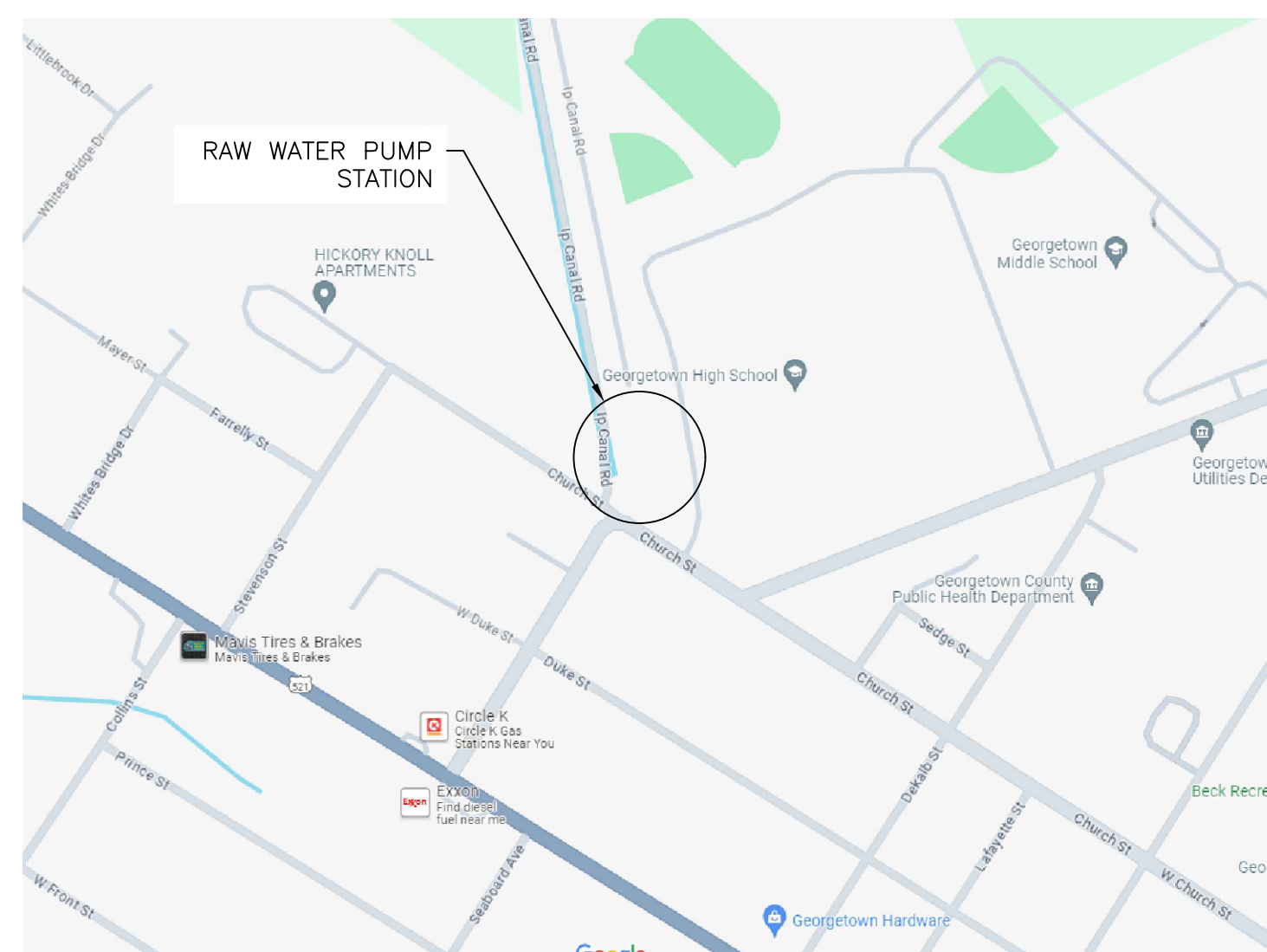




RAW WATER PUMP STATION GENERATOR AND MCC UPGRADES

CITY OF GEORGETOWN PROJECT NUMBER 1607
HEI PROJECT #A23121

VICINITY MAP



INDEX OF DRAWINGS

GENERAL

T1 COVER & INDEX OF DRAWINGS

CIVIL

C1 SITE/DEMOLITION PLAN
C2 ELECTRICAL BUILDING DEMOLITION PLAN
C3 ELECTRICAL BUILDING DEMOLITION PLAN
C4 ELECTRICAL BUILDING PLAN

ELECTRICAL

E1 ELECTRICAL LEGEND, SYMBOLS, AND GENERAL NOTES
E2 ELECTRICAL BUILDING DEMOLITION PLAN
E3 ELECTRICAL SITE PLAN
E4 ELECTRICAL BUILDING RENOVATION PLAN
E5 ONE-LINE DIAGRAM
E6 ELECTRICAL SCHEDULES
E7 ELECTRICAL DETAILS & RISER DIAGRAMS
E8 CONTROL DIAGRAMS

STRUCTURAL

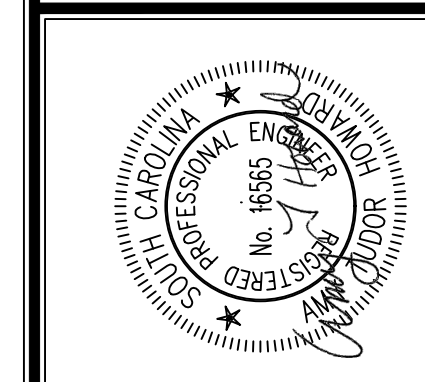
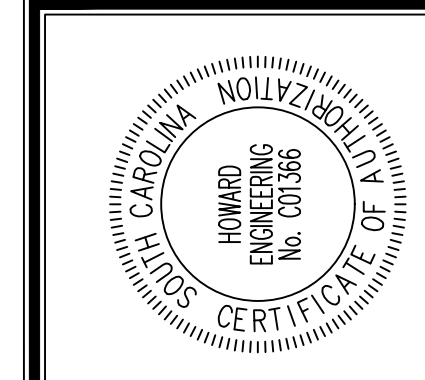
S1 GENERATOR FOUNDATION PLAN

HVAC

H1 HVAC NOTES, SCHEDULE, AND DETAILS
H2 ELECTRICAL BUILDING HVAC PLAN

REVISIONS			
NO.	DESCRIPTION	DATE	BY
1	ISSUED FOR BIDS	4/1/24	STS

APPROVALS			
PROJECT ENG:	DESIGNED BY:	DRAWN BY:	CHECKED BY:
STS	STS	STS	ATH



SHEET TITLE:
COVER & INDEX OF DRAWINGS

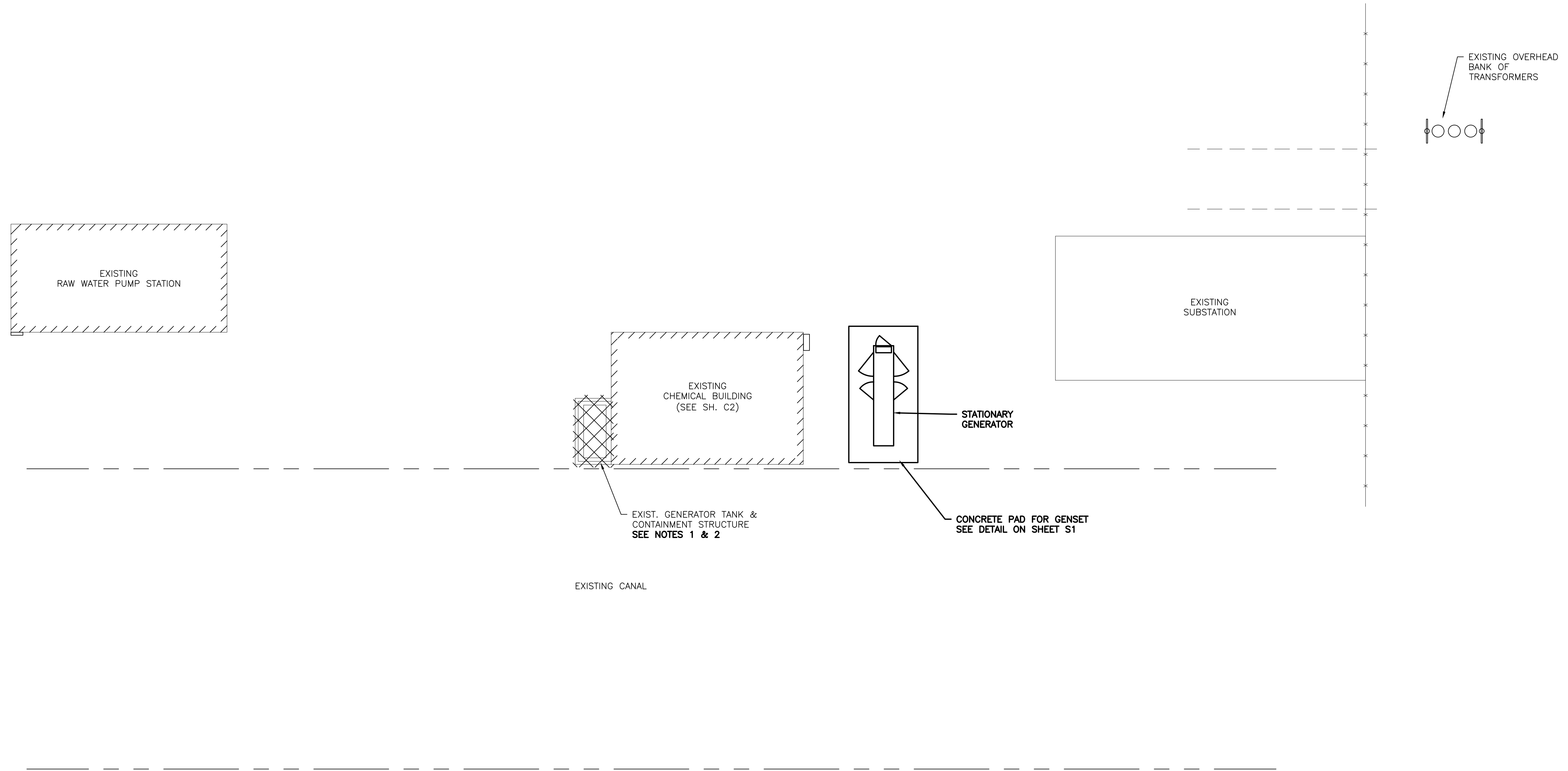
PROJECT:
RAW WATER STATION GENERATOR AND MCC UPGRADES

DATE: APRIL 2024
HEI PROJECT NO. A23121-E
SCALE: AS SHOWN

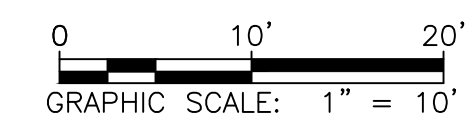
SHEET NO.
T1 OF 16

NOTES:

1. REMOVE EXIST. FUEL TANK AND LINES. CONTRACTOR SHALL DISPOSE OF TANK AT AN APPROVED LANDFILL FACILITY.
2. DEMOLISH THE EXIST. CONCRETE AND BLOCK CONTAINMENT STRUCTURE. REMOVE ALL DEBRIS FROM SITE.

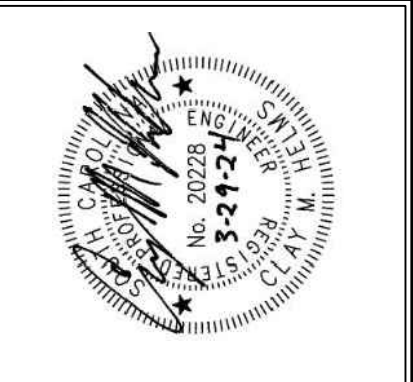


SITE/DEMOLITION PLAN
 SCALE: 1" = 10'-0"



NO.	DESCRIPTION	DATE	BY
1	ISSUED FOR BIDS	4/1/24	CMH

PROJECT ENG:	CMH
DESIGNED BY:	CMH
DRAWN BY:	JCG
CHECKED BY:	CMH
APPROVED:	STS



HOWARD ENGINEERING
 ELECTRICAL-MECHANICAL-CONTROLS
 MARIETTA, SOUTH CAROLINA
 (864) 836-0440

SHEET TITLE:
SITE/DEMOLITION PLAN

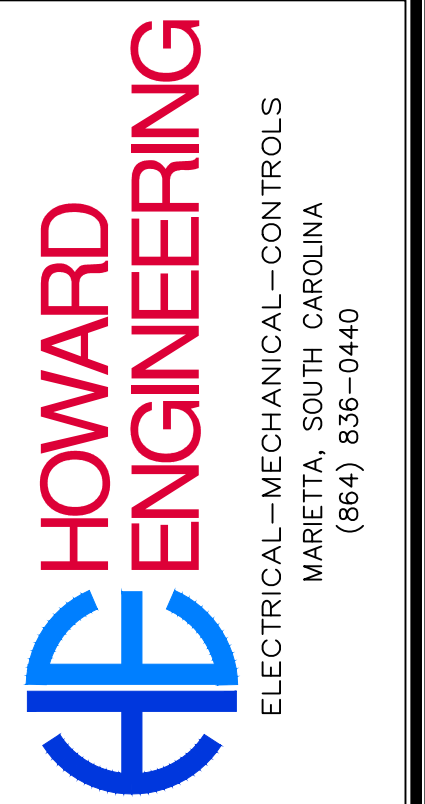
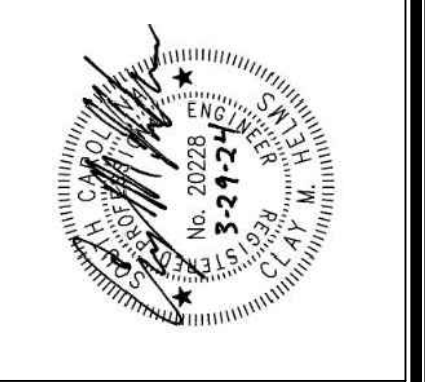
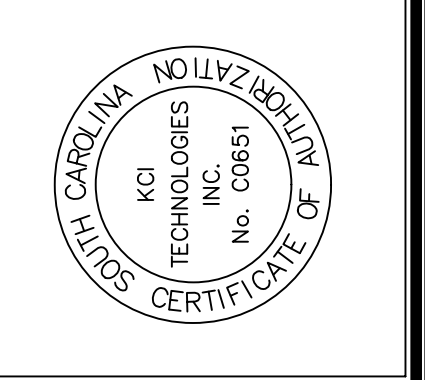
PROJECT:
RAW WATER STATION GENERATOR AND MCC UPGRADES

DATE: APRIL 2024
 HEI PROJECT NO. A23121-E
 SCALE: AS SHOWN

SHEET NO.
C1 OF 16

NO.	DESCRIPTION	DATE	BY
1	ISSUED FOR BIDS	4/1/24	CMH

APPROVALS	PROJECT ENG.	DESIGNED BY:	DRAWN BY:	CHECKED BY:	APPROVED:
	CMH	CMH	JCG	CMH	STS

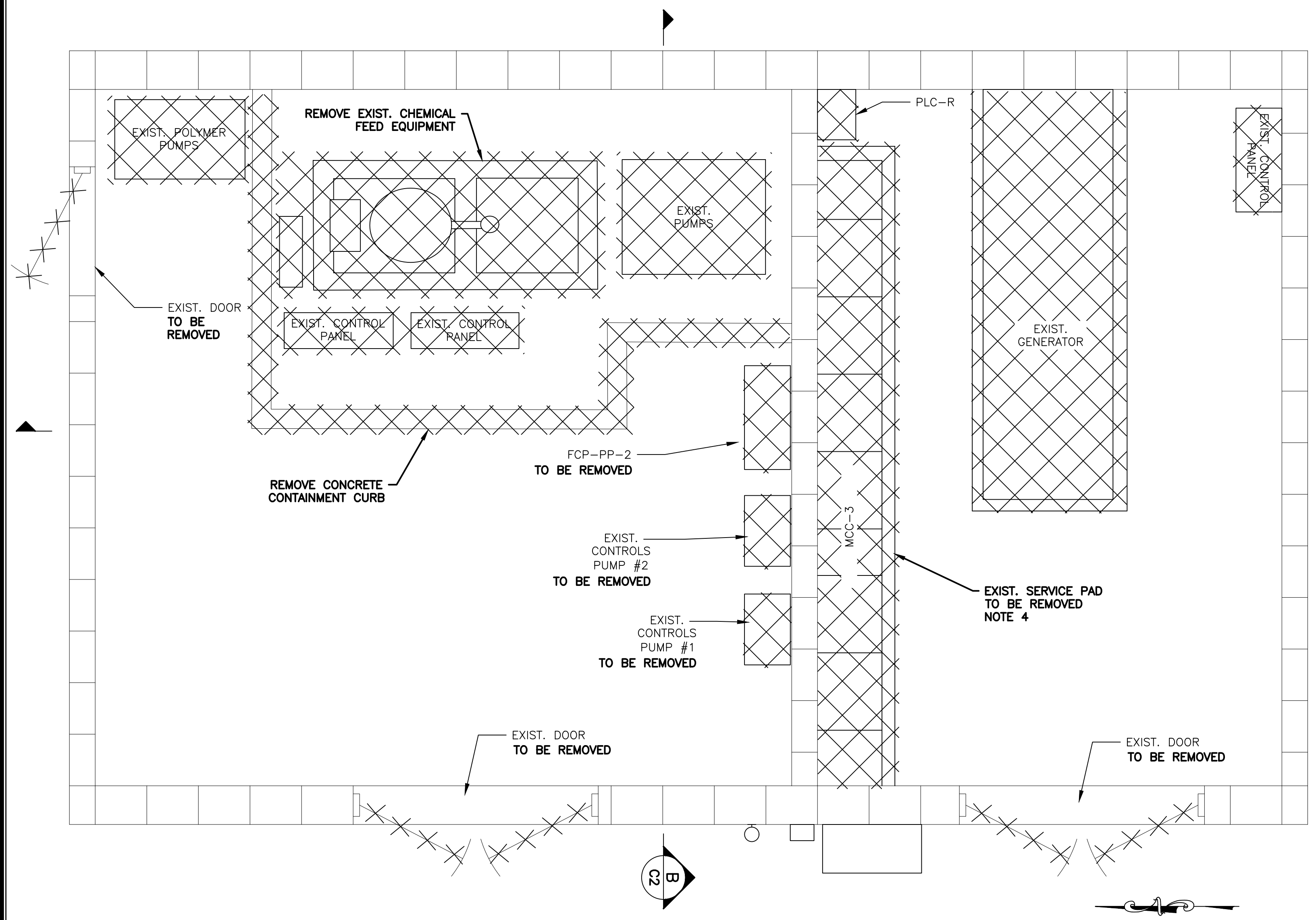


SHEET TITLE:
**ELECTRICAL BUILDING
 DEMOLITION PLAN**

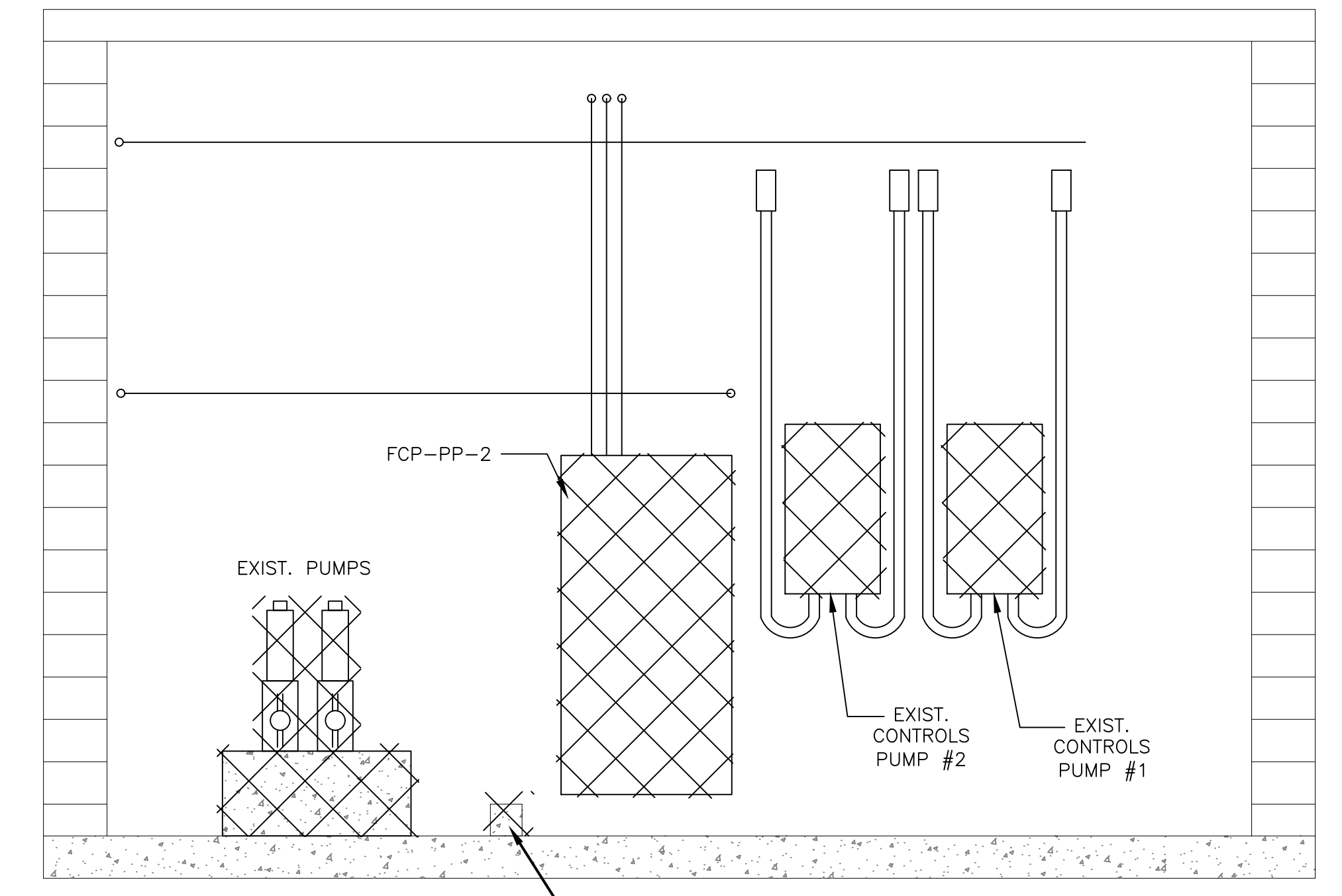
PROJECT:
**RAW WATER STATION
 GENERATOR AND MCC
 UPGRADES**

DATE: APRIL 2024
 HEI PROJECT NO. A23121-E
 SCALE: AS SHOWN

SHEET NO.
C2 OF 16

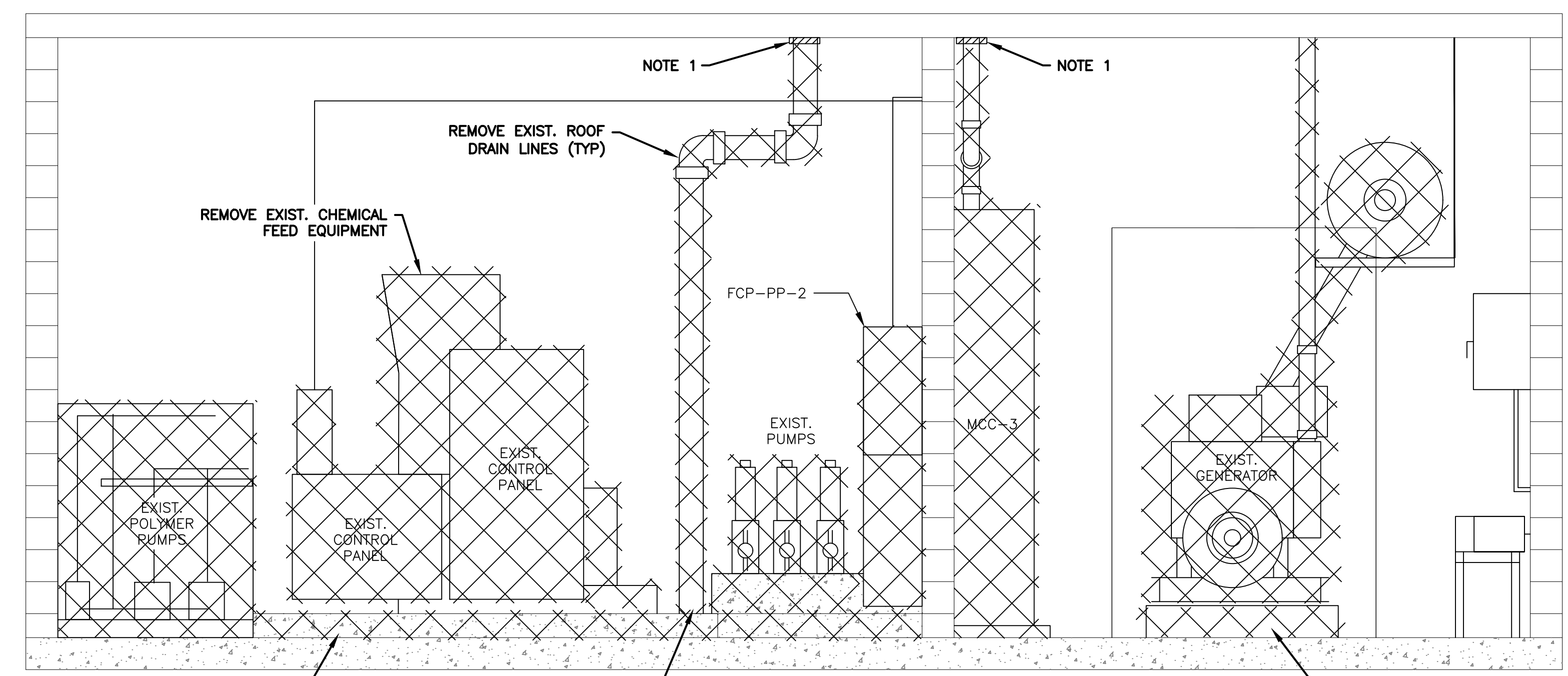


ELECTRICAL BUILDING DEMOLITION PLAN
 SCALE: 1/2" = 1'-0"

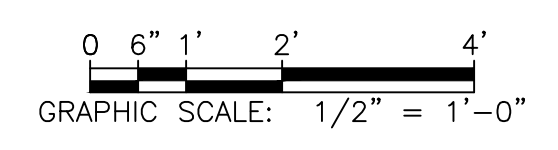


SECTION B-C2
 SCALE: 1/2" = 1'-0"

- NOTES:
1. REMOVE THE EXISTING ROOF DRAIN LINE PIPING. CUT PIPE FLUSH WITH BOTH CEILING AND FLOOR AND PATCH WITH NON-SHRINK GROUT.
 2. REMOVE ALL EXISTING CHEMICAL FEED EQUIPMENT, PIPING AND CONTROL PANELS.
 3. REMOVE EXISTING GENERATOR AND ASSOCIATED EQUIPMENT, FUEL PIPING AND EXHAUST DUCTS AND SYSTEMS.
 4. DEMOLISH ALL CONCRETE EQUIPMENT AND SERVICE PADS ASSOCIATED WITH THE EXISTING CHEMICAL EQUIPMENT AND GENERATOR EQUIPMENT.
 5. REMOVE EXIST. DOORS. DOOR FRAME SHALL REMAIN AND BE REUSED WITH NEW DOORS.



SECTION A-C2
 SCALE: 1/2" = 1'-0"

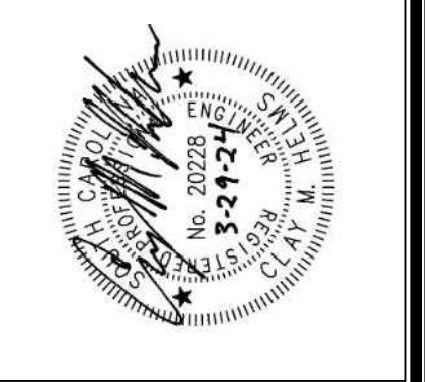
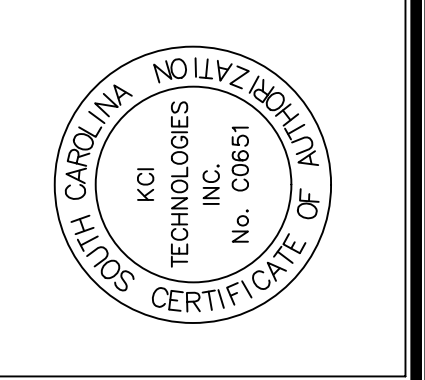


NOTES:

1. REMOVE AND REPLACE THE EXISTING DOORS AND THEIR ASSOCIATED HARDWARE. THE EXISTING DOOR FRAMES SHALL REMAIN AND BE REUSED.
2. PRESSURE WASH/CLEAN EXTERIOR OF BUILDING PRIOR TO PAINTING.
3. CAULK ALL EXISTING EXPANSION JOINTS AFTER PRESSURE WASHING AND PRIOR TO PAINTING.

NO.	DESCRIPTION	DATE	BY
1	ISSUED FOR BIDS	4/1/24	CMH

APPROVALS	PROJECT ENG.	DESIGNED BY:	DRAWN BY:	CHECKED BY:	APPROVED:
	CMH	CMH	JCG	CMH	STS



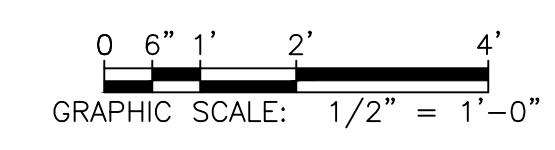
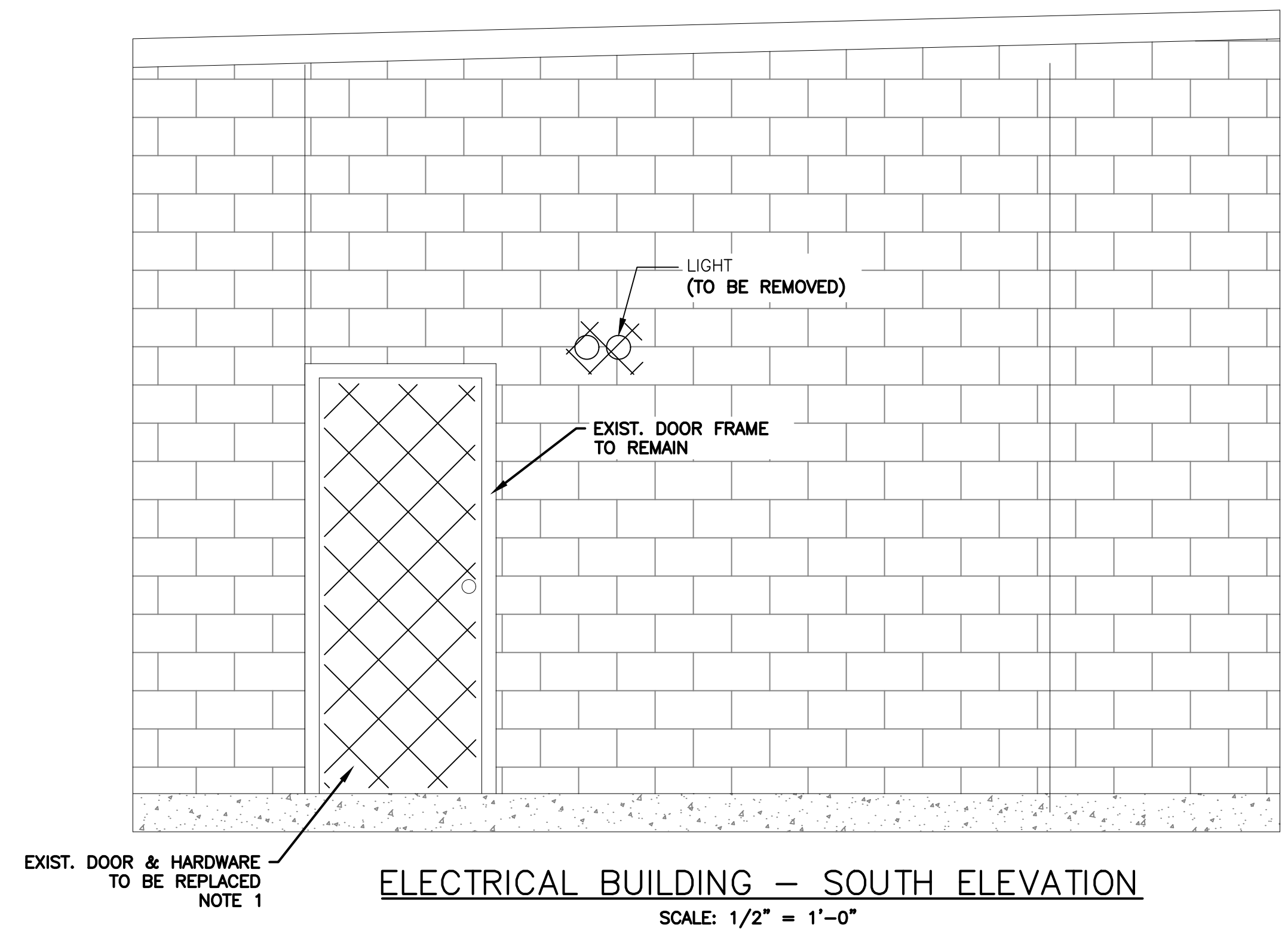
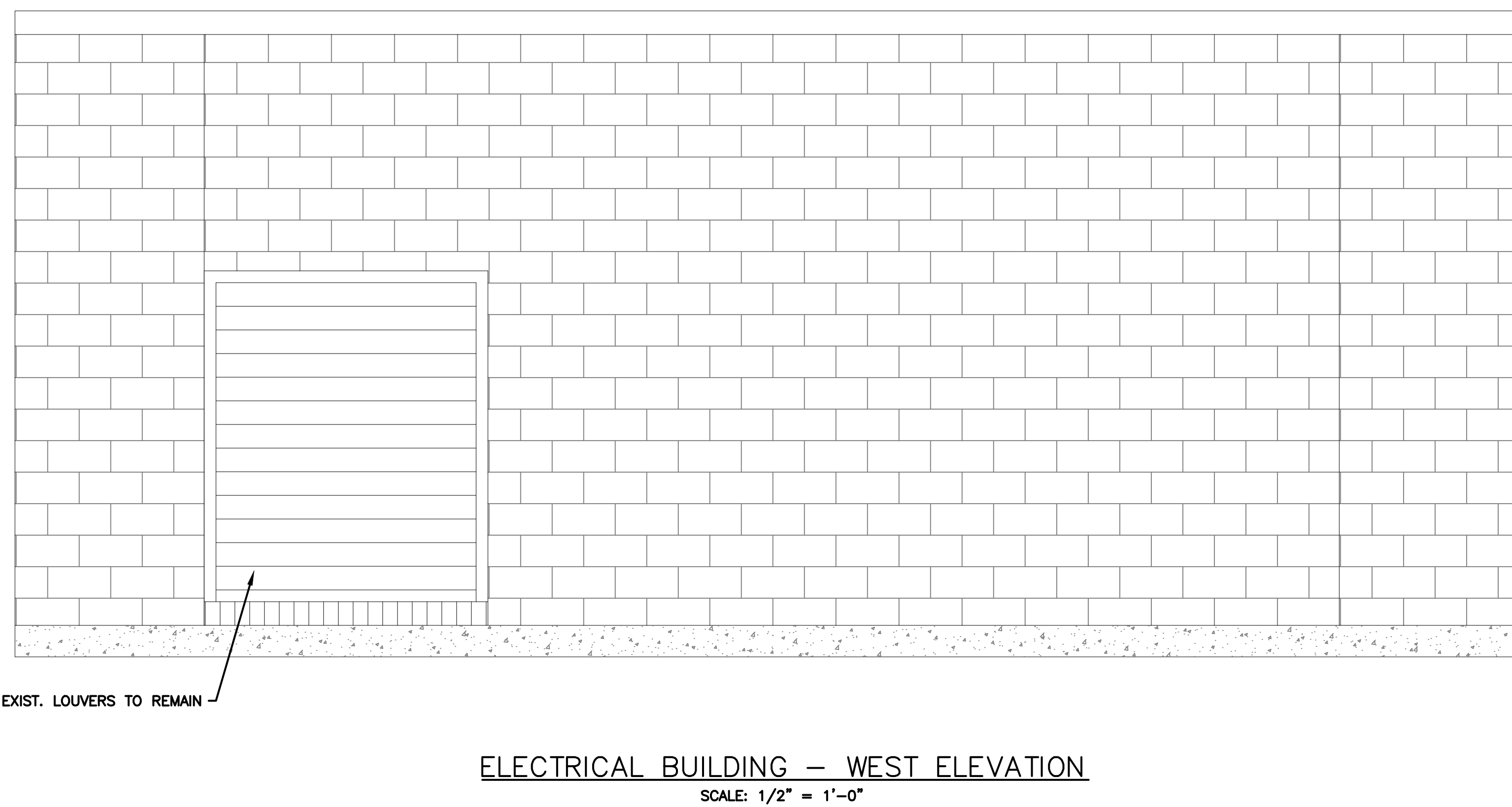
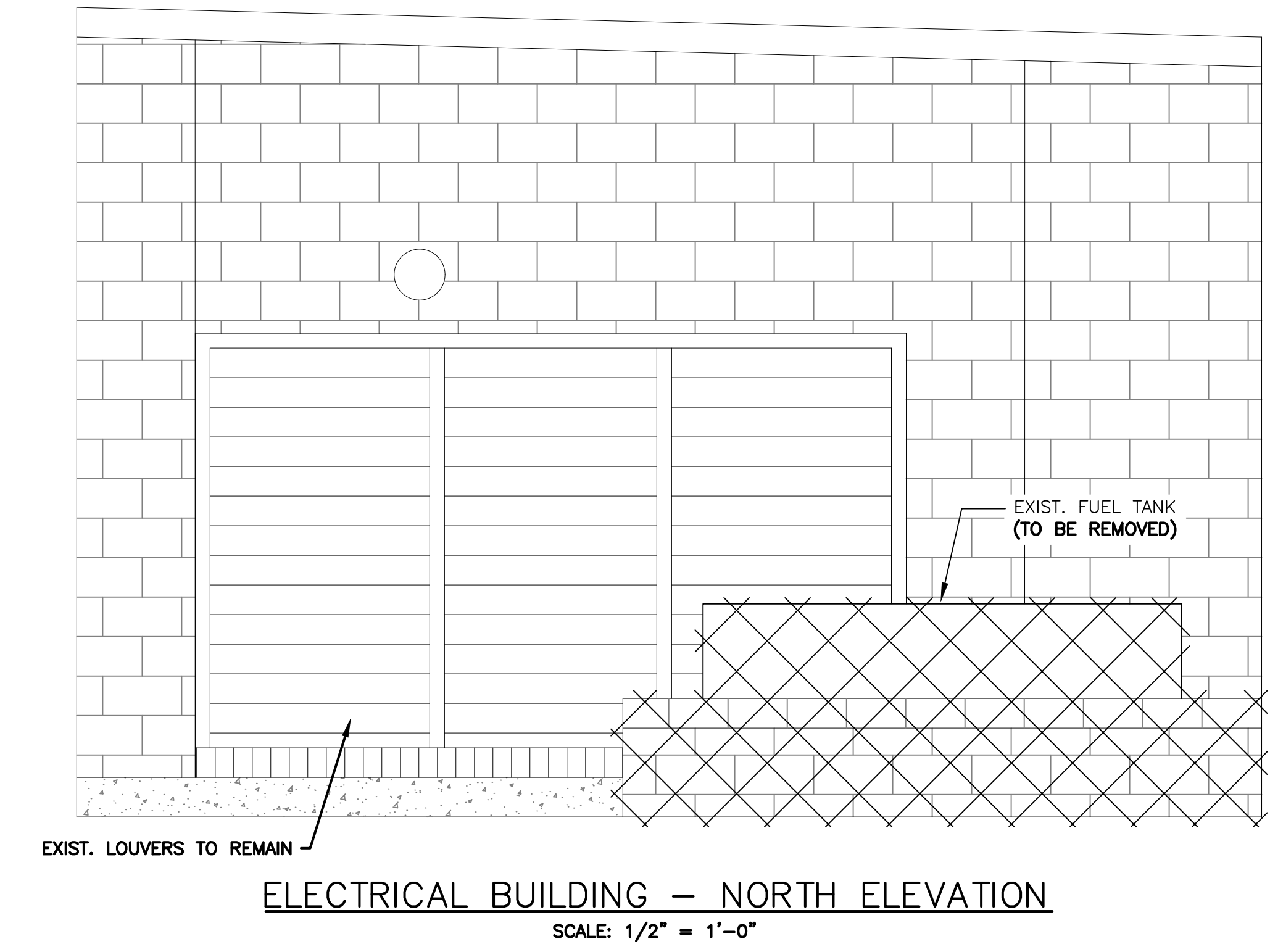
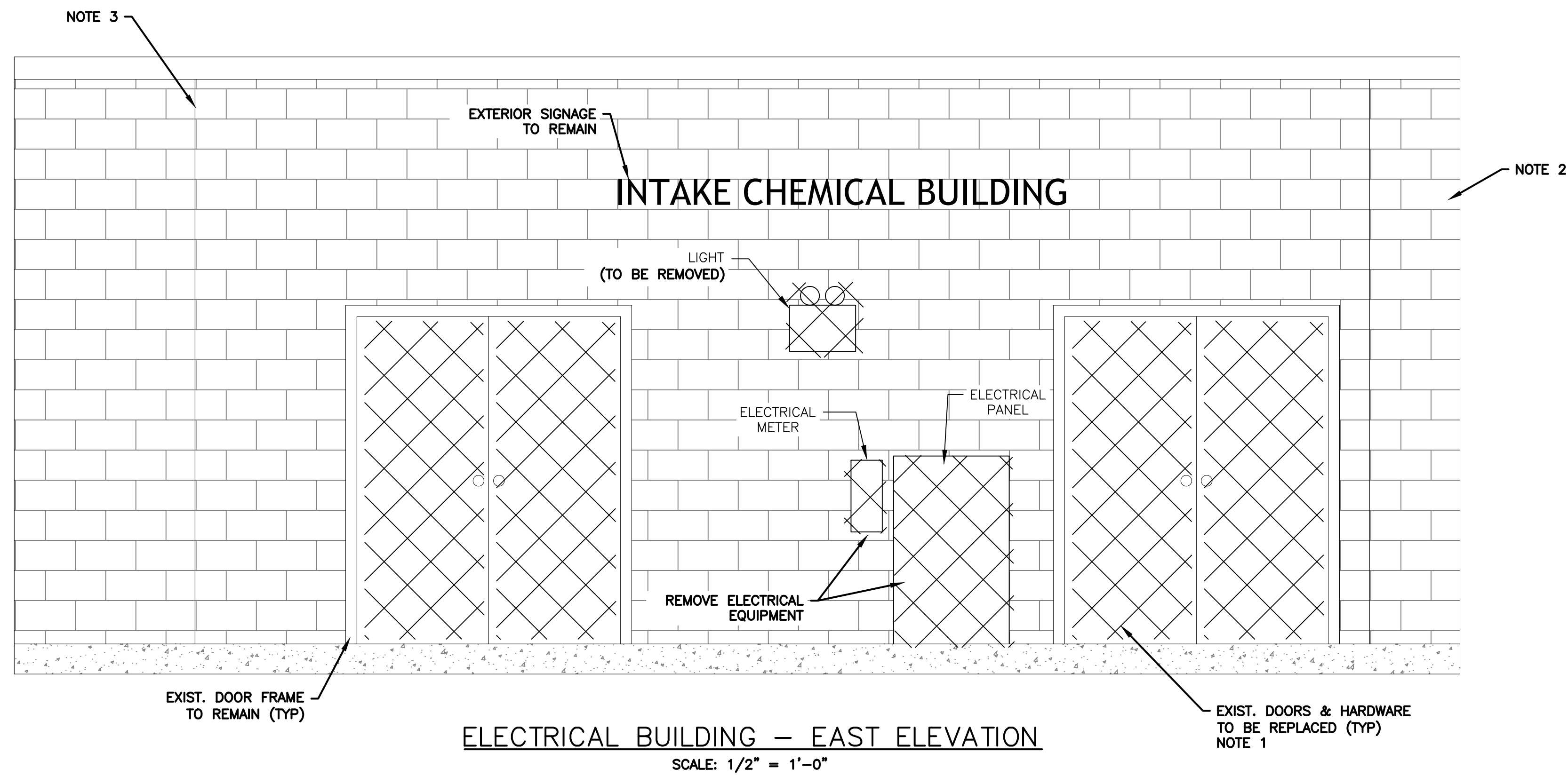
HOWARD ENGINEERING
ELECTRICAL-MECHANICAL-CONTROLS
MARIETTA, SOUTH CAROLINA
(864) 836-0440

SHEET TITLE:
**ELECTRICAL BUILDING
DEMOLITION PLAN**

PROJECT:
**RAW WATER STATION
GENERATOR AND MCC
UPGRADES**

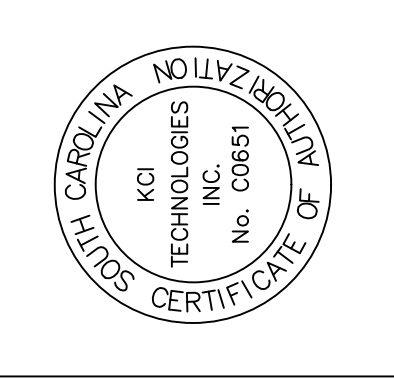
DATE: APRIL 2024
HEI PROJECT NO. A23121-E
SCALE: AS SHOWN

SHEET NO.
C3 OF 16



NO.	DESCRIPTION	DATE	BY
1	ISSUED FOR BIDS	4/1/24	CMH

APPROVALS	PROJECT ENG:	DESIGNED BY:	DRAWN BY:	CHECKED BY:	APPROVED:
	CMH	CMH	JCG	CMH	STS



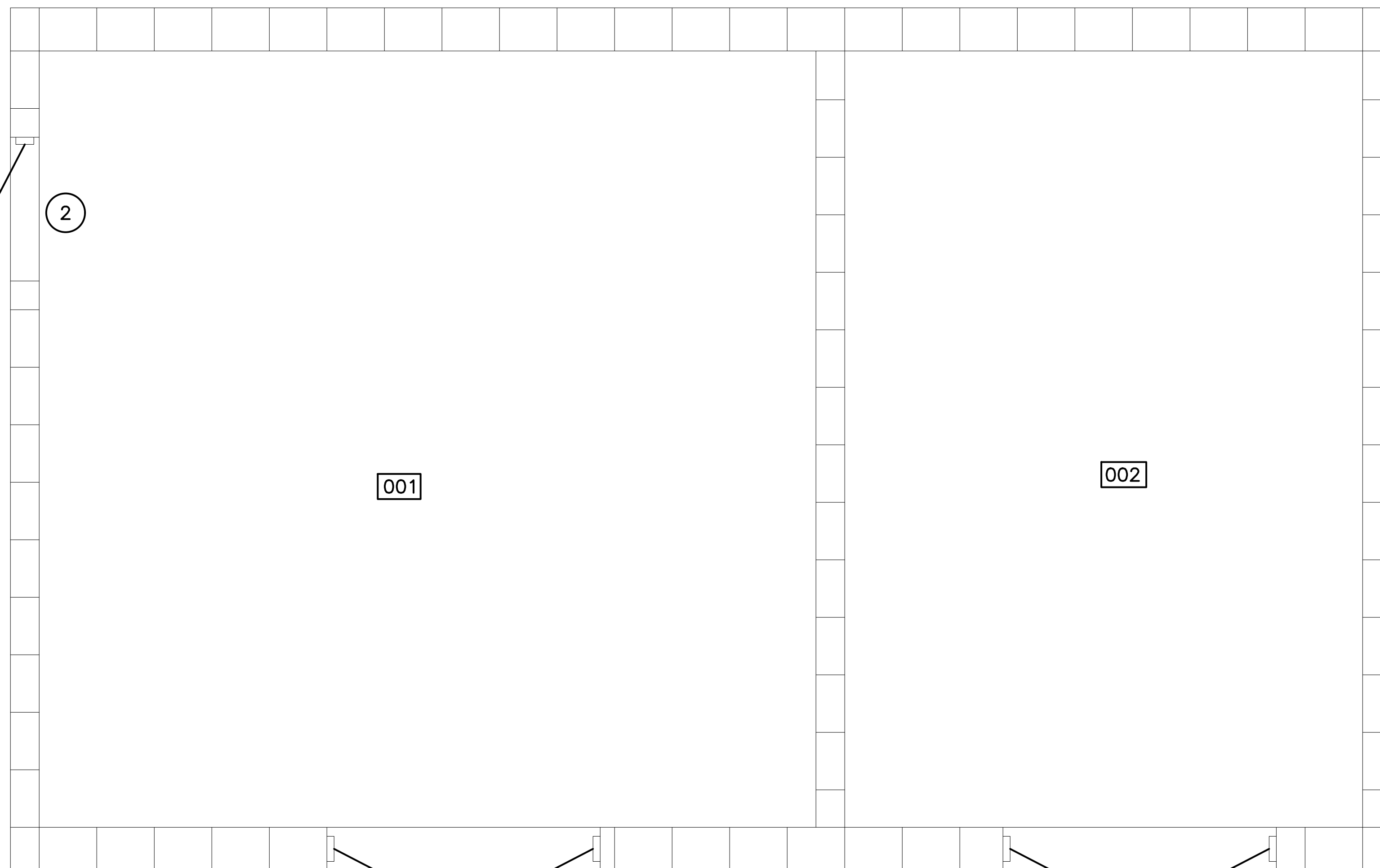
HOWARD ENGINEERING
 ELECTRICAL-MECHANICAL-CONTROLS
 MARIETTA, SOUTH CAROLINA
 (864) 836-0440

SHEET TITLE:
ELECTRICAL BUILDING PLAN

PROJECT:
RAW WATER STATION GENERATOR AND MCC UPGRADES

DATE: APRIL 2024
 HEI PROJECT NO. A23121-E
 SCALE: AS SHOWN

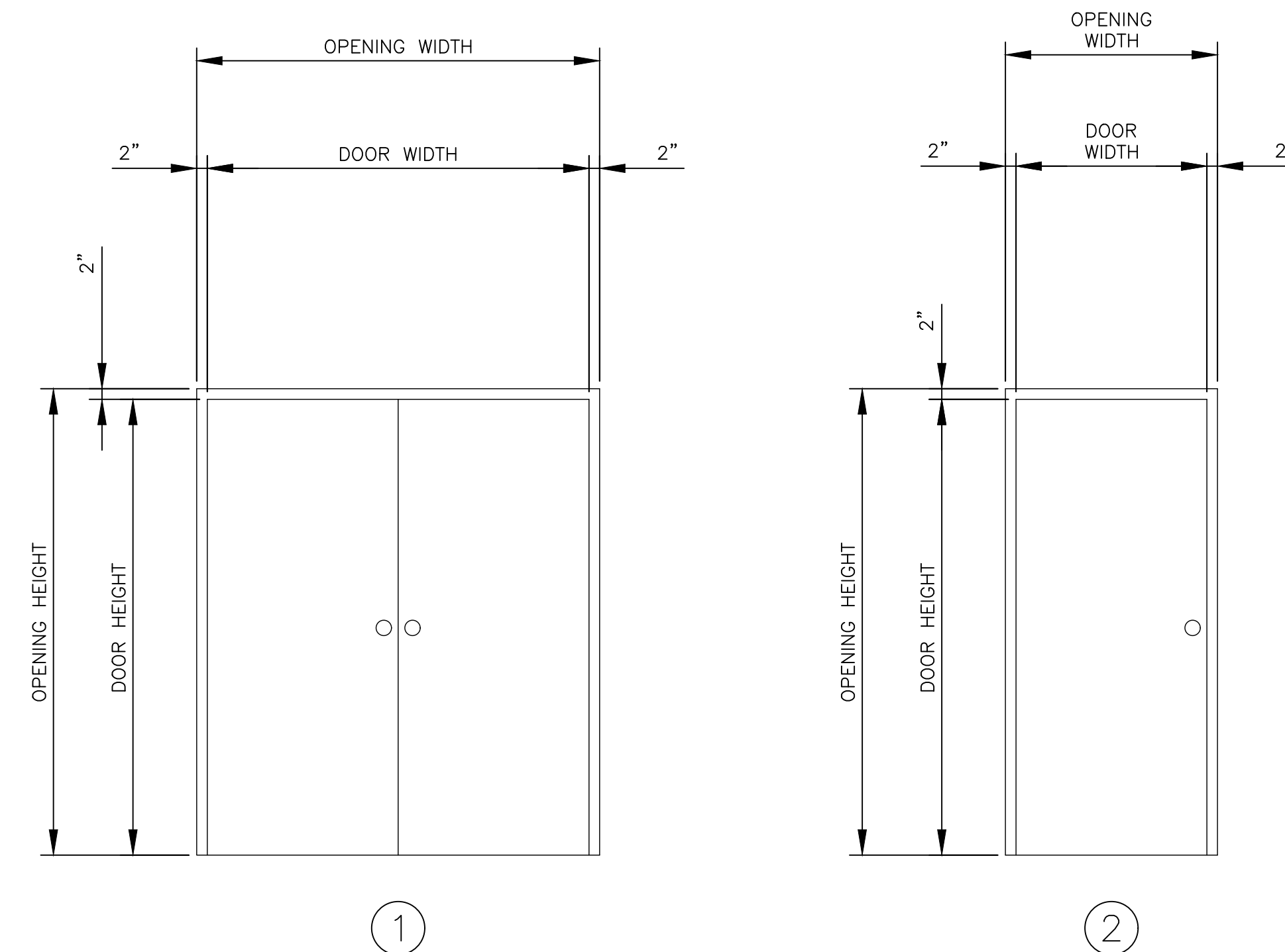
SHEET NO.
C4 OF 16



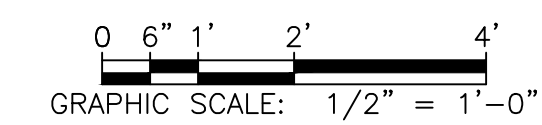
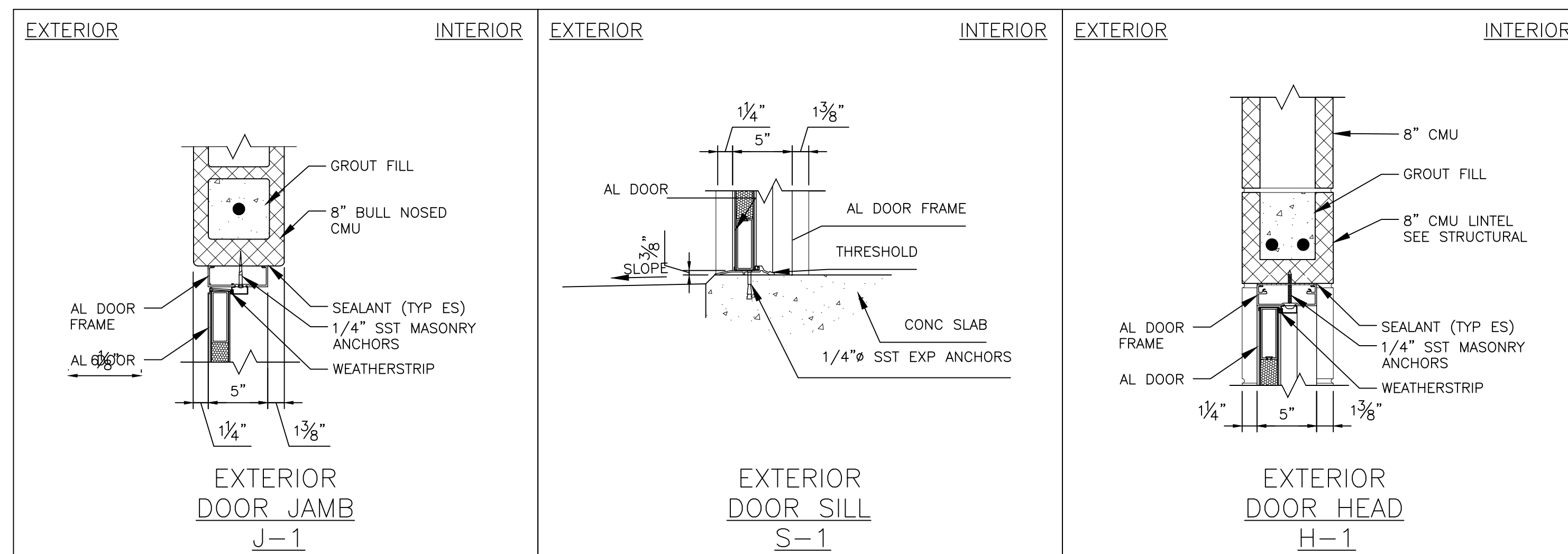
ELECTRICAL BUILDING PLAN
 SCALE: 1/2" = 1'-0"

ROOM FINISH SCHEDULE						
ROOM NO.	ROOM NAME	FLOOR	BASE	WALLS	CEILING MATERIAL	HEIGHT
001	EX. PUMP ROOM	PAINTED CONC	-----	PAINTED MASONRY	PAINTED CONC	----
002	EX. GENERATOR ROOM	PAINTED CONC	-----	PAINTED MASONRY	PAINTED CONC	----

DOOR AND FRAME SCHEDULE										
MARK	DOOR SIZE			ELEV	MATL	FRAME DETAIL			HARDWARE SET NO.	REMARKS
	WIDTH	HEIGHT	THK			HEAD	JAMB	SILL		
1	5'-8"	7'-2"	1-3/4"	1	ALUM	H-1	J-1	S-1	3	EXISTING DOOR FRAMES TO REMAIN
2	3'-0"	7'-2"	1-3/4"	2	ALUM	H-1	J-1	S-1	2	



DOOR ELEVATIONS
 SCALE: 1/2" = 1'-0"



GENERAL ELECTRICAL NOTES

- CONTRACTOR WILL BE HELD RESPONSIBLE FOR HAVING VISITED THE SITE AND BEING FAMILIARIZED WITH THE EXISTING CONDITIONS PRIOR TO SUBMITTING BID.
- CONSULT APPROVED MANUFACTURER'S WIRING AND CONNECTION DIAGRAMS AND SHOP DRAWINGS IN DETAIL FOR EXACT CONNECTION REQUIREMENTS TO EQUIPMENT PROVIDED BY OTHER TRADES.
- DO NOT SCALE THESE DRAWINGS. ALL ROUGHING TO BE DONE FROM DIMENSIONS ON LAYOUT, ARCHITECTURAL, MECHANICAL, STRUCTURAL DRAWINGS AND SITE INVESTIGATION.
- CONSULT LAYOUT, MECHANICAL AND STRUCTURAL DRAWINGS FOR ADDITIONAL DETAILS CONCERNING EQUIPMENT LOCATIONS AND REQUIREMENTS.
- ALL CONTROL, STATUS AND SIGNAL CABLES/WIRING SHALL BE VERIFIED BY THE EQUIPMENT SUPPLIERS AND/OR SYSTEM INTEGRATOR. ANY CHANGES OR ADDITIONS TO THE SYSTEM INDICATED ON THESE ELECTRICAL DRAWINGS THAT ARE REQUIRED TO ACCOMMODATE A SPECIFIC MANUFACTURER'S EQUIPMENT OR INTEGRATOR'S SYSTEM SHALL BE COVERED BY THE SUPPLIER OR INTEGRATOR
- ALL CONTROL, STATUS AND SIGNAL CABLES/WIRING SHALL BE IDENTIFIED AT EACH TERMINATION AND IN PULL BOXES BY COLOR CODE OR NUMBERING SYSTEM. PROVIDE SCHEDULE FOR CONNECTIONS BEING MADE UNDER OTHER DIVISIONS.
- CONTRACTOR'S RECORD DRAWINGS SHALL SHOW EXACT LOCATIONS OF UNDERGROUND CONDUITS AND DUCT BANKS.
- CONNECTIONS TO MOTORS AND EQUIPMENT MADE WITH WATERTIGHT FLEXIBLE CONDUIT (WFC) SHALL BE PROPERLY SUPPORTED AND CLAMPED.
- ALL EXPOSED CONDUIT SHALL BE INSTALLED USING SPECIFIED CLAMPS PROVIDING MINIMUM OF 1/2" SPACE BETWEEN CONDUIT AND MOUNTING SURFACE.
- ALL WIRING PULLS SHALL BE WITHIN CABLE MANUFACTURER'S RECOMMENDED CABLE PULL TENSIONS. VERIFY WITH MANUFACTURER AND FIELD RECORD TENSIONS FOR SUBMITTAL TO ENGINEER.
- ALL CONDUIT JOINTS IN UNDERGROUND RUNS FEEDING EQUIPMENT LOCATED LEVEL WITH OR BELOW CONDUIT ELEVATIONS SHALL BE SEALED WITH COPPER BASE CONDUCTIVE COUPLING COMPOUND AFTER WHICH A SEALANT WITH A PVC TAPE WRAP (1/2" OVERLAP) SHALL BE APPLIED TO EXTERIOR OF COUPLING. EXTEND WRAP 6" BEYOND COUPLING ON BOTH SIDES. THIS SHALL BE IN ADDITION TO CONDUIT COATING AS SPECIFIED.
- ANY COATED MATERIAL THAT HAS FINISH DAMAGED, BROKEN OR CUT DURING INSTALLATION SHALL BE CLEANED AND COATED WITH A REPAIR KIT.
- ALL SUPPORT FRAMING HARDWARE, BOLTS, ANCHORS, ETC. SHALL BE PROVIDED IN ACCORDANCE WITH SPECIFICATIONS.
- CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL EXISTING UNDERGROUND UTILITIES. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO LOCATE, MAINTAIN AND PROTECT ANY EXISTING UTILITIES DURING NEW WORK AND REPAIR ANY AND ALL DAMAGED.
- ALTERNATE ROUTING OF YARD CONDUITS FROM THAT INDICATED MAY BE CONSIDERED BUT MUST FIRST BE APPROVED BY ENGINEER.
- ALL FLOOR SAW CUTTING AND CHASING, WALL AND FLOOR CORING AND CHASING OF EXISTING CONSTRUCTION TO ACCOMMODATE ELECTRICAL INSTALLATION SHALL BE PROVIDED UNDER ELECTRICAL CONTRACT. REPAIR OF SUCH FOR A WATERTIGHT INSTALLATION SHALL BE UNDER GENERAL CONTRACT.
- REMOVE ALL EXISTING ELECTRICAL EQUIPMENT, FIXTURES, CONDUIT AND WIRING DEEMED USELESS AND/OR WHERE REMAINING IN VIEW AFTER RENOVATIONS.
- ALL CONTROL AND SIGNAL CABLES/WIRING SHALL BE CONTINUOUS FROM POINT OF ORIGINATION TO POINT OF TERMINATION AND PULLED THRU PULL BOXES. NO SPLICES WILL BE ALLOWED.
- UNLESS OTHERWISE NOTED PULL AND JUNCTION BOXES SHALL BE PER SPECIFICATIONS AND SIZED PER CODE AND/OR AS CONDITIONS DICTATE.
- MINIMUM RACEWAY SIZE SHALL BE 3/4".
- LEAVE SUFFICIENT SLACK IN ALL WIRING AND CABLES TO REACH FINAL TERMINATION POINTS. VERIFY FROM APPROVED EQUIPMENT DRAWINGS AND WIRING DIAGRAMS.
- ANY POWER INTERRUPTION SHALL BE SCHEDULED WITH OWNER IN WRITING 72 HOURS PRIOR TO SHUTDOWN. SHUTDOWNS MAY BE LIMITED TO OFF-PEAK HOURS (LATE NIGHT).
- SUSPENDED CONDUITS SHALL BE SUPPORTED WITH PROPERLY INSTALLED TRAPEZE HANGERS AND CONDUIT CLAMPS. INSTALL ALL NECESSARY HARDWARE FOR HANGER RODS.
- ROUTING OF RACEWAYS IS ONLY A SUGGESTION BUT SHOULD BE FOLLOWED AS CLOSELY AS POSSIBLE. HOWEVER, ALTERNATE ROUTING WILL BE CONSIDERED WHERE BROUGHT TO THE ATTENTION OF THE ENGINEER AND SHOWN TO BE MORE FEASIBLE. WHERE EXACT ROUTING IS NOT INDICATED, RACEWAYS SHALL BE ROUTED CONCEALED IN SLAB OR STRUCTURE IN THE MOST PRUDENT MANNER.
- TERMINATE ALL METALLIC WIRING AT CONTROL/SCADA/CCTV PANELS AND PROCESS INSTRUMENTATION IN ACCORDANCE WITH MANUFACTURER'S APPROVED WIRING DIAGRAMS.
- COORDINATE EXACT LOCATIONS OF LIGHT FIXTURES TO CLEAR WORK OF OTHER TRADES.
- SPD'S ARE SHOWN ON ONE LINE DIAGRAMS AND INDICATED IN EQUIPMENT SCHEDULES. FIELD COORDINATE LOCATIONS AND CONNECTIONS WHERE EXTERNAL TO EQUIPMENT.
- EXISTING CONDUITS MAY BE RE-USED WHERE CLEANED BY PULLING THROUGH A SWAB FOLLOWED BY A MANDREL 85% OF THE CONDUIT INSIDE DIAMETER.

DEMOLITION NOTES

- REMOVE CONDUIT AND WIRING NO LONGER IN USE AT COMPLETION OF WORK.
- WHERE CONDUIT ASSOCIATED WITH AN ITEM IS IN AN INACCESSIBLE AREA (SUCH AS ENCASED IN CONCRETE), ABANDON INACCESSIBLE CONDUIT IN PLACE AND CAP OR SEAL.
- WHERE SUCH INACCESSIBLE CONDUIT ENDS MUST BE TERMINATED IN FINISHED SURFACE OF WALL, CEILING OR FLOOR, CUT OFF FLUSH AND FILL VOID WITH NON-SHRINKING GROUT AND FINISH TO MATCH SURROUNDING SURFACES.
- MATERIALS THAT MAY BE SALVAGED NOT LISTED ABOVE ARE TO BE TURNED OVER TO THE OWNER. UNWANTED MATERIALS SHALL BE DISPOSED OF BY THIS CONTRACTOR.

ABBREVIATIONS

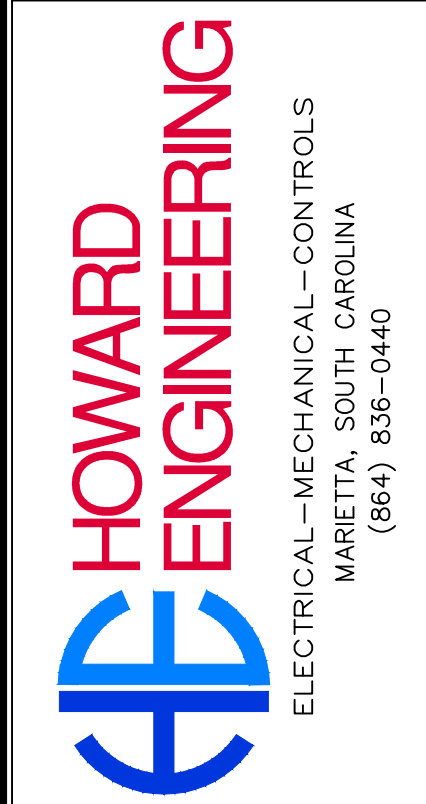
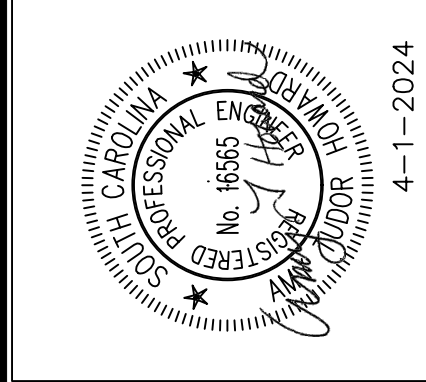
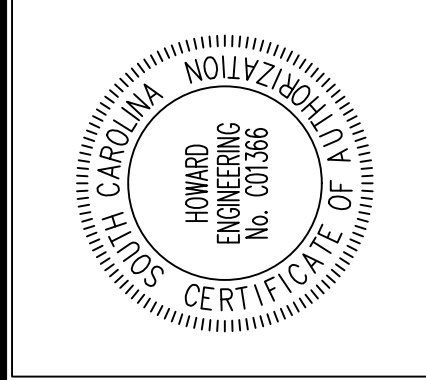
A	- AMPERE (AMPS)
C	- CONDUIT
CPT	- CONTROL POWER TRANSFORMER
CB	- CIRCUIT BREAKER
DC UPS	- DIRECT CURRENT UNINTERRUPTIBLE POWER SUPPLY
DR	- DRIVE
DV/DT	- DV/DT FILTER
EC	- EMPTY CONDUIT
EPD	- EQUIPMENT PROTECTION DEVICE
EQ	- EQUALIZATION
ETM	- ELAPSED TIME METER
FLA	- FULL LOAD AMPS
GND, G	- GROUND
GFI	- GROUND FAULT INTERRUPTER
I/O	- INPUT/OUTPUT
JB	- JUNCTION BOX
KAIC	- KILO AMPERE INTERRUPTING CAPACITY
KVA	- KILO VOLT AMPS
LP	- LIGHTING PANEL
M	- MOTOR STARTER
MCC	- MOTOR CONTROL CENTER
MIN.	- MINIMUM
MOV	- MOTOR OPERATED VALVE ACTUATOR
MTG.	- MOUNTING
NEC	- NATIONAL ELECTRIC CODE
OL	- OVERLOAD
PF	- PASSIVE FILTER
PLC	- PROGRAMMABLE LOGIC CONTROLLER
RVSS	- REDUCED VOLTAGE SOFT STARTER
SCADA	- SUPERVISORY CONTROL AND DATA ACQUISITION
SH.	- SHIELDED
SPD	- SURGE PROTECTIVE DEVICE
S.S.	- STAINLESS STEEL
TEMP	- TEMPERATURE
T'STAT	- THERMOSTAT
TX	- TRANSFORMER
UPS	- UNINTERRUPTIBLE POWER SUPPLY
VFD	- VARIABLE FREQUENCY DRIVE
WFC	- WATERTIGHT FLEXIBLE CONDUIT

ELECTRICAL LEGEND

SYMBOL	DESCRIPTION
	WALL MOUNTED TYPE LUMINAIRE - "A" REFERS TO LIGHTING FIXTURE SCHEDULE DESIGNATION, "3" REFERS TO THE CIRCUIT NUMBER, "b" REFERS TO SWITCH CONTROL IF NECESSARY. "EM" INDICATES LUMINAIRE SHALL BE PROVIDED WITH PROVISIONS FOR POWERING FROM A SEPARATE DC CIRCUIT DURING LOSS OF NORMAL BUILDING POWER. CONNECT TO NEAREST EMERGENCY LIGHTING UNIT.
	SURFACE/PENDANT MOUNTED FLUORESCENT LUMINAIRE - "A" REFERS TO LIGHTING FIXTURE SCHEDULE DESIGNATION, "3" REFERS TO THE CIRCUIT NUMBER, "b" REFERS TO SWITCH CONTROL IF NECESSARY.
	SITE LIGHT- "A" REFERS TO LIGHTING FIXTURE SCHEDULE DESIGNATION, "3" REFERS TO THE CIRCUIT NUMBER, "b" REFERS TO SWITCH CONTROL IF NECESSARY.
	WALL SWITCH - MOUNT AT 48" AFF. 20 AMP. RATED. SINGLE POLE UNLESS NOTED 3-WAY OR 4-WAY. "o" INDICATES LIGHT FIXTURE CONTROLLED.
	HOMERUN - EXTEND FEEDER TO THE DESIGNATED PANELBOARD OR DEVICE. WHERE MORE THAN TWO, CROSSHATCHED LINES INDICATE THE QUANTITY OF CURRENT CARRYING CONDUCTORS NOT INCLUDING THE GROUND CONDUCTOR. CIRCUITS SHARING A COMMON NEUTRAL SHALL BE CONNECTED TO DIFFERENT PHASES REGARDLESS OF THE NUMBERING. ALL CIRCUITS SHALL BE PROVIDED WITH A GREEN CODE SIZE EQUIPMENT GROUND CONDUCTOR. BOND TO GROUND BUS BAR IN PANELBOARD
	RACEWAY RUN EXPOSED. NOTATIONS SAME AS ABOVE.
	RACEWAY RUN UNDERGROUND OR UNDERFLOOR. NOTATIONS SAME AS ABOVE.
	DUPLEX RECEPTACLE- 120-VOLT, 20-AMP. MOUNT 18" AFF TO CENTERLINE, UNLESS OTHERWISE NOTED. "3" REFERS TO THE CIRCUIT NUMBER.
	GROUND FAULT CIRCUIT INTERRUPTING DUPLEX RECEPTACLE - 120-VOLT, 20-AMP WITH GFCI PROTECTION IN THE RECEPTACLE. MOUNT 18" AFF TO CENTERLINE, UNLESS OTHERWISE NOTED. "3" REFERS TO THE CIRCUIT NUMBER. "WP" INDICATES RECEPTACLE SHALL BE WEATHERPROOF AND PROVIDE WITH CONTINUOUS-USE COVER.
	GROUND FAULT RECEPTACLE ABOVE COUNTER. 42" UP TO CENTERLINE - VERIFY.
	TWO DUPLEX RECEPTACLES MTD. IN QUAD BOX. 42" UP TO CENTERLINE UNLESS NOTED OTHERWISE.
	SURFACE JUNCTION BOX OR PULL BOX. SEE SPECIFICATIONS FOR TYPE. A-ANALOG SIGNALS, D-DIGITAL SIGNALS, P-120V OR 480V POWER
	TELEPHONE OUTLET - MOUNT BOX AT 48" AFF. EXTEND 3/4" CONDUIT WITH PULL CORD BACK TO TELEPHONE BOARD. PROVIDE BLANK COVERPLATE.
	DATA OR COMBINATION TELEPHONE/DATA OUTLET, MOUNTING HEIGHT 18 AFF UNLESS NOTE OTHERWISE. EXTEND 3/4" CONDUIT UP ABOVE CEILING AND INSTALL BUSHING. PROVIDE QUAD BOX FOR TELEPHONE DATA OUTLETS BY INSTALLER.
	SPECIAL PURPOSE RECEPTACLE (STOVE - 50 AMP, NEMA 14-50, COORDINATE WITH EQUIPMENT SUPPLIER.
	CONTROL STATION. SEE DESCRIPTION ON PLANS.
	NEMA 4X, 120 VOLT MANUAL MOTOR SWITCH (PROVIDE 1P DEVICE FOR 120V. CIRCUITS, 2P DEVICE FOR 208/240V CIRCUITS, 3P DEVICE FOR 3Ø CIRCUITS). PROVIDE CAST ALUMINUM BOX AND CAST ALUMINUM COVER. ALL SCREWS TO BE STAINLESS STEEL.
	NEMA 4, 120 VOLT MAGNETIC MOTOR STARTER (PROVIDE 1P DEVICE FOR 120V. CIRCUITS, 3P DEVICE FOR 3Ø CIRCUITS).
	HANDHOLE. SEE SPECIFICATIONS.
	600V. HEAVY DUTY SAFETY SWITCH. "XXX/Y/ZZ/FAAA". "XXX" INDICATES FRAME SIZE; "Y" INDICATES NUMBER OF POLES; "ZZ" INDICATES ENCLOSURE NEMA RATING ("1" = NEMA 1, "3R" = NEMA 3R, "4X" = NEMA 4X); AND "FAAA" INDICATES FUSE SIZE ("FPM" = FUSE PER MANUFACTURER REQUIREMENTS), NO TEXT INDICATES NON-FUSED DISCONNECT SWITCH.
	NEMA SIZE 1, 480 VOLT, 3P COMBINATION STARTER WITH H-0-A, CPT AND RED RUN LIGHT IN NEMA 4X SST ENCLOSURE UNLESS NOTED OTHERWISE.
	20 AMP, 1P WALL SWITCH FOR CONTROL OF FAN.
	SINGLE FACE CEILING MOUNTED ILLUMINATED EXIT SIGN. EXIT SIGN SHALL HAVE A FACE (SHADED AREA). PROVIDE WITH A BATTERY PACK FOR OPERATION OF TWO LAMPS DURING LOSS OF NORMAL BUILDING POWER. BATTERY PACK SHALL BE UN-SWITCHED EXCEPT FOR THE CIRCUIT BREAKER. SEE LIGHTING FIXTURE SCHEDULE.
	EMERGENCY LIGHTING UNIT. SEE LIGHTING FIXTURE SCHEDULE.
	INDUCTION MOTOR, DESIGNATION: HORSEPOWER.
	EMERGENCY LIGHTING UNIT REMOTE HEAD. SEE LIGHTING FIXTURE SCHEDULE.
	PHOTOCELL
	CAMERA BY OTHERS. "FF" DENOTES FIXED FRAME, "PTZ" DENOTES PAN, TILT ZOOM
	SOLENOID VALVE, BY OTHERS.
	MOTOR OPERATED VALVE ACTUATOR, BY OTHERS.
	LIMIT SWITCH, BY OTHERS. (H-HIGH, L-LOW)
	PRESSURE INDICATING TRANSMITTER, BY OTHERS. (PE-FLOW ELEMENT)
	LEVEL INDICATING TRANSMITTER, BY OTHERS. (LE-LEVEL ELEMENT)
	NEMA 4X ALARM HORN/LIGHT (RED, 120V). EDWARDS SIGNAL OR EQUAL.

NO.	DESCRIPTION	DATE	BY
1	ISSUED FOR BIDS	4/1/24	STS

PROJECT ENG:	DESIGNED BY:	DRAWN BY:	CHECKED BY:	APPROVED:
STS	STS	STS	ATH	STS

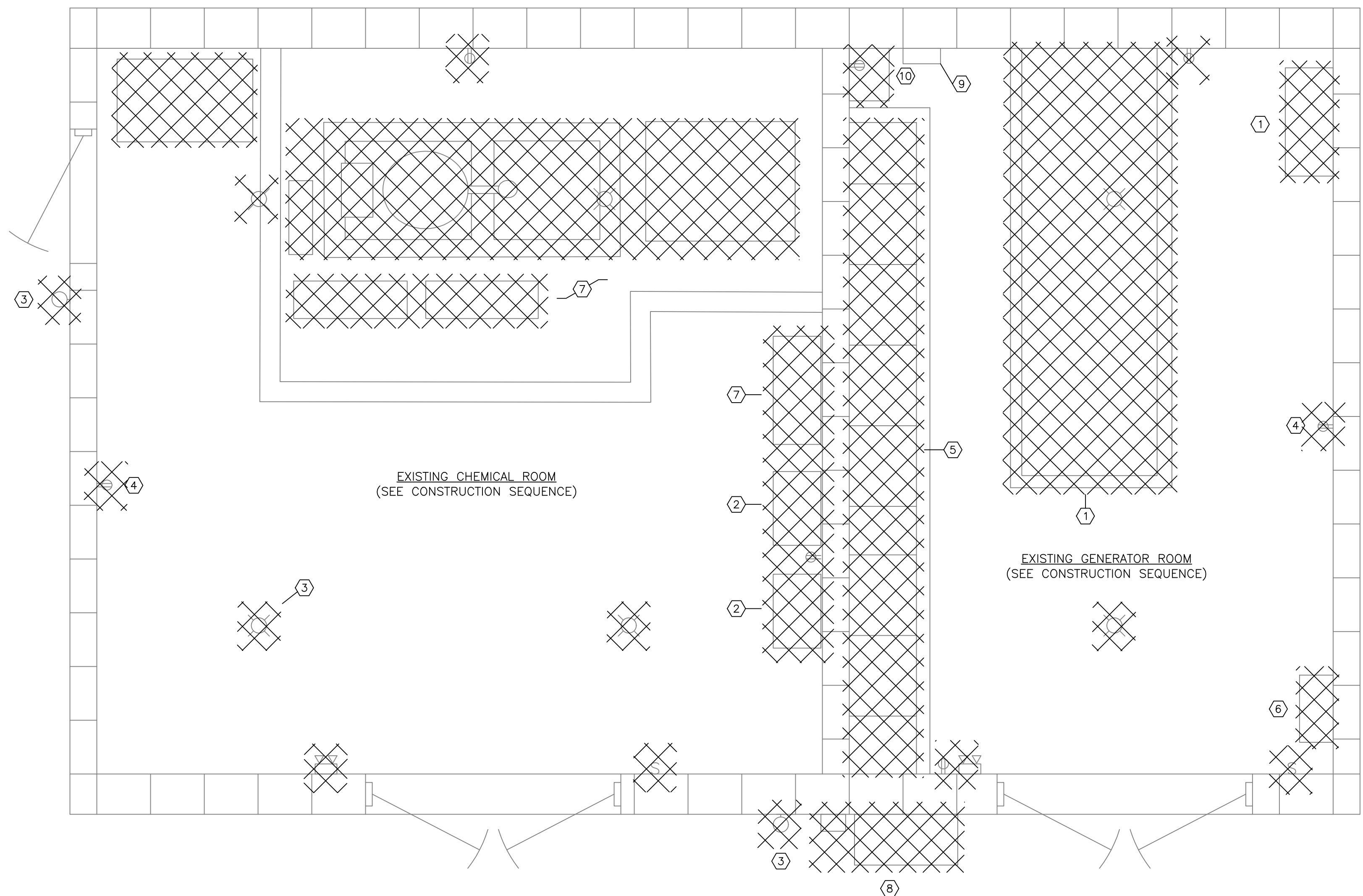


SHEET TITLE:
ELECTRICAL LEGEND,
SYMBOLS, AND
GENERAL NOTES

PROJECT:
RAW WATER STATION
GENERATOR AND MCC
UPGRADES

DATE:
APRIL 2024
HEI PROJECT NO.
A23121-E
SCALE:
AS SHOWN

SHEET NO.
E1 OF 16



ELECTRICAL BUILDING DEMOLITION PLAN

SCALE: 1/2" = 1'-0"

(X) PLAN NOTES

1. REMOVE EXISTING GENERATOR AND ALL ASSOCIATED WIRING, CONDUIT, AND ELECTRICAL COMPONENTS.
2. REMOVE EXISTING GEORGETOWN PUMP VFD CABINETS AND ALL ASSOCIATED WIRING AND CONDUIT. TURN VFDS OVER TO THE CITY OF GEORGETOWN.
3. REMOVE EXISTING LIGHT FIXTURES AND ALL ASSOCIATED WIRING, CONDUIT, AND SWITCHES AS INDICATED. (TYP.)
4. REMOVE EXISTING ELECTRICAL OUTLETS AND ALL ASSOCIATED WIRING, CONDUIT, AND SWITCHES AS INDICATED. (TYP.)
5. REMOVE EXISTING MOTOR CONTROL CENTER AND ALL ASSOCIATED WIRING AND CONDUIT.
6. EXISTING SCADA CABINET AND ALL ASSOCIATED WIRING AND CONDUIT TO BE REMOVED COMPLETELY.
7. REMOVE ALL WIRING AND CONDUIT ASSOCIATED WITH EXISTING CHEMICAL FEED PUMP SYSTEM.
8. EXISTING CT CABINET AND METER TO BE REMOVED COMPLETELY.
9. EXISTING CITY OF GEORGETOWN FIBER TERMINATION CABINET TO REMAIN.
10. EXISTING LIBERTY STEEL SOFT STARTER TO BE REMOVED COMPLETELY. TURN OVER TO LIBERTY STEEL.

CONSTRUCTION SEQUENCE

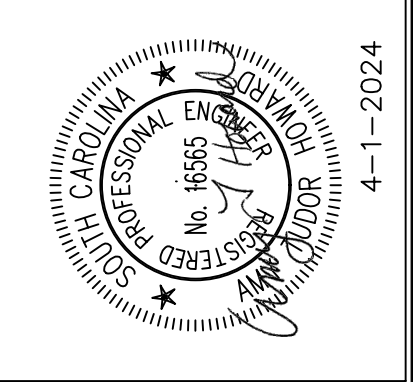
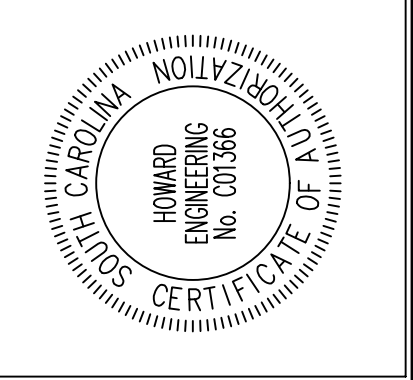
GENERAL - THE WORK SEQUENCE BELOW IS PROVIDED AS A GENERAL GUIDELINE. THE CONTRACTOR SHALL PROVIDE A DETAILED WRITTEN SEQUENCE PRIOR TO BEGINNING WORK.

NO OUTAGES ARE PLANNED FOR THIS WORK SEQUENCE. WHERE THE CONTRACTOR IDENTIFIES A REQUIRED OUTAGE, THE WORK MAY BE CONDUCTED DURING NON-PEAK HOURS AND SHALL NOT EXCEED 4 HOURS.

1. LOCATE AND PROTECT EXISTING SERVICE TO ELECTRICAL BUILDING AND FEEDERS TO PUMP STATION PRIOR TO EXCAVATING FOR NEW CONDUIT.
2. DEMO ALL EQUIPMENT IN CHEMICAL ROOM EXCEPT THE VFDS FOR THE GEORGETOWN PUMPS. PROTECT VFDS FROM DAMAGE AND DUST DURING DEMOLITION ACTIVITIES.
3. AFTER RENOVATIONS ARE COMPLETE, INSTALL MCB, ATS, TRANSFORMER AND LIGHTING PANEL LP, VFDS AND RTU'S.
4. INSTALL CONDUIT AND WIRING BETWEEN NEW ELECTRICAL COMPONENTS.
5. INSTALL GENERATOR.
6. TEST ALL WIRING AND GROUND SYSTEM PRIOR TO ENERGIZING NEW ELECTRICAL SYSTEM.
7. ENERGIZE NEW ELECTRICAL SYSTEM.
8. CONNECT PUMPS TO NEW VFDS ONE PUMP AT A TIME SUCH THAT THE STATION MAINTAINS PUMPING CAPABILITY THROUGHOUT CONSTRUCTION. COORDINATE PUMP ORDER WITH OWNER.
9. AFTER PUMPS ARE COMPLETELY OPERATIONAL ON NEW SYSTEMS (NORMAL AND GENERATOR POWER), COMPLETE DEMOLITION OF GENERATOR ROOM AND RENOVATIONS.

REVISIONS		DATE	BY
NO.	DESCRIPTION		
1	ISSUED FOR BIDS	4/1/24	STS

APPROVALS	PROJECT ENG:	DESIGNED BY:	DRAWN BY:	CHECKED BY:	APPROVED:
STS	STS	STS	STS	ATH	STS



HOWARD ENGINEERING
 ELECTRICAL-MECHANICAL-CONTROLS
 MARIETTA, SOUTH CAROLINA
 (864) 836-0440

SHEET TITLE:
ELECTRICAL BUILDING DEMOLITION PLAN

PROJECT:
RAW WATER STATION GENERATOR AND MCC UPGRADES

DATE: APRIL 2024
 HEI PROJECT NO. A23121-E
 SCALE: AS SHOWN

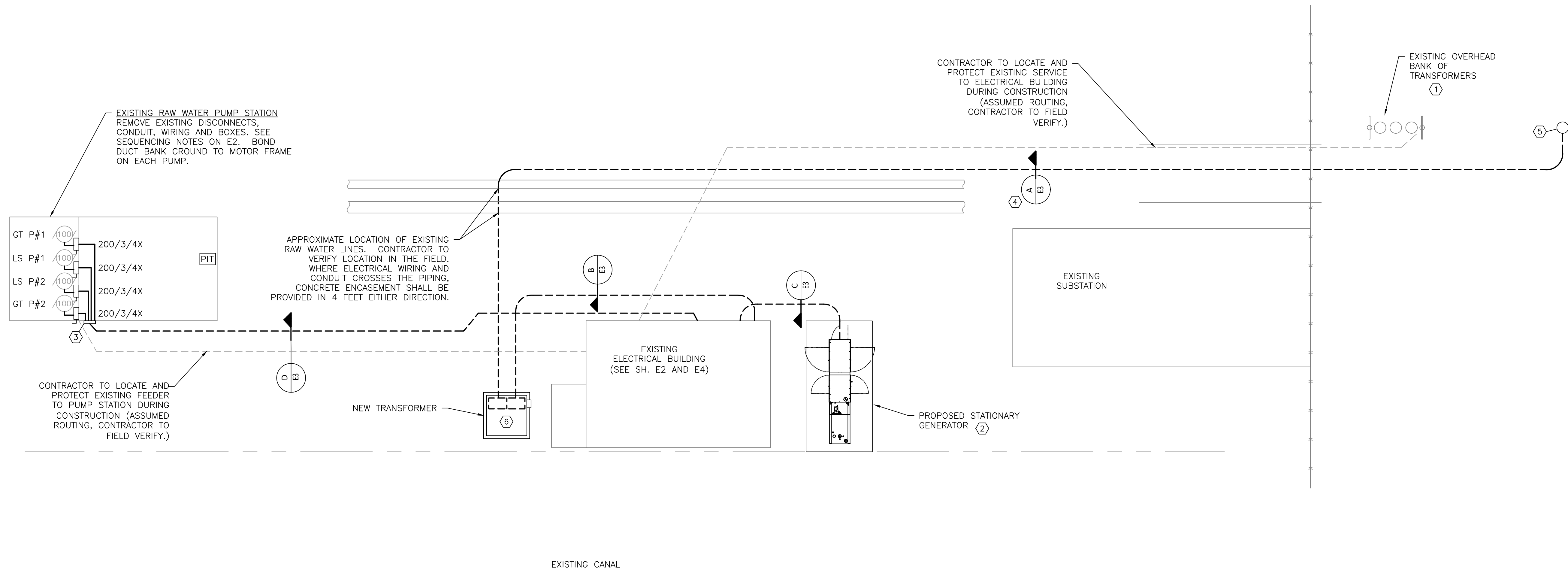
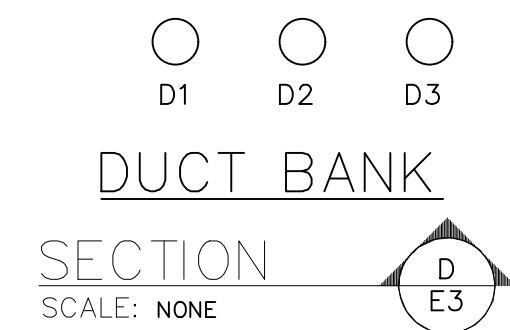
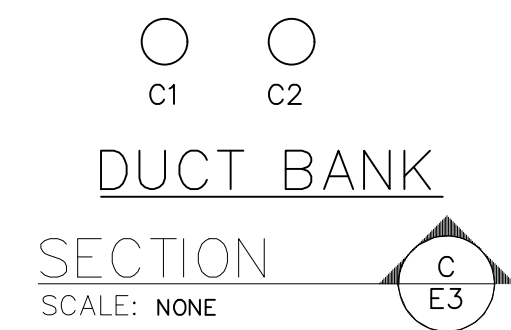
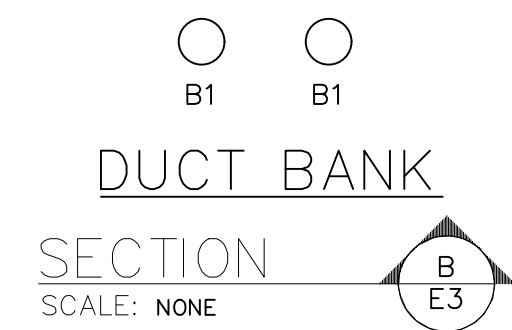
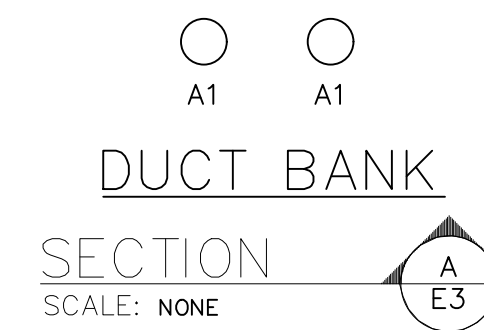
SHEET NO.
E2 OF 16

A1 - PRIMARY SERVICE. (SEE ONE-LINE DIAGRAM)

B1 - SECONDARY SERVICE. (SEE ONE-LINE DIAGRAM)

C1 - 480V (SEE ONE-LINE DIAGRAM)
 C2 - 1" C. (SEE RISER DIAGRAM)
 C3 - 1" C. (SEE RISER DIAGRAM)
 C4 - 1" C. (SEE RISER DIAGRAM)

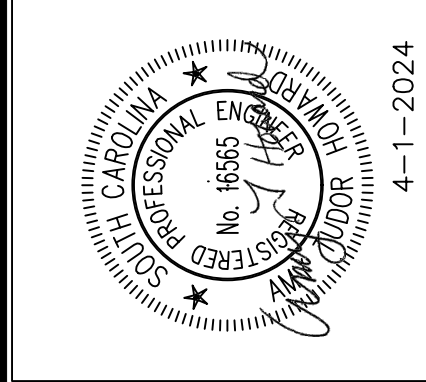
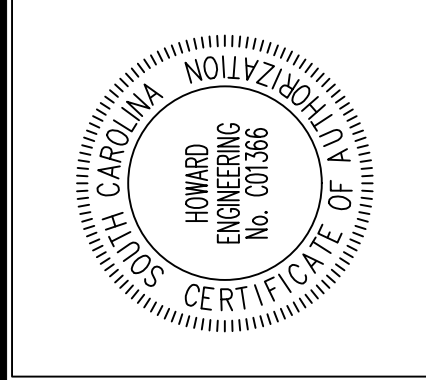
D1 - 480V (SEE ONE-LINE DIAGRAM)
 D2 - 480V (SEE ONE-LINE DIAGRAM)
 D3 - 480V (SEE ONE-LINE DIAGRAM)
 D4 - 480V (SEE ONE-LINE DIAGRAM)
 D5 - 1" C. (SEE RISER DIAGRAM)
 D6 - 2" EMPTY CONDUIT



- (X) **PLAN NOTES**
- TRANSFORMERS TO BE REMOVED BY GEORGETOWN ELECTRIC.
 - CONNECT FOR POWER, CONTROL & MONITORING. VERIFY WIRING REQUIREMENTS AND STUB UP LOCATIONS FROM APPROVED SHOP DRAWINGS.
 - N4X PULL BOX MOUNTED ADJACENT TO EXISTING PULL BOX. SIZE PER CODE REQUIREMENTS. REMOVE EXISTING PULL BOX AFTER NEW SYSTEM IS OPERATIONAL.
 - DUCT BANK GROUND NOT REQUIRED.
 - NEW SERVICE POLE BY GEORGETOWN ELECTRIC. CONTRACTOR SHALL EXTEND ONE CONDUIT 10' UP POLE. THE OTHER CONDUIT SHALL BE CAPPED 12" ABOVE GRADE.
 - NEW PAD MOUNTED TRANSFORMER BY GEORGETOWN ELECTRIC. CONTRACTOR SHALL PROVIDE PAD PER GEORGETOWN SPECIFICATIONS.

NO.	DESCRIPTION	DATE	BY
1	ISSUED FOR BIDS	4/1/24	STS

APPROVALS	PROJECT ENG:	DESIGNED BY:	DRAWN BY:	CHECKED BY:	APPROVED:
	STS	STS	STS	ATH	STS



HOWARD ENGINEERING
 ELECTRICAL-MECHANICAL-CONTROLS
 MARIETTA, SOUTH CAROLINA
 (864) 836-0440

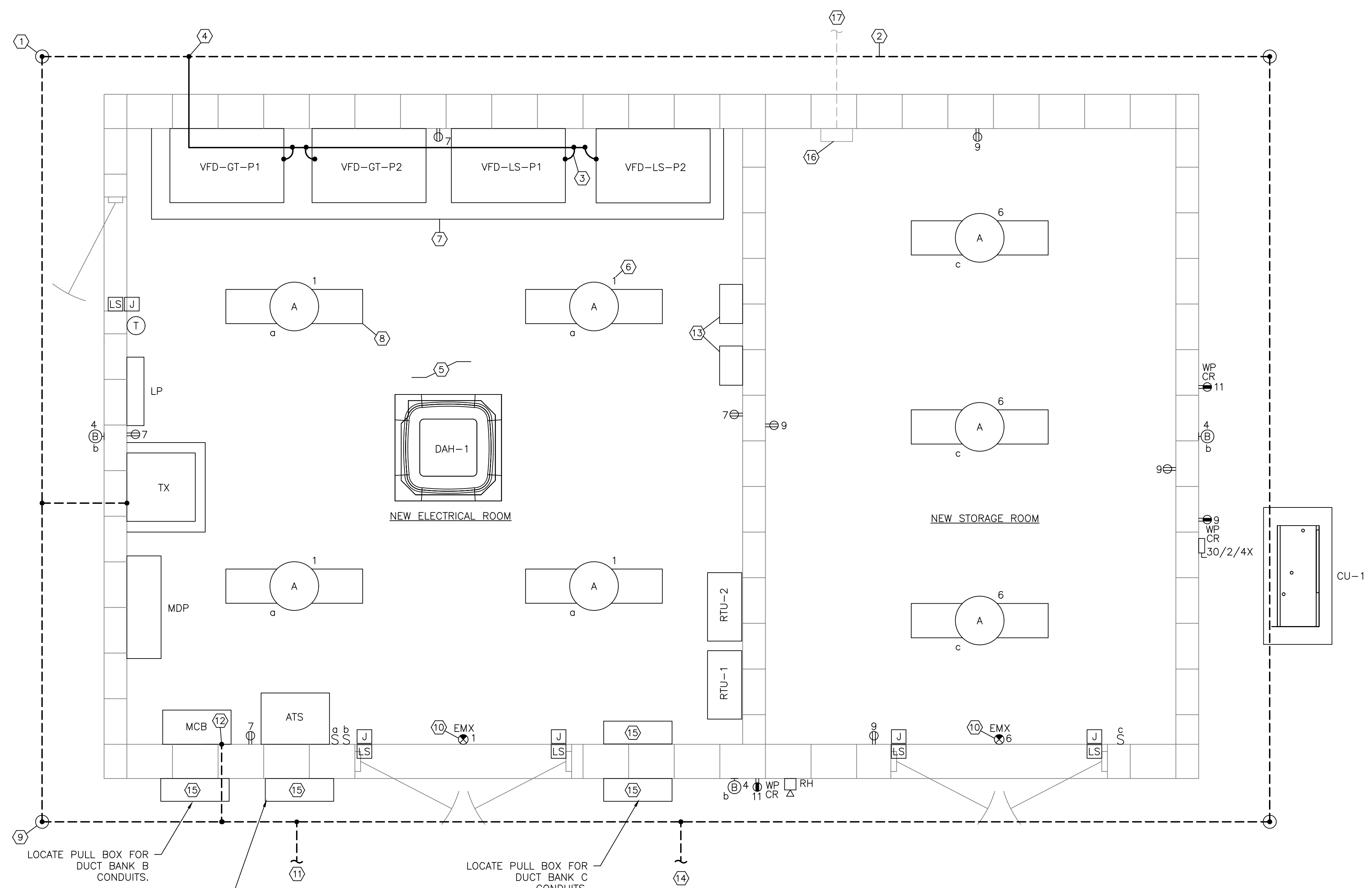
SHEET TITLE:
ELECTRICAL SITE PLAN

PROJECT:
RAW WATER STATION GENERATOR AND MCC UPGRADES

DATE: APRIL 2024
 HEI PROJECT NO. A23121-E
 SCALE: AS SHOWN

SHEET NO.
E3 OF 16

ELECTRICAL SITE PLAN
 SCALE: 1" = 10'-0"

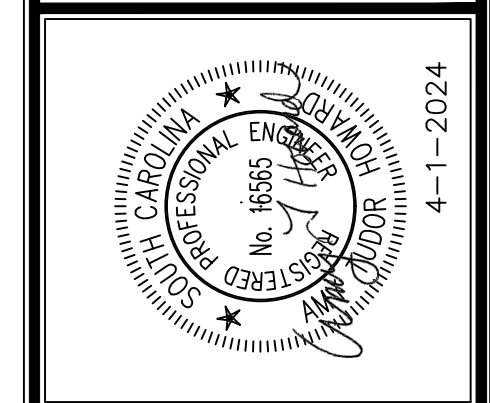
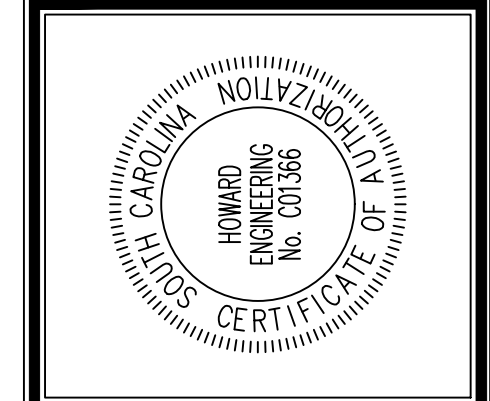


ELECTRICAL BUILDING RENOVATION PLAN
SCALE: 1/2" = 1'-0"

- ⊗ **PLAN NOTES**
- 3/4" X 10' COPPERCLAD DRIVEN GROUND ROD. (TYPICAL)
 - #4/0 BARE COPPER NO LESS THAN 30" DEEP.
 - BOND TO EQUIPMENT WITH #2/0 BARE COPPER GROUND. PROVIDE 1" PVC SLEEVE. (TYPICAL)
 - EXOTHERMIC WELD. (TYPICAL)
 - SEE ONE-LINE AND RISER DIAGRAMS FOR WIRING REQUIREMENTS.
 - DENOTES CIRCUIT IN PANELBOARD LP.
 - 4" THICK CONCRETE HOUSEKEEPING PAD.
 - MOUNT TO BOTTOM OF ROOF STRUCTURE. (TYPICAL)
 - GROUND ROD TEST WELL PER DETAIL.
 - WIRED AHEAD OF LIGHT SWITCH.
 - DUCT BANK GROUND. BOND TO GENERATOR FRAME.
 - INSTALL #4/0 GROUNDING ELECTRODE CONDUCTOR IN 1" SCH. 80 PVC.
 - METER PROVIDED BY GEORGETOWN ELECTRIC.
 - DUCT BANK GROUND. BOND TO PUMP FRAMES.
 - CODE GAUGE/SIZE PULL BOX.
 - EXISTING CITY OF GEORGETOWN FIBER TERMINATION CABINET. SEE RISER DIAGRAM.
 - LOCATE AND PROTECT CITY OF GEORGETOWN FIBER.

NO.	DESCRIPTION	DATE	BY
1	ISSUED FOR BIDS	4/1/24	STS

APPROVALS	PROJECT ENG:	DESIGNED BY:	DRAWN BY:	CHECKED BY:	APPROVED:
	STS	STS	STS	ATH	STS



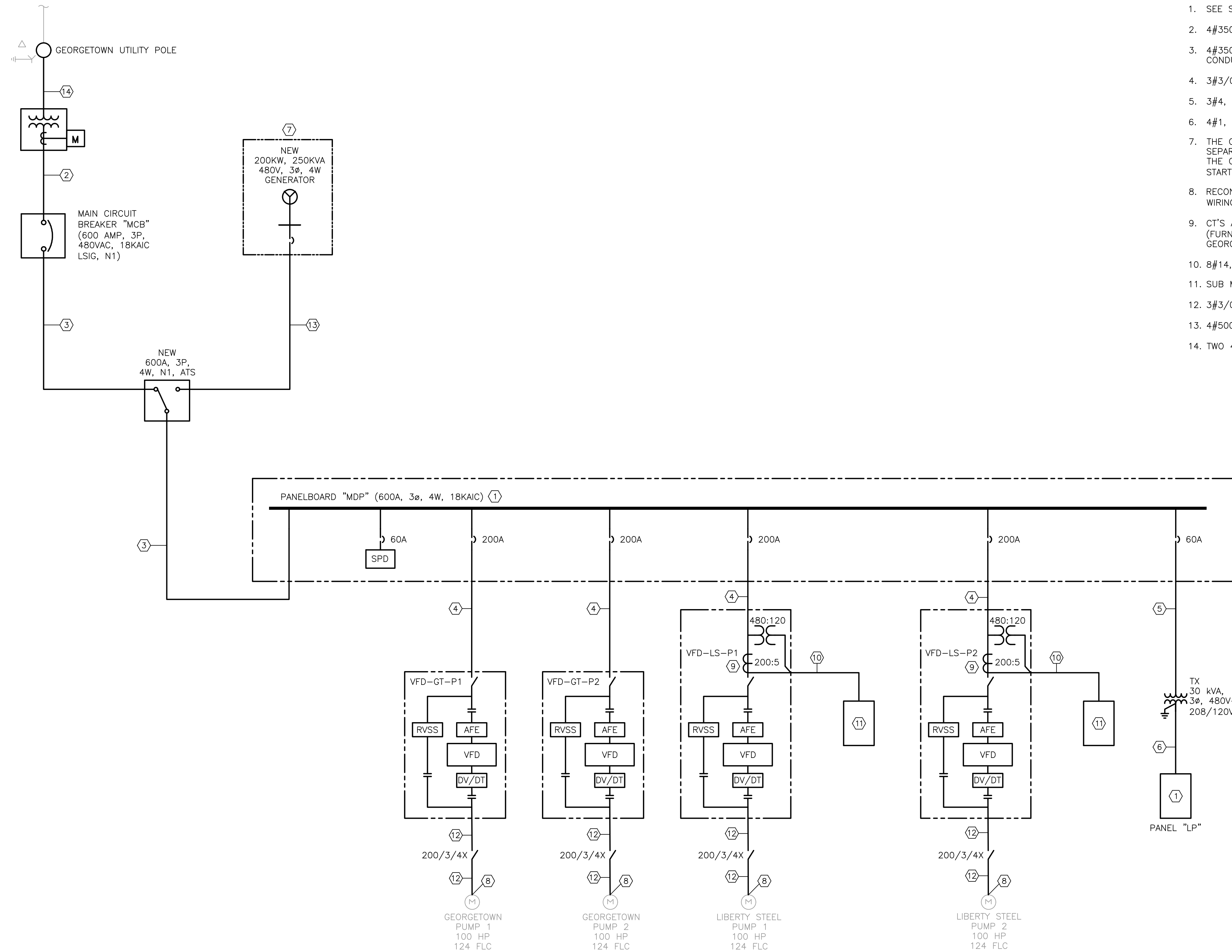
HOWARD ENGINEERING
ELECTRICAL-MECHANICAL-CONTROLS
MARIETTA, SOUTH CAROLINA
(864) 836-0440

SHEET TITLE:
ELECTRICAL BUILDING RENOVATION PLAN

PROJECT:
RAW WATER STATION GENERATOR AND MCC UPGRADES

DATE: APRIL 2024
HEI PROJECT NO. A23121-E
SCALE: AS SHOWN

SHEET NO.
E4 OF 16



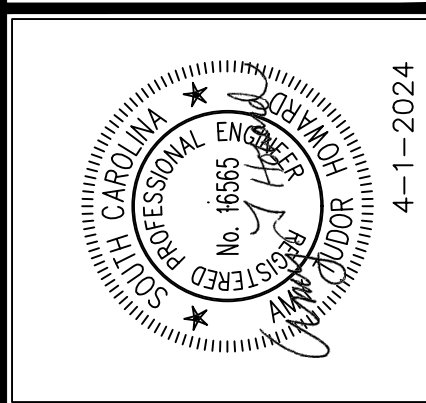
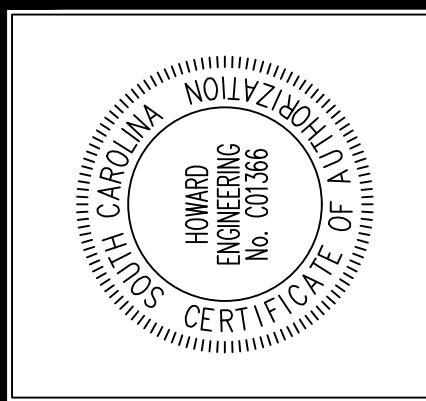
ONE-LINE DIAGRAM
NO SCALE

(X) ONE-LINE NOTES:

1. SEE SCHEDULE FOR ADDITIONAL REQUIREMENTS.
2. 4#350 KCM, IN EACH OF TWO (2) 3" CONDUITS.
3. 4#350 KCM, 1#1G. IN EACH OF TWO (2) 3" CONDUITS.
4. 3#3/0, 1#6G.-2"C.
5. 3#4, 1#10G.-1 1/4"C.
6. 4#1, 1#8G.-1 1/2"C.
7. THE GENERATOR SHALL BE CONNECTED AS A SEPARATELY DERIVED SYSTEM. THE N-G STRAP IN THE GENERATOR SHALL BE REMOVED DURING STARTUP BY THE MFR'S REPRESENTATIVE.
8. RECONNECT TO MOTOR. COIL SPACE HEATER WIRING FOR FUTURE USE. CONFIRM MOTOR T'STAT.
9. CT'S AND PT'S MOUNTED IN VFD CABINET (FURNISHED BY CONTRACTOR). COORDINATE WITH GEORGETOWN ELECTRIC ON REQUIREMENTS.
10. 8#14, 1#14G.-3/4"C.
11. SUB METER PROVIDED BY GEORGETOWN ELECTRIC.
12. 3#3/0, 2#12, 2#14, 1#6G.-2"C.
13. 4#500 KCM, 1#3G.-3"C.
14. TWO 4" EMPTY CONDUITS.

REVISIONS		DATE	BY
NO.	DESCRIPTION	4/1/24	STS
1	ISSUED FOR BIDS		

APPROVALS	
PROJECT ENG:	DESIGNED BY:
STS	STS
DRAWN BY:	CHECKED BY:
STS	ATH
APPROVED: STS	



HOWARD ENGINEERING
ELECTRICAL-MECHANICAL-CONTROLS
MARIETTA, SOUTH CAROLINA
(864) 836-0440

SHEET TITLE:
ONE-LINE DIAGRAM

PROJECT:
RAW WATER STATION GENERATOR AND MCC UPGRADES

DATE: APRIL 2024
HEI PROJECT NO. A23121-E
SCALE: AS SHOWN

SHEET NO.
E5 OF 16

FIXTURE SCHEDULE

TYPE	DESCRIPTION	MOUNTING	LAMPS		MANUFACTURER *	VOLTAGE	REMARKS
			TYPE	WATTS			
A	4" INDUSTRIAL LED	SURFACE	LED	52	H.E. WILLIAMS #82-4-L64/840-DRV-UNV	120	WITH HANGERS AS REQUIRED
B	DIE CAST ALUMINUM HOUSING WALL PACK	WALL	LED	30	BROWNLEE #7037-D30LED-40K-PO1	120	WITH PHOTOCCELL
EMX	EMERGENCY EXT FIXTURE WITH TWO HEADS	WALL	PAR	9	EMERGLITE #BPR1250H1R2-LJ	120	SIZED TO POWER RH.
RH	EMERGENCY REMOTE HEAD (WEATHERPROOF)	WALL	PAR	5.4	EMERGLITE #EF23D-ZBK	120	

*OR APPROVED EQUAL
ALL MANUFACTURERS

PANEL SCHEDULES

PHASE		PANELBOARD: MDP		BUS: COPPER		MAINS: MAIN LUGS ONLY		PHASE	
"A"	"B"	"C"	SERVICE: 480V, 3PH, 4W	RATING: 600A	LOCATION: ELECTRICAL BUILDING	"A"	"B"	"C"	
V.A.	V.A.	V.A.	MOUNTING: SURFACE	18 KAIC	NEMA 1	V.A.	V.A.	V.A.	
34323			PUMP NO. 1 VFD	3	200	1	2	200	3
	34323					3	4		
		34323				5	6		
34323			PUMP NO. 3 VFD	3	200	7	8	200	3
	34323					9	10		
		34323				11	12		
3337			TRANSFORMER	3	60	13	14	20	3
	4516					15	16		
		4375				17	18		
			SPARE	3	20	19	20	20	3
						21	22		
			SPARE	3	20	23	24		
						25	26	50	3
			SPARE	3	20	27	28		
						29	30		
			SPARE	3	20	31	32	20	3
						33	34		
						35	36		
			SPD	3	60	37	38	20	3
						39	40		
						41	42		
71983			TOTAL "A"			140629			TOTAL "A" 68646
	73162		TOTAL "B"			141808			TOTAL "B" 68646
		73021	TOTAL "C"			141667			TOTAL "C" 68646
			TOTAL =			424104			

PHASE		PANELBOARD: LP		BUS: TIN PL. CU		MAINS: 3P-100A MAIN BREAKER		PHASE	
"A"	"B"	"C"	SERVICE: 120/208V, 3PH, 4W, S/N	RATING: 100A	LOCATION: ELECTRICAL BUILDING	"A"	"B"	"C"	
V.A.	V.A.	V.A.	MOUNTING: SURFACE	22KAIC	NEMA 1	V.A.	V.A.	V.A.	
217			ELEC. BLDG. INT. LIGHTS	1	20	1	2	30	1
	1200		GENERATOR SHORE POWER	2	30	3	4	20	1
		1200				5	6	20	1
720			ELEC. BLDG. INT. RECEPTACLES	1	20	7	8	30	1
	720		STORAGE ROOM INT. RECEPTACLES	1	20	9	10	20	1
		540	EXTERIOR RECEPTACLES	1	20	11	12		
			SPARE	1	20	13	14	20	1
			SPARE	1	20	15	16	20	1
			SPARE	1	20	17	18	20	1
			SPARE	1	20	19	20	20	1
			SPARE	1	20	21	22	20	1
			SPARE	1	20	23	24	20	1
			SPD	3	30	25	26	20	1
						27	28	20	1
						29	30	20	1
937			TOTAL "A"			3337			TOTAL "A" 2400
	1920		TOTAL "B"			4516			TOTAL "B" 2596
		1740	TOTAL "C"			4375			TOTAL "C" 2635
			TOTAL =			12228			

20 AMP, 1P CIRCUITS USE 2#12, 1#12G, -3/4" C.
30 AMP, 1P CIRCUITS USE 2#10, 1#10G, -3/4" C.

I/O LIST RTU-1

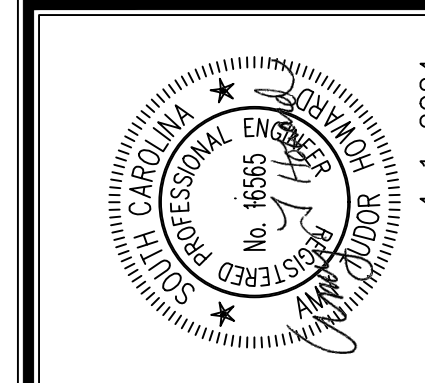
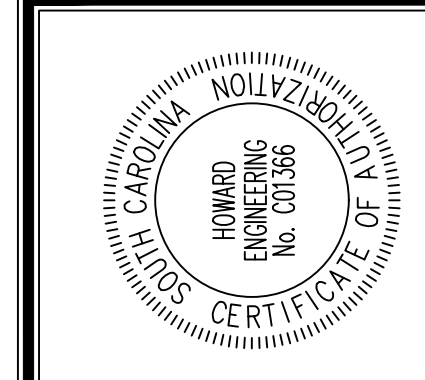
	TYPE	TAG	EQUIPEMENT DESCRIPTION/FUNCTION	SCADA SYSTEM FUNCTION
1	Analog In		Fuel Tank Level	Trend, Alarm on Low
2	Analog In		Spare AI Point, Wired to Analog Surge Protector	
3	Analog In		Spare AI Point, Wired to Analog Surge Protector	
4	Analog In		Spare AI Point, Wired to Analog Surge Protector	
1	Analog Out		Georgetown Pump 1 VFD Speed Reference	
2	Analog Out		Georgetown Pump 2 VFD Speed Reference	
3	Analog Out		Spare AO Point, Wired to Analog Surge Protector	
4	Analog Out		Spare AO Point, Wired to Analog Surge Protector	
1	Digital In		Georgetown Pump #1 High Motor Temperature	Alarm, Archive
2	Digital In		Georgetown Pump #1 Not-in-Auto	Alarm, Archive
3	Digital In		Georgetown Pump #2 High Motor Temperature	Alarm, Archive
4	Digital In		Georgetown Pump #2 Not-in-Auto	Alarm, Archive
5	Digital In		Generator Running	Indicate, Archive
6	Digital In		Generator Fail	Alarm, Archive
7	Digital In		ATS Normal Position	Indicate, Archive
8	Digital In		ATS Emergency Position	Indicate, Archive
9	Digital In		Generator Low Fuel Level	Alarm, Archive
10	Digital In		Georgetown Pump #1 Soft Starter Run Status	Indicate, Archive
11	Digital In		Georgetown Pump #2 Soft Starter Run Status	Indicate, Archive
12	Digital In		Georgetown Pump #1 Soft Starter Fault	Alarm, Archive
13	Digital In		Georgetown Pump #2 Soft Starter Fault	Alarm, Archive
14	Digital In		Electrical Room High Temperature Alarm	Alarm, Archive
15	Digital In		Station Door Alarm	Alarm, Archive
16	Digital In		Spare Digital Input Point, wired to interposing relay	
1	Digital Out		Georgetown Pump 1 VFD Run Command	
2	Digital Out		Georgetown Pump 2 VFD Run Command	
3	Digital Out		Spare Digital Output Point, wired to interposing relay	
4	Digital Out		Spare Digital Output Point, wired to interposing relay	
1	Modbus TCP		Georgetown Pump 1 VFD	Monitor pump speed, status, alarms
2	Modbus TCP		Georgetown Pump 2 VFD	Monitor pump speed, status, alarms

I/O LIST RTU-2

	TYPE	TAG	EQUIPEMENT DESCRIPTION/FUNCTION	SCADA SYSTEM FUNCTION
1	Analog In		Liberty Steel Pump Discharge Pressure	
2	Analog In			
1	Analog Out		Liberty Steel Pump 1 VFD Speed Reference	
2	Analog Out		Liberty Steel Pump 2 VFD Speed Reference	
1	Digital In		Liberty Steel Pump #1 High Motor Temperature	Alarm, Archive
2	Digital In		Liberty Steel Pump #1 Not-in-Auto	Alarm, Archive
3	Digital In		Liberty Steel Pump #2 High Motor Temperature	Alarm, Archive
4	Digital In		Liberty Steel Pump #2 Not-in-Auto	Alarm, Archive
5	Digital In		Spare Digital Input Point, wired to interposing relay	
6	Digital In		Spare Digital Input Point, wired to interposing relay	
7	Digital In		Spare Digital Input Point, wired to interposing relay	
8	Digital In		Spare Digital Input Point, wired to interposing relay	
9	Digital In		Spare Digital Input Point, wired to interposing relay	
10	Digital In		Liberty Steel Pump #1 Soft Starter Run Status	Indicate, Archive
11	Digital In		Liberty Steel Pump #2 Soft Starter Run Status	Indicate, Archive
12	Digital In		Liberty Steel Pump #1 Soft Starter Fault	Alarm, Archive
13	Digital In		Liberty Steel Pump #2 Soft Starter Fault	Alarm, Archive
14	Digital In		Spare Digital Input Point, wired to interposing relay	
15	Digital In		Spare Digital Input Point, wired to interposing relay	
16	Digital In		Spare Digital Input Point, wired to interposing relay	
1	Digital Out		Liberty Steel Pump 1 VFD Run Command	
2	Digital Out		Liberty Steel Pump 2 VFD Run Command	
1	Modbus TCP		Liberty Steel Pump 1 VFD	Monitor pump speed, status, alarms
2	Modbus TCP		Liberty Steel Pump 2 VFD	Monitor pump speed, status, alarms

NO.	DESCRIPTION	DATE	BY
1	ISSUED FOR BIDS	4/1/24	STS

PROJECT ENG:	DESIGNED BY:	DRAWN BY:	CHECKED BY:	APPROVED:
STS	STS	STS	ATH	STS



ELECTRICAL SCHEDULES

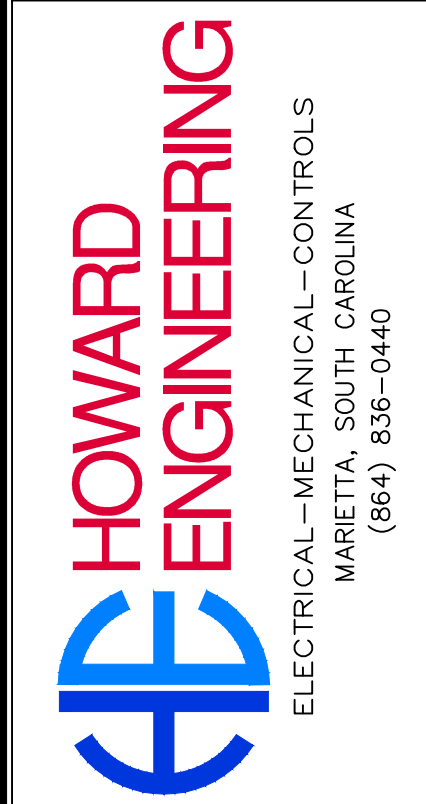
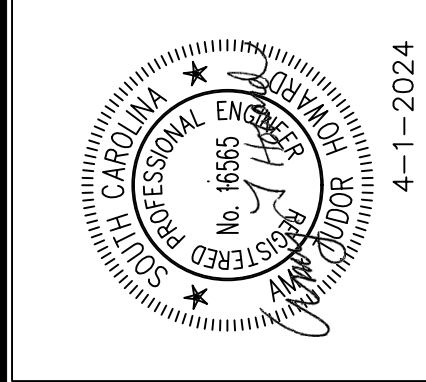
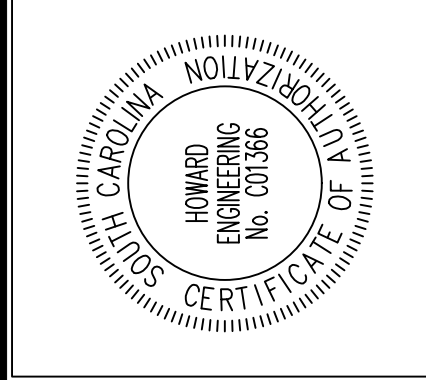
PROJECT: RAW WATER STATION GENERATOR AND MCC UPGRADES

DATE: APRIL 2024
HEI PROJECT NO. A23121-E
SCALE: AS SHOWN

SHEET NO. E6 OF 16

NO.	DESCRIPTION	DATE	BY
1	ISSUED FOR BIDS	4/1/24	STS

APPROVALS	PROJECT ENG:	DESIGNED BY:	DRAWN BY:	CHECKED BY:	APPROVED:
	STS	STS	STS	ATH	STS

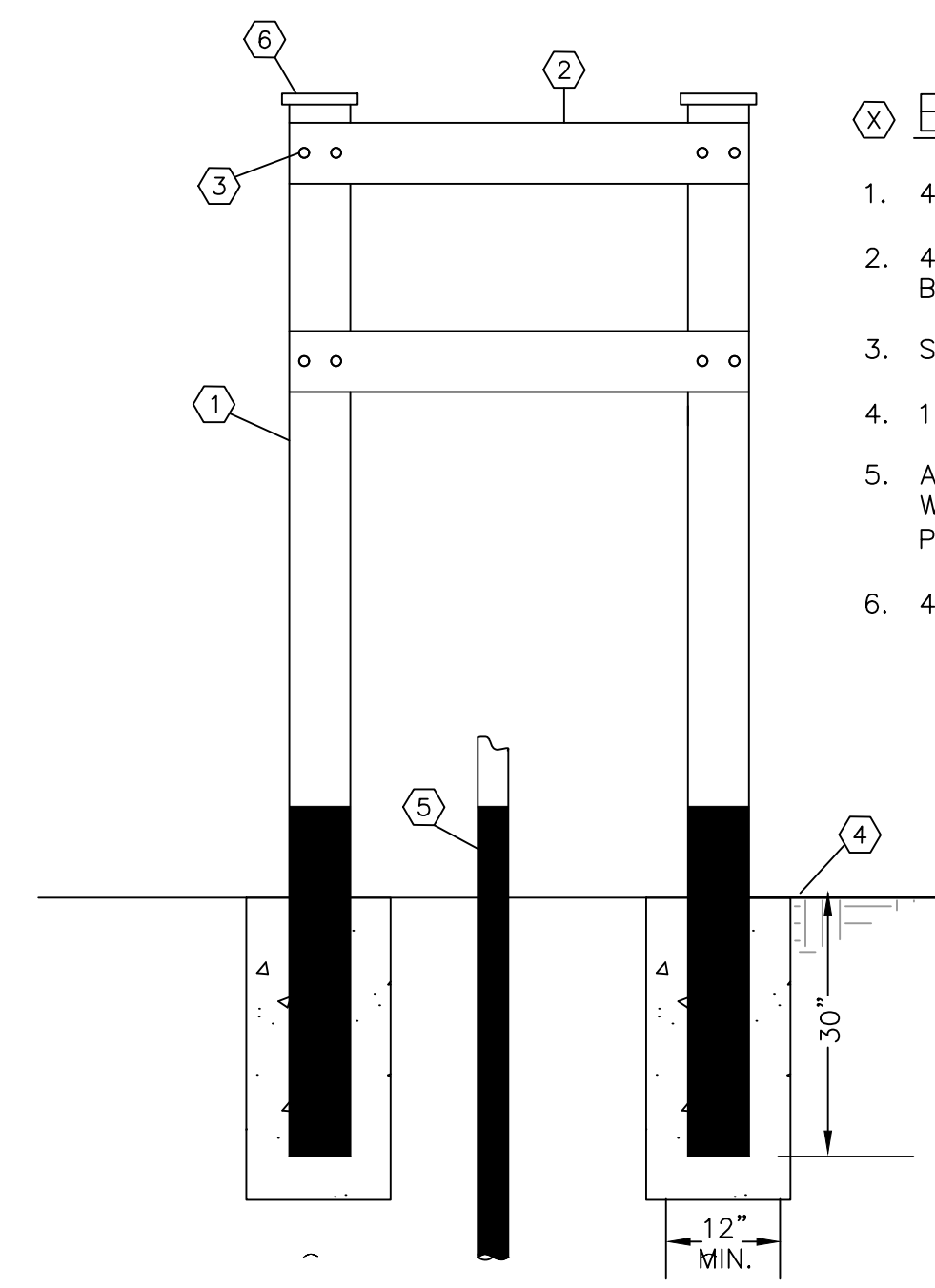


SHEET TITLE:
ELECTRICAL DETAILS & RISER DIAGRAMS

PROJECT:
RAW WATER STATION GENERATOR AND MCC UPGRADES

DATE: APRIL 2024
HEI PROJECT NO. A23121-E
SCALE: AS SHOWN

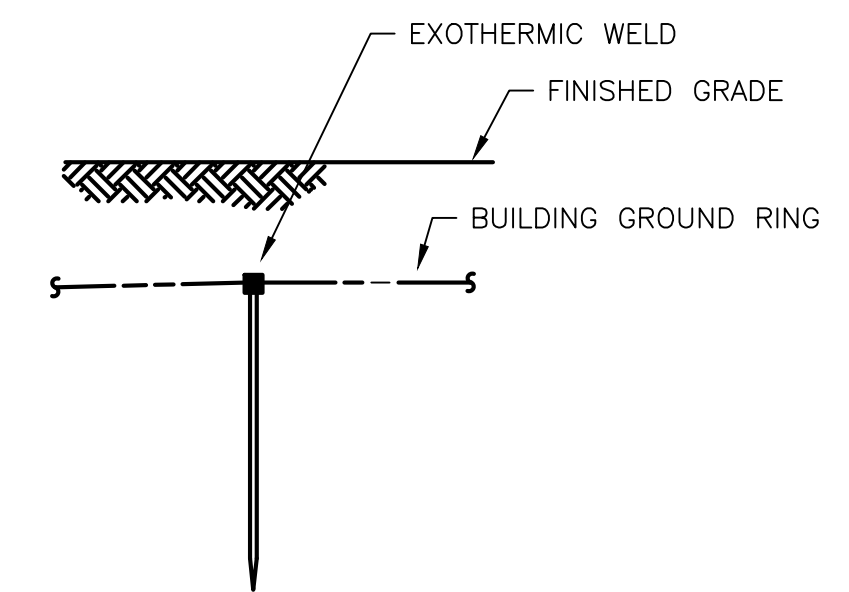
SHEET NO.
E7 OF 16



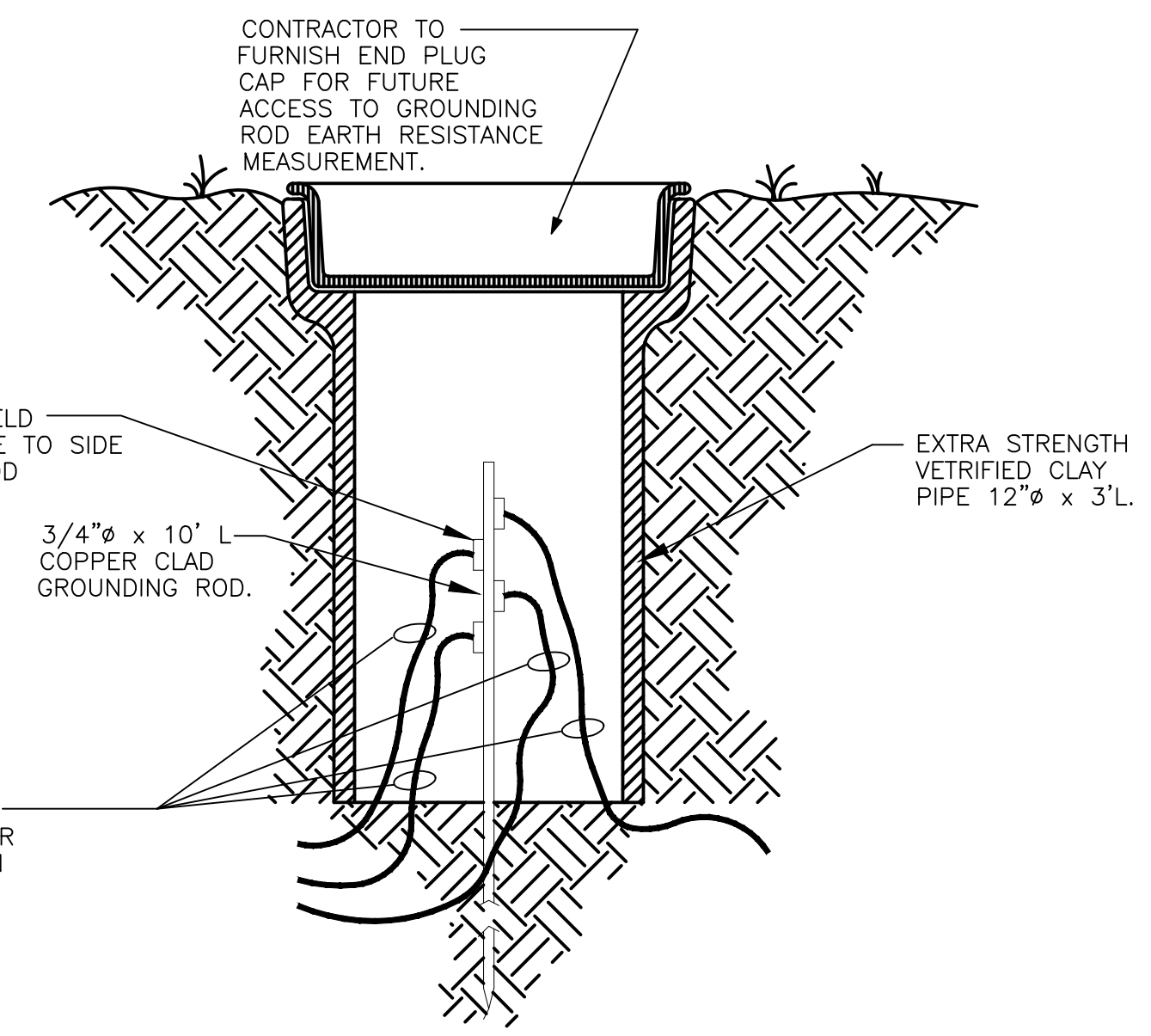
EQUIPMENT RACK DETAIL NOTES:

- 4" SQUARE X 1/4" TH. ALUMINUM TUBING.
- 4" SQUARE X 1/4" TH. ALUMINUM TUBING, NOTCHED AND BOLTED TO VERTICAL MEMBERS.
- STAINLESS STEEL HARDWARE.
- 12" Ø CLASS C CONCRETE
- ALUMINUM TUBING OR CONDUIT SHALL NOT BE IN CONTACT WITH CONCRETE. COAT WITH TWO COATS OF BITUMINOUS PAINT TO 6" ABOVE FINISHED SURFACE.
- 4" SQUARE ALUMINUM ENDCAP.

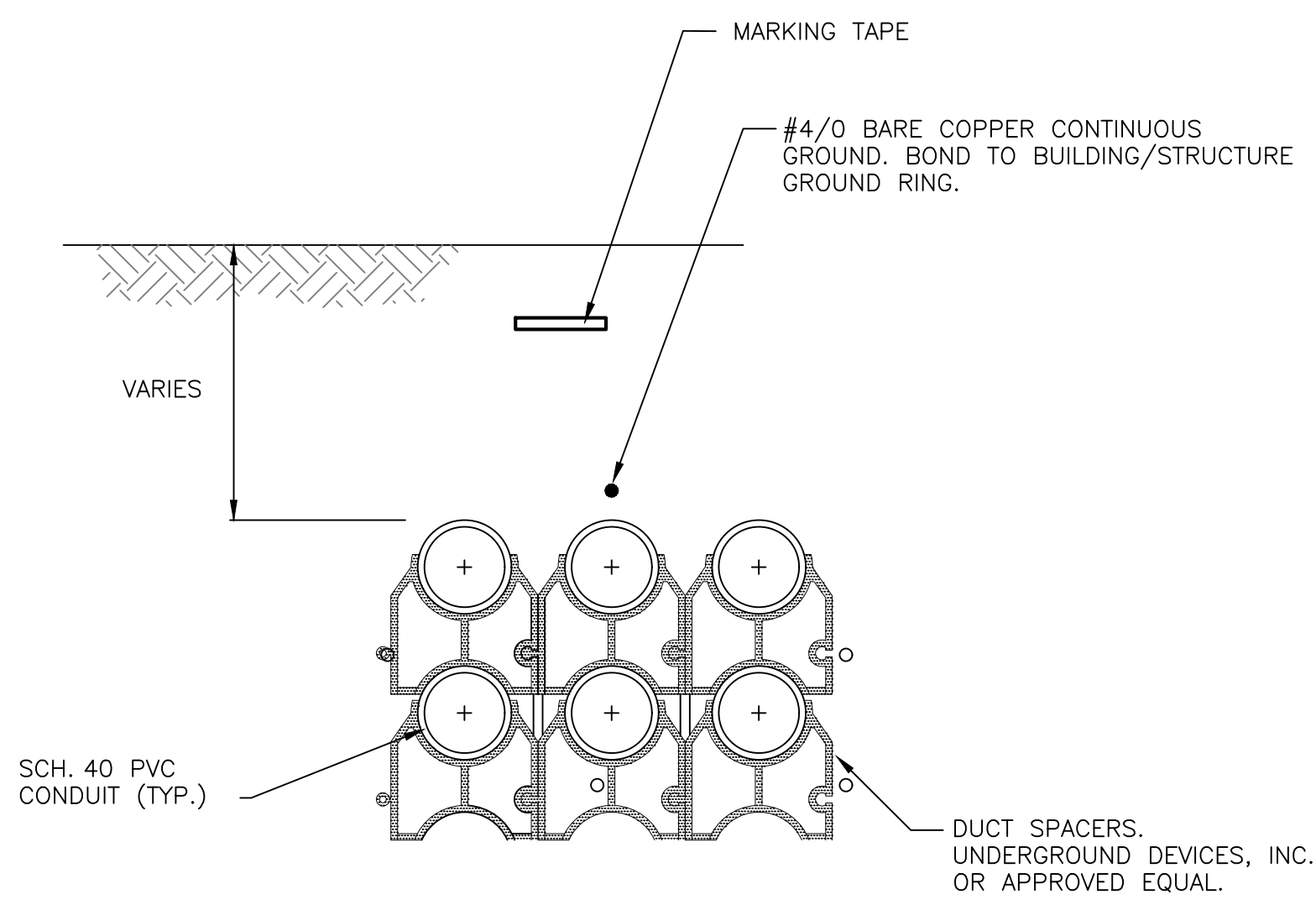
EQUIPMENT RACK DETAIL
NOT TO SCALE



DRIVEN GROUND ROD
NOT TO SCALE

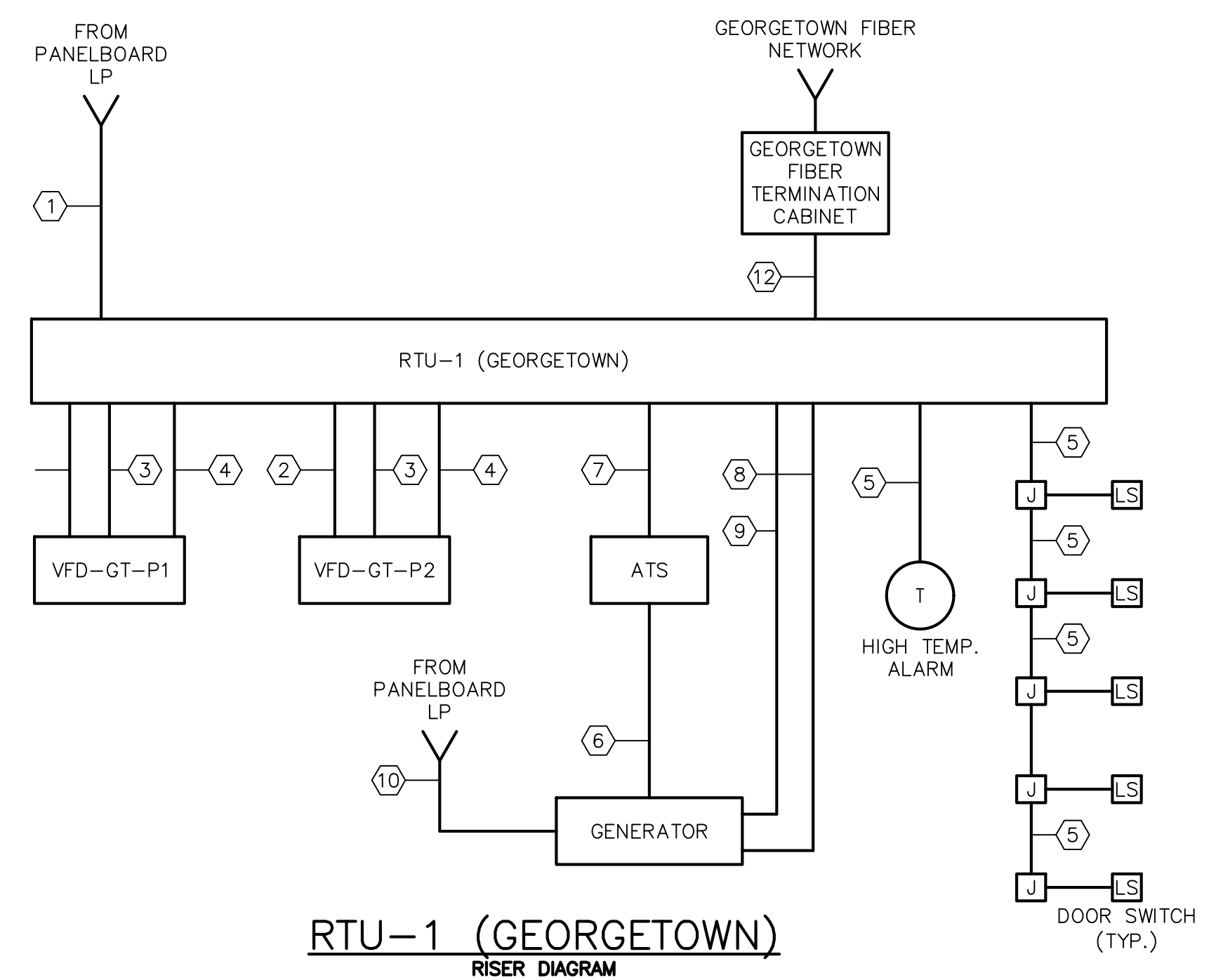


GROUNDING ROD TEST WELL
NOT TO SCALE

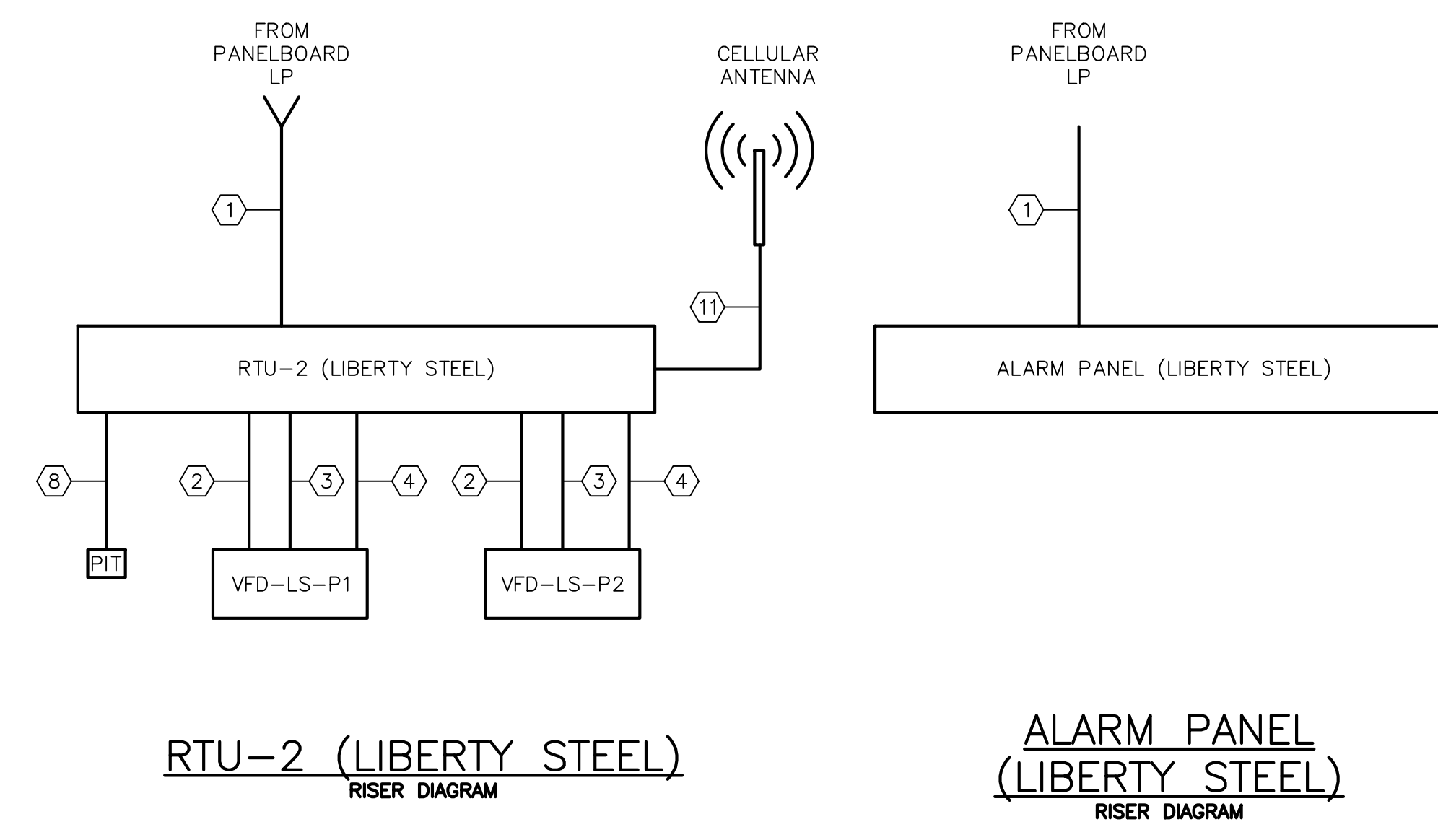


- NOTES:
- DETAIL SHOWN AS A GUIDE AND TO ESTABLISH MINIMUM STANDARDS. REFER TO PLANS FOR SIZE AND QUANTITY OF CONDUITS.
 - INSTALL DUCT SPACERS EVERY 5'-0".

TYPICAL UNDERGROUND CONDUIT SECTION
NOT TO SCALE



RTU-1 (GEORGETOWN)
RISER DIAGRAM

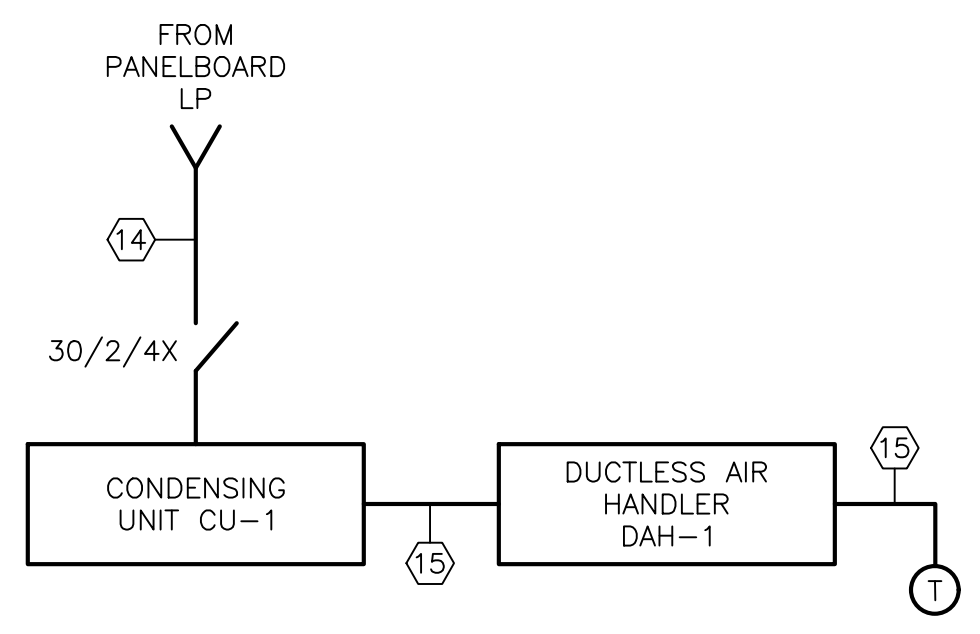


RTU-2 (LIBERTY STEEL)
RISER DIAGRAM

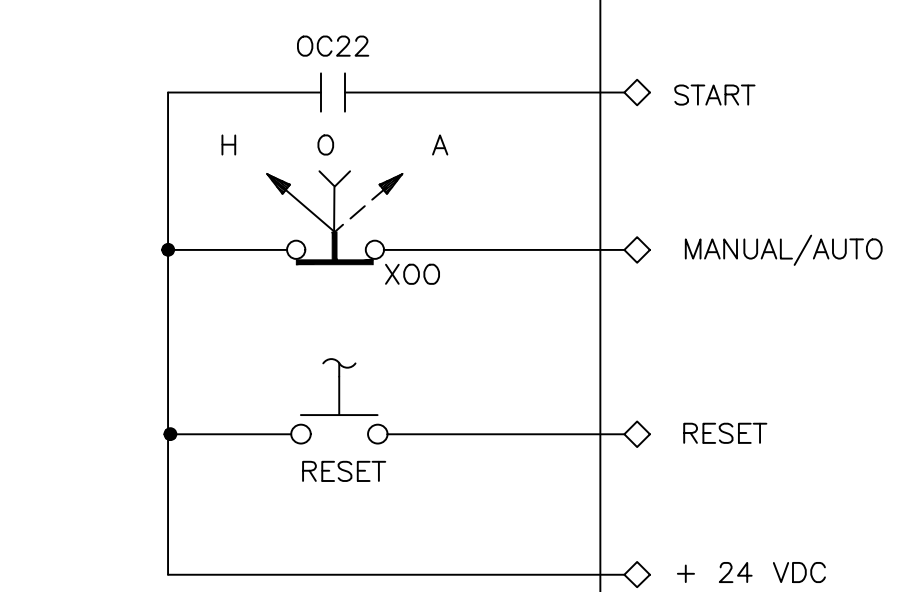
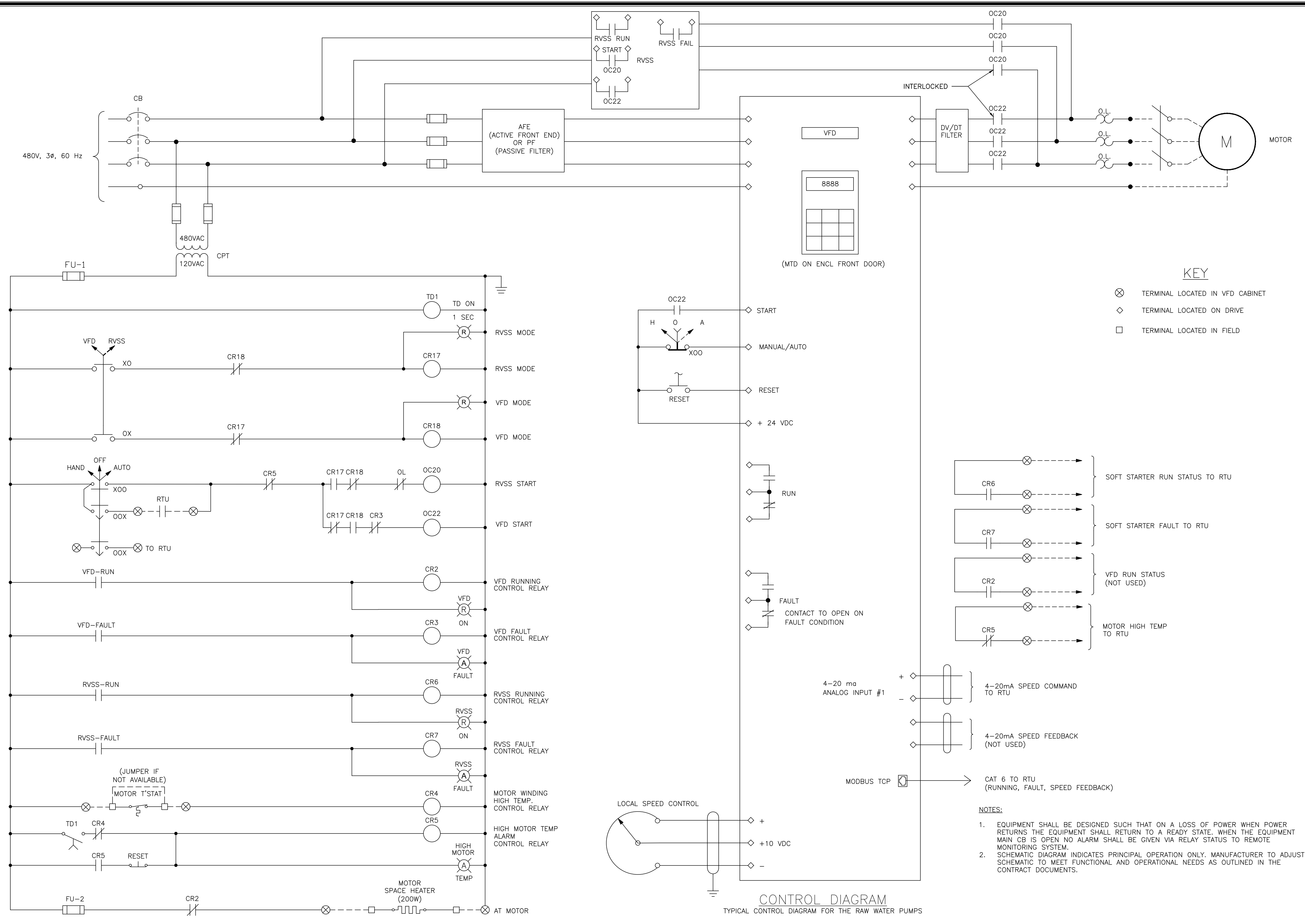
ALARM PANEL (LIBERTY STEEL)
RISER DIAGRAM

RISER DIAGRAM NOTES:

- 2#10, 1#10G.-3/4"C.
- 2-2/C SH, 1#14G.-3/4"C.
- 12#14, 1#14G.-1"C.
- CAT 6 CABLE, 1#14G.-1"C.
- 2#14, 1#14G.-3/4"C.
- 4#14, 1#14G.-3/4"C.
- 6#14, 1#14G.-1"C.
- 2/C SH, 1#14G.-1"C.
- 6#14, 1#14G.-1"C.
- 3#10, 1#10G.-1"C.
- 1" CONDUIT FOR CABLE BY SYSTEM INTEGRATOR. MOUNT OUTSIDE OF BUILDING AS DIRECTED.
- F/O CABLE BY SYSTEM INTEGRATOR. INSTALL IN 1"C.
- CONTRACTOR IS RESPONSIBLE FOR MOUNTING ALARM PANEL AT LIBERTY STEEL FACILITY AT LOCATION AS DIRECTED OWNER. BASE BID ON 120V SOURCE LOCATED 100' FROM ALARM PANEL.
- 2#10, 1#10G.-3/4"C.
- WIRING AS DIRECTED BY EQUIPMENT SUPPLIER.

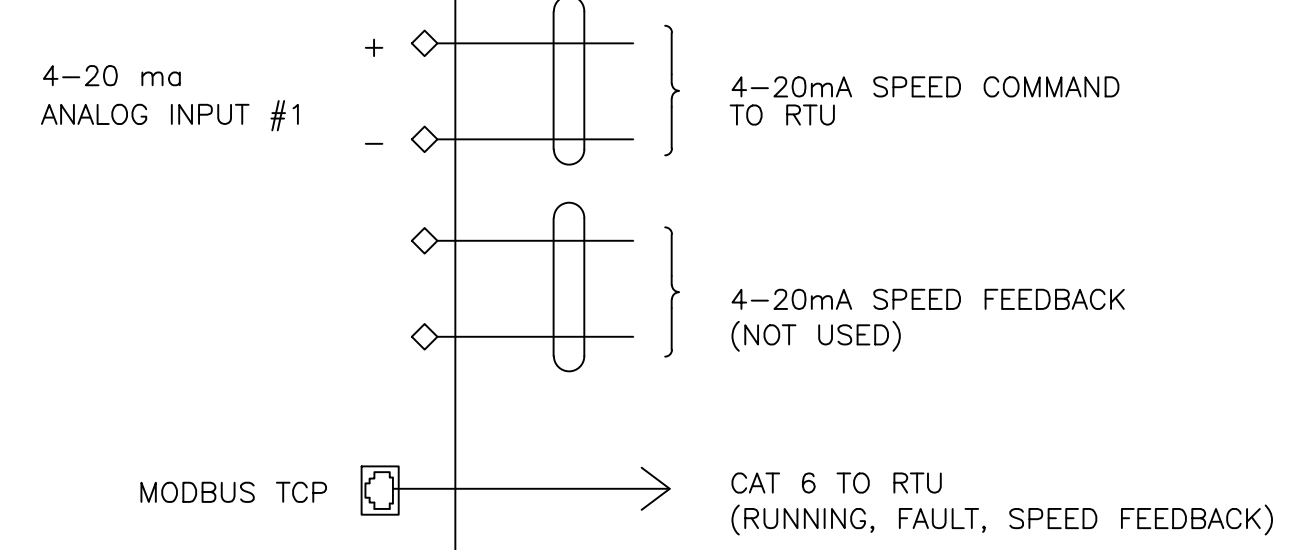
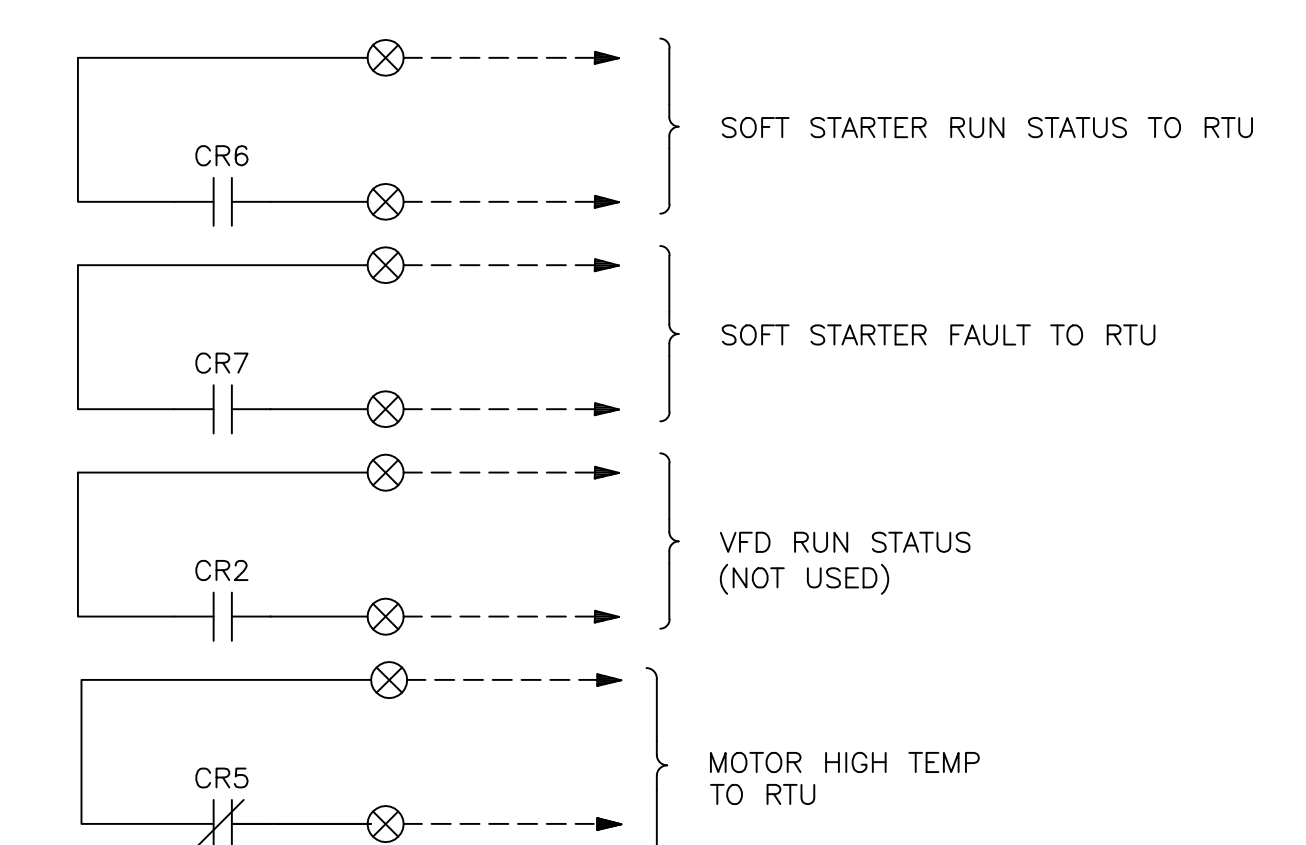


HVAC RISER DIAGRAM
NO SCALE



KEY

- ⊗ TERMINAL LOCATED IN VFD CABINET
- ◇ TERMINAL LOCATED ON DRIVE
- TERMINAL LOCATED IN FIELD

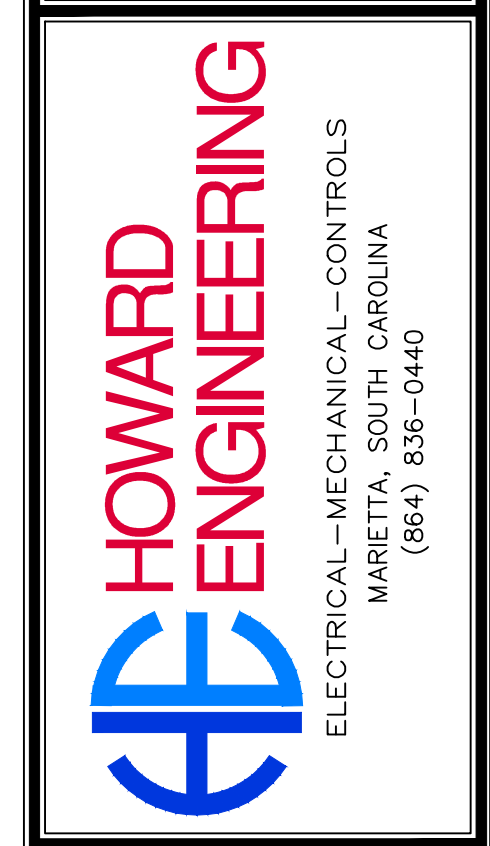
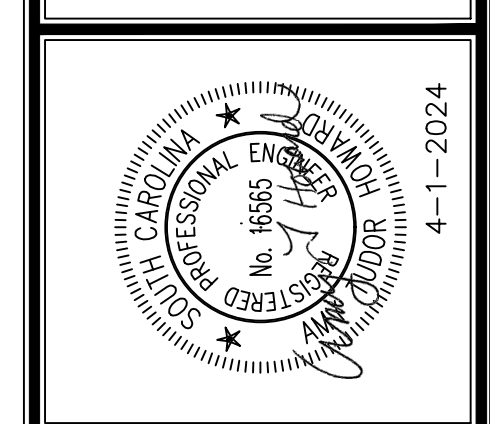
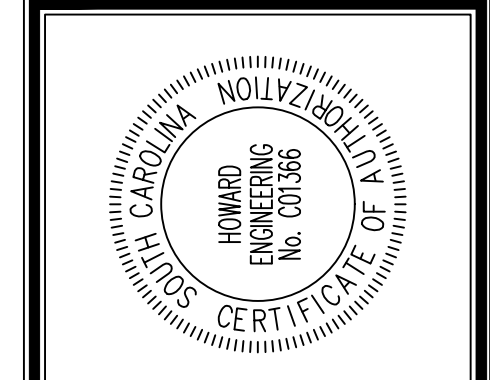


- NOTES:**
- EQUIPMENT SHALL BE DESIGNED SUCH THAT ON A LOSS OF POWER WHEN POWER RETURNS THE EQUIPMENT SHALL RETURN TO A READY STATE. WHEN THE EQUIPMENT MAIN CB IS OPEN NO ALARM SHALL BE GIVEN VIA RELAY STATUS TO REMOTE MONITORING SYSTEM.
 - SCHEMATIC DIAGRAM INDICATES PRINCIPAL OPERATION ONLY. MANUFACTURER TO ADJUST SCHEMATIC TO MEET FUNCTIONAL AND OPERATIONAL NEEDS AS OUTLINED IN THE CONTRACT DOCUMENTS.

CONTROL DIAGRAM
TYPICAL CONTROL DIAGRAM FOR THE RAW WATER PUMPS

NO.	DESCRIPTION	DATE	BY
1	ISSUED FOR BIDS	4/1/24	STS

APPROVALS	PROJECT ENG:	DESIGNED BY:	DRAWN BY:	CHECKED BY:	APPROVED:
	STS	STS	STS	ATH	STS



SHEET TITLE:
CONTROL DIAGRAMS

PROJECT:
RAW WATER STATION GENERATOR AND MCC UPGRADES

DATE:	APRIL 2024
HEI PROJECT NO.	A23121-E
SCALE:	AS SHOWN
SHEET NO.	E8 OF 16

GENERAL NOTES:

- CONSTRUCT THIS PROJECT IN ACCORDANCE WITH THE 2021 INTERNATIONAL BUILDING CODE AND ALL OTHER APPLICABLE BUILDING CODES HAVING JURISDICTION.
- VERIFY ALL DIMENSIONS AND EXISTING CONDITIONS AT THE PROJECT SITE PRIOR TO STARTING WORK. NOTIFY THE ENGINEER OF ANY DISCREPANCIES OR EXISTING CONDITIONS THAT ARE NOT CONSISTENT WITH THE DRAWINGS.
- COORDINATE ALL WORK WITH THE SPECIFICATIONS, APPROVED SHOP DRAWINGS, AND DRAWINGS OF OTHER TRADES BEFORE STARTING WORK. NOTIFY THE ENGINEER IMMEDIATELY OF ANY DISCREPANCIES, INCONSISTENCIES OR CONFLICTS PRIOR TO STARTING FABRICATION OR CONSTRUCTION OF THE WORK.
- REFER TO MECHANICAL, AND ELECTRICAL DRAWINGS AND APPROVED SHOP DRAWINGS FOR SIZES AND LOCATIONS OF OPENINGS, INSERTS, SLEEVES, CHASES, SLAB DEPRESSIONS, EMBEDDED ITEMS, AND OTHER NON-STRUCTURAL ITEMS. REFER TO ELECTRICAL AND MECHANICAL PLANS FOR SIZE AND LOCATION OF ALL OPENINGS FOR CONDUITS, ETC. NOT SHOWN.
- SUBMIT SHOP DRAWINGS TO ENGINEER FOR ALL STRUCTURAL COMPONENTS PRIOR TO FABRICATION. USE OF REPRODUCED CONTRACT DRAWINGS IN PART OR IN WHOLE FOR SHOP DRAWING PREPARATION SHALL NOT RELIEVE THE CONTRACTOR OR SUPPLIER FROM THE REQUIREMENT TO ACCURATELY LAYOUT, DETAIL, AND PROVIDE THEIR PORTION OF THE WORK. SHOP DRAWINGS SHALL BE REVIEWED AND APPROVED BY THE CONTRACTOR FOR ALL DIMENSIONS, ELEVATIONS, AND ERECTION PROCEDURE PRIOR TO SUBMITTING TO THE ENGINEER. PROVIDE AMPLE TIME FOR SHOP DRAWING REVIEW TO TAKE PLACE. REFER TO THE PROJECT SPECIFICATIONS FOR OTHER SUBMITTAL REQUIREMENTS.
- THE ENGINEER'S REVIEW OF SHOP DRAWINGS IS FOR OVERALL CONFORMANCE WITH THE DESIGN INTENT AND GENERAL COMPLIANCE WITH THE CONTRACT DOCUMENTS. THE ENGINEER'S APPROVAL OF SHOP DRAWINGS SHALL NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY FOR DEVIATIONS, ERRORS, OR OMISSIONS FROM THE REQUIREMENTS OF THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL REMAIN SOLELY RESPONSIBLE FOR COORDINATION OF DIMENSIONS, SIZES, AND DETAILS IN THE SHOP DRAWINGS.
- MEANS, METHODS, TECHNIQUES, PROCEDURES, SEQUENCES OF CONSTRUCTION, JOBSITE SAFETY, AND SUPERVISION OF THE WORK ARE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
- PROTECT ALL EXISTING AND IN-PLACE WORK, STRUCTURES, AND UTILITIES FORM DAMAGE DURING CONSTRUCTION.

FOUNDATIONS AND GEOTECHNICAL:

- SUBGRADE PREPARATION, EXCAVATION, AND BACKFILL SHALL BE IN ACCORDANCE WITH THESE NOTES, THE DRAWINGS, PROJECT SPECIFICATIONS, AND THE GEOTECHNICAL REPORT OR WRITTEN GEOTECHNICAL RECOMMENDATIONS FOR THE PROJECT. IN CASE OF CONFLICT, THE MORE STRINGENT REQUIREMENTS SHALL APPLY, UNLESS APPROVED OTHERWISE BY THE ENGINEER.
- ALL FOOTINGS SHALL BEAR ON UNDISTURBED RESIDUAL SOIL OR PROPERLY COMPACTED STRUCTURAL FILL.
- DO NOT PLACE FOOTINGS IN EXCAVATIONS HOLDING WATER OR ON FROZEN SUBGRADE.
- BOTTOM OF ALL FOOTINGS TO BE A MINIMUM OF 10" BELOW FINISHED GRADE UNLESS NOTED OTHERWISE.
- STRIP AND REMOVE ALL TOPSOIL AND ORGANIC MATERIAL TO A MINIMUM 4" DEPTH.
- PROVIDE ADEQUATE DRAINAGE OR DEWATERING TO ALLOW PROPER FINISHING OF EXCAVATIONS AND TO KEEP WATER FROM COLLECTING IN THE BOTTOM OF EXCAVATIONS. FOUNDATIONS SHALL BE PLACED IN THE DRY. DO NOT PLACE FOOTINGS IN WATER.
- REMOVE WATER SOFTENED SOILS FROM FOOTING EXCAVATIONS AND REPLACE WITH COMPACTED FILL, GRAVEL, FLOWABLE FILL, OR CONCRETE, AS APPROVED BY THE ENGINEER, PRIOR TO PLACING CONCRETE.

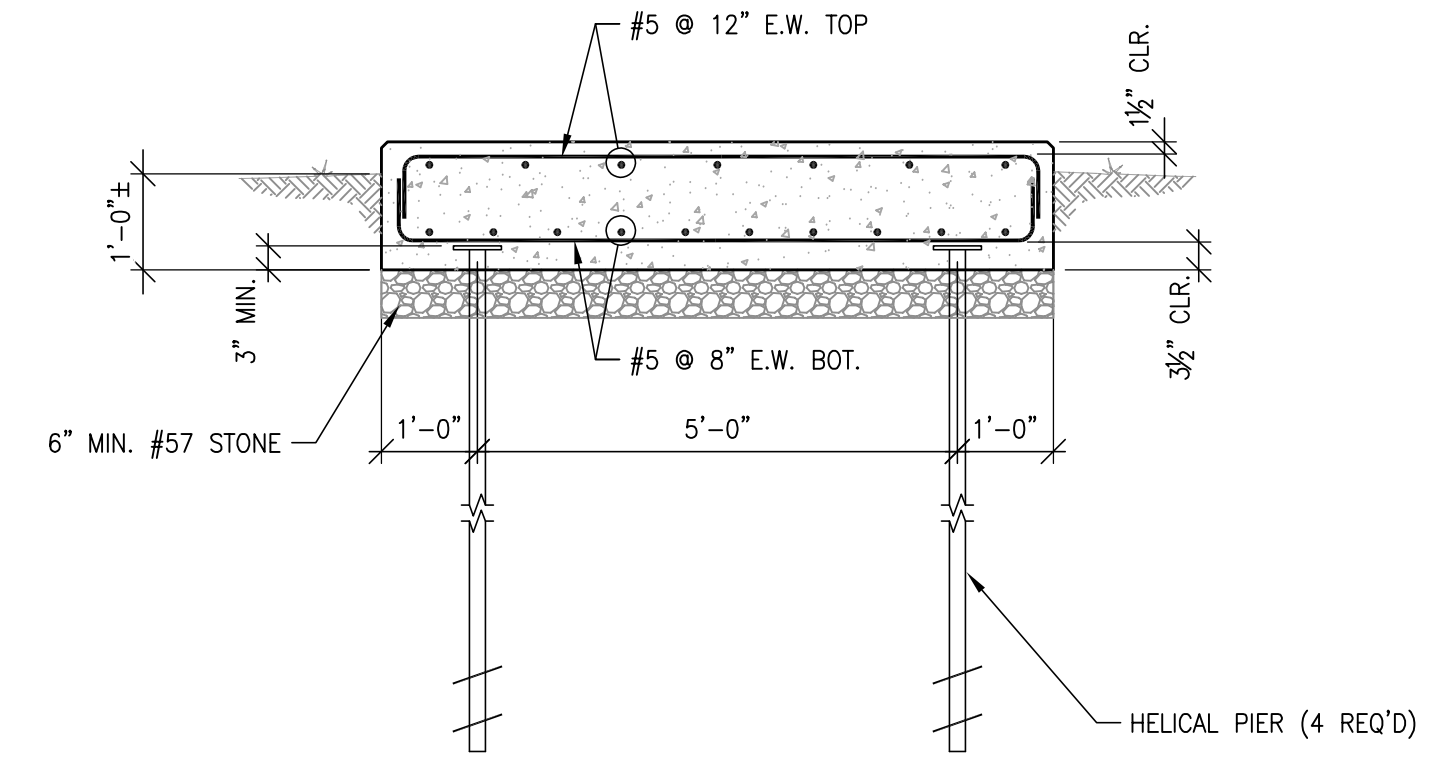
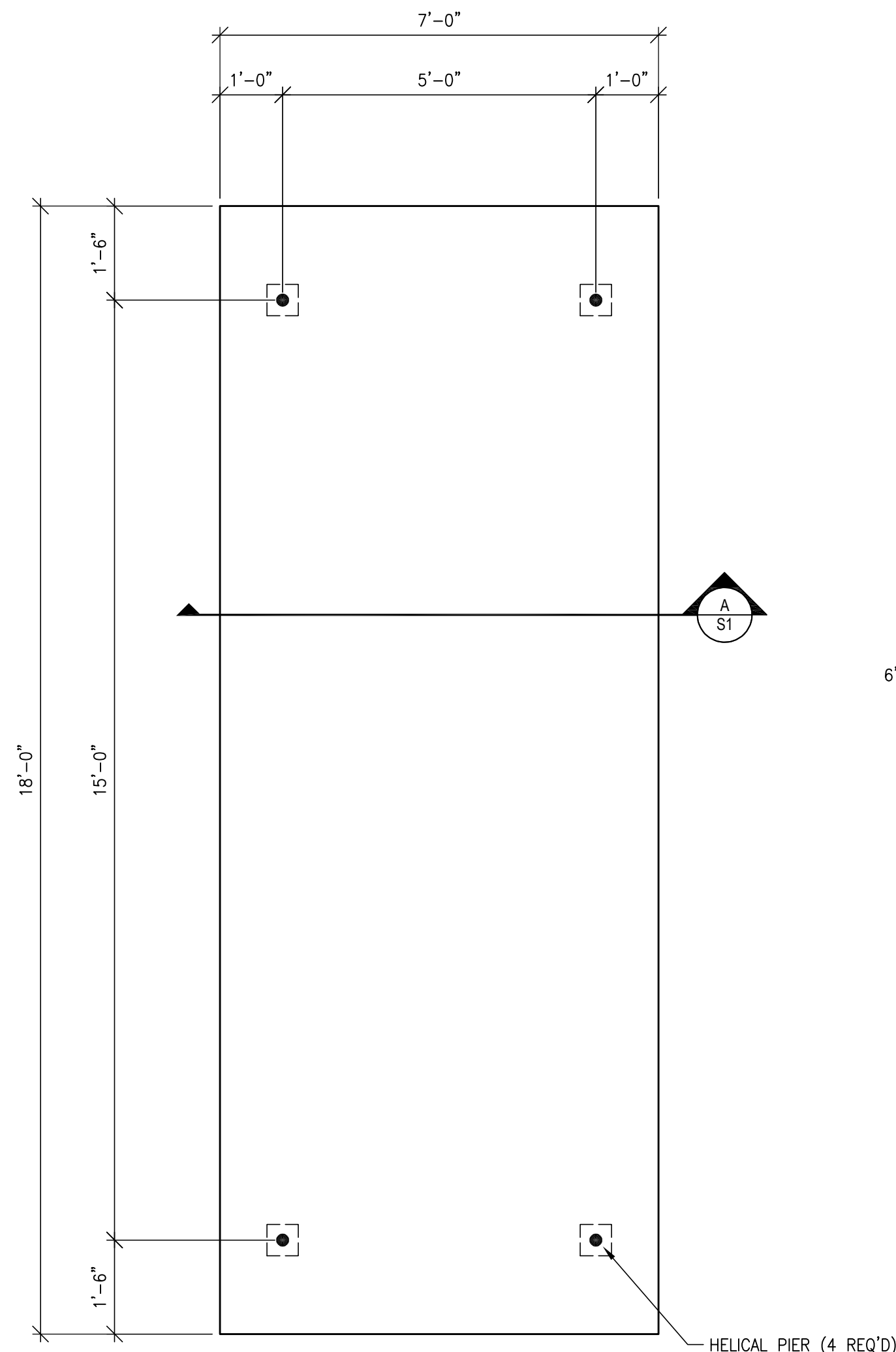
HELICAL SCREW PILES:

- HELICAL PIERS SHALL BE AS MANUFACTURED BY THE A. B. CHANCE CO., CENTRALIA, MO. OR APPROVED EQUAL.
- DESIGN, FABRICATION, AND INSTALLATION SHALL BE PERFORMED IN ACCORDANCE WITH ALL APPLICABLE BUILDING AND SAFETY CODES IN EFFECT AT THE TIME OF INSTALLATION.
- PIERS SHALL CONFORM TO AN OFFICIAL ICBO OR IAPMO EVALUATION REPORT.
- SUBMITTALS:
SHOP DRAWINGS SHOWING SIZE, TYPE, CONFIGURATION, LENGTH, CONNECTIONS TO THE STRUCTURE, INSTALLATION REQUIREMENTS, AND REQUIRED INSTALLATION TORQUE.
PRODUCT DATA.
ENGINEERING CALCULATIONS SIGNED AND SEALED BY A PROFESSIONAL ENGINEER LICENSED IN THE PROJECT STATE.
- DESIGN OF HELICAL PIERS SHALL BE PERFORMED BY A LICENSED ENGINEER ENGAGED BY THE MANUFACTURER.
- HELICAL PIER DESIGN WILL CONSIDER THE DESIGN LOAD WITH A SAFETY FACTOR OF 2.0, AND THE INSTALLATION TORQUE VS. CAPACITY EQUATION PER THE MANUFACTURER'S RECOMMENDATIONS. THE DEPTH (LENGTH) OF THE PIERS SHALL BE AS DETERMINED BY THE DESIGN AND REQUIRED INSTALLATION TORQUE, BUT SHALL BE NO LESS THAN THE MINIMUM DEPTH SPECIFIED BELOW.
- PIER CAPACITIES ARE AS FOLLOWS:
VERTICAL DOWNWARD: 12.5 KIPS ALLOWABLE, 25 KIPS ULTIMATE
MINIMUM DEPTH: 16 FEET
- THE HELICAL LEAD SECTIONS AND EXTENSION SECTIONS SHALL BE SOLID STEEL, SQUARE SHAFT, OR ROUND STEEL PIPE SHAFT WITH ONE OR MORE HELICAL BEARING PLATES WELDED TO THE SHAFT, AND MINIMUM 6" SQUARE PILE CAP PLATE.
- ALL PIERS SHALL BE HOT DIP GALVANIZED.
- INSTALLATION EQUIPMENT SHALL BE CAPABLE OF DEVELOPING THE REQUIRED INSTALLATION TORQUE, AND SHALL BE CAPABLE OF POSITIONING THE PIER AT THE PROPER INSTALLATION LOCATION AND ANGLE.
- INSTALLATION TORQUE SHALL BE MONITORED THROUGHOUT THE INSTALLATION PROCESS, AND PIERS SHALL BE INSTALLED TO THE MINIMUM TORQUE VALUE REQUIRED TO PROVIDE THE SPECIFIED LOAD CAPACITIES.

CONCRETE:

- ALL CONCRETE AND REBAR AND THEIR INSTALLATION SHALL COMPLY WITH THE STANDARDS OF ACI-318 AND ACI-301 LATEST EDITIONS.
- SUBMITTALS:
REINFORCING STEEL SHOP DRAWINGS PREPARED IN ACCORDANCE WITH THE ACI DETAILING MANUAL.
CONCRETE MIX DESIGNS FOR EACH DIFFERENT CONCRETE MIX PREPARED IN COMPLIANCE WITH ACI 318 ARTICLE 5.3 OR 5.4.
MANUFACTURER'S INFORMATION ON CONCRETE ADMIXTURES AND OTHER PROPRIETARY MATERIALS.
- CONCRETE TESTING:
MAKE ONE SET OF FOUR TEST CYLINDERS FOR EACH 50 CUBIC YARDS, OR PORTION THEREOF, OF CONCRETE PLACED. A QUALIFIED TESTING LAB SHALL PERFORM ALL TESTING. FOR EACH SET OF CYLINDERS, BREAK 1 CYLINDER AT 7 DAYS, 2 CYLINDERS AT 28 DAYS, AND HOLD 1 RESERVE CYLINDER.
- REINFORCING STEEL SHALL CONFORM TO ASTM A-615, GRADE 60.
- THE MINIMUM 28 DAY COMPRESSIVE STRENGTH OF CONCRETE SHALL BE AS 4000 PSI.
- CONCRETE MIXES SHALL BE DESIGNED IN ACCORDANCE WITH ACI 301 AND THE FOLLOWING:
MAX W/C RATIO S/LUMP
4000 PSI 0.45 3" TO 5"
- CONCRETE SHALL BE READY MIXED IN ACCORDANCE WITH ASTM C-94. SUBMIT CONCRETE MIX DESIGNS TO THE ENGINEER FOR APPROVAL.
- CONCRETE MATERIALS SHALL COMPLY WITH THE FOLLOWING SPECIFICATIONS:
PORTLAND CEMENT: ASTM C-150 TYPE I OR II
FLY ASH: ASTM C-618
AGGREGATE (NORMAL WT.): ASTM C-33
ADMIXTURES: ASTM C-494, C-260, C989, & C-1017
- FLY ASH SHALL BE NOT MORE THAN 25% OF TOTAL CEMENTITIOUS MATERIALS. DO NOT USE ADMIXTURES CONTAINING CALCIUM CHLORIDE.
- CONCRETE DENSITIES SHALL BE AS FOLLOWS:
NORMAL WEIGHT CONCRETE: 145 PCF
- PROVIDE 5% ± 1% AIR ENTRAINMENT FOR ALL CONCRETE EXPOSED TO WEATHER OR EXTERIOR CONDITIONS, UNLESS NOTED OTHERWISE.
- NO WATER SHALL BE ADDED TO THE CONCRETE AT THE SITE UNLESS APPROVED BY THE ENGINEER.
- REINFORCEMENT SHALL BE ADEQUATELY SUPPORTED AND TIED IN PLACE PRIOR TO CONCRETE PLACEMENT. PROVIDE ANY STANDEES, CHAIRS, BOLSTERS, CARRYING BARS, OR ADDITIONAL BARS AS MAY BE NECESSARY TO ADEQUATELY SUPPORT THE REINFORCEMENT IN ITS PROPER POSITION.
- SUPPORT ALL SLAB REINFORCING ON CONTINUOUS CHAIRS. REINFORCING FOR SLABS ON GRADE MAY BE SUPPORTED ON CONCRETE BRICK.
- UNLESS NOTED OTHERWISE ON THE DRAWINGS, REINFORCING STEEL SHALL HAVE A MINIMUM CONCRETE COVER AS FOLLOWS:
CONCRETE CAST AGAINST EARTH: 3"
CONCRETE EXPOSED TO EARTH OR WEATHER:
#5 BARS OR SMALLER: 1-1/2"
#6 BARS AND LARGER: 2"
- PROVIDE, DESIGN, CONSTRUCT AND ERECT ALL FORMWORK AND SHORING IN ACCORDANCE WITH ACI 347.
- FORMWORK SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR.
- CONDUITS EMBEDDED IN CONCRETE SLABS SHALL HAVE A MAXIMUM OUTSIDE DIAMETER OF 40% OF THE SLAB THICKNESS OR FOR SLABS ON METAL DECK, 40% OF THE SLAB COVER OVER THE HIGH DECK RIBS. PARALLEL CONDUITS SHALL HAVE A CLEAR SPACING OF 4 X THE CONDUIT DIAMETER BUT NOT LESS THAN 4", EXCEPT THAT 2 CONDUITS MAY BE GROUPED TOGETHER (SIDE BY SIDE) IN A PAIR.
- IN HOT WEATHER, PLACE CONCRETE IN ACCORDANCE WITH THE PROVISIONS OF ACI 305. IN COLD WEATHER PLACE CONCRETE ACCORDING TO ACI 306.
- CONTINUOUSLY CURE CONCRETE FOR NOT LESS THAN 7 DAYS AFTER PLACEMENT BY MEANS OF A CONTINUOUS WET CURE, OR USE OF A SUITABLE CURING COMPOUND.
- FINISH CONCRETE SURFACES IN ACCORDANCE WITH ACI 301.
- PROVIDE 3/4" CHAMFER AT ALL EXPOSED EDGES OF CONCRETE WORK UNLESS NOTED OTHERWISE.

TENSION LAP SPLICE LENGTHS FOR GRADE 60 REINFORCING									
BAR SIZE	3000 PSI CONCRETE				BAR SIZE	4000 PSI CONCRETE			
	TOP BARS		OTHER BARS			TOP BARS		OTHER BARS	
	A	B	A	B		A	B	A	B
3	22	28	17	22	3	19	24	15	19
4	29	37	22	29	4	25	32	19	25
5	36	47	28	36	5	31	40	24	31
6	43	56	33	43	6	37	48	29	37
7	63	81	48	63	7	54	70	42	54
8	72	93	55	72	8	62	80	48	62
9	81	105	62	81	9	70	91	54	70
10	91	118	70	91	10	79	102	61	79
11	101	131	78	101	11	87	113	67	87

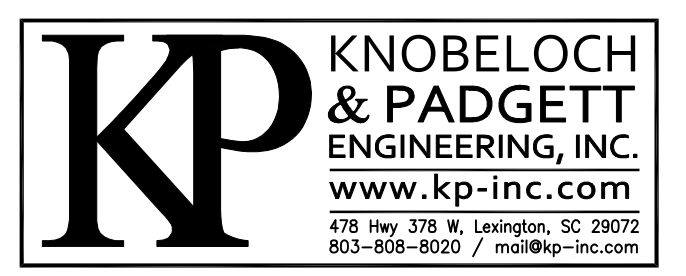


SECTION A
SCALE: 1/2" = 1'-0"

GENERATOR FOUNDATION PLAN

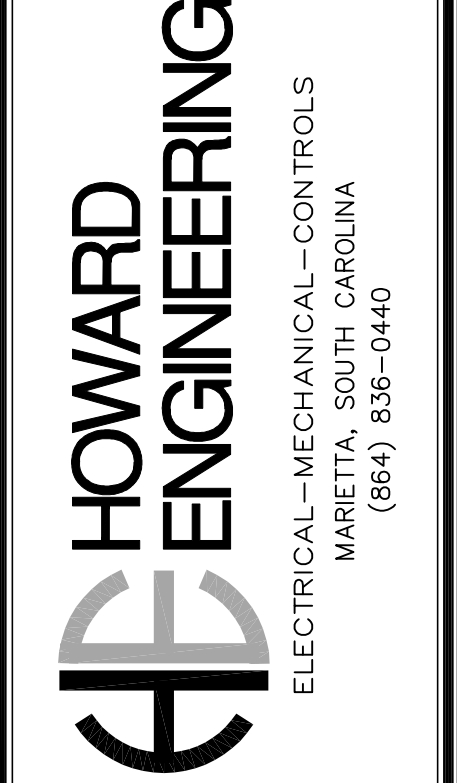
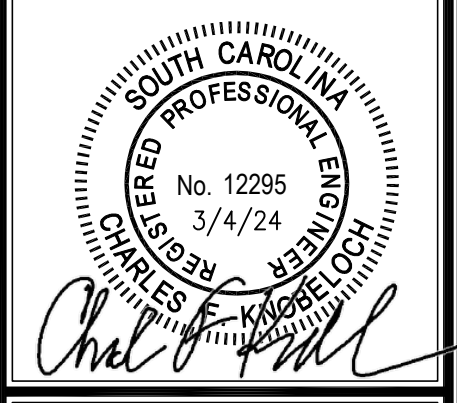
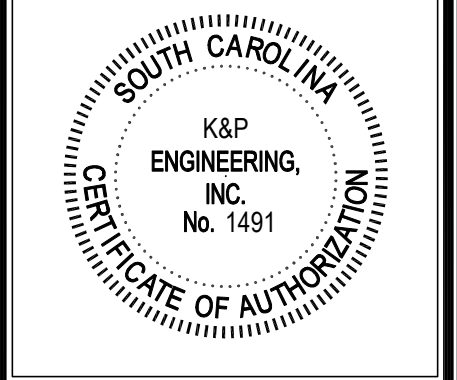
SCALE: 1/2" = 1'-0"

DESIGN CRITERIA	
RISK CATEGORY:	III
DEAD LOADS:	ACTUAL DEAD LOAD OF STRUCTURE
EQUIPMENT LOADS:	GENERATOR EMPTY: 7,000 LBS. GENERATOR (MAX. OPERATING WT.): 13,000 LBS
SNOW LOADS:	GROUND SNOW: 10 P.S.F.
WIND LOADS:	BASIC WIND SPEED: 156 MPH (3 SECOND GUST) EXPOSURE: C
SEISMIC LOADS:	IMPORTANCE FACTOR: 1.25 SITE CLASS: D MAPPED SPECTRAL RESPONSE, S _s : 0.48 MAPPED SPECTRAL RESPONSE, S _i : 0.16 S _{vs} : 0.45 S _{vs} : 0.24 SEISMIC DESIGN CATEGORY: D BASIC SEISMIC FORCE RESISTING SYSTEM: NON-BUILDING STRUCTURES NOT SIMILAR TO BUILDINGS RESPONSE MODIFICATION FACTOR "R": 1.25 SIEMIC RESPONSE COEFFICIENT, C _s : 0.45 ANALYSIS METHOD: EQUIV. LATERAL FORCE SEISMIC BASE SHEAR: 14.5 KIPS
ALL DESIGN CRITERIA PER ASCE 7-16	



NO.	DESCRIPTION	DATE	BY

PROJECT ENG:	DESIGNED BY:	DRAWN BY:	CHECKED BY:	APPROVED:
CFK	CFK	CFK	CFK	STS



SHEET TITLE:

PROJECT:
RAW WATER STATION
GENERATOR AND MCC
UPGRADES

DATE: JANUARY 2024
HEI PROJECT NO. A23121-E
SCALE: AS SHOWN

SHEET NO.
S1 OF 1

GENERAL NOTES

- ALL HVAC WORK SHALL BE IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE AND LOCAL CODES INCLUDING AMENDMENTS: 2021 SOUTH CAROLINA BUILDING CODE 2021 SOUTH CAROLINA MECHANICAL CODE 2009 INTERNATIONAL ENERGY CONSERVATION CODE
- INDOOR DESIGN CONDITIONS:
SUMMER (COOLING): 75°F, 50% RH, AT 97.2°F DB/75.3°F WB OUTDOOR.
WINTER (HEATING): 70°F AT 23.5°F OUTDOOR.
- THE HEATING, VENTILATING AND AIR CONDITIONING (HVAC) CONTRACTOR SHALL VISIT THE SITE TO DETERMINE ALL PRE-EXISTING CONDITIONS AND WORK NECESSARY PRIOR TO SUBMISSION OF BID PRICE.
- THE HEATING, VENTILATING AND AIR CONDITIONING (HVAC) CONTRACTOR SHALL BE FAMILIAR WITH ALL CONTRACT DOCUMENTS FOR ALL TRADES AND COORDINATE WITH OTHER CONTRACTORS.
- DRAWINGS ARE DIAGRAMMATIC ONLY. FINAL ROUTING OF DUCTWORK, PIPING AND EQUIPMENT LOCATIONS SHALL BE DETERMINED IN THE FIELD ADDITIONAL OFFSETS, ELBOWS, ETC., SHALL BE PROVIDED AND INSTALLED WITHOUT ADDITIONAL COST TO THE OWNER.
- THE HVAC CONTRACTOR SHALL COORDINATE ALL ELECTRICAL AND PLUMBING REQUIREMENTS WITH THE ELECTRICAL AND PLUMBING CONTRACTORS.
- THE AUTOMATIC TEMPERATURE CONTROL (ATC) CONTRACTOR SHALL COORDINATE THERMOSTAT LOCATIONS WITH THE ARCHITECTURAL FURNITURE PLANS. THERMOSTATS SHALL BE INSTALLED 48" ABOVE FINISHED FLOOR UNLESS OTHERWISE NOTED.
- THE HVAC CONTRACTOR SHALL FURNISH AND INSTALL ALL INCIDENTAL ACCESSORIES NECESSARY TO MAKE THE HVAC WORK COMPLETE AND READY FOR OPERATION.
- ALL HVAC EQUIPMENT SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
- FURNISH TO THE GENERAL CONTRACTOR ALL INFORMATION REQUIRED FOR SETTING OF WALL, ROOF AND PARTITION OPENINGS FOR HVAC WORK. THIS INFORMATION SHALL BE FURNISHED IN A TIMELY MANNER SUCH THAT CONSTRUCTION SCHEDULE IS NOT JEOPARDIZED.
- COORDINATE PHASING REQUIREMENTS FOR THE PROJECT WITH THE GENERAL CONTRACTOR.
- FIELD MEASURE THE EXACT SIZES AND VERIFY ALL OPENINGS FOR SHAFTS AND LOUVERS PRIOR TO SUBMISSION OF SHOP DRAWINGS AND INSTALLATION.
- MINIMAL CONTROL POWER HAS BEEN IDENTIFIED ON THE DRAWINGS. IF ANY ADDITIONAL POWER IS REQUIRED BASED ON SYSTEMS DESIGN BY THE CONTROLS CONTRACTOR THE ATC/BAS CONTRACTOR SHALL BE RESPONSIBLE TO SUPPLY THAT POWER.
- THE HVAC CONTRACTOR SHALL COORDINATE THE INSTALLATION OF ALL MECHANICAL EQUIPMENT, DUCTWORK, PIPING, ETC. TO FIT WITHIN THE SPACE ALLOWED BY THE ARCHITECTURAL AND STRUCTURAL CONDITIONS. CUTTING OR OTHERWISE ALTERING ANY STRUCTURAL MEMBERS SHALL NOT BE PERMITTED WITHOUT WRITTEN PERMISSION FROM THE ARCHITECT.
- PROVIDE ACCESS PANELS IN NON-ACCESSIBLE CEILINGS AND IN WALL STRUCTURES OF ADEQUATE SIZE TO ALLOW FOR MAINTENANCE, BALANCING AND COMPLETE REPLACEMENT OF EQUIPMENT WITHOUT DISTURBING PERMANENT CONSTRUCTION. ACCESS PANELS IN CEILINGS AND WALLS SHALL BE PROVIDED WHERE SHOWN ON THE PLANS OR NECESSARY TO ACCESS DAMPERS, VALVES, ETC. COORDINATE EXACT LOCATION & SIZES OF ALL ACCESS PANELS WITH THE ARCHITECT DURING THE SHOP DRAWING PROCESS.
- PORTIONS OF DUCTWORK AND PIPE INSULATION VISIBLE THROUGH AIR DISTRIBUTION DEVICES IN FINISHED AREAS SHALL BE PAINTED FLAT BLACK.
- ALL PIPE AND DUCT PENETRATIONS OF FIRE AND/OR SMOKE-RATED ASSEMBLIES SHALL BE FIRE STOPPED AS REQUIRED TO RESTORE THE ASSEMBLY TO ITS ORIGINAL INTEGRITY. FIRE BARRIER PRODUCTS SHALL BE AS MANUFACTURED BY TREMCO, HILTI, 3M OR APPROVED EQUAL.
- WHERE ABOVE CEILING VOLUMES OR MECHANICAL ROOM/CLOSETS ARE UTILIZED AS A RETURN AIR PLENUM, ALL MATERIALS EXPOSED WITHIN THE PLENUMS SHALL BE NON-COMBUSTIBLE OR SHALL HAVE A FLAME SPREAD INDEX OF NOT MORE THAN 25 AND A SMOKE DEVELOPED INDEX OF NOT MORE THAN 50 AS DETERMINED IN ACCORDANCE WITH ASTM E84.
- THE HVAC CONTRACTOR SHALL COORDINATE ELECTRICAL CHARACTERISTICS AND REQUIREMENTS OF ALL MECHANICAL EQUIPMENT WITH ELECTRICAL DRAWINGS PRIOR TO SUBMITTING SHOP DRAWINGS OR ORDERING EQUIPMENT. EQUIPMENT SHALL BE FURNISHED WIRED FOR THE VOLTAGES SHOWN ON THE ELECTRICAL PLANS.
- ALL MECHANICAL EQUIPMENT REQUIRING ELECTRICAL POWER SHALL BE INSTALLED WITH DISCONNECT SWITCHES AT EACH PIECE OF EQUIPMENT. COORDINATE SWITCH TYPE WITH EQUIPMENT CHARACTERISTICS, MANUFACTURER'S RECOMMENDATIONS AND THE ELECTRICAL DRAWINGS.
- ALL REQUIRED CONTROL WIRING (INCLUDING POWER WIRING REQUIRED FOR CONTROL PANELS, DEVICES, ETC.) NOT SHOWN ON THE ELECTRICAL DRAWINGS SHALL BE INCLUDED AS PART OF THE MECHANICAL WORK.
- UNLESS NOTED OTHERWISE, TRANSFORMERS, CONTROLS AND CONTROL WIRING REQUIRED FOR ALL MECHANICAL SYSTEMS SHALL BE FURNISHED WITH THE EQUIPMENT IT SERVES AND INSTALLED BY THE MECHANICAL CONTRACTOR. MOTOR STARTERS FOR HVAC EQUIPMENT SHALL BE FURNISHED WITH THE MOTOR OR APPARATUS WHICH IT OPERATES. MOTOR STARTER INSTALLATION SHALL BE BY THE ELECTRICAL CONTRACTOR.
- ALL EVAPORATORS AND COOLING COILS LOCATED ABOVE THE LOWEST LEVEL FINISHED FLOOR SHALL BE INSTALLED WITH AN AUXILIARY CONDENSATE DRAIN PAN UNDER THE UNIT. PROVIDE AN ELECTRONIC WATER LEVEL DETECTOR WIRED TO SHUTDOWN THE UNIT UPON DETECTION OF WATER IN THE AUXILIARY DRAIN PAN. AS AN ALTERNATE TO THE AUXILIARY CONDENSATE DRAIN PAN, AN ELECTRONIC WATER LEVEL DETECTOR OR WIRED TO SHUTDOWN THE UNIT UPON DETECTION OF WATER MAY BE INSTALLED IN THE PRIMARY DRAIN LINE. THE OVERFLOW DRAIN LINE OR THE EQUIPMENT-SUPPLIED DRAIN PAN. THE WATER LEVEL DETECTOR SHALL BE LOCATED AT A POINT HIGHER THAN THE PRIMARY DRAIN LINE CONNECTION AND BELOW THE OVERFLOW RIM OF PAN.

HVAC SPECIFICATIONS

- ALL WORK SHALL COMPLY WITH THE 2021 EDITION OF THE INTERNATIONAL BUILDING CODE, MECHANICAL CODE, PLUMBING CODE AND OTHER REQUIREMENTS OF NFPA, ADA, EPA AND ALL OTHER AUTHORITIES HAVING JURISDICTION OVER THIS WORK.
- THE CONTRACTOR SHALL PAY ALL FEES AND SECURE ALL LICENSES AND PERMITS REQUIRED FOR THE WORK INDICATED ON THE MECHANICAL DRAWINGS.
- ALL ROTATING PIECES OF MECHANICAL EQUIPMENT SHALL BE PROVIDED WITH VIBRATION ISOLATORS SUITABLE FOR THE SPECIFIC APPLICATION. ISOLATORS MAY BE EITHER INTERNAL OR EXTERNAL AND EITHER SUPPLIED BY THE CONTRACTOR OR EQUIPMENT MANUFACTURER.
- ALL MECHANICAL AND PLUMBING EQUIPMENT, PIPE AND DUCTWORK SHALL BE RESTRAINED TO RESIST SEISMIC FORCES. RESTRAINT DEVICES SHALL BE DESIGNED AND SELECTED FOR THE SPECIFIC APPLICATION TO MEET THE SEISMIC REQUIREMENTS AS DEFINED IN THE CURRENTLY ADOPTED ISSUE OF THE INTERNATIONAL BUILDING CODE. SHOP DRAWINGS, SIGNED AND SEALED BY A REGISTERED ENGINEER, ARE REQUIRED FOR ALL SEISMIC RESTRAINT CALCULATIONS. ALL EQUIPMENT, DUCT, PIPING, ETC. SHALL HAVE AN Ip OF 1.0.
- ALL SUPPLY AIR, RETURN AIR, EXHAUST AIR AND OUTSIDE AIR DUCTWORK SHALL BE GALVANIZED SHEET METAL PER SMACNA STANDARDS AND CONSTRUCTED AND ERECTED IN ACCORDANCE WITH THE INTERNATIONAL MECHANICAL CODE FOR LOW PRESSURE DUCT SYSTEMS. ALL LONGITUDINAL AND TRANSVERSE JOINTS, SEAMS AND CONNECTIONS SHALL BE SECURELY FASTENED AND SEALED WITH GASKETS, MASTICS, OR MASTIC PLUS EMBEDDED FABRIC TAPE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.
- INSTALL ALL ACR COPPER TUBING PER MANUFACTURER'S SPECIFICATIONS. INSULATE COPPER TUBING WITH 3/4" ARMAFLEX INSULATION. ALUMINUM JACKETING SHALL BE APPLIED TO ALL EXTERIOR ARMAFLEX FOR ULTRA-VIOLET PROTECTION.
- LOCATIONS OF LOUVERS SHOWN ON THE PLANS ARE APPROXIMATE. REFER TO ARCHITECTURAL ELEVATIONS FOR EXACT LOCATION.
- PROVIDE TURNING VANES IN ALL 45 AND 90 DEGREE ELBOWS.
- ALL CONTROL ITEMS AND PIECES OF EQUIPMENT SHALL BE PERMANENTLY LABELED.
- AS-BUILT PRINTS SHALL BE PROVIDED TO THE ARCHITECT AT PROJECT CLOSEOUT.
- A COMPLETE TEST AND BALANCE REPORT FOR ALL AIR SYSTEMS SHALL BE PROVIDED TO THE ENGINEER PRIOR TO FINAL INSPECTION.
- CONTRACTOR SHALL PROVIDE COMPLETE OWNER TRAINING FOR ALL MECHANICAL COMPONENTS.
- CONTRACTOR SHALL PROVIDE 2 COPIES OF THE OPERATIONS AND MAINTENANCE MANUALS TO THE OWNER PRIOR TO PROJECT CLOSEOUT.
- CONTRACTOR SHALL PROVIDE 1 YEAR GUARANTEE ON ALL EQUIPMENT AND WORK.

HVAC LEGEND

SYMBOL	DESCRIPTION
Ⓧ	THERMOSTAT
Ⓢ	WALL SWITCH
REF-1	ROOF EXHAUST FAN NO. 1
FSD	FIRE SMOKE DAMPER
L-1	WALL LOUVER NO. 1
PHP-1	PACKAGED HEAT PUMP NO. 1
EUH-1	ELECTRIC UNIT HEATER NO. 1
→	DIRECTION OF AIRFLOW
12x8	RECTANGULAR DUCT
B 50	GRILLE TAG "B" SET FOR 50 CFM
VD	VOLUME DAMPER
10a	ROUND DUCT
⊠	DUCT SECTION - SUPPLY
⊠	DUCT SECTION - RETURN
⊠	DUCT SECTION - EXHAUST

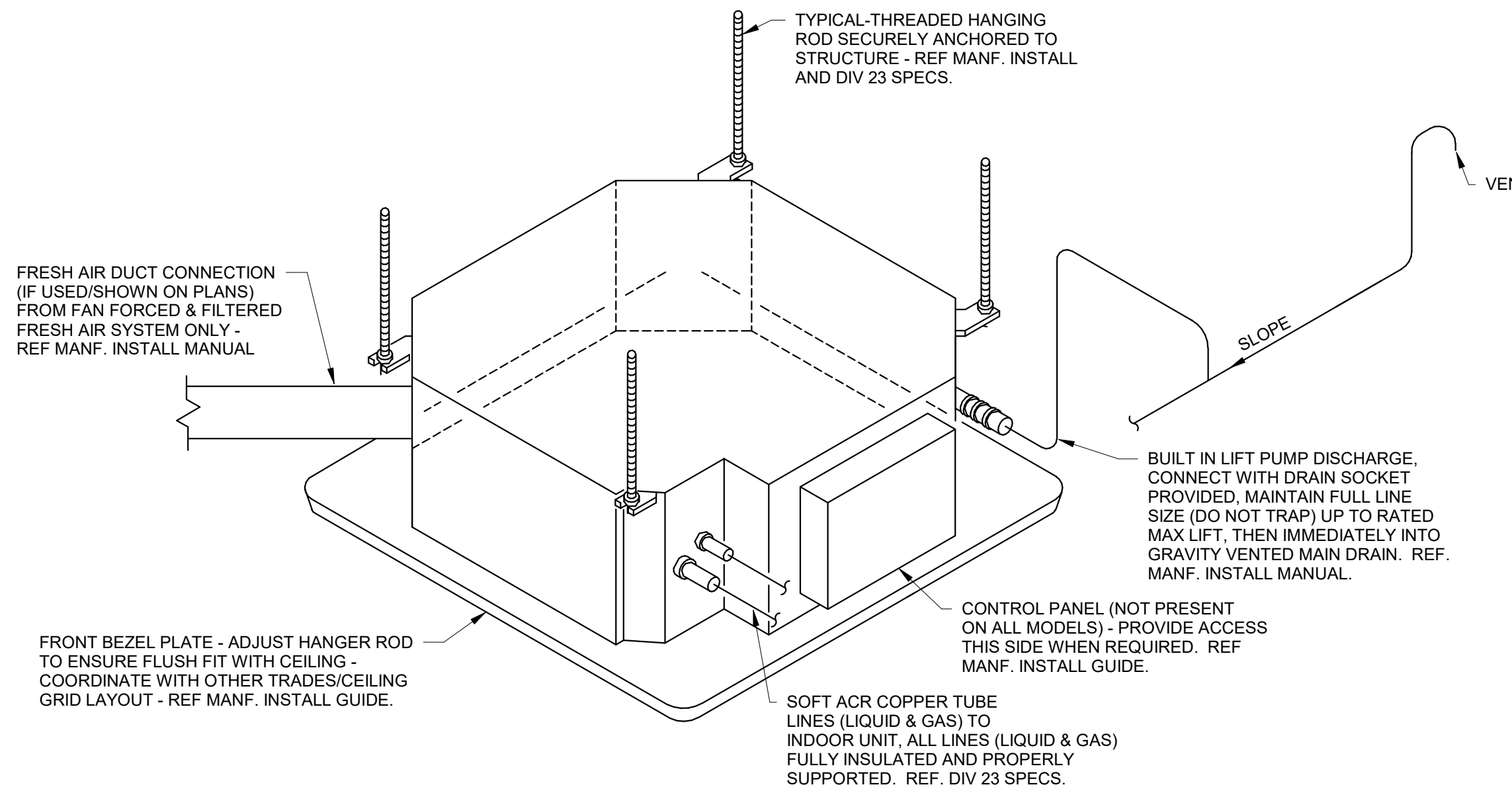
SPLIT SYSTEM HEAT PUMP SCHEDULE

EQUIPMENT TAG	MANUFACTURER'S MODEL NO# (INDOOR/OUTDOOR)	SERVES	INDOOR UNIT	CFM	TOTAL CAPACITY (MBH)		SEER	VOLTAGE	REMARKS
					COOLING	HEATING			
DAH-1/CU-1	PLA-A36EA7/PUZ-A36NKA7	ELEC. BLDG	CEILING HUNG	1200	36.0	38.0	15.0	208/60/1	1,2,3,4,5

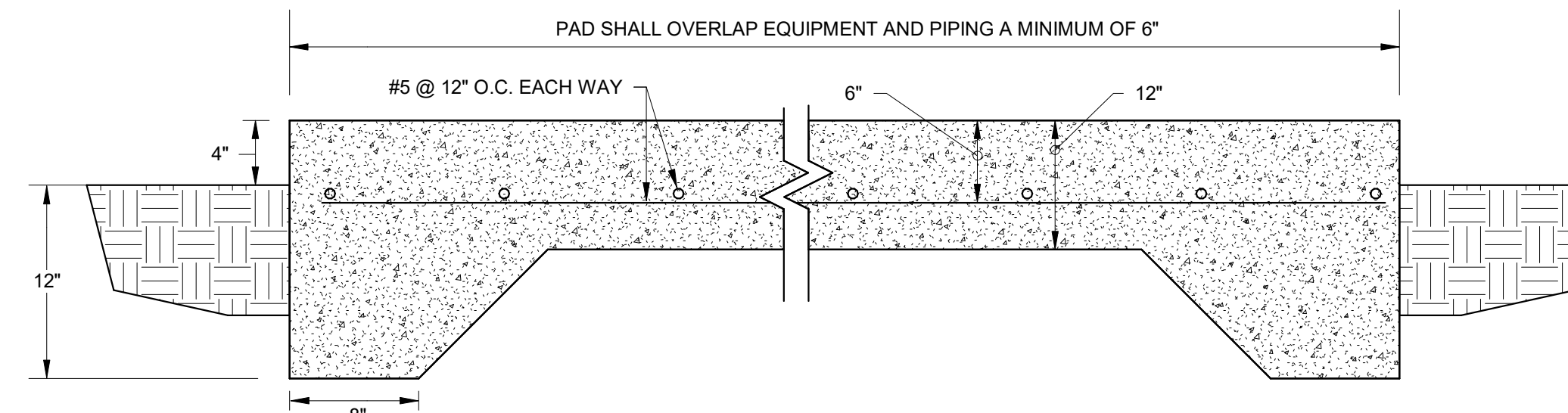
SELECTIONS BASED ON TRANE/MITSUBISHI, APPROVED EQUALS: DAIKIN, CARRIER, & LG

REMARKS:

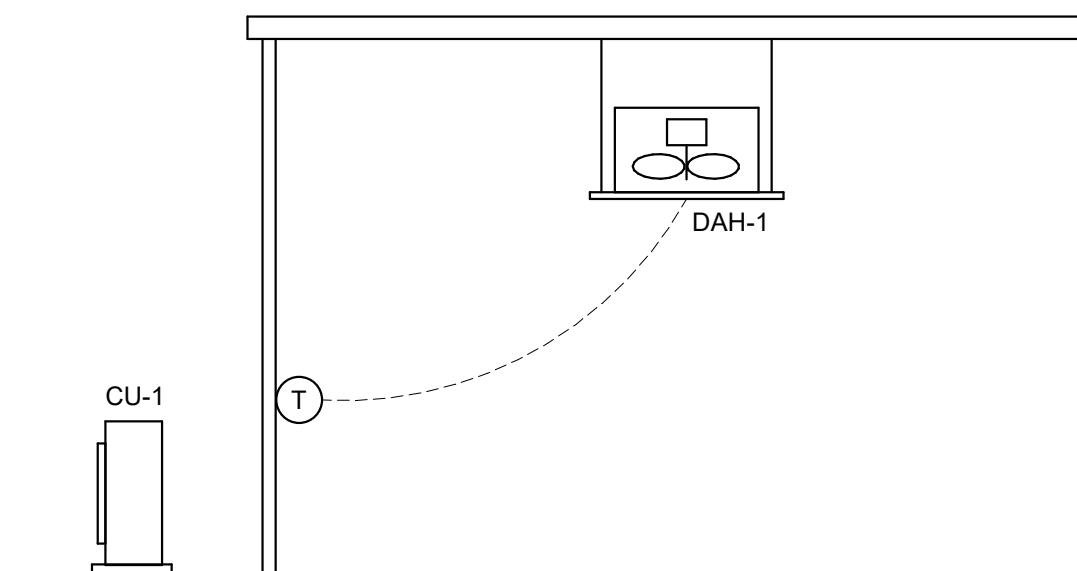
- INSTALL PER MANUFACTURER'S RECOMMENDED CLEARANCES AND GUIDELINES.
- PROVIDE WITH LOW AMBIENT CONTROLS DOWN TO 0°F.
- PROVIDE FLOAT SWITCH TO DISABLE INDOOR UNIT UPON DETECTION OF HIGH WATER LEVEL.
- PROVIDE WALL MOUNTED WIRED THERMOSTAT.
- OUTDOOR UNIT SHALL BE FACTORY COATED WITH BLUE FIN HEX COATING.



① INDOOR CASSETTE MOUNTING DETAIL
NO SCALE



② EXTERIOR CONCRETE PAD DETAIL
NO SCALE

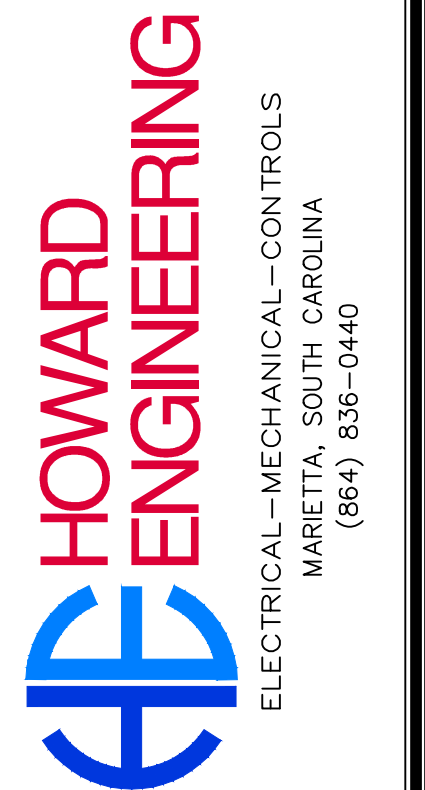
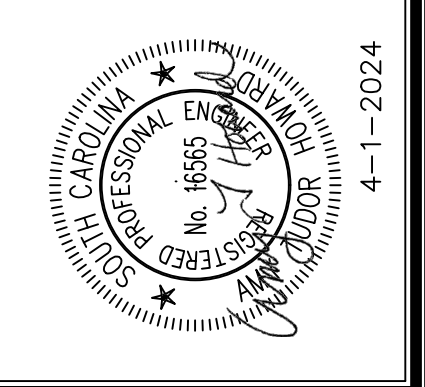
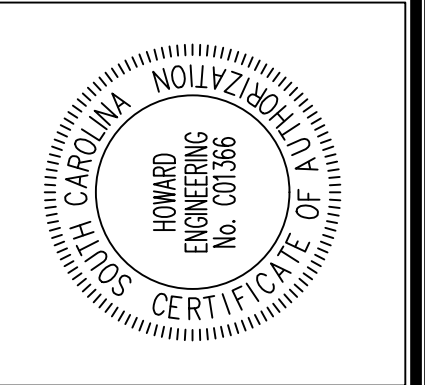


③ CU-1 & DAH-1 SEQUENCE OF OPERATIONS
NO SCALE

- ON A RISE IN SPACE TEMPERATURE AS SENSED BY THE WALL MOUNTED HEAT-COOL THERMOSTAT THE HEAT PUMP OUTDOOR CONDENSING UNIT SHALL BE ENERGIZED TO PROVIDE COOLING. THE VARIABLE SPEED COMPRESSOR SHALL RAMP UP OR DOWN AS REQUIRED TO MATCH THE COOLING LOAD REQUIREMENT. THE INDOOR FAN SHALL RUN CONTINUOUSLY.
- ON A DROP IN SPACE TEMPERATURE AS SENSED BY THE WALL MOUNTED HEAT-COOL THERMOSTAT THE HEAT PUMP OUTDOOR CONDENSING UNIT SHALL BE ENERGIZED TO PROVIDE HEATING. THE VARIABLE SPEED COMPRESSOR SHALL RAMP UP OR DOWN AS REQUIRED TO MATCH THE HEATING LOAD REQUIREMENT. THE INDOOR FAN SHALL RUN CONTINUOUSLY.
- THE UNIT MOUNTED CONDENSATE PUMP SHALL PUMP CONDENSATE HIGH IN THE SPACE TO A GRAVITY DRAIN PIPE. A SAFETY FLOAT SWITCH SHALL SHUTDOWN THE HEAT PUMP SYSTEM IF THE CONDENSATE PUMP FAILS.
- ALL INTERLOCK CONTROL WIRING BETWEEN AIR HANDLER, CONDENSING UNIT, THERMOSTAT AND CONDENSATE PUMP SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR.

NO.	REVISIONS	DESCRIPTION	DATE	BY
1	ISSUED FOR BIDS		4/1/24	STS

PROJECT ENG:	DESIGNED BY:	DRAWN BY:	CHECKED BY:	APPROVED:
STS	STS	STS	ATH	STS



SHEET TITLE:
HVAC NOTES,
SCHEDULE, AND
DETAILS

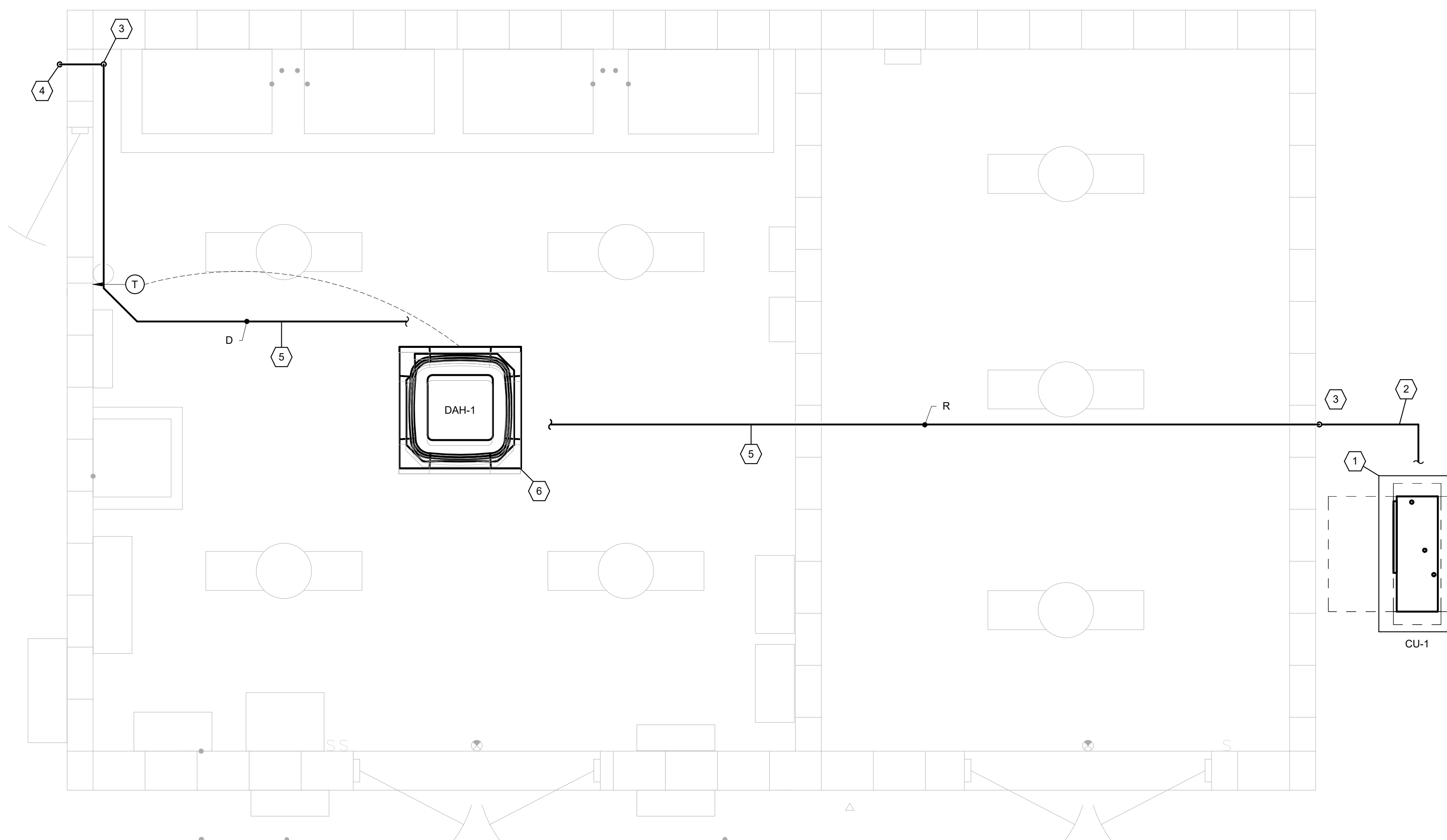
PROJECT:
RAW WATER STATION
GENERATOR AND MCC
UPGRADES

DATE: APRIL 2024
HEI PROJECT NO. A23121-E
SCALE: AS SHOWN

SHEET NO.
H1 OF 16

NOTES:

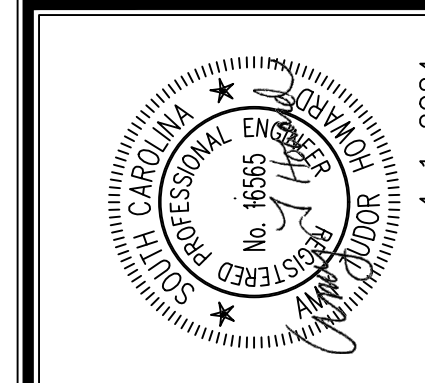
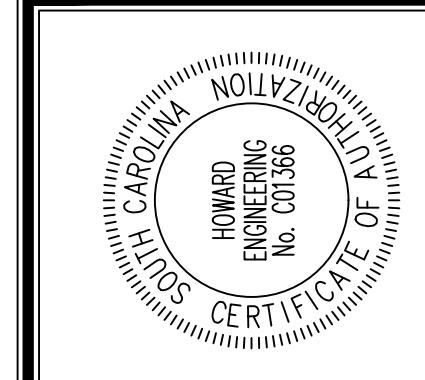
1. PROVIDE EQUIPMENT HOUSEKEEPING PAD PER DETAIL.
2. EXTERIOR REFRIGERANT TUBING SHALL BE PER THE SPECIFICATIONS.
3. ROUTE TUBING UP TIGHT TO WALL.
4. TERMINATE CONDENSATE DRAIN 12" ABOVE FINISHED GRADE.
5. COORDINATE ALL ROUTING OF REFRIGERANT AND CONDENSATE TUBING SUCH THAT IT IS NOT ROUTED OVER ANY ELECTRICAL EQUIPMENT.
6. COORDINATE CASSETTE LOCATION WITH LIGHTS.



① RAW WATER PUMP STATION HVAC PLAN
1/2" = 1'-0"

REVISIONS		NO.	DESCRIPTION	DATE	BY
1	ISSUED FOR BIDS	4/1/24	STS		

APPROVALS	
PROJECT ENG:	STS
DESIGNED BY:	STS
DRAWN BY:	STS
CHECKED BY:	A TH
APPROVED:	STS



HOWARD ENGINEERING
ELECTRICAL-MECHANICAL-CONTROLS
MARIETTA, SOUTH CAROLINA
(864) 836-0440

SHEET TITLE:
**ELECTRICAL BUILDING
HVAC PLAN**

PROJECT:
**RAW WATER STATION
GENERATOR AND MCC
UPGRADES**

DATE: APRIL 2024
HEI PROJECT NO. A23121-E
SCALE: AS SHOWN

SHEET NO.
H2 OF 16