

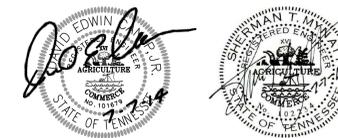
SHELBY COUNTY JUSTICE CENTER GENERATOR REPLACEMENT PHASE 2

201 POPLAR AVE
MEMPHIS, TENNESSEE 38103

PROJECT No. CE13-037
JULY 7, 2013

INDEX OF DRAWINGS

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M3	BASEMENT FLOOR PLAN MECHANICAL DEMOLITION
M4	COURTYARD PLAN MECHANICAL DEMOLITON
M5	BASEMENT FLOOR PLAN NEW GENERATOR EXHAUST
M6	BASEMENT FLOOR PLAN NEW FUEL OIL PIPING
M7	BASEMENT FLOOR PLAN NEW COOLANT WATER
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E3	BASEMENT FLOOR PLAN POWER
E4	COURTYARD PLAN POWER
E5	ELECTRICAL ONE-LINE DIAGRAMS



CRIMINAL JUSTICE CENTER

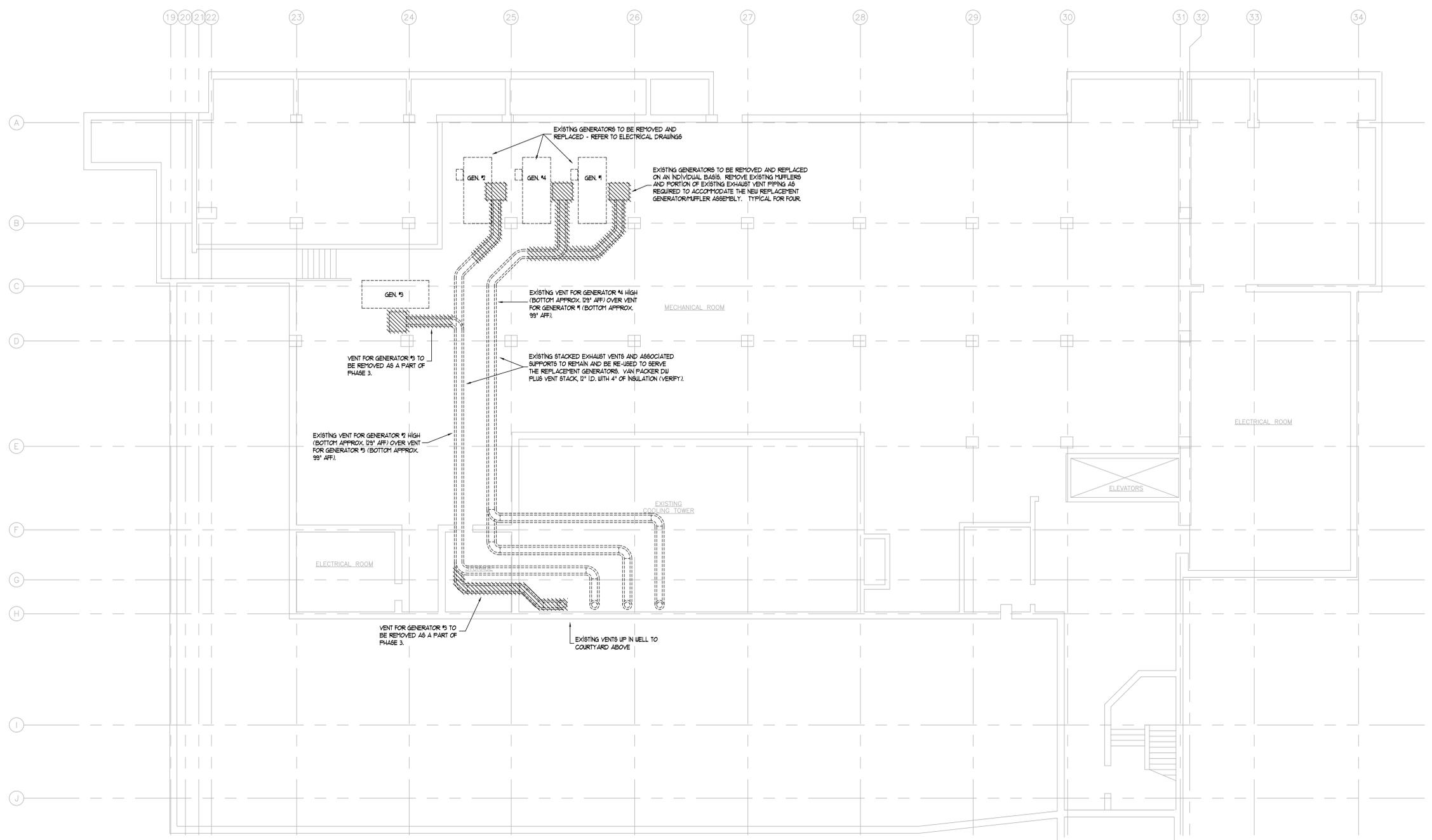
ENUP
ENGINEERING, INC.
ELECTRICAL ENGINEERING CONSULTANTS
7953 STAGE HILLS BLVD. BARTLETT, TN 38133
PHONE: (901) 379-9762 * FAX (901) 379-9763



VICINITY MAP

SET # _____

REVISIONS	DATE



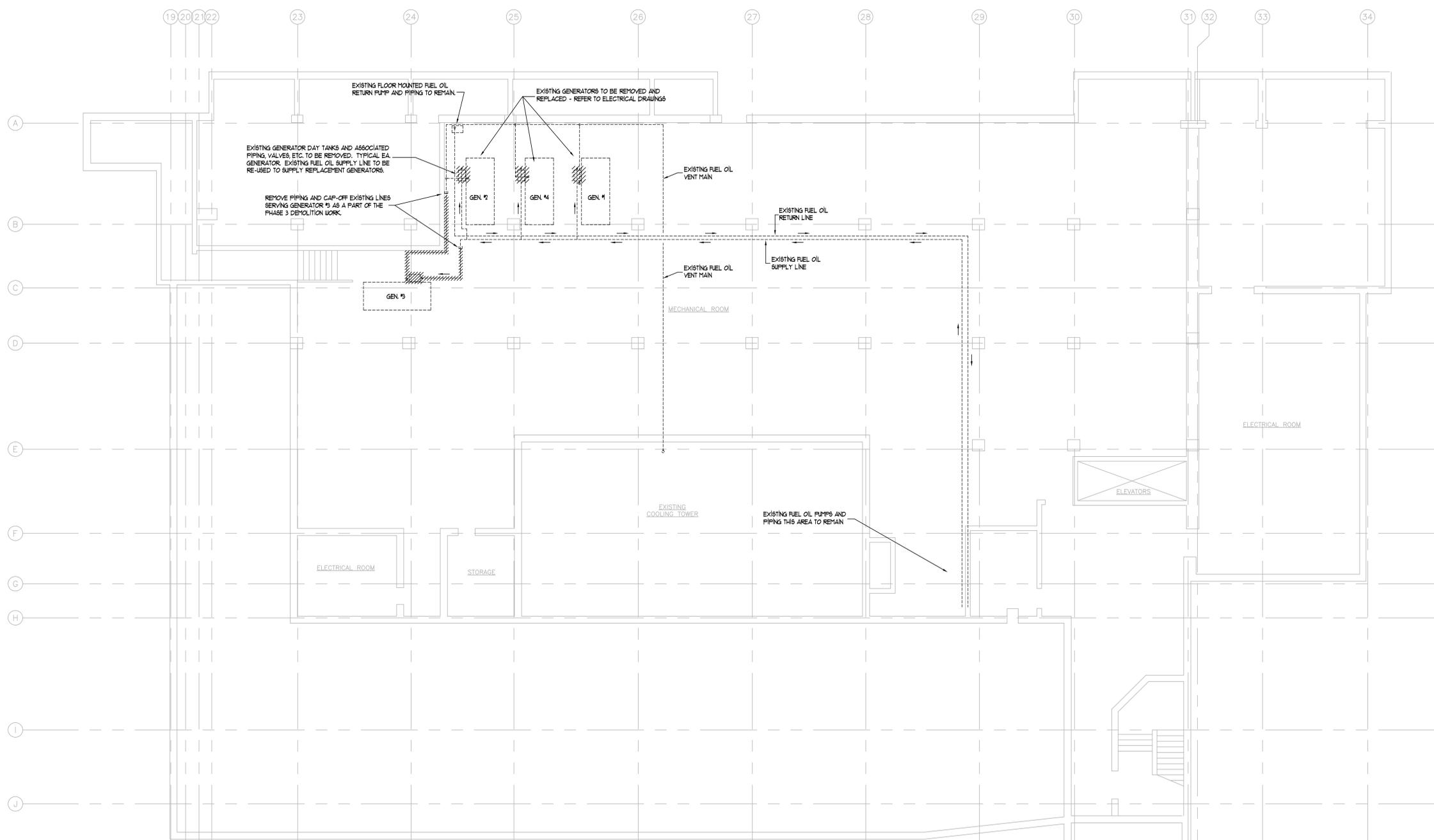
A PARTIAL BASEMENT PLAN - GENERATOR EXHAUST DEMOLITION
1/8" = 1'-0"

Project Phasing
Phase 1
REMOVAL AND REPLACEMENT OF GENERATOR 2
Phase 2
REMOVAL AND REPLACEMENT OF GENERATOR 1
REMOVAL OF GENERATOR 3
REMOVAL AND REPLACEMENT OF GENERATOR 4
REFER TO THE ELECTRICAL DRAWINGS AND SPECIFICATIONS FOR ADDITIONAL INFORMATION.

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1015 Cordova Station Road Cordova, Tennessee 38018
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E-mail: terry@barhamcainmynatt.com

PROJECT TITLE: SHELBY COUNTY JUSTICE CENTER GENERATOR REPLACEMENT PHASE 2	
PROJECT NO.: CE13037	DRAWN BY: STM
DATE: 07.07.2014	DESIGNED BY: STM
SCALE: AS NOTED	CHECKED BY: DEC
SHEET TITLE: BASEMENT FLOOR PLAN MECHANICAL DEMOLITION	SHEET NUMBER: M1

REVISIONS	DESCRIPTION	DATE



(A) PARTIAL BASEMENT PLAN - GENERATOR FUEL SYSTEM DEMOLITION
1/8" = 1'-0"

Project Phasing

Phase 1
REMOVAL AND REPLACEMENT OF GENERATOR 2

Phase 2
REMOVAL AND REPLACEMENT OF GENERATOR 4
REMOVAL OF GENERATOR 5
REMOVAL AND REPLACEMENT OF GENERATOR 1

REFER TO THE ELECTRICAL DRAWINGS AND SPECIFICATIONS FOR ADDITIONAL INFORMATION.

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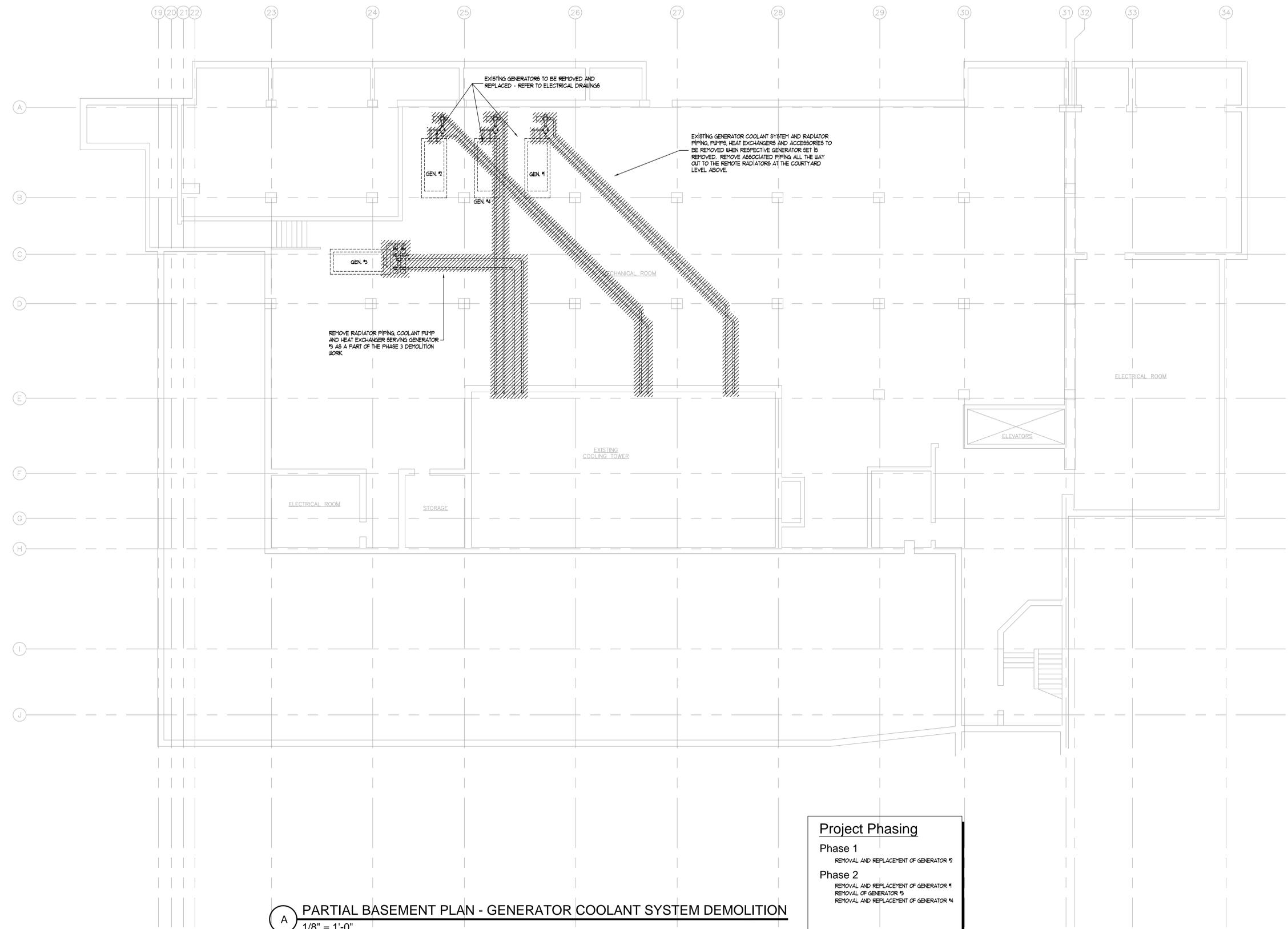
PROJECT TITLE:
SHELBY COUNTY JUSTICE CENTER
GENERATOR REPLACEMENT
PHASE 2

PROJECT NO. CE13037	DRAWN BY: STM
DATE: 07.07.2014	DESIGNED BY: STM
SCALE: AS NOTED	CHECKED BY: DEC

SHEET TITLE:
**BASEMENT FLOOR PLAN
MECHANICAL DEMOLITION**

SHEET NUMBER:
M2

REVISIONS	DESCRIPTION	DATE



A PARTIAL BASEMENT PLAN - GENERATOR COOLANT SYSTEM DEMOLITION
1/8" = 1'-0"

Project Phasing

Phase 1
REMOVAL AND REPLACEMENT OF GENERATOR 2

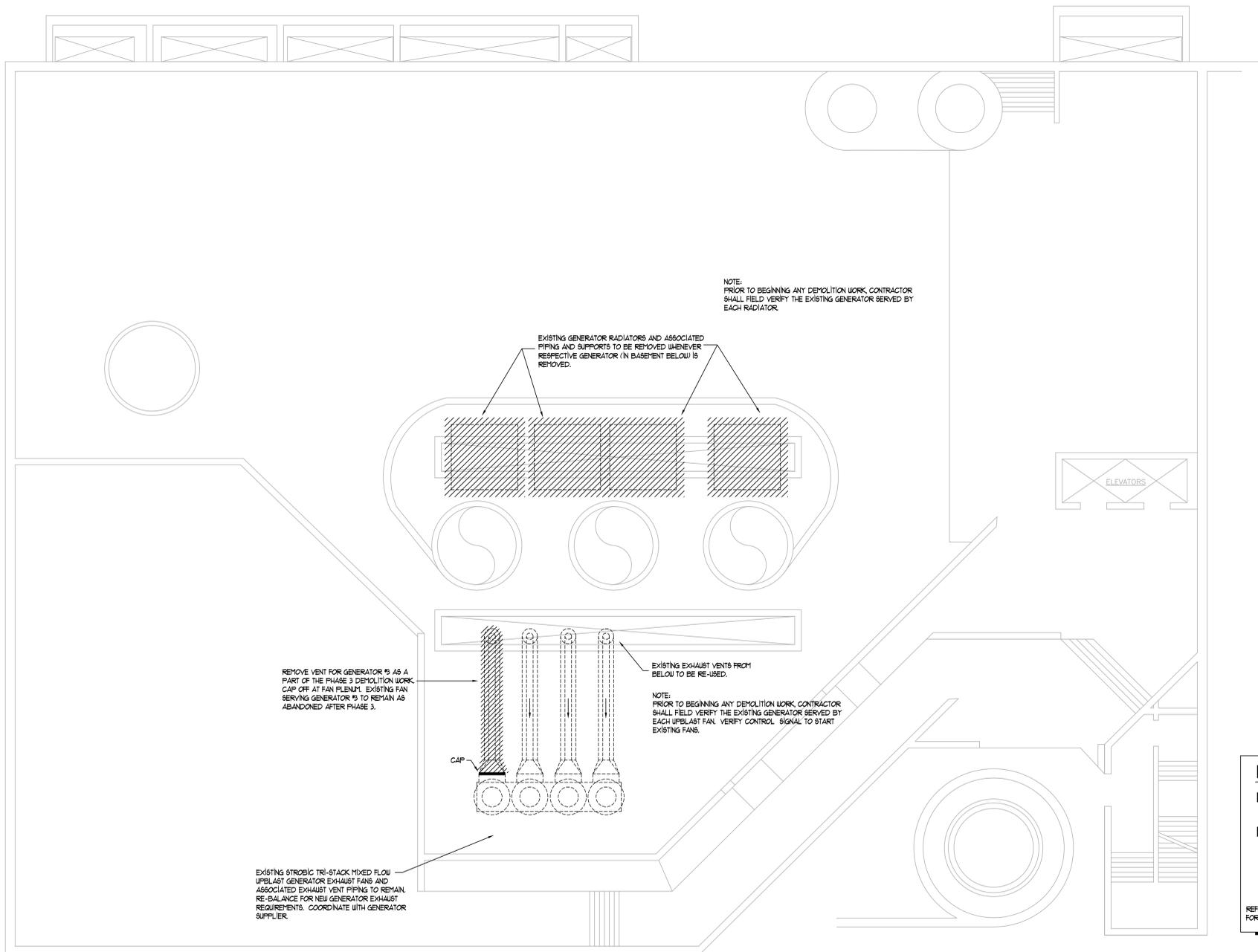
Phase 2
REMOVAL AND REPLACEMENT OF GENERATOR 1
REMOVAL OF GENERATOR 3
REMOVAL AND REPLACEMENT OF GENERATOR 4

REFER TO THE ELECTRICAL DRAWINGS AND SPECIFICATIONS FOR ADDITIONAL INFORMATION.

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PROJECT NO.: CE13037	DRAWN BY: STM
DATE: 07.07.2014	DESIGNED BY: STM
SCALE: AS NOTED	CHECKED BY: DEC
SHEET TITLE: BASEMENT FLOOR PLAN MECHANICAL DEMOLITION	SHEET NUMBER: M3

REVISIONS	DESCRIPTION	DATE



Project Phasing

Phase 1
REMOVAL AND REPLACEMENT OF GENERATOR 12

Phase 2
REMOVAL AND REPLACEMENT OF GENERATOR 11
REMOVAL OF GENERATOR 13
REMOVAL AND REPLACEMENT OF GENERATOR 14

REFER TO THE ELECTRICAL DRAWINGS AND SPECIFICATIONS FOR ADDITIONAL INFORMATION.

A COURTYARD LEVEL PLAN - DEMOLITION
1/8" = 1'-0"

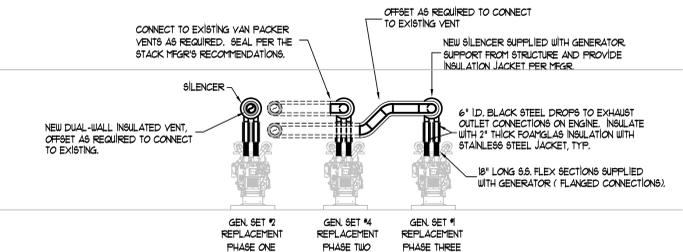
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PROJECT NO.: CE13037	DRAWN BY: STM
DATE: 07.07.2014	DESIGNED BY: STM
SCALE: AS NOTED	CHECKED BY: DEC
SHEET TITLE: COURTYARD PLAN MECHANICAL DEMOLITION	SHEET NUMBER: M4

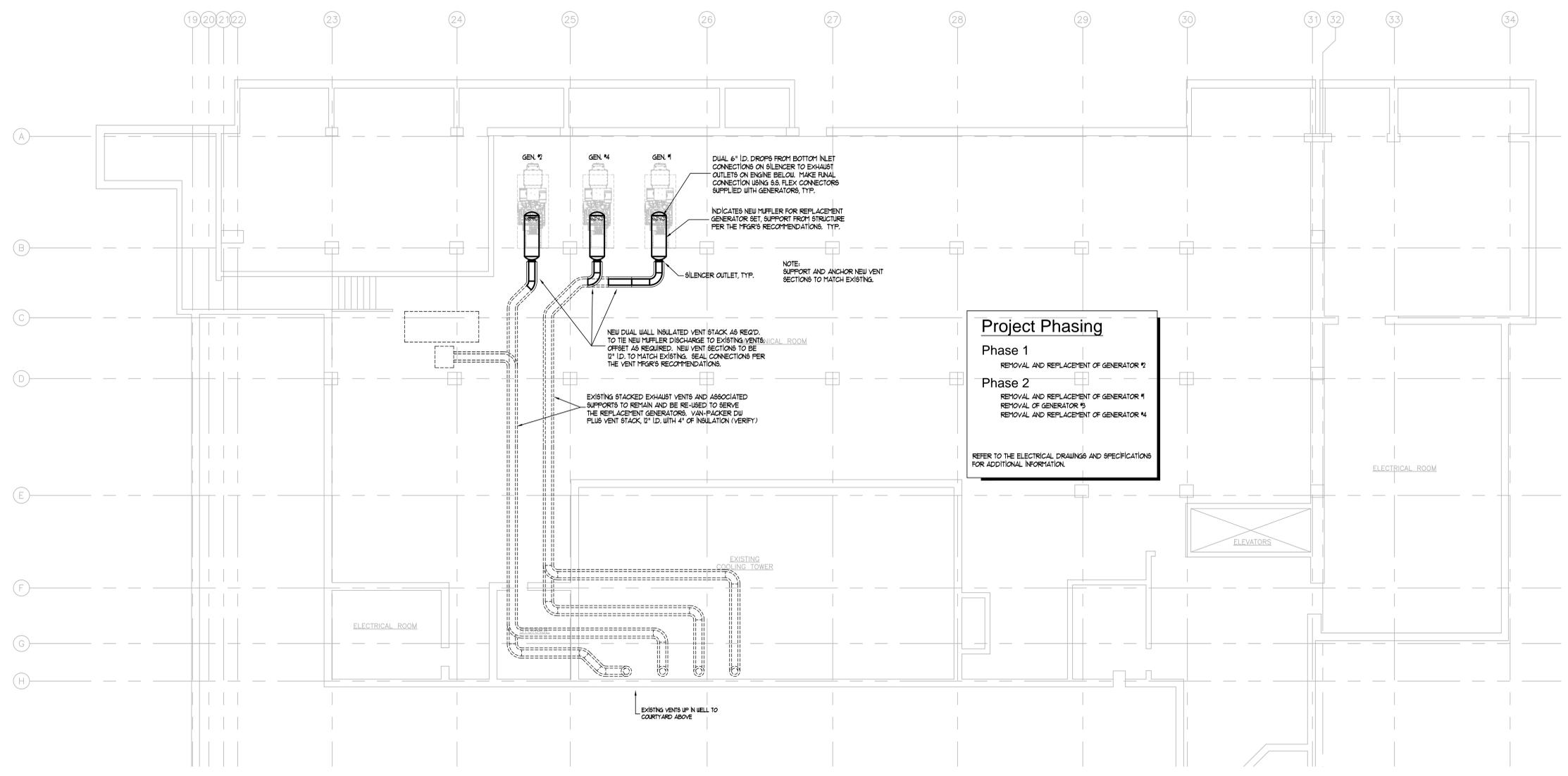
REVISIONS	DESCRIPTION	DATE



NOTES:
 COMPLY WITH GENERATOR MFR'S AND SILENCER MFR'S RECOMMENDATIONS FOR INSTALLATION.
 SILENCERS AND THERMAL WRAP SUPPLIED BY THE ELECTRICAL CONTRACTOR. MECHANICAL CONTRACTOR TO INSTALL THE SILENCERS AND ALL ASSOCIATED EXHAUST VENT PIPING. MECHANICAL CONTRACTOR TO INSTALL THERMAL WRAP ON SILENCERS PER THE MFR'S RECOMMENDATIONS.



B SECTION AT REPLACEMENT GENERATORS
 1/8" = 1'-0"



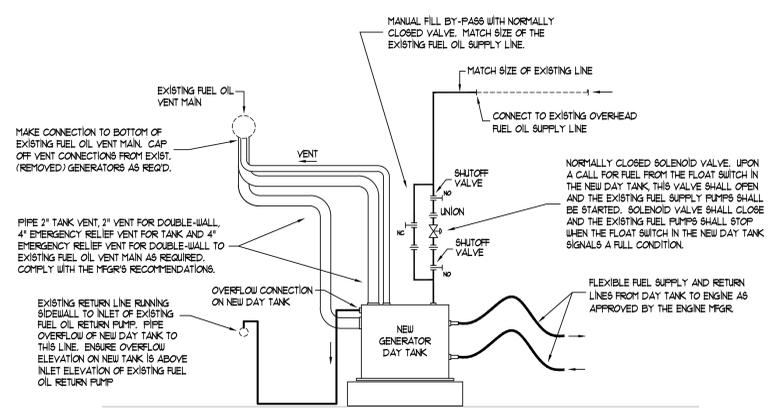
Project Phasing
 Phase 1
 REMOVAL AND REPLACEMENT OF GENERATOR 2
 Phase 2
 REMOVAL AND REPLACEMENT OF GENERATOR 4
 REMOVAL OF GENERATOR 3
 REMOVAL AND REPLACEMENT OF GENERATOR 1
 REFER TO THE ELECTRICAL DRAWINGS AND SPECIFICATIONS FOR ADDITIONAL INFORMATION.

A PARTIAL BASEMENT PLAN - NEW GENERATOR EXHAUST
 1/8" = 1'-0"

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PROJECT NO.: CE13037	DRAWN BY: STM
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SCALE: AS NOTED	CHECKED BY: DEC
SHEET TITLE: BASEMENT FLOOR PLAN NEW GENERATOR EXHAUST	SHEET NUMBER: M5

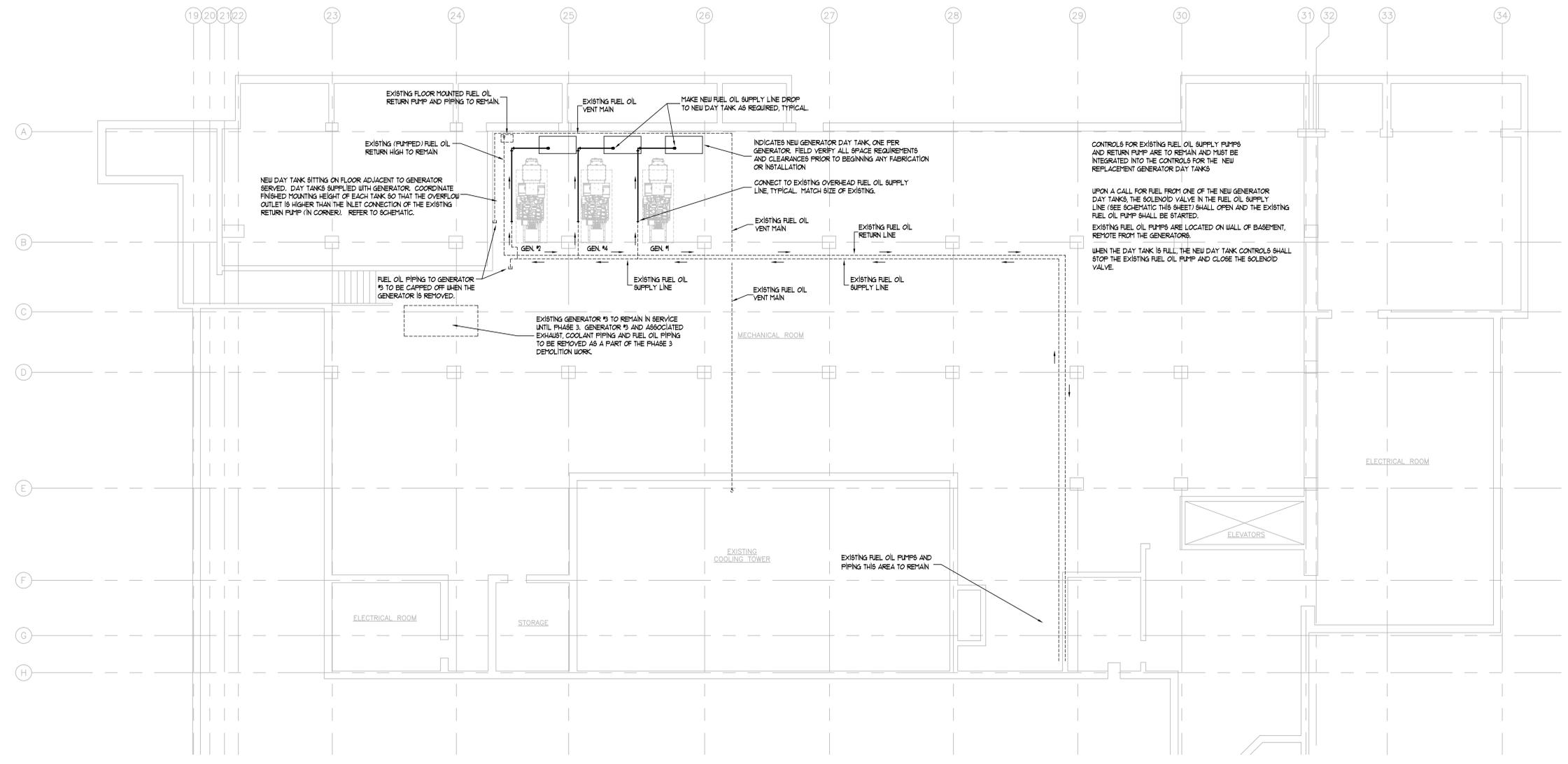
REVISIONS	DATE



NOTES:
FUEL OIL SUPPLY PUMPS SUPPLYING FUEL TO THE GENERATOR DAY TANKS AS NEEDED ARE EXISTING TO REMAIN AND LOCATED SIDEWALL IN THE EXISTING BASEMENT MECHANICAL ROOM. CONTRACTOR TO CONFIRM LOCATION WITH THE OWNER AND VERIFY THE EXISTING SEQUENCE OF OPERATION.
INTERLOCK NEW DAY TANK CONTROLS WITH THE EXISTING CONTROLS FOR THE FUEL OIL PUMPING SYSTEM AS REQUIRED. EXISTING FUEL OIL SUPPLY PUMPS ARE TO REMAIN.

Project Phasing
Phase 1
REMOVAL AND REPLACEMENT OF GENERATOR #2
Phase 2
REMOVAL AND REPLACEMENT OF GENERATOR #1
REMOVAL OF GENERATOR #3
REMOVAL AND REPLACEMENT OF GENERATOR #4
REFER TO THE ELECTRICAL DRAWINGS AND SPECIFICATIONS FOR ADDITIONAL INFORMATION.

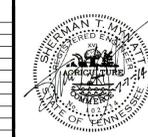
B DAY TANK PIPING SCHEMATIC
NO SCALE



A PARTIAL BASEMENT PLAN - NEW FUEL SUPPLY
1/8" = 1'-0"

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PROJECT NO.: CE13037	DRAWN BY: STM
DATE: 07.07.2014	DESIGNED BY: STM
SCALE: AS NOTED	CHECKED BY: DEC
SHEET TITLE: BASEMENT FLOOR PLAN NEW FUEL OIL PIPING	SHEET NUMBER: M6



REVISIONS	DATE

FRICION LOSS CALCULATIONS

CALCULATIONS BASED ON SPECIFIED CUMMINS DGFAD GENERATORS AND REMOTE RADIATORS. MANUFACTURER'S OF OTHER GENERATORS MUST VERIFY WITH SIMILAR CALCULATIONS.

AFTERCOOLER WATER

80 GPM COOLANT FLOW AFTERCOOLER FOR SPECIFIED GENERATOR
 4" PIPES

EQUIVALENT LENGTH OF PIPE:

TWENTY-FOUR (24) LONG RADIUS ELBOWS (24) X 6.8	1632
TWO (2) 4" SIZE GATE VALVES (OPEN) (2) X 4.1	9.4
500' STRAIGHT PIPE	500
TOTAL EQUIVALENT LENGTH OF PIPE (FEET)	670.6

ADD 20% SAFETY FACTOR
 670.6 X 1.20
805 FEET OF PIPE

EXACT NUMBER OF ELBOWS IN SYSTEM TO BE VERIFIED BASED ON FINAL PIPE LAYOUT. 0 ELBOWS ALLOWED IN EACH LINE (SUPPLY AND RETURN).

ENGINE JACKET WATER

262 GPM COOLANT FLOW FOR WATER JACKET FOR SPECIFIED GENERATOR
 6" PIPES

EQUIVALENT LENGTH OF PIPE:

TWENTY-FOUR (24) LONG RADIUS ELBOWS (24) X 10	240
TWO (2) 6" SIZE GATE VALVES (OPEN) (2) X 7.1	14.2
500' STRAIGHT PIPE	500
TOTAL EQUIVALENT LENGTH OF PIPE (FEET)	754.2

ADD 20% SAFETY FACTOR
 754.2 X 1.20
905 FEET OF PIPE

4" PIPE SIZE = 0.18 PSI PER 100 FT. OF RUN AT 80 GPM FLOW. SAT 0.20

PIPE FRICTION LOSS = 805 FT. X 0.20 PSI / 100 FT. = 162 PSI LOSS

TOTAL PRESSURE LOSS IS THE SUM OF THE PIPING LOSS PLUS THE RADIATOR LOSS:

PIPE FRICTION LOSS:	162 PSI
RADIATOR FRICTION LOSS (PER MFR)	3.8 PSI
TOTAL LOSS	542 PSI †

† SINCE THE ESTIMATED FRICTION LOSS IS LESS THAN THE MAXIMUM ALLOWABLE FRICTION HEAD FROM THE GENERATOR MFR. (1 PSI), AN AUXILIARY COOLANT PUMP IS NOT REQUIRED.

STATIC HEAD

PER EXISTING DRAWINGS, FINISHED FLOOR ELEVATION OF BASEMENT MECHANICAL ROOM IS ELEV. 216.0. ELEVATION OF COURTYARD ABOVE IS 250.0'. STATIC HEAD ON GENERATOR WATER JACKET AND AFTER-COOLER (46') HEIGHT OF LIQUID COLUMN MEASURED FROM CRANKSHAFT CENTERLINE) IS LESS THAN THE MAXIMUM ALLOWED (46') FOR THE SPECIFIED NEW CUMMINS GENERATORS. CONTRACTOR TO FIELD VERIFY PRIOR TO START OF CONSTRUCTION.

6" PIPE SIZE = 0.25 PSI PER 100 FT. OF RUN AT 262 GPM FLOW

PIPE FRICTION LOSS = 905 FT. X 0.25 PSI / 100 FT. = 226 PSI LOSS

TOTAL PRESSURE LOSS IS THE SUM OF THE PIPING LOSS PLUS THE RADIATOR LOSS:

PIPE FRICTION LOSS:	226 PSI
RADIATOR FRICTION LOSS (PER MFR)	4.83 PSI
TOTAL LOSS	109 PSI †

† SINCE THE ESTIMATED FRICTION LOSS IS LESS THAN THE MAXIMUM ALLOWABLE FRICTION HEAD FROM THE GENERATOR MFR. (10 PSI), AN AUXILIARY COOLANT PUMP IS NOT REQUIRED.

TABLE 18. EQUIVALENT LENGTH OF PIPE

Three Long Sweep Elbow=3 x 5.2	15.6
Two Gate Valves (Open)=2 x 1.7	3.4
100' Straight Pipe	100
60' Four Straight Pipe	60.0
EQUIVALENT LENGTH OF PIPE (FEET)	184.2

3. Find the back pressure at the given flow rate and length of pipe for the nominal pipe diameter used in the system. In this example, 3 inch nominal pipe is used. Following the dashed lines in Figure 90 on page 179, 3 inch pipe causes a pressure loss of approximately 1.85 psi per 100 feet of pipe.
 4. Calculate the pressure loss in the piping as follows:
 Piping Loss = 84.2 feet x 1.85 psi = 1.39 psi
 5. The total system loss is the sum of the piping and radiator losses:
 Total Pressure Loss = 1.39 psi piping + 1.00 psi radiator = 2.39 psi
 6. The calculation for this example indicates that the layout of the remote radiator cooling system is adequate in terms of coolant friction head since it is not greater than the allowable friction head. If a calculation indicates excessive coolant friction head, repeat the calculation using the next larger pipe size. Compare the advantages and disadvantages of using larger pipe with that of using an auxiliary coolant pump.

TABLE 19. EQUIVALENT LENGTHS OF PIPE FITTINGS AND VALVES IN FEET (METERS)

TYPE OF FITTING	NOMINAL INCH (MILLIMETER) PIPE SIZE										
	1/2	3/4	1	1-1/4	1-1/2	2	2-1/2	3	4	5	6
90° Std. Elbow or 90° Tee	1.7	2.1	2.8	3.5	4.1	5.2	6.2	7.7	10	13	15
90° Long Sweep Elbow or 90° Tee	1.1	1.4	1.8	2.3	2.7	3.5	4.2	5.2	6.8	8.5	10
45° Elbow	0.8	1.0	1.3	1.6	1.9	2.4	2.9	3.6	4.7	5.9	7.1
Close Return Bend	4.1	5.1	6.5	8.5	9.9	13	15	19	25	31	37
TEE, Side Inlet or Outlet	3.3	4.2	5.3	7.0	8.1	10	12	16	20	25	31
Foot Valve and Strainer	1.7	4.9	7.8	8.9	11	15	16	22	29	36	46
Swivel Check Valve	1.3	3.3	4.4	6.8	7.9	10	13	16	21	26	33
Globe Valve, Fully Open	19	23	29	39	45	58	69	86	113	142	170

AD405309 (Issue B)

TABLE 19. EQUIVALENT LENGTHS OF PIPE FITTINGS AND VALVES IN FEET (METERS)

TYPE OF FITTING	NOMINAL INCH (MILLIMETER) PIPE SIZE										
	1/2	3/4	1	1-1/4	1-1/2	2	2-1/2	3	4	5	6
Angle Valve, Fully Open	0.3	1.2	1.9	1.9	2.9	2.9	3.9	4.9	5.9	7.9	8.9
Gate Valve, Fully Open	0.8	1.0	1.2	1.6	1.8	2.4	2.8	3.5	4.7	5.9	7.1
Open	10.2	10.3	10.4	10.9	10.9	11.7	11.7	12.1	12.1	12.1	12.2

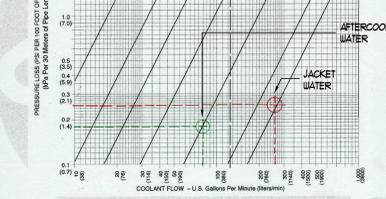
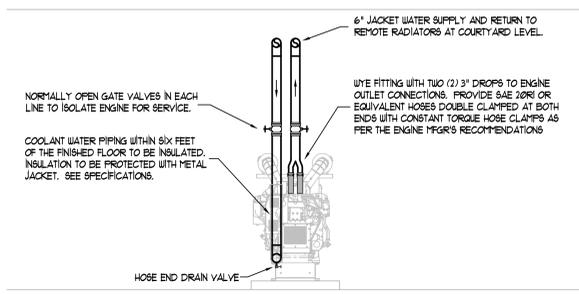
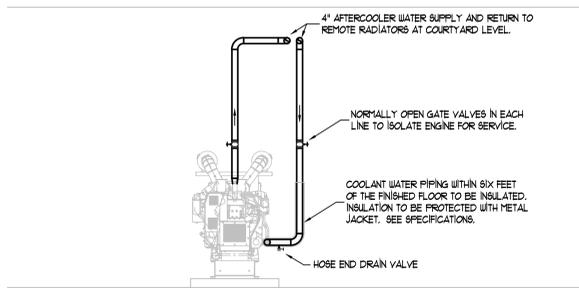


FIGURE 90. FRICTIONAL PRESSURE LOSSES FOR 1/2 INCH (16MM) DIAMETER PIPES
 6.4.9.1 Coolant Treatment
 Antifreeze (ethylene or propylene glycol base) and water are mixed to lower the freezing point of the cooling system and to raise the boiling point. Refer to Table 21 on page 159 for determining the concentration of ethylene or propylene glycol necessary for protection against the coldest ambient temperature expected. Antifreeze/water mixture percentages in the range of 30/70 to 60/40 are recommended for most applications.

AD405309 (Issue B)



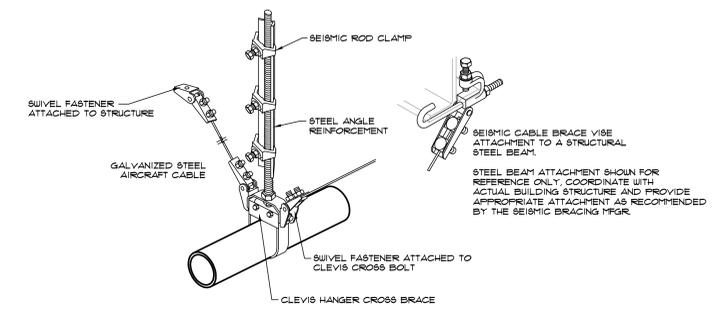
B TYPICAL JACKET WATER PIPING
 NO SCALE



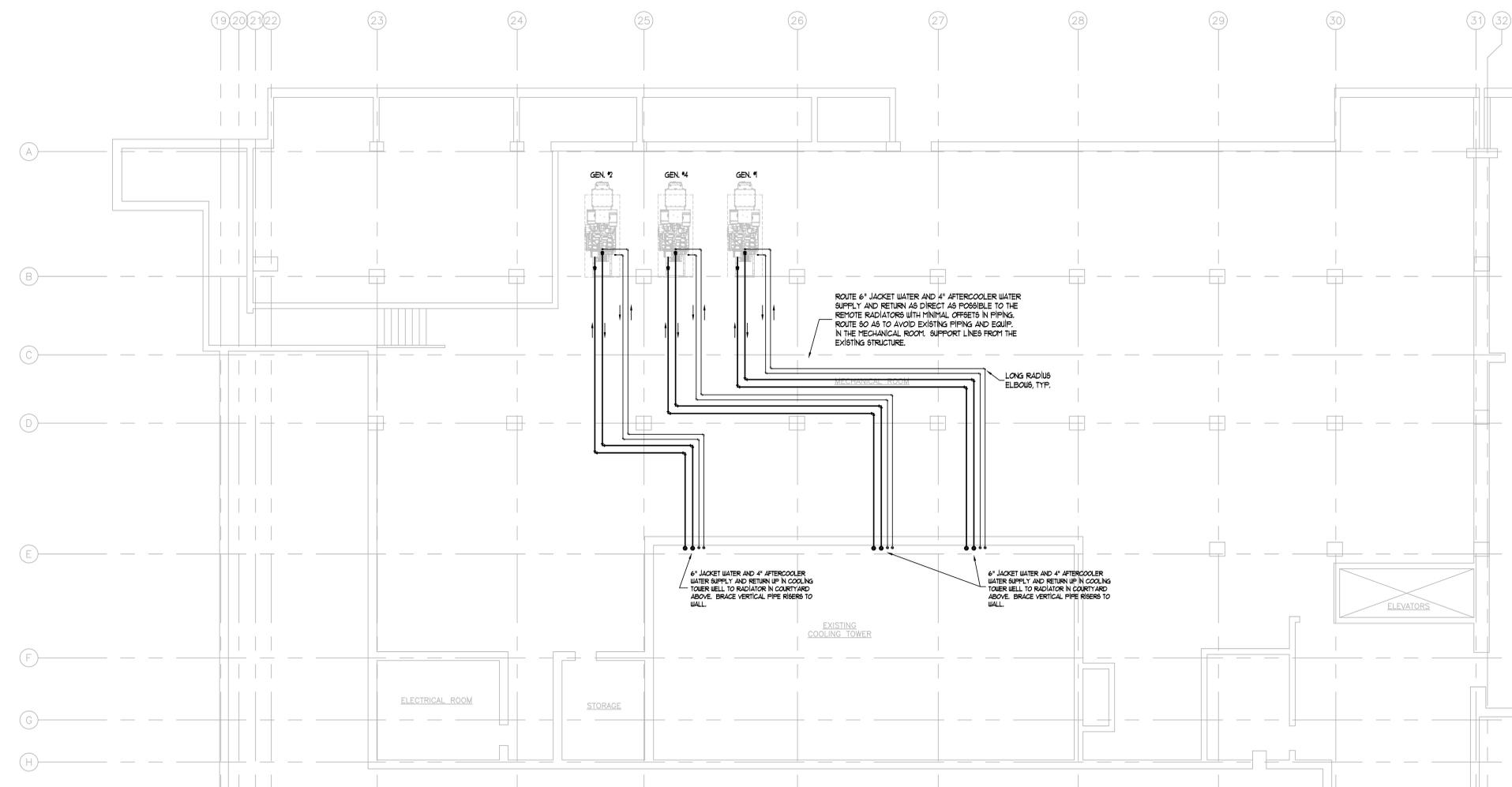
C TYPICAL AFTERCOOLER PIPING
 NO SCALE

Seismic Bracing and Vibration Isolation Schedule		
EQUIPMENT TYPE	VIBRATION ISOLATION	SEISMIC BRACING
ENGINE COOLANT WATER PIPING SERVING REMOTE RADIATORS AND NEW FUEL OIL PIPING	NONE	SEISMIC CABLE BRACING USING MASON "SCB" SWIVEL ANCHORS & AIRCRAFT CABLE.

NOTES:
 REFER TO THE SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
 THE SEISMIC BRACING MANUFACTURER'S SHOP DRAWINGS SHALL INCLUDE A PIPING PLAN SHOWING THE TYPES OF SEISMIC RESTRAINTS TO BE USED AS WELL AS THE LOCATION OF EACH TRANSVERSE AND LONGITUDINAL RESTRAINT. THIS PIPING PLAN AND ALL SEISMIC CALCULATIONS SHALL BE SEALED BY AN ENGINEER LICENSED IN TENNESSEE. A COPY OF THIS ALL SEISMIC BRACING PRODUCT DATA ATTACHMENT METHODS AND CALCULATIONS SHALL BE SUBMITTED TO LOCAL CODE FOR REVIEW AND FILE.
 THE INSTALLATION OF THE SEISMIC BRACING COMPONENTS SHALL BE REVIEWED BY THE COMPONENT MFR'S REPRESENTATIVE. THE MANUFACTURER'S REPRESENTATIVE SHALL VISIT THE SITE AND OBSERVE THE INSTALLATION OF THE SEISMIC BRACING COMPONENTS AND SHALL SUBMIT A LETTER TO LOCAL CODE ENFORCEMENT ASSURING THE DEVICES HAVE BEEN INSTALLED PROPERLY. THIS REVIEW LETTER MUST BE SUBMITTED TO LOCAL CODE PRIOR TO THE FIRST MECHANICAL INSPECTION AND EACH SUBSEQUENT INSPECTION AS REQUIRED BY LOCAL CODE. IN ADDITION, A SIGNED AND SEALED LETTER FROM THE ENGINEER OF RECORD FOR THE GAS PIPING PLAN SHALL BE SUBMITTED TO LOCAL CODE PRIOR TO THE FINAL INSPECTION ASSURING THE PROPER INSTALLATION OF THE DEVICES AND INDICATING HIS ACCEPTANCE OF THE INSTALLATION.

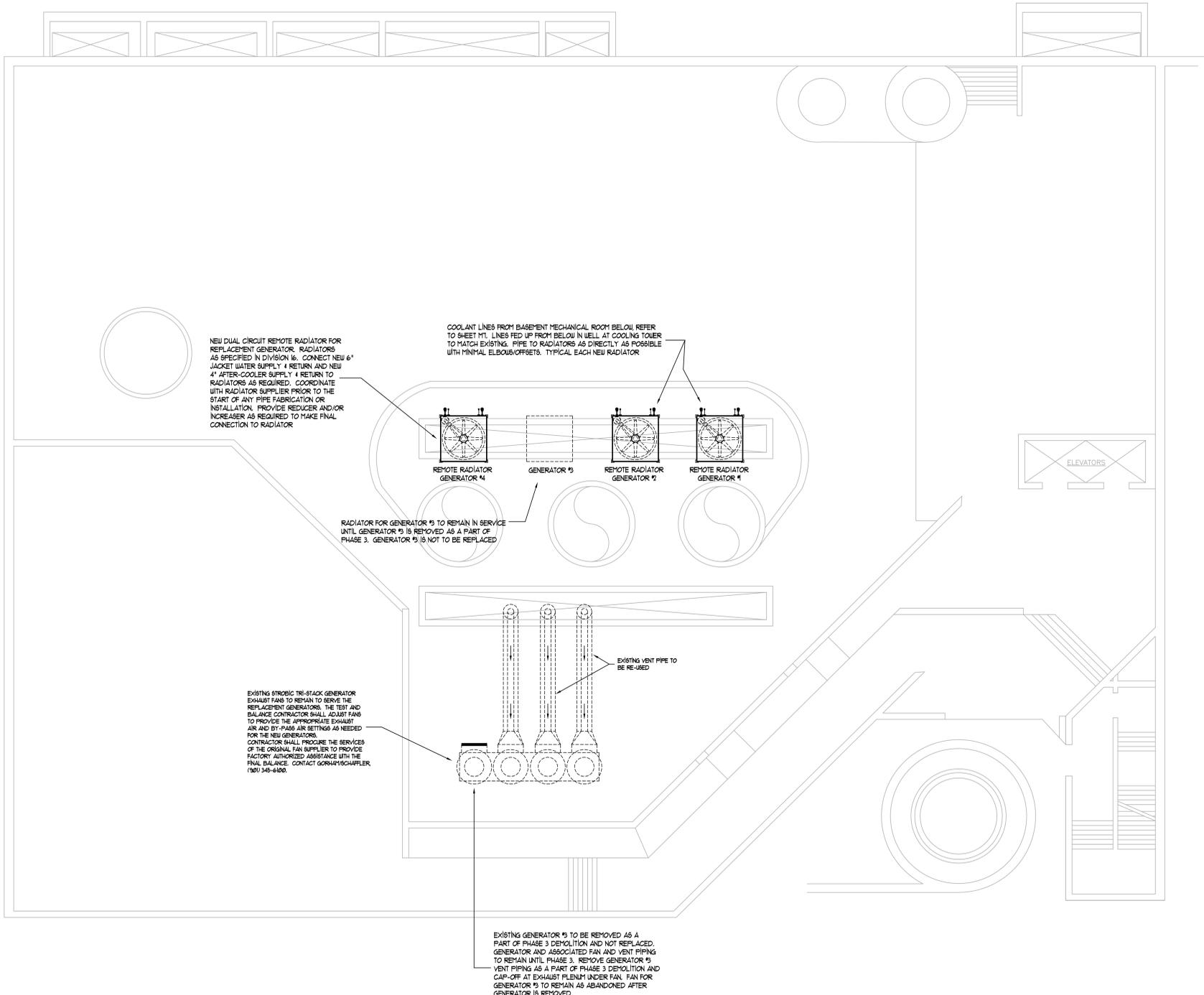


Pipe Seismic Brace Detail
 Pipe Inside the Building
 NO SCALE



A PARTIAL BASEMENT PLAN - ENGINE COOLANT
 1/8" = 1'-0"

REVISIONS	DESCRIPTION	DATE



A COURTYARD LEVEL PLAN
 1/8" = 1'-0"

Project Phasing

Phase 1
 REMOVAL AND REPLACEMENT OF GENERATOR 2

Phase 2
 REMOVAL AND REPLACEMENT OF GENERATOR 1
 REMOVAL OF GENERATOR 3
 REMOVAL AND REPLACEMENT OF GENERATOR 4

REFER TO THE ELECTRICAL DRAWINGS AND SPECIFICATIONS FOR ADDITIONAL INFORMATION.

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PROJECT TITLE: SHELBY COUNTY JUSTICE CENTER GENERATOR REPLACEMENT PHASE 2	
PROJECT NO.: CE13037	DRAWN BY: STM
DATE: 07.07.2014	DESIGNED BY: STM
SCALE: AS NOTED	CHECKED BY: DEC
SHEET TITLE: COURTYARD PLAN MECHANICAL	SHEET NUMBER: M8

ELECTRICAL LEGEND			
SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
SERVICE AND DISTRIBUTION		ABBREVIATIONS	
	SWITCHBOARD	AB	ABOVE BACKSPASH
	DISTRIBUTION PANEL	AF	AMPERES FRAME
	BRANCH CIRCUIT PANEL	AFF	ABOVE FINISHED FLOOR
	TRANSFORMER	AFG	ABOVE FINISHED GRADE
	MOTOR CONNECTION	AC	AMPERES INTERRUPTING CAPACITY
	DISCONNECT SWITCH (FUSED AS REQUIRED)	AT	AMPERES TRIP
	MOTOR CONTROLLER (SPECIFIED IN OTHER THAN DIV. 16)	ATS	AUTOMATIC TRANSFER SWITCH
	EQUIPMENT NOT FURNISHED UNDER DIV. 16 (SPECIFIED IN OTHER THAN DIV. 16)	C	CONDUIT
	EQUIPMENT ELECTRICAL CONNECTION	CB	CIRCUIT BREAKER
	ELECTRIC METER	CFCI	CONTRACTOR FURNISHED, CONTRACTOR INSTALLED
	LIGHTING CONTACTOR	CKT	CIRCUIT
	PHOTOCELL	CT	CURRENT TRANSFORMER
	TIME CLOCK	DISC	DISCONNECT
BASIC MATERIALS		EDF	ELECTRIC DRINKING FOUNTAIN
	BRANCH CIRCUIT WIRE & CONDUIT RUN CONCEALED IN WALL OR ABOVE CEILING, HOME RUN TO PANELBOARD. A NUMERAL, IF PRESENT AT ARROW HEAD, INDICATES CIRCUIT NUMBER. ANY BRANCH CIRCUIT SHOWN WITHOUT SLASH MARKS INDICATES A CONDUIT CONTAINING (3) #12 AWG CONDUCTORS (HOT, NEUTRAL & GROUND). SLASH MARKS, IF PRESENT, INDICATE THE FOLLOWING:	FACP	FIRE ALARM CONTROL PANEL
	HOT (ENERGIZED) CONDUCTOR	FLA	FULL LOAD AMPS
	NEUTRAL CONDUCTOR	FR	FRAME
	GROUND CONDUCTOR	FNVR	FULL VOLTAGE NON-REVERSING
	WIRE & CONDUIT RUN EXPOSED	G	GROUND
	WIRE & CONDUIT RUN IN/UNDER FLOOR OR BELOW GRADE	GFI	GROUND FAULT CIRCUIT-INTERRUPTER
	WIRE & CONDUIT TURNED UP	HOA	HAND-OFF-AUTO
	WIRE & CONDUIT TURNED DOWN	MCP	MOTOR CIRCUIT PROTECTOR
	BARE GROUND CONDUCTOR	MLO	MAIN LUGS ONLY
	JUNCTION BOX	NF	NON-FUSED
		OHE	OVERHEAD ELECTRIC
		PIV	POST INDICATOR VALVE
		RAP	REMOTE ANNUNCIATOR PANEL
		ROS	RIGID GALVANIZED STEEL
		SCWB	SPACE ONLY WITH BUS
		UNO	UNLESS NOTED OTHERWISE
		WP	WEATHERPROOF
		XFMR	TRANSFORMER
		3P	THREE POLE
		3PH	THREE PHASE
		4W	FOUR WIRE
		30/3	30 AMPERE, 3-POLE

NOTE 1: ALL SYMBOLS MAY NOT BE USED ON THIS PROJECT.
 NOTE 2: SYMBOLS FOR SECURITY AND COMMUNICATIONS EQUIPMENT REPRESENT ELECTRICAL ROUGH-IN ONLY. INSTALL (1)-3/4" FROM EACH ROUGH-IN TO NEAREST ACCESSIBLE CEILING SPACE UNLESS NOTED OTHERWISE.

GENERAL PROJECT NOTES:

- THE SCOPE OF THE ELECTRICAL WORK FOR THIS PROJECT IS NOT LIMITED TO THE REQUIREMENTS OF ANY ONE DRAWING, ANY PORTION OF THE DRAWINGS, ANY ONE SPECIFICATION DIVISION, OR ANY PORTION OF THE SPECIFICATIONS WHOSE MAIN THEME IS ELECTRICAL. THE SCOPE OF THE ELECTRICAL WORK FOR THIS PROJECT CONSISTS OF ALL ELECTRICAL WORK REQUIRED TO OBTAIN COMPLETE AND OPERATING SYSTEMS AND EQUIPMENT AS INDICATED ON OR AS CAN BE REASONABLE INFERRED FROM ALL DRAWINGS AND SPECIFICATIONS.
- REVIEW ALL DRAWINGS AND ADJUST ALL WORK TO CONFORM TO ALL CONDITIONS SHOWN THEREIN. DISCREPANCIES BETWEEN DIFFERENT DRAWINGS, OR BETWEEN DRAWINGS AND SPECIFICATIONS OR CODES AND REGULATIONS GOVERNING THE INSTALLATION SHALL BE BROUGHT TO THE ATTENTION OF THE OWNER'S REPRESENTATIVE PRIOR TO THE DATE OF BID OPENING.
- THE LOCATIONS OF EQUIPMENT, MOTORS, ETC., AS INDICATED ON THE DRAWINGS ARE APPROXIMATE ONLY. VERIFY ALL DIMENSIONS WITH THE APPROPRIATE EQUIPMENT INSTALLER BEFORE ROUGH-IN. WHERE CONDUIT, WIRING, SERVICE EQUIPMENT, LIGHTS, SWITCHES, OR OTHER ELECTRICAL EQUIPMENT INTERFERE WITH CONSTRUCTION; REMOVE, RELOCATE AND REARRANGE SUCH MATERIAL AND EQUIPMENT AS REQUIRED TO MAKE A COMPLETE AND SATISFACTORY INSTALLATION.
- PROPERLY SEAL ALL PENETRATIONS THRU FIRE AND/OR SMOKE RATED ASSEMBLIES. ALL MATERIAL USED TO SEAL SUCH PENETRATIONS SHALL BE UL LISTED FOR THE INTENDED USE. SEE ARCHITECTURAL PLANS FOR LOCATIONS OF ALL RATED ASSEMBLIES.
- RACEWAYS, CABLES, BOXES, AND FITTINGS SHALL BE SECURELY FASTENED TO THE BUILDING STRUCTURE. CEILING GRIDS AND ASSOCIATED SUPPORT WIRES SHALL NOT BE USED AS SUPPORTING MEANS.
- INSTALL SEISMIC SUPPORTS FOR ALL NEW ELECTRICAL SYSTEMS AS REQUIRED BY SBC 2006 IBC, ASCE 7, AND LOCAL AUTHORITY HAVING JURISDICTION. REFER TO STRUCTURAL DRAWINGS FOR SEISMIC CLASSIFICATIONS. SECURE THE SERVICES OF AN ENGINEER REGISTERED IN THE STATE OF TENNESSEE TO PROVIDE CALCULATIONS AND SEALED DRAWINGS OF ALL SEISMIC SUPPORT SYSTEMS.
- THESE DRAWINGS DO NOT INDICATE CONTROL WIRING FOR DIVISION 15 SYSTEMS. THE DIVISION 16 CONTRACTOR IS RESPONSIBLE FOR COORDINATING WITH THE GENERAL CONTRACTOR PRIOR TO BID TO OBTAIN AN AGREEMENT ON THE PROCUREMENT AND INSTALLATION OF ALL CONTROL WIRING, CONDUIT, AND CONTROL RELATED DEVICES REQUIRED FOR THE PROPER OPERATION OF ALL DIVISION 15 EQUIPMENT.
- THESE DRAWINGS ARE DIAGRAMMATIC ONLY AND SHALL NOT BE USED FOR SCALING PURPOSES.
- THESE DRAWINGS DO NOT CONSTITUTE SHOP DRAWINGS. DIVISION 16 CONTRACTOR(S) SHALL PREPARE SHOP DRAWINGS USING MANUFACTURER'S PUBLISHED DIMENSIONS FOR THE ACTUAL EQUIPMENT PURCHASED FOR THIS PROJECT.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING THE LOCATIONS OF ALL ELECTRICAL EQUIPMENT WITH EQUIPMENT OF OTHER TRADES. THE CONTRACTOR SHALL REVIEW THE CIVIL, STRUCTURAL, MECHANICAL, PLUMBING, FIRE PROTECTION AND ARCHITECTURAL DRAWINGS AND DETERMINE AREAS WHERE INTERFERENCE MAY OCCUR. ALL AREAS OF INTERFERENCE SHALL BE PROMPTLY BROUGHT TO THE ATTENTION OF THE DESIGN PROFESSIONAL.
- COORDINATE ALL WIRING REQUIREMENTS WITH GENERATOR MANUFACTURER AND PROVIDE ALL NECESSARY WIRING AND RACEWAYS.

EXISTING PANEL "RPH"											
LOCATION: ELEC. RM			MAIN BKR: XXXXX			CONN. LOAD: 132.96 KVA			FEED: XXXXXX		
VOLTAGE: 480Y/277			SYSTEM: 3PH, 4W			M.L.O. [X]			GROUND BUS: [X]		
MOUNTING: SURFACE-UNISTRUT FRAME			BUS RATING: 225A								
LOAD SERVED	BKR	CKT	DMD	L1	L2	L3	DMD	CKT	BKR	LOAD SERVED	
RADIATOR GEN #1	80	1	11080				2	80		RADIATOR GEN #3	
	3	5	11080				6	3			
RADIATOR GEN #2	80	7	11080				8	80		RADIATOR GEN #4	
	3	9	11080				10	3			
	3	11	11080				12	3			
SPACE	-	13					14	-		SPACE	
SPACE	-	15					16	-		SPACE	
SPACE	-	17					18	-		SPACE	
SPACE	-	19					20	-		SPACE	
SPACE	-	21					22	-		SPACE	
SPACE	-	23					24	-		SPACE	
SPACE	-	25					26	-		SPACE	
SPACE	-	27					28	-		SPACE	
SPACE	-	29					30	-		SPACE	
SPACE	-	31					32	-		SPACE	
SPACE	-	33					34	-		SPACE	
SPACE	-	35					36	-		SPACE	
SPACE	-	37					38	-		SPACE	
SPACE	-	39					40	-		SPACE	
SPACE	-	41					42	-		SPACE	
INTERRUPT RATING: 65,000 AIC			44,320 44,320 44,320			FROM: SEE RISER DIAGRAM					
LOADS (N VA)	CONNECTED	DEMAND FACTOR	MINIMUM FEEDER	REMAINING CONTINUOUS LOADS		0		1.25	0		
LIGHTING	0	1.25	0	REMAINING NON-CONTINUOUS LOADS		0		1.0	0		
RECEPTS TO 10 KVA	0	1.0	0	PANEL/XFMR LOADS		0		1.0	0		
RECEPTS REMAINING	0	0.5	0	TOTAL CONNECTED LOAD		132.96 KVA		160	AMPS		
TOTAL MOTORS	132960	1.0	132960	MIN. FEEDER/PANEL CAP.		132.96 KVA		160	AMPS		
LARGEST MOTOR	0	0.25	0	OVERALL DEMAND FACTOR		1.00					
SPACE HEATING	0	1.0	0								
KITCHEN EQUIP.	0	.65	0								

EXISTING SWITCHBOARD "EGSB"											
LOCATION: MECHANICAL ROOM			MAIN BKR: XXXXA			CONN. LOAD: 0 KVA			FEED: XXXXX		
VOLTAGE: 480Y/277			SYSTEM: 3PH, 4W			M.L.O. [X]			GROUND BUS: [X]		
MOUNTING: FLOOR MOUNT			BUS RATING: 4000A								
LOAD SERVED	BKR	CKT	DMD	L1	L2	L3	DMD	CKT	BKR	LOAD SERVED	
GENERATOR	1600	1					2	1600		GENERATOR *	
GENERATOR *	200	3					4	200		GENERATOR *	
	3	3					6	3			
	3	5					6	3			
INTERRUPT RATING: 100,000 AIC			0 0 0			FROM: SEE RISER DIAGRAM					
SUITABLE AS SERVICE ENTRANCE			BOND NEUTRAL BUS TO GROUND								
LOADS (N KVA)	CONNECTED	DEMAND FACTOR	MINIMUM FEEDER	REMAINING CONTINUOUS LOADS		0		1.25	0		
LIGHTING	0	1.25	0	REMAINING NON-CONTINUOUS LOADS		0		1.0	0		
RECEPTS TO 10 KVA	0	1.0	0	PANEL/XFMR LOADS		0		1.0	0		
RECEPTS REMAINING	0	0.5	0	TOTAL CONNECTED LOAD		0 KVA		0	AMPS		
TOTAL MOTORS	0	1.0	0	MIN. FEEDER/PANEL CAP.		0 KVA		0	AMPS		
LARGEST MOTOR	0	0.25	0	OVERALL DEMAND FACTOR		1					
SPACE HEATING	0	1.0	0								
KITCHEN EQUIP.	0	.65	0								

* BREAKER SHALL BE A 1600AMP FRAME W/1200AMP TRIP. PROVIDE A 1600AMP TRIP UNIT FOR FUTURE PHASE OF PROJECT.
 NOTE: SWITCHBOARD SHALL BE ENGINEERED SUCH THAT THE MAIN LUGS ARE IN THE SAME LOCATION AS THE EXISTING TO ALLOW RECONNECTION OF THE ADJACENT SWITCHBOARD SECTION.

Project Phasing

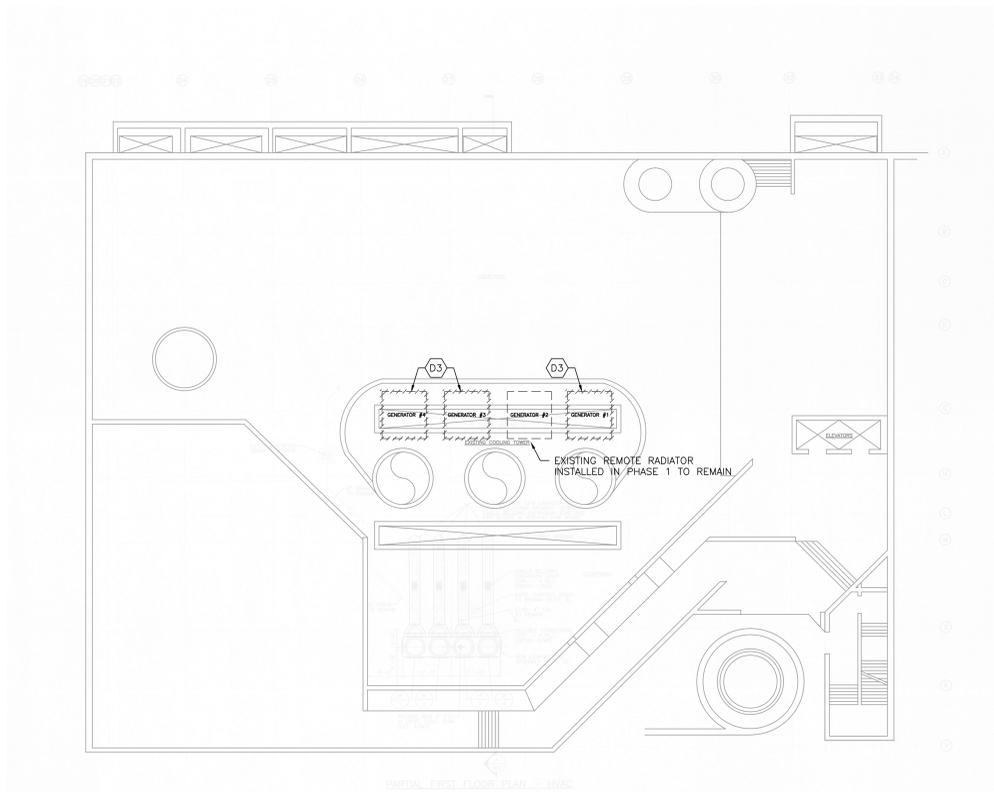
Phase 1
 REMOVAL AND REPLACEMENT OF GENERATOR #2

Phase 2
 REMOVAL AND REPLACEMENT OF GENERATOR #4

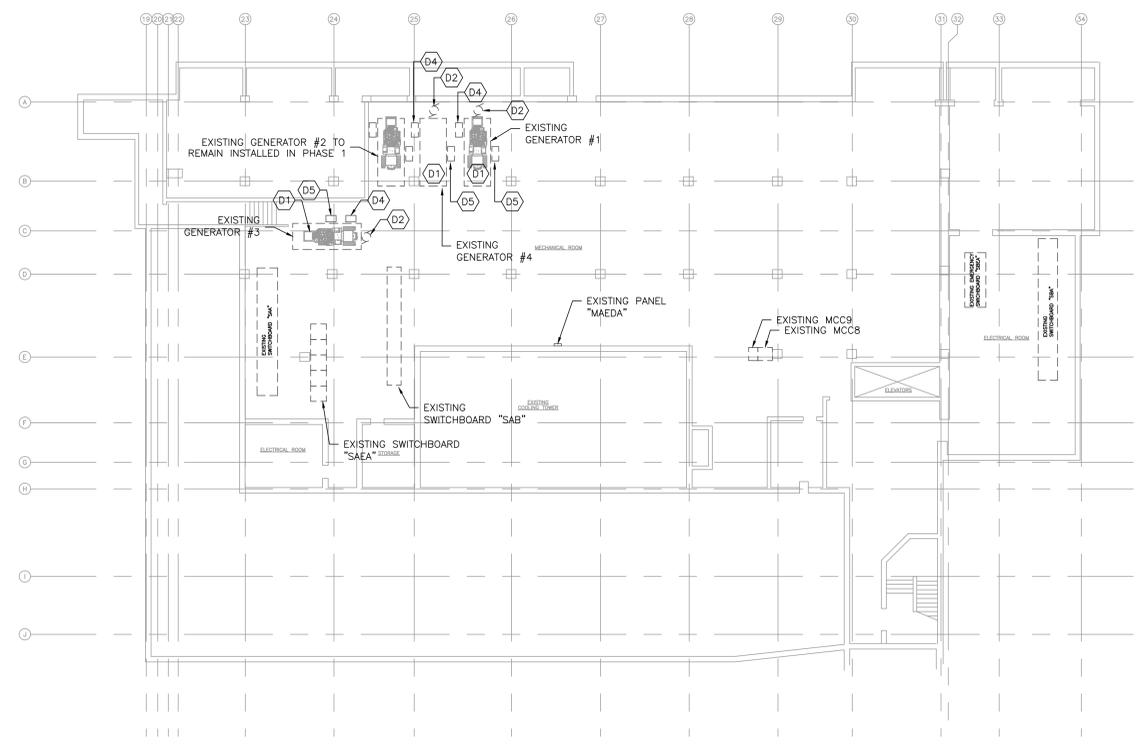
REMOVAL AND REPLACEMENT OF GENERATOR #1
 REMOVAL OF GENERATOR #3

REFER TO THE ELECTRICAL DRAWINGS AND SPECIFICATIONS FOR ADDITIONAL INFORMATION.

- DEMOLITION KEY NOTES:**
- (D1) EXISTING EMERGENCY GENERATOR TO BE REMOVED AS FOLLOWS:
 PHASE 1 (FALL 2013)-GENERATOR #2
 PHASE 2 (SUMMER 2014)-GENERATOR #4
 PHASE 3 (SUMMER 2015)-GENERATOR #1 & #3
 GENERATOR #3 WILL NOT BE REPLACED.
 - (D2) EXISTING COOLANT PUMP TO BE REMOVED. REMOVE EXISTING WIRE, CONDUIT & DISCONNECTS BACK TO SOURCE. LABEL SWITCH/STARTER IN PANEL/MCC AS "SPARE".
 - (D3) EXISTING GENERATOR REMOTE RADIATOR TO BE REMOVED AS FOLLOWS:
 PHASE 1 GENERATOR #2
 PHASE 2 GENERATOR #4
 GENERATOR #1 & #3.
 - (D4) EXISTING GENERATOR DAY TANK TO BE REMOVED. DISCONNECT EXISTING CONTROLS. DAY TANKS SHALL BE REMOVED AS FOLLOWS:
 PHASE 1 (FALL 2013)-GENERATOR #2
 PHASE 2 (SUMMER 2014)-GENERATOR #4
 PHASE 3 (SUMMER 2015)-GENERATOR #1 & #3
 - (D5) EXISTING GENERATOR BATTERY RACK TO BE REMOVED. GRIND SUPPORT LEGS FLUSH WITH FLOOR. PROPERLY DISPOSE OF BATTERIES. BATTERIES/BATTERY STANDS SHALL BE REMOVED AS FOLLOWS:
 PHASE 1 (FALL 2013)-GENERATOR #2
 PHASE 2 (SUMMER 2014)-GENERATOR #4
 PHASE 3 (SUMMER 2015)-GENERATOR #1 & #3



A CJC-COURTYARD-ELECTRICAL DEMOLITION
 1/16" = 1'-0"



B BASEMENT FLOOR PLAN - ELECTRICAL DEMOLITION
 1/16" = 1'-0"

PROJECT TITLE: SHELBY COUNTY JUSTICE CENTER GENERATOR REPLACEMENT PHASE 2	
PROJECT NO: CE13037	DRAWN BY: GDW
DATE: 07.07.2014	DESIGNED BY: DEC
SCALE: AS NOTED	CHECKED BY: DEC
SHEET TITLE: COURTYARD/BASEMENT FLOORPLAN DEMOLITION	SHEET NUMBER: E2

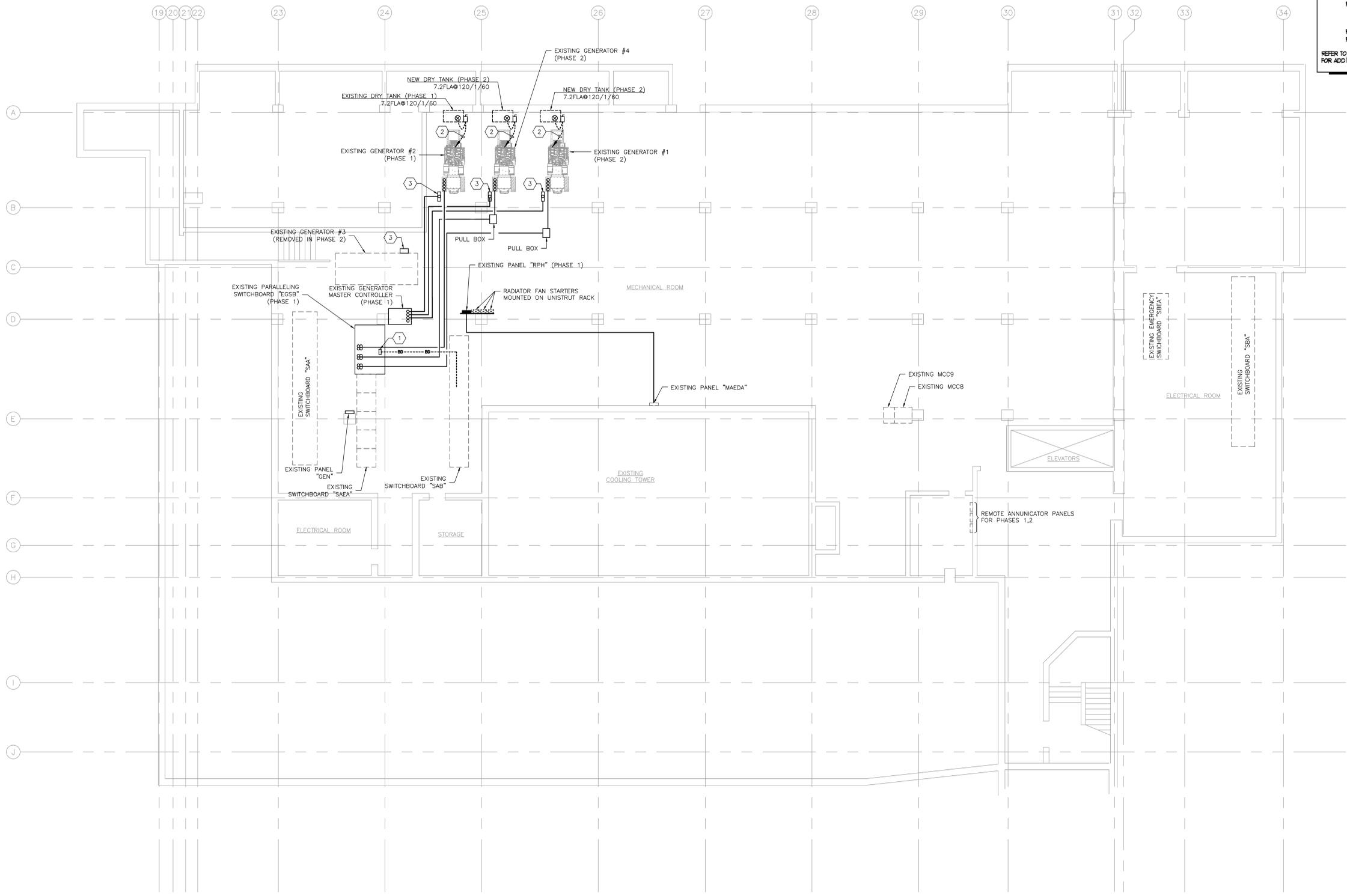
Project Phasing

Phase 1
 REMOVAL AND REPLACEMENT OF GENERATOR #2
 REMOVAL AND REPLACEMENT OF GENERATOR #4

Phase 2
 REMOVAL AND REPLACEMENT OF GENERATOR #1
 REMOVAL OF GENERATOR #3

REFER TO THE ELECTRICAL DRAWINGS AND SPECIFICATIONS FOR ADDITIONAL INFORMATION.

REVISIONS	DESCRIPTION	DATE	SEAL



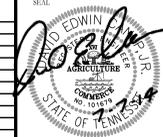
- KEY NOTES:**
- RE-TERMINATE EXISTING BUSDUCT AT NEW SWITCHBOARD "EGSB".
 - TO NEW 20/1 BREAKER IN EXISTING PANEL "GEN".
 - EXISTING GENERATOR CONTROL PANELS INSTALLED ON EXISTING GENERATORS (#1, #3, #4) IN PHASE 1 TO ALLOW ALL GENERATORS TO COMMUNICATE WITH THE NEW MASTER CONTROLLER.

A BASEMENT FLOOR PLAN - POWER
 1/8" = 1'-0"

PROJECT TITLE: SHELBY COUNTY JUSTICE CENTER GENERATOR REPLACEMENT PHASE 2	
PROJECT NO: CE13037	DRAWN BY: GDW
DATE: 07.07.2014	DESIGNED BY: DEC
SCALE: AS NOTED	CHECKED BY: DEC
SHEET TITLE: BASEMENT FLOOR PLAN POWER	SHEET NUMBER: E3

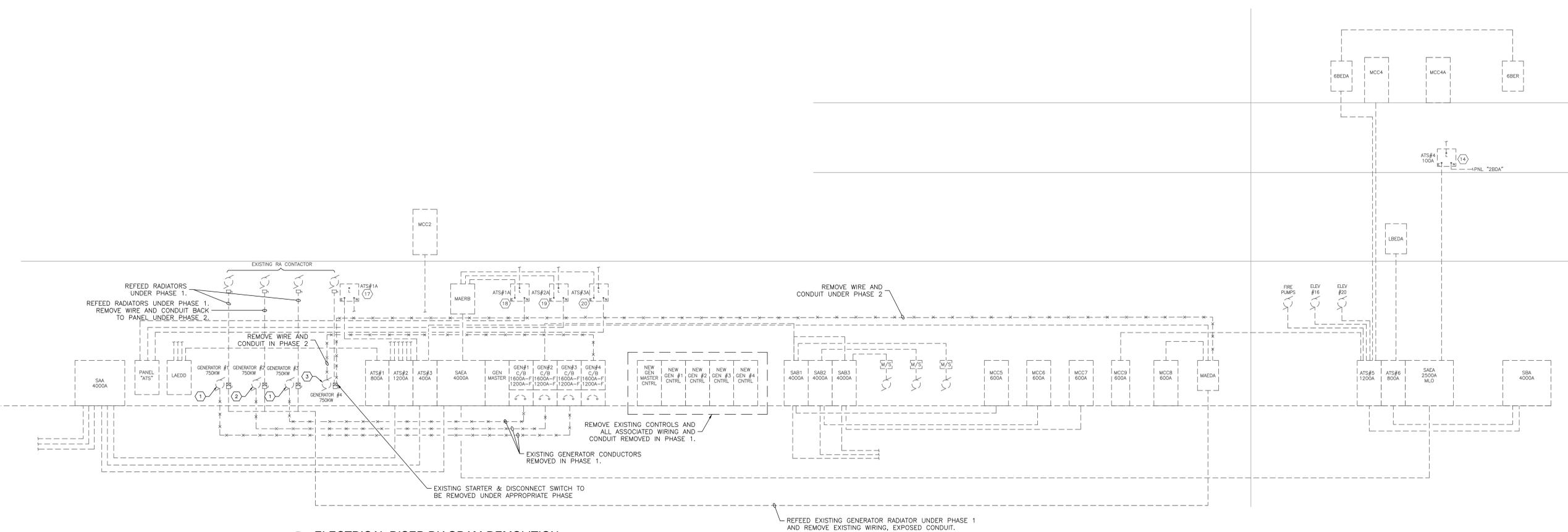
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REVISIONS	DESCRIPTION	DATE

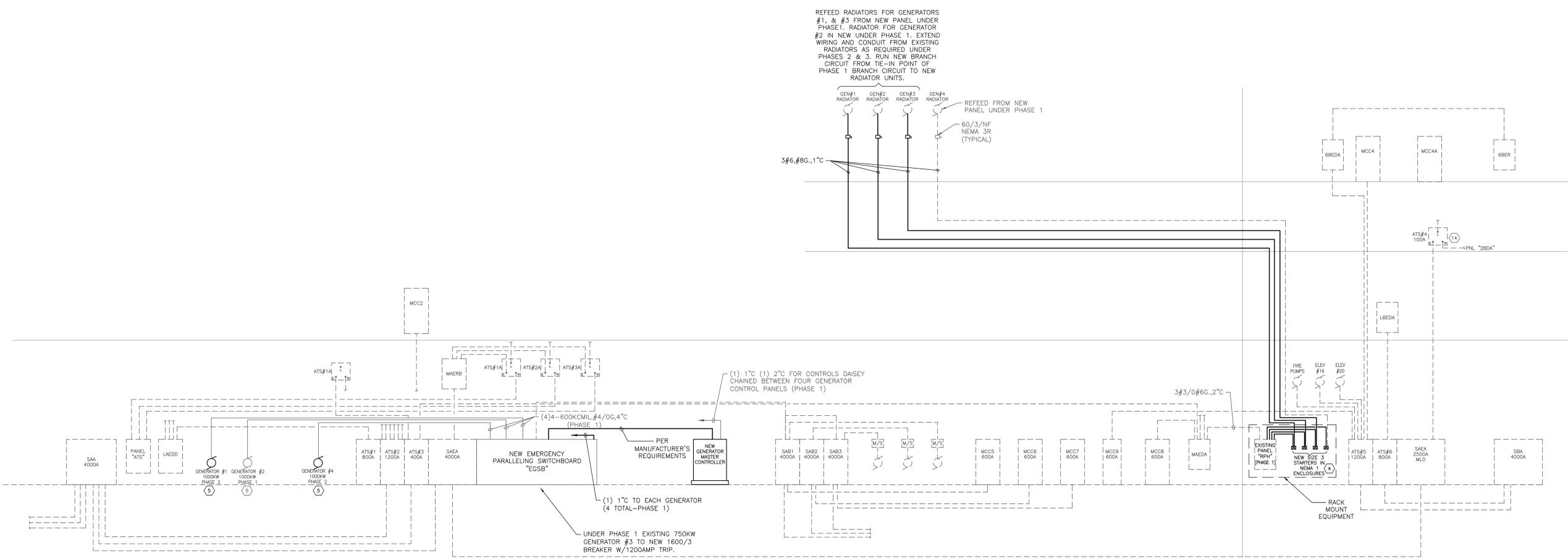


- KEY NOTES:**
- REMOVE IN PHASE 2.
 - REMOVE IN PHASE 1.
 - REMOVE IN PHASE 2.
 - INTERLOCK RADIATORS W/GENERATORS PER MANUFACTURER'S RECOMMENDATIONS.
 - PROVIDE CONTROL WIRING BETWEEN GENERATORS AND CONTROLS AS REQUIRED BY MANUFACTURER.

- NOTES:**
- PROVIDE A CABINET ON WALL WITH (2) 1600AMP TRIP UNIT FOR FUTURE PHASES.



A ELECTRICAL RISER DIAGRAM-DEMOLITION
NTS



B COURT BUILDING RISER DIAGRAM-NEW WORK
NTS

PROJECT TITLE: SHELBY COUNTY JUSTICE CENTER GENERATOR REPLACEMENT PHASE 2	
PROJECT NO: CE13037	DRAWN BY: GDW
DATE: 07.07.2014	DESIGNED BY: DEC
SCALE: AS NOTED	CHECKED BY: DEC
SHEET TITLE: ELECTRICAL ONE-LINE DIAGRAMS	SHEET NUMBER: E5