

METHOD OF SHORT CIRCUIT CURRENT CALCULATIONS

SHORT CIRCUIT CURRENT CALCULATIONS WILL BE PERFORMED ON THE ELECTRICAL SYSTEM USING A BOLTED THREE PHASE FAULT CONDITION FOR MECHANICAL STRESS TO THE SYSTEM FOR CALCULATIONS PURPOSES. EXISTING SHORT CIRCUIT VALUES WILL BE USED OUTSIDE THE WORK AREA, FOR THE STARTING POINT OF THE CALCULATIONS.

METHOD OF VOLTAGE DROP CALCULATIONS

USING OHM'S LAW AND THE KNOWN RESISTIVITY CONSTANT OF CONDUCTOR METAL (CIRCULAR MIL-OHM PER FOOT) FOR COPPER CONDUCTORS, OUR INTENT IS TO CALCULATE THE REQUIRED WIRE SIZE NECESSARY SO AS NOT TO EXCEED THE RECOMMENDED VOLTAGE DROP OF 3% FOR BRANCH CIRCUIT CONDUCTORS.

ELECTRICAL SYMBOL NOTES

A1 b

THE LIGHTING FIXTURE TYPE IS INDICATED BY AN UPPER CASE LETTER OR AN UPPER CASE LETTER AND NUMBER. THE SWITCH DESIGNATION (IF NEEDED) IS INDICATED BY A LOWER CASE LETTER.

EXAMPLE: LIGHTING FIXTURE TYPE 'A1' IS CONTROLLED BY SWITCH 'b'.

EXIT SIGNS: STEM INDICATES WALL MOUNTING. NO STEM INDICATES CEILING MOUNTING. SHADED AREA INDICATES ILLUMINATED FACE(S). ARROW INDICATES DIRECTIONAL ARROW ON ILLUMINATED FACE(S).

E1

EXAMPLE 1: WALL MOUNTED EXIT SIGN TYPE 'E1' WITH SINGLE FACE AND DIRECTIONAL ARROW.

E2

EXAMPLE 2: CEILING MOUNTED EXIT SIGN TYPE 'E2' WITH DOUBLE FACE AND DIRECTIONAL ARROWS.

DEVICES: THE SWITCH DESIGNATION IS INDICATED BY A LOWER CASE LETTER.

EXAMPLE: SPLIT DUPLEX RECEPTACLE: ONE RECEPTACLE OUTLET IS CONTROLLED BY SWITCH 'c'.

The CONTROL DEVICE DESIGNATION IS INDICATED BY A LOWER CASE LETTER.

EXAMPLE: SINGLE POLE SWITCH 'd' TO CONTROL LIGHTING FIXTURES INDICATED BY 'd'.

TRANSFORMERS: THE TRANSFORMER TYPE IS INDICATED BY A NUMBER FOLLOWING THE UPPER CASE LETTER 'T'. SEE THE TRANSFORMER SCHEDULE OR THE SINGLE LINE DIAGRAM FOR THE TRANSFORMER DESCRIPTION AND REQUIREMENTS.

EXAMPLE: TRANSFORMER TYPE 'T1'.

PANELBOARDS: PANELBOARD DOORS MAY BE SHOWN TO INDICATE OPENING SIDE OF RECESSED PANELBOARDS. SEE PANELBOARD IDENTIFICATION FOR DESIGNATION CODES.

SHEET KEY NOTE: SEE THE SHEET KEY NOTES ON THAT SHEET FOR THE NOTE NUMBER INDICATED IN THE HEXAGON.

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DEMOLITION KEY NOTE: SEE THE SHEET KEY NOTES ON THAT SHEET FOR THE NOTE NUMBER INDICATED IN THE SQUARE.

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HOME RUN TO BRANCH CIRCUIT PANEL: THE PANEL DESIGNATION AND CIRCUIT DESIGNATION ARE SHOWN ADJACENT TO THE HOME RUN ARROW. CIRCUIT BREAKER SIZES (AMPS/NUMBER OF POLES) ARE SHOWN IN THE PANEL SCHEDULE WITH THE CORRESPONDING PANEL AND CIRCUIT DESIGNATION.

EXAMPLE: HOME RUN TO PANELBOARD 'LPN'; CIRCUITS 1, 3, 5.

SYMBOL NOTATIONS: UPPER CASE LETTERS ADJACENT TO SYMBOLS INDICATE A UNIT TYPE. SEE APPROPRIATE SCHEDULE OR SPECIFICATIONS.

ELECTRICAL ABBREVIATIONS LIST

1P 1 POLE (2P, 3P, 4P, ETC.)	CONST CONSTRUCTION	GFI GROUND FAULT CIRCUIT INTERRUPTER	MTS MANUAL TRANSFER SWITCH	SS STAINLESS STEEL
1PH 1 PHASE	CONT CONTINUATION OR CONTINUOUS	GND GROUND	MTR MOTOR, MOTORIZED	SSW SELECTOR SWITCH
2C TWO-CONDUCTOR (3C, 4C, ETC.)	CONTR CONTRACTOR	GRS GALVANIZED RIGID STEEL (CONDUIT)	NA NOT APPLICABLE	STD STANDARD
W2 TWO-WIRE (3W, 4W, ETC.)	COORD COORDINATE	GYP BGGYPSUM BOARD	NA NOT APPLICABLE	SURF SURFACE MOUNTED
3PH 3 PHASE	CPT CONTROL POWER TRANSFORMER	HID HIGH-INTENSITY DISCHARGE	NC NORMALLY CLOSED	SW SWITCH
A AMPERE	CRI COLOR RENDERING INDEX	HOA HAND-OFF-AUTOMATIC	NEC NATIONAL ELECTRICAL CODE	SWBD SWITCHBOARD
AAP ALARM ANNUNCIATOR PANEL	CT CURRENT TRANSFORMER	HP HORSEPOWER	NEMA NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION	SYM SYMMETRICAL
AC ABOVE COUNTER	CTV CABLE TELEVISION	HT HEIGHT	NFDS NON-FUSED SAFETY DISCONNECT SWITCH	SY SYSTEM
ACC ACCESSIBLE	CU COPPER	HTR HEATER	NIC NOT IN CONTACT	TC TIMECLOCK
ACLG ABOVE CEILING	CU FT CUBIC FEET	HVAC HEATING, VENTILATING AND AIR CONDITIONING	NL NIGHT LIGHT	TEL TELEPHONE
ADD AUTOMATIC DOOR OPENER	dB DECIBEL	IES ILLUMINATION ENGINEERING SOCIETY	NTS NOT TO SCALE	TEL DATA TELEPHONE/DATA TERM TERMINAL
A/E ARCHITECT/ENGINEER	DB DIRECT BURIAL	IG ISOLATED GROUND	OC ON CENTER	TP TWISTED PAIR
AF AMP FRAME	DC DIRECT CURRENT	IMC INTERMEDIATE METAL CONDUIT	OD OUTSIDE DIAMETER	TPS TWISTED PAIR SHIELDED
AFC AVAILABLE FAULT CURRENT (KILOAMPS)	DEG C DEGREES CELSIUS	IR INFRARED	OH OVERHEAD	TR TAMPER RESISTANT
AFF ABOVE FINISHED FLOOR	DEG F DEGREES FAHRENHEIT	IW INTERLOCK WITH	OL OVERLOAD	T-TSTAT THERMOSTAT
AFO ABOVE FINISHED GRADE	DEMO DEMOLITION/DEMOLITION DEPT DEPARTMENT	IWH INSTANTANEOUS WATER HEATER	PA PUBLIC ADDRESS	TTB TELEPHONE TERMINAL BOARD
AFI ARC FAULT CIRCUIT INTERRUPTER	DIA DIAMETER	J-BOX JUNCTION BOX	PB PULL BOX OR PUSHBUTTON	T-TELEVISION TERMINAL CABINET
AHJ AUTHORITY HAVING JURISDICTION	DISC DISCONNECT	KV KILOVOLT	PBPB PULL BOX OR PUSHBUTTON PREFABRICATED BEDSIDE PATIENT UNIT	TV TELEVISION
AHU AIR HANDLING UNIT	DIST DISTRIBUTION	KVA KILOVOLT-AMPERE	PCB POLYCHLORINATED BIPHENYL	UC UNDER COUNTER
AIC AMPERE INTERRUPTING CAPACITY	DN DOWN	KVAR KILOVOLT-AMPERE REACTIVE	PCD PHOTOELECTRIC CELL	UE UNDERGROUND ELECTRICAL
AL ALUMINUM	DS SAFETY DISCONNECT SWITCH	KWH KILOWATT HOUR	PED PEDESTAL	UG UNDERGROUND
ALT ALTERNATE	DT DOUBLE THROW	LED LIGHT-EMITTING DIODE	PEND PENDANT	UH UNIT HEATER
AMP AMPERE	DWG DRAWING	LF LINEAR FEET/FOOT	PF POWER FACTOR	UL UNDERWRITER'S LABORATORY
APPROX APPROXIMATELY	EC ELECTRICAL CONTRACTOR	LIM LUMEN	PH PHASE	UP UNDERGROUND TELEPHONE UNSHIELDED TWISTED PAIR
ARCH ARCHITECT, ARCHITECTURAL	EG EQUIPMENT GROUND	LRA LOCKED ROTOR AMPS	PIN POST INDICATING VALVE	UT UTIL UTILITY
AT AMP TRIP	ELEV ELEVATOR	LT LIGHT	PNL PANEL	UV UNIT VENTILATOR OR ULTRAVIOLET
ATS AUTOMATIC TRANSFER SWITCH	ELEC ELECTRICAL	LV LOW VOLTAGE	POE POWER-OVER-ETHERNET	
AUX AUXILIARY	EM EMERGENCY	MATV MASTER ANTENNA TELEVISION SYSTEM	PR PAIR	
AV AUDIO VISUAL	EMF ELECTROMAGNETIC INTERFERENCE	MAX MAXIMUM	PRI PRIMARY	
AWG AMERICAN WIRE GAUGE	EMS ENERGY MANAGEMENT SYSTEM	MC MECHANICAL CONTRACTOR	PROJ PROJECTION	
BAS BUILDING AUTOMATION SYSTEM	EMT ELECTRICAL METALLIC TUBING	MCA MINIMUM CIRCUIT AMPACITY	PRV POWER ROOF VENTILATOR	
BATT BATTERY	EPO EMERGENCY POWER OFF EQUIP EQUIPMENT	MC METAL-CLAD (CONDUIT)	PTR POTENTIAL TRANSFORMER	
BC BARE COPPER	ESMT EASEMENT	MCH MECHANICAL CONTRACTOR	PVC POLYVINYL CHLORIDE (CONDUIT)	
BD BOARD FINISHED FLOOR	ETR EXISTING TO REMAIN	MDC MAIN DISTRIBUTION PANEL	PR POWER	
BFF BELOW FINISHED FLOOR	EWX ELECTRIC WATER COOLER	MDP MAIN DISTRIBUTION PANEL		
BLDG BUILDING	EXW ELECTRIC WATER HEATER	MFR MANUFACTURER		
BMS BUILDING MANAGEMENT SYSTEM	EX EXISTING	MFS MAIN FUSED DISCONNECT SWITCH		
BYP BYPASS	EXP EXPLOSION PROOF	MI MICROPHONE		
C CONDUIT	FA FIRE ALARM	MIN MINIMUM		
CAB CABINET	FAAP FIRE ALARM ANNUNCIATOR PANEL	MISC MISCELLANEOUS		
CALC CALCULATED	FCAP FIRE ALARM CONTROL PANEL	MLO MAIN LUGS ONLY		
CAP CAPACITY	FC FOOTCANDLE	MSB MAIN SWITCHBOARD		
CAT CATALOG CATEGORY	FCU FAN COIL UNIT	MT MOUNT		
CATV COMMUNITY ANTENNA TELEVISION	FKT FIXTURE			
CB CIRCUIT BREAKER	FLR FLOOR			
CCT CONTROL CONTACTOR	FLUOR FLUORESCENT			
CCV CLOSED CIRCUIT TELEVISION	FJ FUSE			
CD CANDELA	FJDS FUSED SAFETY DISCONNECT SWITCH			
CD CONSTRUCTION DOCUMENTS	FVR FULL VOLTAGE REVERSING			
CF CONTRACTOR-FURNISHED	FVNR FULL VOLTAGE NON-REVERSING			
CD CANDELA				
CEILING				
COAX COAXIAL CABLE				
COMM COMMUNICATION				
CONN CONNECTION				

GENERAL ELECTRICAL NOTES

- ALL ELECTRICAL DEVICES, FIXTURES, EQUIPMENT AND FEEDERS SHALL BE INSTALLED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, THE MANUFACTURER'S RECOMMENDED PROCEDURES, ALL APPLICABLE LOCAL AND STATE CODES, AMERICANS WITH DISABILITIES ACT AND WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE AND VA STANDARDS.
- PROVIDE ADDITIONAL SUPPORT FOR DEVICES, FIXTURES, EQUIPMENT AND FEEDERS WHERE THE BUILDING CONSTRUCTION IS NOT SUITABLE FOR DIRECT MOUNTING.
- FIRESTOP, DRAFTSTOP, SMOKESTOP AND/OR PROTECT THE ANNULAR SPACE AROUND ALL PENETRATIONS THROUGH WALLS, PARTITIONS, FLOORS, CEILINGS, AND ROOFS IN ACCORDANCE WITH THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE, UL LISTING REQUIREMENT AND THE APPLICABLE BUILDING CODES.
- VERIFY CEILING SYSTEMS AND PROVIDE MOUNTING ACCESSORIES, TRIMS AND ALL REQUIRED MOUNTING HARDWARE TO SUIT THE PARTICULAR INSTALLATION.
- PROTECT EXISTING UNDERGROUND AND BUILDING INTERIOR UTILITIES DURING CONSTRUCTION.
- BRANCH CIRCUIT CONDUCTORS SHALL BE 12 AWG COPPER MINIMUM.
- COORDINATE ANY AND ALL WORK WITH ALL OTHER TRADES PRIOR TO INSTALLATION SO AS TO AVOID CONFLICT DURING CONSTRUCTION.
- ALL PANELS SHALL HAVE TYPED, COMPLETED DIRECTORIES INDICATING EQUIPMENT SERVED AND ROOM NUMBER (AS INDICATED ON FINAL BUILDING ROOM SIGNAGE) OF EQUIPMENT LOCATION, OR SPARE, OR SPACE.
- MANUFACTURER'S NAME AND MODEL NUMBER ARE GIVEN FOR DESCRIPTIVE PURPOSES. TO INDICATE A QUALITY STANDARD, AND ARE NOT INTENDED TO LIMIT PRODUCTS TO A PARTICULAR MANUFACTURER. PRODUCTS DEEMED EQUAL AND APPROVED BY THE DESIGNER WILL BE ACCEPTED. ALL PRODUCTS MUST COMPLY WITH 'BUY AMERICAN ACT'.
- ALL FEEDERS AND CIRCUITRY SHALL BE TORQUED PER THE PANEL, BREAKER, AND/OR PARTICULAR EQUIPMENT MANUFACTURER'S SPECIFICATIONS.
- CIRCUITRY TO SWITCHES, RECEPTACLES, AND ALL OTHER DEVICES SHALL BE TERMINATED ON THE DEVICE'S SCREW TERMINALS.
- MOUNTING HEIGHTS INDICATED ARE TO CENTER OF DEVICE, OUTLET, FIXTURE, OR EQUIPMENT UNLESS NOTED OTHERWISE.
- ALL WIRE TERMINATIONS SHALL BE RATED FOR 75 DEGREES C.
- ALL CONDUCTORS SHALL HAVE THHN/THWN INSULATION, UNLESS OTHERWISE NOTED.
- ALL CONDUIT SHALL BE RGS OR EMT UNLESS OTHERWISE NOTED. FMC CONDUIT SHALL BE USED ON VIBRATING EQUIPMENT (MAXIMUM LENGTH OF 6 FEET). PVC SHALL BE USED FOR UNDERGROUND CONDUIT OR WHERE CONCRETE ENCASED. WHERE VIBRATING EQUIPMENT IS LOCATED OUTSIDE, LFMC CONDUIT SHALL BE USED (MAXIMUM SIX FEET) FOR FINAL CONNECTIONS.
- ALL ELECTRICAL MATERIALS, DEVICES, APPLIANCES AND EQUIPMENT SHALL BE LABEL LISTED BY AN APPROVED THIRD PARTY TESTING AGENCY.
- FOR ALL LED FIXTURES, THE FIXTURE MUST BE CAPABLE OF SELF-RESETTING TO THE SWITCHED/CONTROLLED STATE DURING ANY FLUCTUATION IN POWER SUPPLY WHERE AUTOMATIC PROTECTIVE MEASURES DISABLE THE LED LAMPS. PROVIDE A LETTER OR STATEMENT FROM THE MANUFACTURER, OR OTHER ACCEPTABLE PROOF, THAT ALL LED FIXTURES, WITH OR WITHOUT BROWNOUT PROTECTION, WILL RETURN TO THE SWITCHED/CONTROLLED STATE AUTOMATICALLY. PROVIDE STATEMENT WITH THE FIXTURE SUBMITTALS.
- IN CASE OF CONFLICTS OR DISCREPANCIES WITHIN OR AMONG THE CONTRACT DRAWINGS, THE BETTER QUALITY, MORE STRINGENT REQUIREMENTS OR GREATER QUANTITY OF WORK, AS DETERMINED BY THE GOVERNMENT, SHALL BE PROVIDED.
- COMPRESSION COUPLINGS SHALL BE USED. NO SET SCREW FITTINGS ARE ALLOWED.
- LOCAL DISCONNECTS SHALL BE NEMA 3R.

LIGHTING SYMBOL LEGEND

SYMBOL	HEIGHT AFF *	DESCRIPTION
	---	2' X 2' RECESSED DIRECT/INDIRECT TROFFER
	---	2' X 4' RECESSED DIRECT/INDIRECT TROFFER
	---	2' X 4' RECESSED FLAT PRISMATIC LENS TROFFER
	7'-0" CENTER	2' LINEAR - WALL MOUNTED
	7'-0" CENTER	4' LINEAR - WALL MOUNTED
	---	6' DIAMETER RECESSED DOWNLIGHT
	7'-5" BOTTOM	EXIT SIGN - WALL MOUNTED
	7'-6" CENTER	EMERGENCY LIGHT BATTERY OPERATED - WALL MOUNTED
	6'-0" CENTER	WALL SCONCE
	48" CENTER	SINGLE POLE WALL SWITCH
	---	SWITCH MODIFIERS: OS: OCCUPANCY SENSOR, DUAL TECHNOLOGY LV: LOW VOLTAGE LVD: LOW VOLTAGE DIMMER D: LINE VOLTAGE DIMMER T: DIGITAL TIMER K: KEYED 3: 3 WAY
	---	OCCUPANCY SENSOR, DUAL TECHNOLOGY - WALL/CORNER MOUNTED
	---	LOW VOLTAGE LIGHTING CONTROL DEVICE
	---	LOW VOLTAGE LIGHTING CONTROL DEVICE WITH 0-10V DIMMING
	---	LIGHT LEVEL SENSOR, SINGLE ZONE DIMMING CLOSED LOOP - CEILING MOUNTED
	---	4' LED STRIP FIXTURE - GASKETED AND APPROVED FOR WET LOCATION

* - ANY HEIGHTS INDICATED IN PLANS SHALL SUPERCEDE THOSE LISTED HERE.

ELECTRICAL SYMBOL LEGEND

SYMBOL	HEIGHT	DESCRIPTION
	18"	120V DUPLEX RECEPTACLE
	18"	120V DUPLEX RECEPTACLE EMERGENCY OUTLET AND COVER PLATE SHALL BE RED IN COLOR
	18"	120V QUADRUPLEX RECEPTACLE
	18"	120V QUADRUPLEX RECEPTACLE EMERGENCY OUTLET AND COVER PLATE SHALL BE RED IN COLOR
	18"	208V DUPLEX RECEPTACLE
	18"	SPECIAL RECEPTACLE
	---	120V DUPLEX RECEPTACLE FLOOR BOX
	---	120V DUPLEX RECEPTACLE EMERGENCY FLOOR BOX OUTLET AND COVER PLATE SHALL BE RED IN COLOR
	---	120V QUADRUPLEX RECEPTACLE FLOOR BOX
	---	120V QUADRUPLEX RECEPTACLE EMERGENCY FLOOR BOX OUTLET AND COVER PLATE SHALL BE RED IN COLOR
	---	RECEPTACLE MODIFIERS: AC: 3" ABOVE COUNTERTOP/BACKSPLASH GF: GROUND FAULT CURRENT INTERRUPTER WP: WEATHERPROOF ENCLOSURE DED: DEDICATED CIRCUIT
	AS NOTED	JUNCTION BOX, PURPOSE AS NOTED
	AS NOTED	EQUIPMENT CONNECTION
	MAX 72" TOP	DISCONNECT SWITCH NON-FUSED - NEMA 3R
	MAX 72" TOP	DISCONNECT SWITCH FUSED - NEMA 3R
	M/S	MOTOR-RATED SWITCH
	P	PUMP MOTOR
	VFD	VARIABLE FREQUENCY DRIVE

ALL HEIGHTS ARE TO CENTER OF DEVICE UNLESS NOTED OTHERWISE. TOP HEIGHT TO TOP OF DEVICE. ANY HEIGHTS INDICATED IN PLANS SHALL SUPERCEDE THOSE LISTED HERE.

BID DEDUCTS

- DDC CONTROLS (USE LOCAL CONTROLLERS FOR INDIVIDUAL PIECES OF EQUIPMENT ONLY).
- CHILLED WATER FLOW METERS.
- ALL WORK ASSOCIATED WITH BUILDING 8.
- ALL WORK ASSOCIATED WITH BUILDING 6.
- ALL WORK ASSOCIATED WITH BUILDING 2.

FULLY SPRINKLERED 100% CONSTRUCTION DOCUMENTS

#	Revisions:	Date

CONSULTANTS:

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PROJECT MANAGER: ACG Project Number 17-251

Headquarters:
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 1151 Kildaire Farm Road, Suite 120
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Office of Construction and Facilities Management

VA U.S. Department of Veterans Affairs

Drawing Title:
ELECTRICAL GENERAL NOTES, SYMBOL LEGENDS, AND ABBREVIATIONS

Location:
 1400 BLACKHORSE HILL RD
 COATESVILLE, PA 19320

Project Title:
RENOVATE MECHANICAL ROOMS & EQUIPMENT PHASE 1

Approved: Project Director

Date: 05/01/2019

Checked: CGS

Drawn: ABT

VA PROJECT NUMBER
 542-18-105

Building Number
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Drawing Number
E-001

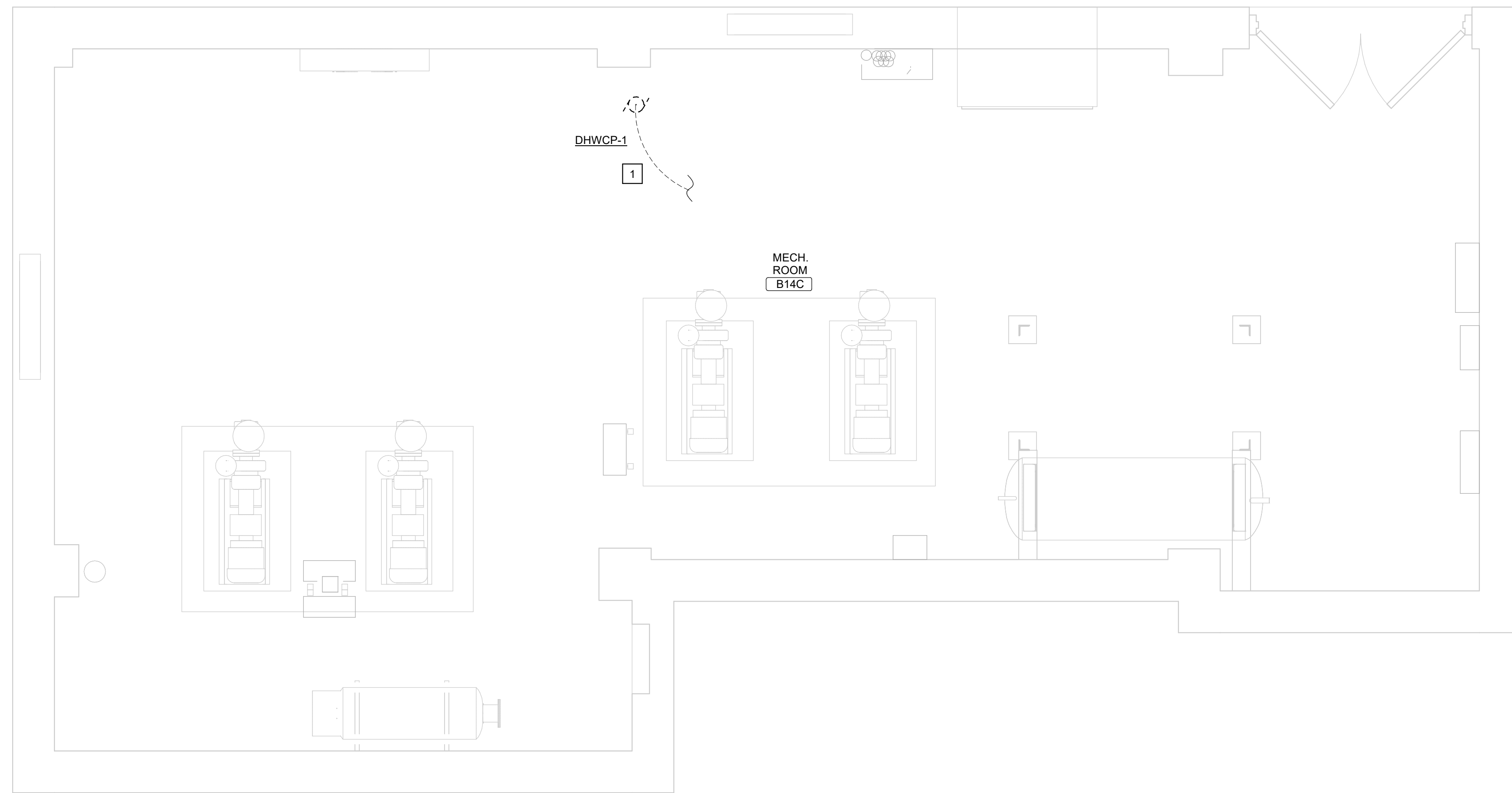
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SHEET NOTES:

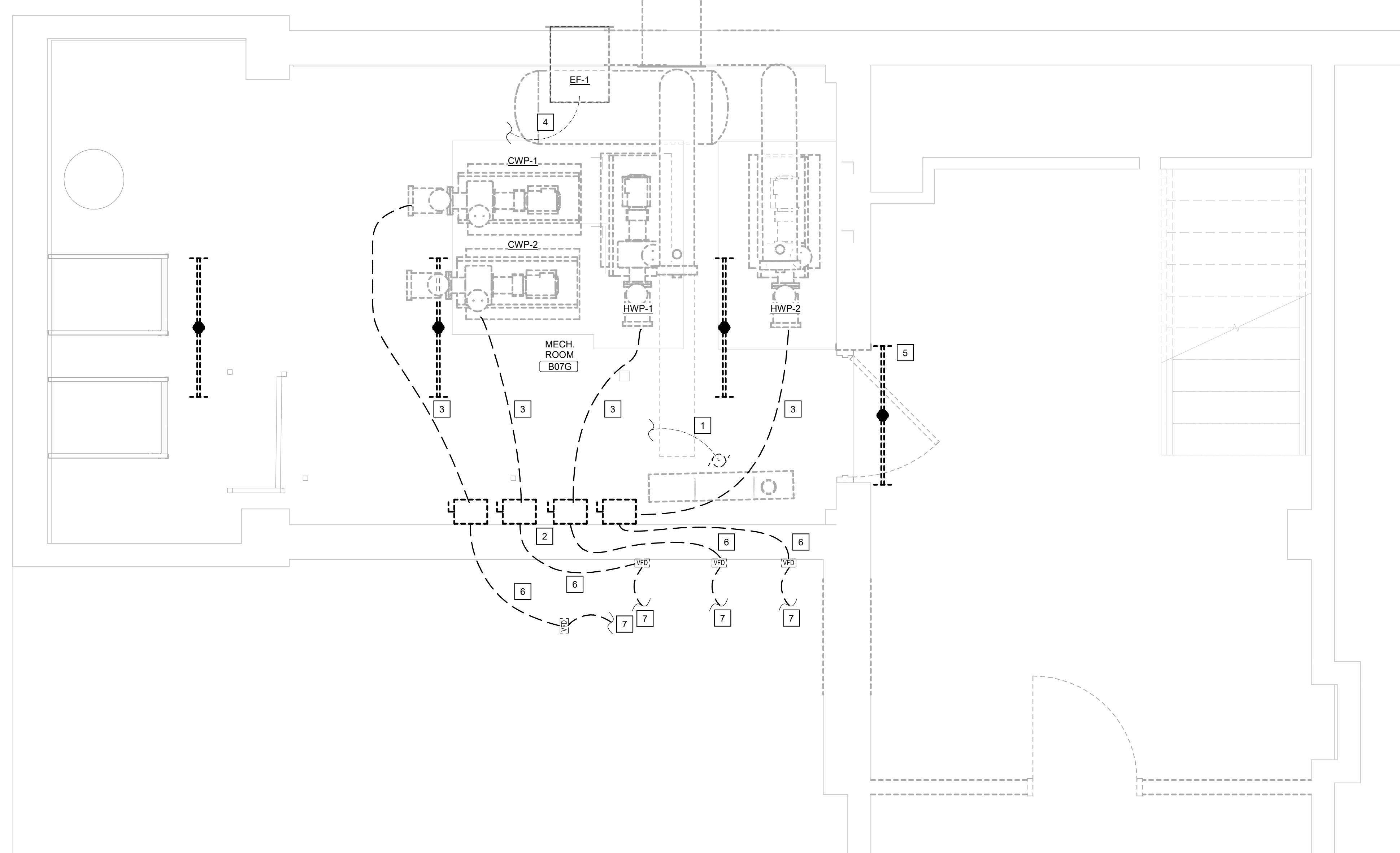
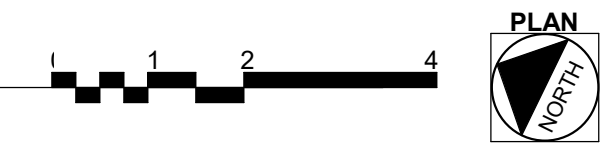
- A. COMPLETELY DEMOLISH CONDUCTORS, CONDUITS, AND J-BOXES BACK TO ELECTRICAL PANEL.
- B. COMPLETELY DEMOLISH ELECTRICAL DEVICES SHOWN ON THIS PLAN.

KEY NOTES:

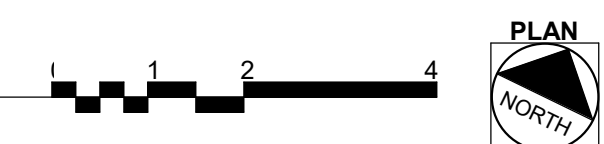
- 1 PUMP TO BE DEMOLISHED. SEE MECHANICAL PLANS DEMOLISH CIRCUIT (SEE SHEET NOTE A) TO RECIRCULATION PUMP. CIRCUIT SHALL BE REUSED FOR NEW PUMP. SEE NEW WORK PLAN EP101.
- 2 DISCONNECTS SERVING CWP-1, CWP-2, HWP-1, AND HWP-2 SHALL BE DEMOLISHED.
- 3 EXISTING BRANCH CIRCUITS SERVING CWP-1 AND CWP-2 SHALL BE REMOVED. EXISTING BRANCH CIRCUITS SERVING HWP-1 AND HWP-2 SHALL BE REMOVED. CIRCUIT SHALL BE REUSED. SEE NEW WORK PLAN EP101.
- 4 DEMOLISH CIRCUIT (SEE SHEET NOTE A) TO VENTILATION FAN. CIRCUIT SHALL BE REUSED FOR NEW FAN. SEE NEW WORK PLAN EP101.
- 5 DEMOLISH LIGHTS AND CIRCUIT. CIRCUIT SHALL BE REUSED. SEE NEW WORK PLAN EP101. (TYP)
- 6 DEMOLISH FOUR CWP AND HWP VFD'S AND CONDUCTORS COMPLETELY (SEE NOTE A).
- 7 DEMOLISH VFD CIRCUITS BACK TO PANEL "FCU-4" LOCATED IN IT CLOSET B09 COMPLETELY (SEE NOTE A).



1 BUILDING 2 ELECTRICAL DEMOLITION PLAN
Scale: 1/2" = 1'-0"

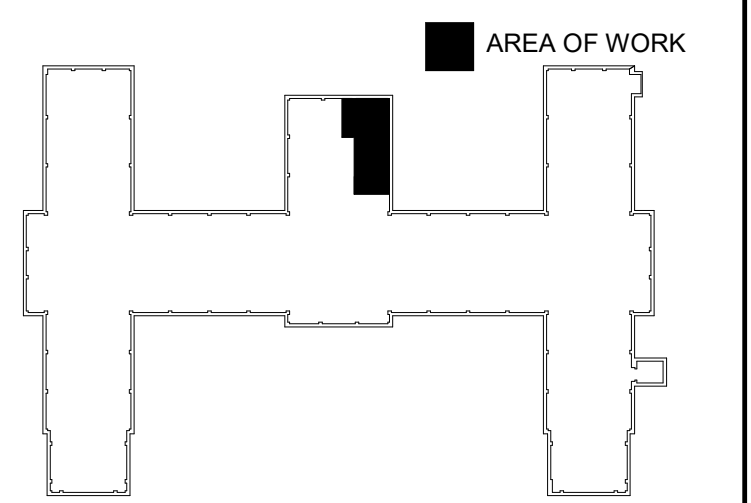


2 BUILDING 4 ELECTRICAL DEMOLITION PLAN
Scale: 1/2" = 1'-0"



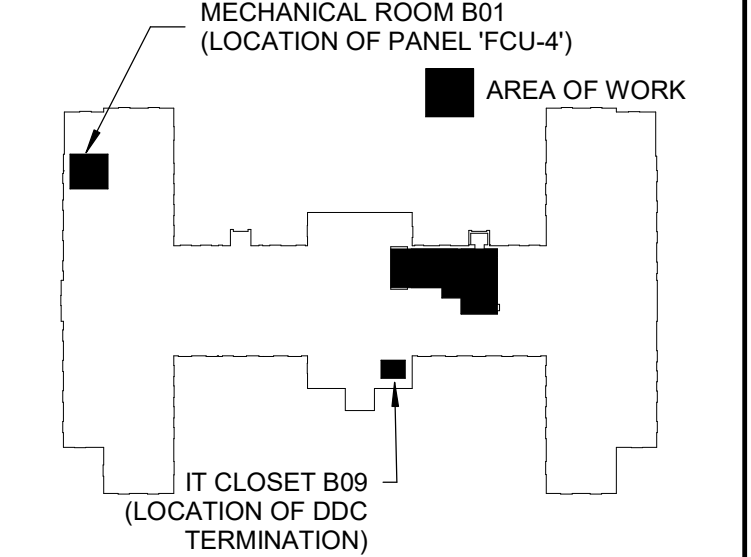
BUILDING 2 KEY PLAN

SCALE: NO SCALE



BUILDING 4 KEY PLAN

SCALE: NO SCALE

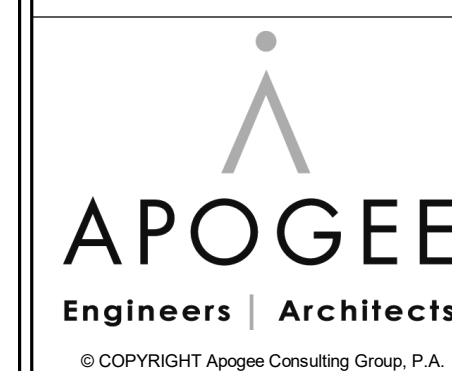


**FULLY SPRINKLERED
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CONSULTANTS:

PROJECT MANAGER:

ACG Project Number
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Office of
Construction
and Facilities
Management



Drawing Title:
**BUILDINGS 2 & 4 ELECTRICAL
DEMOLITION PLAN**

Location
**1400 BLACKHORSE HILL RD
COATESVILLE, PA 19320**

Project Title
**RENOVATE MECHANICAL
ROOMS & EQUIPMENT
PHASE 1**

Approved: Project Director

Date: 05/01/2019
Checked: CGS
Drawn: ABT

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542-18-105
Building Number
2, 4
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Dwg 2 of 9

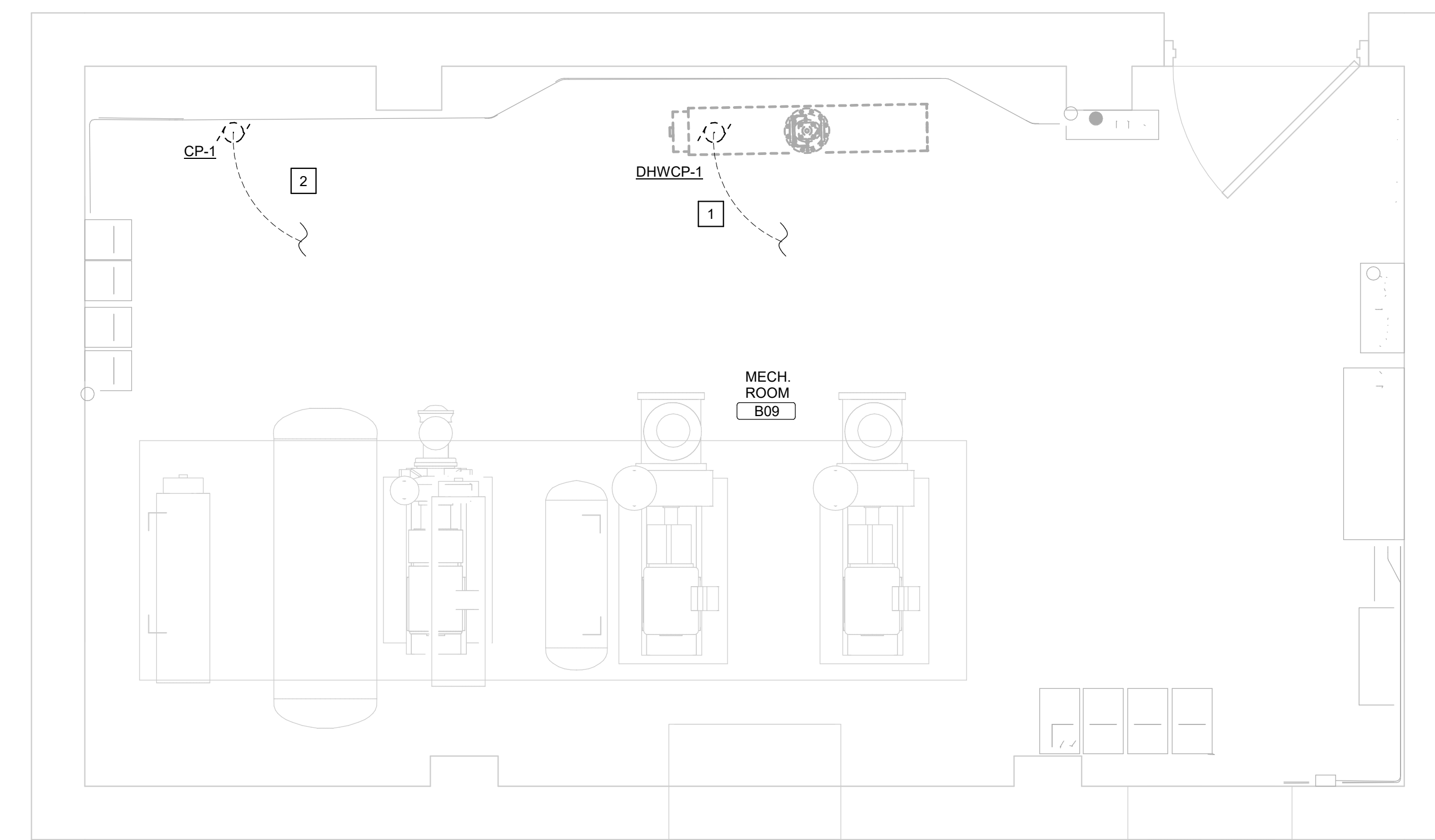
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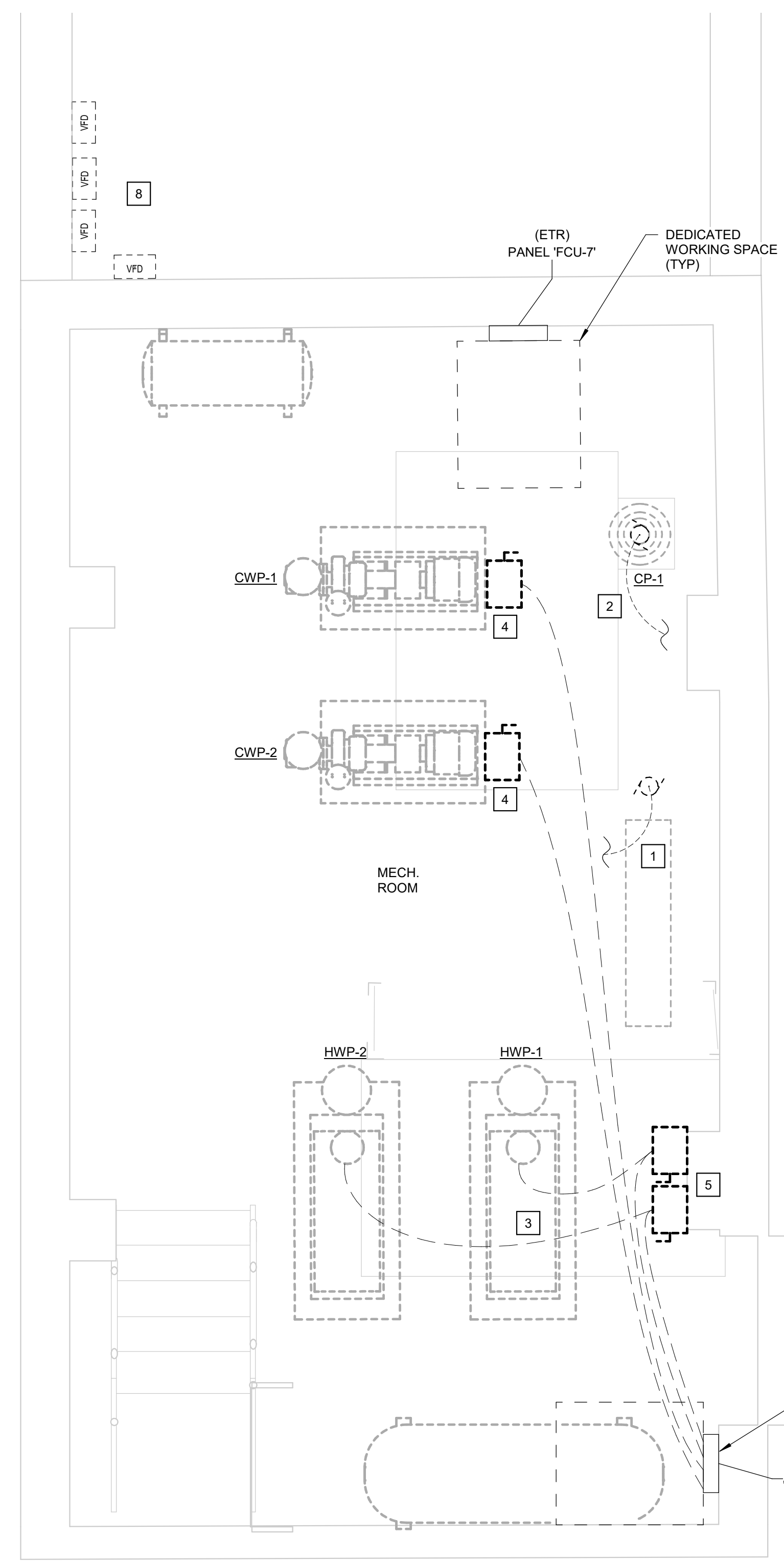
- A. COMPLETELY DEMOLISH CONDUCTORS, CONDUITS, AND J-BOXES BACK TO ELECTRICAL PANEL.
- B. COMPLETELY DEMOLISH ELECTRICAL DEVICES SHOWN ON THIS PLAN.

KEY NOTES:

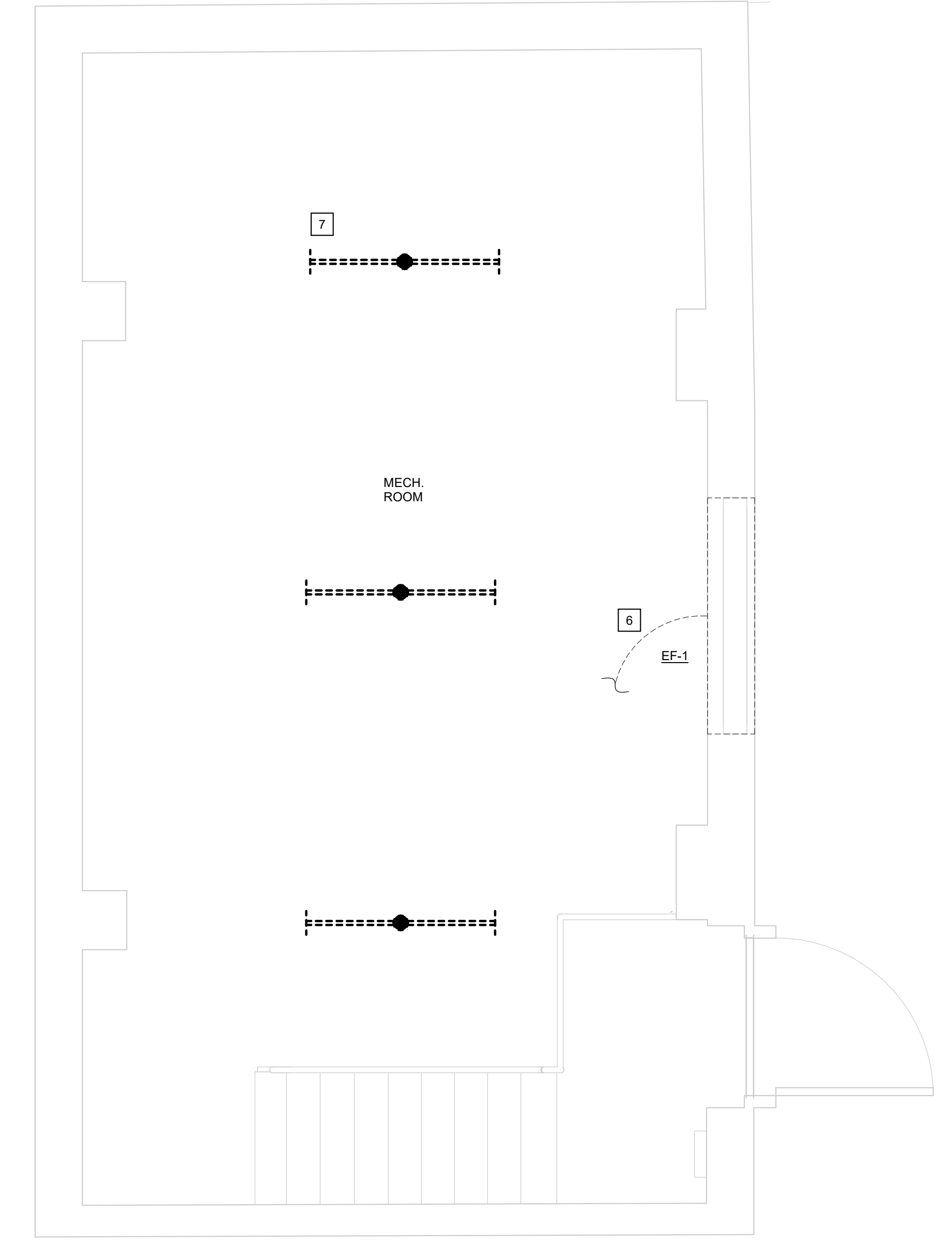
- 1. PUMP TO BE DEMOLISHED. SEE MECHANICAL PLANS. DEMOLISH CIRCUIT (SEE SHEET NOTE A) TO RECIRCULATION PUMP. CIRCUIT SHALL BE REUSED FOR NEW PUMP. SEE NEW WORK PLAN EP102.
- 2. DEMOLISH CIRCUIT (SEE SHEET NOTE A) TO CONDENSATE PUMP. CIRCUIT SHALL BE REUSED FOR NEW PUMP. SEE NEW WORK PLAN EP102.
- 3. DEMOLISH CONDUCTORS BETWEEN VFD AND PUMP COMPLETELY (SEE SHEET NOTE A). DISCONNECT AND REMOVE THE BRANCH CIRCUIT CONDUCTORS, CONDUIT AND VFD'S FROM PANEL 'MEP-7A' TO CHILL WATER PUMPS CWP-1 AND CWP-2.
- 4. DISCONNECT AND REMOVE THE BRANCH CIRCUIT CONDUCTORS, CONDUIT AND VFD'S FROM PANEL 'MEP-7A' TO HOT WATER RECIRCULATION PUMPS HWP-1 AND HWP-2.
- 5. DEMOLISH CIRCUIT (SEE SHEET NOTE A) TO VENTILATION FAN. CIRCUIT SHALL BE REUSED FOR NEW FAN. SEE NEW WORK PLAN EP102.
- 6. DEMOLISH LIGHTS AND CIRCUIT. CIRCUIT SHALL BE REUSED. SEE NEW WORK PLAN EP102. (TYP)
- 7. DEMOLISH FOUR CWP AND HWP VFD'S AND CONDUCTORS COMPLETELY (SEE SHEET NOTE A).



1 BUILDING 6 ELECTRICAL DEMOLITION PLAN
Scale: 1/2" = 1'-0"

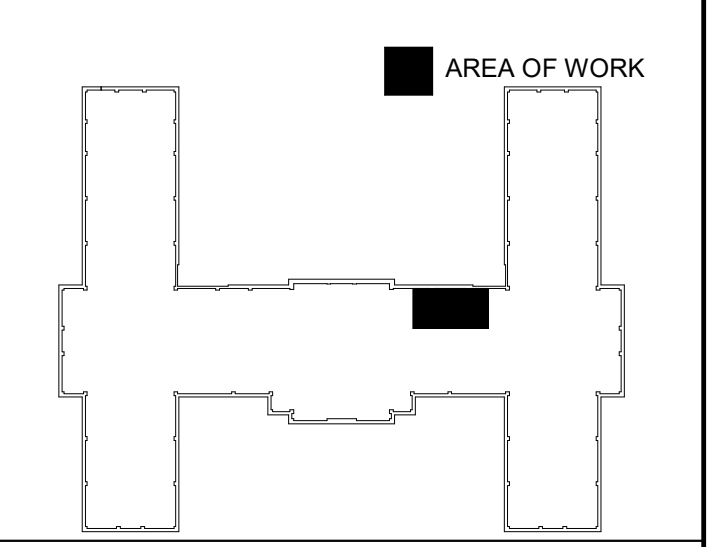


3 BUILDING 7 LOWER LEVEL ELECTRICAL DEMOLITION PLAN
Scale: 1/2" = 1'-0"

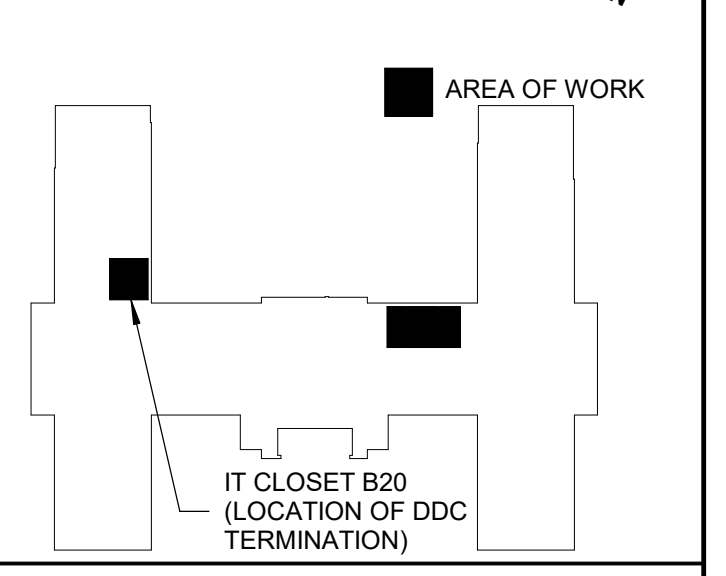


2 BUILDING 7 UPPER LEVEL ELECTRICAL DEMOLITION PLAN
Scale: 1/2" = 1'-0"

BUILDING 6 KEY PLAN
SCALE: NO SCALE



BUILDING 7 KEY PLAN
SCALE: NO SCALE



**FULLY SPRINKLERED
100% CONSTRUCTION DOCUMENTS**

CONSULTANTS:

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Office of Construction and Facilities Management

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Drawing Title:
BUILDINGS 6 & 7 ELECTRICAL DEMOLITION PLAN

Location:
1400 BLACKHORSE HILL RD
COATESVILLE, PA 19320

Project Title:
RENOVATE MECHANICAL ROOMS & EQUIPMENT PHASE 1

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Building Number: # 6, 7

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SHEET NOTES:

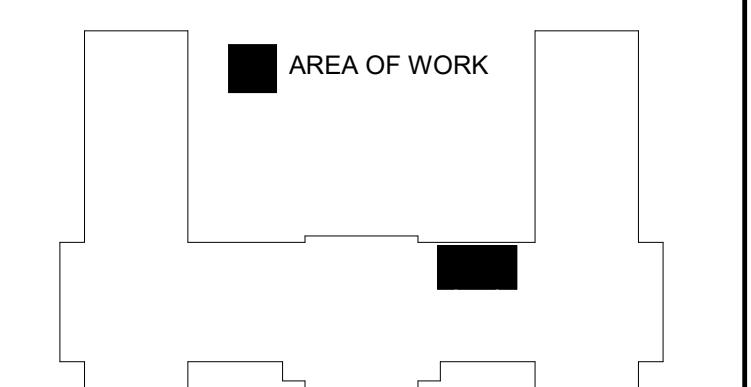
- A. COMPLETELY DEMOLISH CONDUCTORS, CONDUITS, AND J-BOXES BACK TO ELECTRICAL PANEL.
- B. COMPLETELY DEMOLISH ELECTRICAL DEVICES SHOWN ON THIS PLAN.

KEY NOTES:

- 1 PUMP TO BE DEMOLISHED. SEE MECHANICAL PLANS. DEMOLISH CIRCUIT (SEE SHEET NOTE A) TO CONDENSATE PUMP. CIRCUIT SHALL BE REUSED FOR NEW PUMP. SEE NEW WORK PLAN EP103.
- 2 IF PANEL 'MCP-9A' HAS NOT BEEN REPLACED IN A PREVIOUS PROJECT, DEMOLISH PANEL. PROTECT EXISTING FEEDER AND BRANCH CIRCUIT WIRING FOR RECONNECTION TO NEW EQUIPMENT.
- 3 DISCONNECT AND REMOVE THE BRANCH CIRCUIT CONDUCTORS, CONDUIT AND VFD'S FROM PANEL 'MEP-9A' TO CHILL WATER PUMPS CWP-1 AND CWP-2.
- 4 DISCONNECT AND REMOVE THE BRANCH CIRCUIT CONDUCTORS, CONDUIT AND VFD'S FROM PANEL 'MEP-9A' TO HOT WATER RECIRCULATION PUMPS HWP-1 AND HWP-2.
- 5 DEMOLISH CIRCUIT (SEE SHEET NOTE A) TO RECIRCULATION PUMP. CIRCUIT SHALL BE REUSED FOR NEW PUMP. SEE NEW WORK PLAN EP103.
- 6 DEMOLISH CIRCUIT (SEE SHEET NOTE A) TO VENTILATION FAN. CIRCUIT SHALL BE REUSED FOR NEW FAN. SEE NEW WORK PLAN EP103.
- 7 DEMOLISH LOCAL PUMP MOTOR DISCONNECT.
- 8 DEMOLISH LIGHTS AND CIRCUIT. CIRCUIT SHALL BE REUSED. SEE NEW WORK PLAN EP103. (TYP)

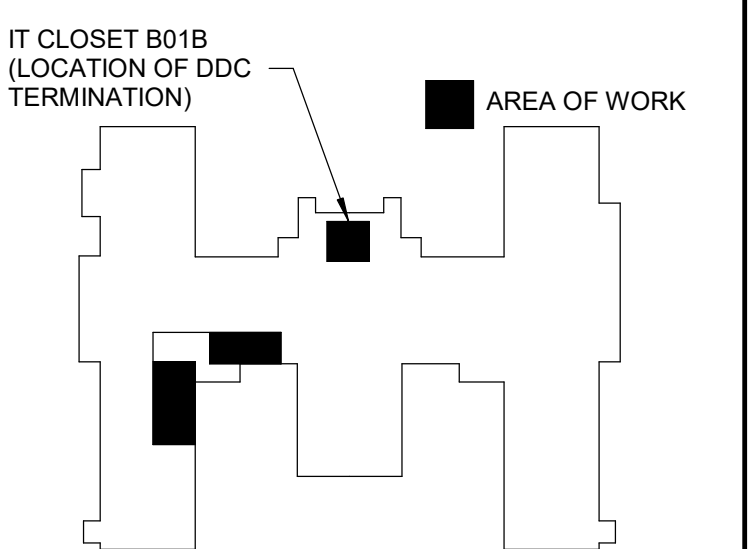
BUILDING 8 KEY PLAN

SCALE: NO SCALE



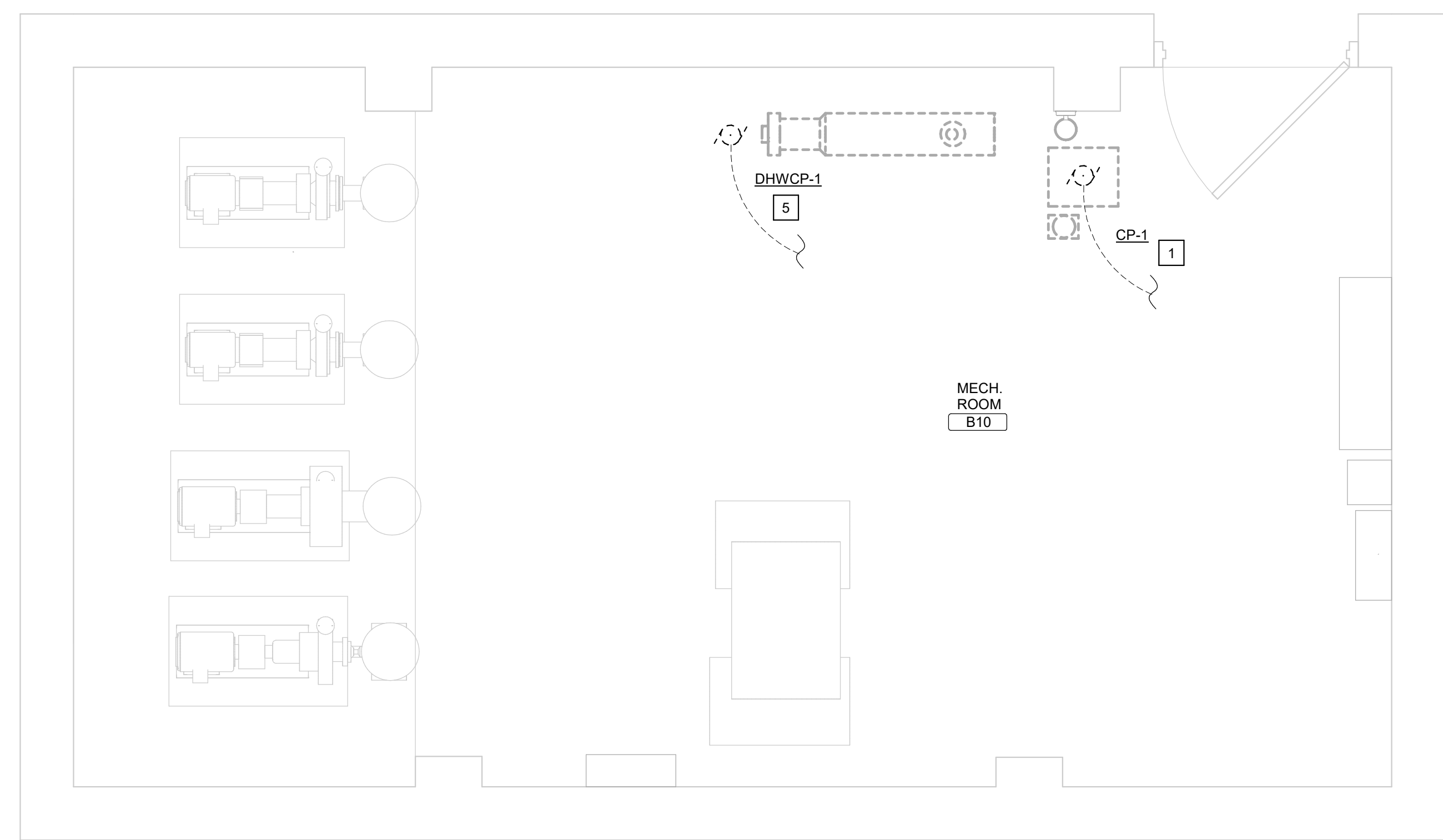
BUILDING 9 KEY PLAN

SCALE: NO SCALE

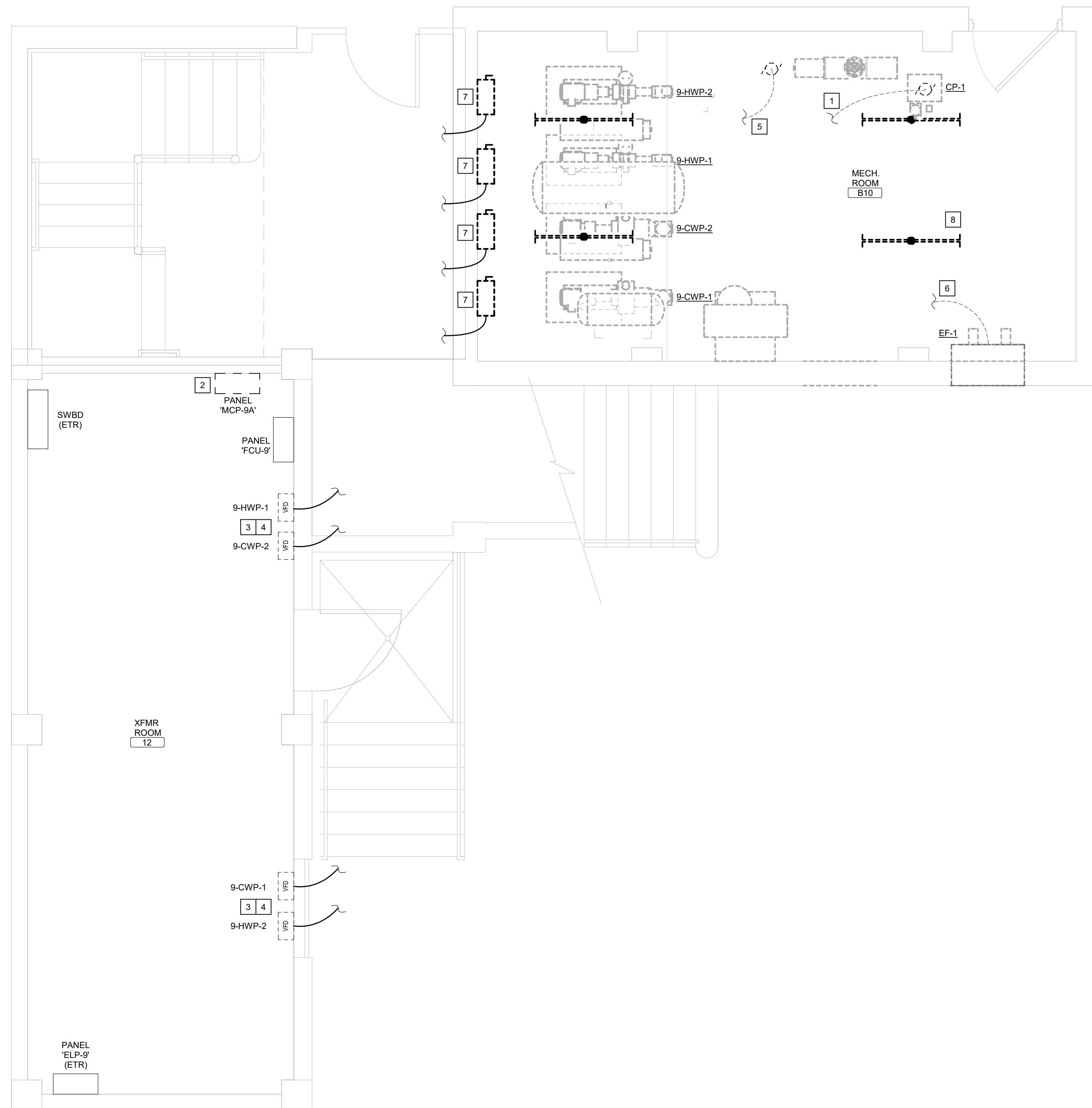
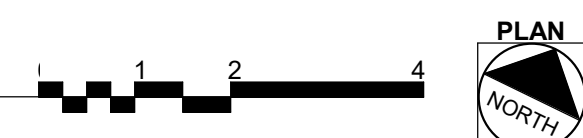


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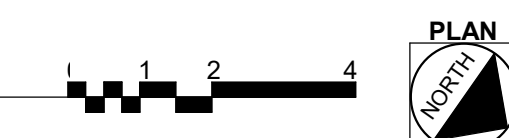
100% CONSTRUCTION DOCUMENTS



2 BUILDING 8 ELECTRICAL DEMOLITION PLAN
Scale: 1/2" = 1'-0"



1 BUILDING 9 ELECTRICAL DEMOLITION PLAN
Scale: 3/8" = 1'-0"



CONSULTANTS:

#	Revisions:	Date

PROJECT MANAGER:

Headquarters:
Apogee Consulting Group, P.A.
1151 Kildaire Farm Road, Suite 120
Cary, North Carolina 27511
www.acg-pa.com 919-858-7420

Office of
Construction
and Facilities
Management



Drawing Title:
**BUILDINGS 8 & 9 ELECTRICAL
DEMOLITION PLAN**

Location
**1400 BLACKHORSE HILL RD
COATESVILLE, PA 19320**

Project Title
**RENOVATE MECHANICAL
ROOMS & EQUIPMENT
PHASE 1**

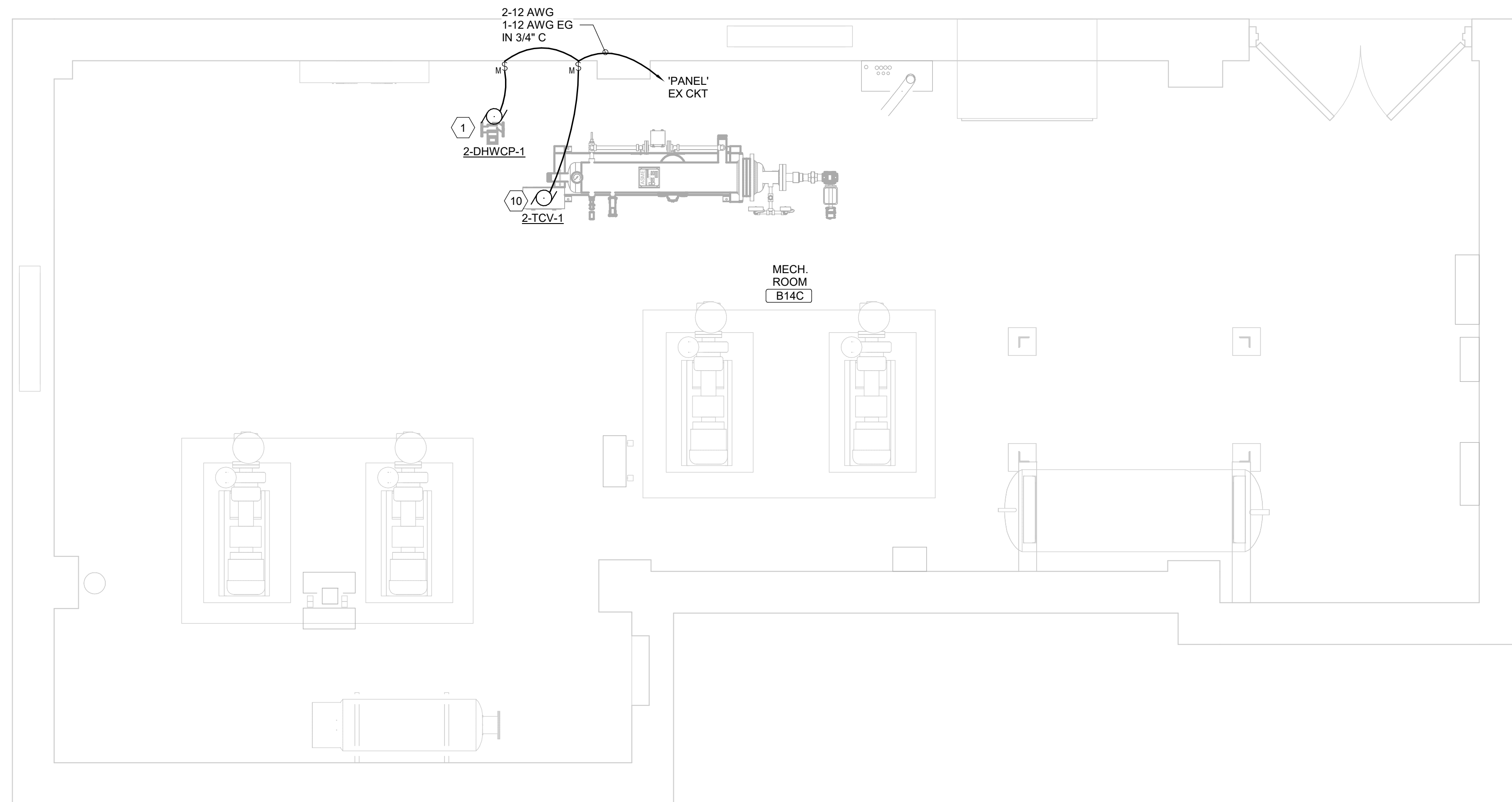
Approved: Project Director

Date: 05/01/2019
Checked: CGS
Drawn: ABT

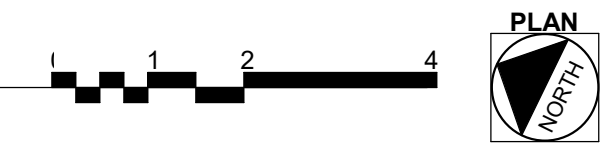
VA PROJECT NUMBER
542-18-105
Building Number
8, 9
Drawing Number
ED103
Dwg 4 of 9

SHEET NOTES:

- A. VFD'S SHOWN ARE SUPPLIED BY MECHANICAL CONTRACTOR, INSTALLED BY ELECTRICAL CONTRACTOR.
- B. ELECTRICAL CONTRACTOR PROVIDED DISCONNECTS SHALL BE INTERLOCKED WITH VFD'S TO PREVENT RUNAWAY.



1 BUILDING 2 ELECTRICAL POWER PLAN
Scale: 1/2" = 1'-0"



KEY NOTES:

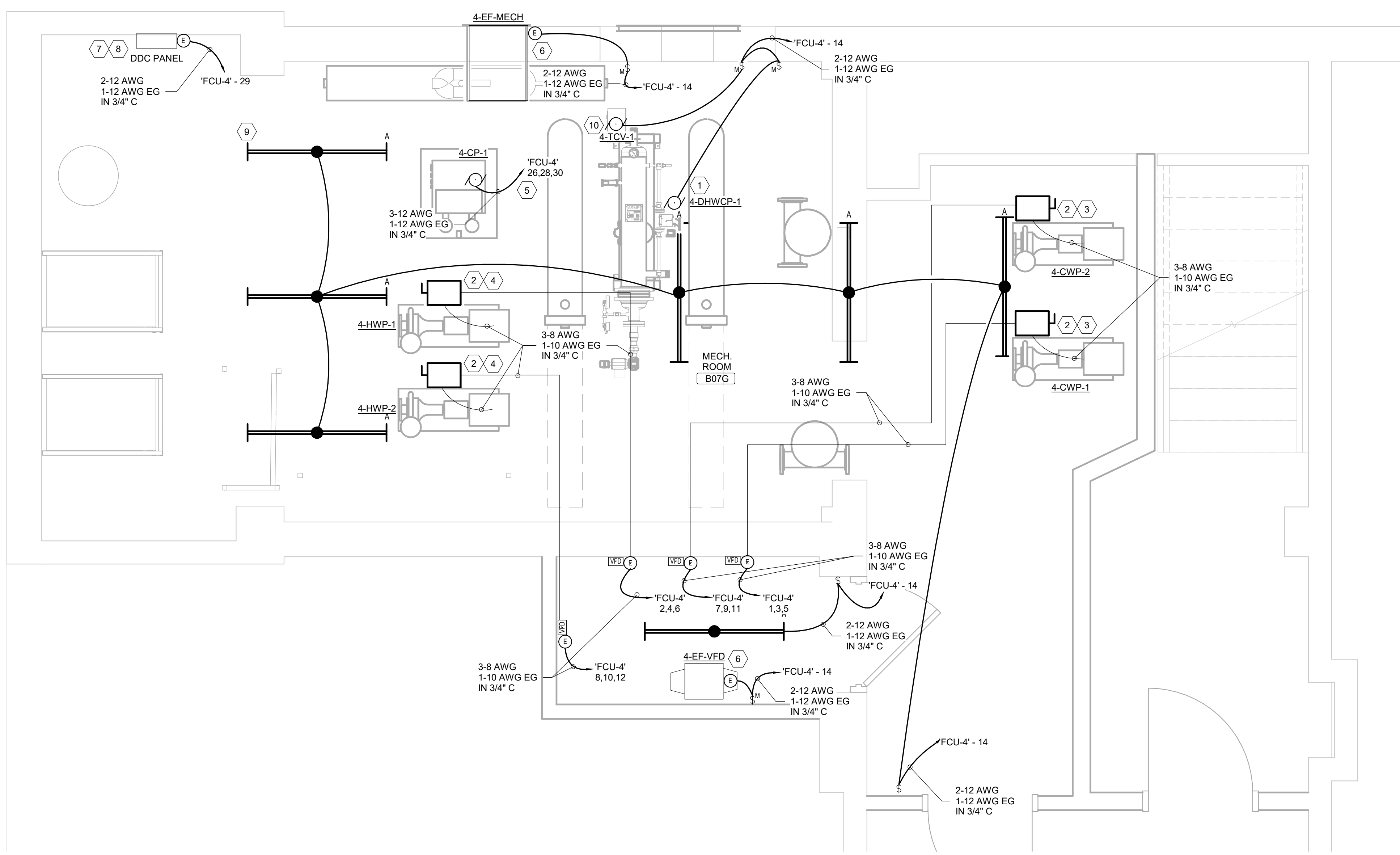
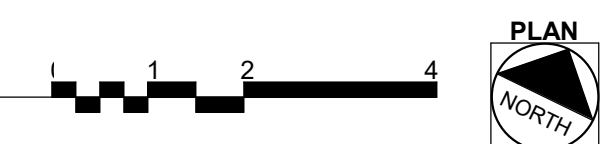
- 1 RECONNECT NEW CIRCULATION PUMP TO EXISTING CIRCUIT.
- 2 INSTALL UNISTRUT SUPPORT STRUCTURE TO MOUNT SAFETY DISCONNECT SWITCH.
- 3 INSTALL NEW BRANCH CIRCUIT FROM VFD'S TO SAFETY DISCONNECT SWITCHES AT CWP-1 AND CWP-2 AND FROM DISCONNECTS TO RELOCATED PANELS.
- 4 INSTALL NEW BRANCH CIRCUIT FROM VFD'S TO SAFETY DISCONNECT SWITCHES AT HWP-1 AND HWP-2 AND FROM DISCONNECTS TO RELOCATED PANELS.
- 5 INSTALL DISCONNECT AND BRANCH CIRCUIT FROM PANEL 'FCU-4'. INSTALL NEW 15A-3P BREAKER FOR DUPLEX CONDENSER PUMP - SEE PANEL SCHEDULE.
- 6 INSTALL NEW 120V/20A BRANCH CIRCUIT FROM PANEL 'FCU-4' TO VENTILATION FAN.
- 7 CONNECT DDC PANEL TO RACK IN IT CLOSET RB. COORDINATE WITH OIT AND DDC CONTRACTOR.
- 8 INSTALL NEW 120V/20A BRANCH CIRCUIT FROM PANEL 'FCU-4' TO NEW DDC PANEL.
- 9 ADJUST LIGHT FIXTURE LOCATION AS CEILING CONDITIONS PERMIT. ENSURE UNIFORM ILLUMINATION THROUGHOUT MECHANICAL ROOM. (TYP)
- 10 WATER HEATER CONTROL PANEL, SINGLE-POINT CONNECTION.

LOAD SERVED	KVA / Phase			DCKT BRKR	DCKT NO	NEUTRAL A B C	DCKT BRKR	DCKT NO	KVA / Phase			LOAD SERVED
	A	B	C						A	B	C	
CHILLED WATER PUMP 4-CWP-1	3.69	---	---	3P-40	1		3	4	3.69	---	---	HOT WATER PUMP 4-HWP-1
CHILLED WATER PUMP 4-CWP-2	3.69	---	---	3P-40	5		7	8	3.69	---	---	HOT WATER PUMP 4-HWP-2
EXISTING CIRCUIT	0.54	---	---	1P-20	13		14	15	1.34	---	---	LIGHTING, 4-EF, 4-DHWCP-1
NEW DDC PANEL	7.92	7.92	7.50	1P-20	29		30	---	0.29	---	---	CONDENSATE PUMP 4-CP-1
SUB TOTAL	16.93	15.59	15.17						9.01	7.67	7.67	TOTAL

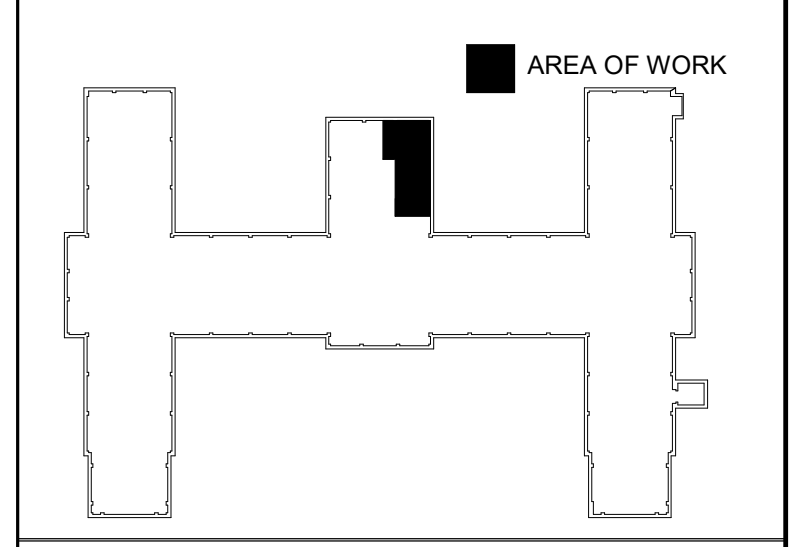
LOAD TYPE	CONNECTED KVA			NEC DEM FACTOR	DEMAND KVA		
	A	B	C		A	B	C
GENERAL LIGHTING	1.34	0.00	0.00	125%	1.68	0.00	0.00
GENERAL USE RECEPT	0.54	0.54	0.12	<=10 KVA@100%	0.54	0.54	0.12
MOTORS AND EQUIPMENT	3.69	3.69	3.69	>10KVA@50%	4.61	4.61	4.61
WATER HEATERS	0.00	0.00	0.00	100%	3.98	3.98	3.98
FIX. ELEC. SPACE HEAT	0.00	0.00	0.00	100%	0.00	0.00	0.00
DEDICATED RECEPT	0.00	0.00	0.00	100%	0.00	0.00	0.00
SIGN	0.00	0.00	0.00	125%	0.00	0.00	0.00
TOTAL KV.	9.55	8.21	7.79		10.81	9.13	8.71
TOTAL DEMAND AMPERES PER PHASE	90	76	73				

LOAD TYPE		CONNECTED KVA			DEMAND KVA		
		A	B	C	A	B	C
PANEL / FEEDER (TOTAL KVA)					28.65		
EXISTING PANEL 'FCU-4'					80		

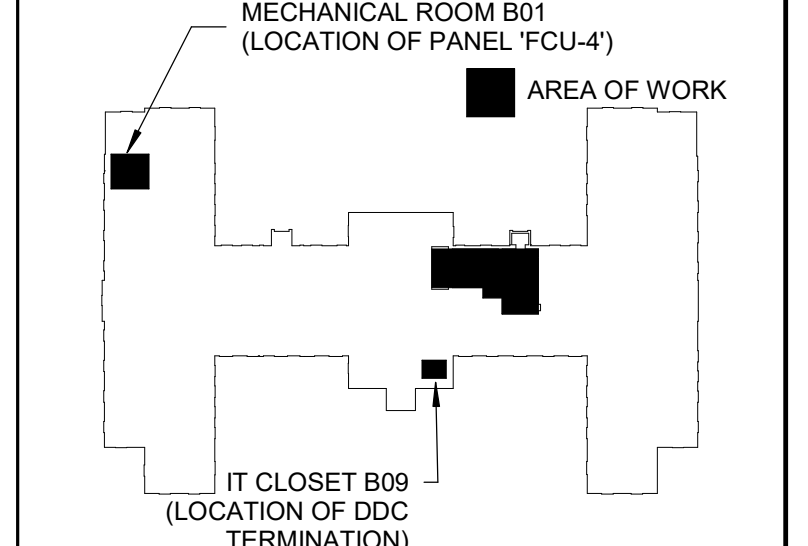
2 BUILDING 4 ELECTRICAL POWER PLAN
Scale: 1/2" = 1'-0"



BUILDING 2 KEY PLAN
SCALE: NO SCALE



BUILDING 4 KEY PLAN
SCALE: NO SCALE



FULLY SPRINKLERED
100% CONSTRUCTION DOCUMENTS

CONSULTANTS:

PROJECT MANAGER: ACG Project Number 17-251
Apogee Consulting Group, P.A.
 Headquarters: 1151 Kildaire Farm Road, Suite 120
 Cary, North Carolina 27511
 www.acg-pa.com 919-858-7420

Office of Construction and Facilities Management
 U.S. Department of Veterans Affairs

Drawing Title: BUILDINGS 2 & 4 POWER PLAN
Location: 1400 BLACKHORSE HILL RD
 COATESVILLE, PA 19320

Project Title: RENOVATE MECHANICAL ROOMS & EQUIPMENT PHASE 1
Approved: Project Director
 Date: 05/01/2019
 Checked: CGS
 Drawn: ABT

VA PROJECT NUMBER: 542-18-105
Building Number: # 2, 4
Drawing Number: EP101
 Dwg 5 of 9

SHEET NOTES:

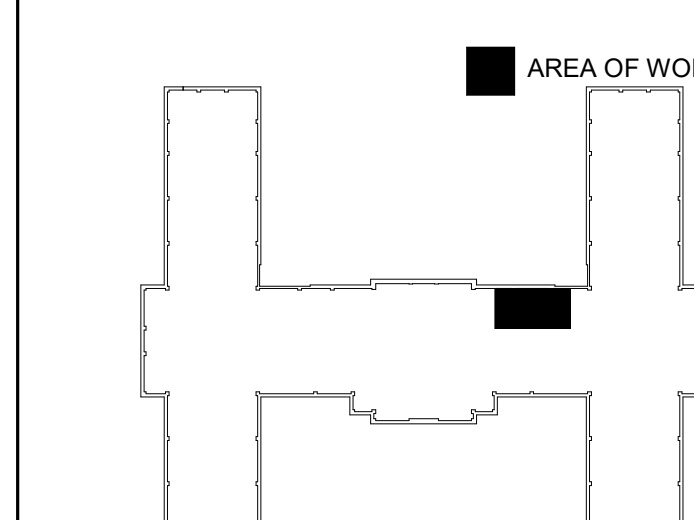
- A. VFD'S SHOWN ARE SUPPLIED BY MECHANICAL CONTRACTOR, INSTALLED BY ELECTRICAL CONTRACTOR.
- B. ELECTRICAL CONTRACTOR PROVIDED DISCONNECTS SHALL BE INTERLOCKED WITH VFD'S TO PREVENT RUNAWAY.

KEY NOTES:

- 1 RECONNECT NEW CIRCULATION PUMP TO EXISTING CIRCUIT.
- 2 CONNECT DDC PANEL TO RACK IN IT CLOSET B20. COORDINATE WITH OIT AND DDC CONTRACTOR.
- 3 INSTALL NEW BRANCH CIRCUIT FROM VFD'S TO SAFETY DISCONNECT SWITCHES AT CWP-1 AND CWP-2 AND FROM DISCONNECTS TO RELOCATED PUMPS.
- 4 INSTALL NEW BRANCH CIRCUIT FROM VFD'S TO SAFETY DISCONNECT SWITCHES AT HWP-1 AND HWP-2 AND FROM DISCONNECTS TO RELOCATED PANELS.
- 5 INSTALL BRANCH CIRCUIT FROM PANEL 'MEP-7A' TO SAFETY DISCONNECT SWITCHES AT HWP-1 AND HWP-2 AND FROM DISCONNECTS TO RELOCATED PANELS.
- 6 INSTALL NEW 120V/20A BRANCH CIRCUIT FROM PANEL 'MEP-7A' TO VENTILATION FAN.
- 7 INSTALL NEW 120V/20A BRANCH CIRCUIT FROM PANEL 'MEP-7A' TO CIRCULATION PUMP.
- 8 INSTALL NEW 120V/20A BRANCH CIRCUIT FROM PANEL 'MEP-7A' TO NEW DDC PANEL.
- 9 ADJUST LIGHT FIXTURE LOCATIONS BELOW MEZZANINE AS CEILING CONDITIONS PERMIT. ENSURE UNIFORM ILLUMINATION THROUGHOUT MECHANICAL ROOM.
- 10 ADJUST LIGHT FIXTURE LOCATIONS ABOVE MEZZANINE AS CEILING CONDITIONS PERMIT. ENSURE UNIFORM ILLUMINATION THROUGHOUT MECHANICAL ROOM.
- 11 WATER HEATER CONTROL PANEL, SINGLE-POINT CONNECTION.
- 12 INSTALL UNISTRUT SUPPORT STRUCTURE TO MOUNT SAFETY DISCONNECT SWITCH. MOUNT DISCONNECTS STACKED VERTICALLY ON STRUCTURAL BEAM WITH SAFETY DISCONNECT HANDLES NOT TO EXCEED 6'-7" AFF.

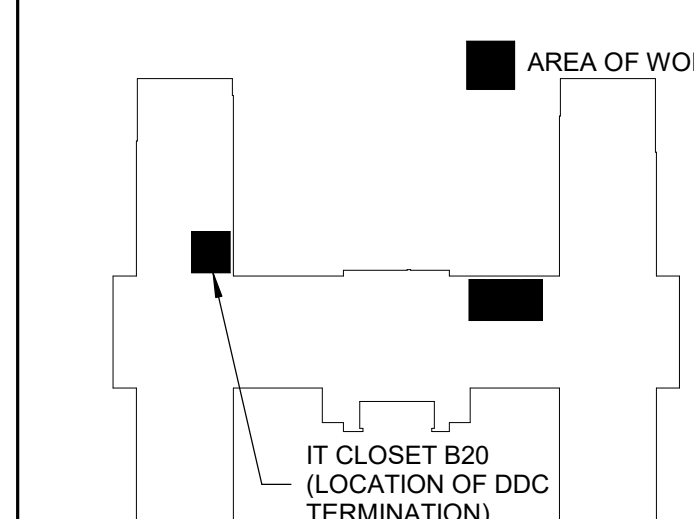
BUILDING 6 KEY PLAN

SCALE: NO SCALE



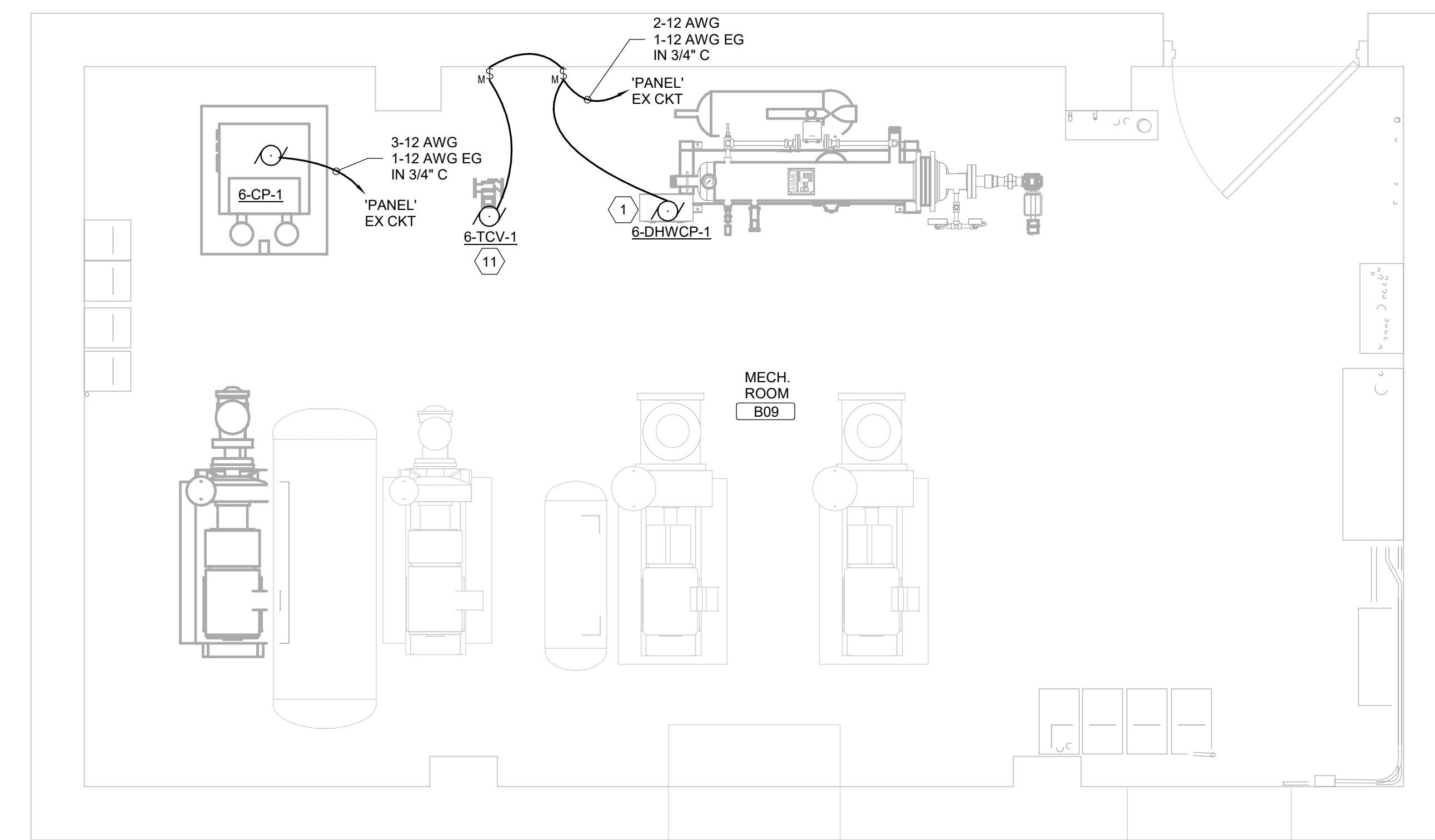
BUILDING 7 KEY PLAN

SCALE: NO SCALE

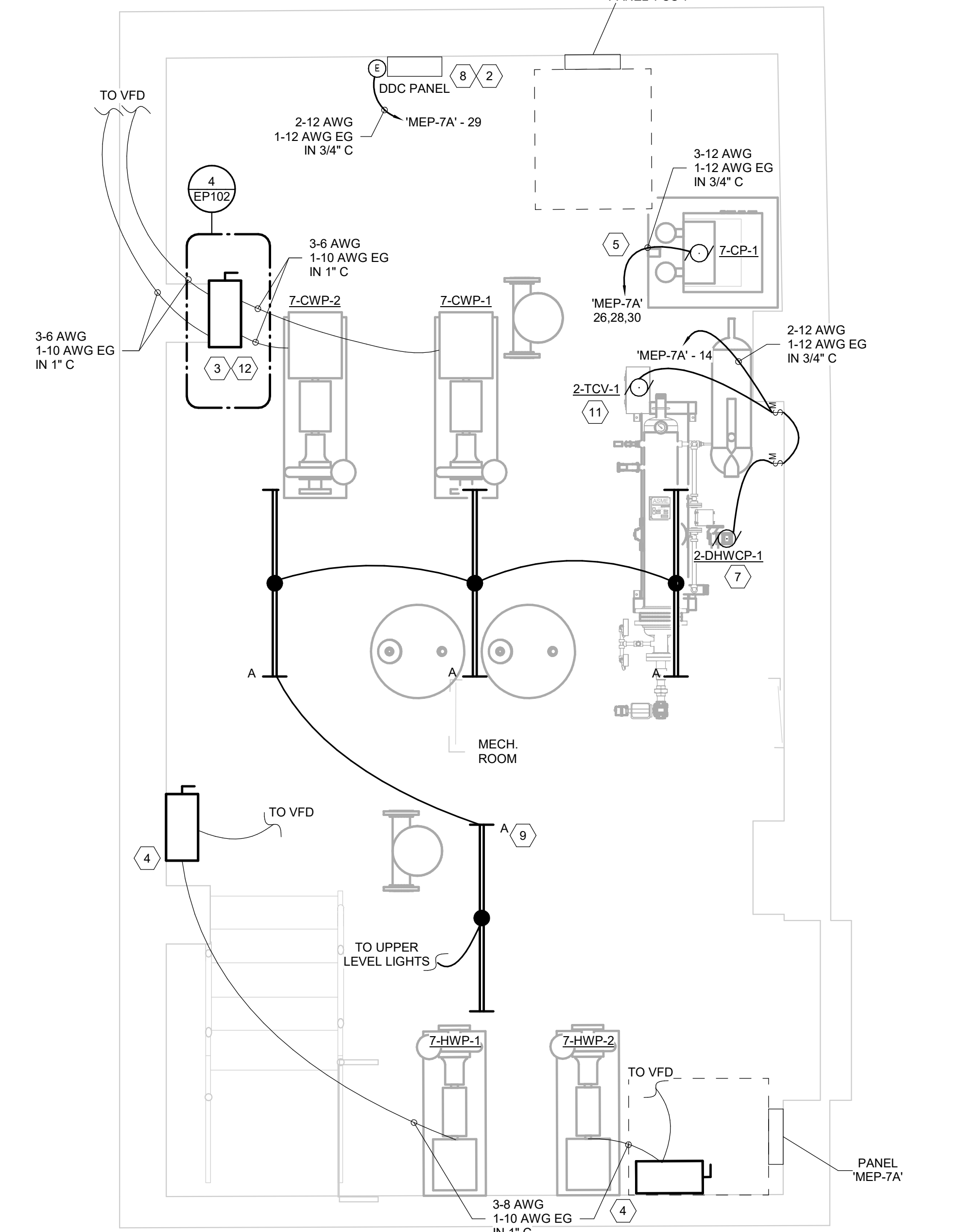


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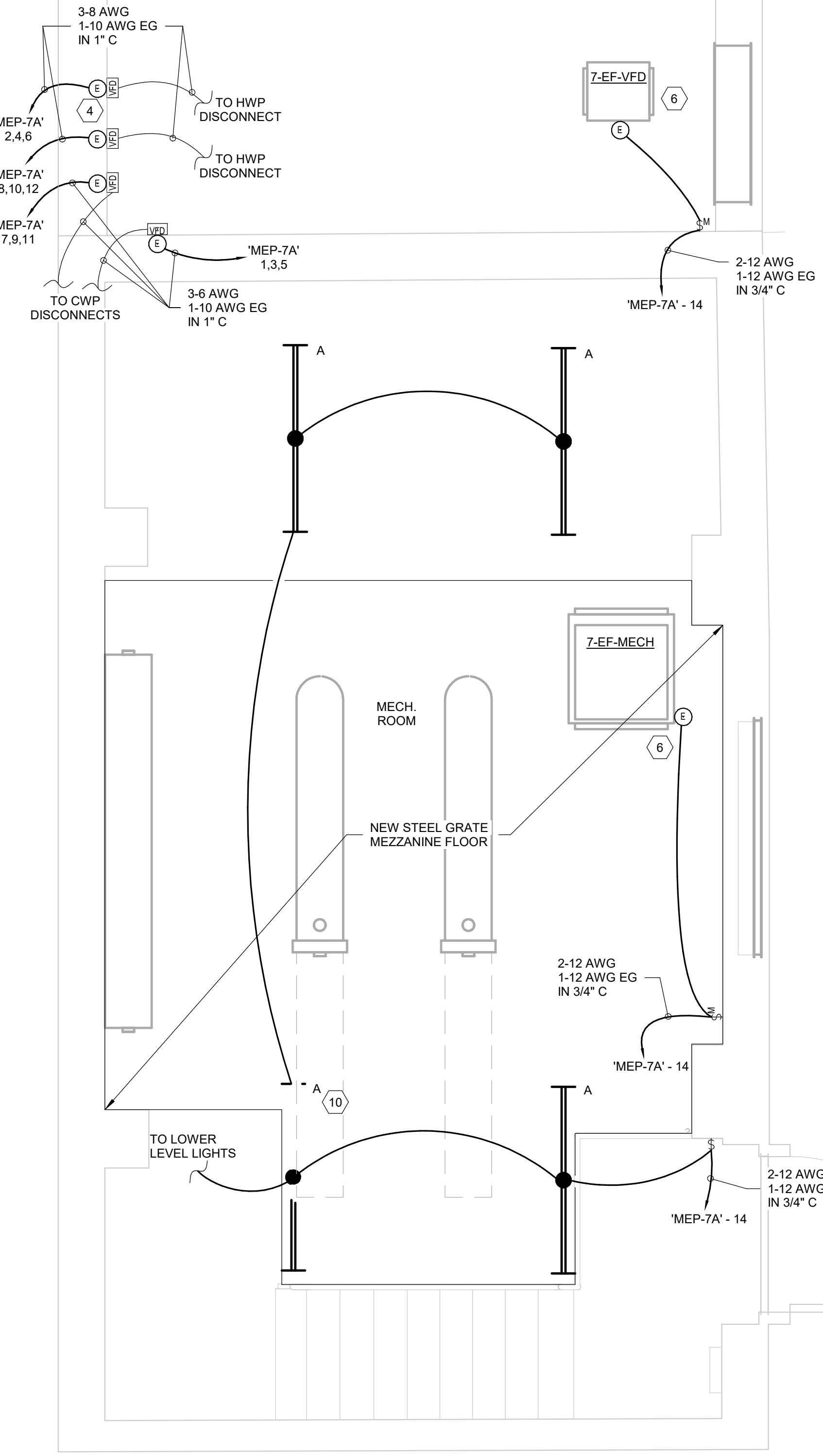
100% CONSTRUCTION DOCUMENTS



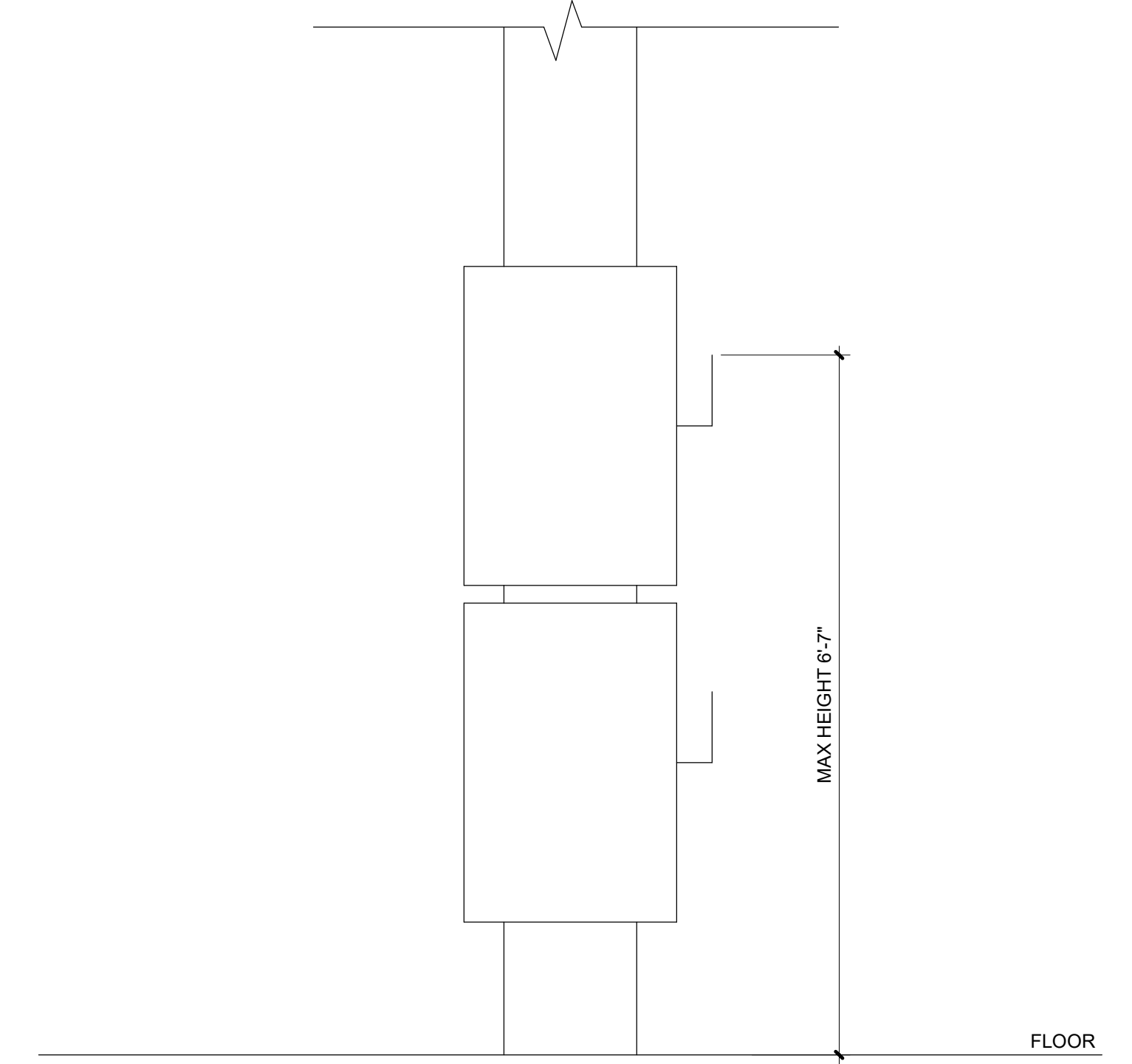
1 BUILDING 6 ELECTRICAL POWER PLAN
Scale: 1/2" = 1'-0"



2 BUILDING 7 LOWER LEVEL ELECTRICAL POWER PLAN
Scale: 1/2" = 1'-0"



3 BUILDING 7 UPPER LEVEL ELECTRICAL POWER PLAN
Scale: 1/2" = 1'-0"



4 BUILDING 7 COLD WATER PUMP DISCONNECT ELEVATION
Scale: No Scale

LOAD SERVED	KVA / Phase			CKT BRKR	NEUTRAL A B C	CKT NO	CKT BRKR	KVA / Phase			LOAD SERVED
	A	B	C					A	B	C	
CHILLED WATER PUMP 7-CWP-1	5.54	---	---	3P-60	1	2	3P-40	3.69	---	---	HOT WATER PUMP 7-HWP-1
CHILLED WATER PUMP 7-CWP-2	5.54	---	---	3P-60	3	4	3P-40	3.69	---	---	HOT WATER PUMP 7-HWP-2
EXISTING CIRCUIT	0.54	---	---	1P-20	5	6	---	---	---	---	LIGHTING, 7-EF, 7-DHWCP-1
EXISTING CIRCUIT	0.54	---	---	1P-20	7	8	---	---	---	---	SPARE
SPARE	0.00	---	---	1P-20	9	10	---	---	---	---	SPARE
SPARE	0.00	---	---	1P-20	11	12	---	---	---	---	SPARE
SPARE	0.00	---	---	1P-20	13	14	---	---	---	---	SPARE
SPARE	0.00	---	---	1P-20	15	16	---	---	---	---	SPARE
SPARE	0.00	---	---	1P-20	17	18	---	---	---	---	SPARE
SPARE	0.00	---	---	1P-20	19	20	---	---	---	---	SPARE
SPARE	0.00	---	---	1P-20	21	22	---	---	---	---	SPARE
SPARE	0.00	---	---	1P-20	23	24	---	---	---	---	SPARE
SPARE	0.00	---	---	1P-20	25	26	---	---	---	---	SPARE
SPARE	0.00	---	---	1P-20	27	28	3P-15	0.29	---	---	CONDENSATE PUMP 7-CP-1
NEW DDC PANEL	---	---	---	1P-20	29	30	---	---	---	---	CONDENSATE PUMP 7-CP-1
SUB TOTAL	11.62	11.62	11.20	---	---	---	---	9.01	7.67	7.67	SUB TOTAL
TOTAL											
CONNECTED KVA											
NEC DEM FACTOR											
DEMAND KVA											
LOAD TYPE											
GENERAL LIGHTING											
GENERAL USE											
RECEIPT											
MOTORS AND EQUIPMENT											
WATER HEATERS											
FIX. ELEC. SPACE HEAT											
DEDICATED RECEIPT											
SIGN											
TOTAL KVA											
TOTAL DEMAND AMPERES PER PHASE											
PANEL / FEEDER (TOTAL KVA)											
35.59											

CONSULTANTS:		
#	Revisions:	Date

PROJECT MANAGER:
ACG Project Number 17-251
Headquarters:
APOGEE Engineers | Architects
1151 Kildaire Farm Road, Suite 120
Cary, North Carolina 27511
www.acg-pa.com 919-858-7420

Office of Construction and Facilities Management
U.S. Department of Veterans Affairs

Drawing Title: **BUILDINGS 6 & 7 POWER PLAN**
Location: **1400 BLACKHORSE HILL RD COATESVILLE, PA 19320**

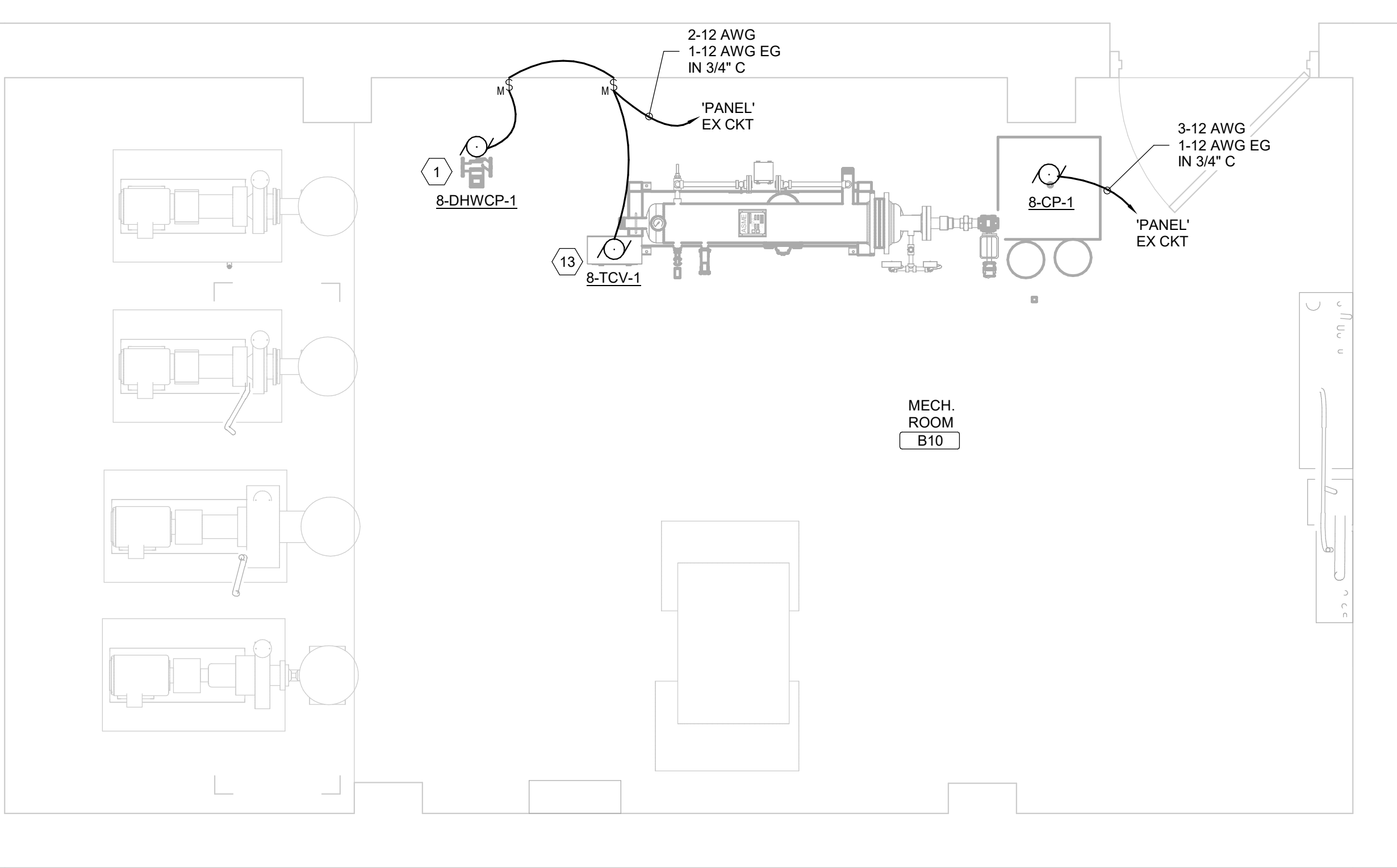
Project Title: **RENOVATE MECHANICAL ROOMS & EQUIPMENT PHASE 1**
Approved: Project Director
Date: 05/01/2019
Checked: CGS
Drawn: ABT
Drawing Number: **EP102**
Dwg 6 of 9

SHEET NOTES:

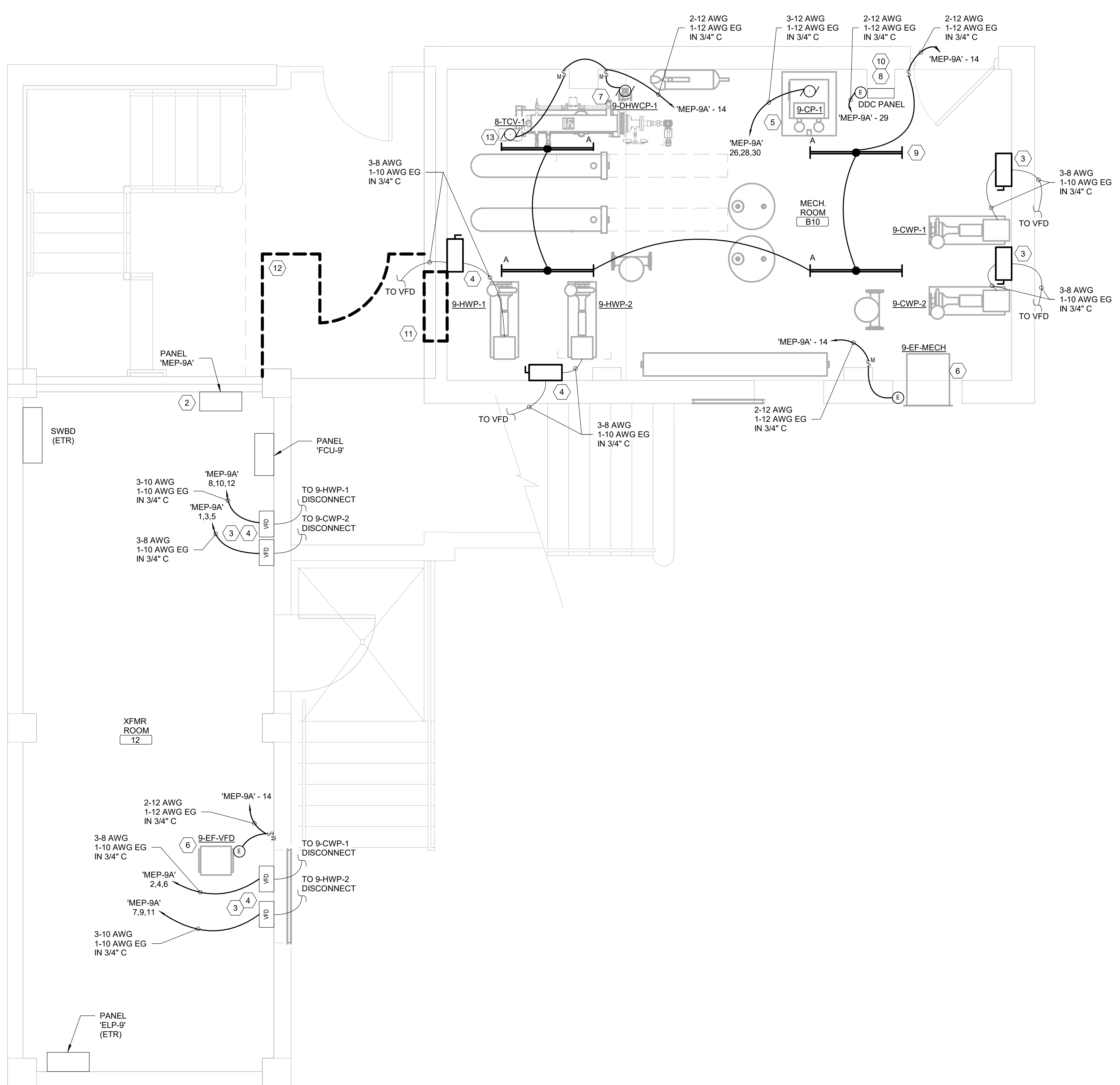
- A. VFD'S SHOWN ARE SUPPLIED BY MECHANICAL CONTRACTOR, INSTALLED BY ELECTRICAL CONTRACTOR.
- B. ELECTRICAL CONTRACTOR PROVIDED DISCONNECTS SHALL BE INTERLOCKED WITH VFD'S TO PREVENT RUNAWAY.

LOAD SERVED	KVA / Phase			CKT BRKR	NEUTRAL A B C	CKT NO	CKT BRKR	KVA / Phase			LOAD SERVED
	A	B	C					A	B	C	
CHILLED WATER PUMP 9-CWP-2	3.69	---	---	3P-40	1	2	3	3.69	---	---	CHILLED WATER PUMP 9-CWP-1
HOT WATER PUMP 9-HWP-2	2.90	---	---	3P-30	4	5	6	2.90	---	---	HOT WATER PUMP 9-HWP-1
RECEPT - ROOM B10	0.54	---	---	1P-15	13	14	15	1.34	---	---	LIGHTING, 9-EF, 9-DHWCP-1
LCTP PANEL	---	0.54	---	1P-20	16	17	18	0.00	---	---	SPACE
SPACE	---	---	0.00	1P-20	19	20	21	0.00	---	---	SPACE
SPACE	0.00	---	---	1P-20	22	23	24	0.00	---	---	SPACE
SPACE	---	---	0.00	1P-20	25	26	27	0.29	---	---	CONDENSATE PUMP 9-CP-1
SPACE	---	0.00	---	1P-20	28	29	30	0.29	---	---	CONDENSATE PUMP 9-CP-1
NEW DDC PANEL	---	---	0.12	1P-20	29	30	31	0.29	---	---	CONDENSATE PUMP 9-CP-1
SUB TOTAL	7.13	7.13	6.71					8.22	6.88	6.88	SUB TOTAL
								15.35	14.01	13.59	TOTAL

C/B TEMP, 75 C	RATING	CONNECTED KVA			NEC DEM FACTOR	DEMAND KVA		
		A	B	C		A	B	C
MOUNTING SURFACE		1.34	0.00	0.00	125%	1.68	0.00	0.00
ISOLATED GROUND BUS	YES	0.54	0.54	0.12	<=10 KVA @ 100%	0.54	0.54	0.12
MAIN CIRCUIT BREAKER	YES	3.69	3.69	3.69	>10 KVA @ 50%	0.00	0.00	0.00
SERVICE ENTR. RATED	YES	3.19	3.19	3.19	100%	3.19	3.19	3.19
MINIMUM AIC (K AMPS)	22,000	0.00	0.00	0.00	125%	0.00	0.00	0.00
MOB RATING MLO		0.00	0.00	0.00	100%	0.00	0.00	0.00
BUS RATINGS 225A		0.00	0.00	0.00	125%	0.00	0.00	0.00
NEUTRAL RATINGS 100%		0.00	0.00	0.00	100%	0.00	0.00	0.00
NOTE: ALL MOTOR CIRCUIT BREAKERS SHALL BE HACR RATED.		0.00	0.00	0.00	125%	0.00	0.00	0.00
		8.76	7.42	7.00		10.02	8.34	7.92
						83	70	66
		PANEL / FEEDER (TOTAL KVA)				26.28		



2 BUILDING 8 ELECTRICAL POWER PLAN
Scale: 1/2" = 1'-0"

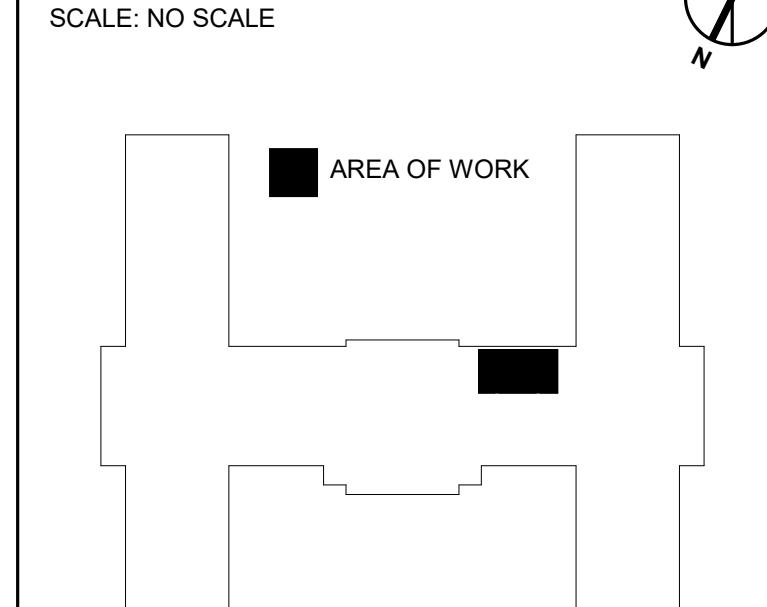


1 BUILDING 9 ELECTRICAL POWER PLAN
Scale: 3/8" = 1'-0"

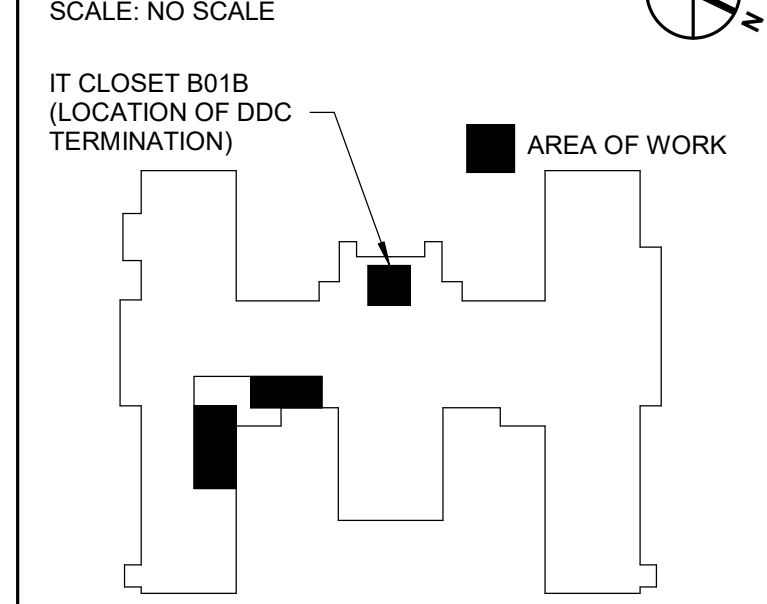
KEY NOTES:

- 1 RECONNECT NEW CIRCULATION PUMP TO EXISTING CIRCUIT.
- 2 IF PANEL 'MEP-9A' HAS BEEN INSTALLED IN PREVIOUS PROJECT, PROVIDE VA WITH FULL CREDIT. OTHERWISE, INSTALL NEW PANEL 'MEP-9A' AS SHOWN.
- 3 INSTALL NEW BRANCH CIRCUIT FROM VFD'S TO SAFETY DISCONNECT SWITCHES AT CWP-1 AND CWP-2 AND FROM DISCONNECTS TO RELOCATED PUMPS.
- 4 INSTALL NEW BRANCH CIRCUIT FROM VFD'S TO SAFETY DISCONNECT SWITCHES AT HWP-1 AND HWP-2 AND FROM DISCONNECTS TO RELOCATED PANELS.
- 5 INSTALL BRANCH CIRCUIT FROM PANEL 'MEP-9A' TO NEW DDC PANEL.
- 6 INSTALL NEW 120V/20A BRANCH CIRCUIT FROM PANEL 'MEP-9A' TO VENTILATION FAN.
- 7 INSTALL NEW 120V/20A BRANCH CIRCUIT FROM PANEL 'MEP-9A' TO CIRCULATION PUMP.
- 8 INSTALL NEW 120V/20A BRANCH CIRCUIT FROM PANEL 'MEP-9A' TO NEW DDC PANEL.
- 9 ADJUST LIGHT FIXTURE LOCATION AS CEILING CONDITIONS PERMIT. ENSURE UNIFORM ILLUMINATION THROUGHOUT MECHANICAL ROOM.
- 10 CONNECT DDC PANEL TO RACK IN IT CLOSET B01B. COORDINATE WITH OIT AND DDC CONTRACTOR.
- 11 TEMPORARY CONSTRUCTION ENTRANCE SHALL BE USED BY CONTRACTORS TO ACCESS AREA OF WORK.
- 12 TEMPORARY RATED WALL TO ENCLOSE OPENING IN MECHANICAL ROOM WALL FOR CONSTRUCTION ENTRANCE.
- 13 WATER HEATER CONTROL PANEL, SINGLE-POINT CONNECTION.

BUILDING 8 KEY PLAN



BUILDING 9 KEY PLAN



FULLY SPRINKLERED
100% CONSTRUCTION DOCUMENTS

CONSULTANTS:

PROJECT MANAGER: ACG Project Number 17-251
Apogee Consulting Group, P.A.
 Headquarters:
 1151 Kildaire Farm Road, Suite 120
 Cary, North Carolina 27511
 www.acg-pa.com 919-858-7420

Office of Construction and Facilities Management
 U.S. Department of Veterans Affairs

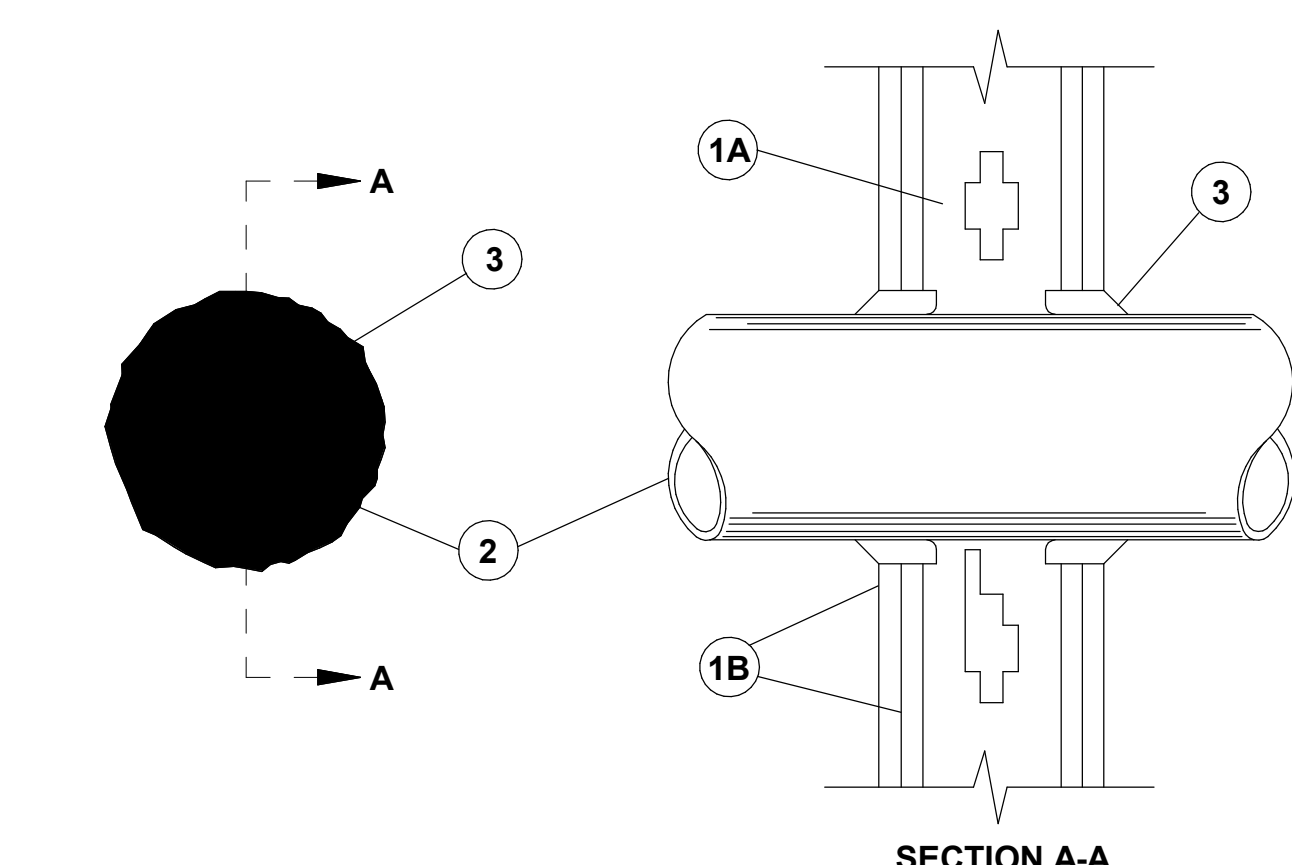
Drawing Title: **BUILDINGS 8 & 9 POWER PLAN**
 Location: **1400 BLACKHORSE HILL RD COATESVILLE, PA 19320**

Project Title: **RENOVATE MECHANICAL ROOMS & EQUIPMENT PHASE 1**
 Approved: Project Director
 Date: 05/01/2019
 Checked: CGS
 Drawn: ABT

VA PROJECT NUMBER: 542-18-105
 Building Number: # 8, 9
 Drawing Number: **EP103**
 Dwg 7 of 9

#	Revisions:	Date

SYSTEM NO. W-L-1001
 JUNE 15, 2005
 F RATINGS - 1, 2, 3 AND 4 HR (SEE ITEMS 2 AND 3)
 T RATINGS - 0, 1, 2, 3, AND 4 HR (SEE ITEM 3)
 L RATING AT AMBIENT - LESS THAN 1 CFM/SQ. FT
 L RATING AT 400 F - LESS THAN 1 CFM/SQ. FT



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

A. STUDS - WALL FRAMING MAY CONSIST OF EITHER WOOD STUDS (MAX 2 HR FIRE RATED ASSEMBLES) OR STEEL CHANNEL STUDS. WOOD STUDS TO CONSIST OF NOM 2 BY 4 IN. (51 BY 102 MM) LUMBER SPACED 16 IN. (408 MM) OC WITH NOM 2 BY 4 IN. (51 BY 102 MM) LUMBER END PLATES AND CROSS BRACES. STEEL STUDS TO BE MIN 3-5/8 IN. (92 MM) WIDE BY 1-3/8 IN. (35 MM) DEEP CHANNELS SPACED MAX 24 IN. (610 MM) OC.

B. GYPSUM BOARD - NOM 1/2 OR 5/8 IN. (13 OR 16 MM) THICK, 4 FT. (122 CM) WIDE WITH SQUARE OR TAPERED EDGES. THE GYPSUM WALLBOARD TYPE, THICKNESS, NUMBER OF LAYERS, FASTENER TYPE AND SHEET ORIENTATION SHALL BE AS SPECIFIED IN THE INDIVIDUAL U300 OR U400 SERIES DESIGN IN THE UL FIRE RESISTANCE DIRECTORY. MAX DIAM OF OPENING IS 26 IN. (660 MM).

2. THROUGH PENETRANT - ONE METALLIC PIPE, CONDUIT OR TUBING INSTALLED EITHER CONCENTRICALLY OR ECCENTRICALLY WITHIN THE FIRESTOP SYSTEM. THE ANNULAR SPACE BETWEEN PIPE, CONDUIT OR TUBING AND PERIPHERY OF OPENING SHALL BE MIN OF 0 IN. (0 MM) (POINT CONTACT) TO MAX 2 IN. (51 MM) PIPE, CONDUIT OR TUBING TO BE RIGIDLY SUPPORTED ON BOTH SIDES OF WALL ASSEMBLY. THE FOLLOWING TYPES AND SIZES OF METALLIC PIPES, CONDUITS OR TUBING MAY BE USED:

A. STEEL PIPE - NOM 24 IN. (610 MM) DIAM (OR SMALLER) SCHEDULE 10 (OR HEAVIER) STEEL PIPE.
B. IRON PIPE - NOM 24 IN. (610 MM) DIAM (OR SMALLER) SERVICE WEIGHT (OR HEAVIER) CAST IRON SOIL PIPE, NOM 12 IN. (305 MM) DIAM (OR SMALLER) OR CLASS 50 (OR HEAVIER) DUCTILE IRON PRESSURE PIPE.
C. CONDUIT - NOM 6 IN. (152 MM) DIAM (OR SMALLER) STEEL CONDUIT OR NOM 4 IN. (102 MM) DIAM (OR SMALLER) STEEL ELECTRICAL METALLIC TUBING.
D. COPPER TUBING - NOM 6 IN. (152 MM) DIAM (OR SMALLER) TYPE L (OR HEAVIER) COPPER TUBING.
E. COPPER PIPE - NOM 6 IN. (152 MM) DIAM (OR SMALLER) REGULAR (OR HEAVIER) COPPER PIPE.
F. THROUGH PENETRATING PRODUCT - FLEXIBLE METAL PIPING - THE FOLLOWING TYPES OF STEEL FLEXIBLE METAL GAS PIPING MAY BE USED:

1. NOM 2 IN. (51 MM) DIAM (OR SMALLER) STEEL FLEXIBLE METAL GAS PIPING. PLASTIC COVERING ON PIPING MAY OR MAY NOT BE REMOVED ON BOTH SIDES OF FLOOR OR WALL ASSEMBLY.
OMEGA FLEX INC

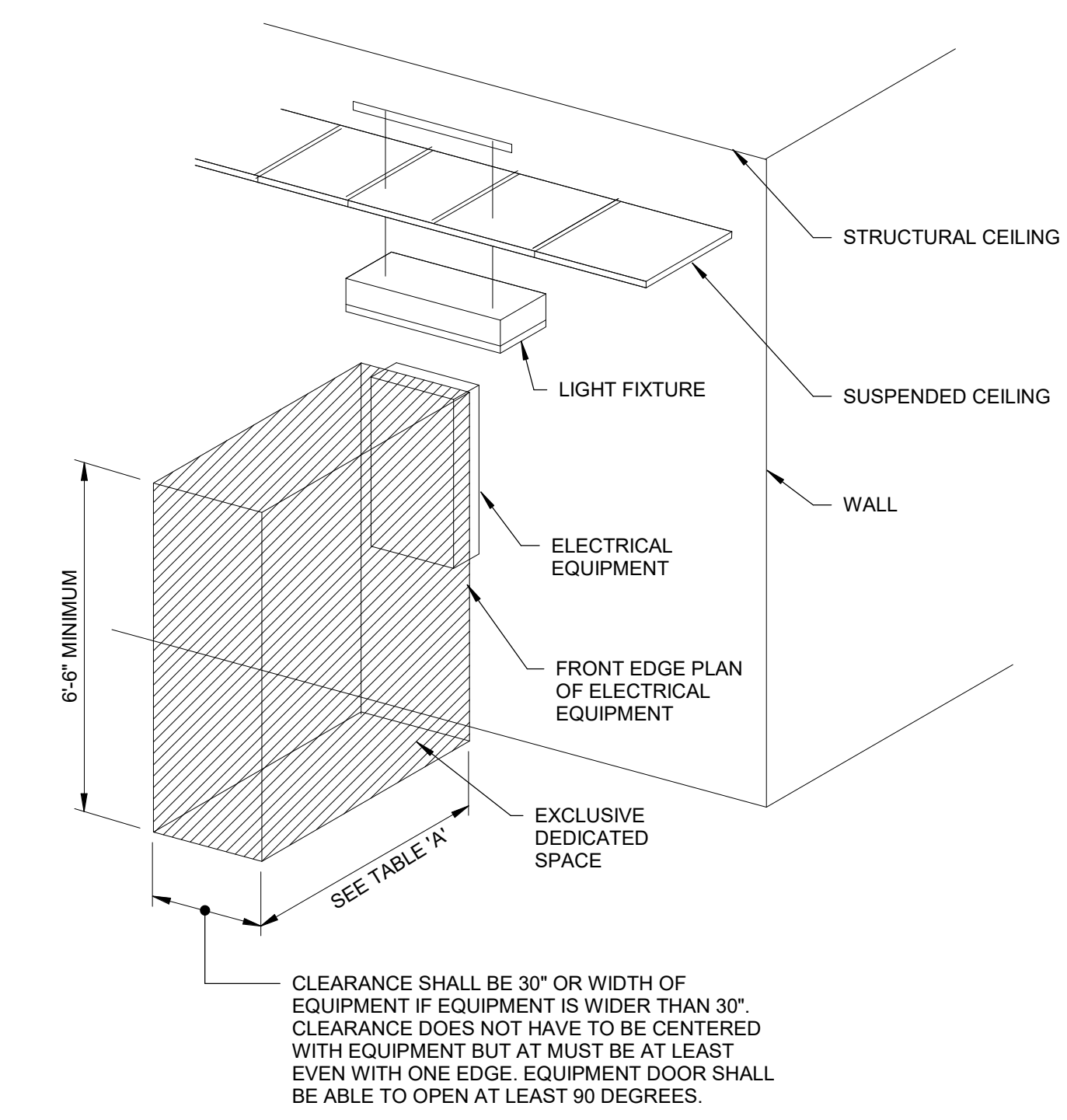
2. NOM 1 IN. (25 MM) DIAM (OR SMALLER) STEEL FLEXIBLE METAL GAS PIPING. PLASTIC COVERING ON PIPING MAY OR MAY NOT BE REMOVED ON BOTH SIDES OF FLOOR OR WALL ASSEMBLY.
TITEX FLEX CORP
A BUNDDY CO

3. NOM 1 IN. (25 MM) DIAM (OR SMALLER) STEEL FLEXIBLE METAL GAS PIPING. PLASTIC COVERING ON PIPING MAY OR MAY NOT BE REMOVED ON BOTH SIDES OF FLOOR OR WALL ASSEMBLY.
WARD MFG INC

3. FILL, VOID OR CAVITY MATERIAL - CAULK OR SEALANT - MIN 5/8, 1-1/4, 1-7/8 AND 2-1/2 IN. (16, 32, 48 AND 64 MM) THICKNESS OF CAULK FOR 1, 2, 3 AND 4 HR RATED ASSEMBLIES, RESPECTIVELY, APPLIED WITHIN ANNULUS, FLUSH WITH BOTH SURFACES OF WALL. MIN 1/4 IN. (6 MM) DIAM BEAD OF CAULK APPLIED TO GYPSUM BOARD/PENETRANT INTERFACE AT POINT CONTACT LOCATION ON BOTH SIDES OF WALL. THE HOURLY F RATING OF THE FIRESTOP SYSTEM IS DEPENDENT UPON THE HOURLY FIRE RATING OF THE WALL ASSEMBLY IN WHICH IT IS INSTALLED, AS SHOWN IN THE FOLLOWING TABLE. THE HOURLY T RATING OF THE FIRESTOP SYSTEM IS DEPENDENT UPON THE TYPE OR SIZE OF THE PIPE OR CONDUIT AND THE HOURLY FIRE RATING OF THE WALL ASSEMBLY IN WHICH IT IS INSTALLED, AS TABULATED BELOW.

MAX PIPE OR CONDUIT DIAM IN. (mm)	F RATING HR	T RATING HR
1 (25)	1 OR 2	0+, 1 OR 2
1 (25)	3 OR 4	3 OR 4
4 (102)	1 OR 2	0
6 (152)	3 OR 4	0
12 (305)	1 OR 2	0

*WHEN COPPER PIPE IS USED, T RATING IS 0 HR.
3M COMPANY - CP 25WB+ CAULK OR FB-3000 WT SEALANT.
 *BEARING THE UL CLASSIFICATION MARKING



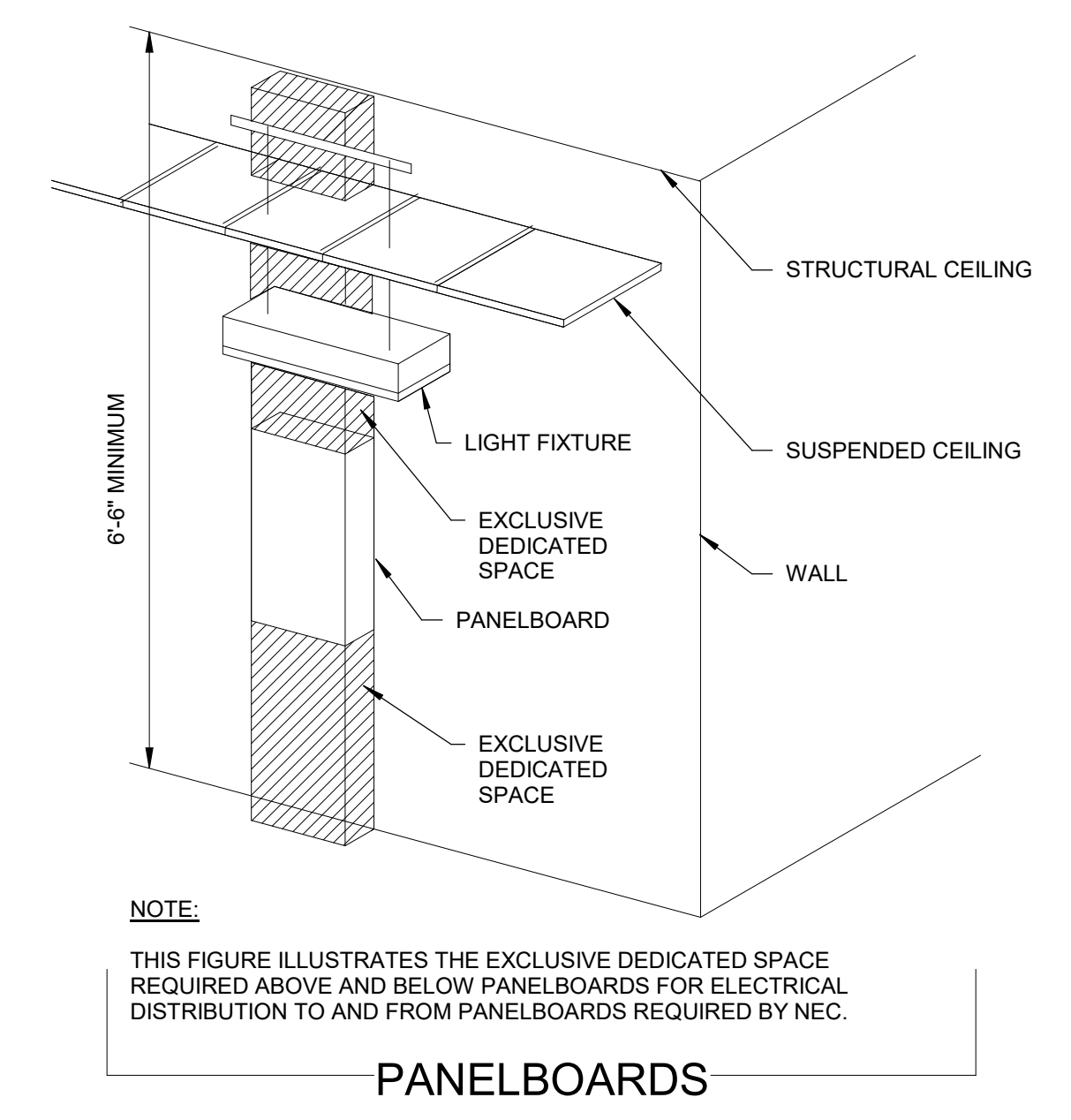
NOTE:
 THIS FIGURE ILLUSTRATES THE WORKING SPACE IN FRONT OF ELECTRICAL EQUIPMENT REQUIRED BY NEC 110.16.

ALL ELECTRICAL EQUIPMENT

GENERAL NOTES:

- ELECTRICAL EQUIPMENT INCLUDES BUT IS NOT LIMITED TO PANELBOARDS, SAFETY SWITCHES, MOTOR STARTERS, JUNCTION BOXES, AND OTHER ELECTRICAL DISTRIBUTION AND CONTROLS EQUIPMENT.
- PIPING, DUCTS OR EQUIPMENT FOREIGN TO THE ELECTRICAL EQUIPMENT OR ARCHITECTURAL APPURTENANCES SHALL NOT BE PERMITTED TO BE INSTALLED IN, ENTER, OR PASS THROUGH THE DEDICATED SPACES SHOWN ABOVE.

CLEARANCE SHALL BE 30" OR WIDTH OF EQUIPMENT IF EQUIPMENT IS WIDER THAN 30". CLEARANCE DOES NOT HAVE TO BE CENTERED WITH EQUIPMENT BUT AT MUST BE AT LEAST EVEN WITH ONE EDGE. EQUIPMENT DOOR SHALL BE ABLE TO OPEN AT LEAST 90 DEGREES.



NOTE:
 THIS FIGURE ILLUSTRATES THE EXCLUSIVE DEDICATED SPACE REQUIRED ABOVE AND BELOW PANELBOARDS FOR ELECTRICAL DISTRIBUTION TO AND FROM PANELBOARDS REQUIRED BY NEC.

PANELBOARDS

VOLTAGE TO GROUND (NOMINAL)	MINIMUM CLEAR DISTANCE		
	CONDITION 1	CONDITION 2	CONDITION 3
0 - 150	3' - 0"	3' - 0"	3' - 0"
150 - 600	3' - 0"	3' - 6"	4' - 0"

TABLE 'A' DEFINITIONS:

CONDITION 1: EXPOSED LIVE PARTS ON ONE SIDE AND NO LIVE OR GROUND PARTS ON THE OTHER SIDE OF THE WORKING SPACE.

OR

EXPOSED LIVE PARTS ON BOTH SIDES EFFECTIVELY GUARDED BY SUITABLE WOOD OR OTHER INSULATING MATERIALS.

CONDITION 2: EXPOSED LIVE PARTS ON ONE SIDE AND GROUND PARTS ON THE OTHER SIDE.

CONDITION 3: EXPOSED LIVE PARTS ON BOTH SIDES OF THE WORKING SPACE (NOT GUARDED AS PROVIDED IN CONDITION 1) WITH THE OPERATOR BETWEEN.

INSULATED WIRE OR INSULATED BUSBARS OPERATING AT NOT OVER 300V SHALL NOT BE CONSIDERED LIVE PARTS.

2 DEDICATED WORKING SPACE REQUIREMENTS FOR ELECTRICAL EQUIPMENT
 Scale: N.T.S.

1 UL PENETRATION DETAIL W-L-1001
 Scale: N.T.S.

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 100% CONSTRUCTION DOCUMENTS

CONSULTANTS:	PROJECT MANAGER:	ACG Project Number 17-251	Office of Construction and Facilities Management	Drawing Title: ELECTRICAL DETAILS	Project Title RENOVATE MECHANICAL ROOMS & EQUIPMENT PHASE 1	VA PROJECT NUMBER 542-18-105
		Headquarters: APOGEE Consulting Group, P.A. 1151 Kildaire Farm Road, Suite 120 Cary, North Carolina 27511	www.acg-pa.com 919-858-7420	Location 1400 BLACKHORSE HILL RD COATESVILLE, PA 19320	Approved: Project Director	Building Number #
#	Revisions:	Date			Date 05/01/2019	Checked CGS
					Drawn ABT	Drawing Number E-501
						Dwg 8 of 9

STEAM CONDENSATE PUMP SCHEDULE													
MARK	LOCATION	SYSTEM AND/OR SERVICE	TYPE UNIT	FLOW EACH PUMP	DISCHARGE PRESSURE	MIN RECEIVER SIZE	MOTOR			BASIS OF DESIGN MANUF.	BASIS OF DESIGN MODEL NO.	REMARKS	
				GPM	PSIG	GAL	NOMINAL POWER EACH	PHASE	VOLT				RPM
4-CP-1	BUILDING 4 MER	BLDG 4 STEAM	DUPLEX	22.5	20	21	1/2	3	208	3500	SPIRAX SARCO	VNS152	1, 2, 3
6-CP-1	BUILDING 6 MER	BLDG 6 STEAM	DUPLEX	22.5	20	21	1/2	3	208	3500	SPIRAX SARCO	VNS152	1, 2, 3
7-CP-1	BUILDING 7 MER	BLDG 7 STEAM	DUPLEX	22.5	20	21	1/2	3	208	3500	SPIRAX SARCO	VNS152	1, 2, 3
8-CP-1	BUILDING 8 MER	BLDG 8 STEAM	DUPLEX	22.5	20	21	1/2	3	208	3500	SPIRAX SARCO	VNS152	1, 2, 3
9-CP-1	BUILDING 9 MER	BLDG 9 STEAM	DUPLEX	22.5	20	21	1/2	3	208	3500	SPIRAX SARCO	VNS152	1, 2, 3

*FOR REFERENCE ONLY, SEE MECHANICAL DRAWINGS FOR REMARKS.

FAN SCHEDULE																			
MARK	LOCATION	AREA AND/OR BLDG SERVED	AIR FLOW	ESP	TSP	FAN						MOTOR ELECTRICAL					CONTROL SEQUENCE	REMARKS	
			CFM	IN W.G.	IN W.G.	TYPE	WHEEL	DIAMETER	MIN % EFF	DRIVE	FAN MAX RPM	NOMINAL POWER	PHASE	VOLT	RPM	SPEED CONTROL			
4-EF-MECH	BUILDING 4 MER	BUILDING 4 MER	1,620	0.15	0.348	SIDEWALL PROPELLER	AXIAL	14	40%	DIRECT	1,502	0.22	1/3	1	115	1725	CONSTANT	COOLING THERMOSTAT	1, 2, 4, 5
4-EF-VFD	BUILDING 4 VFD CLOSET	BUILDING 4 VFD CLOSET	100	0.25	0.25	SQUARE INLINE	CENTRIFUGAL	6	19%	DIRECT	1,536	0.02	1/15	1	115	1725	CONSTANT	COOLING THERMOSTAT	
7-EF-MECH	BUILDING 7 MER	BUILDING 7 MER	2,700	0.25	0.25	SQUARE INLINE	CENTRIFUGAL	18	35%	BELT	764	0.33	1/2	1	115	1725	CONSTANT	COOLING THERMOSTAT	1, 3, 4, 5
7-EF-VFD	STORAGE B02	STORAGE B02	250	0.25	0.25	SQUARE INLINE	CENTRIFUGAL	8	30%	DIRECT	1,320	0.03	1/10	1	115	1725	CONSTANT	COOLING THERMOSTAT	
9-EF-MECH	BUILDING 9 MER	BUILDING 9 MER	1,400	0.15	0.254	SIDEWALL PROPELLER	AXIAL	16	31%	DIRECT	1,036	0.18	1/4	1	115	1725	CONSTANT	COOLING THERMOSTAT	1, 2, 4, 5
9-EF-VFD	TRANSFORMER B12	TRANSFORMER B12	350	0.25	0.25	SQUARE INLINE	CENTRIFUGAL	9	40	DIRECT	1,239	0.03	1/10	1	115	1725	CONSTANT	COOLING THERMOSTAT	

*FOR REFERENCE ONLY, SEE MECHANICAL DRAWINGS FOR REMARKS.

HYDRONIC PUMP SCHEDULE																		
MARK	LOCATION	AREA AND/OR BLDG SERVED	SYSTEM AND/OR SERVICE	TYPE	CIRCULATING FLUID				MIN % EFF	ELECTRICAL MOTOR					BASIS OF DESIGN MANUF.	BASIS OF DESIGN MODEL NO.	REMARKS	
					FLUID	FLOW	HEAD	NPSH REQUIRED		SP GR	NOMINAL POWER	PHASE	VOLT	MAX RPM				SPEED CONTROL
4-CWP-1	BUILDING 4 MER	BUILDING 4	CHILLED WATER	BASE MOUNTED END SUCTION	WATER	325	77	9.4	1	77	10	3	208	1800	VARIABLE	BELL & GOSSETT	e-1510 2.58B	1, 2, 3
4-CWP-2	BUILDING 4 MER	BUILDING 4	CHILLED WATER	BASE MOUNTED END SUCTION	WATER	325	77	9.4	1	77	10	3	208	1800	VARIABLE	BELL & GOSSETT	e-1510 2.58B	1, 2, 3, 4
4-HWP-1	BUILDING 4 MER	BUILDING 4	HEATING WATER	BASE MOUNTED END SUCTION	WATER	305	71	8.65	1	77	10	3	208	1800	VARIABLE	BELL & GOSSETT	e-1510 2.58B	1, 2, 3
4-HWP-2	BUILDING 4 MER	BUILDING 4	HEATING WATER	BASE MOUNTED END SUCTION	WATER	305	71	8.65	1	77	10	3	208	1800	VARIABLE	BELL & GOSSETT	e-1510 2.58B	1, 2, 3, 4
7-CWP-1	BUILDING 7 MER	BUILDING 7	CHILLED WATER	BASE MOUNTED END SUCTION	WATER	295	100	14	1	66	15	3	208	1800	VARIABLE	BELL & GOSSETT	e-1510 2GB	1, 2, 3
7-CWP-2	BUILDING 7 MER	BUILDING 7	CHILLED WATER	BASE MOUNTED END SUCTION	WATER	295	100	14	1	66	15	3	208	1800	VARIABLE	BELL & GOSSETT	e-1510 2GB	1, 2, 3, 4
7-HWP-1	BUILDING 7 MER	BUILDING 7	HEATING WATER	BASE MOUNTED END SUCTION	WATER	280	85	11.9	1	72	10	3	208	1800	VARIABLE	BELL & GOSSETT	e-1510 2EB	1, 2, 3
7-HWP-2	BUILDING 7 MER	BUILDING 7	HEATING WATER	BASE MOUNTED END SUCTION	WATER	280	85	11.9	1	72	10	3	208	1800	VARIABLE	BELL & GOSSETT	e-1510 2EB	1, 2, 3, 4
9-CWP-1	BUILDING 9 MER	BUILDING 9	CHILLED WATER	BASE MOUNTED END SUCTION	WATER	260	70	7.4	1	77	10	3	208	1800	VARIABLE	BELL & GOSSETT	e-1510 2.58B	1, 2, 3
9-CWP-2	BUILDING 9 MER	BUILDING 9	CHILLED WATER	BASE MOUNTED END SUCTION	WATER	260	70	7.4	1	77	10	3	208	1800	VARIABLE	BELL & GOSSETT	e-1510 2.58B	1, 2, 3, 4
9-HWP-1	BUILDING 9 MER	BUILDING 9	HEATING WATER	BASE MOUNTED END SUCTION	WATER	260	50	17.9	1	63	7.5	3	208	1800	VARIABLE	BELL & GOSSETT	e-1510 2BD	1, 2, 3
9-HWP-2	BUILDING 9 MER	BUILDING 9	HEATING WATER	BASE MOUNTED END SUCTION	WATER	260	50	17.9	1	63	7.5	3	208	1800	VARIABLE	BELL & GOSSETT	e-1510 2BD	1, 2, 3, 4

*FOR REFERENCE ONLY, SEE MECHANICAL DRAWINGS FOR REMARKS.

LIGHTING FIXTURE SCHEDULE							
TYPE	MANUFACTURER	CATALOG NUMBER	LAMP DESCRIPTION	VOLTAGE	LOAD (VA)	MOUNTING	DESCRIPTION
A	COLUMBIA	LXEM4-40ML-RFP-EU	LED, 4,760 LUMENS, 80 CRI, 4000K	120-277V	37.4	SUSPENDED	4 INDUSTRIAL STRIP ENCLOSURE AND GASKETED WITH RIBBED, FROSTED POLYCARBONATE LENS. WET LOCATION.

GENERAL NOTES:

- MANUFACTURER AND CATALOG NUMBERS SHOWN ARE FOR BASIS OF DESIGN. DESCRIPTIVE AND QUALITY STANDARDS ONLY. NOT TO BE USED FOR ORDERING WITHOUT VERIFICATION AND APPROVAL. CONTRACTOR TO PROVIDE PRODUCT OR EQUAL FOR APPROVAL BY OWNER, ARCHITECT AND ENGINEER. ENGINEER SHALL NOT BE RESPONSIBLE FOR MISMATCHED OR INACCURATE PART NUMBERS.
- VERIFY ALL LIGHT FIXTURE MOUNTING TYPES AND COLORS WITH ARCHITECT.
- FOR ALL LED FIXTURES, THE FIXTURE SHALL BE CAPABLE OF SELF-RESETTING TO THE SWITCHED/CONTROLLED STATE DURING ANY FLUCTUATION IN POWER SUPPLY WHERE AUTOMATIC PROTECTIVE MEASURES DISABLE THE LED LAMPS. PROVIDE A LETTER OR STATEMENT FROM THE MANUFACTURER, OR OTHER ACCEPTABLE PROOF, THAT ALL LED FIXTURES, WITH OR WITHOUT BROWNOUT PROTECTION, SHALL RETURN TO THE SWITCHED/CONTROLLED STATE AUTOMATICALLY. PROVIDE STATEMENT WITH THE FIXTURE SUBMITTALS.
- LIGHTING CONTROLS, INCLUDING CONTROL SCHEMATICS, DEVICES, SWITCHES, SENSORS AND GRAPHIC DISPLAYS/CONTROLLERS. THIS INFORMATION MUST BE SUBMITTED WITH THE LIGHT FIXTURE SHOP DRAWINGS, FOR A COMPLETE REVIEW.
- AMBIENT TEMPERATURE OPERATION IS -40°F UP TO +122°F.

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100% CONSTRUCTION DOCUMENTS

CONSULTANTS:		PROJECT MANAGER:		Office of Construction and Facilities Management		Drawing Title:		Project Title		VA PROJECT NUMBER	
		ACG Project Number 17-251		www.acg-pa.com 919-858-7420		ELECTRICAL SCHEDULES		RENOVATE MECHANICAL ROOMS & EQUIPMENT PHASE 1		542-18-105	
		Headquarters: Apogee Consulting Group, P.A. 1151 Kildaire Farm Road, Suite 120 Cary, North Carolina 27511		VA U.S. Department of Veterans Affairs		Location: 1400 BLACKHORSE HILL RD COATESVILLE, PA 19320		Approved: Project Director		#	
								Date: 05/01/2019		E-601	
								Checked: CGS		Dwg 9 of 9	
								Drawn: ABT			
#	Revisions:										