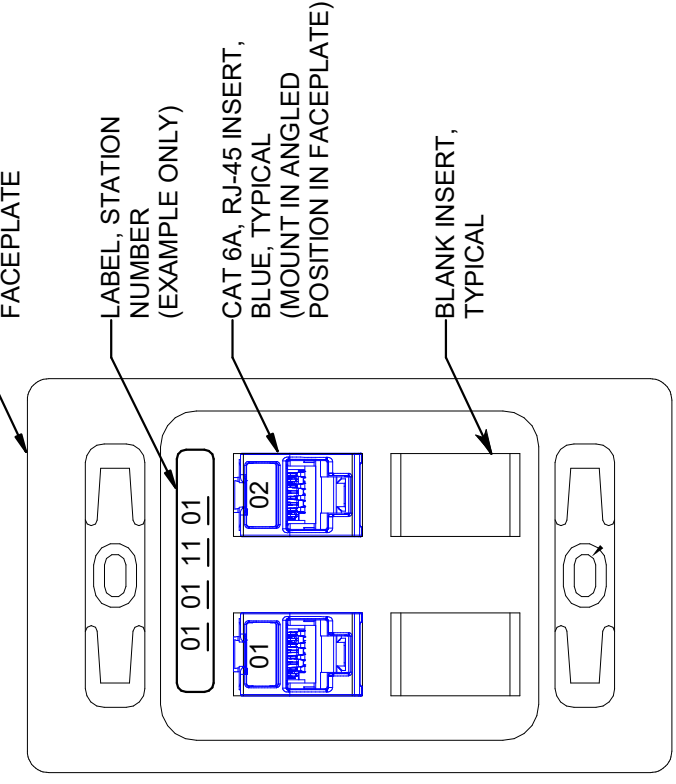
**B6** TYPICAL 3-PORT WALL DATA OUTLET  
SCALE: NTS



**A6** TYPICAL 1-PORT WALL DATA OUTLET  
SCALE: NTS

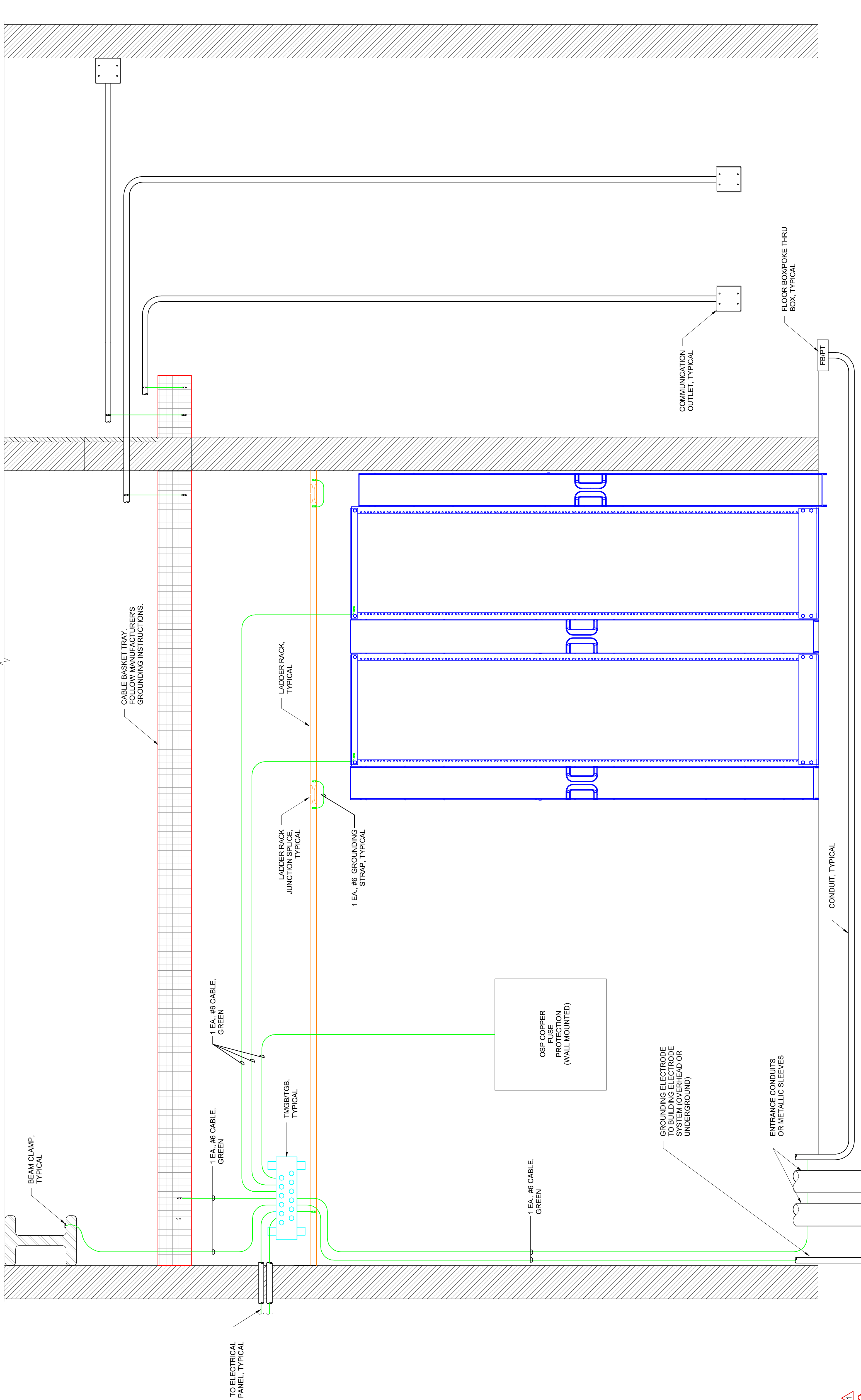


**B5** TYPICAL 4-PORT WALL DATA OUTLET  
SCALE: NTS



**A5** TYPICAL 2-PORT WALL DATA OUTLET  
SCALE: NTS

- GENERAL NOTES:**
1. ALL LOW VOLTAGE COMMUNICATIONS CONDUIT SHALL BE GROUNDED TO BASKET TRAY OR TELECOMMUNICATIONS GROUNDING BUS BAR.
  2. "TMGB" SHOULD BE 1/4"x2"x24".
  3. "TGP" SHOULD BE 1/4"x2"x24".
  4. EMT CONDUIT GROUNDING CLAMP SHOULD BE ELECTROLYTIC CAST BRONZE (PANDUIT PART NUMBER GPL-7X-7X, OR EQUAL).
  5. RIGID CONDUIT GROUND CLAMP SHOULD BE PART NUMBER OZZGEDNEY BLG-XXXX, OR HBLC-XXXX, OR EQUAL.
  6. GROUNDING LUGS SHOULD BE TWO-HOLE LONG (PANDUIT PART NUMBER LGCR, OR EQUAL).



TYPICAL TELECOM EQUIPMENT RACK GROUNDING DETAIL

SCALE: 1/8" = 1'-0"

(A2)









**A1** LEVEL 5 AUDIO VISUAL ROUGH-IN PLAN  
SCALE: 1/8" = 1'-0"

### GENERAL SHEET NOTES

A. COORDINATE EXACT LOCATION OF ALL FLOOR BOXES WITH ARCHITECT PRIOR TO INSTALLATION.

B. COORDINATE EXACT JUNCTION BOX LOCATIONS SO THAT THEY ARE EASILY ACCESSIBLE AND ARE NOT BEHIND DOORS, FURNITURE, MONITORS, ETC.

C. ELECTRICAL INSTALLER TO ENSURE ALL WALL MOUNTED ELECTRICAL DEVICES (AV JUNCTIONS BOXES, DATA JACKS, ETC.) ARE PLUMB, LEVEL, AND VERTICALLY ALIGNED WHERE APPLICABLE.

### SHEET KEYNOTES

1 INSTALL JUNCTION BOX FOR VIDEO CABLE PASS-THRU BELOW TABLETOP AT 18" AFF.

VCBO ARCHITECTURE  
524 SOUTH 600 EAST  
SALT LAKE CITY, UT 84102  
801-575-8800  
VCBO.COM

No. 8192456  
TYLER SQUIRE  
STATE OF UTAH  
10/25/2022

SPECTRUM ENGINEERS  
324 S. State St., Suite 400  
Salt Lake City, UT 84111  
800-675-7077  
801-328-5151  
fax: 801-328-5155  
www.spectrum-engineers.com

REV	DATE	DESCRIPTION
1	11/07/2022	ADD #01

VCBO NUMBER: 22015  
CLIENT NUMBER: 00000  
DATE: 2022 10 25

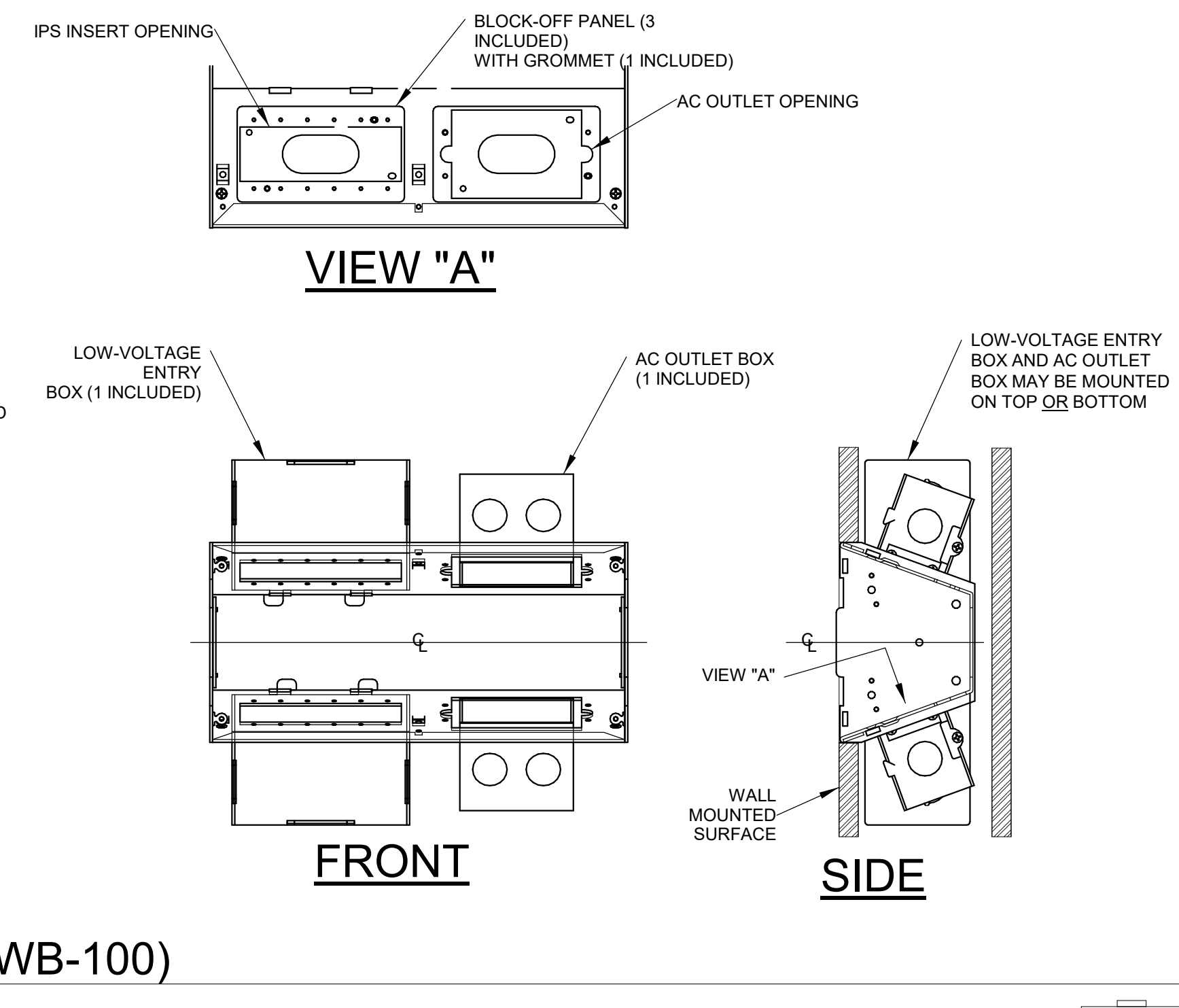
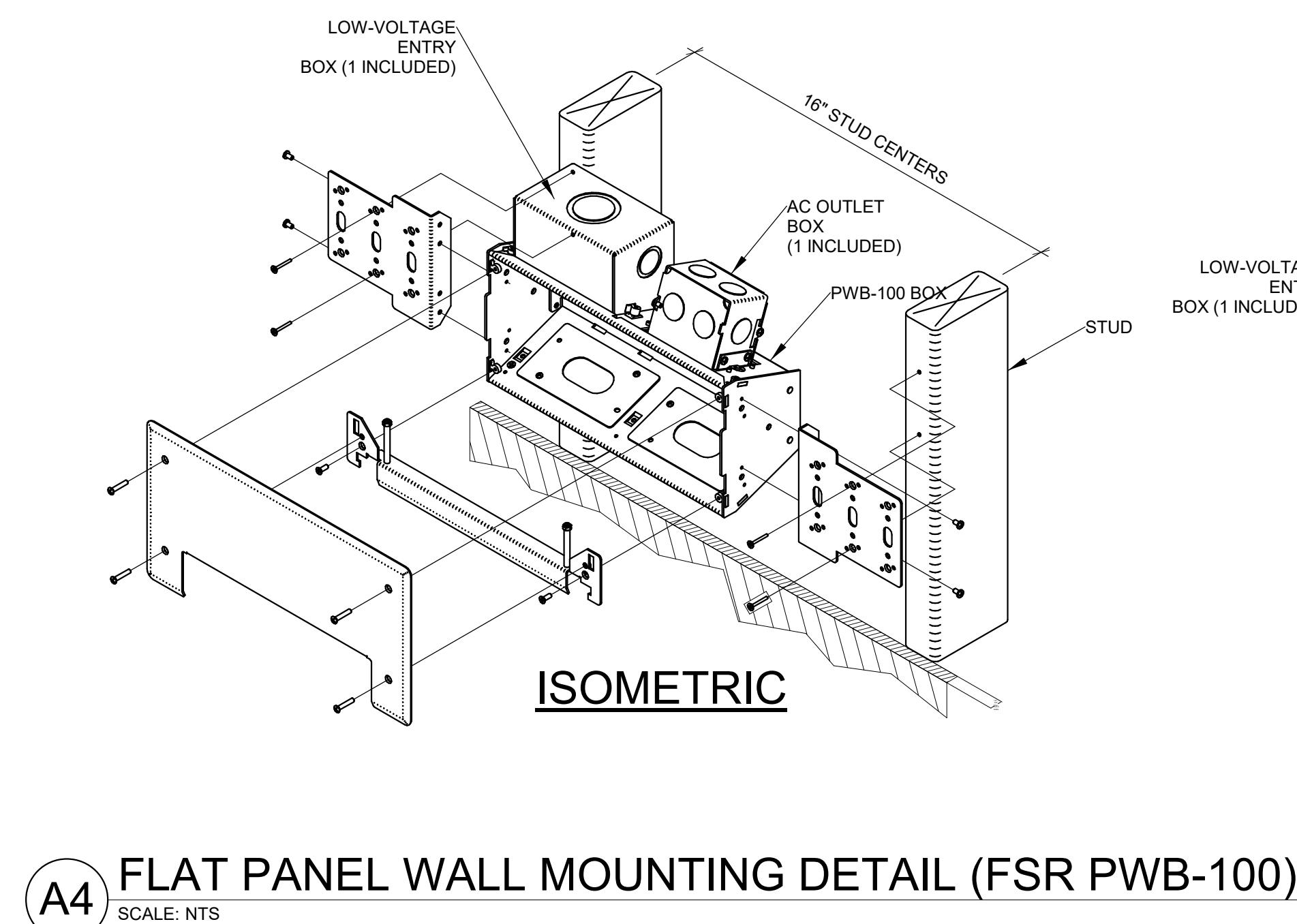
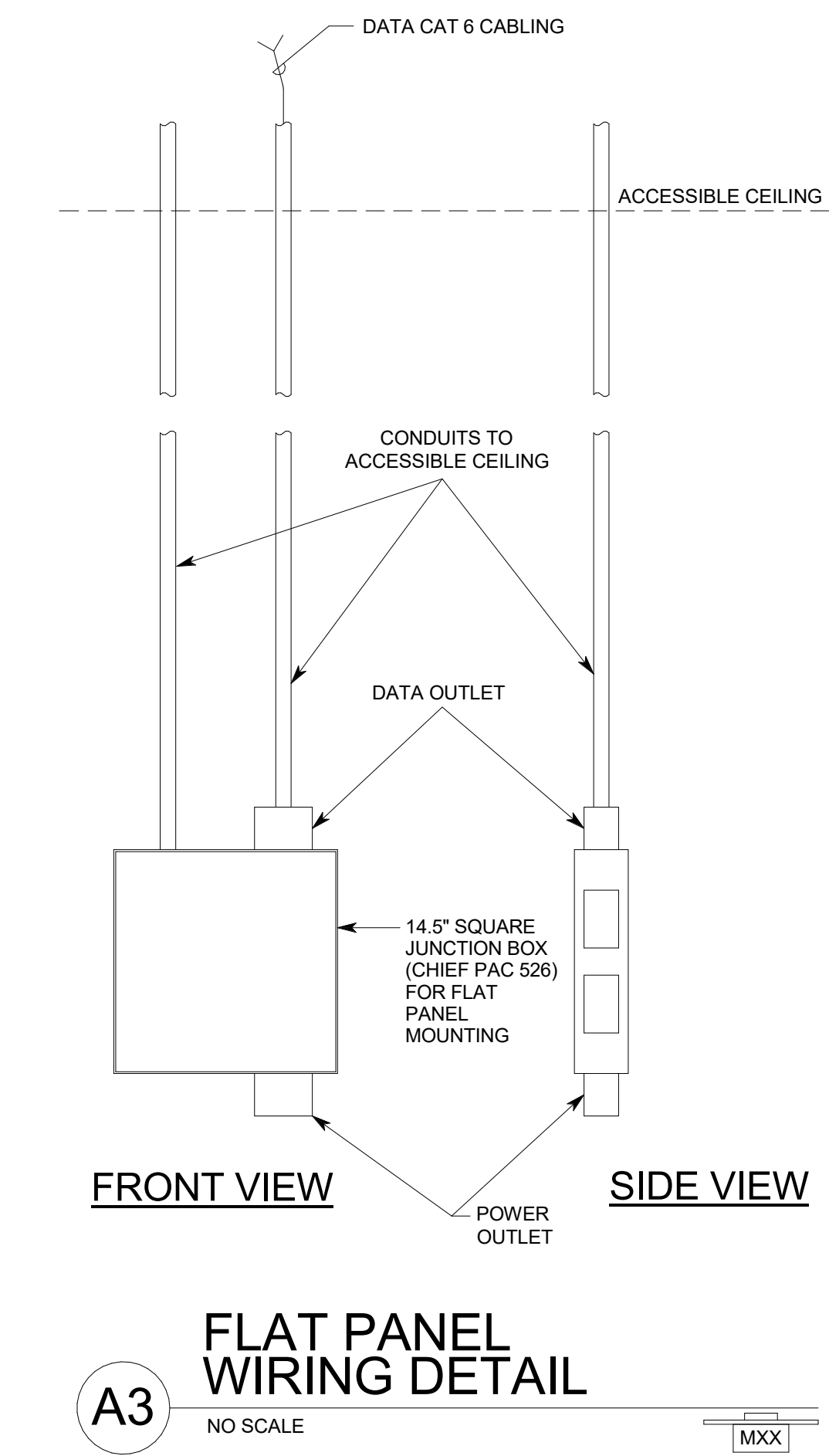
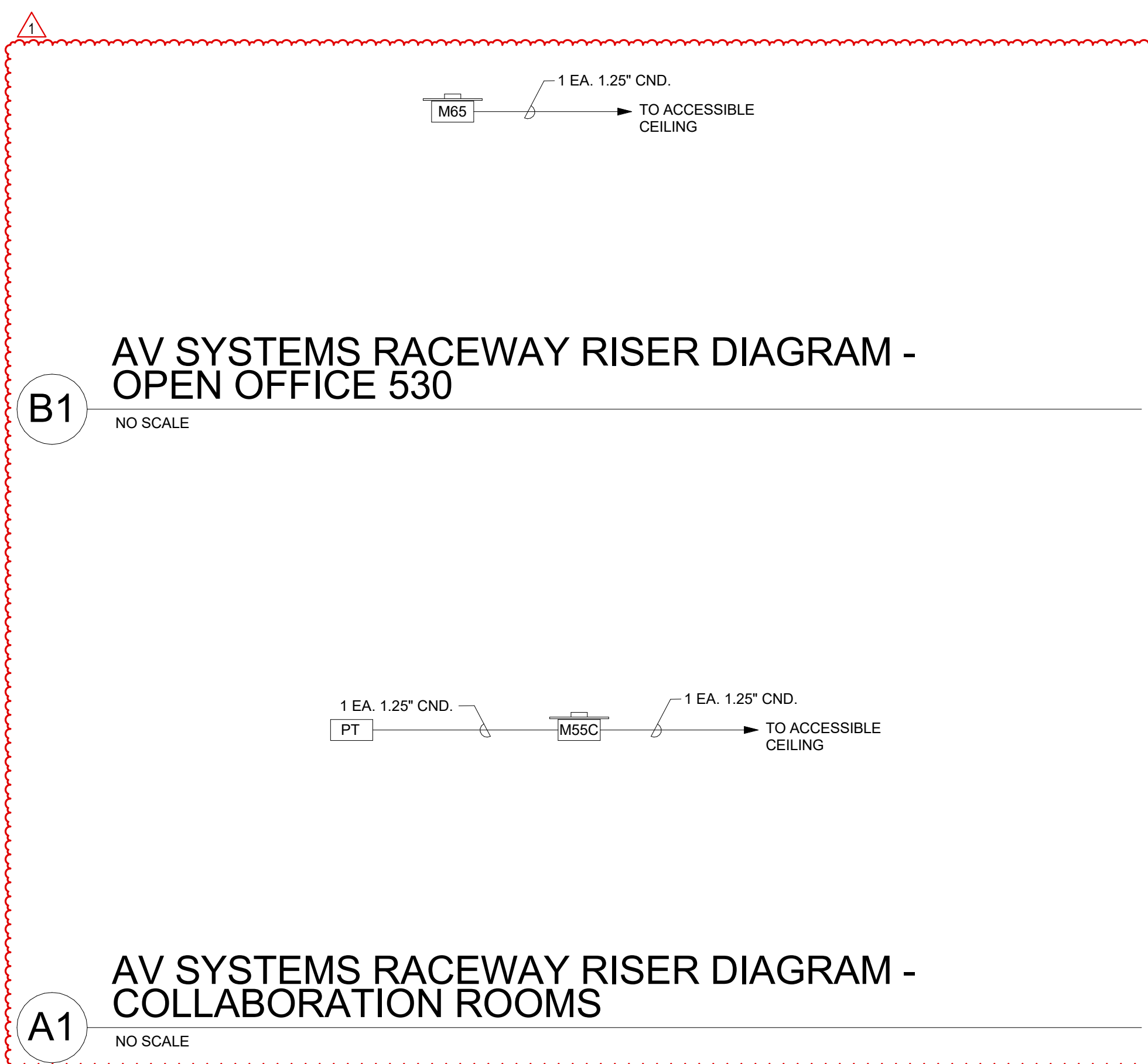
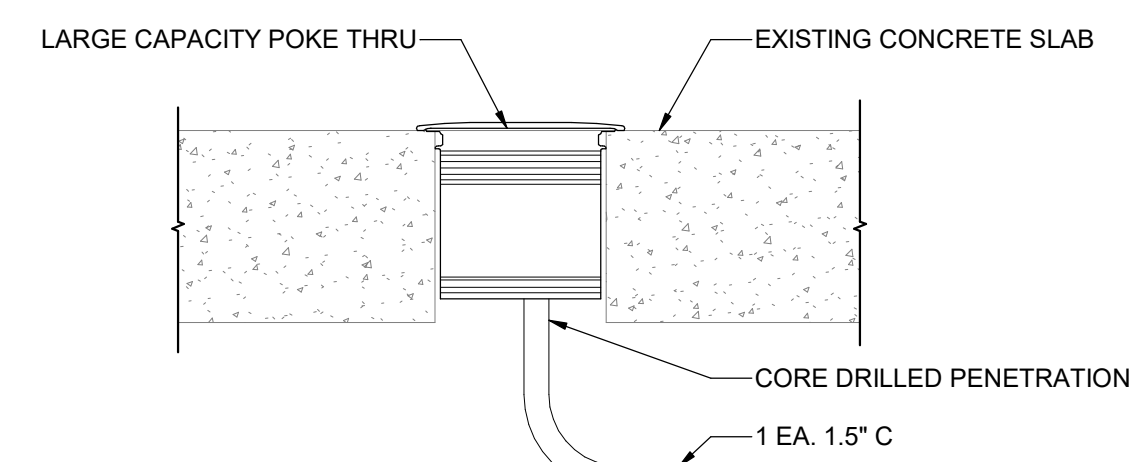
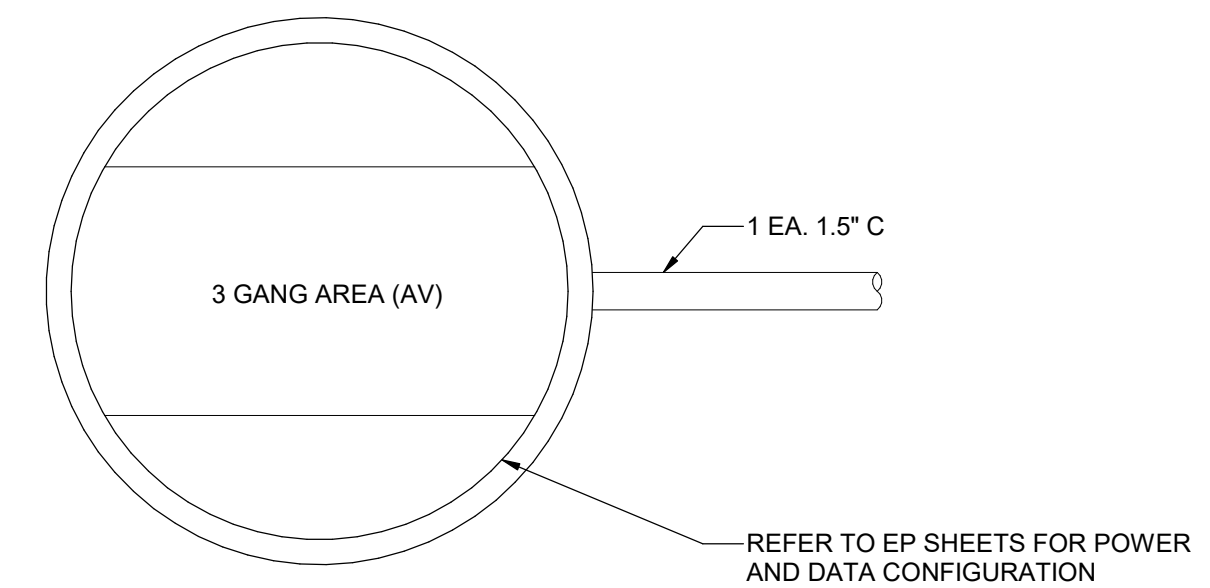
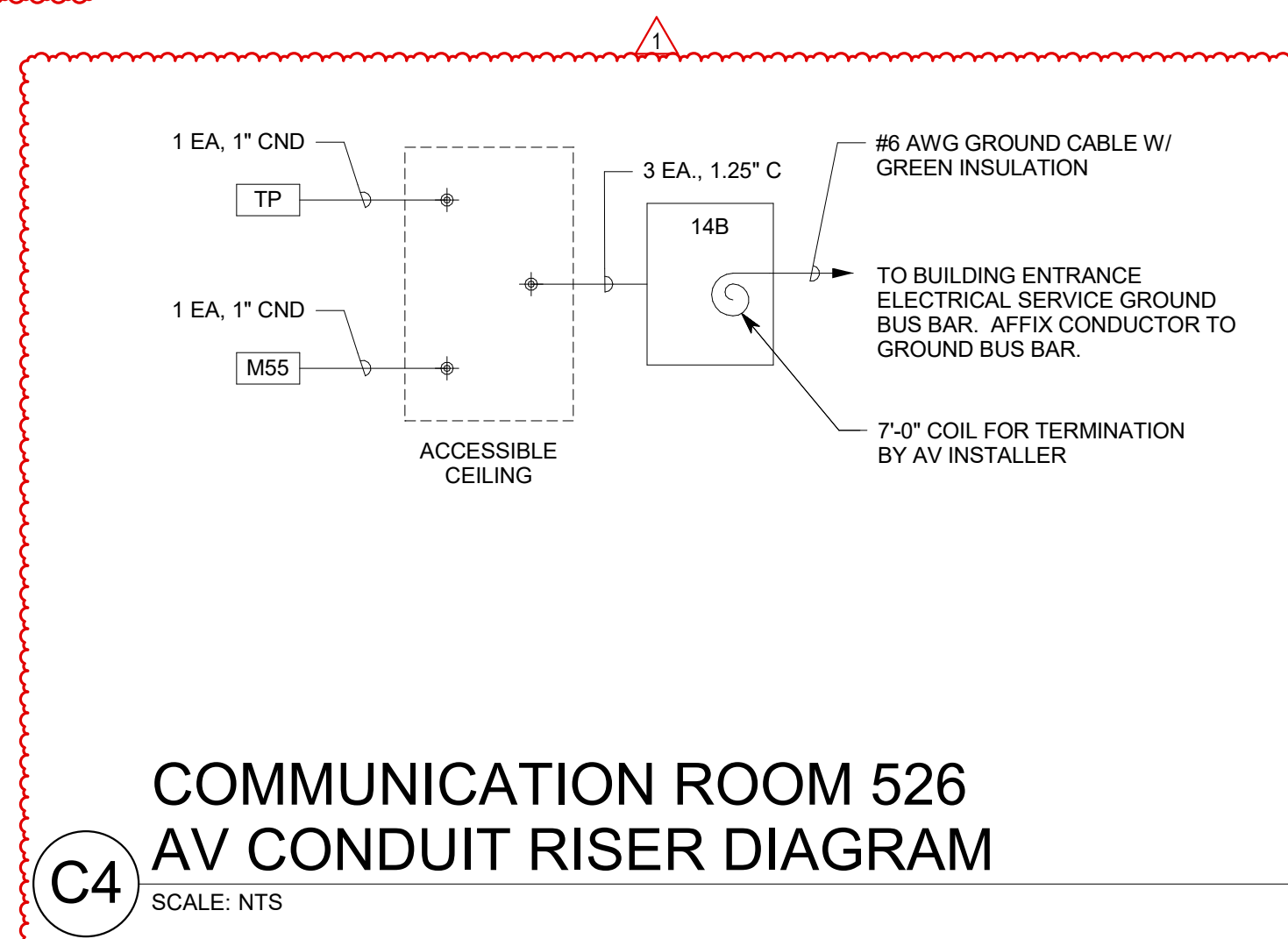
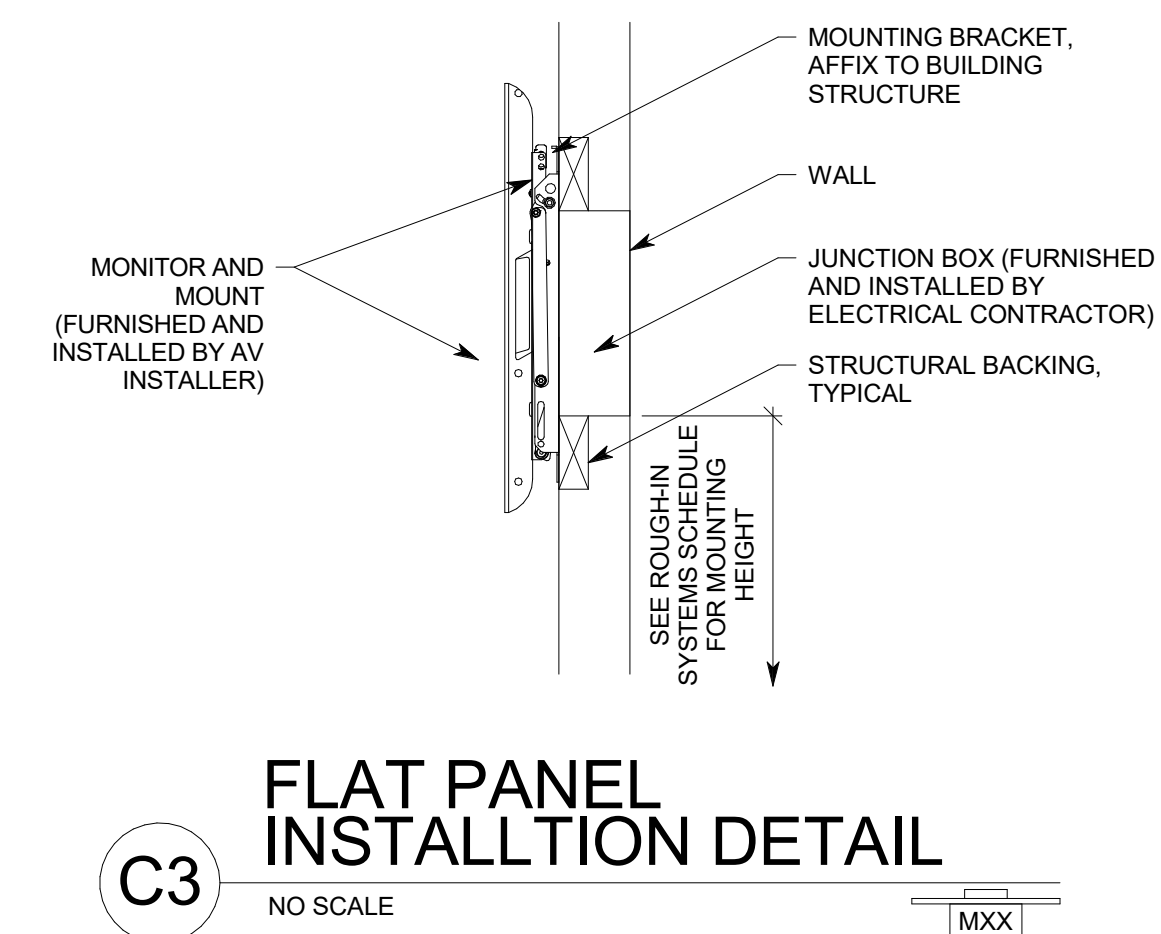
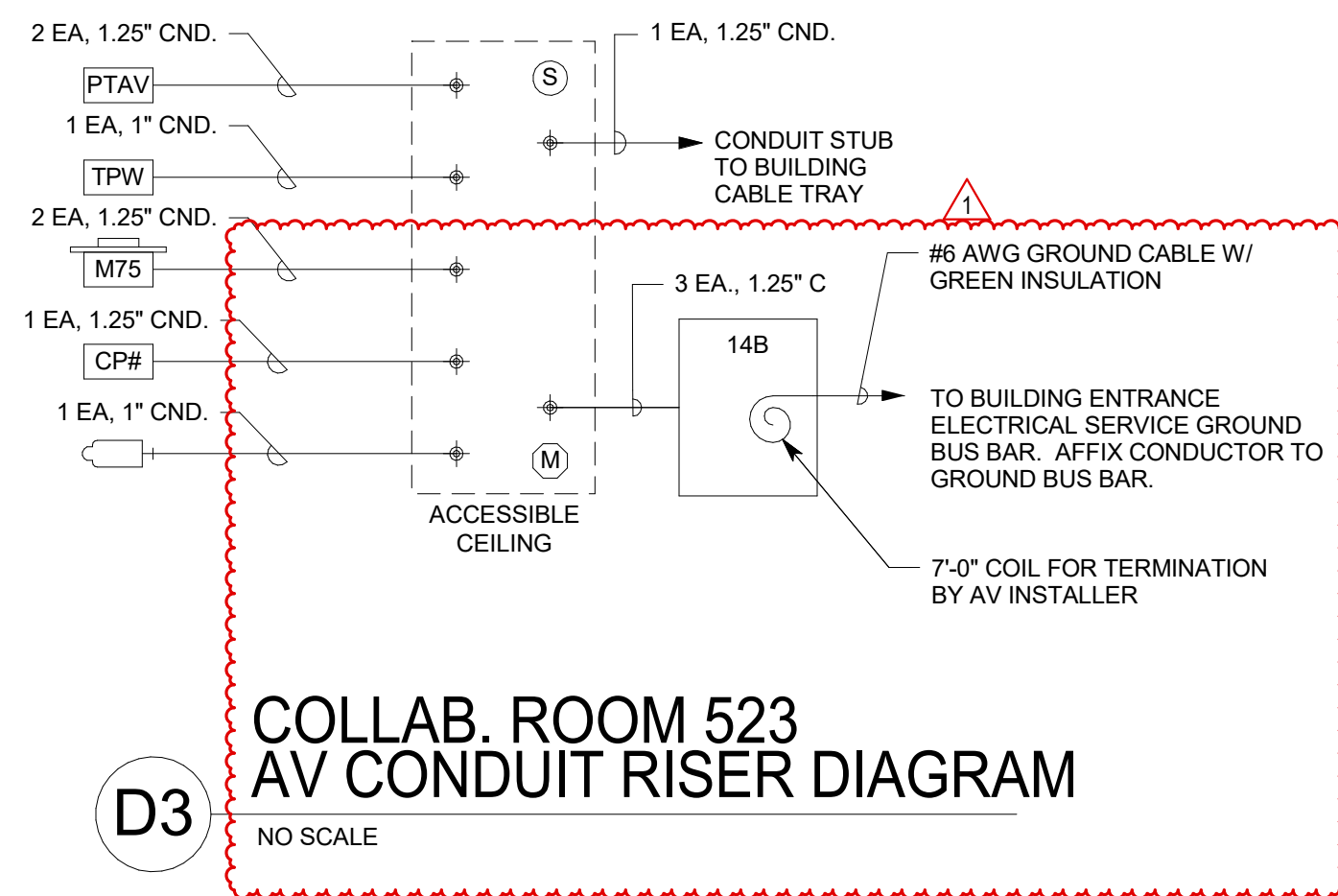
## CLASSIC AIR - VCT 5TH FLOOR REMODEL

INTERMOUNTAIN HEALTHCARE  
VALLEY CENTER TOWER - 5373 SOUTH GREEN STREET  
MURRAY, UTAH  
BID SET

LEVEL 5 AV ROUGH-IN PLAN

**EJ105**







## AV SIGNAL TYPE ABBREVIATIONS SCHEDULE

ABBREVIATION	SIGNAL TYPE
AL	AUDIO, LEFT (LINE LEVEL)
AR	AUDIO, RIGHT (LINE LEVEL)
AA	ANALOG AUDIO (LINE LEVEL)
V	VIDEO, COMPOSITE-STANDARD RESOLUTION ANALOG VIDEO
YC	S-VIDEO-STANDARD RESOLUTION ANALOG VIDEO
YU	COMPONENT VIDEO-STANDARD RESOLUTION ANALOG VIDEO
RGBV	RED, GREEN, BLUE, HORIZONTAL & VERTICAL SYNC-HIGH RESOLUTION ANALOG VIDEO
XGA/GX	EXTENDED GRAPHICS ARRAY/VIDEO GRAPHICS ARRAY-HIGH RESOLUTION ANALOG VIDEO
DVI	DIGITAL VIDEO INTERFACE-HIGH RESOLUTION DIGITAL VIDEO
HDMI	HIGH DEFINITION MULTIMEDIA INTERFACE-HIGH RESOLUTION DIGITAL VIDEO
DP	DISPLAY PORT-HIGH RESOLUTION DIGITAL VIDEO
TP	TWISTED PAIR
IP	INTERNET PROTOCOL
ENET	ETHERNET
HOBT	HD BASE T

## AUDIO AND VIDEO SYSTEM EQUIPMENT LIST

[illegible]

SYMBOL	DESCRIPTION	QUANTITY	ACCEPTABLE TYPES
[DP]	DATAPANEL KVM DATA PORTS AS REQUIRED PLUS 25%	AR	MANUFACTURER TO MATCH I.T. EQUIPMENT
[MSA]	FLAT PANEL DISPLAY, 55" LCD, 4K, 24/7 OPERATION	OPF	SONY FH-58B26H OR AS APPROVED
[GPU]	VIDEO WALL MOUNTING SYSTEM WITH RAILS	OPF	CHEF T502T W/ ALL NECESSARY ACCESSORIES
	COMPUTER OWNER FURNISHED AND INSTALLED	0	A/V INSTALLER TO CONNECT GPU TO A/V SYSTEM
	CONNECTOR, SEE NOTE 5	AR	
	POWER SUPPLIES, NMS+ TRANSFORMERS, SIGNAL SENSORS, PROTOCOL CONVERTERS, SEE NOTES 4, 7, 8	AR	
	PATCH CORDS, SEE NOTE 6	AR	
	ADAPTER CABLES, SEE NOTE 9	AR	
	CABLE, SEE AUDIO/VIDEO SYSTEMS CABLE SCHEDULE	AR	
	RACK MOUNT SHELF	AR	MIDDLE ATLANTIC UTRI
	Nylon BRACKETED EXPANDABLE SLEEVING	AR	TECH-FLEX FLEXO-PET
	TRANSFORMER, NMS+ VIDEO WALL (P/T/C/S), REMOVABLE BACK AND SIDE SHELF, FIXED (NO CASTERS)	1	TRANSFORMER, NMS+ WIRELESS & WI EXTENSION CABLE CLIPPY, 50W, AND EQUIPMENT AS DETAILLED, ARCHITECT TO SELECT FINISH.
[PTX]	NETWORK VIDEO ENCODER	OPF	VISIONARY E4100
[PRX]	NETWORK VIDEO DECODER	OPF	VISIONARY D4100
[CS]	CONTROL SYSTEM	OPF	QSC Q-SYS NANO
[TVSS]	TRANSIENT VOLTAGE SURGE SUPPRESSOR AT MONITORS	OPF	SUPERSHIELD OR TRIPP LITE SMOABE
[TVSS]	TRANSIENT VOLTAGE SURGE SUPPRESSOR, 20 AMP, BACK MOUNT	OPF	TRIPP LITE BARI32-20ULTRA
[CAB]	EQUIPMENT RACK, CABINET MOUNTED	ROOM 523 ROOM 526	MIDDLE ATLANTIC SSR-R4-16 MIDDLE ATLANTIC SSR-R4-30
	RACK SHELF	AR	MIDDLE ATLANTIC
	EXHAUST FAN	2	MIDDLE ATLANTIC MAPAN-10
[UPS]	UNINTERRUPTIBLE POWER SUPPLY, 20 AMP	OPF	MIDDLE ATLANTIC UPS-2200R
[STB]	DISCHARGE SUPPLIER SET TOP BOX	OFCI	
[AM]	WIRELESS VIDEO RECEIVER	OPF	CRESTRON ARMEDIA 2
[WR2]	WIRELESS MICROPHONE SYSTEM WITH BODY WORN AND HANDHELD TRANSMITTER, LAVALIER MICROPHONE	OPF	SHURE LX9D
		1	UXL02688 HANDHELD TRANSMITTER
[TFW]	WALL MOUNTED TOUCH SCREEN CONTROL PANEL, 10" P&E	OPF	UXL01 BODYPAK TRANSMITTER AND WL183 LAPTEL MIC
	POWER AMPLIFIER, 1 CHANNEL, 75 WATTS MINIMUM, 70V	OPF	QSC TSC-101-G3
	CEILING MICROPHONE, STEARBLE, DANTE	OPF	CRESTRON AMP X75
[ASPI]	AUDIO DIGITAL SIGNAL PROCESSOR, 24 10 W/DANTE AND USB	OPF	SHURE MXA620W-S
[ALS]	ASSISTED LISTENING SYSTEM, W/HFI & RF WITH LOCAL W-I FI ACCESS POINT	OPF	QSC CORE 100F
	CAMERA, PTZ, 1P CONNECTIVITY, 12X ZOOM	OPF	LISTEN CS-120-01 W/ ACCESS POINT
[PTAV]	CONNECTION PLATE MOUNTED IN POKE THRU	OPF	Q-SYS NC-12-80
[MTR]	LOGITECH MICROSOFT TEAMS ROOM SYSTEM	OPF	PLATE W/ CUSTOM CONNECTIONS AND ENGRAVING AS DETAILED, SEE DETAILS ON SHEET TA501
[TPT]		OPF	LOGITECH TAPBASEL W/ LENOVO MM FOR TEAMS ROOMS (MTR), LOGITECH TAP (NEEDS CAN RE KIT CONV.), TABLE MOUNT, AND ALL NECESSARY ACCESSORIES
[CNV]		OPF	ATLAS-IBD AP433T
[S]	SPEAKER, 6.5" CEILING MOUNTED, W/ GRILLE AND TILE RAILS	OPF	NETGEAR M4250-40GBX-PXE-4US
[NS]	NETWORK SWITCH, POE GIGABIT, MANAGED, PHE+	AR	PLATE W/ CUSTOM CONNECTIONS AND ENGRAVING AS DETAILED, SEE DETAILS ON SHEET TA501
[CPN]	CONNECTION PANELS	OPF	
[PT]	CABLE PASS-THROUGH WALL PLATE	OPF	
[MSC]	FLAT PANEL DISPLAY, 55", LCD, 4K ARTICULATING WALL MOUNT, LANDSCAPE	OPF	LG 55UT64HS, OR SIMILAR
	FLAT PANEL DISPLAY, 60", LCD, 4K	OPF	CHEF T502ST W/ ALL NECESSARY ACCESSORIES
[MR5]	ARTICULATING WALL MOUNT, LANDSCAPE	OPF	LG 55UT64HS, OR SIMILAR
[MT5]	FLAT PANEL DISPLAY, 65" LCD, 4K ARTICULATING WALL MOUNT, LANDSCAPE	OPF	CHEF T502ST W/ ALL NECESSARY ACCESSORIES
	ARTICULATING WALL MOUNT, LANDSCAPE	OPF	LOG 70004HS, OR SIMILAR
	ARTICULATING WALL MOUNT, LANDSCAPE	OPF	CHEF T502ST W/ ALL NECESSARY ACCESSORIES
[NTX]	NETWORK VIDEO TRANSDUCER	OPF	QSC W-0251 (CORE CAPABLE)

A/R = AS REQUIRED, OFP = OBTAIN FROM PLANS, OFCI = OWNER FURNISHED CONTRACTOR INSTALLED

## AV SYSTEMS SHEET INDEX

TA001	SHEET INDEX, ABBREVIATIONS, AND GENERAL NOTES
TA501	AUDIO VISUAL SYSTEMS DETAILS
TA601	AUDIO VISUAL SYSTEMS RISER DIAGRAMS

## SPECIAL PROJECT NOTES

The IDES SYSTEM EQUIPMENT LISTS IDENTIFY EQUIPMENT ITEMS OF SIGNIFICANCE BY MANUFACTURER AND MODEL NUMBER. THE SOLE PURPOSE FOR THESE EQUIPMENT LISTS IS TO PRECLUDE THE INSTALLATION OF VIDEO ITEMS ON ALL EQUIPMENT LISTS. IT IS NOT THE INTENT OF THE AUDIO AND VIDEO ITEMS SYSTEM EQUIPMENT LIST TO PRECLUDE THE INSTALLATION OF EQUIPMENT ITEMS THAT ARE JUDGED TO BE EQUAL TO THOSE EQUIPMENT ITEMS IDENTIFIED IN THE LIST. PROVIDING THE EQUIPMENT DOES NOT CONTRADICT ANY EXISTING SYSTEMS OR EXISTING HEAD-END EQUIPMENT AND OTHER EXISTING DEVICES COMPONENTS. WHEN CONSIDERING THE EQUIPMENT LIST, THE ENGINEER MUST CONSIDER THE NEEDS OF THE BUILDING AND HOUSE AND SENATE OFFICE BUILDINGS. OTHER MANUFACTURERS' EQUIPMENT MAY BE LIMITED TO THE ENGINEER'S DISCRETION AT LEAST 7 DAYS PRIOR TO THE BIDDING.

## GENERAL SHEET NOTES

[illegible]

FURNISH AND INSTALL ALL CABLE AND CONNECTORS REQUIRED FOR ALL AUDIO AND VIDEO SYSTEMS TO COMPLETE MANUFACTURER RECOMMENDED CABLE TO EQUIPMENT TERMINATION TO FORM A COMPLETE AND FULLY FUNCTIONAL SYSTEM AS SHOWN. SELECT CONNECTORS WHICH PASS FULL BANDWIDTH CAPABILITY OF SPECIFIED CABLE.

PROVIDE PATCH CABLES TO FULLY INTERCONNECT ALL SPECIFIED AND/OR OWNER FURNISHED EQUIPMENT WITH THE SPECIFIED CONNECTION PANELS, SYSTEM INTERFACES, AND MISCELLANEOUS EQUIPMENT.

PROVIDE MANUFACTURER RECOMMENDED AND INDUSTRY STANDARD, SIGNAL LEVELS THROUGHOUT ENTIRE SYSTEM. PROVIDE ALL REQUIRED DISTRIBUTION AND PROCESSING EQUIPMENT, INCLUDING BUT NOT LIMITED TO SIGNAL DISTRIBUTION AMPLIFIERS, WHETHER SHOWN IN THE SINGLE LINE DIAGRAMS OR NOT.

PROVIDE POWER, CURRENT, AND/OR SIGNAL SENSORS FOR ALL EQUIPMENT WHERE IT IS NECESSARY FOR CORRECT CONTROL SYSTEM OPERATION.

PROVIDE PRE-MANUFACTURED ADAPTER CABLES WHERE REQUIRED FOR MATING CABLE TO CONNECTORS.

Q. PROVIDE RACK MOUNT KITS FOR ALL RACK MOUNTED EQUIPMENT. WHERE MANUFACTURERS DO NOT PROVIDE RACK MOUNT KITS, PROVIDE CUSTOM RACK MOUNT KITS AS SPECIFIED

WORK SPACE WITH BLANK/VENT PANELS.

2. WHEN AUDIO, VIDEO, OR CONTROL CABLE IS INSTALLED IN CABLE TRAY PROVIDE COORDINATION WITH STATE IT PERSONNEL. WHERE CABLE IS INSTALLED OUTSIDE OF CABLE TRAY OR CONDUIT INSTALL IN "J" HOOKS. MAXIMUM "J" HOOK SEPARATION IS 4'. DO NOT SUSPEND "J" HOOKS FROM WIRE HUNG BY OTHER TRADES. AFFIX "J" HOOKS DIRECTLY TO BUILDING STRUCTURE OR INSTALL INDIVIDUAL WIRE HANGARS.

3. PROVIDE MANUFACTURER RECOMMENDED POWER SUPPLIES, POE++ INJECTORS AND/OR TRANSFORMERS FOR ALL SPECIFIED EQUIPMENT.

4. CONDUCT AN RF FREQUENCY AUDIT OF THE SITE PRIOR TO SELECTION OF WIRELESS RF OPERATING FREQUENCIES. SELECT FREQUENCIES TO ASSURE INTERFERENCE FREE OPERATION. INSTALL ANTENNAS/TRANSCIVERS OUTSIDE OF THE EQUIPMENT RACK, AT AN ARCHITECT APPROVED LOCATION, WHERE THE BEST SYSTEM PERFORMANCE IS ACHIEVED.

5. FURNISH AND INSTALL ALL MOUNTS FOR MONITORS, AFFIX ALL MOUNTS TO THE BUILDING STRUCTURE IN COMPLIANCE WITH GENERAL NOTE 4. FURNISH AND INSTALL ALL REQUIRED ACCESSORIES INCLUDING, BUT NOT LIMITED TO, MOUNTING PLATES, FASTENERS, BRACKETS, UNISTRUT, PIPE EXTENSIONS, PIPE COUPLERS, CABLES, THREADED ROD, CABLES, CLAMPS, TURNBUCKLES, EXPOSED, ETC., TO INSTALL AND POSITION THE DISPLAY DEVICES FOR ITS INTENDED USE IN FULL COMPLIANCE WITH THE WRITTEN INSTRUCTIONS OF THE DISPLAY DEVICE MANUFACTURER, AS WELL AS, THE MOUNT MANUFACTURER.

6. PROVIDE BALANCING TRANSFORMERS FOR ALL AUDIO INPUTS/OUTPUTS WHICH ARE NOT BALANCED BY THE MANUFACTURER.

7. PROVIDE 120 VAC TO ALL EQUIPMENT THROUGH THE SPECIFIED TRANSIENT VOLTAGE SURGE SUPPRESSERS.

3. BUNDLE, LACE, SUPPORT SEGREGATE, WRAP ETC... ALL CABLE IN ALL CABINETS  
AND RACKS IN A NEAT, PARALLEL/PERPENDICULAR AND ORDERLY MANNER. STRAIN  
RELIEF ALL WIRE BUNDLES WITH SUPPORTS, BUSHINGS ETC...

9. LABEL ALL CONNECTORS AND USER CONTROLS IN COMPLIANCE WITH THE REQUIREMENTS IDENTIFIED IN THE SPECIFICATION.

0. NETWORK ALL CONTROL SYSTEM CENTRAL PROCESSORS TOGETHER VIA THE STATE'S LOCAL AREA NETWORK (LAN). PROGRAM ALL REQUIRED TOUCH PANEL PAGES FOR CENTRAL MONITORING AND CONTROL OF ALL INDIVIDUAL CONTROL SYSTEM CENTRAL PROCESSORS. EXTEND CONTROL OF ALL AV SYSTEMS TO THE MASTER CONTROL ROOM TOUCH PANEL. UTILIZE THE SPECIFIED ROOM MANAGEMENT SOFTWARE PROGRAM.

1. WHERE ANY GROUP OF CABLES ARE INSTALLED IN A FASHION WHERE EXPOSED TO PUBLIC VIEW, INSTALL CABLE INSIDE THE SPECIFIED BRAIDED EXPANDABLE SLEEVING. EXAMPLES OF SUCH LOCATIONS INCLUDE, BUT ARE NOT LIMITED TO CABLES EXITING FLOOR BOXES, & CABLES TO EQUIPMENT ON HORIZONTAL WORK SURFACES.

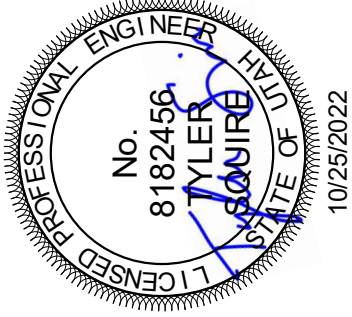
2. POWER ALL SPECIFIED TRANSMITTERS AND RECEIVERS FROM THE EQUIPMENT RACK.

3. USE LACING BARS AT REGULAR INTERVALS FOR CABLE MANAGEMENT ON THE REAR OF THE 2-POST EQUIPMENT RACK.

4. PROGRAM ALL NEW AV DEVICES WITH PASSWORDS WITH A NEW (NON-FACTORY DEFAULT) PASSWORD. PROVIDE A SPREADSHEET TO THE OWNER IDENTIFYING ALL PROGRAMMED PASSWORDS. WORK WITH THE OWNER'S I.T. STAFF TO PROGRAM THE SPECIFIED NETWORK SWITCH WITH SECURITY HARDENING.

6. PROVIDE COMPLETE NETWORK SWITCH CONFIGURATION AND PROGRAMMING SERVICES INCLUDING, BUT NOT LIMITED TO, UPDATING ALL NETWORK SWITCHES TO THE LATEST CODE, CONFIGURING ALL REQUIRED VLANS AND ASSIGNING ALL IP ADDRESS SCHEMES FOR SUBNET MASK GATEWAY AND DEVICE IP ADDRESS ASSIGNMENT. COORDINATE WITH THE OWNER'S NETWORK STAFF FOR ALL IP ADDRESS SCHEME

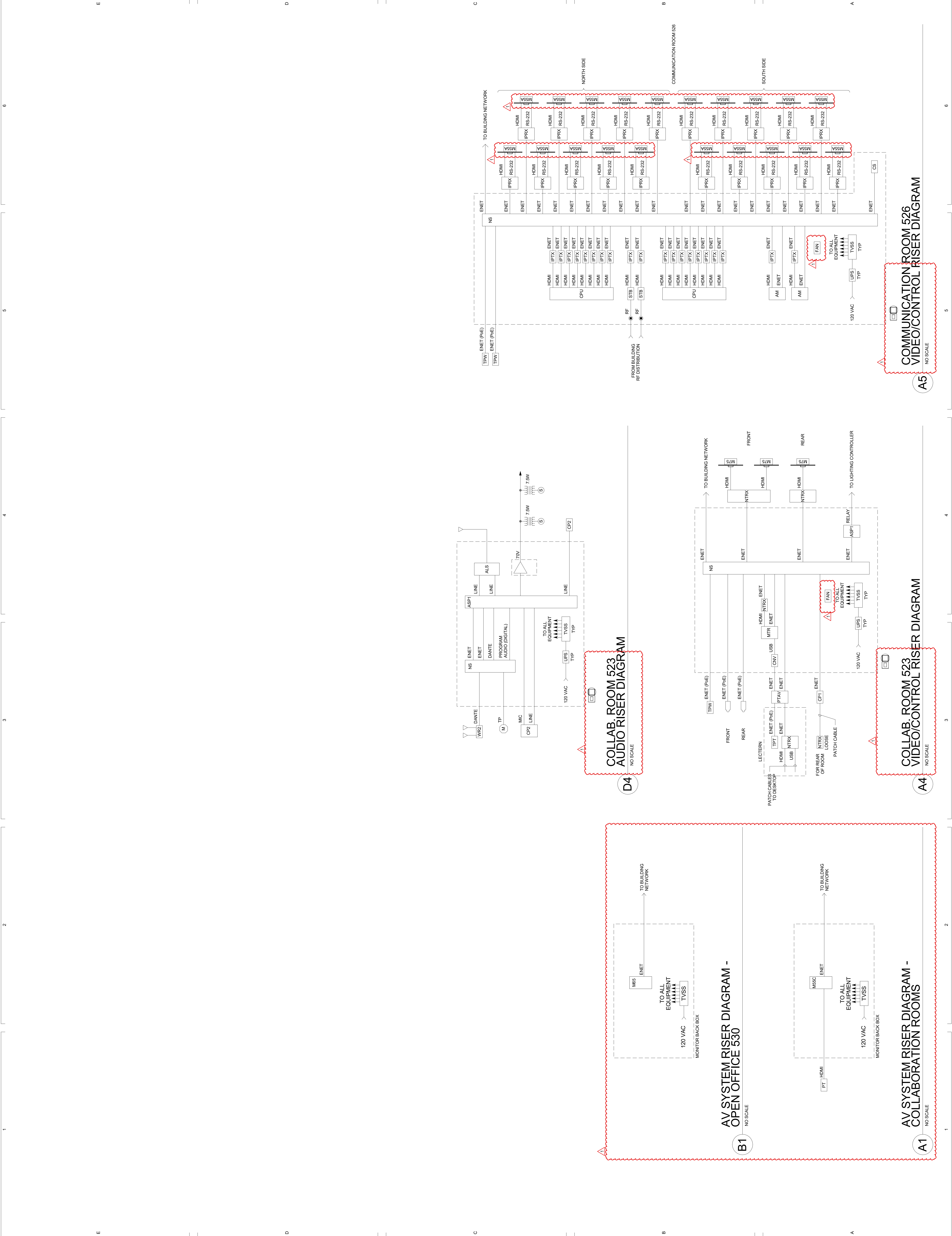
3. REUSE THE IDENTIFIED EXISTING SPEAKER ASSEMBLIES IN OPEN OFFICE C209. REWIRING EXISTING SPEAKER ASSEMBLIES AS SHOWN, AND ADD A WALL MOUNTED VOLUME CONTROL. RECONNECT TO THE EXISTING POWER AMPLIFIER





# CLASSIC AIR - VCT 5TH FLOOR REMODEL

INTERMOUNTAIN HEALTHCARE  
VALLEY CENTER TOWER - 5373 SOUTH GREEN STREET  
MURRAY, UTAH  
BID SET



## **SECTION 27 4113**

### **AUDIO SYSTEMS**

#### **PART 1 - GENERAL**

##### **1.1 SUMMARY**

- A. The audio system will provide for voice amplification and media device audio program amplification. Media device audio program and voice audio amplification will originate from various media sources and microphones, be switched through a source selection switcher, and/or be mixed, processed and amplified to the speaker system. In addition provide multi-channel audio routing between all processors.
- B. This Section includes requirements for audio system components including, but not limited to, the following:
  - 1. Microphones
  - 2. Mixers
  - 3. Power Amplifiers
  - 4. Cabinets
  - 5. Racks
  - 6. Loudspeaker Systems
  - 7. Microphone Inputs
  - 8. Processors
  - 9. Combiners
  - 10. Source Devices
  - 11. Digital Signal Processors
  - 12. Wire, Cable, and Connectors

##### **1.2 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Related Sections: The following Division 27 sections contain requirements that relate to this section:
  - 1. General Technology Systems Requirements
  - 2. Basic Technology Systems Requirements
  - 3. Basic Technology Systems Materials and Methods
  - 4. Video Systems
  - 5. Control Systems
- C. Related Sections: Several sections of Division 26 contain requirements that relate to this section.

##### **1.3 SYSTEM DESCRIPTION**

- A. General: The audio systems shall be a complete systems for amplifying sound signals from microphones and media source equipment and distributing them to loudspeakers at various locations.
- B. Functional Performance: Components and system features and functions shall include, but are not limited to, the following:
  - 1. Meet the following performance parameters as measured in 1/3 octave bands:
    - a. From 100 Hz to 2kHz, flat within plus or minus 2dB.
    - b. Above 2kHz, slope down along an approximate 3dB octave slope to 8kHz.
  - 2. Sound pressure levels at 2kHz octave band shall not deviate more than plus or minus 2dB.
  - 3. When driven to maximum output, clipping shall first occur in power amplifiers.
  - 4. No noise, hum, RFI pickup or distortion shall be audible under normal operating conditions.
  - 5. Sound system shall reproduce program material at a level of 90 dBA without audible distortion.

#### **1.4 SUBMITTALS**

- A. Submit in accordance with Sections 013310, Submittal Procedures, and 013323, Shop Drawings, Product Data and Samples.
- B. General: Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections:
  - 1. Product data for each type of product specified.
  - 2. Shop drawings detailing audio system including, but not limited to the following:
    - a. Connection panels.
    - b. Rack elevations showing component arrangement inside equipment racks.
    - c. Complete layouts of all DSP devices. Including but not limited to audio routing, control, logic, level control, etc...
  - 3. Wiring Diagrams detailing wiring for power, signal, and control. Provide actual hook-up drawings showing the connection point of each conductor. Single line drawings will not be accepted. Include all cable labeling on wiring diagrams. Identify terminal numbers and wiring color codes to facilitate installation, operation, and maintenance.
  - 4. Maintenance data for materials and products, for inclusion in Operating and Maintenance Manual specified in Division 1 and Division 27 Section "Basic A/V System Requirements." Provide complete operations and maintenance manual material concurrently with system submittal and provide updated final versions of manuals one month before completion of construction and final system turnover. Include the following:
    - a. Equipment list showing quantity, make, model, and serial number.
    - b. System operating instructions.
    - c. System maintenance instructions.
    - d.
  - 5. Proposed DSP configuration showing individual processor blocks with block resources identified, and signal flow.
  - 6. Wiring codes for all system cable. (See "labeling", this section).
  - 7. Proposed labeling for system components. (See "labeling", this section).
  - 8. All special submittal instructions indicated on supplied design drawings.

#### **1.5 QUALITY ASSURANCE**

- A. **Manufacturer's Qualifications:** Firms regularly engaged in manufacture of sound system, components and accessories, of types, capacities and characteristics required, whose products have been in satisfactory use in similar service for not less than 5 years.
- B. **Installer's Qualifications:** Firms with at least 5 years of successful installation experience of A/V system projects similar to that required for this project. In addition, installers must have successfully completed a minimum of 3 similar installations over a period of 2 years prior to the date of the bid opening for this project. System installations must have included similar automatic mixers, matrices, digital signal processors, and echo cancellor hardware and software. To qualify as similar, audio systems must have included complete installation, set up, programming, balancing, and equalization of automatic mixers, matrix routers, echo cancellors, and digital signal processors. All such installation, set up, programming, balancing, and equalization work must have been completed by a factory trained and certified technician of the specified mixer, matrix, echo cancellor, and digital audio processor manufacturer. The certified technician must have successfully completed all relevant training courses recommended by the manufacturers of the above referenced equipment for proficiency in these skill sets. In addition, the certified technician must have been, and now be, a direct employee of the installer, in a permanent office staffed with factory qualified technicians, working for a minimum of 40 hours per week as a direct employee of the installer. The certified technician and factory trained installers must be the direct employees of the installer; sub-contracted, third party maintenance agreements, or similar arrangements are expressly prohibited, and do not qualify. Upon request, submit evidence of such qualifications to the Designer/Engineer. All of the above requirements must be complied with prior to the bid opening for this project.
- C. Approved installers for this project are Marshall Industries and Cache Valley Electric.
- D. **Manufacturer Training:** Installer shall have a manufacturer (Extron or Crestron) trained and certified technician on staff and on site during the installation of all headend devices.
- E. **Electrical Component Standard:** Provide work complying with applicable requirements of NFPA 70 "National Electrical Code."
- F. **EIA Compliance:** Comply with the following Technology Industries Association Standards:
  - 1. Sound Systems, EIA-160.
  - 2. Loudspeaker, Dynamic Magnetic Structures, and Impedance, EIA-299-A.
  - 3. Racks, Panels, and Associated Equipment, EIA-310-A.
  - 4. Amplifiers for Sound Equipment, SE-101-A.
  - 5. Speakers for Sound Equipment, SE-103.
  - 6. Microphones for Sound Equipment, SE-105.
- G. **UL Compliance:** Comply with requirements of UL 50.
- H. All installation practices shall be in accordance with, but not limited to, these specifications and drawings. Installation shall be performed in accordance with the applicable standards, requirements, and recommendations of the Uniform Building Code, the National Electrical Code and all local authorities having jurisdiction. All installation work shall follow "standard broadcast wiring" and installation practices, as excerpted from "Recommended Wiring Practices," Sound System Engineering, (2nd Edition), D. Davis, and performed to the highest standards of acknowledged industry practices.

## **1.6 DELIVERY, STORAGE, AND HANDLING**

- A. Deliver products in factory containers. Store in clean, dry space in original containers. Protect products from fumes and construction traffic. Handle carefully to avoid damage.

## **1.7 WARRANTY REQUIREMENTS**

- A. Audio system shall be subject to warranty requirements as stated in section 27 4100.

## **PART 2 - PRODUCTS**

### **1.1 MANUFACTURERS**

- A. Manufacturers: Subject to compliance with requirements, provide products by those manufacturers identified in the equipment list. Firms regularly engaged in manufacture of sound system components and accessories, of types, capacities and characteristics required, whose products have been in satisfactory use in similar service for not less than 5 years.
- B. All equipment and material shall be new, and must have been commercially available for at least one year prior to bid.
- C. All equipment must be UL listed or built to UL standards.

### **1.2 SYSTEM REQUIREMENTS**

- A. General: Provide complete and fully functional audio systems using materials and equipment of types, sizes, ratings, and performances as indicated in the equipment list in the accompanying drawings. Use materials and equipment that comply with referenced standards and manufacturers' standard design and construction in accordance with published product information. Coordinate the features of materials and equipment so they form an integrated system with components and interconnections matched for optimum performance of specified functions.
- B. Provide all wire, cable, and connectors as required to complete the installation of all systems as designed and specified.

### **1.3 EQUIPMENT AND MATERIALS**

- A. General: Provide equipment selected from equipment list on drawings, or as substituted following the proscribed substitution process, using all solid-state components fully rated for continuous duty at the ratings indicated or specified. Select equipment for normal operation on input power supplied at 105-130 V, 60 Hz.

## **PART 3 - EXECUTION**

### **1.1 EXAMINATION**

- A. Examine conditions for compliance with requirements and other conditions affecting the performance of the Audio System work.

- B. Do not proceed until unsatisfactory conditions have been corrected.

## **1.2 INSTALLATION**

- A. General: Install system in accordance with NFPA 70 and other applicable codes. Install equipment in accordance with manufacturer's written instructions.
- B. All equipment shall be firmly secured in place unless requirements of portability dictate otherwise. Fastenings and supports shall be adequate to support their loads with a safety factor of at least three times the weight of the equipment being installed. Any structural mounting that is not able to meet this requirement due to the specific nature of the equipment, manufacturer's requirements or limitations of the facility, shall not be installed without prior approval of the Engineer. Install all boxes, equipment, hardware, and other materials plumb, level, and square.
- C. Install all technology equipment and support equipment in podium, and the other millwork in a neat and cosmetically dressed-out manner. All saw cuts, holes and recesses into laminates and woodwork shall be straight, all radius and circular cuts shall be consistent, and all uneven surfaces shall be corrected. This shall include the use of moldings, grommets, bushings, laminates, and wood products as required to dress out the installation of equipment. Assure that the installation of equipment and panels in the technology racks and podiums are completed by using matching screws, hardware and grommets.
- D. Speakers:
  - 1. Confirm polarity of speaker before installation and wire to maintain uniform polarity.
  - 2. Mount transformers with screws securely to speaker brackets or enclosures.
  - 3. Neatly mount speaker grilles, panels, connector plates, control panels, etc., tight, plumb, and square unless indicated otherwise on drawings.
  - 4. Provide brackets, screws, adapters, springs, rack mounting kits, etc., recommended by manufacturer for correct assembly and installation of speaker assemblies and technology components.
  - 5. Make speaker cable connections with rosin core solder or wire nut or equivalent connections.
  - 6. Loosely but completely fill speaker back boxes that do not have fiberglass installed with fiberglass.
  - 7. Seal cone speakers to backbox so air will not pass from one side of speaker to another.
  - 8. Securely mount theater style speaker systems to custom wall mount brackets as detailed in the supplied design drawings. Comply with applicable seismic codes and requirements.
- E. Technology:
  - 1. Assure sufficient ventilation for adequate cooling of equipment.
  - 2. Mount amplifiers at top of equipment cabinet. Install vent rack panels in unused spaces. Install vent panels at top and bottom and above each power amplifier.
  - 3. Securely fasten equipment plumb and square in place. Where equipment is installed in rack cabinets, utilize all fastening holes and cover open spaces with perforated panels.
  - 4. Securely fasten relays and small components. Do not use sticky-back tape for fasteners.
  - 5. Install balancing transformer on each unbalanced input or output that connects to device outside equipment cabinet, or that connects to balanced input or output within equipment cabinet.
  - 6. Connect powered components to 120 VAC outlets on transient voltage surge suppressors. Do not connect to outlets on other components.
  - 7. Leave sufficient service loops of uniform length on cables to allow operation of system with chassis outside cabinet.

8. All equipment shall be held firmly in place with proper types of mounting hardware as recommended and/or supplied by the manufacturer. All mounting hardware provided with equipment shall be used when practical. This shall include, but not be limited to, front and rear rack rails, angle brackets and rack mount kits. All equipment shall be installed so as to provide reasonable safety to the operator.

F. Cable, Wire, and Connectors:

1. All cable and wire shall be new and unspliced. Splicing of cables and conductors is expressly prohibited in any location other than the equipment racks. Splicing of audio and video cables will not be allowed in any location. Splicing of control conductors shall be accomplished via punch block or terminal strip connections only.
2. Additional cable length shall be provided at all connector locations. Duplex box, junction box, and floor box locations shall be installed with sufficient cable length behind cover plates to permit wiring maintenance and connector replacement in the future.
3. When cable runs utilize the vertical cable raceways located within walls, the acoustic integrity of the walls shall be maintained. All cables that pass through cover plates of junction boxes and raceways, through slab-to-slab walls, and through conduit lines shall be properly gasketed and sealed and all acoustic material shall be restored or replaced.
4. Separation between system cables and all other services shall be maximized to prevent and/or minimize the potential for electro-magnetic interference (EMI). Particular care shall be taken to ensure at least a 12" separation from electrical lines whenever feasible. At points where separation is unavoidable, distribution cables shall cross other services at right angles whenever practical to minimize EMI.
5. Cables shall be installed in a manner that shall ensure no signal cables are placed on top of any lighting fixtures, ceiling speakers, video projector lifts, projection screens, HVAC controls or sensing devices, fire safety and sprinkler system detection technology, or any other technology or mechanical equipment.
6. No cables shall be laid directly on top of T-bar grid ceiling tiles. Support cables installed outside of conduit at a maximum of four foot intervals from the building structure. Do not utilize support wires from other trades or systems.
7. System cables shall be installed in a manner that will not block access to other equipment or services, across removable service panels and/or in any other manner to prohibit routine maintenance of HVAC systems, fire safety equipment and building mechanical control systems.
8. All exposed conductors inside of equipment racks shall be dressed with heavy duty neoprene heat-shrink tubing.
9. All inter-rack cabling shall be neatly laced, dressed, strain relieved and adequately supported.
10. After completion of wiring and cable installation, all trough and box covers shall be notched out and grommetted for clearance of the various cable bundles, (i.e., separate audio, video, and control). These panel covers shall be screwed back in place and all gaskets shall be restored or replaced.
11. Do not place any wires and cables for this system in any conduit, raceway, wire way or cable tray that is used for the mechanical systems of the building.
12. Provide connectors of the type and quality as detailed in this contract, and/or as required to meet the minimum bandwidth requirements of the equipment to which the connectors are terminated. The overall quantity of connectors shall not be limited by the quantities indicated in the drawings and shall be provided as required.
13. No connectors shall be installed in non-accessible locations or used for splicing cables. All connectors shall be new.
14. All connectors shall incorporate strain relief mechanisms which firmly grip the jacket of connected cables. All connectors shall be properly polarized to prevent improper seating. Connectors shall provide appropriate electrical characteristics for the circuitry to which they are attached.

15. All inner-rack cables shall be grouped according to the signals being carried to reduce signal contamination. Separate groups shall be formed for the following:
  - a. Power
  - b. Control
  - c. Video
  - d. Audio cables carrying signals less than -20 dBm.
  - e. Audio cables carrying signals between -20 dBm and +20 dBm.
  - f. Audio cables carrying signals over +20 dBm.
16. Route all cable and wiring within equipment racks, cabinets and millwork according to function, separating wires of different signal levels (microphone, line level, amplifier output, AC, control, etc.) by as much distance as possible. Neatly arrange, harness and bundle all cable with nylon U/V rated ties.
17. As a general practice, all power cables, control cables, and high level cables shall be run on the left side of equipment racks as viewed from the rear. All other cables shall be run on the right side of all equipment racks as viewed from the rear.
18. All cables, except video cables which must be cut to an electrical length, shall be cut to the length dictated by the cable run.
19. Terminal blocks, boards, strips or connectors, shall be furnished by the installer for all cables which interface with racks, cabinets, consoles, or equipment modules. Affix terminal blocks, boards, strips or connectors to equipment racks using screws only. Double sided tape will not be accepted.
20. Comply with industry standard circuit polarity and loudspeaker wiring polarity. No cables shall be terminated with a polarity reversal between connectors at either end.
21. All system wire, after being cut and stripped, shall have the wire strands twisted back to their original lay and be terminated by approved soldered or mechanical means. No bare wire ends shall be accepted.
22. Heat-shrink type tubing shall be used to insulate and dress the ends of all wire and cables including a separate tube for the ground or drain wire.
23. All solder connections shall be made with rosin-core solder. Temperature controlled soldering irons rated at least 60 watts shall be used for all soldering work. No soldering guns, gas or butane, or temperature unregulated irons shall be used on the job site.
24. All mechanical connections shall be made with approved crimp lugs of the correct size and type for the connection. Wire nuts shall not be permitted except inside speaker enclosures. Each connector shall be attached with the proper size controlled-duty-cycle ratcheting crimp tool which has been approved by the manufacturer of the connectors.
25. Conventional non-ratcheting type crimping tools are unacceptable, and shall not be used on the job site. The presence of such tools on the job site shall constitute evidence of mechanical connections made with unauthorized tools and shall provide sufficient grounds for rejection of all mechanical connections in the system, and the subsequent re-work of same.
26. Shields for audio cables shall be grounded at the input end only, of the various equipment items on the system to prevent potential for ground loops.
27. Where AV cable is installed in areas that are exposed to the view of end users, install AV cable and associated power cables inside nylon braided sleeving (wire loom). Examples of such areas include, but are not limited to cables installed to projectors and monitors, and cables installed to devices in/on lecterns such as touch panels and document cameras. Where security cables are specified for physical security to such devices, install the specified security cables inside the nylon braided sleeving along with the AV cables.

G. Identification and Labeling:

1. All cables, regardless of length, shall be identified with a machine-printed wrap-around labeling system at both ends. These labels shall be self laminating to ensure durability. The label format used shall be equal, or better than, the system detailed.
2. There shall be no unmarked cables any place in the system.



3. Marking codes used on cables shall correspond to codes provided with submittals, and/or the written documentation of the "as built" drawings.
  4. All connectors, controls, equipment components, terminal blocks and equipment racks are to be permanently labeled in a format approved during the submittal process.
  5. All equipment labels are to be permanently engraved in metal. Any alternative method shall be approved during the submittal process.
  6. Clearly and permanently label all jacks, controls, connections, and so forth. Embossed or printed label tape shall not be used and is considered unacceptable for this system. Attach labels with double stick tape as required.
  7. All labeling shall be completed prior to acceptance of the final system.
- H. Repairs: Wherever walls, ceilings, floors, or other building finishes are cut for installation, or accidentally marred during installation, repair, restore, and refinish to original appearance.

### **1.3 GROUNDING**

- A. Provide equipment grounding connections for audio system as indicated. Tighten connections to comply with tightening torques specified in UL Standard 486A to assure permanent and effective grounds.
- B. Ground equipment, conductor, and cable shields to eliminate shock hazard and to eliminate ground loops, common mode returns, noise pickup, cross talk, and other impairments. Provide 5-ohm ground at main equipment location. Measure, record, and report ground resistance.
- C. Provide one #6 ground conductor with green insulation between all equipment racks and the main electrical panel ground bus. Connect at each end.

### **1.4 FIELD QUALITY CONTROL**

- A. Manufacturer's Field Services: Provide services of a factory authorized service representative to supervise the field assembly and connection of components and the pretesting, testing, and adjustment of the system.
- B. Pretesting: Upon completing installation of the system, align, adjust, and balance the system and perform complete pretesting. Determine, through pretesting, the conformance of the system to the requirements of the Drawings and Specifications. Correct deficiencies observed in pretesting. Replace malfunctioning or damaged items with new, and retest until materials satisfactory performance and conditions are achieved.
- C. Balance and Equalization: Perform the final balance and equalization. Comply with the equalization requirements stated above.
- D. Designer/Engineer Final Review:
  1. Contractor shall assist Designer/Engineer in performing the final review, and spot checking the balance and equalization.
  2. Coordinate final inspection schedule with Designer/Engineer two weeks minimum prior to Consultant's final inspection.
  3. Have copy of red-lined as-built documents available at time of inspection.
  4. Have loose equipment (microphones, cables, etc) available at time of inspection.
  5. Assist Sound/Acoustic Consultant in final inspection of completed system.
  6. Provide the following test equipment in good working order:

- a. Battery operated hand-held 1/3 octave real-time audio spectrum analyzer with SPL meter and precision microphone.
- b. Digitally generated random pick noise generator, 20Hz-20kHz, minimum 2 hr repetition rate.
- c. Direct reading audio impedance meter, minimum 3 frequencies, 10% accuracy.
- d. Digital Volt-Ohmmeter.
- e. Audio oscillator, variable frequency, 20Hz-20kHz.
- f. Battery operated oscilloscope, 1 MHz minimum bandwidth.
- g. Necessary charger, cables, test leads, adapter, power strip, etc, for test equipment.
- 7. Correct minor items so Designer/Engineer may certify satisfactory completion during his visit.
- 8. Pay Designer/Engineer's additional fees and expenses if building or systems have not been completed properly or sufficiently, requiring Designer/Engineer to make subsequent visits to balance, equalize, inspect, or certify completion.

## **1.5 COMMISSIONING**

- A. Train Owner's maintenance personnel in the procedures and schedules involved in operating, troubleshooting, servicing, and preventative maintenance of the system.
- B. Train Owner's non-technical users, and technical support personnel in the procedures and schedules involved in operating, troubleshooting, servicing, and preventative maintenance of the system. Provide a minimum of 4 hours training on two non-consecutive days (8 hours total). Provide training on days when training sessions are not provided to comply with the training requirements specified in other related sections. Include separate training sessions for non-technical users and for technical support personnel. Have ready, and refer to, all project documentation including, but not limited to, operating and maintenance instructions and As-built drawings. Allow the Owner to record any or all training sessions using audio and/or video recording equipment at their discretion.
- C. Schedule training with Owner through the Architect, with at least 21 days advance notice.

## **1.6 CLEANING AND PROTECTION**

- A. Prior to final acceptance, clean system components and protect from damage and deterioration.

END OF SECTION 27 4113