

ELECTRICAL ABBREVIATIONS

#		DPDT	DOUBLE POLE, DOUBLE THROW		MINIMUM
1P	SINGLE POLE	DPST	DOUBLE POLE, SINGLE THROW	MLO	MAIN LUGS ONLY
1PH	SINGLE PHASE	DRSW	DOOR SWITCH	MOCOP	MAXIMUM OVERCURRENT PROTECTION
2/C	TWO-CONDUCTOR	DS	DISCONNECT SWITCH	MT	MOUNT
3/C	THREE-CONDUCTOR	DWG	DRAWING	MTD	MOUNTED
3PH	THREE PHASE			MTG	MOUNTING
4/C	FOUR-CONDUCTOR	E	ELEVATION	MTS	MANUAL TRANSFER SWITCH
4W	FOUR WIRE	EL	ELECTRIC OR ELECTRICAL	MV	MEDIUM VOLTAGE
		ELEV	ELEVATOR	MVA	MEGAVOLT-AMPERE
		EMCP	EMERGENCY MONITORING CONTROL PANEL	MW	MEGAWATT
A	AIR CONDITIONING UNIT	EMER	EMERGENCY	N	NOT APPLICABLE
A/E	ARCHITECT / ENGINEER	EMI	ELECTROMAGNETIC INTERFERENCE	NA	NORMALLY CLOSED
AAP	ALARM ANNUNCIATOR PANEL	EMT	ELECTRICAL METALLIC TUBING	NEC	NATIONAL ELECTRIC CODE
AC	ALTERNATING CURRENT OR ARMORED CABLE	ENCL	ENCLOSURE	NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
ACC	ACCESSIBLE	EPO	EMERGENCY POWER OFF	NEUT OR N	NEUTRAL
ADDL	ADDITIONAL	EPRF	EXPLOSION PROOF	NFPA	NATIONAL FIRE PROTECTION ASSOCIATION
ADJ	ADJACENT OR ADJOINING	ESMT	EASEMENT	NIC	NOT IN CONTRACT
ADO	AUTOMATIC DOOR OPENER	EWC	ELECTRIC WATER COOLER	NL	NIGHT LIGHT
AF	AMPERE FRAME OR AMP FUSE	EWL	ELECTRIC WATER HEATER	NO	NORMALLY OPEN
AFB	ABOVE FINISHED COUNTER, AUTOMATIC FREQUENCY CONTROL, OR AVAILABLE FAULT CURRENT	EXST	EXISTING	NS	NO SCALE
AFS	ABOVE FINISHED FLOOR	EC	ELECTRICAL CONTRACTOR	NTS	NOT TO SCALE
AFG	ABOVE FINISHED GRADE	F	FIRE ALARM		
AH	AMPERE-HOUR	FA	FIRE ALARM ANNUNCIATOR PANEL	O	ON CENTER
AHJ	AUTHORITY HAVING JURISDICTION	FAAP	FIRE ALARM BELL	OC	OUTSIDE DIAMETER
AIC	AMPERE INTERRUPTING CAPACITY	FABL	FIRE ALARM BOX	OD	OVERLOAD
ALT	ALTERNATE	FABX	FIRE ALARM CONTROL PANEL	OL	
AMB OR A	AMBIENT	FACP	FIXTURE		
AMP	AMPERE	FC	FULL LOAD AMPS	P	POLE
ARCH	ARCHITECT	FIXT	FLEXIBLE METALLIC CONDUIT	PA	PUBLIC ADDRESS
ASC	AMPS SHORT CIRCUIT	FLA	FLOODLIGHT	PB	PULL BOX OR PANEL BOARD
AT	AMPERE TRIP	FLEX	FLUORESCENT	PBBU	PREFABRICATED BEDSIDE PATIENT UNIT
ATS	AUTOMATIC TRANSFER SWITCH	FLT	FLUORESCENT FIXTURE	PCB	POLYCHLORINATED BIPHENYL
AUTO	AUTOMATIC	FLUOR	TELEPHONE FLOOR OUTLET	PEC	PHOTOELECTRIC CELL
AV	AUDIO VISUAL	FOUJT	FIRE PROTECTION	PED	PEDESTAL
		FP	FEET OR FOOT	PEND	PENDANT
B	BATTERY	FT	FUSED SWITCH	PF	POWER FACTOR
BAT	BATTERY	FU SW	FULL VOLTAGE NON-REVERSING	PH	PHASE
BC	BARE COPPER	FVNR	FULL VOLTAGE REVERSING	PNL	PANEL
BD	BOARD	FVR		PT	POTENTIAL TRANSFORMER
BFF	BELOW FINISHED FLOOR			PVC	POLYVINYL CHLORIDE (PLASTIC)
BIL	BASIC INSULATION LEVEL	G	ELECTRICAL GROUND	PWR	POWER
BLDG	BUILDING	G OR GND	GENERAL CONTRACTOR		
BPIP	BOILER PLANT INSTRUMENTATION PANEL	GC	GENERATOR	R	REFLECTED CEILING PLAN
BRKR	BREAKER	GEN	GROUND FAULT CIRCUIT INTERRUPTER	REC	RECESSED
BYP	BYPASS	GFCI	GROUND TERMINAL BOX	RECPT	RECEPTACLE
		GTB		REQ	REQUIRED
C	CONDUIT	H	HIGH INTENSITY DISCHARGE	RGS	RIGID GALVANIZED STEEL
CAB	CABINET	HID	HORSEPOWER	RM	ROOM
CALC	CALCULATE	HOA	HEIGHT	RMS	ROOT MEAN SQUARE
CAP	CAPACITY	HP	HERTZ		
CAT	CATALOG	HT		S	SHORT CIRCUIT CAPACITY
CATV	COMMUNITY ANTENNA TELEVISION	HZ		SD	SMOKE DETECTOR
CCR	CONTROL CONTACTOR	I	ILLUMINATION ENGINEERING SOCIETY OF NORTH AMERICA	SES	SERVICE ENTRANCE SECTION
CCTV	CLOSED CIRCUIT TELEVISION	IESNA	INTERMEDIATE METAL CONDUIT	SF	SQUARE FOOT (FEET)
CD	CANDELA OR CONSTRUCTION DOCUMENTS	IMC	INCANDESCENT	SHT	SHEET
CF	CONTRACTOR FURNISHED	IR	INFRARED	SI	INTERNATIONAL SYSTEM OF UNITS
CFICI	CONTRACTOR FURNISHED / CONTRACTOR INSTALLED	IWH	INSTANTANEOUS WATER HEATER	SPEC	SPECIFICATION
CFIOI	CONTRACTOR FURNISHED / OWNER INSTALLED	J	JUNCTION BOX	SPST	SINGLE POLE, SINGLE THROW
CFE	CONTRACTOR FURNISHED EQUIPMENT	J-BOX		SURF	SURFACE
CHW	CHILLED WATER	K	KILOVOLT	SW	SWITCH
CHWP	CHILLED WATER PUMP	KV	KILOVOLT-AMPERE	SWBD	SWITCHBOARD
CKT	CIRCUIT	KVA	KILOVOLT-AMPERE PER HOUR	SWGR	SWITCHGEAR
CKT BRKR	CIRCUIT BREAKER	KVAH	KILOVOLT-AMPERE REACTIVE	SC	SECURITY CONTRACTOR
CLF	CURRENT LIMITING FUSE	KVAR	KILOWATT	T	TELEPHONE
CLG	CEILING	KWH	KILOWATT HOUR	TEL	TELEPHONE
CMU	CONCRETE MASONRY UNIT	KWHM	KILOWATT HOUR METER	TP	TWISTED PAIR
CO	CONTRACTING OFFICER			TPS	TWISTED PAIR SHIELDED
COAX	COAX CABLE	L	LIGHT EMITTING DIODE	TTB	TELEPHONE TERMINAL BOARD
COMM	COMMUNICATION	LED	LINEAR FEET (FOOT)	TV	TELEVISION
COMPT	COMPARTMENT	LF	LUMEN	TYP	TYPICAL
CONC	CONCRETE	LM	LIGHT POLE	U	UNDERFLOOR DUCT
CONC	CONCRETE	LP	LOW PRESSURE SODIUM	UGND	UNDERGROUND
CONT	CONTINUE	LPS	LOCKED ROTOR AMPS	UL	UNDERWRITERS LABORATORY
CONTR	CONTRACTOR	LRA	LIGHT	UON	UNLESS OTHERWISE NOTED
COORD	COORDINATE	LT	LIGHTING	UPS	UNINTERRUPTIBLE POWER SUPPLY
COR	CONTRACTING OFFICER'S REPRESENTATIVE	LTG	LIGHTING PANEL	UTIL	UTILITY
CPT	CONTROL POWER TRANSFORMER	LTNG	LIGHTNING	V	VOLT
CRI	COLOR RENDERING INDEX	LV	LOW VOLTAGE	VA	VOLT-AMPERE
CT	CURRENT TRANSFORMER	M	MASTER ANTENNA TELEVISION SYSTEM	VAR	VOLT-AMPERE REACTIVE
CTV	CABLE TELEVISION	MATV	MAXIMUM	VFD	VARIABLE FREQUENCY DRIVE
CU	COPPER	MAX	METAL-CLAD	VOLT	VOLTAGE
CU FT	CUBIC FEET	MC	MINIMUM CIRCUIT AMPS	W	WATT
CUR	CURRENT	MCA	MAIN CIRCUIT BREAKER	WH	WATER HEATER
		MCB	MOTOR CONTROL CENTER	WP	WEATHERPROOF
DB	DECIBEL	MCC	MECHANICAL	X	TRANSFER
DC	DIRECT CURRENT	MDP	MOTOR GENERATOR	XFER	TRANSFER
DCP	DIMMER CONTROL PANEL	MECH	MANHOLE	XFMR	TRANSFORMER
DEG C	DEGREES CELSIUS	MG			
DEG F	DEGREES FAHRENHEIT	MH			
DEMO	DEMOLITION				
DIAG	DIAGRAM				
DISC	DISCONNECT				
DISTR	DISTRIBUTION				
DISTR PNL	DISTRIBUTION PANEL				
DMR SW	DIMMER SWITCH				
DN	DOWN				

PIPING AND DUCTWORK
2015 IBC AND ASCE 7-10 NONSTRUCTURAL SEISMIC RESTRAINT, BRACING AND ANCHORAGE NOTES:

REFERENCE SPECIFICATION: SECTION 13 05 41
 SEISMIC RESTRAINT REQUIREMENTS FOR NON-STRUCTURAL COMPONENTS

SEISMIC DESIGN DATA FOR ANALYSIS AND DESIGN:

H-18-8 SEISMICITY = MODERATE-HIGH
 SEISMIC RISK CATEGORY BASED UPON OCCUPANCY = III
 COMPONENT IMPORTANCE FACTORS:
 IP=1.0 FOR NON-ESSENTIAL COMPONENTS
 IP=1.5 FOR LIFE SAFETY AND DESIGNATED SEISMIC SYSTEMS (DSS) AND PERMANENT EQUIPMENT AND COMPONENTS REQUIRING SPECIAL SEISMIC CERTIFICATION PER H-18-8

MAPPED SPECTRAL RESPONSE ACCELERATION PARAMETERS:
 SS=0.533G S1=0.154G

SITE CLASS C (PER GEOTECHNICAL REPORT)

DESIGN SPECTRAL RESPONSE ACCELERATION PARAMETERS:
 SDS=0.421G SD1=0.169G

SEISMIC DESIGN CATEGORY (SDC) = C

NOTE: NONSTRUCTURAL SEISMIC EXCEPTIONS AND EXEMPTIONS SHALL BE DETERMINED IN ACCORDANCE WITH H-18-8 AND CHAPTER 13 OF ASCE 7 FOR SDC = D. REFERENCE SPECIFICATION SECTION 13 05 14.

H-18-8 SPECIAL SEISMIC CERTIFICATION (SSC) REQUIREMENT:

IN STRUCTURES ASSIGNED TO SEISMIC DESIGN CATEGORY C, D, E, OR F, PERMANENT EQUIPMENT AND COMPONENTS ARE TO HAVE SPECIAL SEISMIC CERTIFICATION IN ACCORDANCE WITH REQUIREMENTS OF SECTION 13.2.2 OF ASCE 7 EXCEPT FOR EQUIPMENT AND COMPONENTS THAT ARE CONSIDERED RUGGED AS LISTED IN SECTION 2.2 OF OSHPD CODE APPLICATION NOTICE CAN NO. 2-1708A.5, AND SHALL COMPLY WITH SECTION 13.2.6 OF ASCE 7.

CLARIFICATION OF ASCE 7 "12 INCH RULE" SUSPENDED SEISMIC BRACING CODE EXCEPTION FOR PIPING AND HVAC DUCTWORK:

ALL PIPING OR DUCTWORK SUSPENDED BY INDIVIDUAL HANGER RODS 12" OR LESS AS MEASURED FROM THE TOP OF THE PIPING OR DUCTWORK TO THE BOTTOM OF THE SUPPORT WHERE THE HANGER IS ATTACHED. IF THE 12" LIMIT IS EXCEEDED BY ANY HANGER IN THE RUN, SEISMIC BRACING IS REQUIRED FOR THE RUN. NOTE: A SINGLE SUPPORT LOCATION THAT MEETS THE REQUIREMENT OF THIS EXCEPTION DOES NOT CONSTITUTE A SEISMIC SWAY BRACE LOCATION. IN ADDITION, TO MEET THE CODE REQUIREMENTS, ALL OF THE FOLLOWING CONDITIONS MUST ALSO BE SATISFIED:

- LATERAL MOTION OF PIPING OR DUCTWORK WILL NOT CAUSE DAMAGING IMPACT WITH SURROUNDING SYSTEMS (E.G. OTHER CONDUIT, TRAY, PIPE, DUCT, EQUIPMENT, SPRINKLER HEADS ETC.) OR CAUSE LOSS OF SYSTEM VERTICAL SUPPORT.
- PIPING OR DUCTWORK MUST BE MADE OF DUCTILE MATERIAL WITH DUCTILE CONNECTIONS.

ELECTRICAL SEISMIC GENERAL NOTES

- GC MUST HAVE SEISMIC-FORCE-RESTRAINT SHOP DRAWINGS AND CALCULATIONS PREPARED BY PROFESSIONAL STRUCTURAL ENGINEER EXPERIENCED IN THE AREA OF SEISMIC FORCE RESTRAINTS. THE PROFESSIONAL STRUCTURAL ENGINEER SHALL BE REGISTERED IN THE STATE WHERE THE PROJECT IS LOCATED.
- SUBMIT DESIGN TABLES AND INFORMATION USED FOR THE DESIGN-FORCE LEVELS, STAMPED AND SIGNED BY A PROFESSIONAL STRUCTURAL ENGINEER REGISTERED IN THE STATE WHERE THE PROJECT IS LOCATED.
- "DO NOT INSTALL" SEISMIC RESTRAINT SUBMITTALS ARE APPROVED BY THE COR. COORDINATE AND INSTALL TRAPEZE OR OTHER MULTI-PIPE HANGER SYSTEMS PRIOR TO PIPE INSTALLATION.
- IN STRUCTURES ASSIGNED TO IBC SEISMIC DESIGN CATEGORY C, D, E, OR F, PERMANENT EQUIPMENTS AND COMPONENTS ARE TO HAVE SPECIAL SEISMIC CERTIFICATION IN ACCORDANCE WITH REQUIREMENTS OF SECTION 13.2.2 OF THE ASCE 7 EXCEPT FOR EQUIPMENT THAT ARE CONSIDERED RUGGED AS LISTED IN SECTION 2.2 OSHPD CODE APPLICATION NOTICE CAN NO. 2-1708A.5 AND SHALL COMPLY WITH SECTION 13.2.6 OF ASCE 7.
- GC AND MC MUST REVIEW AND COMPLETE ALL SEISMIC RESTRAINT REQUIREMENTS PER SPECIFICATION SECTION 13 05 41.

ELECTRICAL GENERAL NOTES

- SPECIFICATIONS TAKE PRECEDENCE OVER DRAWINGS.
- MULTI-GANG BACKBOXES FOR DIFFERENT VOLTAGES AND TYPES OF EMERGENCY AND NORMAL BRANCH WIRING DEVICES SHALL HAVE DIVIDERS BETWEEN DEVICES.
- CORE DRILL AND SAW CUT, AS REQUIRED, FOR FLOOR AND WALL PENETRATIONS. SEAL REMAINING ANNULUS WITH FIRE CAULK. REFER TO SPECIFICATION "FIRE STOPPING" 07-84-00.
- FURNISH ACCESS DOORS OR PANELS FOR INSTALLATION BY GENERAL CONTRACTOR IN WALLS AND CEILINGS WHERE ACCESS IS REQUIRED TO CONCEALED ELECTRICAL BOXES AND DEVICES.
- ARMORED CABLE (AC) MAY BE USED FOR LAY-IN FIXTURE PIGTAILS. ARMORED CABLE (AC) SHALL NOT BE USED FOR BRANCH CIRCUIT HOMERUNS. ARMORED CABLE (AC) SHALL NOT BE USED WHERE MORE THAN THREE CONDUCTORS (PHASE/NEUTRAL/GROUND) ARE REQUIRED, WHERE EXPOSED; OR IN LENGTHS EXCEEDING 20 FEET EXCEPT FOR TEMPORARY WIRING.
- PROVIDE ALL ELECTRICAL WORK IN ACCORDANCE WITH THE CURRENT NATIONAL ELECTRICAL CODE AND THE REQUIREMENTS OF THE VHA.
- COORDINATE ALL OUTAGES WITH VHA COR PER SPECS PRIOR TO WORK BEING DONE.

LIGHTING GENERAL NOTES

- ALL RECESSED LIGHTING FIXTURE IN LAY-IN CEILINGS SHALL BE INSTALLED WITH 6' LONG FLEXIBLE METAL CONDUIT.
- ALL MOUNTING HEIGHTS FOR LIGHTING FIXTURES ARE TO THE BOTTOM OF THE FIXTURES UNLESS INDICATED OTHERWISE.
- SEE ARCHITECTURAL EXTERIOR ELEVATIONS FOR MOUNTING HEIGHTS OF EXTERIOR LIGHTING FIXTURES.
- CIRCUIT WIRING IS NOT SHOWN. SWITCH AND CIRCUITING INTENT SHALL BE AS DESIGNATED AT EACH LIGHT FIXTURE.
- PROVIDE PROPER NUMBER OF CONDUCTORS TO ACHIEVE CIRCUITING AND SWITCHING SHOWN.
- CIRCUIT NUMBERS AT DEVICES CORRESPOND TO PANELBOARD BREAKERS (SEE PANELBOARD SCHEDULES). BRANCH CIRCUITS SHALL BE SIZED ACCORDING TO THE CIRCUIT BREAKER RATING, UNLESS INDICATED OTHERWISE ON THE ELECTRICAL EQUIPMENT SCHEDULE.

COMMUNICATION GENERAL NOTES

- SECURITY CONTRACTOR (SC) TO PROVIDE SHOP DRAWINGS AND SUBMIT TO VHA FOR APPROVAL BEFORE PROJECT START.
- EXISTING SYSTEMS AND SERVICES ALREADY IN USE MAY DETERMINE A BROADER REQUIREMENT FOR A COMPLETE WORKING AND UNIFIED SYSTEM.
- FIELD COORDINATE CAMERA TYPES AND MOUNTING HARDWARE IN CONJUNCTION TO THE MOUNTING APPLICATIONS AND LOCATION - VERIFY CORRECT INTRA-CONNECT CABLING WITH DEVICE TYPES AND LOCATION FIBER OPTIC CABLING WILL BE REQUIRED BASED ON ANY DISTANCE OVER 90 METERS.

ELECTRICAL GENERAL NOTES - DEMOLITION

- SEE ARCHITECTURAL DRAWINGS AND SPECIFICATIONS FOR PHASES OF DEMOLITION AND CONSTRUCTION. COORDINATE WITH GENERAL CONSTRUCTION.
- DISCONNECT AND REMOVE ALL ELECTRICAL DEVICES AND LIGHTING FIXTURES IN DEMOLITION AREAS UNLESS NOTED OTHERWISE. DISCONNECT AND REMOVE ASSOCIATED CONDUIT AND WIRE BACK TO OVERCURRENT PROTECTIVE DEVICE. COMPLETELY CUT/CAP CONDUITS IN CONCRETE SLAB AND IN THE AREA OF WORK PERIMETER. DISCONNECT AND REMOVE ALL ABANDONED CIRCUITS AND CONDUITS. PROVIDE CONDUIT AND WIRE AS REQUIRED FOR CONTINUITY OF CIRCUITS TO ANY EXISTING DEVICES TO REMAIN. COORDINATE AND VERIFY REQUIREMENTS WITHIN NEW AREA OF WORK. REMAIN. COORDINATE AND VERIFY REQUIREMENTS WITHIN NEW AREA OF WORK.

KEYNOTES

00 KEYNOTE

NEW - EXISTING AND DEMO LINE TYPES

	NEW LINE TYPE
	EXISTING LINE TYPE
	DEMO LINE TYPE
	DEMO HATCH

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				Approved: Project Director	Location 3687 VETERANS DRIVE, FORT HARRISON, MT 59636	Drawing Number 173 & 154	
Issue Date 08/05/2020	Checked TL	Drawn BWW	E001				

ELECTRICAL SYMBOLS - DIAGRAM

Table of electrical symbols for diagrams, including Delta Connection, Motor, Transformer, Wye Connection, Pull Box, Manhole, Pressure Switch, Switch, Relay, Fuse, Breaker, Disconnect Switch, Fusible Link, Starter, Generator, Capacitor, Pothead, Lightning Arrestor, Rectifier, Ammeter, Voltmeter, Wattmeter, Transformer, Duct, Earth Ground, and Ladder Cable Tray.

ELECTRICAL SYMBOLS - POWER PLAN

Table of electrical symbols for power plans, including Branch Circuit Homerun, Cable Tray, Rigid Conduit Line, Direct Burial Cable, Power Duct, Underground Electrical Service, Substation, Voltage Switch, Manhole, Busway, Floor Outlet, Data Communication, Outlet, Push Button, Distribution Panel, Lighting Panel, Panelboard Cabinet, Grounding Bar, Receptacle, Duplex, Emergency Power, Interupter, Counter Height, Duplex, Quadruplex, Single, Single with Switch, Quadruplex on Emergency Power, Special Purpose Receptacle, Ceiling Mounted Receptacle, Switched Duplex, Drop Cord, Electrical Striple Mold, 3-Gang Compartment Box, Time Clock, Ventilator, Conduit Terminated, Conduit Terminated w/ Coupling, Switch, Fused Switch, Key Operated, Lock, Low Voltage Master, Manual Motor Starting, Momentary Contact, Motor Snap with Pilot Light, With Pilot Light, Explosion Proof, Blank Outlet Box, and Headwall.

COMMUNICATION SYMBOLS:

Table of communication symbols, including Card Reader, Electric Door Strike, Magnetic Door Position Switch, Vandal Resistant Camera, Four Square Junction Box, Magnetic Lock, Remote Door Release Button, Request to Exit Motion Detector, CCTV System Workstation, Duress Button, Code Blue Button, Nurse Call Master Console, Ethernet Network Switch, Wireless Access Point, Data Box, Outlet, Combination Telephone/Data Communication, Cable Television Line, Closed Circuit Television Line, Fiber Optics Line, Telephone Line, Intercom & Public Address Line, Sound Line, Nurse Call Line, Radio Conduit Run, Telecommunications Manhole, Floor Receptacle, Telephone, Outlet Telephone, Outlet Data Only, Outlet Data and Telecom, Outlet Television, Speaker, Radio Channel Selector Facilities, Speaker Program Selector Switch, Outlet Television, Nurse's Call Master Station, Nurse Call Terminal Cabinet, Nurse Call Station, Telephone Terminal Cabinet, Telephone Backboard, and 3-Pole Twist-Lock Receptacle.

ELECTRICAL SYMBOLS - LIGHTING PLAN

Table of electrical symbols for lighting plans, including Switch, Recessed Downlight Fixture, Recessed Troffer Light Fixture, Ceiling Surface Mounted Light Fixture, Wall Surface Mounted Light Fixture, Light Fixture Power Connection Designations, Dual Passive Infrared / Microphonic Technology, Exit Sign, Lighting, Light Pole, Light Pole with Bracket, Light Pole, One Mast Arm, Light Pole, Two Mast Arms, Light Pole, Post Top Mount Luminaire, Light Exterior Building Mounted Fixture, Light Pole, One Luminaire, Light Pole, Two Luminaires, Lighting, Exterior Building, Exterior Flood Light, Light Fixture, Light Fixture, Directional, and Intercom Station.

Table with columns for Issued and Date.

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STAMP: PROFESSIONAL ENGINEER, STATE OF COLORADO, License No. 100000000, dated 8/15/2020

U.S. Department of Veterans Affairs logo

Drawing Title: ELECTRICAL SYMBOLS, Approved: Project Director

Phase: 100% CONSTRUCTION DOCUMENTS, Issue Date: 08/05/2020, Checked: TL, Drawn: BWW

Project Title: OUTPATIENT MENTAL HEALTH / EDUCATION ADDITION, Location: 3687 VETERANS DRIVE, FORT HARRISON, MT 59636, Issue Date: 08/05/2020, Checked: TL, Drawn: BWW

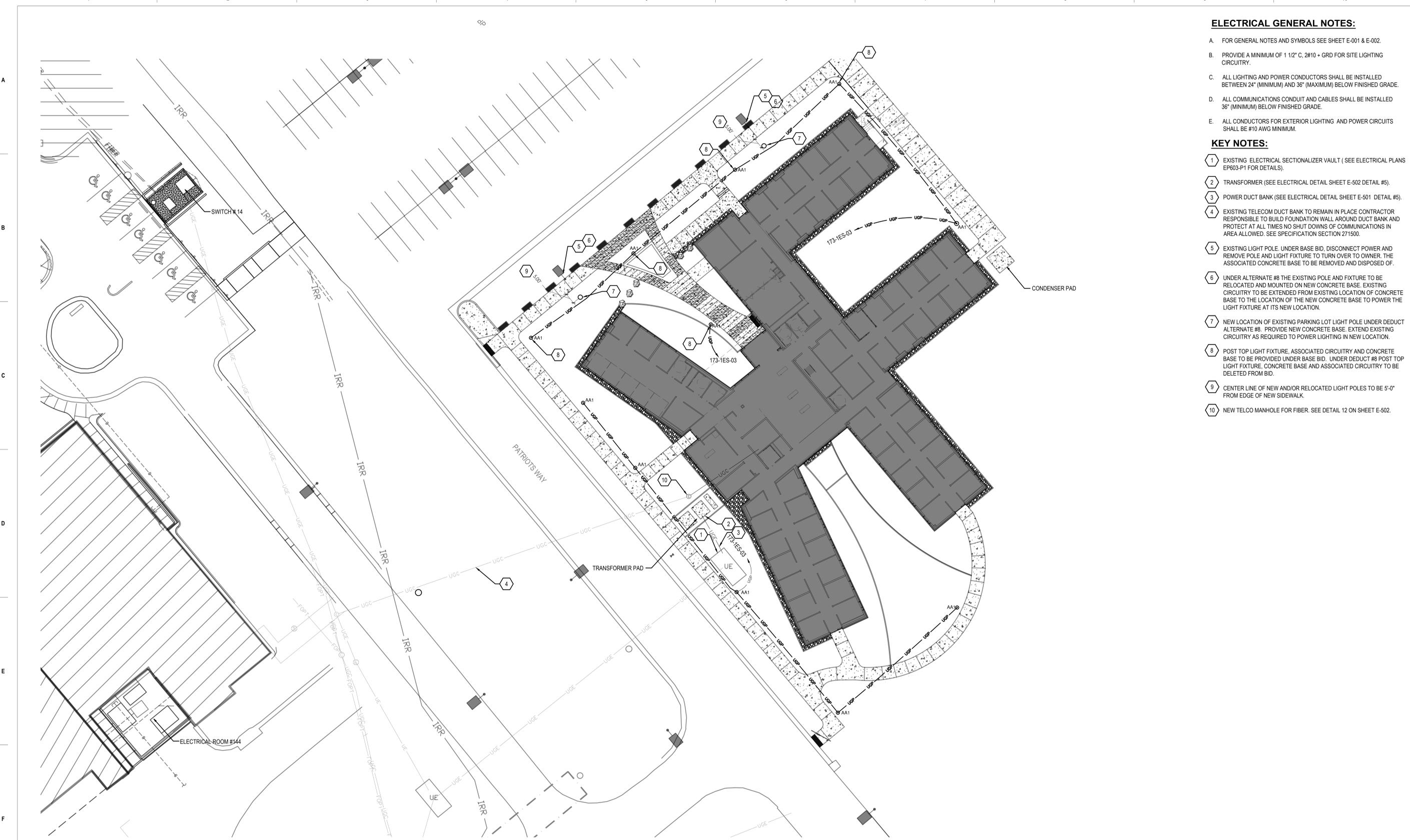
Project Number: 436-114, Building Number: 173 & 154, Drawing Number: E-002

ELECTRICAL GENERAL NOTES:

- A. FOR GENERAL NOTES AND SYMBOLS SEE SHEET E-001 & E-002.
- B. PROVIDE A MINIMUM OF 1 1/2" C, 2#10 + GRD FOR SITE LIGHTING CIRCUITRY.
- C. ALL LIGHTING AND POWER CONDUCTORS SHALL BE INSTALLED BETWEEN 24" (MINIMUM) AND 36" (MAXIMUM) BELOW FINISHED GRADE.
- D. ALL COMMUNICATIONS CONDUIT AND CABLES SHALL BE INSTALLED 36" (MINIMUM) BELOW FINISHED GRADE.
- E. ALL CONDUCTORS FOR EXTERIOR LIGHTING AND POWER CIRCUITS SHALL BE #10 AWG MINIMUM.

KEY NOTES:

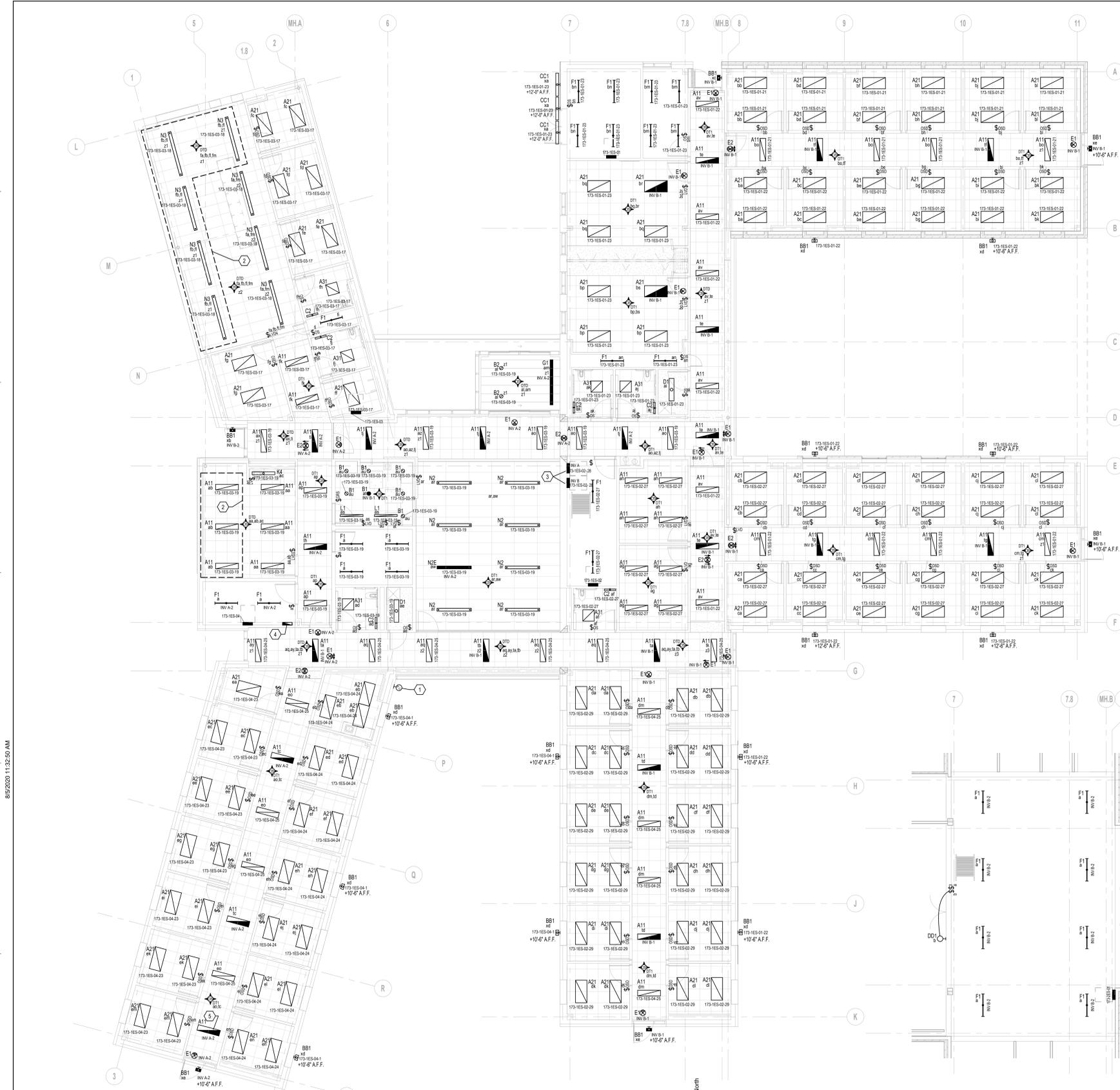
- 1 EXISTING ELECTRICAL SECTIONALIZER VAULT (SEE ELECTRICAL PLANS EP603-P1 FOR DETAILS).
- 2 TRANSFORMER (SEE ELECTRICAL DETAIL SHEET E-502 DETAIL #5).
- 3 POWER DUCT BANK (SEE ELECTRICAL DETAIL SHEET E-501 DETAIL #5).
- 4 EXISTING TELECOM DUCT BANK TO REMAIN IN PLACE CONTRACTOR RESPONSIBLE TO BUILD FOUNDATION WALL AROUND DUCT BANK AND PROTECT AT ALL TIMES NO SHUT DOWNS OF COMMUNICATIONS IN AREA ALLOWED. SEE SPECIFICATION SECTION 271500.
- 5 EXISTING LIGHT POLE. UNDER BASE BID, DISCONNECT POWER AND REMOVE POLE AND LIGHT FIXTURE TO TURN OVER TO OWNER. THE ASSOCIATED CONCRETE BASE TO BE REMOVED AND DISPOSED OF.
- 6 UNDER ALTERNATE #8 THE EXISTING POLE AND FIXTURE TO BE RELOCATED AND MOUNTED ON NEW CONCRETE BASE. EXISTING CIRCUITRY TO BE EXTENDED FROM EXISTING LOCATION OF CONCRETE BASE TO THE LOCATION OF THE NEW CONCRETE BASE TO POWER THE LIGHT FIXTURE AT ITS NEW LOCATION.
- 7 NEW LOCATION OF EXISTING PARKING LOT LIGHT POLE UNDER DEDUCT ALTERNATE #8. PROVIDE NEW CONCRETE BASE. EXTEND EXISTING CIRCUITRY AS REQUIRED TO POWER LIGHTING IN NEW LOCATION.
- 8 POST TOP LIGHT FIXTURE, ASSOCIATED CIRCUITRY AND CONCRETE BASE TO BE PROVIDED UNDER BASE BID. UNDER DEDUCT #8 POST TOP LIGHT FIXTURE, CONCRETE BASE AND ASSOCIATED CIRCUITRY TO BE DELETED FROM BID.
- 9 CENTER LINE OF NEW AND/OR RELOCATED LIGHT POLES TO BE 5'-0" FROM EDGE OF NEW SIDEWALK.
- 10 NEW TELCO MANHOLE FOR FIBER. SEE DETAIL 12 ON SHEET E-502.



1 ELECTRICAL SITE PLAN
SCALE: 1" = 10'

Issued: _____ Date: _____ VA FORM 08-6231	CONSULTANTS:  HOEFER WYSOCKI 11460 TOMAHAWK CREEK PARKWAY SUITE 400 LEANWOOD, KANSAS 64051  Protection Engineering  JIRSA HEDRICK Structural Engineers	ARCHITECT/ENGINEERS:  VALHALLA ENGINEERING GROUP, LLC 750 W HAMPDEN AVE SUITE #300 ENGLEWOOD CO 80110 (720) 550-6307 WWW.VALHALLAENGINEERING.COM VEG 4.11	STAMP:   U.S. Department of Veterans Affairs	Drawing Title POWER SITE PLAN Approved: Project Director	Phase 100% CONSTRUCTION DOCUMENTS	Project Title OUTPATIENT MENTAL HEALTH / EDUCATION ADDITION Location 3687 VETERANS DRIVE, FORT HARRISON, MT 59636 Issue Date 08/05/2020	Project Number 436-114 Building Number 173 Drawing Number ES101-P1
	Checked TL	Drawn BWW					

A
B
C
D
E
F



- ELECTRICAL GENERAL NOTES:**
- A. REFER TO DRAWING E-001 FOR GENERAL NOTES PERTAINING TO THIS DRAWING.
 - B. FOR NON-DIMMED FIXTURES CONNECTED TO EMERGENCY INVERTER POWER PROVIDE A DIGITAL EMERGENCY SWITCHED RELAY PACK FOR EVERY CHANNEL CONTROLLING NON-DIMMED LIGHT FIXTURES.
 - C. FOR 0-10VDC DIMMED FIXTURES CONNECTED TO EMERGENCY INVERTER POWER PROVIDE A DIGITAL EMERGENCY 0-10VDC DIMMING RELAY PACK FOR EVERY CHANNEL CONTROLLING 0-10VDC DIMMING LIGHT FIXTURES.
- KEY NOTES:**
- 1. LOW VOLTAGE LIGHTING CONTROL SYSTEM EXTERIOR PHOTOCELL MOUNTED AT 12'-0" A.F.F.
 - 2. LIGHT FIXTURES LOCATED WITHIN DASHED AREA ARE MUST BE CONTROLLED BY OCCUPANCY SENSOR AND DAYLIGHT PHOTOCELL LOCATED IN ROOM.
 - 3. PROVIDE WALL MOUNTED INVERTER FOR EMERGENCY (LIFE SAFETY) EGRESS LIGHTING. MOUNT INVERTER AT 6'-0" A.F.F. TO THE BOTTOM OF INVERTER.
 - 4. LOW VOLTAGE LIGHTING CONTROL NETWORK CONTROL DEVICE CONTROL DEVICE MUST BE MOUNTED WITHIN A 14"x14"x1" DEEP NEMA 1 RATED SURFACE MOUNTED BACKBOX. BACKBOX MUST HAVE A SURFACE MOUNTED COVER. PROVIDE A 120VOLT CONNECTION TO CIRCUIT INV-A-2.

1 OUTPATIENT BUILDING - FIRST FLOOR LIGHTING
1/8" = 1'-0"

2 OUTPATIENT BUILDING - PENTHOUSE LIGHTING
1/8" = 1'-0"

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Issued:	Date:

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U.S. Department of Veterans Affairs

Drawing Title	Project Title
OUTPATIENT BUILDING - FIRST FLOOR LIGHTING	OUTPATIENT MENTAL HEALTH / EDUCATION ADDITION
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Phase	Project Title
100% CONSTRUCTION DOCUMENTS	OUTPATIENT MENTAL HEALTH / EDUCATION ADDITION
	Location 3687 Veterans Drive, Fort Harrison, MT 59636

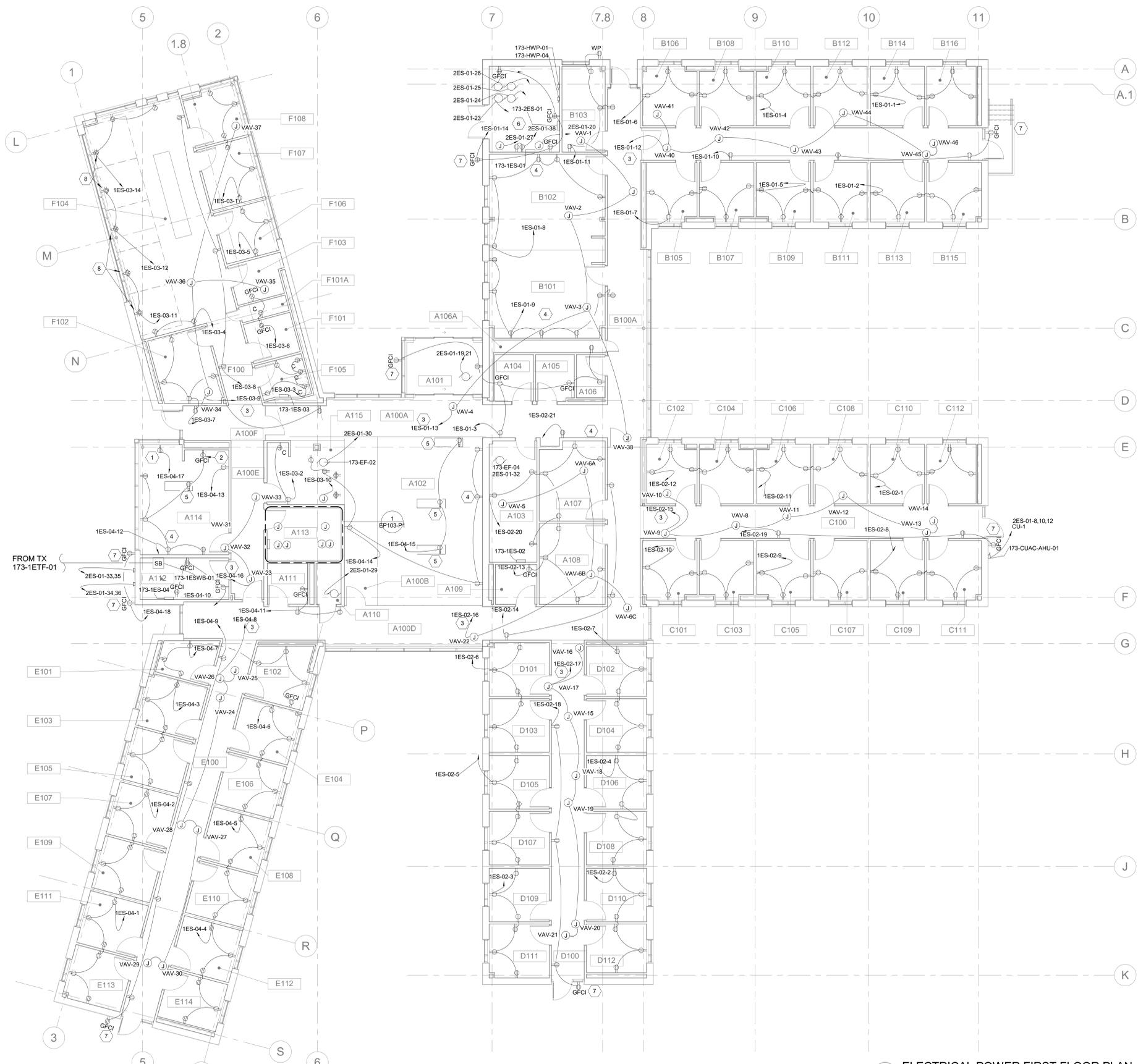
Issue Date	Checked	Drawn	Project Number
08/05/2020	TL	JEE	436-114
			Building Number 173
			Drawing Number EL101-P1

ELECTRICAL GENERAL NOTES:

1. FOR GENERAL NOTES, ABBREVIATIONS AND SYMBOLS SEE SHEET E-001.
2. REFER TO SHEET MH101-P1 IN MECHANICAL SHEETS TO COORDINATE EXACT LOCATION OF JUNCTION BOXES FOR VAV'S AND VAV ID TAGS.

KEY NOTES:

- 1 PROVIDE RECEPTACLE FOR MICROWAVE. COORDINATE EXACT LOCATION WITH CASEWORK ELEVATIONS.
- 2 PROVIDE RECEPTACLE FOR REFRIGERATOR. COORDINATE EXACT LOCATION WITH CASEWORK ELEVATIONS.
- 3 ELECTRICAL CONTRACTOR MUST PROVIDE A 50VA, 120V/24V CONTROL TRANSFORMER FOR VAVS AND A 20A, 120V CIRCUIT FROM INDICATED PANELS.
- 4 PROVIDE DUPLEX RECEPTACLE AND EMPTY SINGLE GANG BOX FOR TV LOCATION MOUNTED AT 60" ABOVE FINISHED FLOOR.
- 5 PROVIDE CONCRETE FLOOR BOX WITH A SINGLE DUPLEX 20A, 120V RECEPTACLE AND A DUPLEX DATA OUTLET SIMILAR TO LEGRAND RPB2-0G. VERIFY EXACT LOCATION PRIOR TO ROUGH-IN.
- 6 PROVIDE SPARE 2" CONDUIT EXTENDED FROM ELECTRICAL ROOM "A112" TO THIS LOCATION FOR FUTURE CAPACITY. STUB AND CAP BOTH ENDS.
- 7 PROVIDE 120V/20A WEATHERPOOF DUPLEX, GFCI RECEPTACLE ON INDICATED CIRCUIT.
- 8 INSTALL RECEPTACLES NOT MORE THAN 16" ABOVE FINISHED FLOOR.



1 ELECTRICAL POWER FIRST FLOOR PLAN
1/8" = 1'-0"

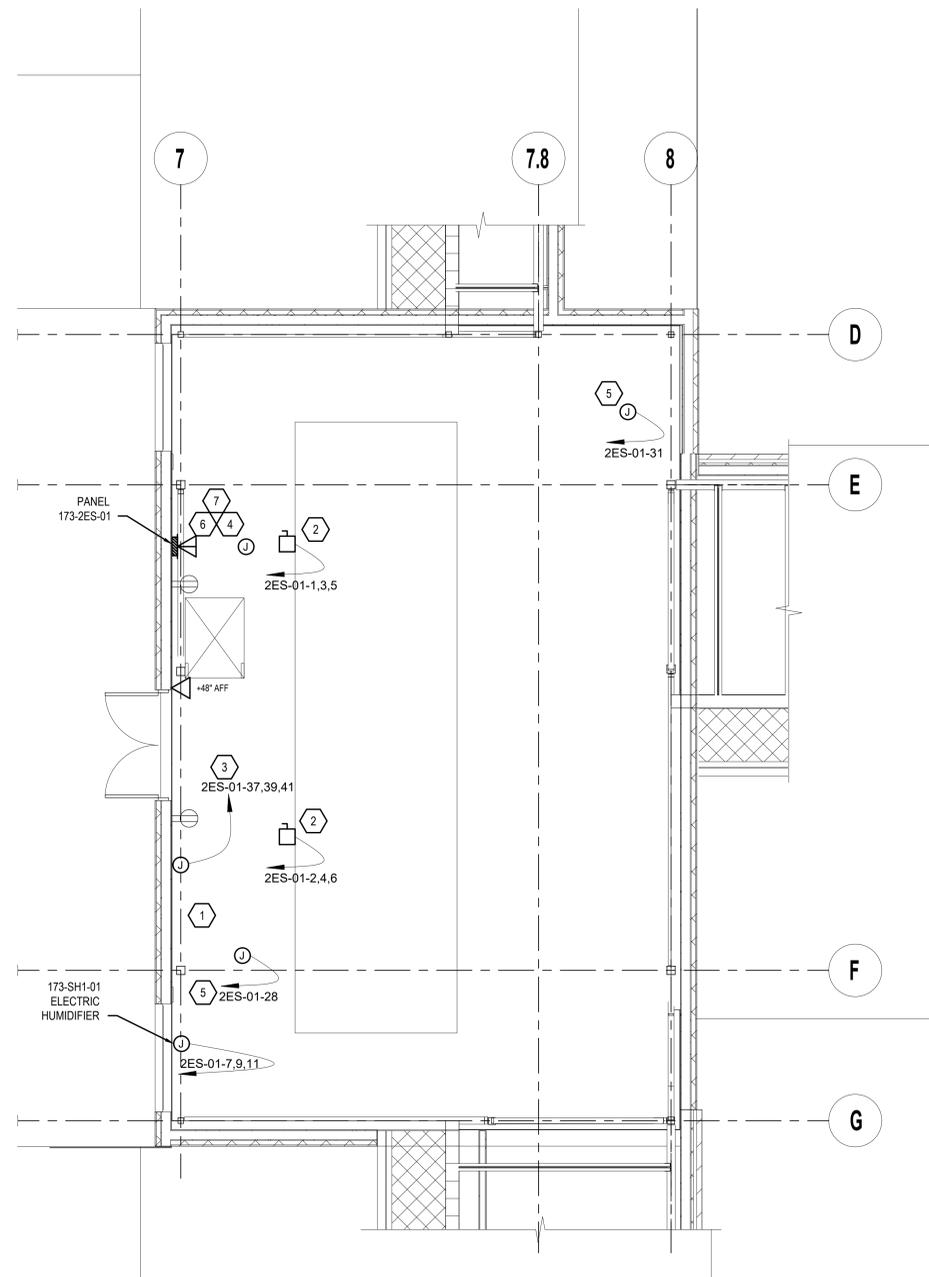
<p>CONSULTANTS:</p> <p>HOEFER WYSOCKI 1840 TONAHAWK CREEK PARKWAY SUITE 400, LEANWOOD, KANSAS 66041</p> <p>PROTECTION ENGINEERING CONSULTANTS</p> <p>JIRSA HEDRICK STRUCTURAL ENGINEERS</p>	<p>ARCHITECT/ENGINEER OF RECORD:</p> <p>VALHALLA ENGINEERING GROUP, LLC 750 W HAMPDEN AVE SUITE 300 ENGLEWOOD, CO 80110 (720) 550-6307 WWW.VALHALLAENGINEERING.COM</p>	<p>STAMP:</p>		<p>Drawing Title</p> <p>POWER PLAN - FIRST FLOOR</p> <p>Approved: Project Director</p>	<p>Phase</p> <p>95% CONSTRUCTION DOCUMENTS</p>	<p>Project Title</p> <p>OUTPATIENT MENTAL HEALTH / EDUCATION ADDITION</p> <p>Location 3687 VETERANS DRIVE, FORT HARRISON, MT 59636</p> <p>Issue Date 02/20/2019</p> <p>Checked TL</p> <p>Drawn BWW</p>	<p>Project Number</p> <p>436-114</p> <p>Building Number</p> <p>173</p> <p>Drawing Number</p> <p>EP101-P1</p>
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ELECTRICAL GENERAL NOTES:

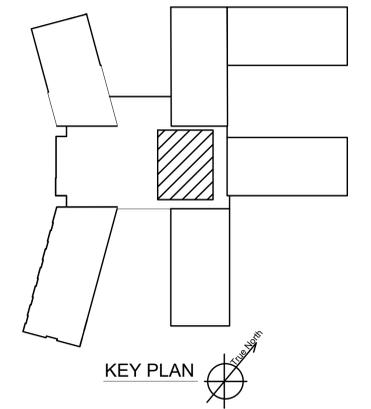
A. FOR GENERAL NOTES AND SYMBOLS SEE SHEET E-001 & E-002.

KEY NOTES:

- 1 PROVIDE J.BOX FOR STEAM HUMIDIFIER.
- 2 PROVIDE POWER TO VFD. VERIFY EXACT LOCATION PRIOR TO ROUGH-IN.
- 3 PROVIDE POWER CONNECTION FOR HEAT TRACE.
- 4 PROVIDE J.BOX FOR VFD SIGNAL TO SMARTSTRUXURE (OR SIMILAR) BAS CONTROLS LOCATED IN IT ROOM A113.
- 5 PROVIDE J.BOX FOR MECHANICAL EQUIPMENT POWER. REFER TO MECHANICAL SHEETS FOR MORE INFORMATION.
- 6 PROVIDE SPARE (1)-2" CONDUIT FROM ELECTRICAL ROOM "A112" AND (1)-2" CONDUIT FROM IT ROOM "A113" EXTENDED TO THIS LOCATION FOR FUTURE CAPACITY. STUB AND CAP BOTH ENDS.
- 7 FIELD COORDINATE DATA LOCATION WITHIN THE CONTROL PANEL FOR NETWORK CONNECTION.



1 ELECTRICAL PLAN - PENTHOUSE
 SCALE: 1/4" = 1'-0"
 0 1' 2' 4' 8' 16'



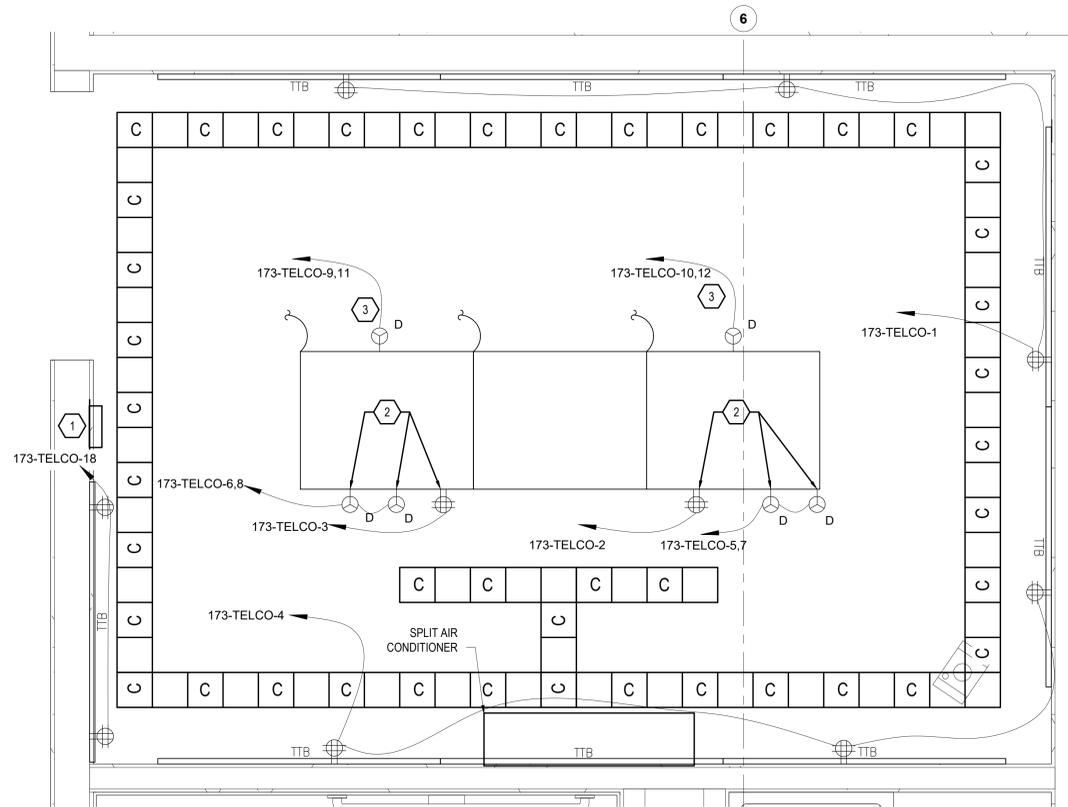
Issued: Date:	CONSULTANTS:  HOEFER WYSOCKI 11440 TOMAHAWK CREEK PARKWAY SUITE 400, LEANWOOD, KANSAS 66211	ARCHITECT/ENGINEERS:  VALHALLA ENGINEERING GROUP, LLC 750 W HAMPDEN AVE SUITE #200 ENGLEWOOD CO 80110 (720) 550-6307 WWW.VALHALLAENGINEERING.COM	STAMP:  8/5/2020	 U.S. Department of Veterans Affairs	Drawing Title POWER PLAN - PENTHOUSE	Phase 100% CONSTRUCTION DOCUMENTS	Project Title OUTPATIENT MENTAL HEALTH / EDUCATION ADDITION	Project Number 436-114
					Approved: Project Director	Location 3687 VETERANS DRIVE, FORT HARRISON, MT 59636	Building Number 173	Drawing Number EP102-P1

ELECTRICAL GENERAL NOTES:

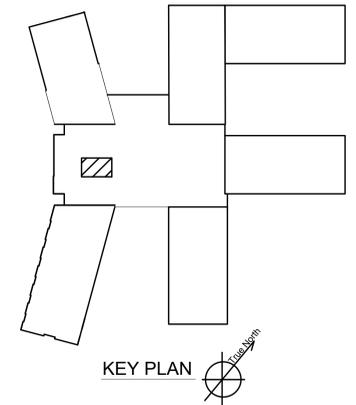
A. FOR SYMBOLS AND GENERAL NOTES SEE SHEET E-001 & E-002.

KEY NOTES:

- 1 PROVIDE PANEL "TELCO" AS SCHEDULED TO BE DEDICATED FOR "A113" ROOM POWER.
- 2 PROVIDE (2) NEMA L5-30R AND (1) DOUBLE-DUPLEX RECEPTACLE ABOVE RACK. CIRCUIT AS INDICATED.
- 3 PROVIDE NEMA L5-30R RECEPTACLE ON RACK FOR UPS SIMILAR TO APC SMART-UPS 500VA RACKMOUNT/TOWER UPS. UPS SHALL BE PROVIDED WITH DRY CONTACTS AND ONE "FORM C" CONTACT FOR LOCAL COMPUTER SIGNALING AND SHALL COME WITH COMPUTER SYSTEM SHUTDOWN SOFTWARE AND HARDWARE CONNECTIVITY, AS REQUIRED. UPS SHALL BE CAPABLE OF SUPPORTING 100% OF LOAD CONSISTING OF (2) CISCO 3850 SERVERS FOR A PERIOD OF ONE HOUR MINIMUM. SEE SPECIFICATION 26-33-53 "STATIC UNINTERRUPTIBLE POWER SUPPLY" FOR DETAILS.



1 BLDG 173 TELECOM ROOM POWER PLAN
SCALE: NO SCALE



KEY PLAN

Issued: _____ Date: _____ VA FORM 08-6231	CONSULTANTS:  11460 TOMAHAWK CREEK PARKWAY SUITE 400 LEANWOOD, KANSAS 66041		ARCHITECT/ENGINEERS:  750 W HAMPDEN AVE SUITE #300 ENGLEWOOD CO 80110 (720) 550-6307 WWW.VALHALLAENGINEERING.COM		STAMP: 		Drawing Title TELECOM ROOM POWER LAYOUT	Phase 100% CONSTRUCTION DOCUMENTS	Project Title OUTPATIENT MENTAL HEALTH / EDUCATION ADDITION	Project Number 436-114
	 		VEG 4.11		Approved: Project Director	Location 3687 VETERANS DRIVE, FORT HARRISON, MT 59636	Issue Date 08/05/2020	Checked TL	Drawn GH	Building Number 173



DATA CABLE FURNITURE WHIP: FURNISH ONE (1) DEEP DEVICE WALL BOX AT 18" AFF. CONNECT 1-1/4 INCH EMT CONDUIT FROM ABOVE CEILING AND EXTEND 1-1/4 INCH LIQUID TIGHT OR FLEXIBLE CONDUIT TO THE FURNITURE SPINE

1 ELECTRICAL TEL-COMM FIRST FLOOR PLAN
1/8" = 1'-0"

TELECOMMUNICATION GENERAL NOTES:

1. FOR GENERAL NOTES, ABBREVIATIONS AND SYMBOLS SEE SHEET E-001.

KEY NOTES:

- 1 PROVIDE DUPLEX DATA RECEPTACLE & EMPTY SINGLE GANG BOX FOR TV LOCATION MOUNTED AT 60" ABOVE FINISHED FLOOR. PROVIDE 3/4" CONDUIT WITH PULL STRING TO ABOVE ACCESSIBLE CEILING FOR LOW VOLTAGE CABLING BY LOW VOLTAGE CONTRACTOR. COORDINATE EXACT MOUNTING HEIGHT WITH CASE WORK DETAIL.
- 2 CONTRACTOR TO CLOSELY COORDINATE WITH MECHANICAL INSTALLATION FOR THIS AREA. CLEARANCES WILL BE LOW AND USE OF CONDUIT BRIDGING MAY BE REQUIRED.
- 3 (NOT USED)
- 4 PROVIDE CONCRETE FLOOR BOX WITH A SINGLE DUPLEX 20A, 120V RECEPTACLE AND A DUPLEX DATA OUTLET SIMILAR TO LEGEND RPB2-OG. VERIFY EXACT LOCATION PRIOR TO ROUGH-IN.
- 5 COORDINATE WITH VHA COR ON QUANTITY, TYPE, AND LOCATION OF DATA RECEPTACLES IN THIS ROOM PRIOR TO ROUGH-IN.
- 6 PROVIDE DUPLEX DATA RECEPTACLE AND EMPTY SINGLE GANG BOX FOR SMART BOARD LOCATION MOUNTED AT 60" ABOVE FINISHED FLOOR. PROVIDE 3/4" CONDUIT WITH PULL STRING TO ABOVE ACCESSIBLE CEILING FOR LOW VOLTAGE CABLING BY OTHERS. COORDINATE EXACT MOUNTING HEIGHT WITH ARCHITECT PRIOR TO ROUGH-IN.
- 7 NOT USED.
- 8 NOT USED.
- 9 SEE SHEET EP103-P1 FOR MORE DETAIL ON TELCOM ROOM POWER. SEE SHEET ET103-P1 FOR MORE DETAIL ON TELCOM ROOM DATA.
- 10 LINK NURSE CALL AND LIGHT POWER OVER ETHERNET BACK TO NURSE CALL ROUTER IN IT ROOM "A113" USING CAT6 CABLE TO FEED SIGNAL AND POWER INTO EXISTING NURSE CALL SYSTEM HEAD IN BUILDING 150 ROOM "B13" IN BASEMENT FROM BLDG 173 FIBER (TYP).
- 11 SPEAKERS FOR PUBLIC ADDRESS SYSTEM. LINK TO EXISTING PUBLIC ADDRESS SYSTEM IN BASEMENT OF BUILDING 150 ROOM "B13" USING CAT6 CABLE AND FIBER. PA CONTRACTOR TO FURNISH SHOP DRAWINGS FOR A COMPLETE AND WORKING SYSTEM THROUGHOUT ALL OCCUPIED SPACES AND CORRIDORS.
- 12 WIRELESS ACCESS POINT TO BE INSTALLED IN CEILING. FIELD COORDINATE ALL LOCATIONS WITH THE IT DEPARTMENT PRIOR TO START. ACCESS POINT HEATMAP PROVIDED BY OIT. FIELD COORDINATE ALL LOCATIONS WITH THE IT DEPARTMENT PRIOR TO START OF WORK. ACCESS POINT HEAT MAP PROVIDED BY OIT.
- 13 NEW LADDER CABLE TRAY TO EXTEND FROM NEW IT ROOM "A113" PER VA SPECIFICATION 270533 AND 270526 AND GENERAL NOTES. HEAD IN LOCATIONS ARE AS FOLLOWS: ROOM 9 IN BASEMENT BUILDING 150 FOR IT, ROOM "B1A" IN BASEMENT BUILDING 150 FOR FIBER, ROOM "B13" IN BASEMENT BUILDING 150 FOR PUBLIC ACCESS INTERCOM, VAV CONTROL AND FOR WAP.
- 14 NOT USED.
- 15 PROVIDE JBOX IN CEILING FOR DURESS ALARM OVER ETHERNET BACK TO DURESS ALARM ROUTER IN IT ROOM "A113." FEED SIGNAL AND POWER INTO EXISTING DURESS ALARM SYSTEM HEAD IN BUILDING 150 ROOM "B13" IN BASEMENT USING CAT6 CABLE AND FIBER.
- 16 PROVIDE SPARE 2" CONDUIT EXTENDED FROM IT ROOM "A113" TO THIS LOCATION FOR FUTURE CAPACITY. STUB AND CAP BOTH ENDS.

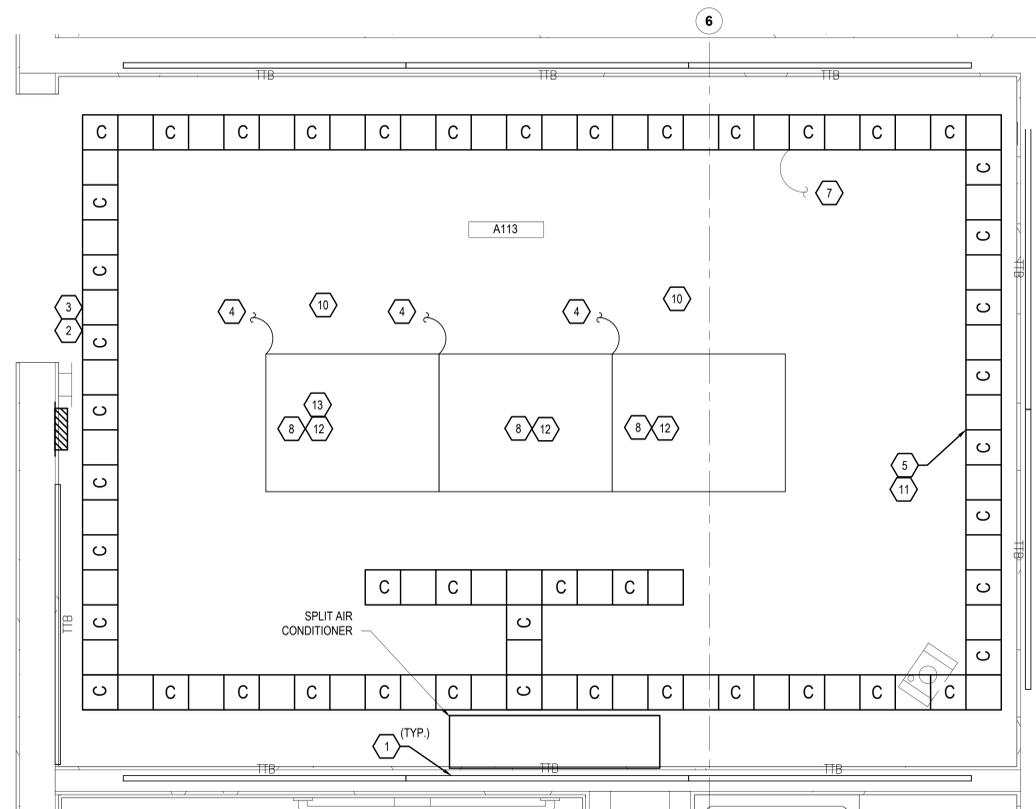
CONSULTANTS: 	ARCHITECT/ENGINEER OF RECORD: 	STAMP: 		Drawing Title	Phase	Project Title	Project Number
				TELCO / INSTRUMENTATION PLAN FIRST FLOOR	95% CONSTRUCTION DOCUMENTS	OUTPATIENT MENTAL HEALTH / EDUCATION ADDITION	436-114 Building Number 173
Issued: _____ Date: _____	750 W HAMPDEN AVE SUITE 500 ENGLEWOOD, CO 80110 (720) 550-6307 WWW.VALHALLAENGINEERING.COM	Approved: Project Director	Location 3687 VETERANS DRIVE, FORT HARRISON, MT 59636	Issue Date 08/05/2020	Checked TL	Drawn GG	Drawing Number ET101-P1

ELECTRICAL GENERAL NOTES:

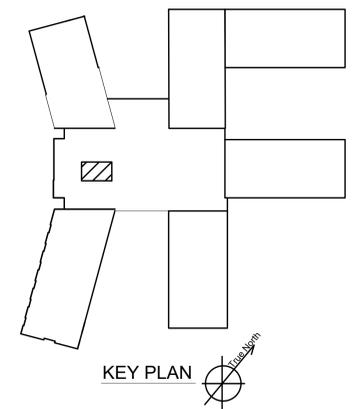
- A. FOR SYMBOLS AND GENERAL NOTES SEE SHEET E-001 & E-002.
- B. ALL COMPONENTS ARE REQUIRED TO BE INSTALLED BY OEM CERTIFIED INSTALLER OF ITEMS PROVIDED FOR TELECOMMUNICATIONS CLOSET.
- C. PROVIDE AND INSTALL SHEETS OF 3/4" FIRE RETARDANT PLYWOOD, PAINTED WITH WHITE FIRE RETARDANT PAINT (FIRE RETARDANT MARKINGS ON PLYWOOD MUST REMAIN VISIBLE) FROM 36" ABOVE FLOOR, UP 4" ALONG THREE WALLS INCLUDING DEMARC (LOCAL EXCHANGE CARRIER POINT OF PRESENCE) WALL OF THE IT CLOSET. SEE SPECIFICATION 07-84-00 "FIRESTOPPING" FOR ADDITIONAL INFORMATION.

KEY NOTES:

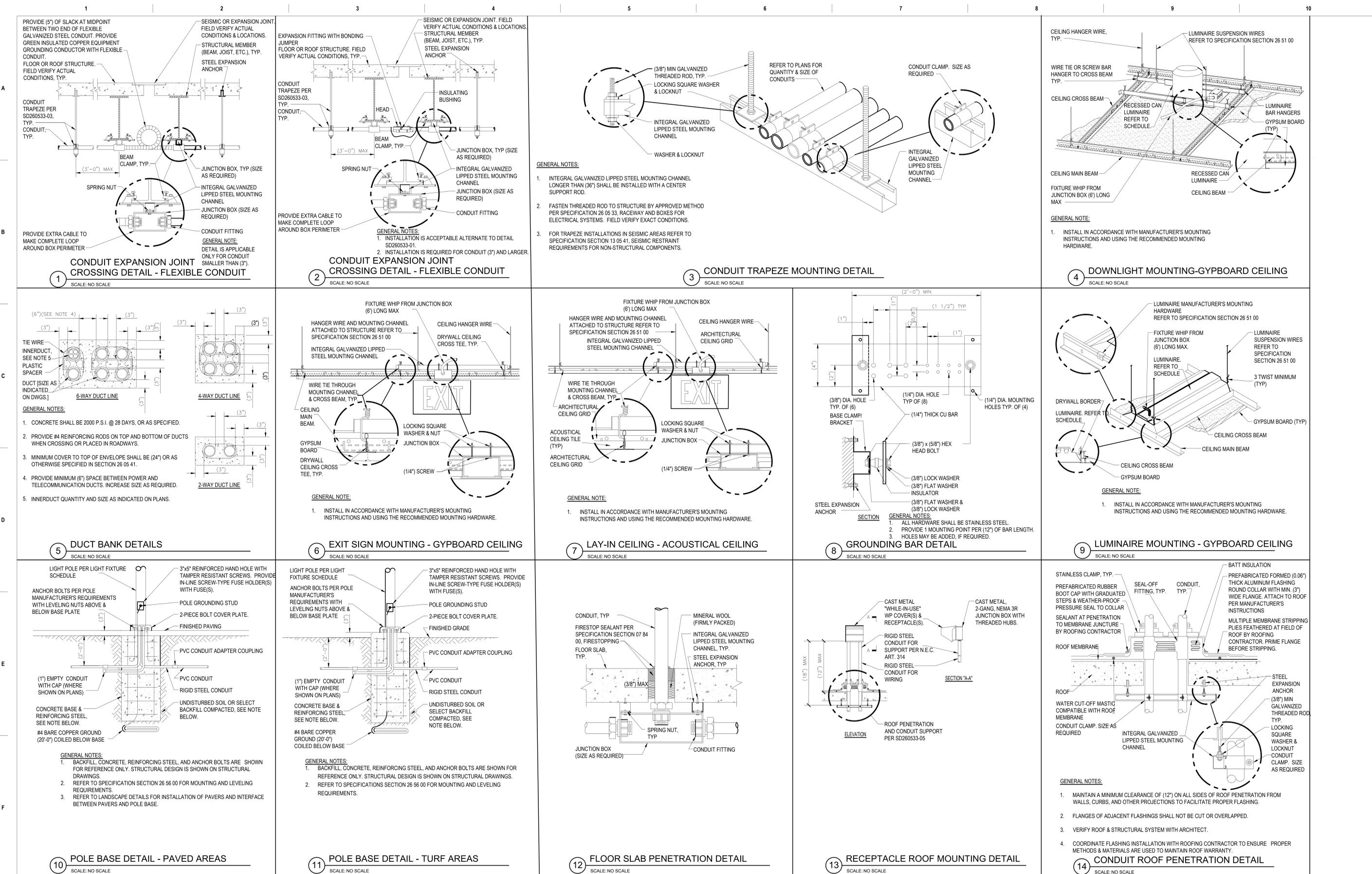
- 1. GENERAL CONTRACTOR SHALL PROVIDE 4'X8' FIRE TREATED BACKBOARD MOUNTED VERTICALLY WITH TOP AT 72" AFF PER SPECIFICATION 07-84-00 "FIRESTOPPING".
- 2. PROVIDE GROUND BAR PER DETAIL 8 ON SHEET E-501 AND PER SPECIFICATIONS 27-05-26 "GROUNDING AND BONDING FOR COMMUNICATION SYSTEMS."
- 3. PROVIDE #10 AWG STRANDED COPPER WIRE FROM GROUND BAR TO BUILDING STEEL WITHIN 6 FEET OF THE GROUND BAR, AND TERMINATE BOTH ENDS.
- 4. PROVIDE #6 AWG STRANDED COPPER WIRE INSTALLED WITH MINIMUM 2" SEPARATION FROM ALL OTHER CABLE TYPES, TO GROUND BAR IN ROOM AND TERMINATE BOTH ENDS.
- 5. REFERENCE TECHNICAL SPECIFICATIONS FOR THE UPS CHARACTERISTICS, SPECIFICATION No. 27-15-00 "COMMUNICATIONS STRUCTURED CABLING" AND 27- 11-00 "COMMUNICATIONS EQUIPMENT ROOM FITTINGS".
- 6. NOT USED.
- 7. PROVIDE CONTINUOUS #6 AWG STRANDED COPPER WIRE LOOP AROUND CABLE TRAY AND TERMINATE ON GROUND BAR IN ROOM. BOND CONDUCTOR TO TRAY AS REQUIRED BY SPECIFICATION 27-05-26 "GROUNDING AND BONDING FOR COMMUNICATION SYSTEMS."
- 8. REFERENCE TECHNICAL SPECIFICATIONS FOR THE COMPUTER RACK CHARACTERISTICS, SPECIFICATION No. 27-11-00 "COMMUNICATIONS EQUIPMENT ROOM FITTINGS".
- 9. NOT USED.
- 10. REFERENCE TECHNICAL SPECIFICATIONS FOR THE UPS CHARACTERISTICS, SPECIFICATION No. 27-15-00 "COMMUNICATIONS STRUCTURED CABLING" AND 27- 11-00 "COMMUNICATIONS EQUIPMENT ROOM FITTINGS".
- 11. ALL HORIZONTAL WIRE AND CABLE SHALL BE INSTALLED IN A RACEWAY SYSTEM WITHIN THE TELECOMMUNICATION CLOSET. THIS RACEWAY SHALL BE SUPPORTED FROM ABOVE THE RACK AREA WITH ENOUGH VERTICAL SPACE TO ALLOW FOR EASY ACCESS TO BOTH THE RACEWAY AND TOP OF THE RACK SYSTEM AND A GRACEFUL ENTRY FROM THE ABOVE RACEWAYS TO THE EQUIPMENT WITHIN THE RACKS BELOW. WATERFALL DEVICES PROVIDE THE SOFT TRANSITION FROM THE RACEWAY ABOVE THE RACKS TO THE DEVICES BELOW AND SHALL BE INSTALLED IN ADEQUATE NUMBERS TO FACILITATE THE NETWORK HARDWARE BEING DEPLOYED AND ADDITIONAL WATERFALL DEVICES PROVIDED TO IT FOR CURRENT AND FUTURE NEEDS. RACEWAY MUST RUN ACROSS THE TOP OF THE RACK IN FOUR DIRECTIONS, EACH POINT MEETING AT THE CENTER.
- 12. CONTRACTOR MUST INCLUDE IN THE PROCUREMENT THE NECESSARY PATCH CABLING TO SUPPORT EACH NETWORK JACK THAT IS INSTALLED. THESE CABLES SHALL BE GRAY 10' (STATION) AND GRAY 7' (CLOSET CABLES) SUPPORTING BOTH THE STATION SIDE AND THE TELECOMMUNICATIONS CLOSET.
- 13. CONTRACTOR MUST PROVIDE AND INSTALL POINT OF DEMARCATION EXTENSION FROM THE LOCAL EXCHANGE CARRIER (LEC) DEMARCATION POINT TO THE MAIN IT TELECOMMUNICATIONS ROOM. IF LEC FIBER DATA CIRCUIT HANDOFF IS AVAILABLE AT THE DEMARC, A 6 PAIR SINGLE MODE FIBER TERMINATED WITH LC BULKHEADS WILL BE PROVIDED FOR EXTENDING THE CIRCUIT.

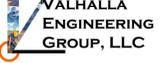


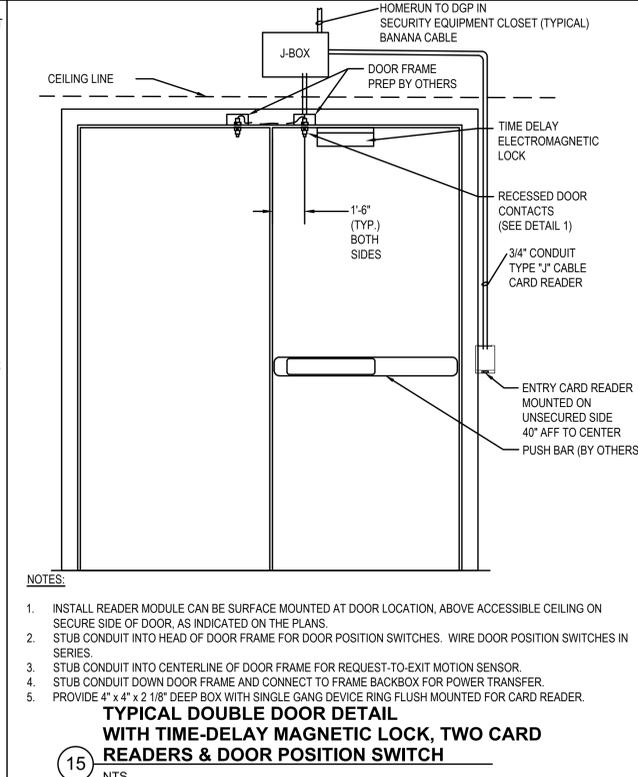
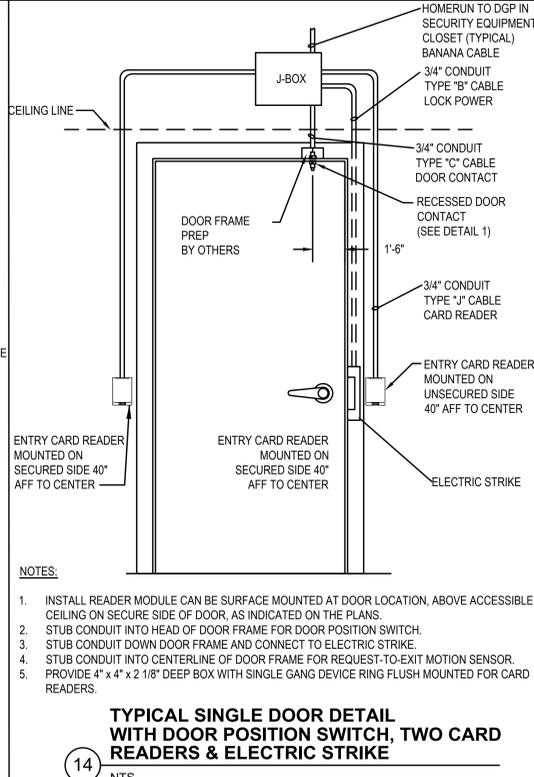
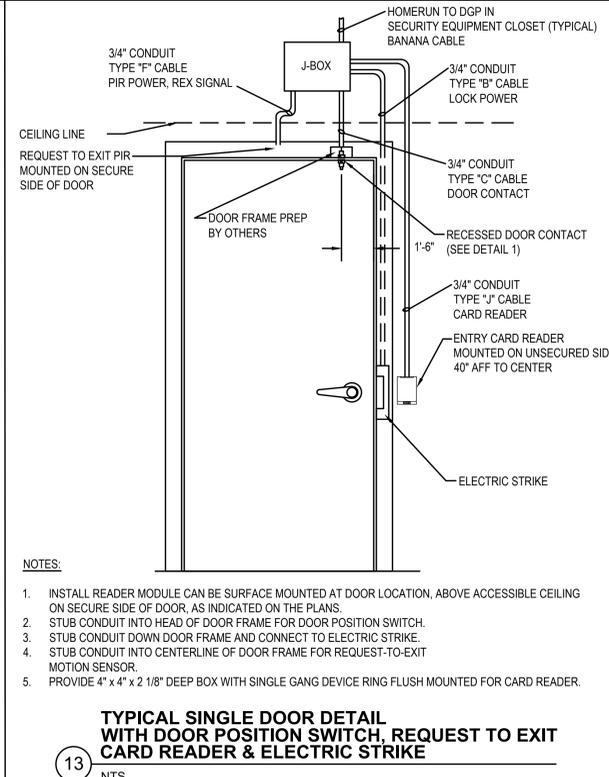
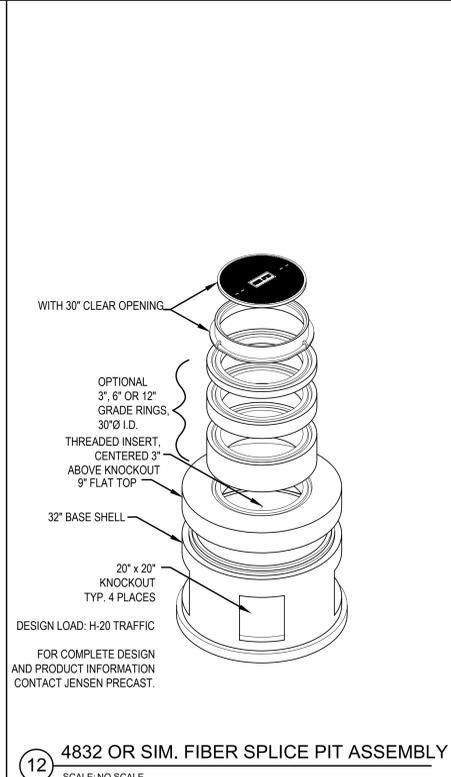
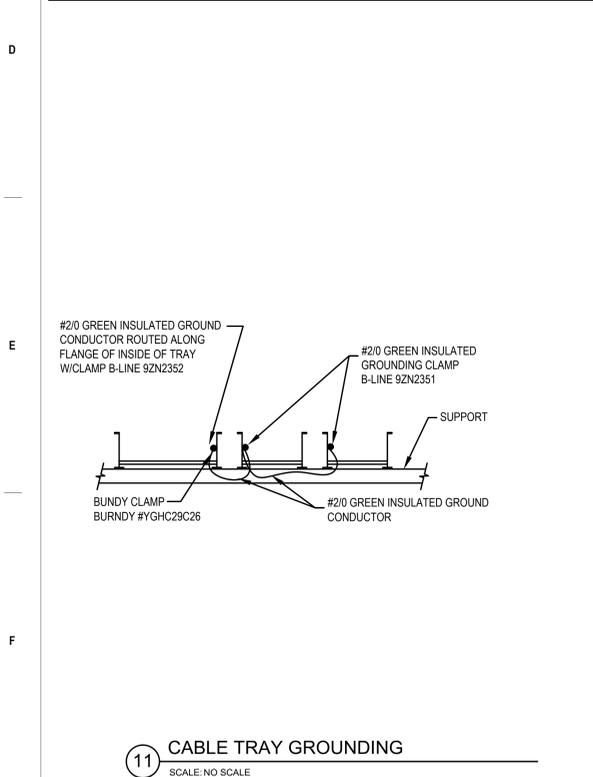
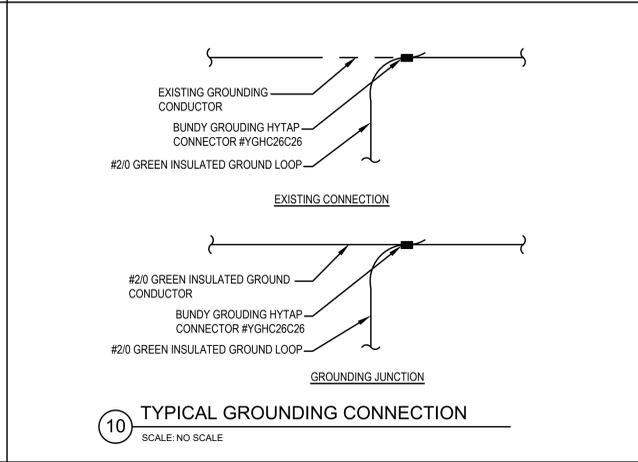
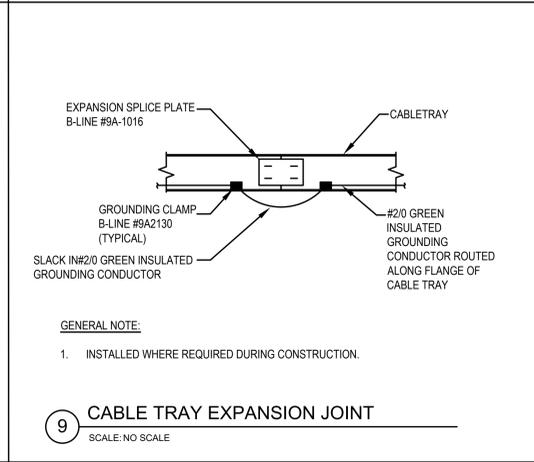
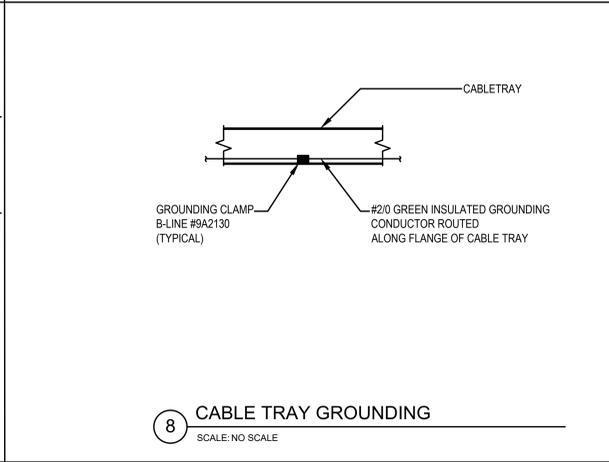
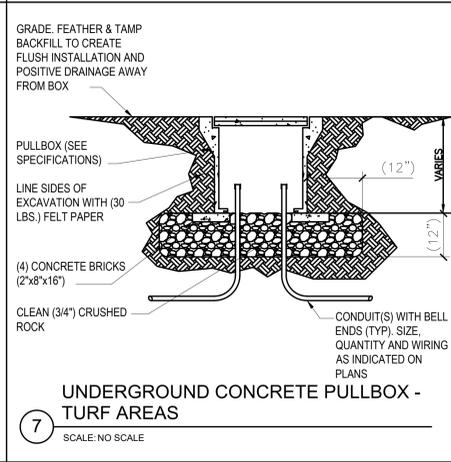
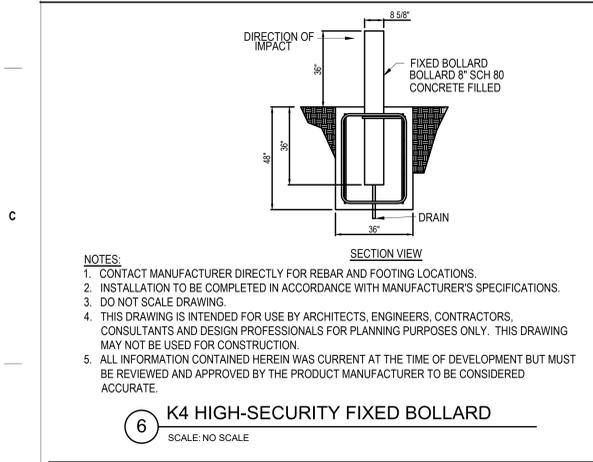
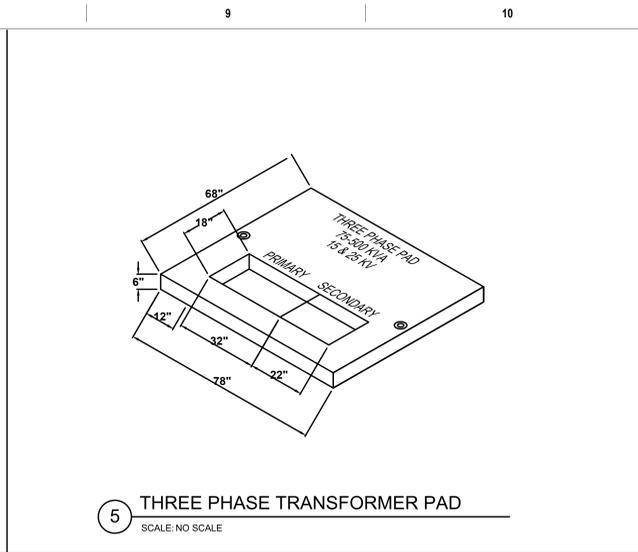
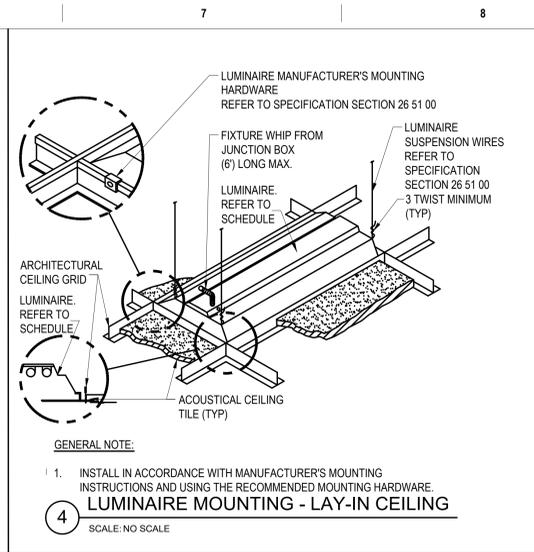
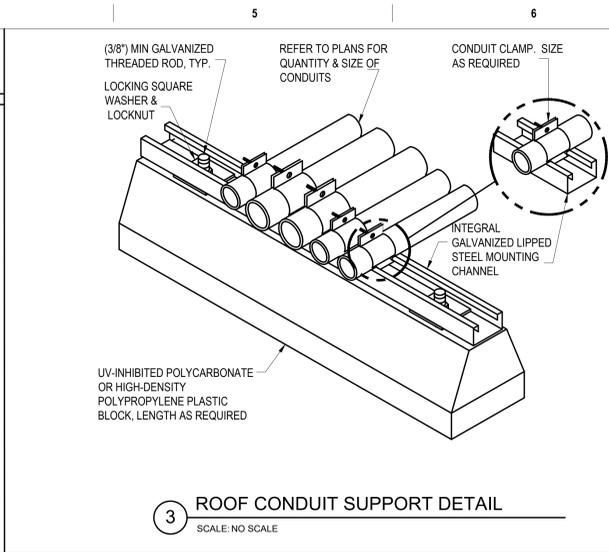
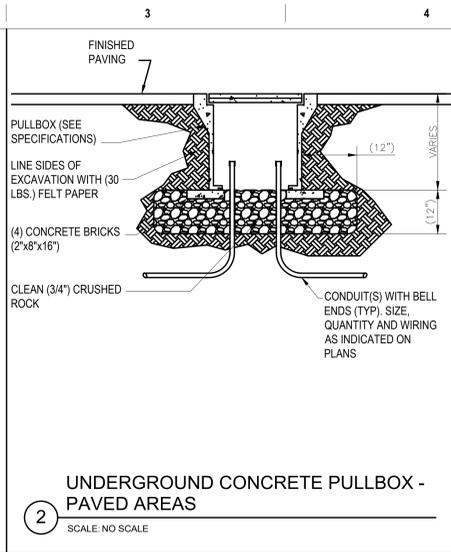
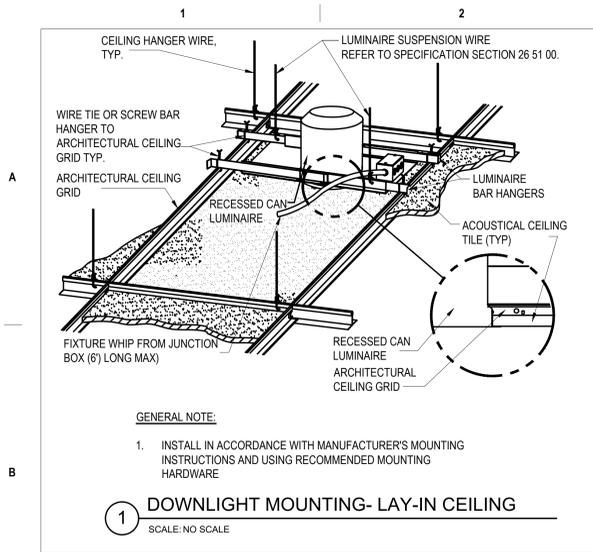
1 BLDG 173 TELECOM ROOM TELECOMM PLAN
SCALE: NO SCALE



Issued: _____ Date: _____ VA FORM 08-6231	CONSULTANTS:  11460 TOMAHAWK CREEK PARKWAY SUITE 400 LEANWOOD, KANSAS 66041  11460 TOMAHAWK CREEK PARKWAY SUITE 400 LEANWOOD, KANSAS 66041	ARCHITECT/ENGINEERS:  750 W HAMPDEN AVE SUITE #300 ENGLEWOOD CO 80110 (720) 550-6307 WWW.VALHALLAENGINEERING.COM	STAMP:  8/15/2020	 U.S. Department of Veterans Affairs	Drawing Title TELECOM ROOM LAYOUT	Phase 100% CONSTRUCTION DOCUMENTS	Project Title OUTPATIENT MENTAL HEALTH / EDUCATION ADDITION	Project Number 436-114
	Approved: Project Director	Location 3687 VETERANS DRIVE, FORT HARRISON, MT 59636	Issue Date 08/05/2020	Checked TL	Drawn GG	Building Number 173	Drawing Number ET102-P1	



CONSULTANTS:  11460 TONAWANDA CREEK PARKWAY SUITE 400 LEANWOOD, KANSAS 66041		ARCHITECT/ENGINEERS:  750 W HAMPDEN AVE SUITE #300 ENGLEWOOD CO 80110 (720) 550-6307 WWW.VALHALLAENGINEERING.COM		STAMP:  VEG 4.11		Drawing Title ELECTRICAL DETAIL SHEET Approved: Project Director		Phase 100% CONSTRUCTION DOCUMENTS		Project Title OUTPATIENT MENTAL HEALTH / EDUCATION ADDITION		Project Number 436-114	
Issued: _____ Date: _____		 				Location 3687 VETERANS DRIVE, FORT HARRISON, MT 59636		Issue Date 08/05/2020		Checked TL		Drawn BWW	
										Building Number 173 & 154		Drawing Number E-501	



Issued:	Date:

CONSULTANTS:

HOEFER WYSOCKI
11460 TOMAHAWK CREEK PARKWAY SUITE 400 LEANWOOD, MARYLAND 20631

LANDS

Protection Engineering

JIRSA HEDRICK
Structural Engineers

ARCHITECT/ENGINEERS:

VALHALLA ENGINEERING GROUP, LLC
750 W HAMPDEN AVE SUITE #300 ENGLEWOOD CO 80110 (720) 550-6307 WWW.VALHALLAENGINEERING.COM

STAMP:

Professional Engineer
8/15/2020

U.S. Department of Veterans Affairs

Drawing Title
ELECTRICAL DETAIL SHEET

Approved: Project Director

Phase
100% CONSTRUCTION DOCUMENTS

Project Title
OUTPATIENT MENTAL HEALTH / EDUCATION ADDITION

Location
3687 VETERANS DRIVE, FORT HARRISON, MT 59636

Issue Date
08/05/2020

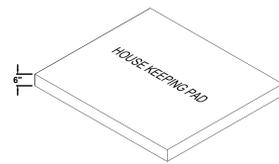
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Drawn
BWW

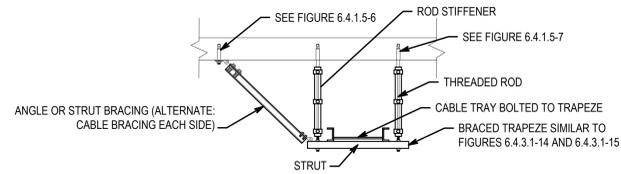
Project Number
436-114

Building Number
173 & 154

Drawing Number
E-502



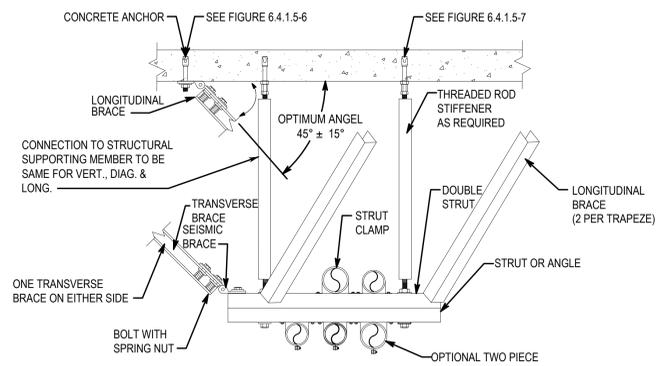
1 COMMON ELECTRICAL EQUIPMENT HOUSE KEEPING PAD
SCALE: NO SCALE



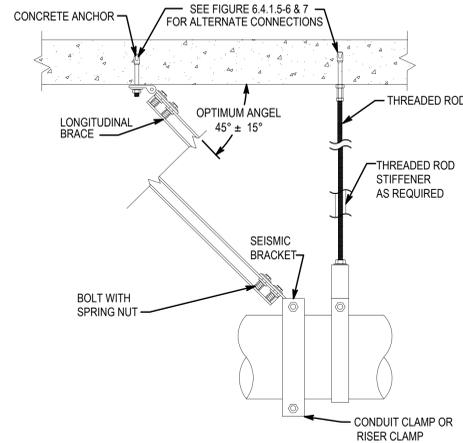
2 CABLE TRAY ON BRACED TRAPEZE
SCALE: NO SCALE

ELECTRICAL GENERAL NOTES:

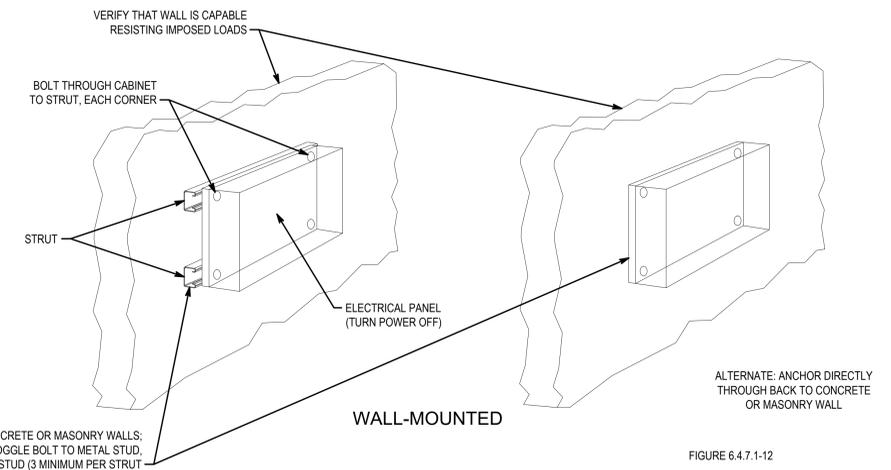
- SEE SHEET E-001 FOR SEISMIC RESTRAINT NOTES AND FACILITY-SPECIFIC SEISMIC DESIGN BASIS PARAMETERS.
- FIGURES ARE FROM FEMA E-74 REDUCING THE RISKS OF NONSTRUCTURAL EARTHQUAKE DAMAGE - A PRACTICAL GUIDE, DECEMBER 2012.



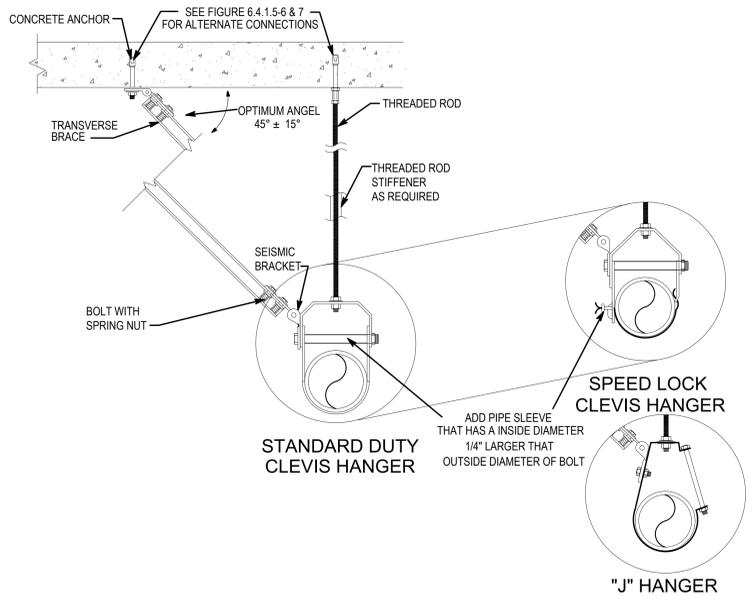
3 RIGID BRACING - TRAPEZE SUPPORTED CONDUIT
SCALE: NO SCALE



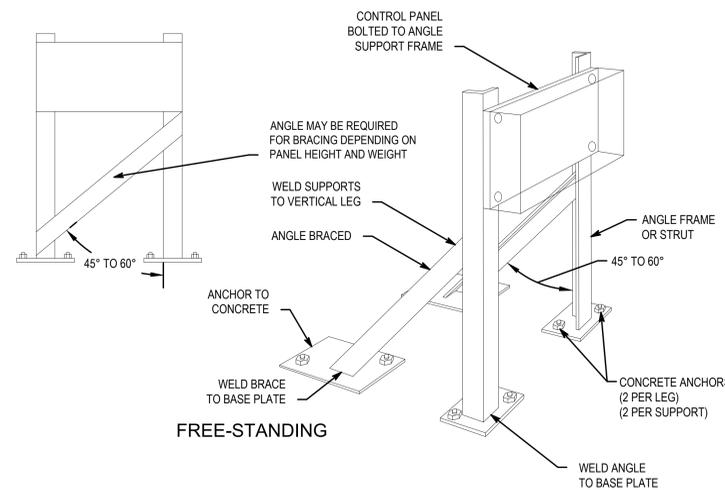
4 RIGID BRACING - SINGLE CONDUIT LONGITUDINAL
SCALE: NO SCALE



7 WALL-MOUNTED ELECTRICAL CONTROL PANELS, MOTOR CONTROLS CENTERS OR SWITCHGEAR (ER).
SCALE: NO SCALE



5 RIGID BRACING - SINGLE CONDUIT TRANSVERSE
SCALE: NO SCALE



6 FREE STANDING ELECTRICAL CONTROL PANELS, MOTOR CONTROLS CENTERS OR SWITCHGEAR (ER).
SCALE: NO SCALE

Issued:	Date:

CONSULTANTS:

HOEFER WYSOCKI
11460 TONAHAWKE CREEK PARKWAY SUITE 400 LEANWOOD, KANSAS 66041

LANDS

Protection Engineering

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Structural Engineers

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STAMP:

Professional Engineer License
8/15/2020

VEG 4.11



Drawing Title: ELECTRICAL SEISMIC DETAILS

Approved: Project Director

Phase: 100% CONSTRUCTION DOCUMENTS

Project Title: OUTPATIENT MENTAL HEALTH / EDUCATION ADDITION

Location: 3687 VETERANS DRIVE, FORT HARRISON, MT 59636

Issue Date: 08/05/2020

Checked: TL

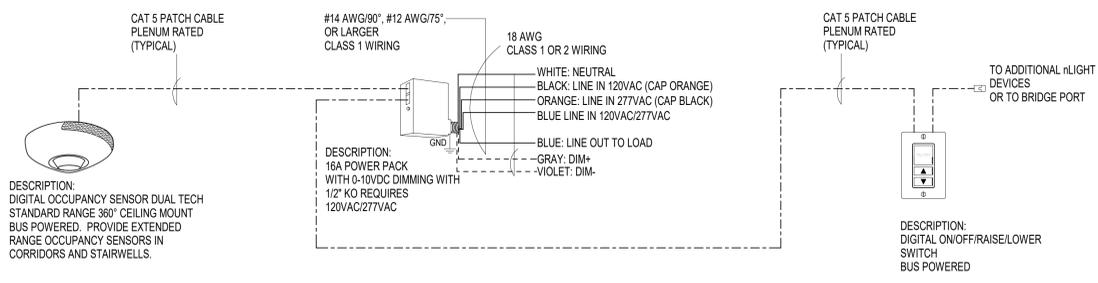
Drawn: BWW

Project Number: 436-114

Building Number: 173 & 154

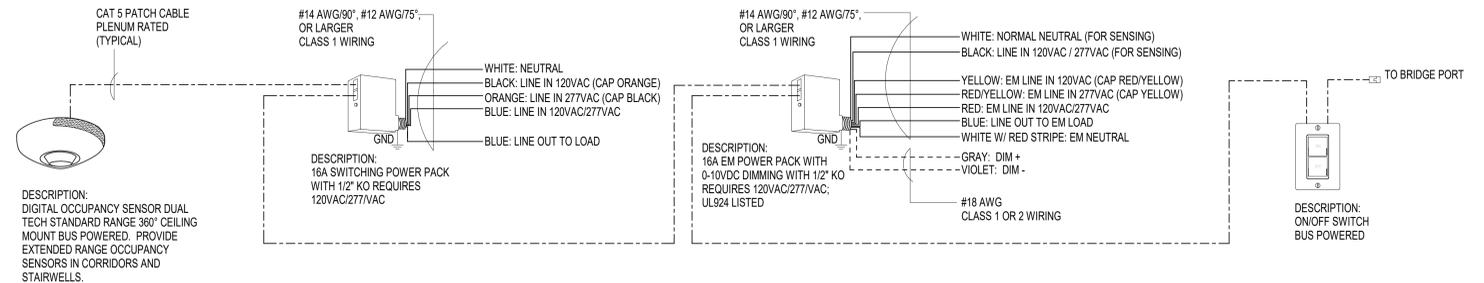
Drawing Number: E-503

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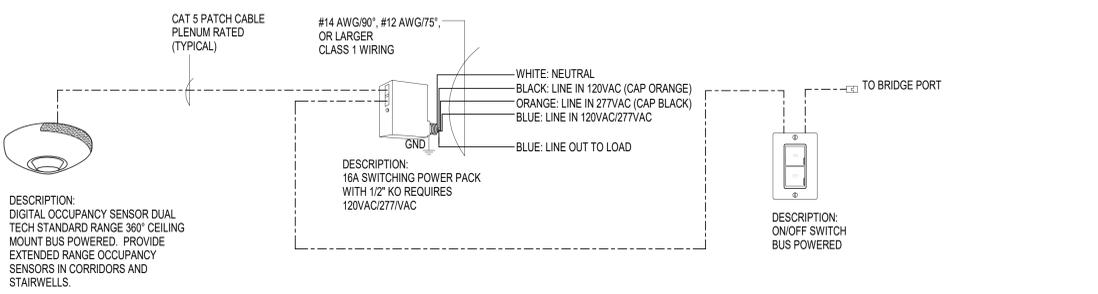
SEQUENCE OF OPERATION:
 1. LIGHTS ARE MANUAL ON.
 2. OCCUPANCY SENSOR PROVIDES AUTOMATIC ON/OFF OF LIGHTS BASED ON ROOM OCCUPANCY (USE DEFAULT TIME DELAY FOR OCCUPANCY SENSOR).
 3. DIMMER SWITCH PROVIDES MANUAL OVERRIDE OF THE LIGHTS: ON/OFF/RAISE/LOWER.

1 LOW VOLTAGE LIGHTING CONTROL WITH DIMMING - PH 1
NO SCALE



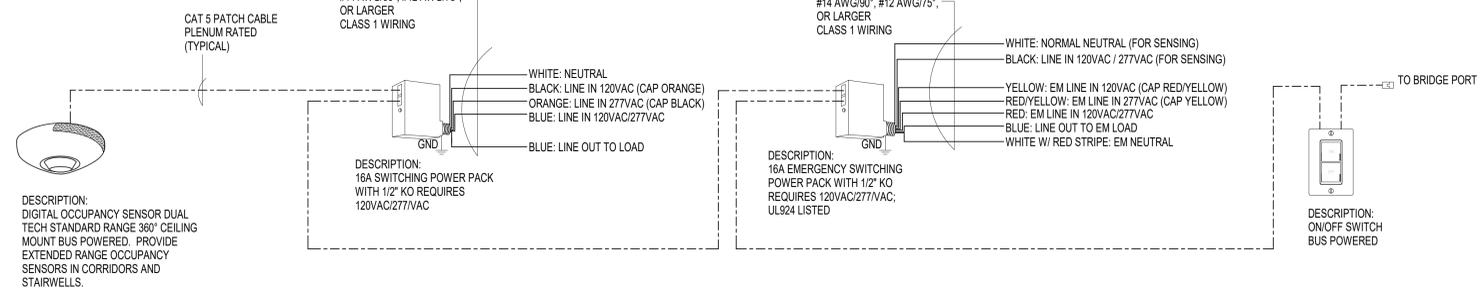
SEQUENCE OF OPERATION:
 1. LIGHTS ARE MANUAL ON.
 2. OCCUPANCY SENSOR PROVIDES AUTOMATIC OFF OF LIGHTS BASED ON ROOM OCCUPANCY. USE DEFAULT TIME DELAY FOR OCCUPANCY SENSOR.
 3. SWITCH PROVIDES MANUAL OVERRIDE OF THE LIGHTS: ON/OFF.

4 LOW VOLTAGE LIGHTING CONTROL WITH 0-10VDC DIMMING W/EMER. TRANSFER DEVICE- PH 1
NO SCALE



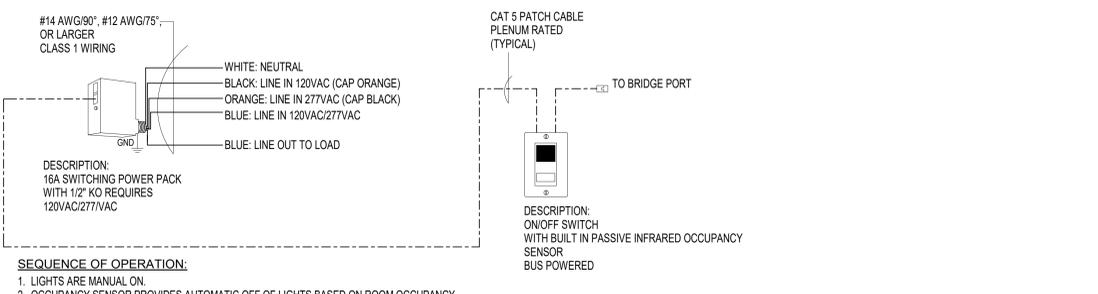
SEQUENCE OF OPERATION:
 1. LIGHTS ARE MANUAL ON.
 2. OCCUPANCY SENSOR PROVIDES AUTOMATIC OFF OF LIGHTS BASED ON ROOM OCCUPANCY. USE DEFAULT TIME DELAY FOR OCCUPANCY SENSOR.
 3. SWITCH PROVIDES MANUAL OVERRIDE OF THE LIGHTS: ON/OFF.

2 LOW VOLTAGE LIGHTING CONTROL WITH SWITCHING- PH 1
NO SCALE



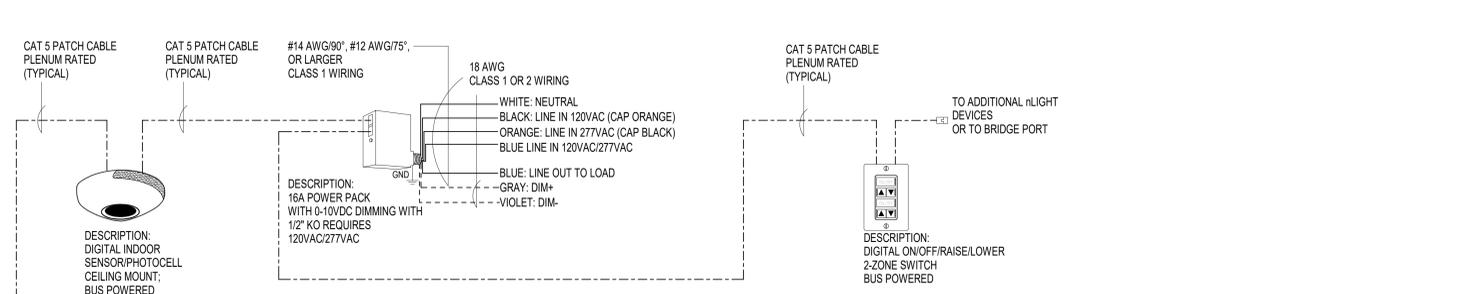
SEQUENCE OF OPERATION:
 1. LIGHTS ARE MANUAL ON.
 2. OCCUPANCY SENSOR PROVIDES AUTOMATIC OFF OF LIGHTS BASED ON ROOM OCCUPANCY. USE DEFAULT TIME DELAY FOR OCCUPANCY SENSOR.
 3. SWITCH PROVIDES MANUAL OVERRIDE OF THE LIGHTS: ON/OFF.

5 LOW VOLTAGE LIGHTING CONTROL WITH SWITCHING W/EMER. TRANSFER DEVICE- PH 1
NO SCALE



SEQUENCE OF OPERATION:
 1. LIGHTS ARE MANUAL ON.
 2. OCCUPANCY SENSOR PROVIDES AUTOMATIC OFF OF LIGHTS BASED ON ROOM OCCUPANCY. USE DEFAULT TIME DELAY FOR OCCUPANCY SENSOR.
 3. SWITCH PROVIDES MANUAL OVERRIDE OF THE LIGHTS: ON/OFF.

3 LOW VOLTAGE LIGHT SWITCH WITH INTEGRAL OCCUPANCY SENSOR SWITCH - PH 1
NO SCALE



SEQUENCE OF OPERATION:
 1. LIGHTS ARE MANUAL ON.
 2. OCCUPANCY SENSOR PROVIDES AUTOMATIC ON/OFF OF LIGHTS BASED ON ROOM OCCUPANCY (SET 20 MINUTE TIME DELAY FOR OCCUPANCY SENSOR).
 3. LOW VOLTAGE SWITCH(S) PROVIDE MANUAL OVERRIDE OF THE LIGHTS: ON/OFF/RAISE/LOWER.
 4. PHOTOSENSOR INTEGRAL IN DESIGNATED OCCUPANCY SENSOR PROVIDES CONTINUOUS DIMMING OF DAYLIGHT ZONE, AND WILL PROVIDE COMPLETE SHUTOFF IF AMPLE DAYLIGHT IS PRESENT. PROGRAMMING TO BE READILY ACCESSIBLE.

6 LOW VOLTAGE LIGHTING CONTROL WITH DIMMING W/ DAYLIGHTING - PH 1
NO SCALE

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CONSULTANTS: 		ARCHITECT/ENGINEER OF RECORD: 		STAMP: 		Drawing Title LOW VOLTAGE LIGHTING CONTROL WIRING DIAGRAMS		Phase 100% CONSTRUCTION DOCUMENTS		Project Title OUTPATIENT MENTAL HEALTH / EDUCATION ADDITION		Project Number 436-114	
Issued: _____ Date: _____		750 W HAMPDEN AVE SUITE 300 ENGLEWOOD, CO 80110 (720) 550-6307 WWW.VALHALLAENGINEERING.COM		U.S. Department of Veterans Affairs		Approved: Project Director		Location 3687 Veterans Drive, Fort Harrison, MT 59636		Issue Date 08/05/2020		Checked TL	
				VEG 4.11				Drawn JEE		Drawing Number E-505-P1			

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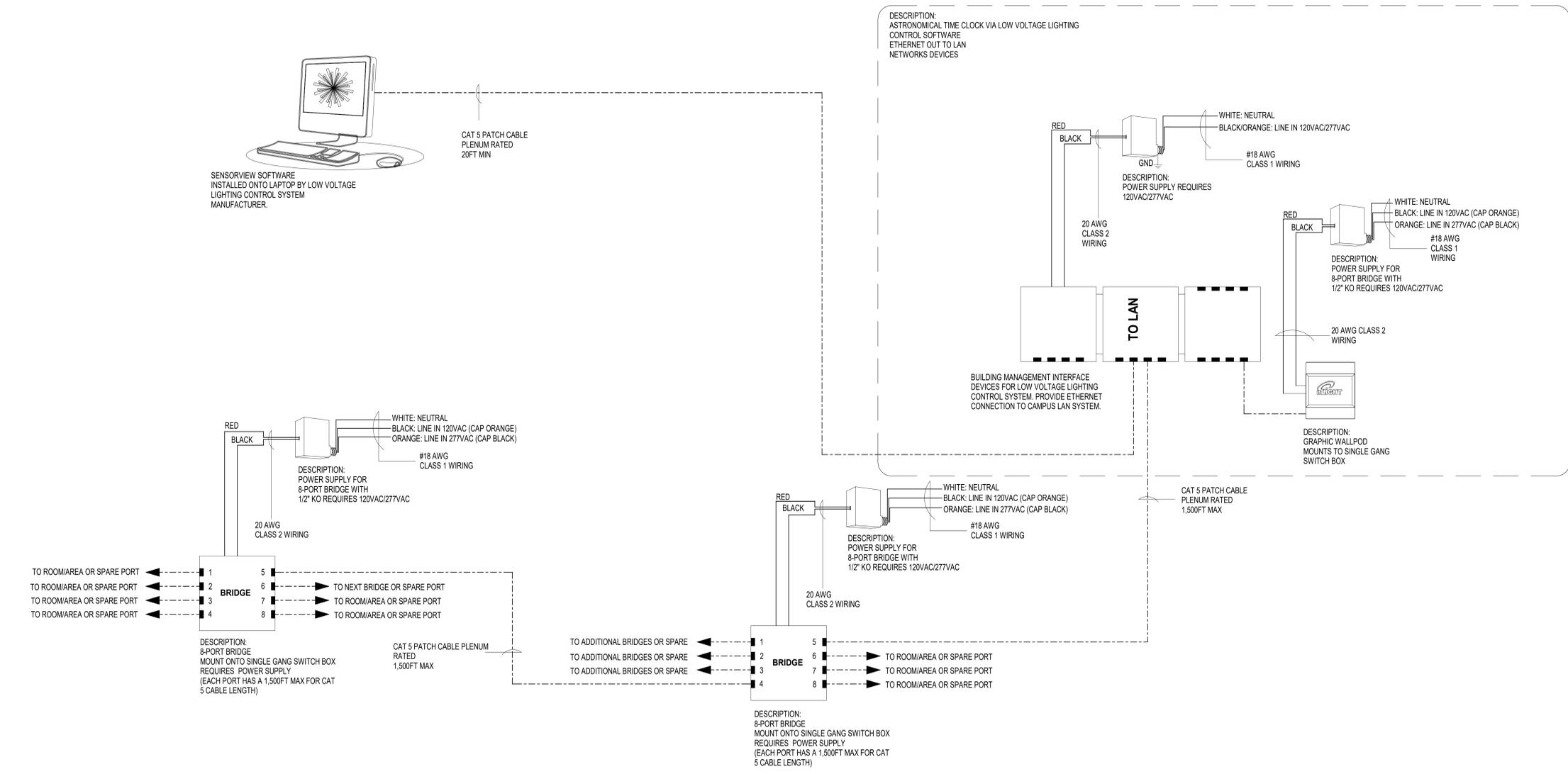
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1 NETWORK BACKBONE RISER DIAGRAM - PH 1
NO SCALE

GENERAL SYSTEM NOTES:

ON DIGITAL SYSTEMS, ALL DEVICES TO BE CONNECTED IN A DAISY CHAIN PATTERN SO THAT THE FIRST AND LAST DEVICE IN THE CHAIN HAS AN OPEN PORT. NO T-TAP CONNECTIONS EXCEPT FOR NLIGHT "RUB" DEVICES UTILIZING THEIR INCLUDED R445 SPLITTER INSIDE PACKAGING.

ON DIGITAL SYSTEMS, CONTRACTOR SHALL NOTE AND LABEL ADDRESS AND LOCATION OF EACH DEVICE ON THE SYSTEM ONE-LINE DIAGRAMS OR SYSTEM LAYOUT DRAWINGS AT TIME OF INSTALLATION.

WIRING SHALL CONFORM TO THE NATIONAL ELECTRICAL CODE (NEC) AND APPLICABLE LOCAL CODES, INCLUDING PROVISION OF EQUIPMENT GROUNDING AS REQUIRED BY THE NEC. POWER CONDUCTORS SHALL BE SIZED PER THE NEC AMPACITY TABLES (ARTICLE 310), INCLUDING ADJUSTMENT FACTOR AND NEUTRAL CONDUCTOR REQUIREMENTS (FEED AND BRANCH NEUTRAL CONDUCTORS MUST BE COUNTED AS CURRENT CARRYING CONDUCTORS). RUN SEPARATE NEUTRAL CONDUCTORS FOR EACH DIMMED LOAD CIRCUIT.

FOR 0-10VDC DIMMING SYSTEMS, VIOLET AND GRAY CONDUCTORS ARE FOR 0-10VDC LOW VOLTAGE TERMINATIONS ONLY. NEVER TERMINATE LINE VOLTAGE (120/200/277VAC) TO VIOLET AND GRAY.

CONTRACTOR IS RESPONSIBLE FOR ALL CONTROL TERMINATIONS. NO SPLICES ARE PERMITTED IN CONTROL WIRING.

POWER AND CONTROL CONDUCTORS MUST NOT SHARE THE SAME RACEWAY OR CONDUIT EXCEPT WHERE ALLOWED.

LIGHTING CONTROL EQUIPMENT MUST BE INSTALLED, MAINTAINED, AND OPERATED IN AN "OFFICE CLEAN" DRY ENVIRONMENT, INDOOR DRY LOCATIONS ONLY. 10% - 90% RELATIVE HUMIDITY. AMBIENT TEMPERATURE 0° - 40°C (32° - 104°F); 0° - 35°C (32° - 95°F) RECOMMENDED.

SENSORS IN ELECTRICAL/MECHANICAL LOCATIONS NEED TO BE VERIFIED WITH AUTHORITY HAVING JURISDICTION. REFER TO NEC 110.26.D.

VERIFY MAXIMUM CABLE LENGTHS BASED ON CONTROL SYSTEM MANUFACTURER IS NOT RESPONSIBLE FOR SYSTEMS EXCEEDING CABLING PARAMETERS.

LOW VOLTAGE CABLE MUST BE INSTALLED AT LEAST 12 INCHES FROM ALL LINE VOLTAGE CONDUCTORS EXCEPT TO CROSS OR MAKE TERMINATIONS. CAT. 5 CABLE MUST BE KEPT AWAY FROM ALL EMF DEVICES SUCH AS BALLASTS OR TRANSFORMERS.

NETWORKED LOW VOLTAGE SYSTEM NOTES:

EVERY DIGITAL LOW VOLTAGE LIGHTING CONTROL SYSTEM ENABLED DEVICE IS FURNISHED WITH (1) PERMANENTLY ADHERED ID TAG AND (1) MATCHING, PARTIALLY ADHERED ID TAG TO BE PLACED ON THE RISER DIAGRAM SHEET PROVIDED AS PART OF THE DIGITAL LOW VOLTAGE LIGHTING SYSTEM SUBMITTAL DRAWINGS. DURING INSTALLATION AND PRIOR TO FACTORY STARTUP, CONTRACTOR SHALL PLACE EACH ID TAG BELOW EACH CORRESPONDING DEVICE SHOWN ON RISER DIAGRAM TO FACILITATE FACTORY STARTUP. FAILURE TO COMPLY MAY RESULT IN STARTUP DELAYS AND ADDITIONAL COSTS AT THE CONTRACTOR'S EXPENSE. DO NOT PLACE DEVICE ID STICKERS ON FLOOR PLAN.

ONE RELAY PACK IS NEEDED PER CIRCUIT ZONE TO BE CONTROLLED AND CAN RESIDE WITHIN SENSORS, WALLPODS, OR RELAY PACKS. REQUIRED POWER PACKS ARE NOT INDICATED ON DRAWINGS. REFER TO LOW VOLTAGE LIGHTING CONTROL SYSTEM RISER DIAGRAM PROVIDED BY SYSTEM MANUFACTURER WITHIN THE SUBMITTAL DRAWINGS. FINAL PLACEMENT IS UP TO DISCRETION OF CONTRACTOR/ENGINEER. PLEASE RECHECK COUNTS TO VERIFY THE NUMBER OF RELAYS NEEDED TO SWITCH ALL DESIRED LOADS.

BRIDGES: RELAYS, POWER PACKS ARE NOT INDICATED ON THE DRAWINGS. THE TYPICAL LIGHTING CONTROL WIRING DIAGRAMS SHALL BE USED TO DETERMINE THE QUANTITY OF REQUIRED BRIDGES, RELAYS AND POWER PACKS. WALLPODS AND SENSORS ON DRAWINGS WERE PLACED WITH INFORMATION PROVIDED AT TIME OF DESIGN. ADDITIONAL BRIDGES AND/OR SENSORS MAY BE REQUIRED DEPENDING ON BUILDING CHANGES, FINAL PARTITION HEIGHT/PLACEMENT, FURNITURE PLACEMENT, EQUIPMENT HEIGHT/PLACEMENT AND SHELVING HEIGHT/PLACEMENT. A TYPICAL LAYOUT OF THE NETWORK BACKBONE (BRIDGES AND GATEWAYS) HAS BEEN PLACED IN A SEPARATE TREE DIAGRAM AND NOT ON THE ACTUAL LAYOUT. FINAL PLACEMENT OF THE BRIDGES AND GATEWAYS DEVICES SHALL BE AT THE CONTRACTOR'S / ENGINEER'S DISCRETION.

ALL DEVICES HAVE RJ-45 FEMALE PORTS. MAKING NETWORK CONTROL CABLES IS REQUIRED. T568B TERMINATIONS ARE RECOMMENDED. IT IS IMPERATIVE THAT ALL NETWORK CONTROL CABLES BE TESTED WITH A LAN CABLE TESTER TO VERIFY PROPER TERMINATIONS.

DAISY-CHAINED DEVICES SHOULD BE POWERED UP AND WORKING ON DEFAULT PROGRAMMING PRIOR TO CONNECTION TO BRIDGE OR GATEWAYS.

LOW VOLTAGE NETWORK CONTROL CABLE (CAT5/E6) RUNS FOR LOCAL ZONES, HOMERUNS AND BACKBONE SHOULD BE WHITE WITH CABLES LABELED.

CONTRACTOR TO VERIFY BLINK/DIAGNOSTIC CODES WHEN CONNECTING GATEWAYS/BRIDGES TO ZONES. MAXIMUM CABLE LENGTH FROM START DEVICE TO END DEVICE IS 1500' INCLUDING HOMERUN TO BRIDGE DEVICE, IF PRESENT. MANUFACTURER IS NOT RESPONSIBLE FOR SYSTEMS EXCEEDING CABLING PARAMETERS.

CONTRACTOR/INSTALLER TO VERIFY WITH THE MANUFACTURER TYPE AND QUANTITY OF OCCUPANCY SENSORS TO ENSURE 100% COVERAGE OF THE SPACE(S) WHERE SHOWN CONTROLLED BY OCCUPANCY SENSOR(S).

LOW VOLTAGE LIGHTING CONTROL SYSTEM SOFTWARE SHALL BE LOADED ONTO LAPTOP COMPUTER PROVIDED BY LOW VOLTAGE LIGHTING CONTROL SYSTEM MANUFACTURER. SYSTEM SOFTWARE IS PROHIBITED TO BE LOADED ONTO VA NETWORK.

DURING NETWORK SYSTEM SET-UP, ALL NETWORK DEVICES POPULATED IN THE LOW VOLTAGE LIGHTING CONTROLS SOFTWARE SHALL BE RENAMED USING OWNER DESIGNATED ROOM NAME AND ROOM NUMBER FOR EASY REFERENCE BY OWNER.

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CONSULTANTS: 		ARCHITECT/ENGINEER OF RECORD: 750 W HAMPDEN AVE SUITE 300 ENGLEWOOD, CO 80110 (720) 550-6307 WWW.VALHALLAENGINEERING.COM		STAMP: 	 U.S. Department of Veterans Affairs	Drawing Title TYPICAL LOW VOLTAGE LIGHTING CONTROL NETWORK WIRING Approved: Project Director	Phase 100% CONSTRUCTION DOCUMENTS	Project Title OUTPATIENT MENTAL HEALTH / EDUCATION ADDITION	Project Number 436-114 Building Number	Location 3687 Veterans Drive, Fort Harrison, MT 59636	Drawing Number E-506-P1
Issue Date 08/05/2020	Checked TL	Drawn JEE									

Branch Panel: 173-1ES-01

Location: GROUP B102
 Supply From: 173-1ESWB-01
 Mounting: Recessed
 Enclosure: Type 1

Volts: 120/208 Wye
 Phases: 3
 Wires: 4

A.I.C. Rating: 22,000 A
 Mains Type:
 Mains Rating: 225 A
 MCB Rating: 225 A

Notes:

CKT	Circuit Description	Trip	Poles	A	B	C	Poles	Trip	Circuit Description	CKT	
1ES-01-1	B114/B116 Recepts	20 A	1	1080VA/1080VA			1	20 A	B113/B115 Recepts	1ES-01-2	
1ES-01-3	A104/A105/A106 Recepts	20 A	1	1080VA/1080VA	1080VA/1080VA		1	20 A	B110/B112 Recepts	1ES-01-4	
1ES-01-5	B109/B111 Recepts	20 A	1			1080VA/1080VA	1	20 A	B106/B108 Recepts	1ES-01-6	
1ES-01-7	B109/B107 Recepts	20 A	1	1080VA/900 VA			1	20 A	B102 Recepts	1ES-01-8	
1ES-01-9	B101 Recepts	20 A	1		1260 1720 VA		1	20 A	B100C Corr Recepts	1ES-01-10	
1ES-01-11	B103 Recepts	20 A	1		720 VA 49 VA		1	20 A	B Wing VAVs	1ES-01-12	
1ES-01-13	A/B Wing VAVs	20 A	1	42 VA						1ES-01-14	
1ES-01-15										1ES-01-16	
1ES-01-17										1ES-01-18	
1ES-01-19										1ES-01-20	
1ES-01-21	LITES AREA 'B'	20 A	1		800 VA 1100VA		1	20 A	LITES AREA 'B'	1ES-01-22	
1ES-01-23	LITES AREA 'B'	20 A	1			1100VA				1ES-01-24	
1ES-01-25										1ES-01-26	
1ES-01-27										1ES-01-28	
1ES-01-29										1ES-01-30	
1ES-01-31										1ES-01-32	
1ES-01-33										1ES-01-34	
1ES-01-35										1ES-01-36	
1ES-01-37										1ES-01-38	
1ES-01-39										1ES-01-40	
1ES-01-41										1ES-01-42	
				Total Load:	4182 VA	6140 VA	1029 VA				
				Total Amps:	15 A	20 A	10 A				

Legend:

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals
Power	91 VA	100.00%	91 VA	
Receptacle	11160 VA	94.80%	10580 VA	Total Conn. Load: 12251 VA
Lighting	3000 VA	125.00%	3750 VA	Total Est. Demand: 14421 VA
				Total Conn.: 39 A
				Total Est. Demand: 40 A

Notes:

Branch Panel: 173-1ES-02

Location: RR A109
 Supply From: 173-1ESWB-01
 Mounting: Recessed
 Enclosure: Type 1

Volts: 120/208 Wye
 Phases: 3
 Wires: 4

A.I.C. Rating: 10,000 A
 Mains Type:
 Mains Rating: 225 A
 MCB Rating: 225 A

Notes:

CKT	Circuit Description	Trip	Poles	A	B	C	Poles	Trip	Circuit Description	CKT	
1ES-02-1	C110/D112 Recepts	20 A	1	1080VA/1080VA			1	20 A	D110/D112 Recepts	1ES-02-2	
1ES-02-3	D109/D111 Recepts	20 A	1	1080VA/1080VA	1080VA/1080VA		1	20 A	D109/D108 Recepts	1ES-02-4	
1ES-02-5	D105/D107 Recepts	20 A	1			1080VA/1080VA	1	20 A	D101/D103 Recepts	1ES-02-6	
1ES-02-7	D102/D104 Recepts	20 A	1	1080VA/1080VA			1	20 A	C109/C111 Recepts	1ES-02-8	
1ES-02-9	C105/C107 Recepts	20 A	1	1080VA/1080VA	1080VA/1080VA		1	20 A	C101/C103 Recepts	1ES-02-10	
1ES-02-11	C106/C108 Recepts	20 A	1			1080VA/1080VA	1	20 A	C102/C104 Recepts	1ES-02-12	
1ES-02-13	A109/A109 Recepts	20 A	1	900 VA 540 VA			1	20 A	A/C/D Wing VAVs	1ES-02-14	
1ES-02-15	C Wing VAVs	20 A	1	49 VA 35 VA			1	20 A	A/C/D Wing VAVs	1ES-02-16	
1ES-02-17	D Wing VAVs	20 A	1		49 VA 720 VA		1	20 A	D100 Corr Recepts	1ES-02-18	
1ES-02-19	C100 Corr Recepts	20 A	1	540 VA 1260VA			1	20 A	A103/A107 Recepts	1ES-02-20	
1ES-02-21	Drinking Fountains	20 A	1		180 VA					1ES-02-22	
1ES-02-23										1ES-02-24	
1ES-02-25										1ES-02-26	
1ES-02-27	LITES AREA 'A' & 'C'	20 A	1		1800VA 1300VA		1	20 A	EMERG. INVERTER 'A' & 'B'	1ES-02-28	
1ES-02-29	LITES AREA 'D'	20 A	1			1400VA				1ES-02-30	
1ES-02-31										1ES-02-32	
1ES-02-33										1ES-02-34	
1ES-02-35										1ES-02-36	
1ES-02-37										1ES-02-38	
1ES-02-39										1ES-02-40	
1ES-02-41										1ES-02-42	
				Total Load:	7560 VA	7684 VA	6489 VA				
				Total Amps:	25 A	66 A	57 A				

Legend:

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals
Power	133 VA	100.00%	133 VA	
Receptacle	16820 VA	79.24%	13407 VA	Total Conn. Load: 21733 VA
Lighting	4500 VA	125.00%	5625 VA	Total Est. Demand: 19295 VA
				Total Conn.: 60 A
				Total Est. Demand: 54 A

Notes:

Branch Panel: 173-1ES-03

Location: COPY F105
 Supply From: 173-1ESWB-01
 Mounting: Recessed
 Enclosure: Type 1

Volts: 120/208 Wye
 Phases: 3
 Wires: 4

A.I.C. Rating: 10,000 A
 Mains Type:
 Mains Rating: 225 A
 MCB Rating: 225 A

Notes:

CKT	Circuit Description	Trip	Poles	A	B	C	Poles	Trip	Circuit Description	CKT	
1ES-03-1	F107/F108 Recepts	20 A	1	1080VA/360 VA			1	20 A	A115 Reception Printer	1ES-03-2	
1ES-03-3	F105 Copy Room	20 A	1	1080VA/360 VA	900 VA 1080VA		1	20 A	F104 Open Office Recepts	1ES-03-4	
1ES-03-5	F106 Recepts	20 A	1			540 VA 540 VA	1	20 A	F101/F103 Recepts	1ES-03-6	
1ES-03-7	F102 Telemed Recepts	20 A	1	900VA 720 VA			1	20 A	F104 Corr Recepts	1ES-03-8	
1ES-03-9	F Wing VAVs	20 A	1		28 VA 1080VA		1	20 A	A115 Reception Recepts	1ES-03-10	
1ES-03-11										1ES-03-12	
1ES-03-13										1ES-03-14	
1ES-03-15										1ES-03-16	
1ES-03-17	LITES OFFICES AREA 'F'	20 A	1			700 VA 1200VA	1	20 A	LITES OPEN OFFICE F104	1ES-03-18	
1ES-03-19	LITES AREA 'A'	20 A	1	1400VA						1ES-03-20	
1ES-03-21										1ES-03-22	
1ES-03-23										1ES-03-24	
1ES-03-25										1ES-03-26	
1ES-03-27										1ES-03-28	
1ES-03-29										1ES-03-30	
1ES-03-31										1ES-03-32	
1ES-03-33										1ES-03-34	
1ES-03-35										1ES-03-36	
1ES-03-37										1ES-03-38	
1ES-03-39										1ES-03-40	
1ES-03-41										1ES-03-42	
				Total Load:	4460 VA	3088 VA	2880 VA				
				Total Amps:	44 A	28 A	27 A				

Legend:

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals
Power	133 VA	100.00%	133 VA	
Receptacle	6300 VA	100.00%	6300 VA	Total Conn. Load: 10528 VA
Lighting	3340 VA	125.00%	4175 VA	Total Est. Demand: 11583 VA
				Total Conn.: 30 A
				Total Est. Demand: 33 A

Notes:

Branch Panel: 173-1ES-04

Location: ELEC A112
 Supply From: 173-1ESWB-01
 Mounting: Surface
 Enclosure: Type 1

Volts: 120/208 Wye
 Phases: 3
 Wires: 4

A.I.C. Rating: 10,000 A
 Mains Type:
 Mains Rating: 225 A
 MCB Rating: 225 A

Notes:

CKT	Circuit Description	Trip	Poles	A	B	C	Poles	Trip	Circuit Description	CKT	
173-1ES-04-1	E111/E113 Recepts	20 A	1	1080VA/1080VA			1	20 A	E107/E109 Recepts	173-1ES-04-2	
173-1ES-04-3	E103/E105 Recepts	20 A	1	1080VA/1080VA	1080VA/1080VA		1	20 A	E112/E114 Recepts	173-1ES-04-4	
173-1ES-04-5	E108/110 Recepts	20 A	1			1080VA/1080VA	1	20 A	E104/E106 Recepts	173-1ES-04-6	
173-1ES-04-7	E101/E102 Recepts	20 A	1	1260VA 49 VA			1	20 A	E Wing VAVs	173-1ES-04-8	
173-1ES-04-9	E100 Corr Recepts	20 A	1		300 VA 180 VA		1	20 A	A112 Elec Rm Recept	173-1ES-04-10	
173-1ES-04-11	A111/HAC Recepts	20 A	1		960 VA 1080VA		1	20 A	A114 Recepts	173-1ES-04-12	
173-1ES-04-13	A114 Refrigerator	20 A	1	180 VA 1080VA			1	20 A	A102 Waiting Recepts	173-1ES-04-14	
173-1ES-04-15	A102 Waiting Floor Recepts	20 A	1	540 VA 21 VA			1	20 A	A100E VAVs	173-1ES-04-16	
173-1ES-04-17	A114 Microwave	20 A	1			180 VA				173-1ES-04-18	
173-1ES-04-19										173-1ES-04-20	
173-1ES-04-21										173-1ES-04-22	
173-1ES-04-23	LITES AREA 'E'	20 A	1			800 VA 900 VA	1	20 A	LITES AREA 'E'	173-1ES-04-24	
173-1ES-04-25	LITES CORR 'A', 'D' & 'E'	20 A	1	400 VA						173-1ES-04-26	
173-1ES-04-27										173-1ES-04-28	
173-1ES-04-29										173-1ES-04-30	
173-1ES-04-31										173-1ES-04-32	
173-1ES-04-33										173-1ES-04-34	
173-1ES-04-35										173-1ES-04-36	
173-1ES-04-37										173-1ES-04-38	
173-1ES-04-39										173-1ES-04-40	
173-1ES-04-41										173-1ES-04-42	
				Total Load:	5129 VA	3801 VA	5480 VA				
				Total Amps:	44 A	32 A	47 A				

Legend:

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals
Power	70 VA	100.00%	70 VA	
Receptacle	11880 VA	90.26%	10723 VA	Total Conn. Load: 14410 VA
Lighting	2100 VA	125.00%	2625 VA	Total Est. Demand: 13418 VA
				Total Conn.: 41 A
				Total Est. Demand: 38 A

Notes:

Switchboard: 173-1ESWB-01

Location: ELEC A112
 Supply From:
 Mounting:
 Enclosure:

Volts: 120/208 Wye
 Phases: 3
 Wires: 4

A.I.C. Rating: 22,000 A
 Mains Type:
 Mains Rating: 800 A
 MCB Rating: 800 A

Notes:

CKT	Circuit Description	# of Poles	Frame Size	Trip Rating	Load	Remarks
1	173-1ES-04	3	400 A	225 A	14410 VA	
2	173-1ES-03	3	400 A	225 A	10528 VA	
3	173-1ES-02	3	400 A	225 A	21733 VA	
4	173-1ES-01	3	400 A	225 A	12251 VA	
5	173-2ES-01	3	400 A	225 A	86720 VA	
6	173-TELCO	3	400 A	20 A	5980 VA	
7						
8						
9						
10						
11						
12						
13						
14						
15						
16						
17						
18						
19						
20						
					Total Conn. Load:	151522 VA
					Total Amps:	421 A

Legend:

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals
Power	90762 VA	100.00%	90762 VA	
Receptacle	50220 VA	59.96%	30110 VA	Total Conn. Load: 140982 VA
				Total Est. Demand: 120872 VA
				Total Conn.: 421 A
				Total Est. Demand: 335 A

Notes:

Branch Panel: 173-1ES-TELCO

Location: IT ROOM A113
 Supply From: 173-1ESWB-01
 Mounting: Surface
 Enclosure: Type 1

Volts: 120/208 Wye
 Phases: 3
 Wires: 4

A.I.C. Rating: 10,000 A
 Mains Type:
 Mains Rating: 60 A
 MCB Rating: MLO

Notes:

ELECTRICAL GENERAL NOTES:

- CONTRACTOR MUST PROVIDE FAN OPTION THAT INCLUDES NEMA 3R/4X DISCONNECT SAFETY SWITCH ACCESSORY.
- CONTRACTOR MUST PROVIDE A 200A RATED, NEMA 3R, HEAVY DUTY, FUSIBLE DISCONNECT SAFETY SWITCH WITH A 150A, TIME DELAY FUSE.
- CONTRACTOR MUST PROVIDE A 60A RATED, NEMA 3R, HEAVY DUTY, FUSIBLE DISCONNECT SAFETY SWITCH WITH A 35A, TIME DELAY FUSE.
- CONTRACTOR MUST PROVIDE FAN OPTION THAT INCLUDES NEMA 1 DISCONNECT SAFETY SWITCH ACCESSORY.
- CONTRACTOR MUST PROVIDE UNIT WHICH INCLUDES VFD CONTROL OPTION.
- CONTRACTOR MUST PROVIDE 30A, HEAVY DUTY, SAFETY SWITCH
- CONTRACTOR MUST PROVIDE 30A, HEAVY DUTY, NEMA 3R/4X, 15A FUSED, DISCONNECT SWITCH FOR OUTDOOR UNIT.
- CONTRACTOR MUST PROVIDE OPTION WHICH INCLUDES UNIT MOUNTED TOGGLE SWITCH FOR ON/OFF CONTROL.
- CONTRACTOR MUST PROVIDE GENERAL USE SWITCH RATED AT 30A.
- CONTRACTOR MUST PROVIDE "THRU THE DOOR DISCONNECT SWITCH" OPTION AS PART OF EQUIPMENT PACKAGE.
- CONTRACTOR MUST PROVIDE 30A, HEAVY DUTY, NEMA 3R/4X, 15A FUSED, DISCONNECT SWITCH FOR OUTDOOR UNIT.

Branch Panel: 173-2ES-01											
Location: 173-1ESWB-01				Vots: 120/208 Wye				A.I.C. Rating: 10,000 A			
Supply From: 173-1ESWB-01				Phases: 3				Mains Type:			
Mounting: Surface				Wires: 4				Mains Rating: 225 A			
Enclosure: Type 1								MCB Rating: 225 A			
Notes:											
CKT	Circuit Description	Trip	Poles	A	B	C	Poles	Trip	Circuit Description	CKT	
173-2ES-01-1	173-AHU-01 SUPPLY	125 A	3	6100VA 6100VA	6100VA 6100VA	6100VA 6100VA	3	125 A	173-AHU-01 RETURN	173-2ES-01-2	
173-2ES-01-3										173-2ES-01-4	
173-2ES-01-5										173-2ES-01-6	
173-2ES-01-7	173-SH-01	125 A	3	6200VA 1530VA	6200VA 1530VA	6200VA 1530VA	3	225 A	173-CUAC-AHU-01	173-2ES-01-8	
173-2ES-01-9										173-2ES-01-10	
173-2ES-01-11										173-2ES-01-12	
173-2ES-01-13	173-HWP-01	20 A	3	600VA 600VA	600VA 600VA	600VA 600VA	3	20 A	173-HWP-04	173-2ES-01-14	
173-2ES-01-15										173-2ES-01-16	
173-2ES-01-17										173-2ES-01-18	
173-2ES-01-19	173-CUH-01	20 A	2	200VA 800VA	200VA 360 VA	1500VA 1500VA	1	20 A	173-WH-01	173-2ES-01-20	
173-2ES-01-21									RECEPTACLES	173-2ES-01-22	
173-2ES-01-23	173-HWB-01	20 A	1				1	20 A	173-HWB-02	173-2ES-01-24	
173-2ES-01-25										173-2ES-01-26	
173-2ES-01-27	173-GF-01	20 A	1	1200VA 1200VA	880VA 530VA	830VA 530VA	1	20 A	173-HWUH-01	173-2ES-01-28	
173-2ES-01-29	173-EF-01	20 A	1				1	20 A	173-EF-02	173-2ES-01-30	
173-2ES-01-31	173-EF-03	20 A	1	530VA 530VA			1	20 A	173-EF-04	173-2ES-01-32	
173-2ES-01-33	173-ACU-01	20 A	2	800VA 800VA	800VA 800VA		2	20 A	173-ACU-02	173-2ES-01-34	
173-2ES-01-35										173-2ES-01-36	
173-2ES-01-37	173 HEAT TRACE	100 A	3	3100VA 360VA	3100VA 0	3100VA 0	1	20 A	RECEPTACLES	173-2ES-01-38	
173-2ES-01-39									SPACE	173-2ES-01-40	
173-2ES-01-41									SPACE	173-2ES-01-42	
				Total Load:	29050 VA	27780VA	29890 VA				
				Total Amps:	81 A	77A	82 A				

Load Classification	Connected Load	Demand Factor	Estimated Demand	Panel Totals
Power	86360 VA	100.00%	86360 VA	
Receptacle	360 VA	100.00%	360 VA	
				Total Conn. Load: 86720 VA
				Total Est. Demand: 86720 VA
				Total Conn.: 240 A
				Total Est. Demand: 240 A

Notes:

MECHANICAL EQUIPMENT CONNECTION SCHEDULE									
MARK	LOAD Kva	HP	VOLTAGE	PHASE	AMPS	SOURCE	WIRE SIZE	DISC.	
173-VAV-12	0.01	-	120	1	0.06	1ES-02-15	3#12, 1#12G, 3/4"C	J. BOX	
173-VAV-13	0.01	-	120	1	0.06	1ES-02-15	3#12, 1#12G, 3/4"C	J. BOX	
173-VAV-14	0.01	-	120	1	0.06	1ES-02-15	3#12, 1#12G, 3/4"C	J. BOX	
173-VAV-15	0.01	-	120	1	0.06	1ES-02-17	3#12, 1#12G, 3/4"C	J. BOX	
173-VAV-16	0.01	-	120	1	0.06	1ES-02-17	3#12, 1#12G, 3/4"C	J. BOX	
173-VAV-17	0.01	-	120	1	0.06	1ES-02-17	3#12, 1#12G, 3/4"C	J. BOX	
173-VAV-18	0.01	-	120	1	0.06	1ES-02-17	3#12, 1#12G, 3/4"C	J. BOX	
173-VAV-19	0.01	-	120	1	0.06	1ES-02-17	3#12, 1#12G, 3/4"C	J. BOX	
173-VAV-20	0.01	-	120	1	0.06	1ES-02-17	3#12, 1#12G, 3/4"C	J. BOX	
173-VAV-21	0.01	-	120	1	0.06	1ES-02-17	3#12, 1#12G, 3/4"C	J. BOX	
173-VAV-22	0.01	-	120	1	0.06	1ES-02-16	3#12, 1#12G, 3/4"C	J. BOX	
173-VAV-23	0.01	-	120	1	0.06	1ES-04-16	3#12, 1#12G, 3/4"C	J. BOX	
173-VAV-24	0.01	-	120	1	0.06	1ES-04-08	3#12, 1#12G, 3/4"C	J. BOX	
173-VAV-25	0.01	-	120	1	0.06	1ES-04-08	3#12, 1#12G, 3/4"C	J. BOX	
173-VAV-26	0.01	-	120	1	0.06	1ES-04-08	3#12, 1#12G, 3/4"C	J. BOX	
173-VAV-27	0.01	-	120	1	0.06	1ES-04-08	3#12, 1#12G, 3/4"C	J. BOX	
173-VAV-28	0.01	-	120	1	0.06	1ES-04-08	3#12, 1#12G, 3/4"C	J. BOX	
173-VAV-29	0.01	-	120	1	0.06	1ES-04-08	3#12, 1#12G, 3/4"C	J. BOX	
173-VAV-30	0.01	-	120	1	0.06	1ES-04-08	3#12, 1#12G, 3/4"C	J. BOX	
173-VAV-31	0.01	-	120	1	0.06	1ES-04-16	3#12, 1#12G, 3/4"C	J. BOX	
173-VAV-32	0.01	-	120	1	0.06	1ES-04-16	3#12, 1#12G, 3/4"C	J. BOX	
173-VAV-33	0.01	-	120	1	0.06	1ES-04-16	3#12, 1#12G, 3/4"C	J. BOX	
173-VAV-34	0.01	-	120	1	0.06	1ES-03-09	3#12, 1#12G, 3/4"C	J. BOX	
173-VAV-35	0.01	-	120	1	0.06	1ES-03-09	3#12, 1#12G, 3/4"C	J. BOX	
173-VAV-36	0.01	-	120	1	0.06	1ES-03-09	3#12, 1#12G, 3/4"C	J. BOX	
173-VAV-37	0.01	-	120	1	0.06	1ES-03-09	3#12, 1#12G, 3/4"C	J. BOX	
173-VAV-38	0.01	-	120	1	0.06	1ES-01-13	3#12, 1#12G, 3/4"C	J. BOX	
173-VAV-39	0.01	-	120	1	0.06	1ES-01-12	3#12, 1#12G, 3/4"C	J. BOX	
173-VAV-40	0.01	-	120	1	0.06	1ES-01-12	3#12, 1#12G, 3/4"C	J. BOX	
173-VAV-41	0.01	-	120	1	0.06	1ES-01-12	3#12, 1#12G, 3/4"C	J. BOX	
173-VAV-42	0.01	-	120	1	0.06	1ES-01-12	3#12, 1#12G, 3/4"C	J. BOX	
173-VAV-43	0.01	-	120	1	0.06	1ES-01-12	3#12, 1#12G, 3/4"C	J. BOX	
173-VAV-44	0.01	-	120	1	0.06	1ES-01-12	3#12, 1#12G, 3/4"C	J. BOX	
173-VAV-45	0.01	-	120	1	0.06	1ES-01-12	3#12, 1#12G, 3/4"C	J. BOX	
173-VAV-46	0.01	-	120	1	0.06	1ES-01-12	3#12, 1#12G, 3/4"C	J. BOX	

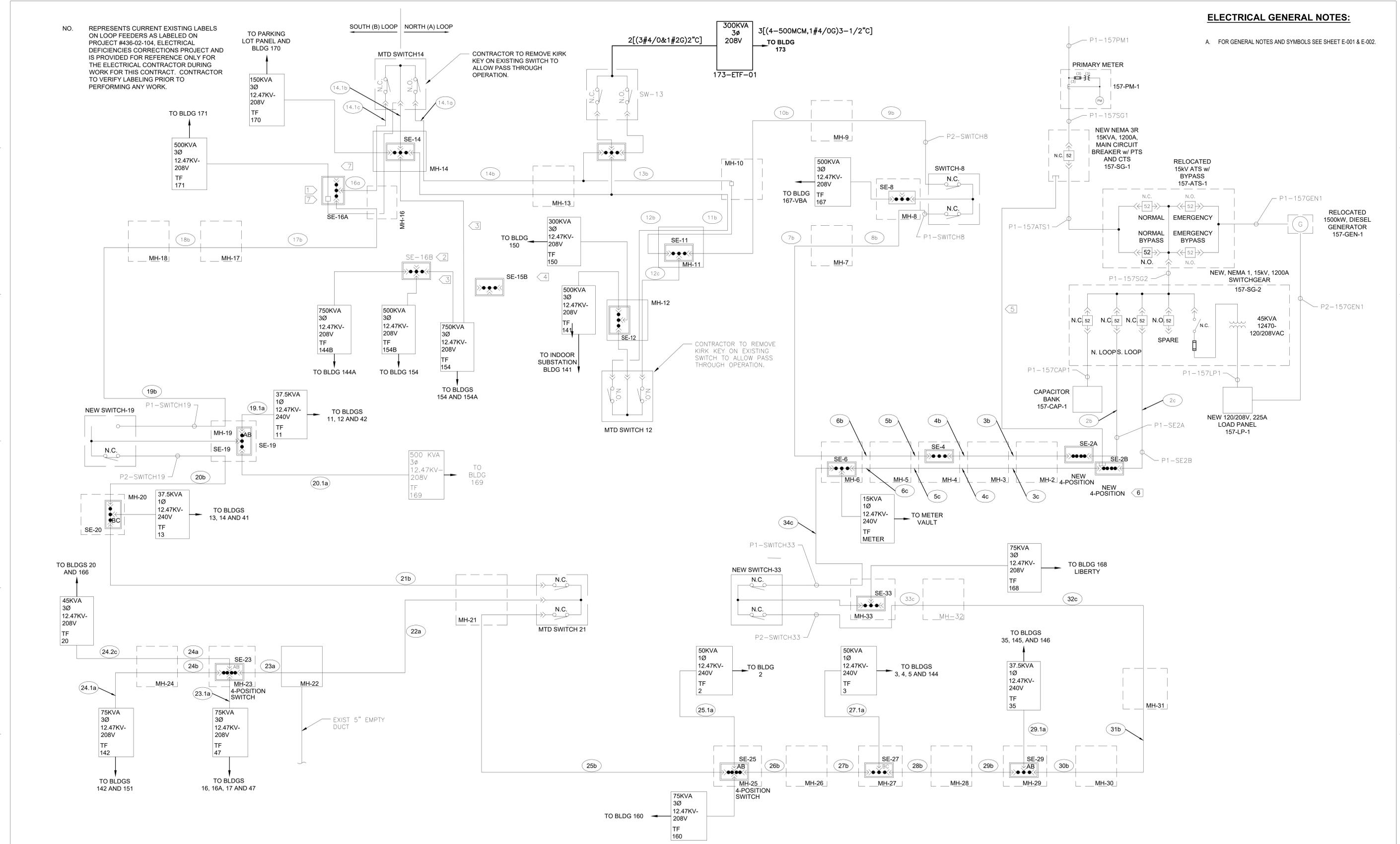
MECHANICAL EQUIPMENT CONNECTION SCHEDULE									
MARK	LOAD Kva	HP	VOLTAGE	PHASE	AMPS	SOURCE	WIRE SIZE	DISC.	
173-AHU-01 SUPPLY	-	30	208	3	107	2ES-01-1,3,5	(2), 3#1, 1#6G, 1-1/2"C	VFD	
173-AHU-01 RETURN	-	30	208	3	107	2ES-01-2,4,6	(2), 3#1, 1#6G, 1-1/2"C	VFD	
173-SH-01	-	30	208	3	89	2ES-01-7,9,11	3#2, 1#6G, 1-1/2"C	SEE NOTE 2	
173-HWB-01	-	16.3	120	1	13.1	2ES-01-23	3#12, 1#12G, 3/4"C	SEE NOTE 3	
173-HWB-02	-	16.3	120	1	13.1	2ES-01-24	3#12, 1#12G, 3/4"C	SEE NOTE 3	
173-CUAC-AHU-01	-	75	208	3	197.4	2ES-01-8,10,12	3#3/0, 1#4G, 2"C	SEE NOTE 10	
173-GF-01	-	1/3	120	1	7.2	2ES-01-27	3#12, 1#12G, 3/4"C	LOCAL DISC	
173-EF-01	-	1/8	120	1	4.4	2ES-01-29	3#12, 1#12G, 3/4"C	SEE NOTE 1	
173-EF-02	-	1/6	120	1	4.4	2ES-01-30	3#12, 1#12G, 3/4"C	SEE NOTE 1	
173-EF-03	-	1/8	120	1	4.4	2ES-01-31	3#12, 1#12G, 3/4"C	SEE NOTE 4	
173-EF-04	-	1/8	120	1	4.4	2ES-01-32	3#12, 1#12G, 3/4"C	SEE NOTE 4	
173-HWP-01	-	2	208	3	7.5	2ES-01-13,15,17	3#12, 1#12G, 3/4"C	SEE NOTE 5	
173-HWP-02	-	1/2	120	1	9.8	2ES-01-25	3#12, 1#12G, 3/4"C	SEE NOTE 6	
173-HWP-03	-	1/3	120	1	9.8	2ES-01-26	3#12, 1#12G, 3/4"C	SEE NOTE 6	
173-HWP-04	-	2	208	3	7.5	2ES-01-14,16,18	3#12, 1#12G, 3/4"C	SEE NOTE 5	
173-CUH-01	-	1/8	208	1	4.4	2ES-01-19,21	2#12, 1#12G, 3/4"C	SEE NOTE 7	
173-HWUH-01	-	1/16	120	1	4.4	2ES-01-28	3#12, 1#12G, 3/4"C	SEE NOTE 8	
173-WH-01	-	-	120	1	5	2ES-01-20	2#12, 1#12G, 3/4"C	SEE NOTE 9	
173-ACU-01	-	-	208	1	17	2ES-01-33,35	2#12, 1#12G, 3/4"C	SEE NOTE 11	
173-ACU-02	-	-	208	1	17	2ES-01-34,36	3#12, 1#12G, 3/4"C	SEE NOTE 11	
173-VAV-1	0.01	-	120	1	0.06	1ES-01-13	3#12, 1#12G, 3/4"C	J. BOX	
173-VAV-2	0.01	-	120	1	0.06	1ES-01-13	3#12, 1#12G, 3/4"C	J. BOX	
173-VAV-3	0.01	-	120	1	0.06	1ES-01-13	3#12, 1#12G, 3/4"C	J. BOX	
173-VAV-4	0.01	-	120	1	0.06	1ES-01-13	3#12, 1#12G, 3/4"C	J. BOX	
173-VAV-5	0.01	-	120	1	0.06	1ES-02-16	3#12, 1#12G, 3/4"C	J. BOX	
173-VAV-6A	0.01	-	120	1	0.06	1ES-02-16	3#12, 1#12G, 3/4"C	J. BOX	
173-VAV-6B	0.01	-	120	1	0.06	1ES-02-16	3#12, 1#12G, 3/4"C	J. BOX	
173-VAV-6C	0.01	-	120	1	0.06	1ES-02-16	3#12, 1#12G, 3/4"C	J. BOX	
173-VAV-7	0.01	-	120	1	0.06	1ES-01-13	3#12, 1#12G, 3/4"C	J. BOX	
173-VAV-8	0.01	-	120	1	0.06	1ES-02-15	3#12, 1#12G, 3/4"C	J. BOX	
173-VAV-9	0.01	-	120	1	0.06	1ES-02-15	3#12, 1#12G, 3/4"C	J. BOX	
173-VAV-10	0.01	-	120	1	0.06	1ES-02-15	3#12, 1#12G, 3/4"C	J. BOX	
173-VAV-11	0.01	-	120	1	0.06	1ES-02-15	3#12, 1#12G, 3/4"C	J. BOX	

CONSULTANTS: 		ARCHITECT/ENGINEERS: 		STAMP: 				Drawing Title MECHANICAL EQUIPMENT CONNECTION SCHEDULE		Phase 100% CONSTRUCTION DOCUMENTS		Project Title OUTPATIENT MENTAL HEALTH / EDUCATION ADDITION		Project Number 436-114	
				750 W HAMPDEN AVE SUITE #300 ENGLEWOOD CO 80110 (720) 556-6307 WWW.VALHALLAENGINEERING.COM		Approved: Project Director		Location 3687 VETERANS DRIVE, FORT HARRISON, MT 59636		Issue Date 08/05/2020		Checked TL		Drawn GH	
Date:		VEG 4.11		8/5/2020		EP602-P1		Building Number 173		Drawing Number EP602-P1		Location 3687 VETERANS DRIVE, FORT HARRISON, MT 59636		Project Number 436-114	

ELECTRICAL GENERAL NOTES:

A. FOR GENERAL NOTES AND SYMBOLS SEE SHEET E-001 & E-002.

NO. REPRESENTS CURRENT EXISTING LABELS ON LOOP FEEDERS AS LABELED ON PROJECT #436-02-104. ELECTRICAL DEFICIENCIES CORRECTIONS PROJECT AND IS PROVIDED FOR REFERENCE ONLY FOR THE ELECTRICAL CONTRACTOR DURING WORK FOR THIS CONTRACT. CONTRACTOR TO VERIFY LABELING PRIOR TO PERFORMING ANY WORK.



1 ONE LINE DIAGRAM
SCALE: NO SCALE

CONSULTANTS:  11460 TONAWANDA CREEK PARKWAY SUITE 400 LEANWOOD, KANSAS 66041		ARCHITECT/ENGINEERS:  750 W HAMPDEN AVE SUITE #300 ENGLEWOOD CO 80110 (720) 550-6307 WWW.VALHALLAENGINEERING.COM		STAMP:  U.S. Department of Veterans Affairs		Drawing Title ONE-LINE DIAGRAMS & PHASE DIAGRAMS Approved: Project Director		Phase 100% CONSTRUCTION DOCUMENTS		Project Title OUTPATIENT MENTAL HEALTH / EDUCATION ADDITION		Project Number 436-114	
Protection Engineering 		JIRSA HEDRICK 		VEG 4.11		Location 3687 VETERANS DRIVE, FORT HARRISON, MT 59636		Issue Date 08/05/2020		Checked TL		Drawn BWW	
Issued:		Date:		Building Number 173		Drawing Number EP603-P1		Issue Date 08/05/2020		Checked TL		Drawn BWW	

ELECTRICAL GENERAL NOTES:

A. FOR GENERAL NOTES AND SYMBOLS SEE SHEET E-001 & E-002.

KEY NOTES:

① TO FURTHEST BRANCH CIRCUIT USE #8 AWG MIN FOR VOLTAGE DROP.

SHORT CIRCUIT TABLE	
ID	SHORT CIRCUIT VALUE
①	18505A lsc
②	17495A lsc
③	14312A lsc
④	9693A lsc
⑤	9998A lsc
⑥	6263A lsc
⑦	NOT USED
⑧	8785 lsc
⑨	13372 lsc

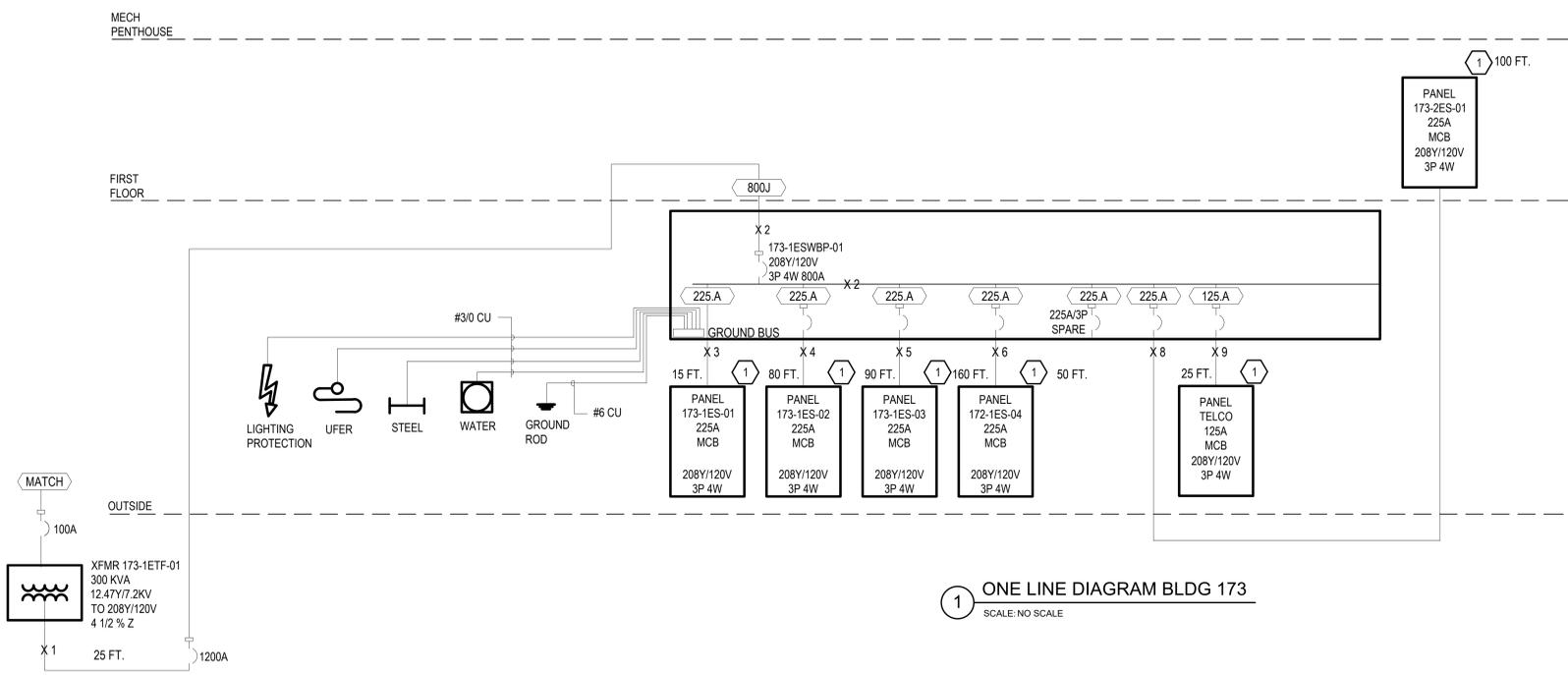
FEEDER SCHEDULE		
ID	FEEDER AMPS	CONDUIT AND FEEDER
②25.A	225	2-1/2" C, 3#4/0, #4/0N, #4G
⑧00J	800	(3)3" C, 3#300kcmil, #300kcmil N, #1/0G
MATCH	-	MATCH EXISTING FEEDER FROM SECTIONALIZER
①25.A	125	2-1/2" C, #1/0, #1/0N, #8G

SIZING METHOD: COPPER, 60°C #12 THROUGH #1, 75°C 1/0 AND ABOVE FEEDER SCHEDULE

FEEDER VOLTAGE DROP		
FROM	TO	VOLTAGE DROP %
173-1ETF-01	173-1ES-01	0.17 %
173-1ESWBP-01	173-1ES-02	0.91 %
173-1ESWBP-01	173-1ES-03	1.03 %
173-1ESWBP-01	173-1ES-04	1.82 %
173-1ESWBP-01	173-2ES-01	1.14 %
173-1ESWBP-01	TELCO	0.20 %

ELECTRICAL LOAD SUMMARY						
Square Footage:	16202					
Load Description:		Unit	Demand Factor	Diversity Factor	Unit	
Lighting:	16202	SF	3.5	1.25	70884	KVA
Receptacles:						
1st 10kVA-	10000	KVA	1	1	10000	KVA
Remainder-	6202	KVA	0.5	1	3101	KVA
Motor:						
Largest-	62.7	KW	1.25	1	87	KVA
Remainder-	94.75	KW	1	1	105	KVA
Calculated Load:					84177	KVA
Future Load:			1.2	1	101013	KVA
Demand Load:					269367	KVA
Service Voltage:	208		Phase:	3		
Total Amps:					748	A

① ONE LINE DIAGRAM BLDG 173
SCALE: NO SCALE



File Path

VA FORM 08-6231

Issued:	Date:

CONSULTANTS:

HOEFER WYSOCKI
11460 TONAWANDA CREEK PARKWAY SUITE 400, LEANWOOD, KANSAS 66041

LAND3

Protection Engineering
11460 TONAWANDA CREEK PARKWAY SUITE 400, LEANWOOD, KANSAS 66041

JIRSA HEDRICK
Structural Engineers

ARCHITECT/ENGINEERS:

VALHALLA ENGINEERING GROUP, LLC
750 W HAMPTDEN AVE
SUITE #300
ENGLEWOOD, CO 80110
(720) 550-6307
WWW.VALHALLAENGINEERING.COM

VEG 4.11

STAMP:

Professional Engineer Seal for Valhalla Engineering Group, LLC, dated 8/5/2020.

U.S. Department of Veterans Affairs

Drawing Title: **ONE-LINE DIAGRAMS & CALCULATIONS**

Approved: Project Director

Phase: **100% CONSTRUCTION DOCUMENTS**

Project Title: **OUTPATIENT MENTAL HEALTH / EDUCATION ADDITION**

Location: 3687 VETERANS DRIVE, FORT HARRISON, MT 59636

Issue Date: 08/05/2020

Checked: TL

Drawn: GH

Project Number: 436-114

Building Number: 173

Drawing Number: **EP604-P1**