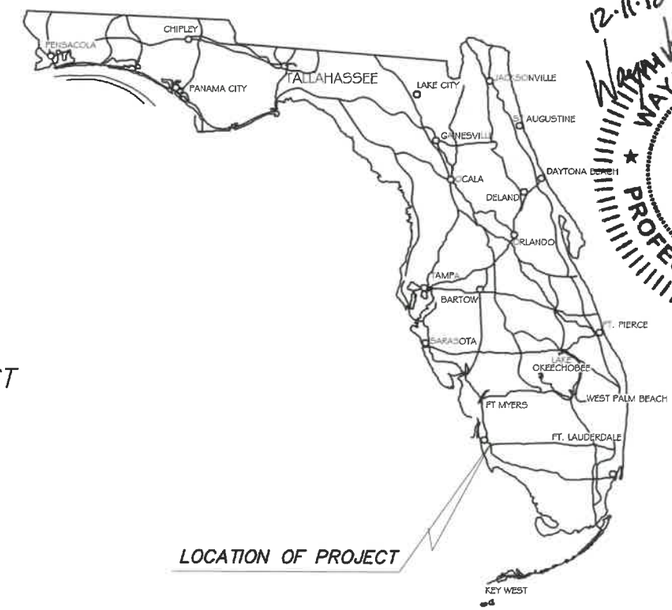
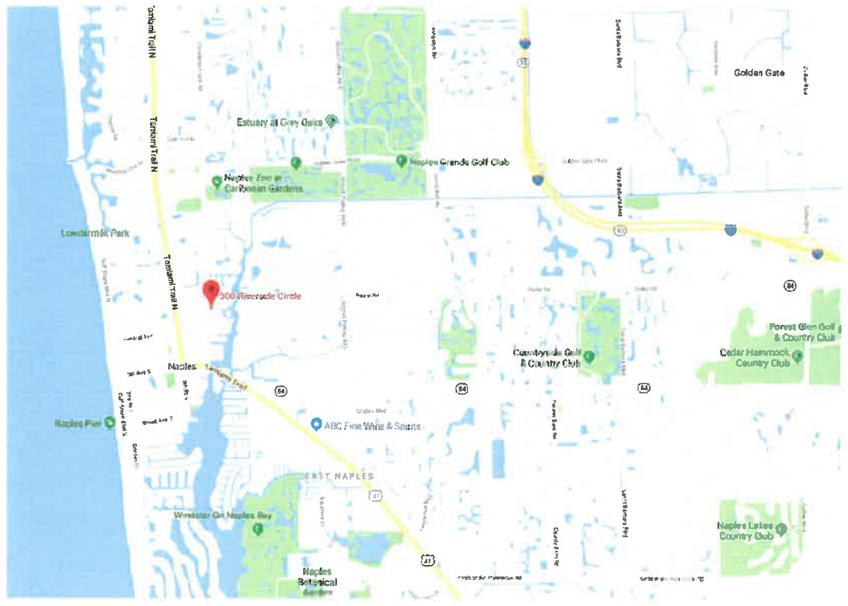
ATTACHMENT B - NAPLES WWTP SWITCHGEAR FINAL PLANS

SHEET INDEX

CONSTRUCTION PLANS
CITY OF NAPLES WWTP
SWITCHGEAR REPLACEMENT
FOR
CITY OF NAPLES
LOCATED IN
SECTION 03, TOWNSHIP 50 SOUTH, RANGE 25 EAST
NAPLES, FL
DEC. 2018
CITY OF NAPLES REQUISITION NO. 11014





LOCATION MAP

N
W E
S

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CITY OF NAPLES WWTP
SWITCHGEAR REPLACEMENT
CONSTRUCTION PLANS
CITY OF NAPLES
NAPLES, FL

REVISIONS

NO.	DESCRIPTION	DATE

DATE:	DEC. 2018
PROJECT NO.	20150110-007
FILE NO.	03-50-25
SCALE:	NONE

PROJECT COVER SHEET

SHEET NUMBER
E00

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ABBREVIATIONS

A	AMPERES, AMBER OR ALARM
AH	AMP HOUR OR ALARM HORN
AL	ALARM LIGHT
ALM	ALARM
ASR	ALARM SILIENCE RELAY
AHU	AIR HANDLING UNIT
AIC	AMPS INTERRUPTING CURRENT
ATS	AUTOMATIC TRANSFER SWITCH
AUX	AUXILIARY
BAT	BATTERY
BPC	BACKUP PUMP CONTROLLER
BOM	BILL OF MATERIAL
CB	CIRCUIT BREAKER
C	CONDUIT
CP	CONTROL PANEL
CPSA	CONTROL PANEL SURGE ARRESTOR
CT	CURRENT TRANSFORMER
CU	COPPER
DISC	DISCONNECT
DO	DIGITAL OUTPUT
DPDT	DOUBLE POLE DOUBLE THROW
DPST	DOUBLE POLE SINGLE THROW
EG	EQUIPMENT GROUND
ETM	ELAPSED TIME METER
F	FUSE
FLT	FAULT
FPL	FLORIDA POWER AND LIGHT
FMC	FLEXIBLE METALLIC CONDUIT
FS	FLOAT SWITCH
GEN	GENERATOR
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GND, G	GROUND
GRS	GALVANIZED RIGID STEEL
H	HIGH
HS	HAND SWITCH
HOA	HAND-OFF-AUTOMATIC
HOR	HAND-OFF-REMOTE
HMI	HUMAN MACHINE INTERFACE
I	INDICATOR
I&C	INSTRUMENTATION & CONTROL
INTR	INTRUSION
JB	JUNCTION BOX
L	LEVEL OR LOW
LR	LINE REACTOR
NEUT, N	NEUTRAL
NTS	NOT TO SCALE
O/C	OPEN / CLOSE
OIT	OPERATOR INTERFACE TERMINAL
MOV	MOTOR OPERATED VALVE
MSC	MANUFACTURER'S SUPPLIED CABLE
NF	NON-FUSIBLE
P	PRESSURE
PB	PUSHBUTTON
PLC	PROGRAMMABLE LOGIC CONTROLLER
PH, ø	PHASE
PC	PHOTOCELL
PCP	PUMP CONTROL PANEL
PM	PHASE MONITOR
PS	POWER SUPPLY
PTT	PUSH-TO-TEST
Q	TOTALIZER
RECPT.	RECEPTACLE
R	RELAY, TREND, RESISTOR
RTU	REMOTE TELEMETRY UNIT
SCCR	SHORT CIRCUIT CURRENT RATING
SHLD	SHIELDED
SPD	SURGE PROTECTION DEVICE
S	SWITCH
SS	SELECTOR SWITCH
SSOL	SOLID STATE OVERLOAD
SV	SOLENOID VALVE
TB	TERMINAL BLOCK
TD	TIME DELAY
TSP	TWISTED SHIELDED PAIR
UG	UNDERGROUND
UPS	UNINTERRUPTABLE POWER SUPPLY
VFD	VARIABLE FREQUENCY DRIVE
XFMR	TRANSFORMER
Z	POSITION

SYMBOLS

FIT / MAG	MAGNETIC FLOW INDICATING TRANSMITTER
PIT	PRESSURE INDICATING TRANSMITTER
FIT	FLOW INDICATING TRANSMITTER
FE	FLOW ELEMENT
LS	LEVEL (FLOAT) SWITCH
PS	PRESSURE SWITCH
FS	FLOW SWITCH
MOV	MOTOR OPERATED VALVE (MOV)
SV	SOLENOID VALVE (SV)
SV	SOLENOID VALVE (SV)
	DIAPHRAGM VALVE
V	VOLTMETER
A	AMMETER
GFI	GROUND FAULT INTERRUPTER
	DRAW-OUT CIRCUIT BREAKER
30A	CIRCUIT BREAKER WITH TRIP RATING
HP	MOTOR WITH HP RATING
	EQUIPMENT GROUND
	DRIVEN ROD-TYPE GROUNDING ELECTRODE
	DRIVEN ROD-TYPE GROUNDING ELECTRODE WITH GROUND ACCESS WELL
	NON-FUSIBLE DISCONNECT SWITCH, 30A, 3P UNLESS OTHERWISE INDICATED
	CURRENT TRANSFORMER
	TRANSFORMER
	CONDUIT OR WIRE ROUTING; SHORT HASH MARK = PHASE CONDUCTOR LONG HASH MARK = NEUTRAL CONDUCTOR
	MOTOR OVERLOAD (EUTECTIC ALLOY)
	AC/DC POWER SUPPLY
	SURGE SUPPRESSOR (PROTECTED/UNPROTECTED)
	FUSED LEVER-TYPE TERMINAL BLOCK WITH LED INDICATOR
	CT SHORTING BAR

	DUPLEX RECEPTACLE
	NORMALLY OPEN CONTACT
	NORMALLY CLOSED CONTACT
	LIMIT SWITCH, NORMALLY OPEN
	LIMIT SWITCH, NORMALLY CLOSED
	PRESSURE SWITCH, NORMALLY OPEN
	PRESSURE SWITCH, NORMALLY CLOSED
	FLOAT SWITCH, NORMALLY OPEN
	FLOAT SWITCH, NORMALLY CLOSED
	FLOW SWITCH, NORMALLY OPEN
	FLOW SWITCH, NORMALLY CLOSED
	TEMP. SWITCH, NORMALLY OPEN
	TEMP. SWITCH, NORMALLY CLOSED
	NORMALLY OPEN TIMED TO CLOSE CONTACT
	NORMALLY CLOSED TIMED TO OPEN CONTACT
	NORMALLY CLOSED TIMED TO CLOSE CONTACT
	NORMALLY OPEN TIMED TO OPEN CONTACT
LS	LIMIT SWITCH
XS	TORQUE SWITCH
PS	PRESSURE SWITCH
VS	VIBRATION SWITCH
AR	ALARM RELAY
CR	CONTROL RELAY
M	MOTOR STARTER
TR	TIMING RELAY
R	INDICATING LIGHT WITH COLOR
	NORMALLY OPEN PUSHBUTTON
	NORMALLY CLOSED PUSHBUTTON
	MAINTAINED SWITCH
	FUSE WITH RATING
	REMOTE TERMINAL POINT
	HORN
	PUMP
	TERMINAL BLOCK
K	KEY INTERLOCK

PROJECT ELECTRICAL NOTES

1. ALL DEMOED EQUIPMENT SHALL BE DISPOSED OF BY THE CONTRACTOR.
2. SEE SPECIFICATIONS FOR CONTRUCTION STAGING SCHEDULE, DETAILS, PROCEDURES AND LIMITATIONS ON EQUIPMENT UNAVAILABILTY.

GENERAL ELECTRICAL NOTES

1. ALL NEW CONSTRUCTION SHALL COMPLY WITH APPLICABLE N.E.C. AND LOCAL CODES.
2. CONDUCTORS SHALL NOT BE SPLICED.
3. ALL MULTICONDUCTOR CONTROL CABLE SHALL BE #14 AWG XHHW-2, OMNICABLE P/N AF114XX, OR EQ.
4. ALL BELOW GRADE CONDUIT RUNS SHALL BE IN SCHEDULE 80 PVC CONDUIT UNLESS NOTED OTHERWISE. ALL ABOVE GRADE CONDUIT RUNS SHALL BE IN RIGID ALUMINUM CONDUIT UNLESS NOTED OTHERWISE. PROVIDE PVC CONDUIT SLEEVE AROUND CONDUIT PENETRATIONS IN CONCRETE FOR PROTECTION.
5. ALL BONDING CONDUCTORS SHALL BE ROUTED IN SCHEDULE 80 PVC CONDUIT.
6. ALL CONDUIT RACEWAYS SHALL HAVE AN INSULATED COPPER SYSTEM GROUND CONDUCTOR THROUGHOUT THE ENTIRE LENGTH OF THE CIRCUIT INSTALLED PER N.E.C.
7. ALL CONDUIT RACEWAYS WHICH ARE INSTALLED FOR FUTURE USE SHALL HAVE A NYLON PULLCORD.
8. PVC CONDUIT JOINTS SHALL BE SOLVENT-WELDED, EXCEPT FOR RIGID METALLIC TO PVC COUPLINGS.
9. MINIMUM CONDUIT SIZE SHALL BE 3/4".
10. ALL CONDUIT RACEWAYS SHALL BE RUN IN NEAT AND WORKMANLIKE MANNER AND SHALL BE PROPERLY SUPPORTED PER N.E.C.
11. ALL CONNECTIONS TO MOTORS AND OTHER VIBRATING EQUIPMENT OR AT OTHER LOCATIONS WHERE REQUIRED SHALL BE MADE WITH FLEXIBLE LIQUID-TIGHT STEEL CONDUIT 12" TO 36" IN LENGTH.
12. ALL FEEDER AND BRANCH CIRCUIT WIRING SHALL BE COLOR CODED AS FOLLOWS:
    - 3-PHASE 480Y/277VAC (A/B/C/N/G) : PUR/BRN/YEL/WHT/GRN
    - 3-PHASE 240/120VAC (A/B(HI)/C/N/G) : BLK/RED(ORG)/BLU/WHT/GRN
    - 1-PHASE AC POWER : BLK, 12 AWG MIN.
    - AC POWER HOT : BLK, 12 AWG MIN.
    - AC POWER NEUTRAL : WHT, 12 AWG MIN.
    - AC SWITCHED : RED, 16 AWG MIN.
    - EXTERNALLY POWERED : YEL, 16 AWG MIN.
    - GROUND : GRN, 12 AWG MIN.
    - DC + : BLU, 16 AWG MIN.
    - DC - : BLU WITH WHT STRIPE, 16 AWG MIN.
    - TSP (+/-) : RED/BLK, 16 AWG. MIN., BELDEN 1118A, OR EQ.
13. ALL CONDUCTORS SHALL BE 600-VOLT RATED, STRANDED COPPER.
14. ETHERNET CABLE SHALL BE CAT-5e 600V UL AWM RATED
15. ALL WIRES AND CABLES SHALL BE MARKED USING WHITE HEAT SHRINK MARKERS.
16. BRANCH CIRCUITS EXCEEDING 75' SHALL BE WIRED WITH MINIMUM #10AWG WIRE.
17. COORDINATE ALL SERVICE ENTRANCE WORK WITH THE LOCAL ELECTRIC UTILITY AND ADHERE TO ALL UTILITY STANDARDS.
18. CONTRACTOR SHALL BE RESPONSIBLE FOR PERFORMING THE WORK AND FURNISHING ALL MATERIALS OUTLINED IN THESE PLANS AND ANY OTHER MATERIALS AND WORK NECESSARY FOR A FULLY OPERATIONAL SYSTEM.

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CITY OF NAPLES WWTP
SWITCHGEAR REPLACEMENT
CONSTRUCTION PLANS
CITY OF NAPLES
NAPLES, FL

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NOTES & SYMBOLS

SHEET NUMBER

E01

ELECTRICAL ROOM #1
SWITCHGEAR-1 AND GENERATOR-1

ADMIN. BUILDING

N
W E
S

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SCALE:	TBD

WWTP SITE PLAN

SHEET NUMBER
E02

FPL ELECTRIC UTILITY
MAX. AVAILABLE FAULT
CURRENT = 58,380 kAIC

FPL VAULT

FP&L ELECTRIC UTILITY
(FUTURE)

65 TYPE E

65 TYPE E
(FUTURE)

EX. TRANSFORMER
13.2 KV x 480/277VAC, 3PH, 4W
1500 KVA, 1804 FLA

TRANSFORMER
13.2 KV x 480/277VAC, 3PH, 4W
1500 KVA, 1804 FLA
(FUTURE)

MTR
M

CT'S

CT'S
(FUTURE)

PROVIDE (6) SETS OF (4) 750 KCMIL AND
(1) 400KCMIL GND XHHW-2 TRAY CABLE
IN 24"W X 5" LADDER WIRING TROUGH

NOTES: (#)

1. HARD-WIRED CIRCUIT BREAKER ELECTRICAL INTERLOCKS
2. CIRCUIT BREAKERS EQUIPPED WITH ACCESSORIES:
   - (2) SHUNT TRIP WITH INTERPOSING RELAY
   - SHUNT CLOSE WITH INTERPOSING RELAY
   - SPRING CHARGING MOTOR
3. EQUIPPED WITH MODBUS COMMUNICATION MODULES FOR NETWORK STATUS SIGNALS
   - CIRCUIT BREAKER COMMS MODULE
   - CRADLE COMMS MODULE
4. ALL CIRCUIT BREAKERS TO BE EQUIPPED WITH ELECTRONIC TRIP UNITS WITH ADJUSTABLE RATING PLUG AND POWER METERING.
5. SWITCHGEAR SHALL BE RATED FOR 85 kAIC, 3200A HORIZONTAL BUS, VERTICAL BUS AND NEUTRAL BUS FULLY RATED, 1500A GROUND BUS.
6. MODIFICATIONS REQUIRED
7. SWITCHGEAR SHALL BE SUPPLIED WITH EXTERNAL 24VDC CONTROL POWER.
8. GENERATOR LOAD BANKS WILL BE ONLY CONNECTED TEMPORARILY AS REQUIRED FOR GENERATOR TESTING.

GENERATOR #1 ROOM

GENERATOR #1

480/277VAC, 3PH, 60HZ
1200KW, 1500 KVA, 0.8 PF
1804 FLA CONTINUOUS RATING

UTILIZE EXISTING (4) SETS OF (3) 500 KCMIL AND (1) 4/0 CONDUCTORS AND CONDUIT; ADD (1) SETOF (3) 500 KCMIL

ELECTRICAL ROOM

SWGR-1
(5)

ELECTRICAL INTERLOCKS

480V, 3PH, 4W, 3200A, 85 kAIC

1BC M1 — 3200AF 3200AS 3P LSIG E.O. — POWER METER PM1 — 24VDC — (4) CT'S

5BC M2 — 3200AF 3200AS 3P LSIG E.O. — POWER METER PM2 — 24VDC — (4) CT'S

5D GEN1 — 2000AF 2000AS 3P LSIG E.O. — POWER METER PM3 — 24VDC — (4) CT'S

2 3 3BC — E.O. 3200AF 3200AS 3P TIE (1)

1A	1C	2A	2B	2C	2D	3A	3D	4A	4B	4C	4D	5A
30A	F11	F12	F13	F14	F15	F16	F21	F22	F23	F24	F25	30A
SPD-1 240KA/PH	800AF 800AS 3P LSI	800AF 800AS 3P LSI	800AF 800AT 3P LSI	800AF 800AS 3P LSI	800AF 600AS 3P LSI	800AF 400AS 3P LSI	800AF 800AS 3P LSI	800AF 800AS 3P LSI	800AF 800AS 3P LSI	800AF 800AS 3P LSI	800AF 800AS 3P LSI	SPD-2 240KA/PH

3#C UG WITH (2) SETS 600 KCMIL AND (1) 1/0 GND — INSTALL IN EX. UG CONDUIT — MCC-8 — 800A/3P — 400A/3P — 400A/3P — MCC-2

(3) SETS 350 KCMIL AND (1) 1/0 GND — VFD — 600 — EFFLUENT REUSE PUMP #2 480VAC, 3PH, 60HZ 679 FLA PF = 91.3; EFF. = 95.0

(3) SETS 350 KCMIL AND (1) 1/0 GND — INSTALL TRAY CABLE IN LADDER WIRING TROUGH (TYP. OF 4) — VFD — 600 — EFFLUENT REUSE PUMP #4 480VAC, 3PH, 60HZ 679 FLA PF = 91.3; EFF. = 95.0

spare spare spare

3#C UG WITH (2) SETS 600 KCMIL AND (1) 1/0 GND — INSTALL IN EX. UG CONDUIT — MCC-7 — 800A/3P — 400A/3P — MCC-1

(3) SETS 350 KCMIL AND (1) 1/0 GND — VFD — 600 — EFFLUENT REUSE PUMP #1 480VAC, 3PH, 60HZ 679 FLA PF = 91.3; EFF. = 95.0

(3) SETS 350 KCMIL AND (1) 1/0 GND — VFD — 600 — EFFLUENT REUSE PUMP #3 480VAC, 3PH, 60HZ 679 FLA PF = 91.3; EFF. = 95.0

(8) GENERATOR LOAD BANK #1 (TEMPORARY)

GENERATOR LOAD BANK #2 (TEMPORARY)

(7) 24VDC CONTROL POWER — SWITCHGEAR CONTROL PANEL

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CITY OF NAPLES WWTP
SWITCHGEAR REPLACEMENT
CONSTRUCTION PLANS
CITY OF NAPLES
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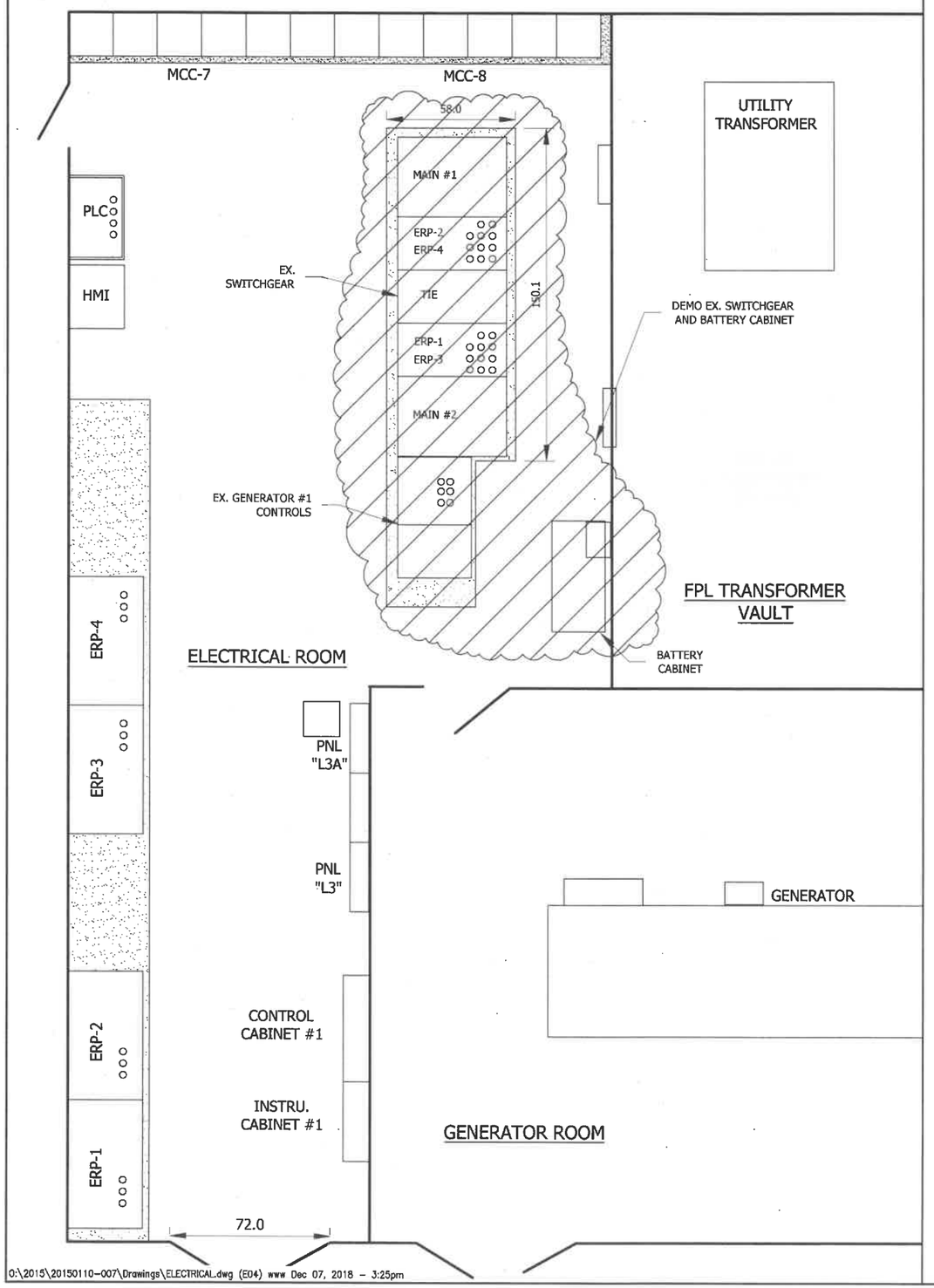
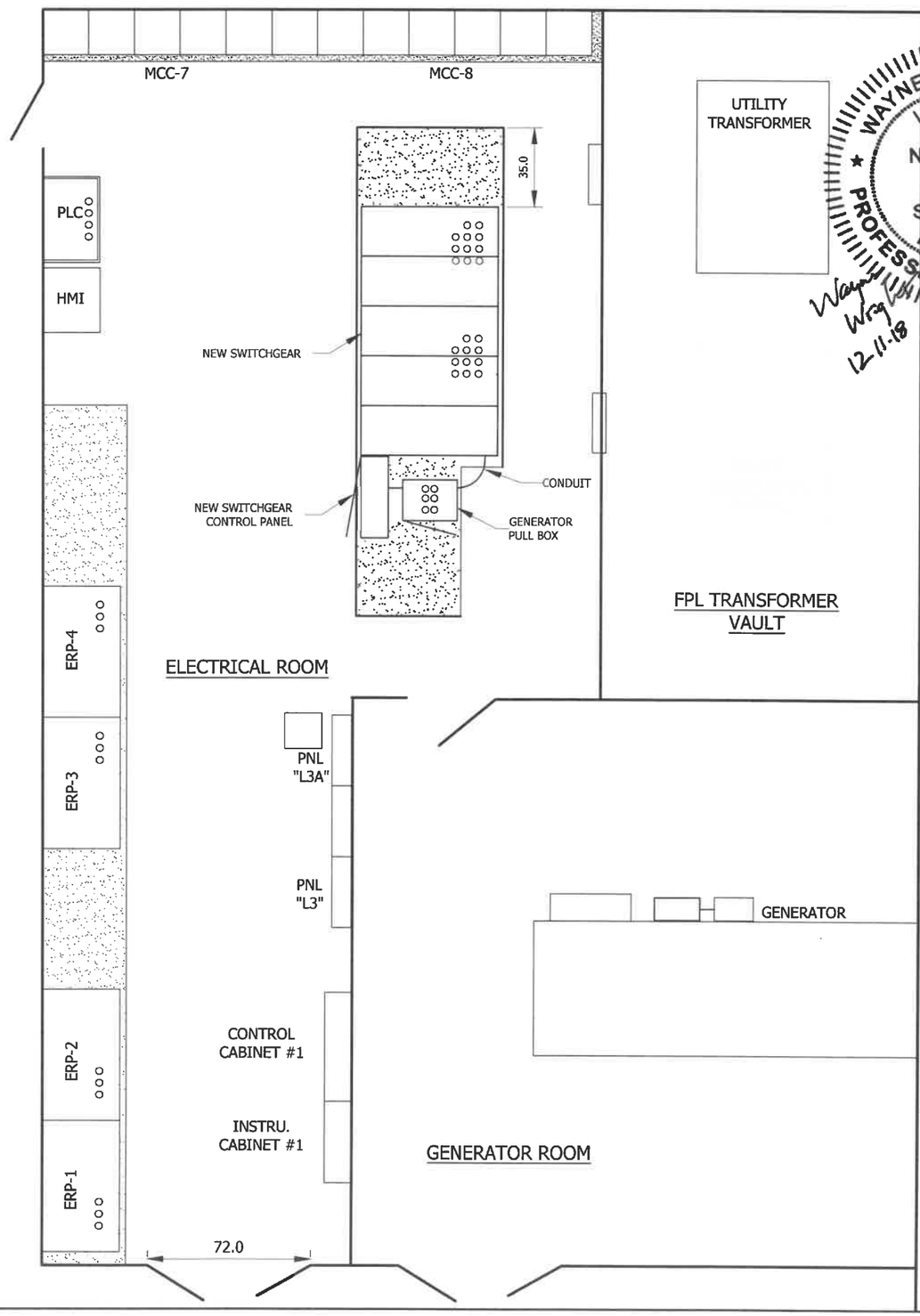
SWGR-1 PROPOSED SINGLE LINE DIAGRAM

SHEET NUMBER
E03

EXISTING SWITCHGEAR ARRANGEMENT



PROPOSED SWITCHGEAR ARRANGEMENT



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SWGR-1 SITE PLAN

SHEET NUMBER
E04

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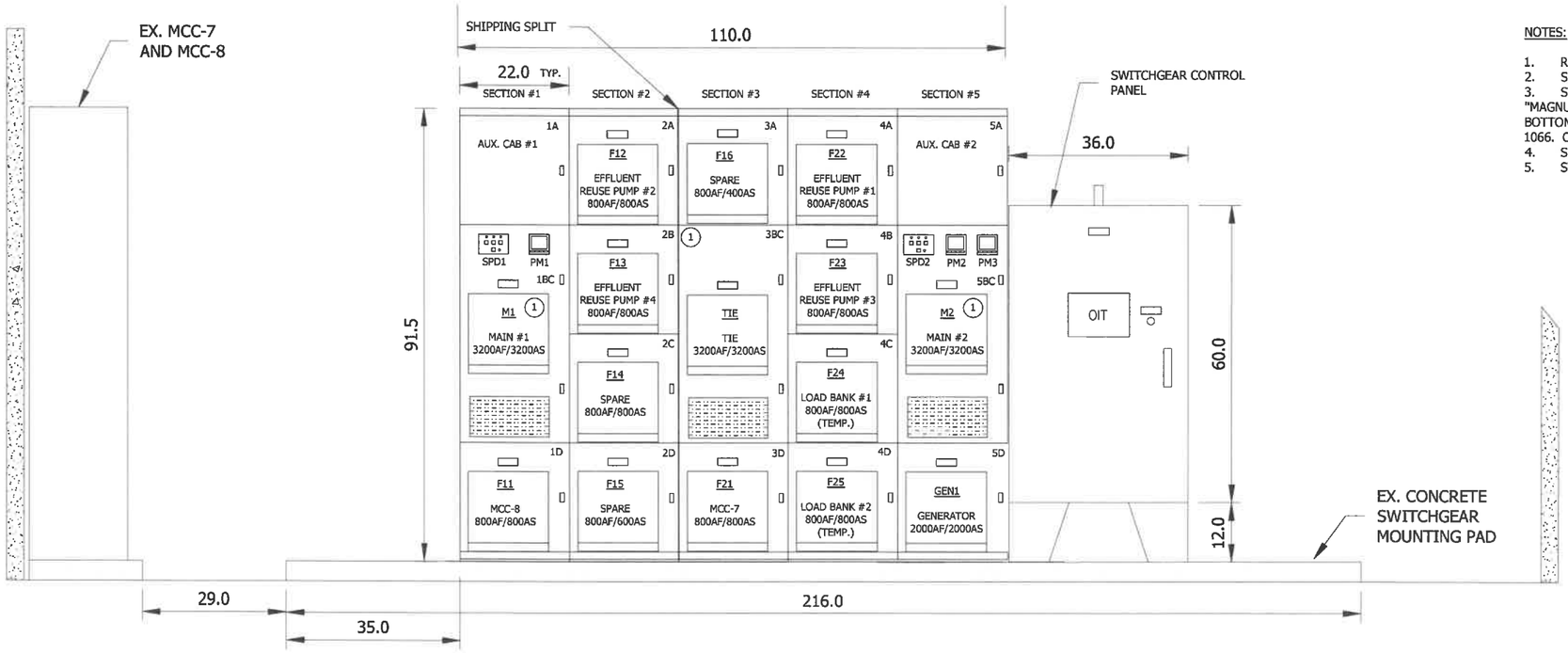
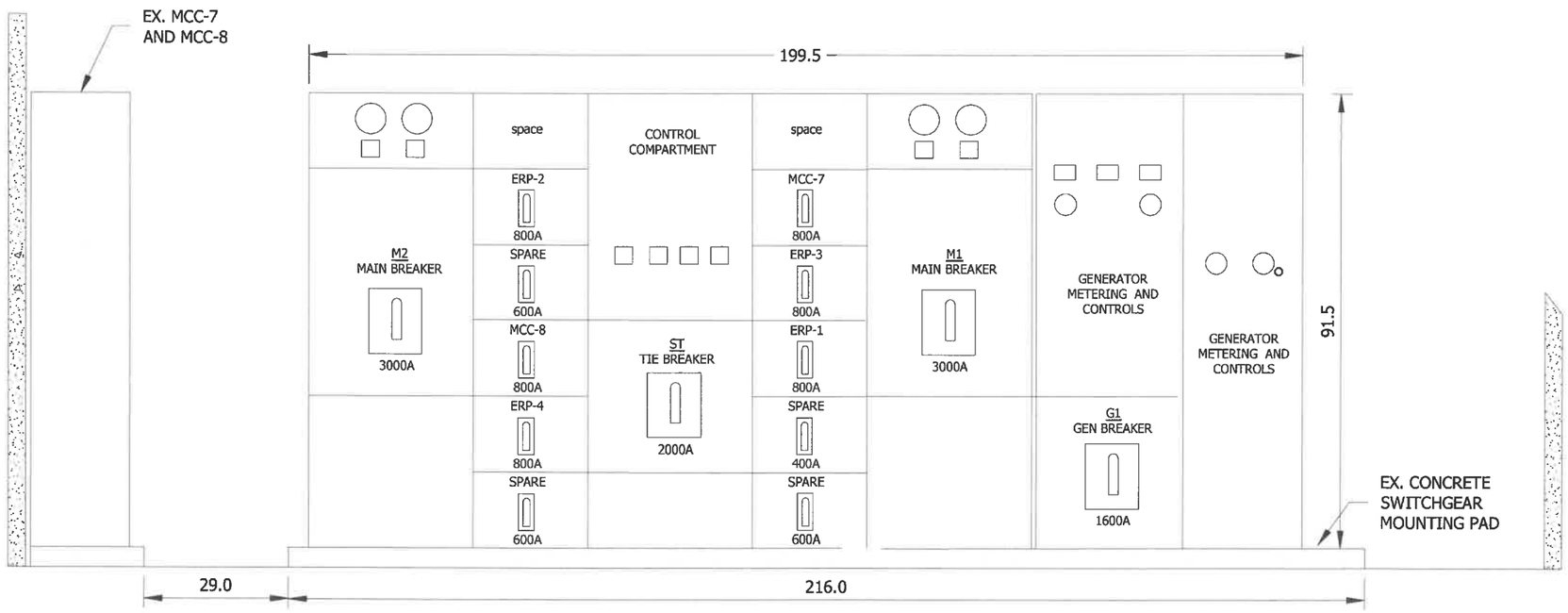


PROPOSED SWITCHGEAR ELEVATION

NOTES: (#)

1. REMOTE RACKING DEVICE TO BE SUPPLIED FOR DESIGNATED BREAKERS.
2. SEE SHOP DRAWINGS FOR ACTUAL CONSTRUCTION DETAILS.
3. SWITCHGEAR TO BE SCHNEIDER ELECTRIC "POWER ZONE 4" OR EATON "MAGNUM DS" DRAWOUT LOW VOLTAGE, M1 AND M2 TOP ENTRY, GEN1 BOTTOM ENTRY, SERVICE ENTRANCE RATED, 480VAC, 3PH, 4W, RATED UL 1066. CIRCUIT BREAKERS TO BE THROUGH-DOOR TYPE.
4. SEE SINGLE LINE DIAGRAM AND NETWORK DIAGRAM FOR DETAILS.
5. SWITCHGEAR DEPTH = 60".

SWGR1 - NAMEPLATES			
POSITION	PLATE COLOR / SIZE	TEXT COLOR / SIZE	ENGRAVING (L1|L2|L3)
1A	BLK /1.5"H x 4"W	WHT / .25"	AUXILIARY CABINET #1
1BC	BLK /1.5"H x 4"W	WHT / .25"	MAIN C/B|M1
1D	BLK /1.5"H x 4"W	WHT / .25"	MCC-8 FEEDER C/B|F11
2A	BLK /1.5"H x 4"W	WHT / .25"	EFFLUENT REUSE PUMP #2|F12
2B	BLK /1.5"H x 4"W	WHT / .25"	EFFLUENT REUSE PUMP #4|F13
2C	BLK /1.5"H x 4"W	WHT / .25"	SPARE FEEDER C/B|F14
2D	BLK /1.5"H x 4"W	WHT / .25"	SPARE FEEDER C/B|F15
3A	BLK /1.5"H x 4"W	WHT / .25"	SPARE FEEDER C/B|F16
3BC	BLK /1.5"H x 4"W	WHT / .25"	TIE C/B|TIE
3D	BLK /1.5"H x 4"W	WHT / .25"	MCC-7 FEEDER C/B|F21
4A	BLK /1.5"H x 4"W	WHT / .25"	EFFLUENT REUSE PUMP #1|F22
4B	BLK /1.5"H x 4"W	WHT / .25"	EFFLUENT REUSE PUMP #3|F23
4C	BLK /1.5"H x 4"W	WHT / .25"	LOAD BANK #1 FEEDER C/B|F24
4D	BLK /1.5"H x 4"W	WHT / .25"	LOAD BANK #2 FEEDER C/B|F25
5A	BLK /1.5"H x 4"W	WHT / .25"	AUXILIARY CABINET #2
5BC	BLK /1.5"H x 4"W	WHT / .25"	MAIN C/B|M2
5D	BLK /1.5"H x 4"W	WHT / .25"	GENERATOR #1 C/B|GEN1



EXISTING SWITCHGEAR ELEVATION

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SWGR-1 ELEVATION

SHEET NUMBER
E05

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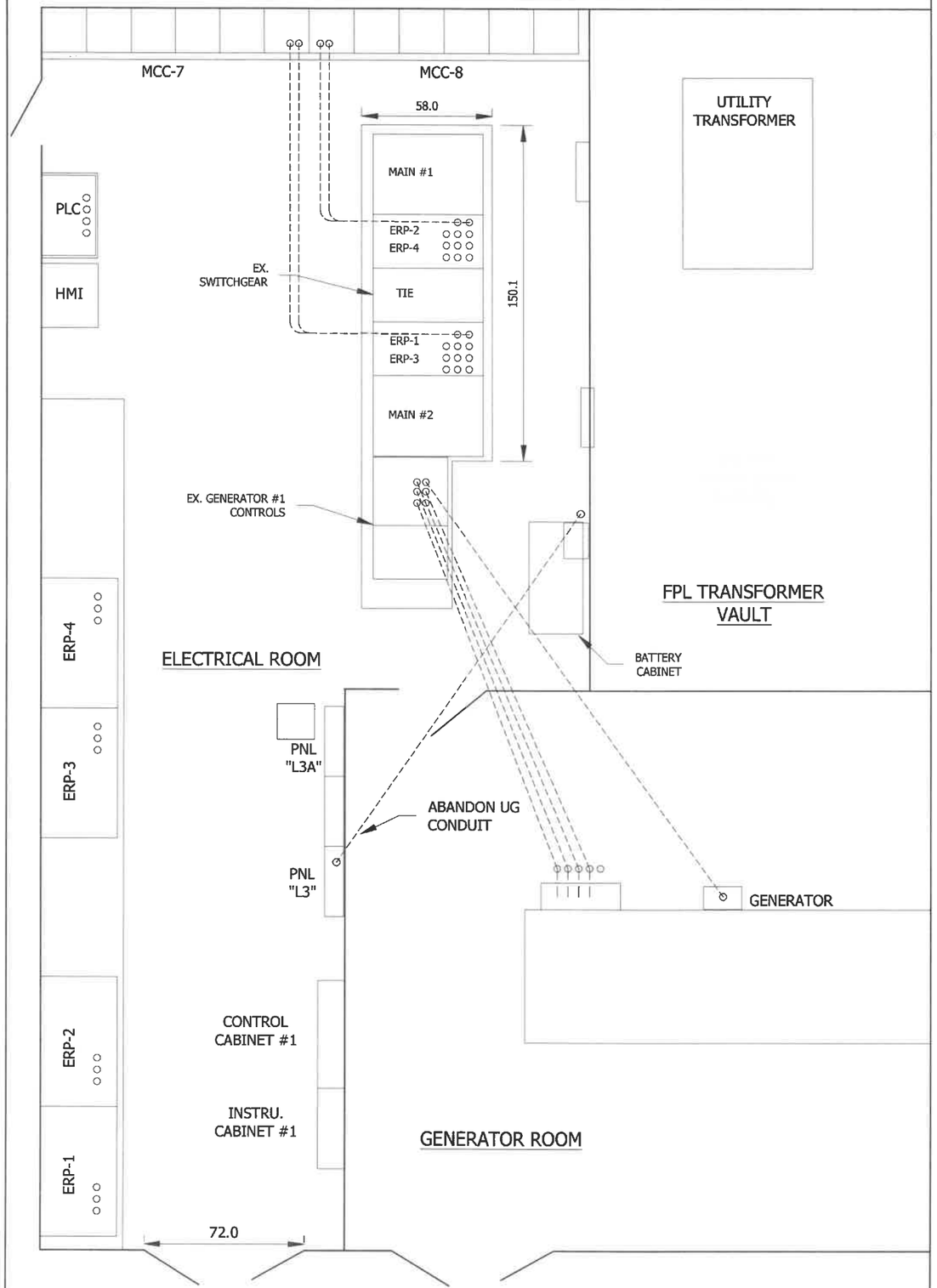
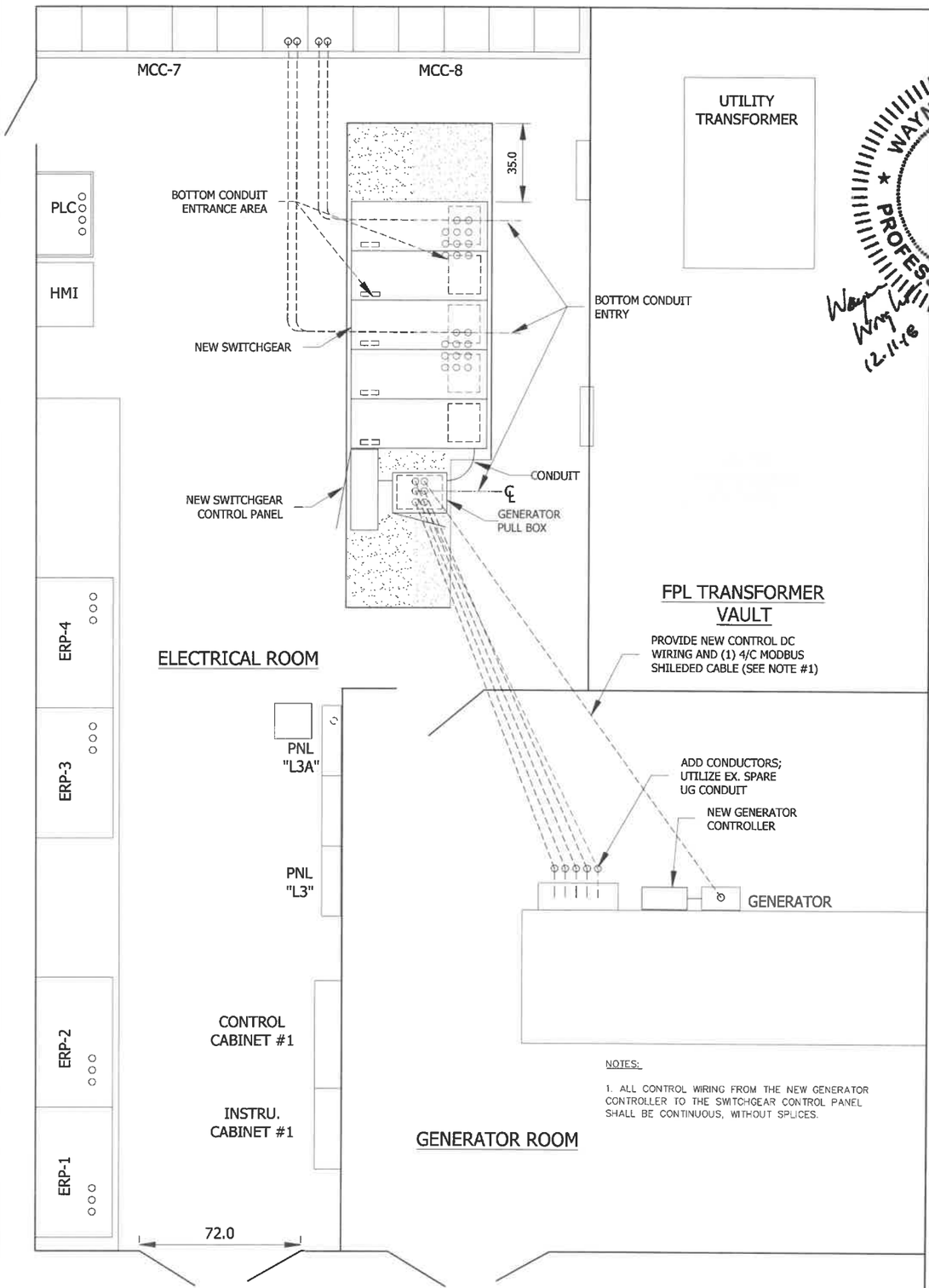
EXISTING SWITCHGEAR UNDERGROUND CONDUIT



PROPOSED SWITCHGEAR UNDERGROUND CONDUIT



NOTES:

1. ALL CONTROL WIRING FROM THE NEW GENERATOR CONTROLLER TO THE SWITCHGEAR CONTROL PANEL SHALL BE CONTINUOUS, WITHOUT SPLICES.

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FLORIDA
PROFESSIONAL ENGINEER
12-11-18

CITY OF NAPLES FLORIDA ON THE GULF

City of Naples

CITY OF NAPLES WWTP
SWITCHGEAR REPLACEMENT
CONSTRUCTION PLANS
CITY OF NAPLES
NAPLES, FL

REVISIONS

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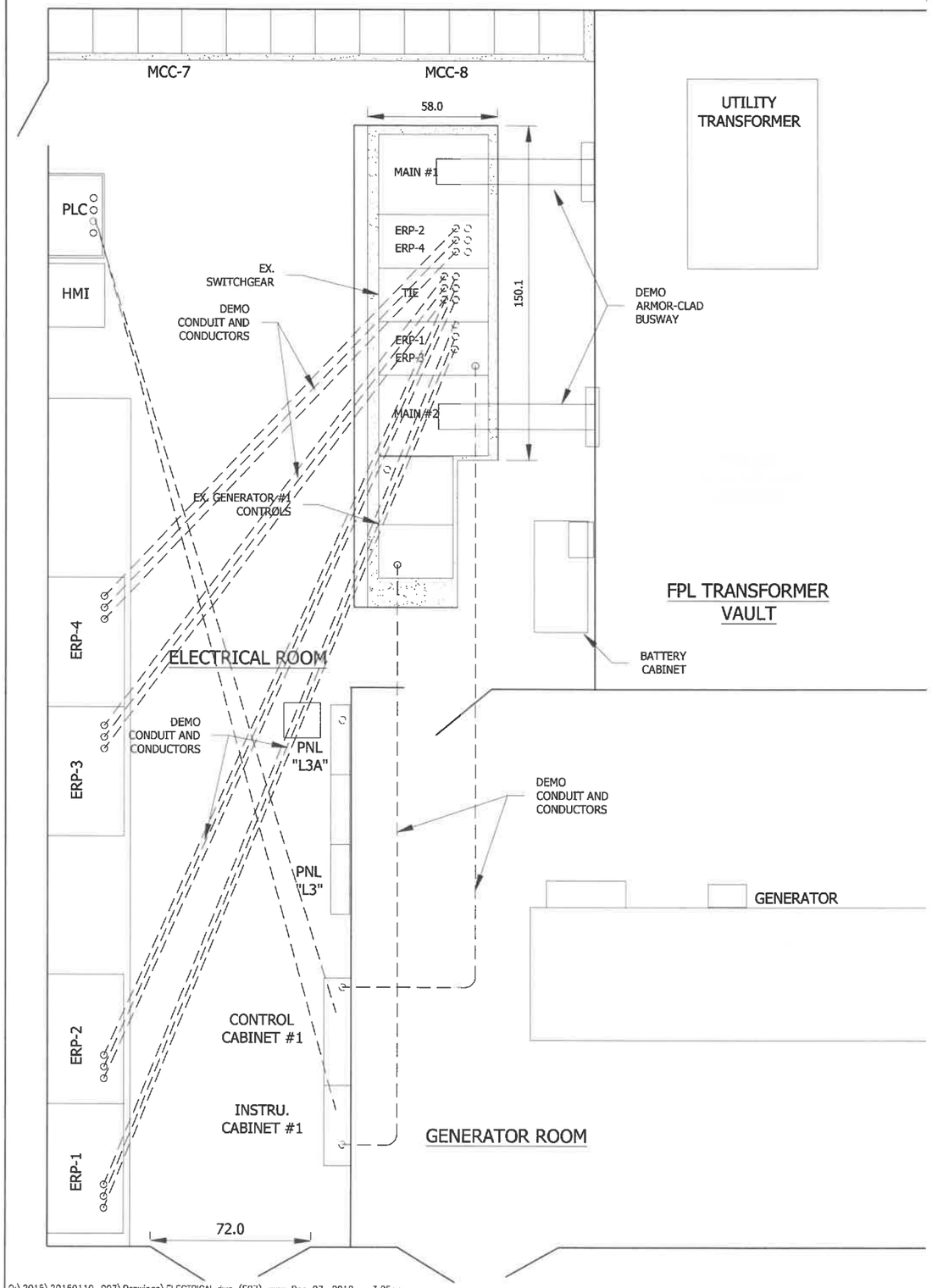
SCALE:	1" = 60'

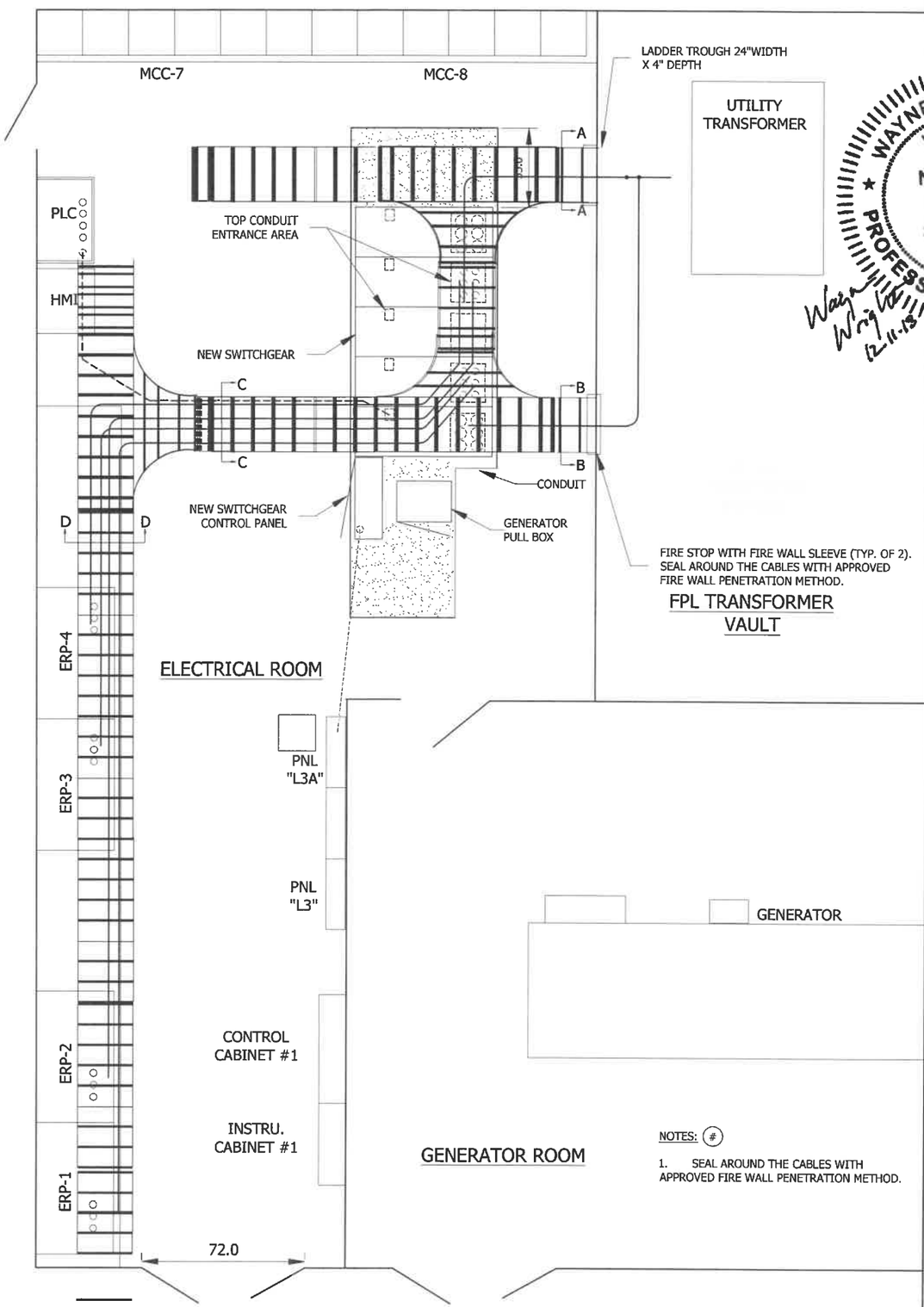
SWGR-1 U.G. CONDUIT PLAN

SHEET NUMBER
E06

EXISTING SWITCHGEAR ABOVE GROUND CONDUIT



PROPOSED SWITCHGEAR WITH TWO LEVEL LADDER TROUGH



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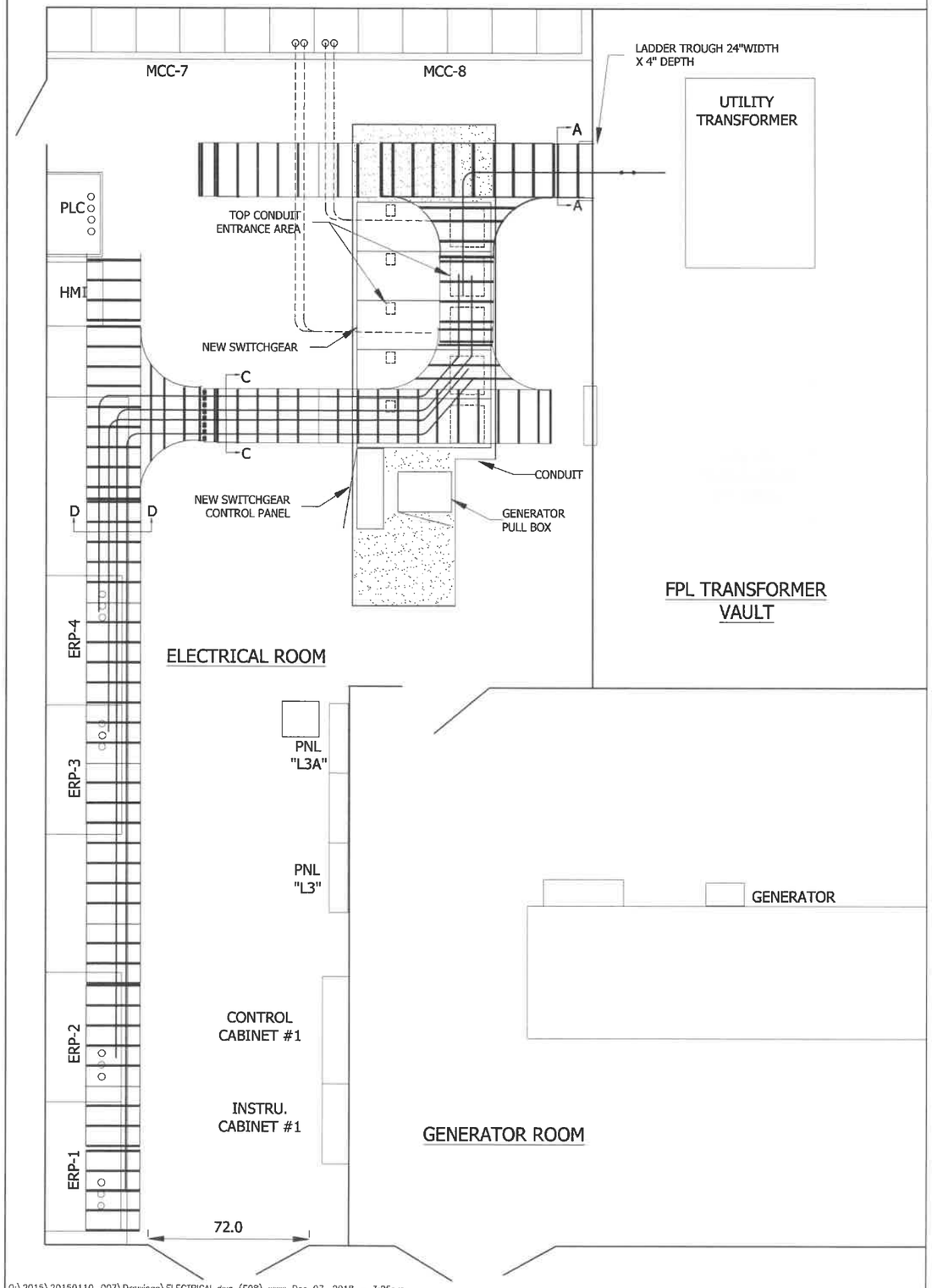
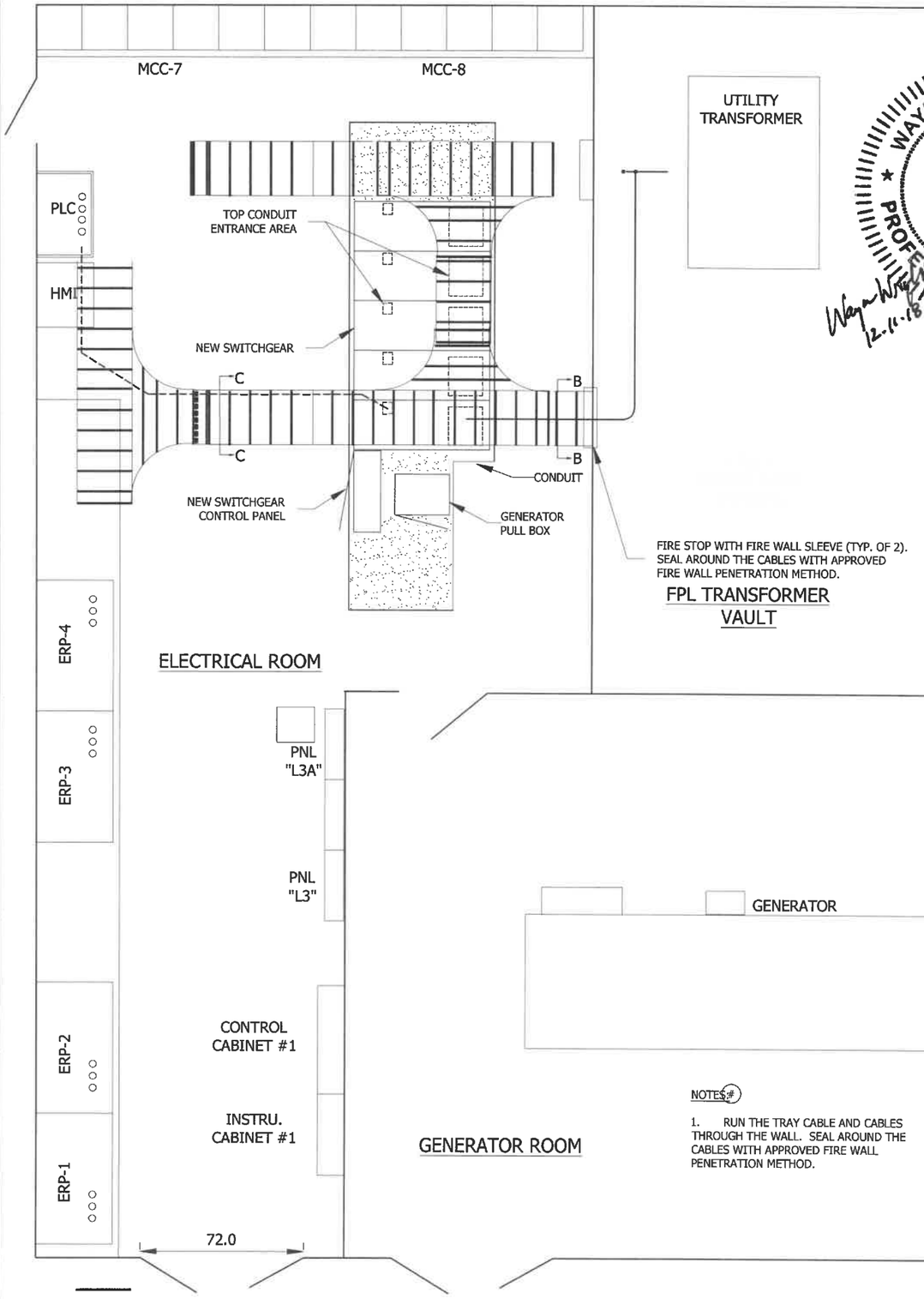
SWGR-1 AG CONDUIT AND TROUGH PLAN

SHEET NUMBER
E07

PROPOSED SWITCHGEAR WITH UPPER LEVEL LADDER TROUGH



PROPOSED SWITCHGEAR WITH LOWER LEVEL LADDER TROUGH



NOTES:

1. RUN THE TRAY CABLE AND CABLES THROUGH THE WALL. SEAL AROUND THE CABLES WITH APPROVED FIRE WALL PENETRATION METHOD.

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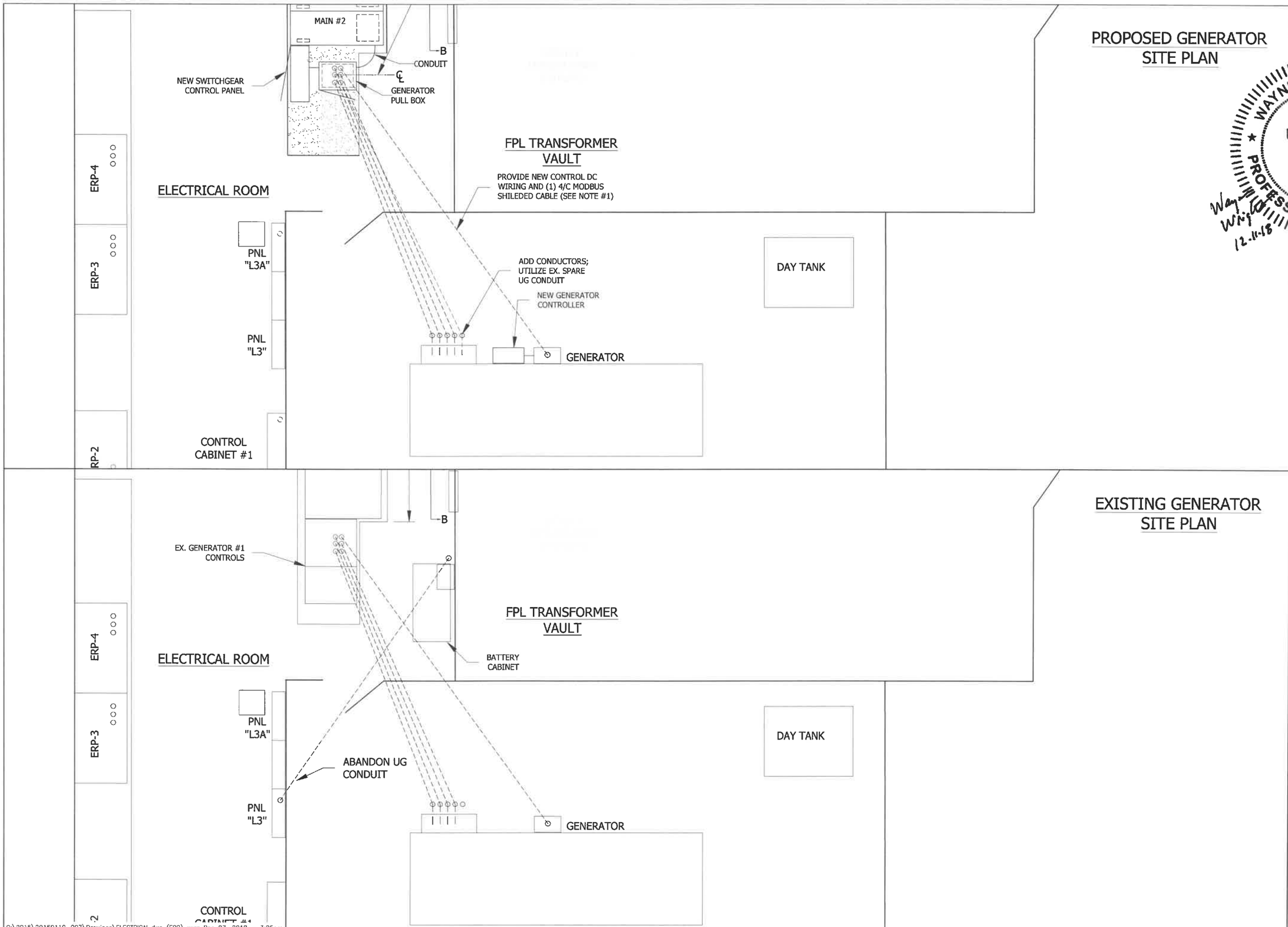
SWGR-1 AG CONDUIT AND TROUGH PLAN

SHEET NUMBER

E08



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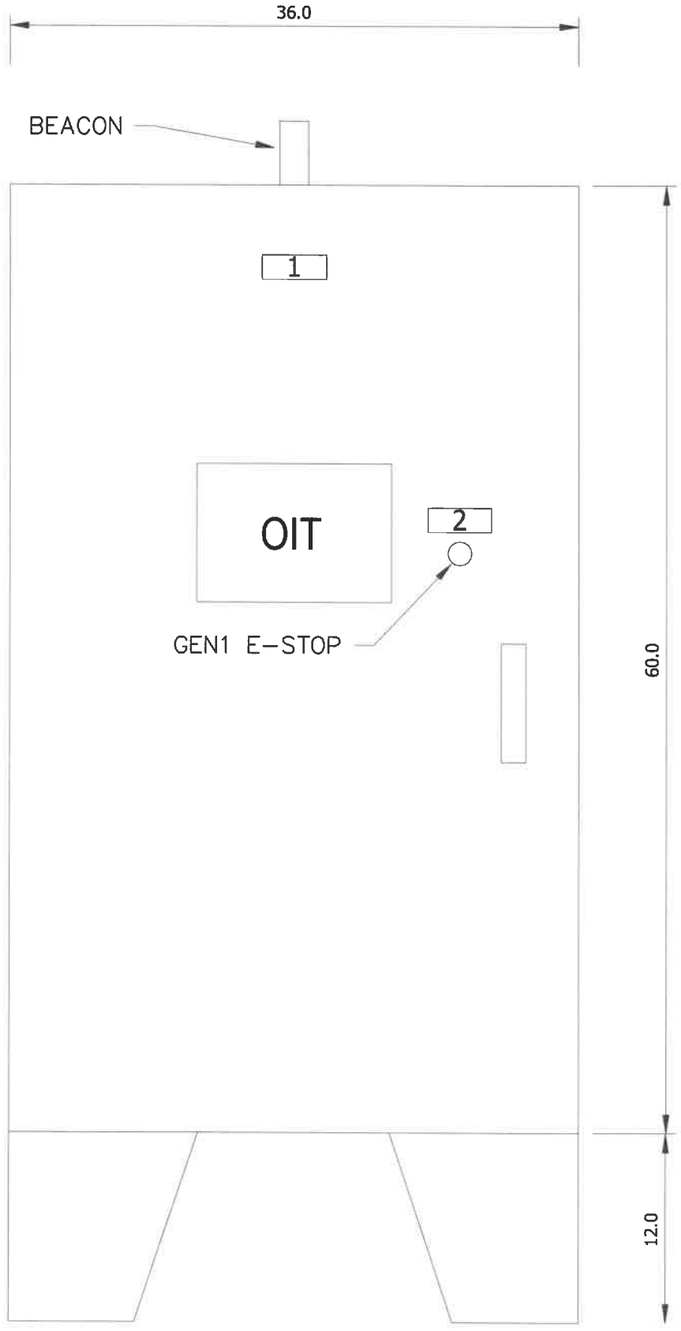
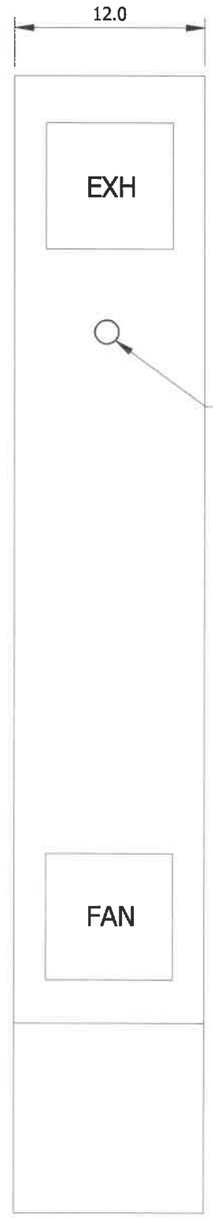
GENERATOR #1 SITE PLAN

SHEET NUMBER

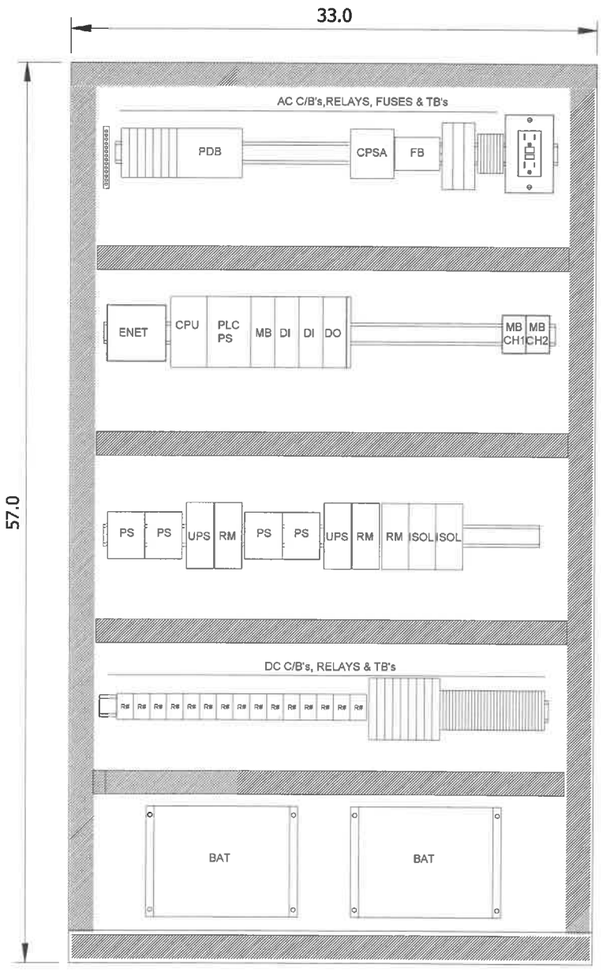
E09



EXTERIOR VIEW



RIGHT SIDE VIEW



INTERIOR VIEW

CP-SWGR1 - NAMEPLATES			
POSITION	PLATE COLOR / SIZE	TEXT COLOR / SIZE	ENGRAVING (L1|L2|L3)
1	BLK /1.5"H x 4"W	WHT / .25"	SWITCHGEAR-1 CONTROL PANEL
2	BLK /1"H x 3"W	WHT / .25"	GEN #1 E-STOP

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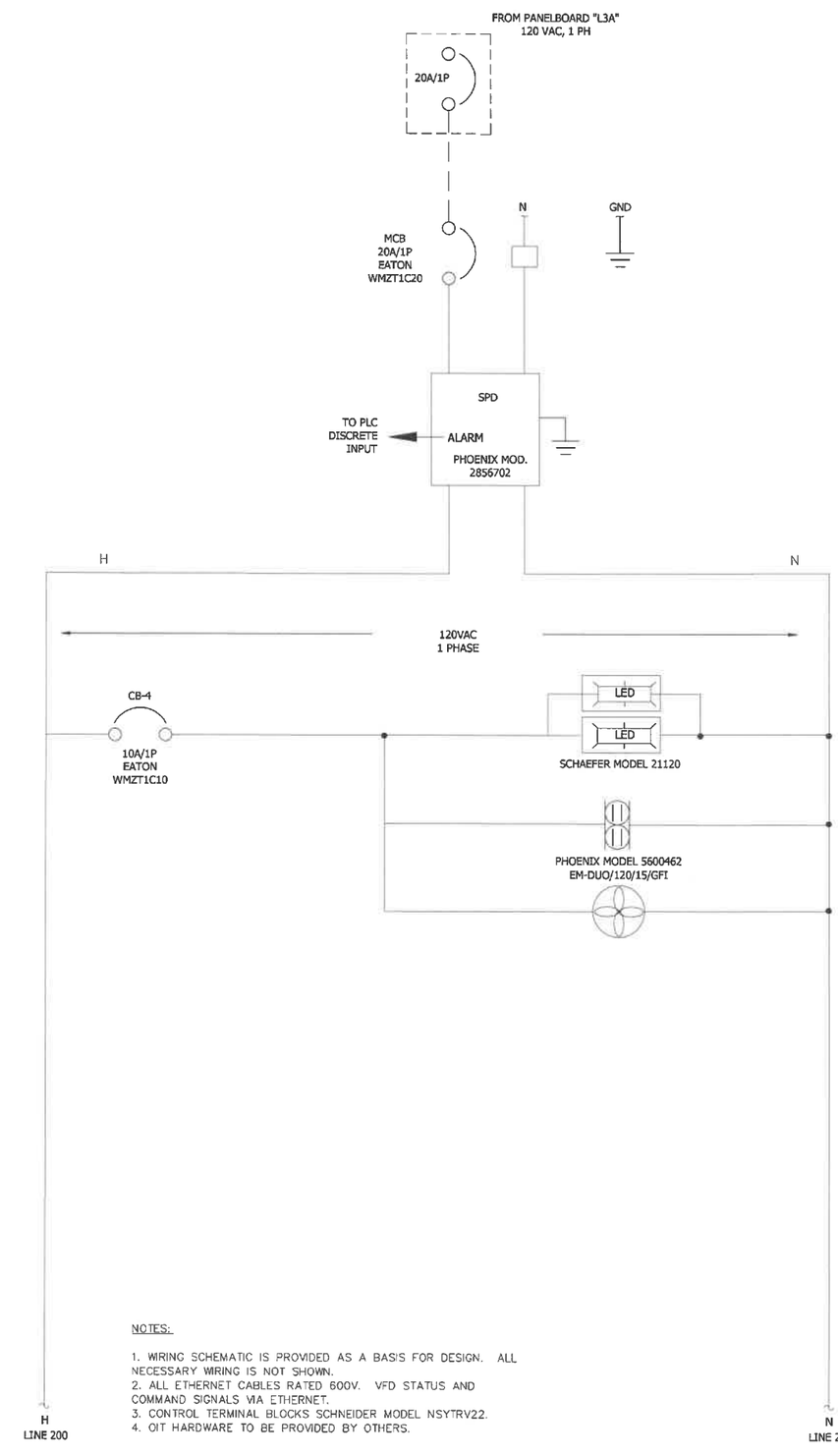
CP-SWGR-1 CONTROL PANEL LAYOUT

SHEET NUMBER

E10



NOTES:

1. WIRING SCHEMATIC IS PROVIDED AS A BASIS FOR DESIGN. ALL NECESSARY WIRING IS NOT SHOWN.
2. ALL ETHERNET CABLES RATED 600V. VFD STATUS AND COMMAND SIGNALS VIA ETHERNET.
3. CONTROL TERMINAL BLOCKS SCHNEIDER MODEL NSYTRV22.
4. OIT HARDWARE TO BE PROVIDED BY OTHERS.

		SWGR1 CP I/O LIST		
	PT	DESCRIPTION	DEVICE	NOTES
PROSOFT MVI69E-MBS		MODBUS MODULE SLOT 1		
	ETH			
	P1	MODBUS #1	PLC	MODBUS 4W RS-485
	P2	MODBUS #2	PLC	MODBUS 4W RS-486
AB 1769-IQ16		DISCRETE INPUTS SLOT 2		
	0	PANEL SPD ALARM	SPD	FAILSAFE WIRING
	1	REDUNDANCY OK	RM-A	FAILSAFE WIRING
	2	REPLACE BATTERY	UPS-A	FAILSAFE WIRING
	3	BATTERY BUFFERING		FAILSAFE WIRING
	4	UPS READY		FAILSAFE WIRING
	5	REDUNDANCY OK	RM-B	FAILSAFE WIRING
	6	REPLACE BATTERY	UPS-B	FAILSAFE WIRING
	7	BATTERY BUFFERING		FAILSAFE WIRING
	8	UPS READY		FAILSAFE WIRING
	9	REDUNDANCY OK	RM-C	FAILSAFE WIRING
	10	SERVICE #1 POWER OK	PM1	FAILSAFE WIRING
	11	SERVICE #2 POWER OK	PM2	FAILSAFE WIRING
	12	GENERATOR #1 POWER OK	PM3	FAILSAFE WIRING
	13	spare		
	14	spare		
	15	spare		
AB 1769-IQ16		DISCRETE INPUTS SLOT 3		
	0	BREAKER M1 STATUS	M1 C/B	1 = CLOSED
	1	BREAKER M2 STATUS	M2 C/B	1 = CLOSED
	2	BREAKER GEN1 STATUS	GEN1 C/B	1 = CLOSED
	3	BREAKER TIE STATUS	TIE C/B	1 = CLOSED
	4	GEN #1 EMER. STOP PB	E-STOP	FAILSAFE WIRING
	5	GEN #1 RUNNING	GEN #1	
	6	GEN #1 NOT IN AUTO	GEN #1	
	7	GEN #1 READY TO LOAD	GEN #1	
	8	GEN #1 COMMON WARNING	GEN #1	
	9	GEN #1 COMMON ALARM	GEN #1	
	10	GEN #1 COMMON SHUTDOWN	GEN #1	
	11	spare		
	12	spare		
	13	spare		
	14	spare		
	15	spare		
AB 1769-OB16		DISCRETE OUTPUTS SLOT #4		
	0	BREAKER M1 SHUNT TRIP	M1 C/B	RELAY
	1	BREAKER M2 SHUNT TRIP	M2 C/B	RELAY
	2	BREAKER GEN1 SHUNT TRIP	GEN1 C/B	RELAY
	3	BREAKER TIE SHUNT TRIP	TIE C/B	RELAY
	4	GEN #1 START/STOP COMMAND	GEN #1	RELAY
	5	spare		RELAY
	6	spare		RELAY
	7	spare		RELAY
	8	spare		RELAY
	9	spare		RELAY
	10	spare		
	11	spare		
	12	spare		
	13	spare		
	14	BUZZER	HORN	
	15	BEACON	BEACON	

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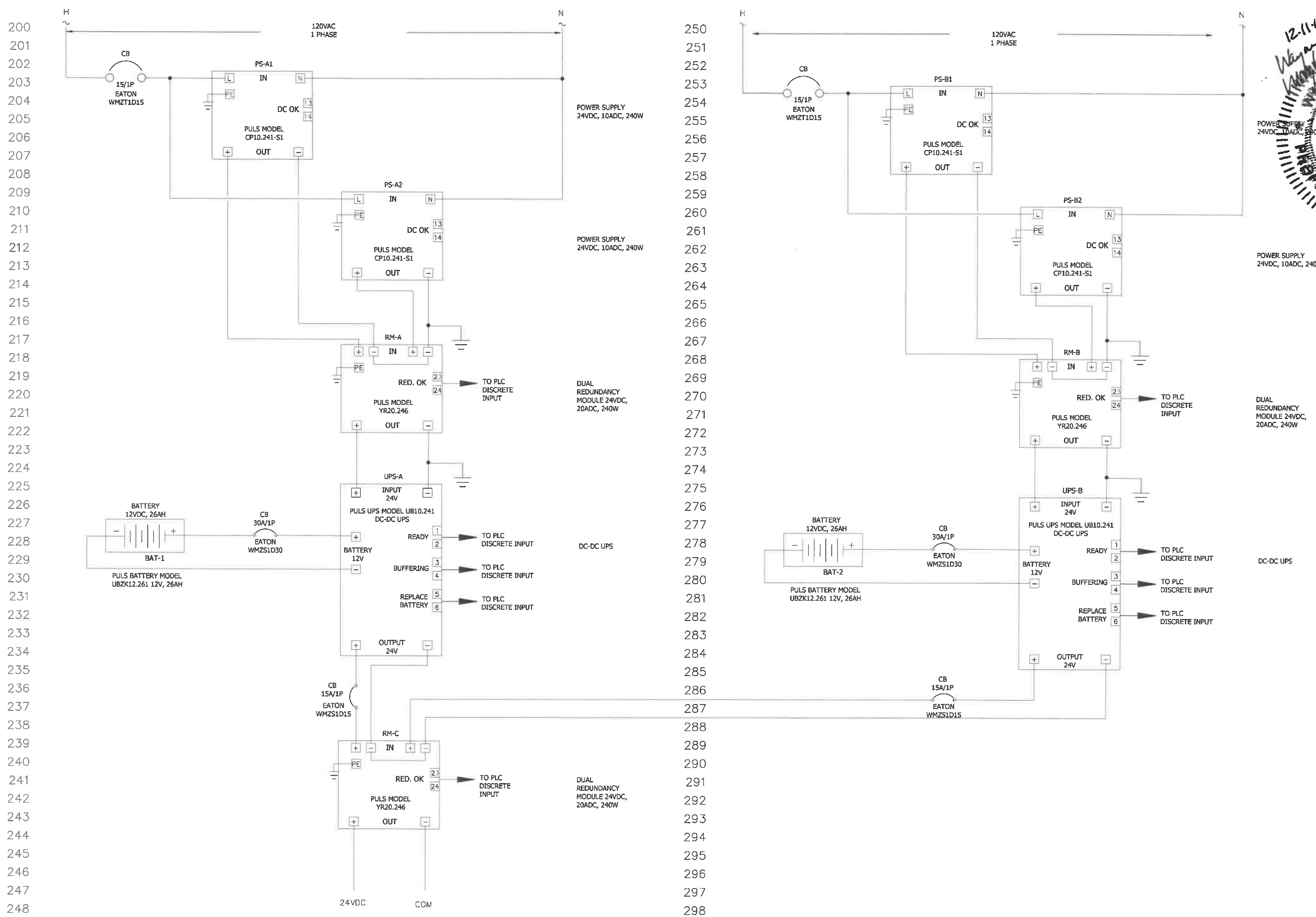
CP-SWGR-1 PANEL SWGR1 ELECTRICAL SCHEMATICS

SHEET NUMBER

E11



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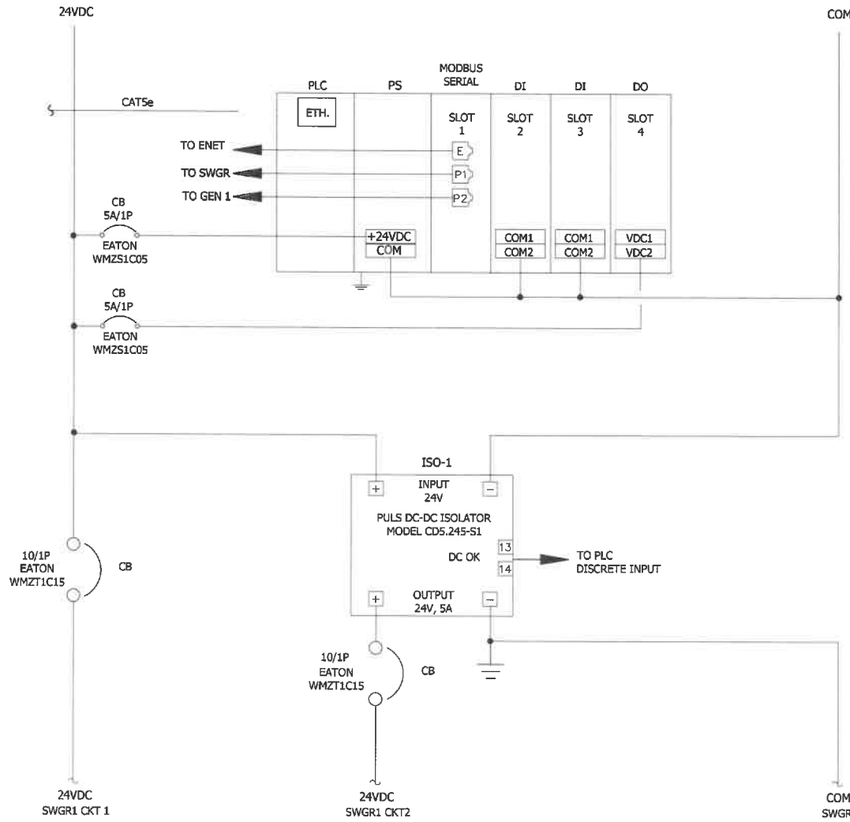
CP-SWGR-1 PANEL
SWGR1
ELECTRICAL
SCHEMATICS

SHEET NUMBER
E12

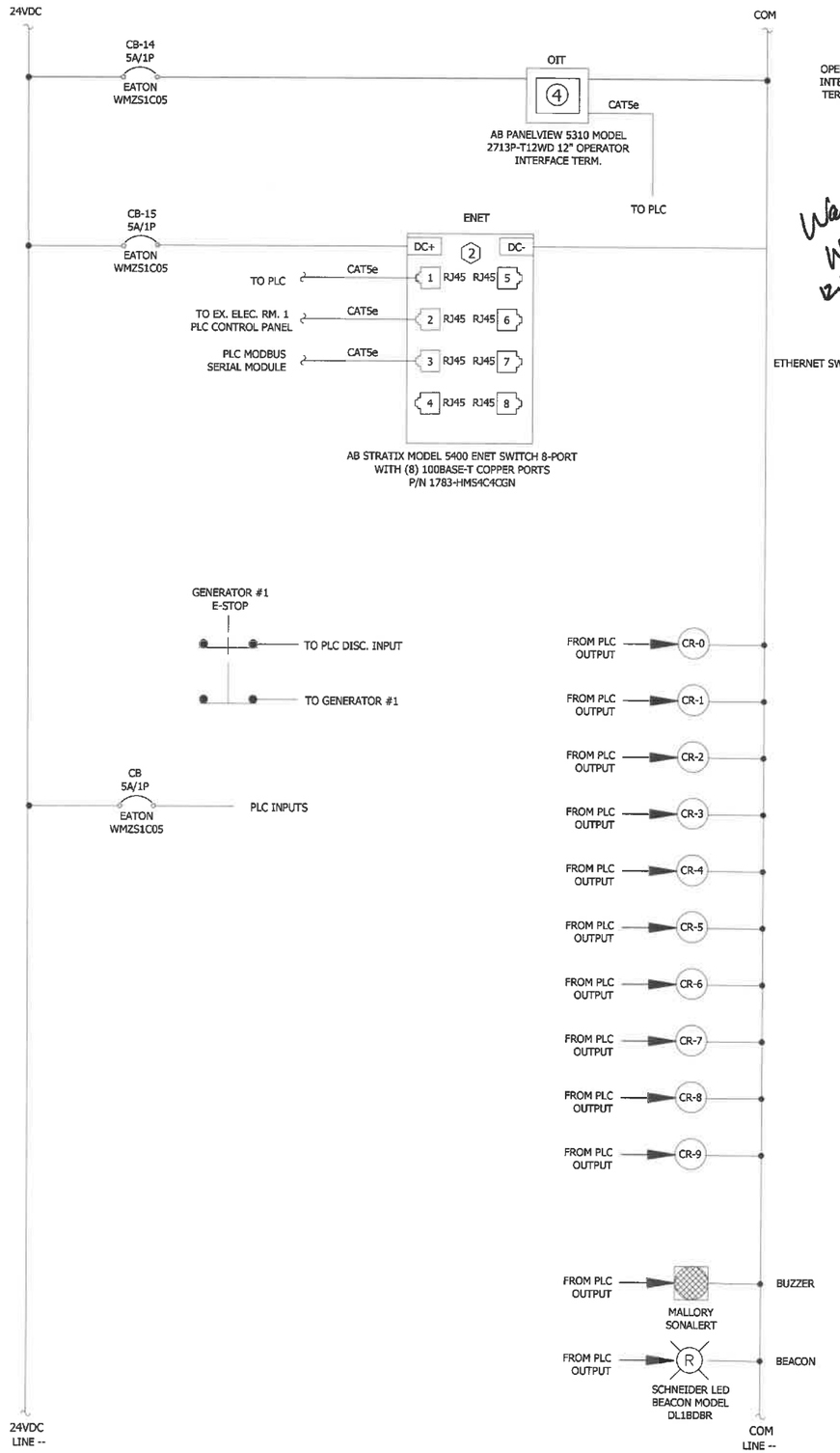


① PLC RACK
COMPACTLOGIX 1769-L3

PLC: 1769-L33ER
PS: 1769-PB2
SLOT 1: PROSOFT MVI69E-MBS
SLOT 2: 1769-IQ16
SLOT 3: 1769-IQ16
SLOT 4: 1769-OB16

NOTES:

1. PLC HARDWARE TO BE PROVIDED BY OTHERS.



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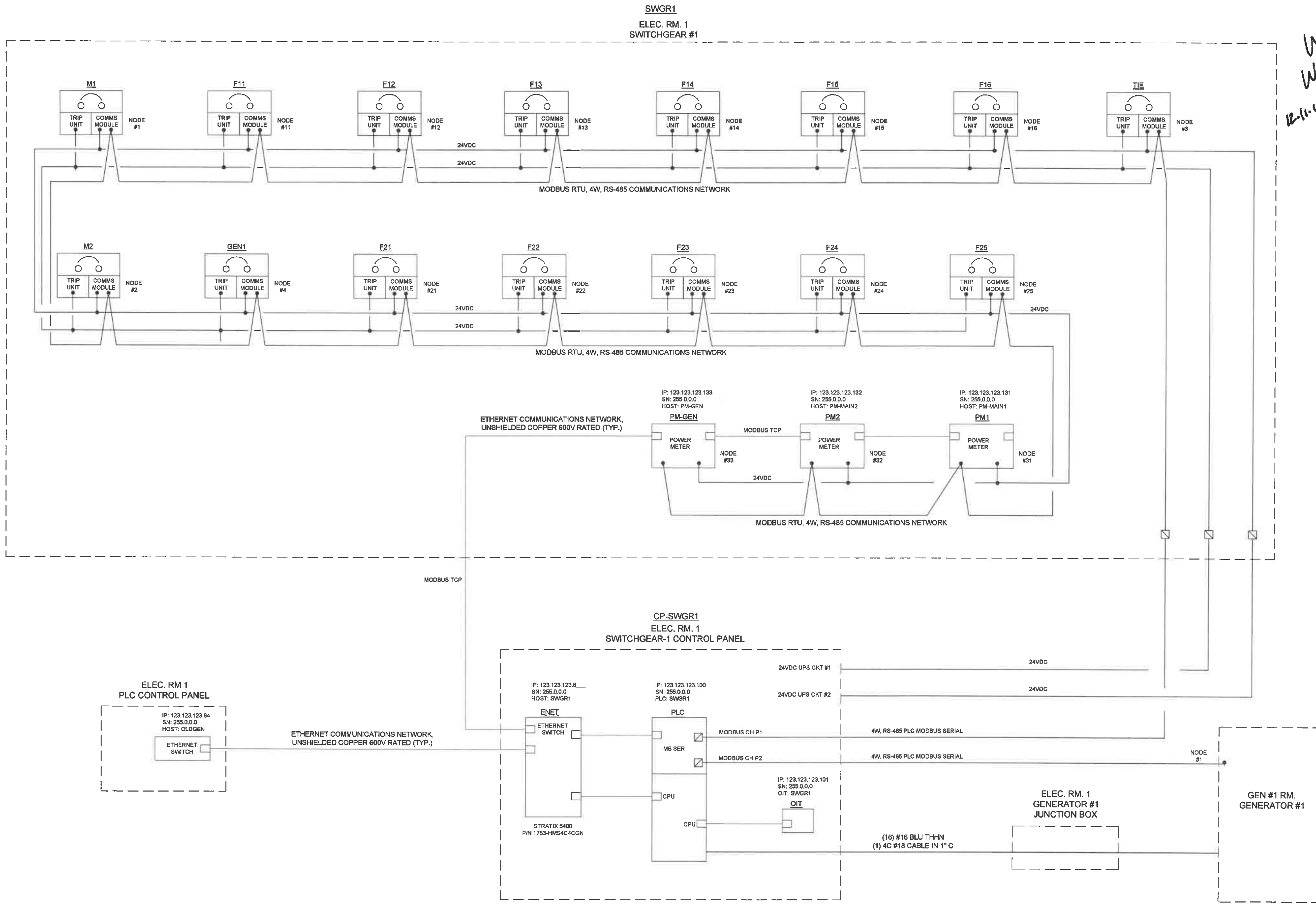
CP-SWGR-1 PANEL
SWGR1 ELECTRICAL
SCHEMATICS

SHEET NUMBER
E13

NOTES: (##)

1. ETHERNET CABLES TO BE 600V RATED, CAT 5e, 24AWG, SHIELDED TWISTED BONDED PAIRS, BELDEN #7958A, OR EQ.
2. MODBUS CABLE 4C #18 SHIELDED. ALL MODBUS DEVICES TO BE CONFIGURED AS SLAVES.



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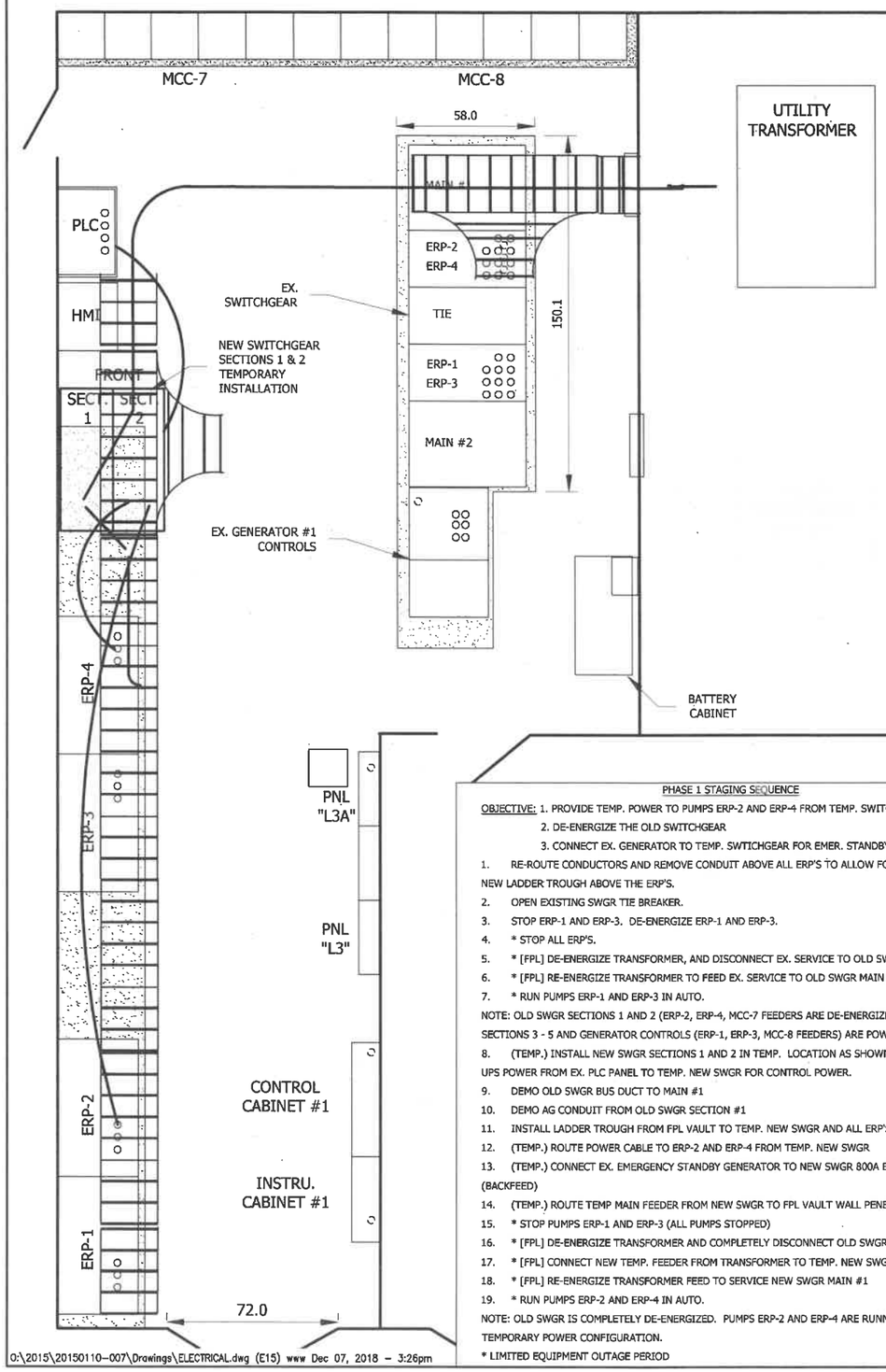
SWGR-1 NETWORK AND INTERCONNECTION DIAGRAM

SHEET NUMBER

E14

SWITCHGEAR CONSTRUCTION STAGING PLAN - PHASE 1



PHASE 1 STAGING SEQUENCE

OBJECTIVE: 1. PROVIDE TEMP. POWER TO PUMPS ERP-2 AND ERP-4 FROM TEMP. SWITCHGEAR
2. DE-ENERGIZE THE OLD SWITCHGEAR
3. CONNECT EX. GENERATOR TO TEMP. SWTICHGEAR FOR EMER. STANDBY POWER

1. RE-ROUTE CONDUCTORS AND REMOVE CONDUIT ABOVE ALL ERP'S TO ALLOW FOR PLACEMENT OF NEW LADDER TROUGH ABOVE THE ERP'S.
2. OPEN EXISTING SWGR TIE BREAKER.
3. STOP ERP-1 AND ERP-3. DE-ENERGIZE ERP-1 AND ERP-3.
4. * STOP ALL ERP'S.
5. * [FPL] DE-ENERGIZE TRANSFORMER, AND DISCONNECT EX. SERVICE TO OLD SWGR MAIN #1 ONLY
6. * [FPL] RE-ENERGIZE TRANSFORMER TO FEED EX. SERVICE TO OLD SWGR MAIN #2
7. * RUN PUMPS ERP-1 AND ERP-3 IN AUTO.

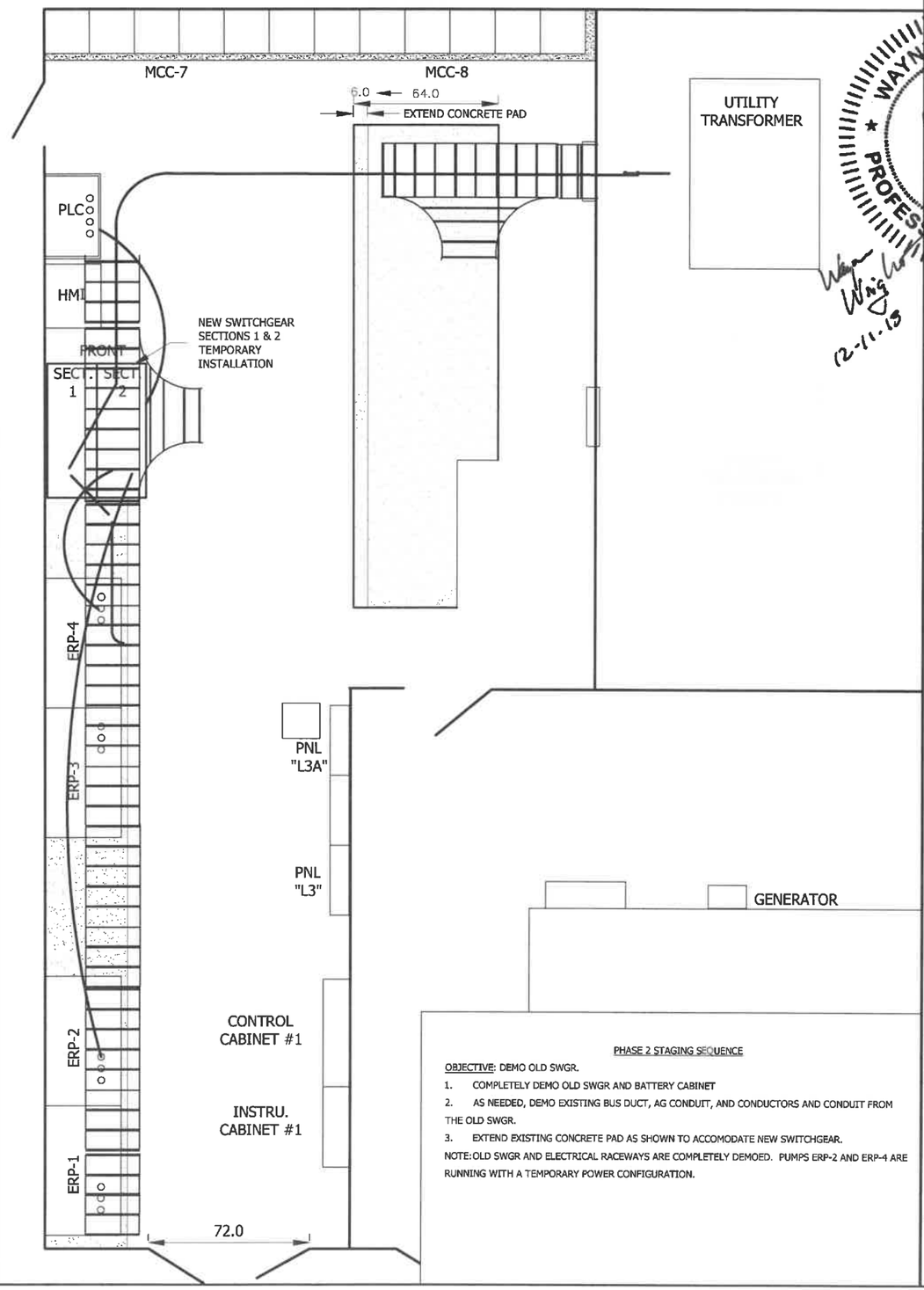
NOTE: OLD SWGR SECTIONS 1 AND 2 (ERP-2, ERP-4, MCC-7 FEEDERS ARE DE-ENERGIZED). OLD SWGR SECTIONS 3 - 5 AND GENERATOR CONTROLS (ERP-1, ERP-3, MCC-8 FEEDERS) ARE POWERED NORMALLY.

8. (TEMP.) INSTALL NEW SWGR SECTIONS 1 AND 2 IN TEMP. LOCATION AS SHOWN. ROUTE 24VDC UPS POWER FROM EX. PLC PANEL TO TEMP. NEW SWGR FOR CONTROL POWER.
9. DEMO OLD SWGR BUS DUCT TO MAIN #1
10. DEMO AG CONDUIT FROM OLD SWGR SECTION #1
11. INSTALL LADDER TROUGH FROM FPL VAULT TO TEMP. NEW SWGR AND ALL ERP'S
12. (TEMP.) ROUTE POWER CABLE TO ERP-2 AND ERP-4 FROM TEMP. NEW SWGR
13. (TEMP.) CONNECT EX. EMERGENCY STANDBY GENERATOR TO NEW SWGR 800A BREAKER (BACKFEED)
14. (TEMP.) ROUTE TEMP MAIN FEEDER FROM NEW SWGR TO FPL VAULT WALL PENETRATION
15. * STOP PUMPS ERP-1 AND ERP-3 (ALL PUMPS STOPPED)
16. * [FPL] DE-ENERGIZE TRANSFORMER AND COMPLETELY DISCONNECT OLD SWGR FROM SERVICE
17. * [FPL] CONNECT NEW TEMP. FEEDER FROM TRANSFORMER TO TEMP. NEW SWGR MAIN #1.
18. * [FPL] RE-ENERGIZE TRANSFORMER FEED TO SERVICE NEW SWGR MAIN #1
19. * RUN PUMPS ERP-2 AND ERP-4 IN AUTO.

NOTE: OLD SWGR IS COMPLETELY DE-ENERGIZED. PUMPS ERP-2 AND ERP-4 ARE RUNNING WITH A TEMPORARY POWER CONFIGURATION.

* LIMITED EQUIPMENT OUTAGE PERIOD

SWITCHGEAR CONSTRUCTION STAGING PLAN - PHASE 2



PHASE 2 STAGING SEQUENCE

OBJECTIVE: DEMO OLD SWGR.

1. COMPLETELY DEMO OLD SWGR AND BATTERY CABINET
2. AS NEEDED, DEMO EXISTING BUS DUCT, AG CONDUIT, AND CONDUCTORS AND CONDUIT FROM THE OLD SWGR.
3. EXTEND EXISTING CONCRETE PAD AS SHOWN TO ACCOMODATE NEW SWITCHGEAR.

NOTE: OLD SWGR AND ELECTRICAL RACEWAYS ARE COMPLETELY DEMOED. PUMPS ERP-2 AND ERP-4 ARE RUNNING WITH A TEMPORARY POWER CONFIGURATION.

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SWGR-1 CONSTRUCTION STAGING PLAN PH 1-2

SHEET NUMBER

E15

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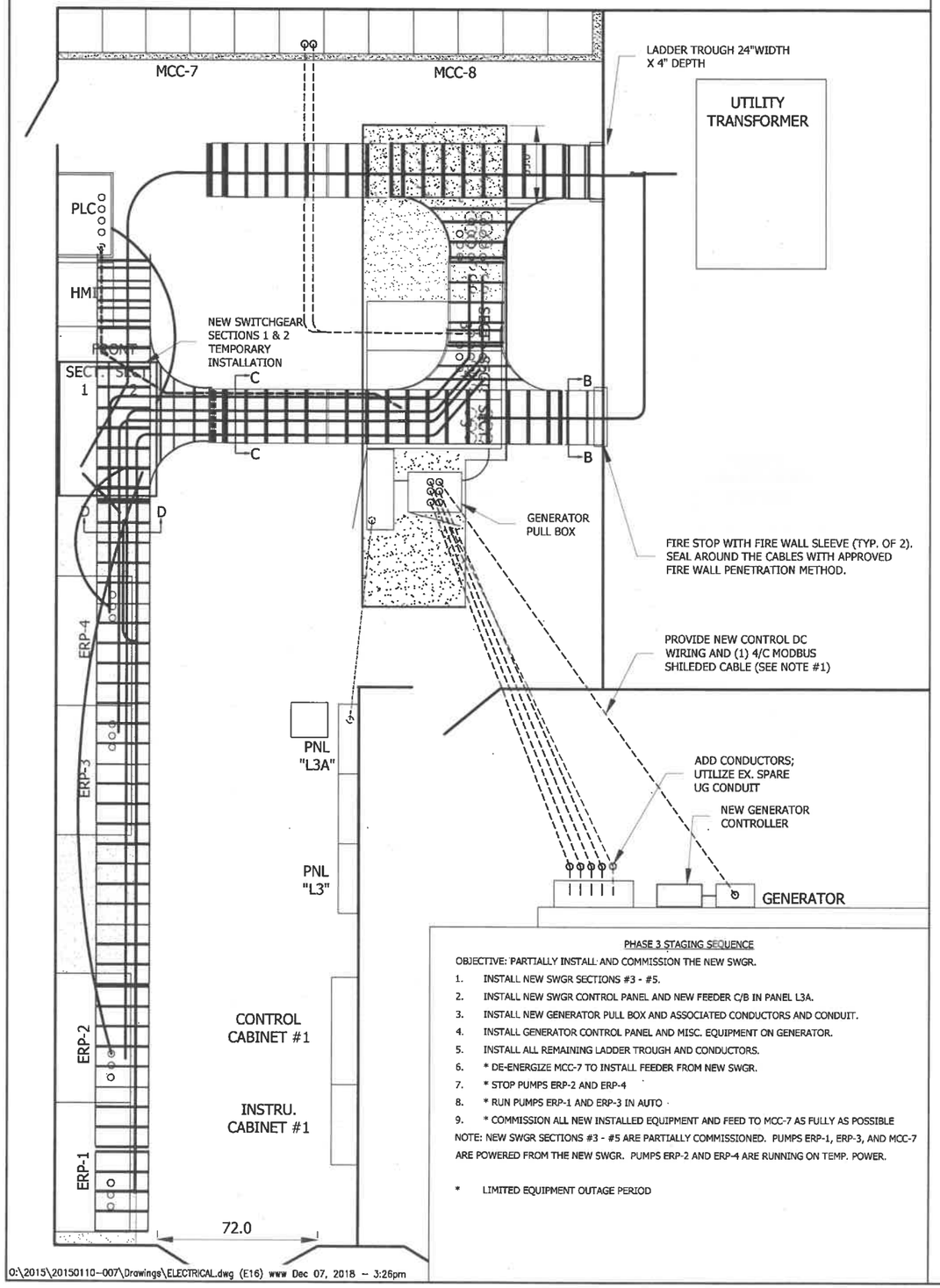
SWITCHGEAR CONSTRUCTION STAGING PLAN - PHASE 3



PHASE 3 STAGING SEQUENCE

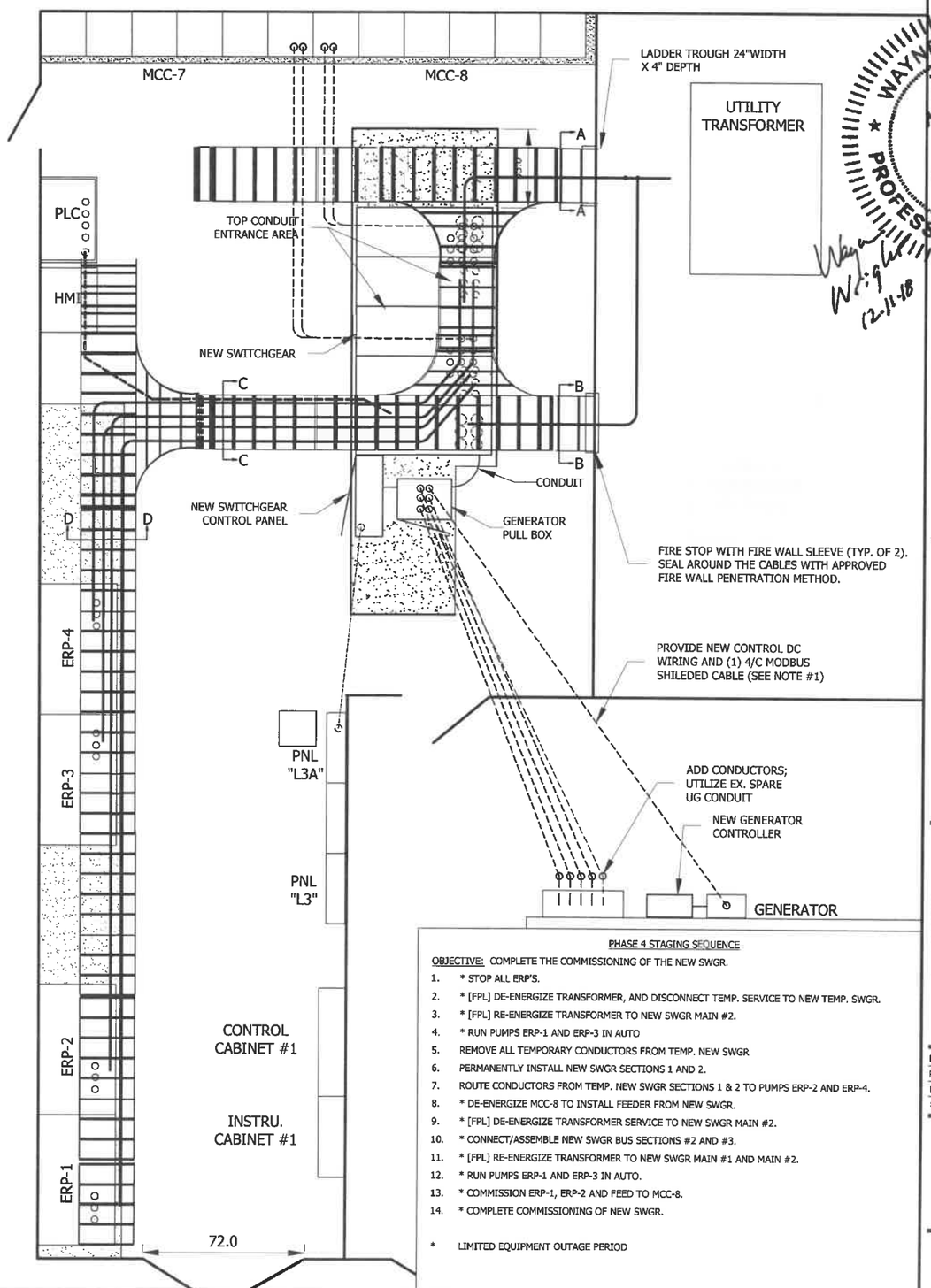
OBJECTIVE: PARTIALLY INSTALL AND COMMISSION THE NEW SWGR.

1. INSTALL NEW SWGR SECTIONS #3 - #5.
2. INSTALL NEW SWGR CONTROL PANEL AND NEW FEEDER C/B IN PANEL L3A.
3. INSTALL NEW GENERATOR PULL BOX AND ASSOCIATED CONDUCTORS AND CONDUIT.
4. INSTALL GENERATOR CONTROL PANEL AND MISC. EQUIPMENT ON GENERATOR.
5. INSTALL ALL REMAINING LADDER TROUGH AND CONDUCTORS.
6. * DE-ENERGIZE MCC-7 TO INSTALL FEEDER FROM NEW SWGR.
7. * STOP PUMPS ERP-2 AND ERP-4
8. * RUN PUMPS ERP-1 AND ERP-3 IN AUTO
9. * COMMISSION ALL NEW INSTALLED EQUIPMENT AND FEED TO MCC-7 AS FULLY AS POSSIBLE

NOTE: NEW SWGR SECTIONS #3 - #5 ARE PARTIALLY COMMISSIONED. PUMPS ERP-1, ERP-3, AND MCC-7 ARE POWERED FROM THE NEW SWGR. PUMPS ERP-2 AND ERP-4 ARE RUNNING ON TEMP. POWER.

* LIMITED EQUIPMENT OUTAGE PERIOD

SWITCHGEAR CONSTRUCTION STAGING PLAN - PHASE 4



PHASE 4 STAGING SEQUENCE

OBJECTIVE: COMPLETE THE COMMISSIONING OF THE NEW SWGR.

1. * STOP ALL ERP'S.
2. * [FPL] DE-ENERGIZE TRANSFORMER, AND DISCONNECT TEMP. SERVICE TO NEW TEMP. SWGR.
3. * [FPL] RE-ENERGIZE TRANSFORMER TO NEW SWGR MAIN #2.
4. * RUN PUMPS ERP-1 AND ERP-3 IN AUTO
5. REMOVE ALL TEMPORARY CONDUCTORS FROM TEMP. NEW SWGR
6. PERMANENTLY INSTALL NEW SWGR SECTIONS 1 AND 2.
7. ROUTE CONDUCTORS FROM TEMP. NEW SWGR SECTIONS 1 & 2 TO PUMPS ERP-2 AND ERP-4.
8. * DE-ENERGIZE MCC-8 TO INSTALL FEEDER FROM NEW SWGR.
9. * [FPL] DE-ENERGIZE TRANSFORMER SERVICE TO NEW SWGR MAIN #2.
10. * CONNECT/ASSEMBLE NEW SWGR BUS SECTIONS #2 AND #3.
11. * [FPL] RE-ENERGIZE TRANSFORMER TO NEW SWGR MAIN #1 AND MAIN #2.
12. * RUN PUMPS ERP-1 AND ERP-3 IN AUTO.
13. * COMMISSION ERP-1, ERP-2 AND FEED TO MCC-8.
14. * COMPLETE COMMISSIONING OF NEW SWGR.

* LIMITED EQUIPMENT OUTAGE PERIOD

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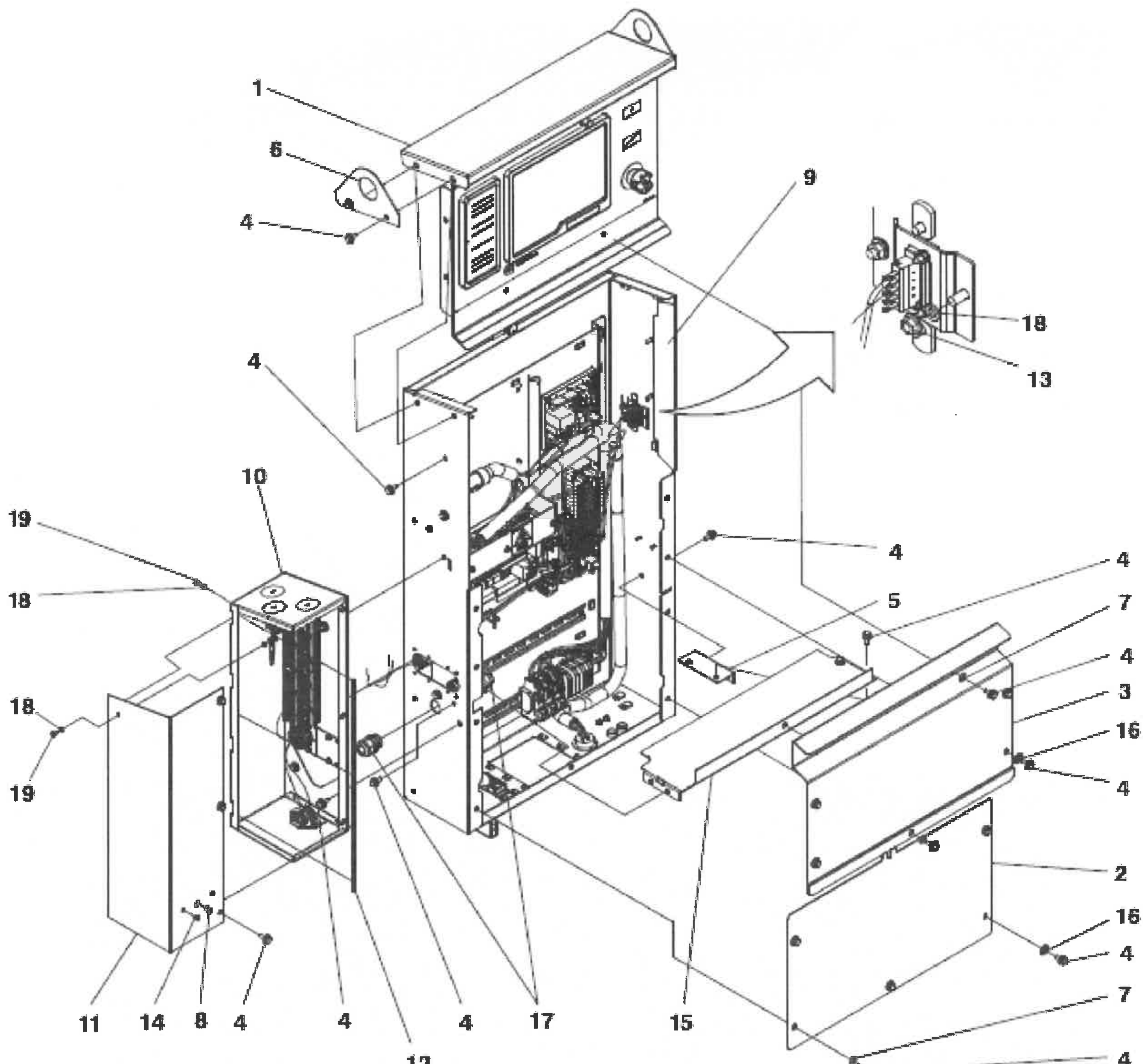
FILE NO.	03-50-25
SCALE:	########

SWGR-1 CONSTRUCTION STAGING PLAN PH 3-4

SHEET NUMBER

E16



NOTES: (#)

1. PROVIDE GENERATOR CONTROLLER CUMMINS PCC3300 CONTROL ASSEMBLY KIT. EXISTING GENSET BATTERY OPERATION IS 24 VDC.
2. PROVIDE CUMMINS MODEL 0541-1291 AUX101 BASE AND MODEL 0541-0772 AUX102 EXPANSION I/O MODULES.
3. GENSET CONTROLLER HARD-WIRED INPUTS FROM SWITCHGEAR CONTROL PANEL (AUX101):
   - REMOTE EMERGENCY STOP
   - REMOTE START/STOP
5. GENSET CONTROLLER HARD-WIRED OUTPUTS TO SWITCHGEAR CONTROL PANEL (AUX101):
   - GENSET RUNNING
   - NOT IN AUTO
   - READY TO LOAD
   - COMMON WARNING
   - COMMON ALARM
   - COMMON SHUTDOWN
6. CONTRACTOR IS RESPONSIBLE FOR CUMNMINS TECH SUPPORT, RELATED INSTRUMENTATION, INSTALLATION AND SUPPLIER COMMISSIONING.
7. GENSET MODBUS RS485 TO BE CONNECTED TO SWITCHGEAR CONTROL PANEL FOR MISC. SIGNALS.

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WAYNE WRIGHT LICENSE No. 58220 STATE OF FLORIDA PROFESSIONAL ENGINEER

Wayne Wright 12-11-18

City of Naples

CITY OF NAPLES WWTP
SWITCHGEAR REPLACEMENT
CONSTRUCTION PLANS
CITY OF NAPLES
NAPLES, FL

REVISIONS

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GEN-1 GENERATOR
#1 CONTROL PANEL

SHEET NUMBER
E17

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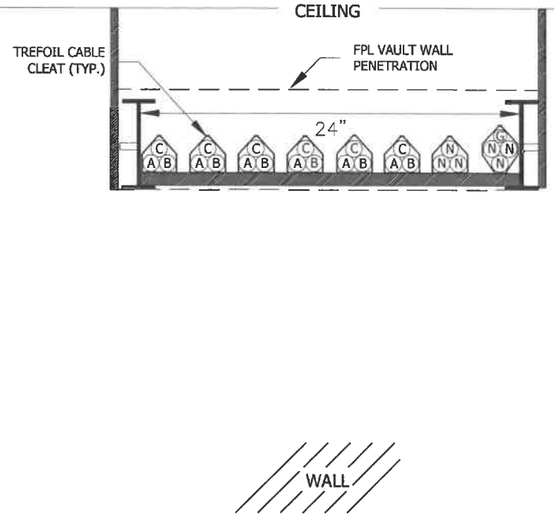
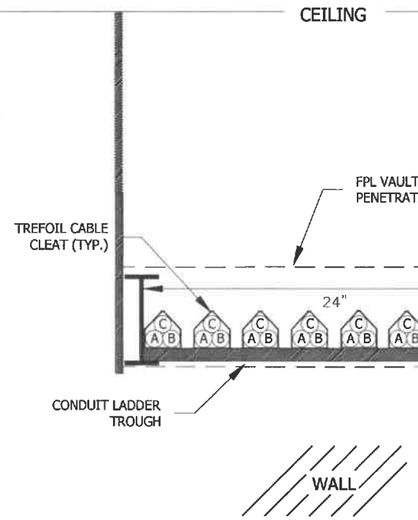


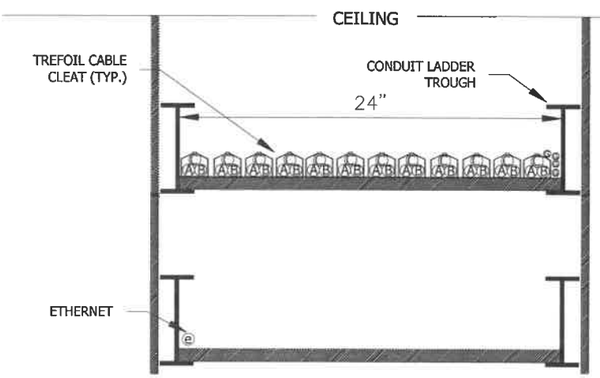
UPPER LADDER RACEWAY TROUGH
CABLE INSTALLATION ARRANGEMENT
SECTION A-A

NTS



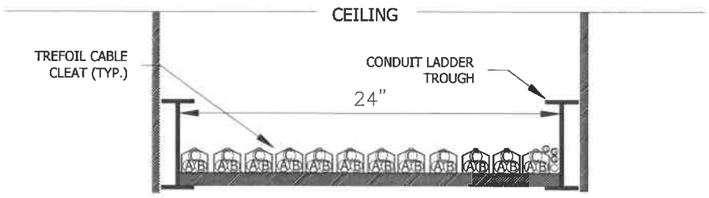
LOWER LADDER RACEWAY TROUGH
CABLE INSTALLATION ARRANGEMENT
SECTION B-B

NTS



UPPER LADDER RACEWAY TROUGH
CABLE INSTALLATION ARRANGEMENT
SECTION C-C

NTS



UPPER LADDER RACEWAY TROUGH
CABLE INSTALLATION ARRANGEMENT
SECTION D-D

NTS

NOTES:

1. LADDER TROUGH:

INSIDE WIDTH:	24"
MATERIAL:	ALUMINUM
RUNG SPACING:	9"
TROUGH TYPE:	LADDER
LOADING DEPTH:	4"
SIDE RAIL HEIGHT:	5"
WORKING LOAD:	75 LBS/FT. MIN.
MFR:	EATON B-LINE SERIES 25

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CITY OF NAPLES FLORIDA ON THE GULF

City of Naples

CITY OF NAPLES WWTP
SWITCHGEAR REPLACEMENT
CONSTRUCTION PLANS
CITY OF NAPLES
NAPLES, FL

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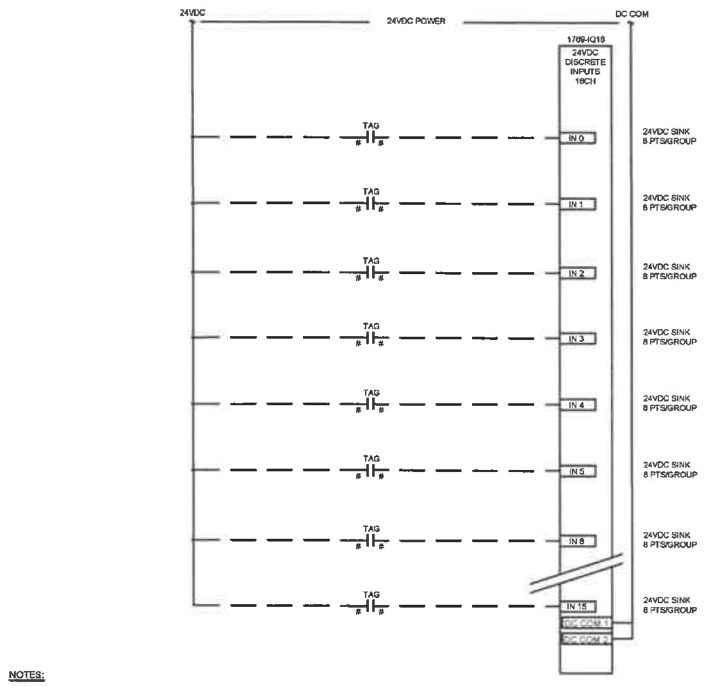
SCALE:	NONE

ELECTRICAL DETAILS

SHEET NUMBER

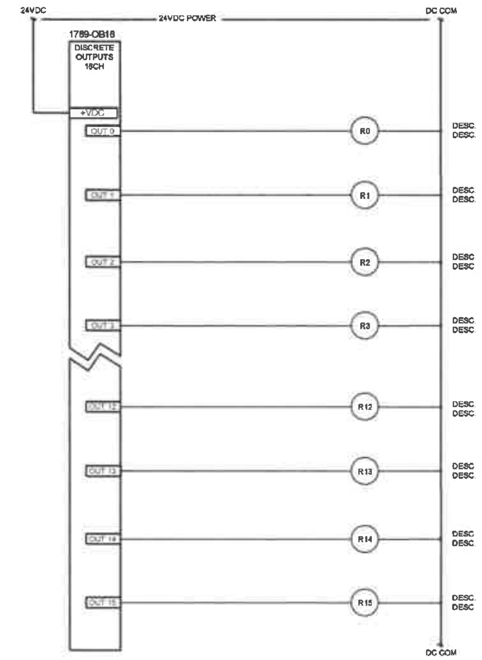
ED01



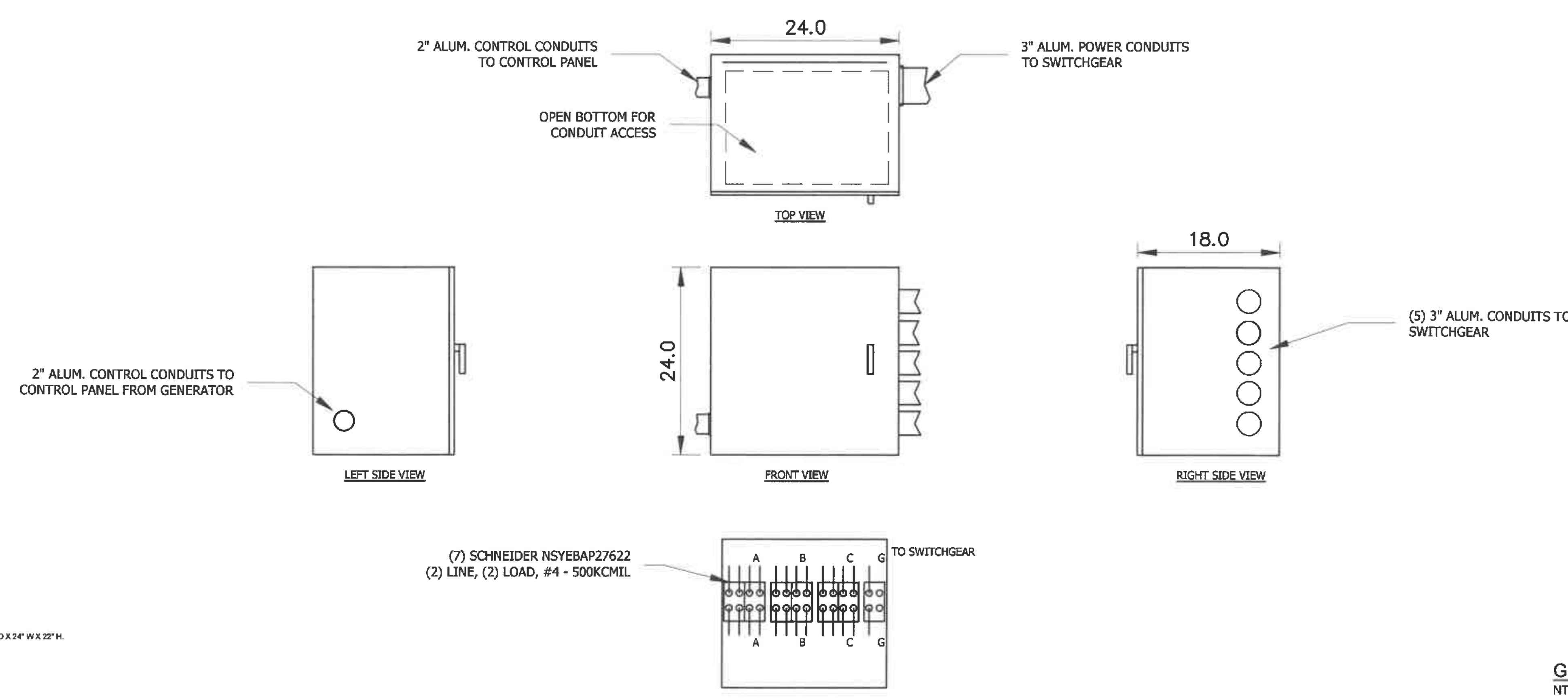
NOTES:

1. SURGE ARRESTORS INSTALLED ON ALL EXTERNAL CIRCUITS.
PHOENIX PT 2X1-24DC-ST 2-PT PLUG P/N 2856087 WITH P/N 2856139 BASE
PHOENIX PT 4X1-24DC-ST 4-PT PLUG P/N 2838322 WITH P/N 2839363 BASE
2. ALL EXTERNAL SIGNALS PROTECTED BY MINIATURE CIRCUIT BREAKERS, UNLESS NOTED.

16-CH 24VDC DISCRETE INPUT MODULE (TYP.)
1769-IQ16



16-CH DISCRETE OUTPUT MODULE (TYP.)
1769-OB16



NOTES:

1. GENERATOR PULL BOX DIMENSIONS APPROX. 18"D X 24" W X 22" H.

GENERATOR PULL BOX
NTS

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REVISIONS		
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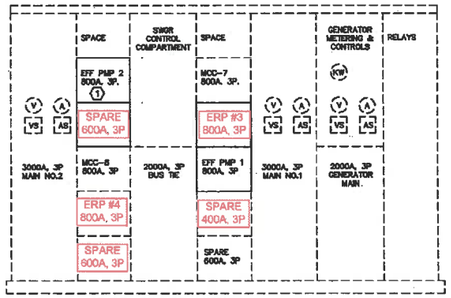
FILE NO.	03-50-25
SCALE:	NONE

ELECTRICAL DETAILS

SHEET NUMBER
ED02



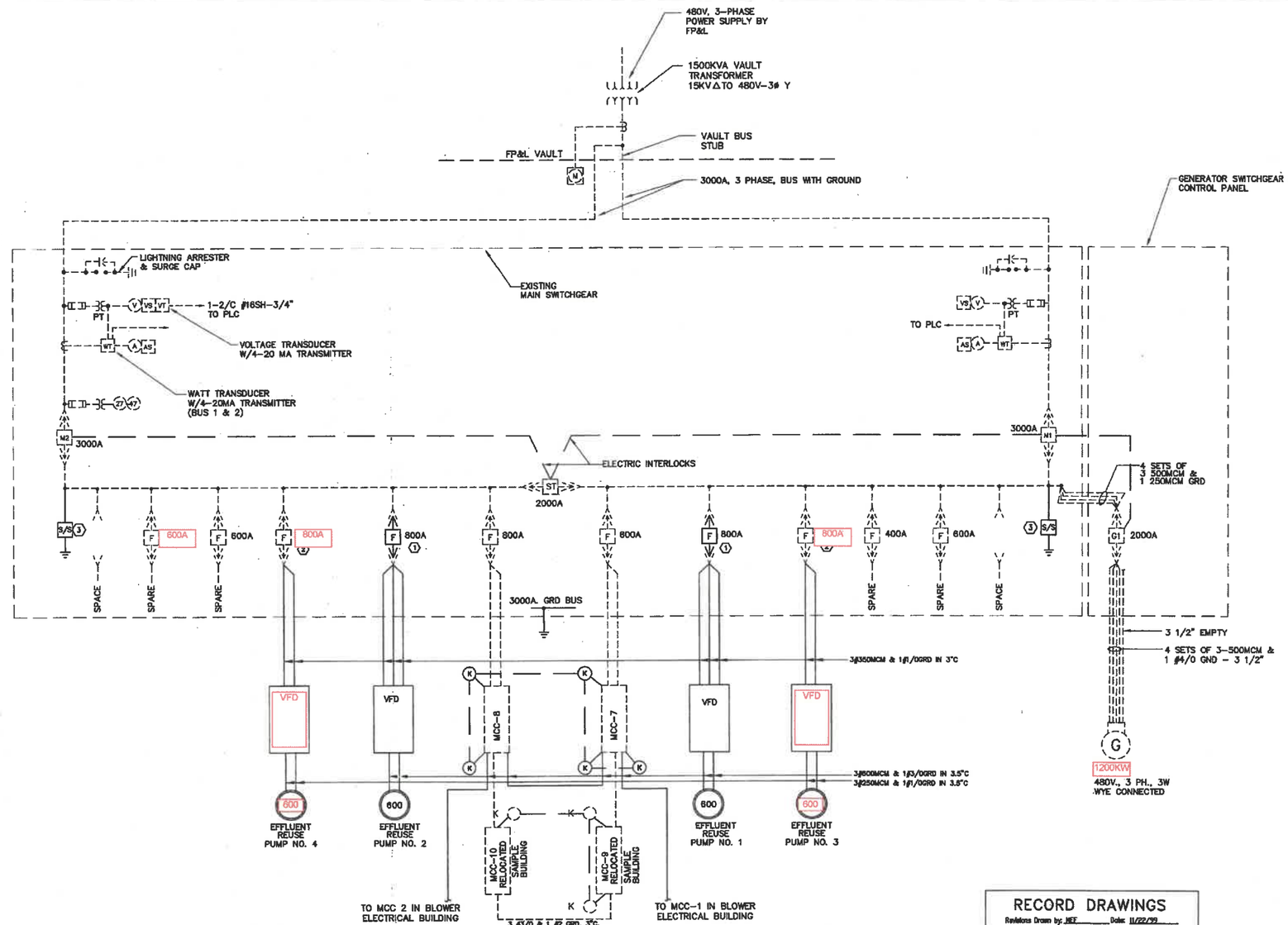
SWGR FRONT VIEW
N.T.S.

KEYNOTES

1.) MODIFY FOR 800A. TRIP UNIT. MODIFY BUS CONNECTION FOR ADDITIONAL CABLES. PROVIDE NEW TRIP UNIT FOR 100% RATING.

2.)

3.) PROPOSED HIGH ENERGY SURGE SUPPRESSION DEVICE INTERNALLY FUSED, MOUNTED TO REAR OF EXISTING CABINET PER MANUFACTURER INSTRUCTIONS, G.E. TYPE 9L10F SERIES RATED 100KA: NO EQUAL.



EXISTING SERVICE MODIFICATIONS
SINGLE LINE DIAGRAM

RECORD DRAWINGS

Revisions Drawn by: MEF Date: 11/22/99

THESE RECORD DRAWINGS HAVE BEEN PREPARED IN PART ON THE BASIS OF INFORMATION COMPILED BY OTHERS. THEY ARE NOT INTENDED TO REPRESENT IN DETAIL THE EXACT LOCATION TYPE OF COMPONENT NOR MANNER OF CONSTRUCTION. THE ENGINEER WILL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS WHICH HAVE NOT BEEN INCORPORATED INTO THE RECORD DRAWINGS.

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PLOT SCALE: 1=48

JOB NO.	494-480
CAD FILE:	44801E5
SCALE:	NONE
DATE:	AUG 1995

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Orlando • Ft. Myers • Tallahassee • Cleveland • Cocoa

NO.	DATE	REVISIONS ISSUED FOR	BY

DON WILLIAMS, P.E.
Florida Reg. No. 29504

HOLE, MONTES & ASSOCIATES, INC.
ENGINEERS - PLANNERS - SURVEYORS

DESIGNED	DRAWN	CHECKED	PROJ. ENG.
-	-	-	-

CITY OF NAPLES WWTRF EXPANSION & UPGRADE

PROPOSED MODIFICATIONS TO EXISTING ELECTRICAL SERVICE SINGLE LINE DIAGRAM

PROJECT NO.	94.30
DATE:	08/95
SHEET:	1E5

NOTES:

1. THIS DRAWING IS PROVIDED FOR REFERENCE ONLY.

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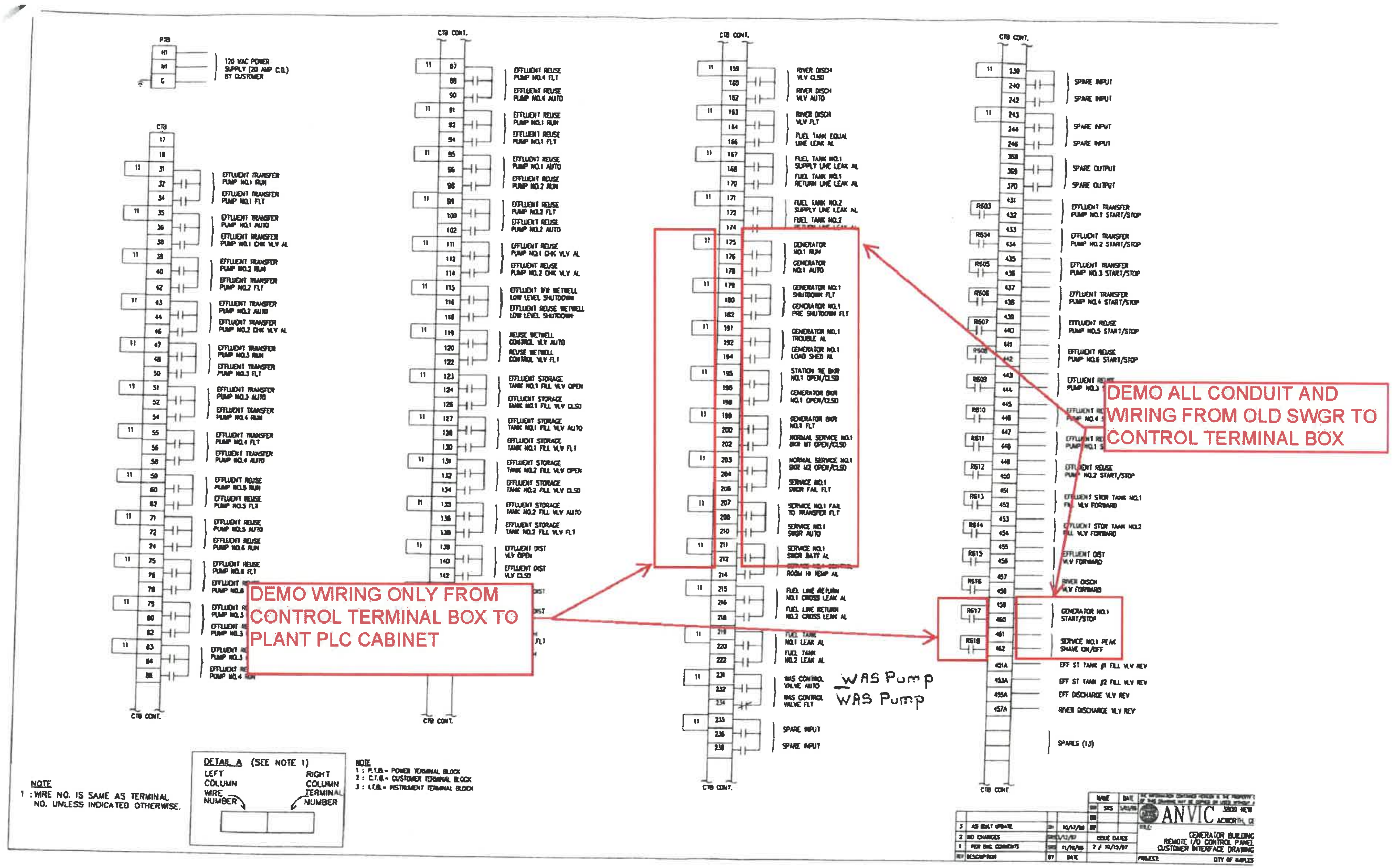
(REF) EX. SWITCHGEAR SINGLE LINE DIAGRAM

SHEET NUMBER

ER01



NOTES:

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CITY OF NAPLES WWTP SWITCHGEAR REPLACEMENT CONSTRUCTION PLANS
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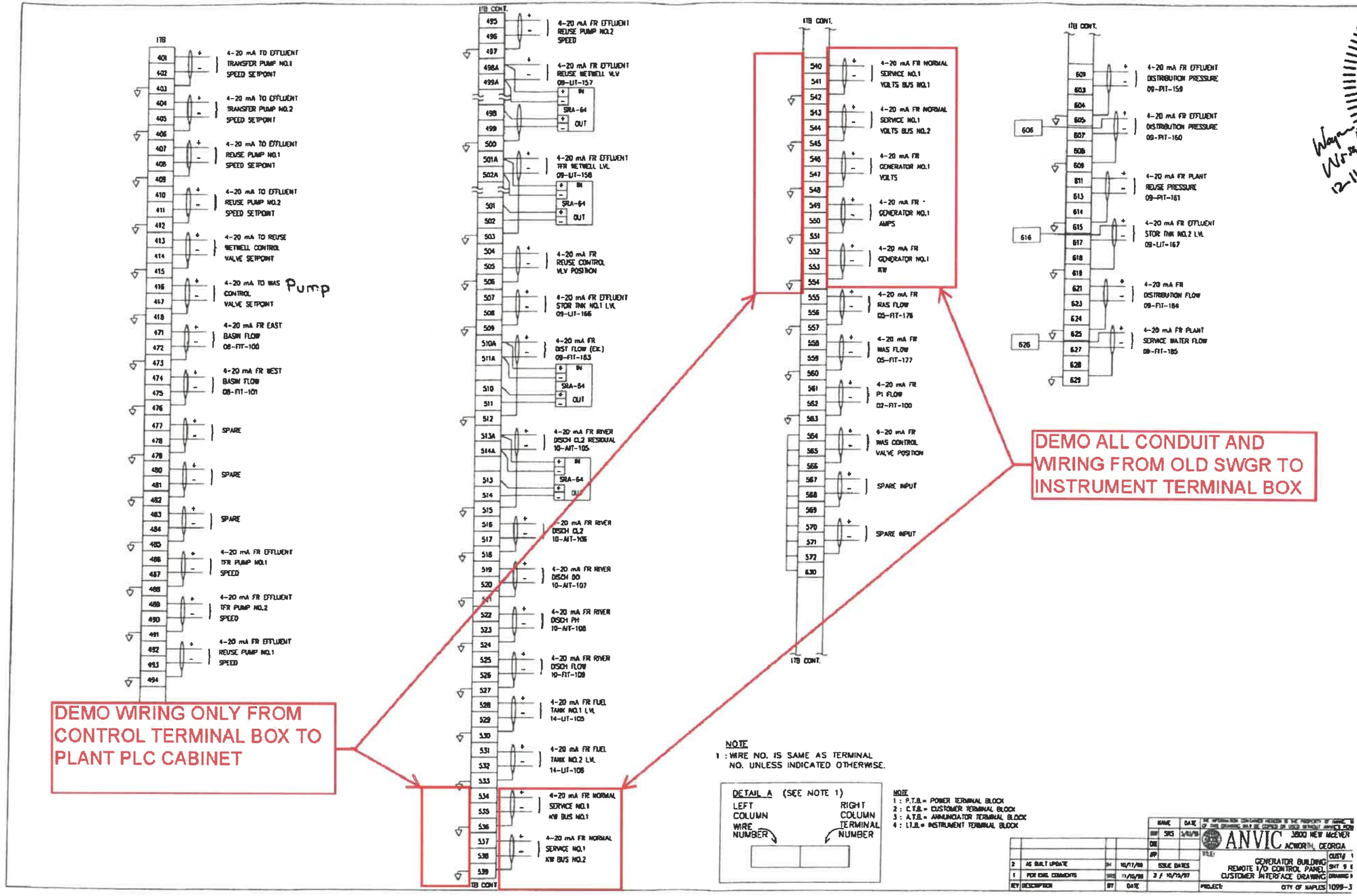
SCALE:	AS SHOWN

(REF) EX. CONTROL CABINET JB

SHEET NUMBER
ER02



NOTES:

1. THIS DRAWING IS PROVIDED FOR REFERENCE ONLY.

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(REF) EX. INSTRU. CABINET JB

SHEET NUMBER

ER03

ERP-1,2 VFD'S AND ERP-3,4 VFD'S
ELECTRICAL ROOM #1

FPL VAULT
ELECTRICAL ROOM #1

EX. SWITCHGEAR (FRONT VIEW)
ELECTRICAL ROOM #1

EX. SWITCHGEAR (TOP VIEW)
ELECTRICAL ROOM #1

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SCALE:	AS SHOWN

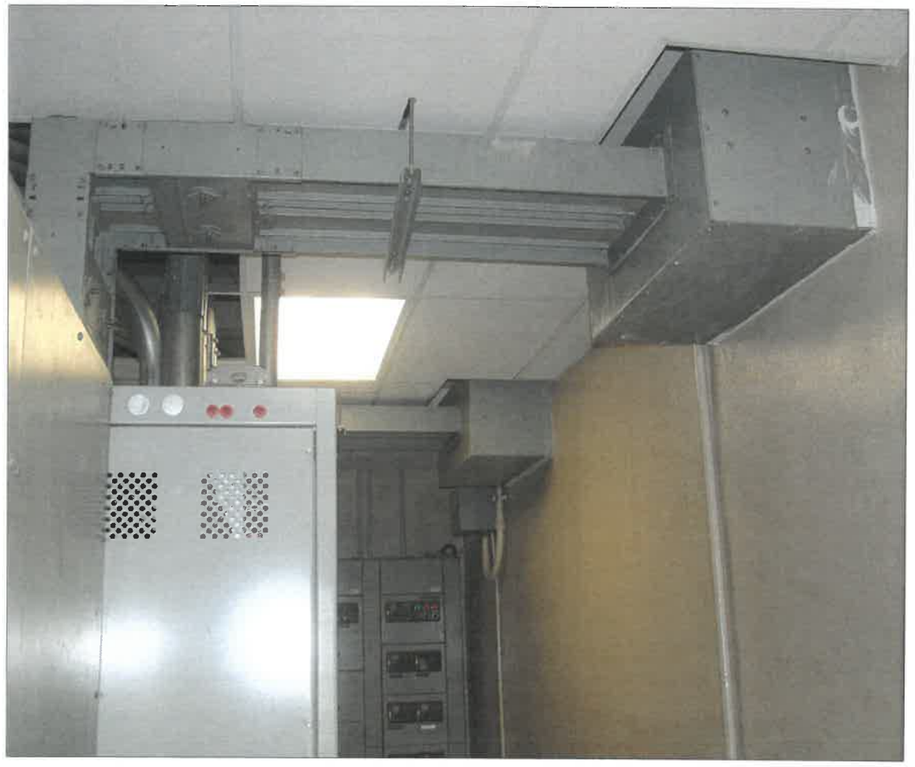
(REF) PHOTOS

SHEET NUMBER
ER04

ENTRANCE AND EQUIPMENT ACCESS
ELECTRICAL ROOM #1

EX. SWITCHGEAR OVERHEAD CONDUIT AND BUS DUCT
ELECTRICAL ROOM #1

EX. GENERATOR #1
ELECTRICAL ROOM #1



EX. SWITCHGEAR BUS DUCT TO FPL VAULT
ELECTRICAL ROOM #1

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12-4-18

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(REF) PHOTOS

SHEET NUMBER
ER05