

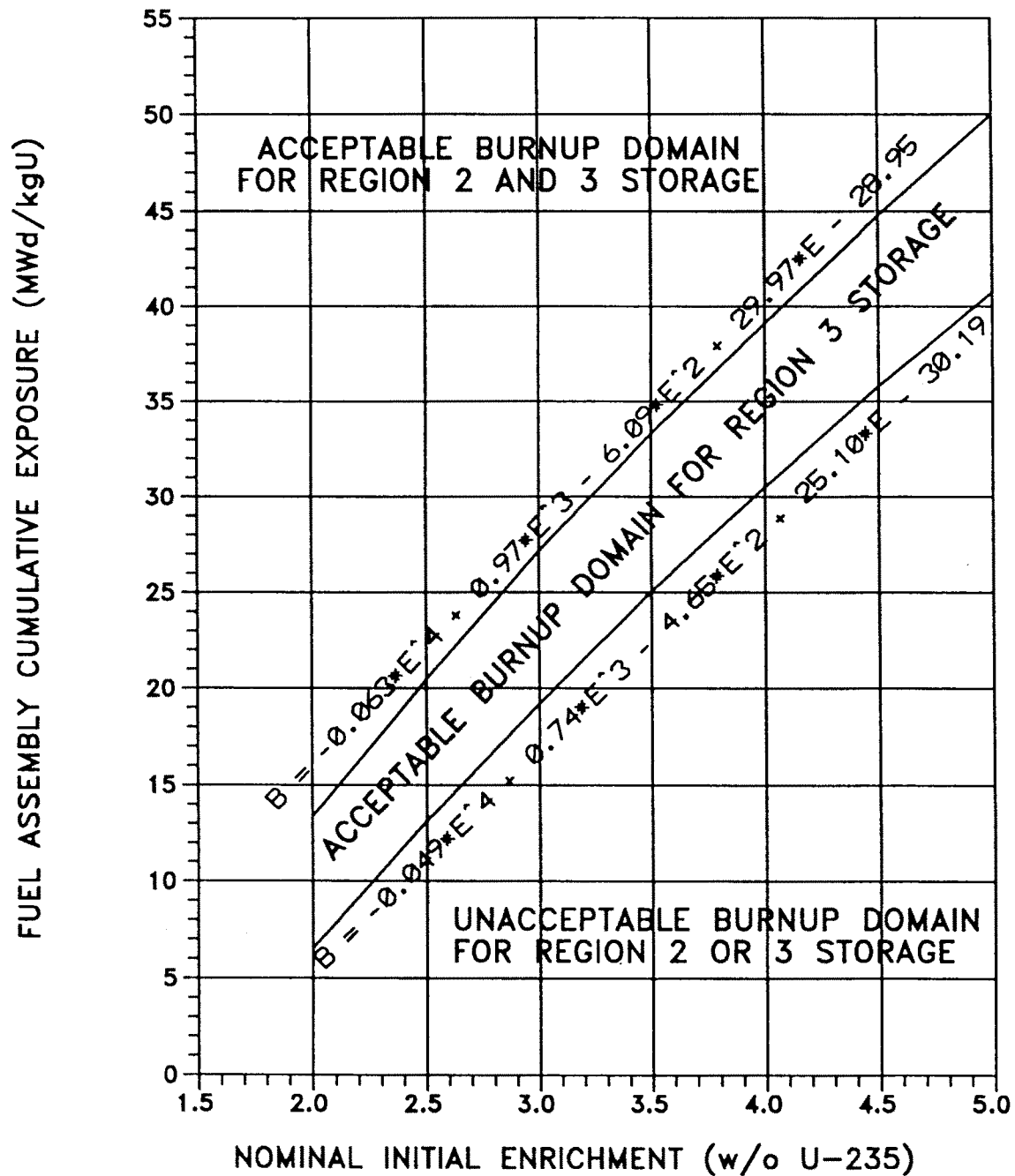
Region 1	Region 2	Region 3	Region 3	Reg. 3
Region 2	Region 2	Region 3	Region 3	Reg. 3
Region 1	Region 2	Region 3	Region 3	Reg. 3
Region 2	Region 2	Region 2	Region 2	Reg. 2
Region 1	Region 2	Region 1	Region 2	Reg. 1
Region 2	Region 2	Region 1	Region 2	Reg. 1
Region 1	Region 2	Region 2	Region 2	Reg. 2
Region 2	Region 2	Region 3	Region 3	Reg. 3
Region 1	Region 2	Region 3	Region 3	Reg. 3
Region 2	Region 2	Region 3	Region 3	Reg. 3

Figure 9.1A-1 Representation of the KENO5a Reference MZTR Calculational Model

Region 1	Empty	Region 1	Empty	Reg- 1
Empty	Region 1	Empty	Region 1	Emp ty
Region 1	Empty	Region 1	Empty	Reg- 1
Empty	Region 1	Empty	Region 1	Emp ty
Region 1	Empty	Region 1	Empty	Reg- 1

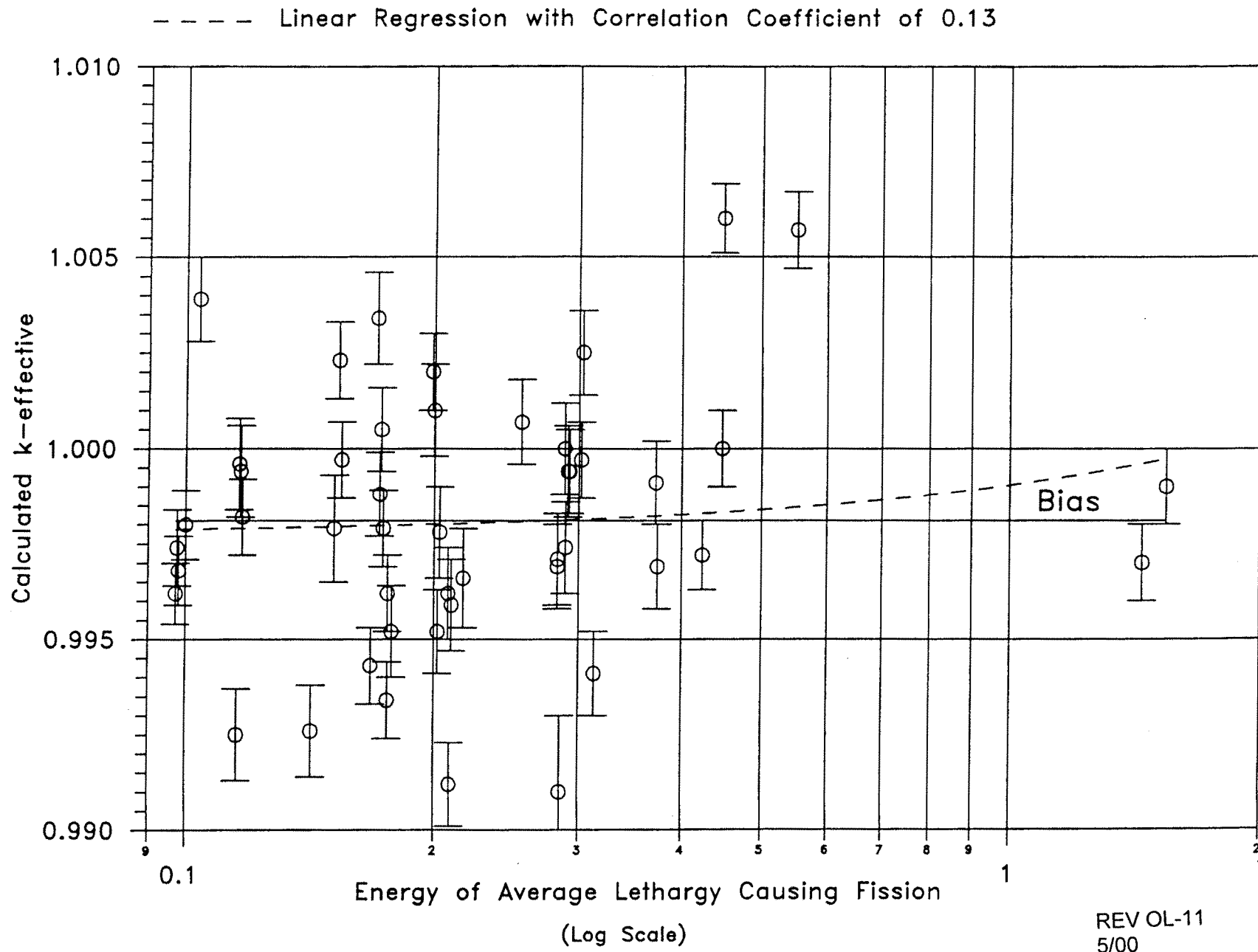
Figure 9.1A-2 Representation of the KENO5a Reference Checkerboard Computational Model

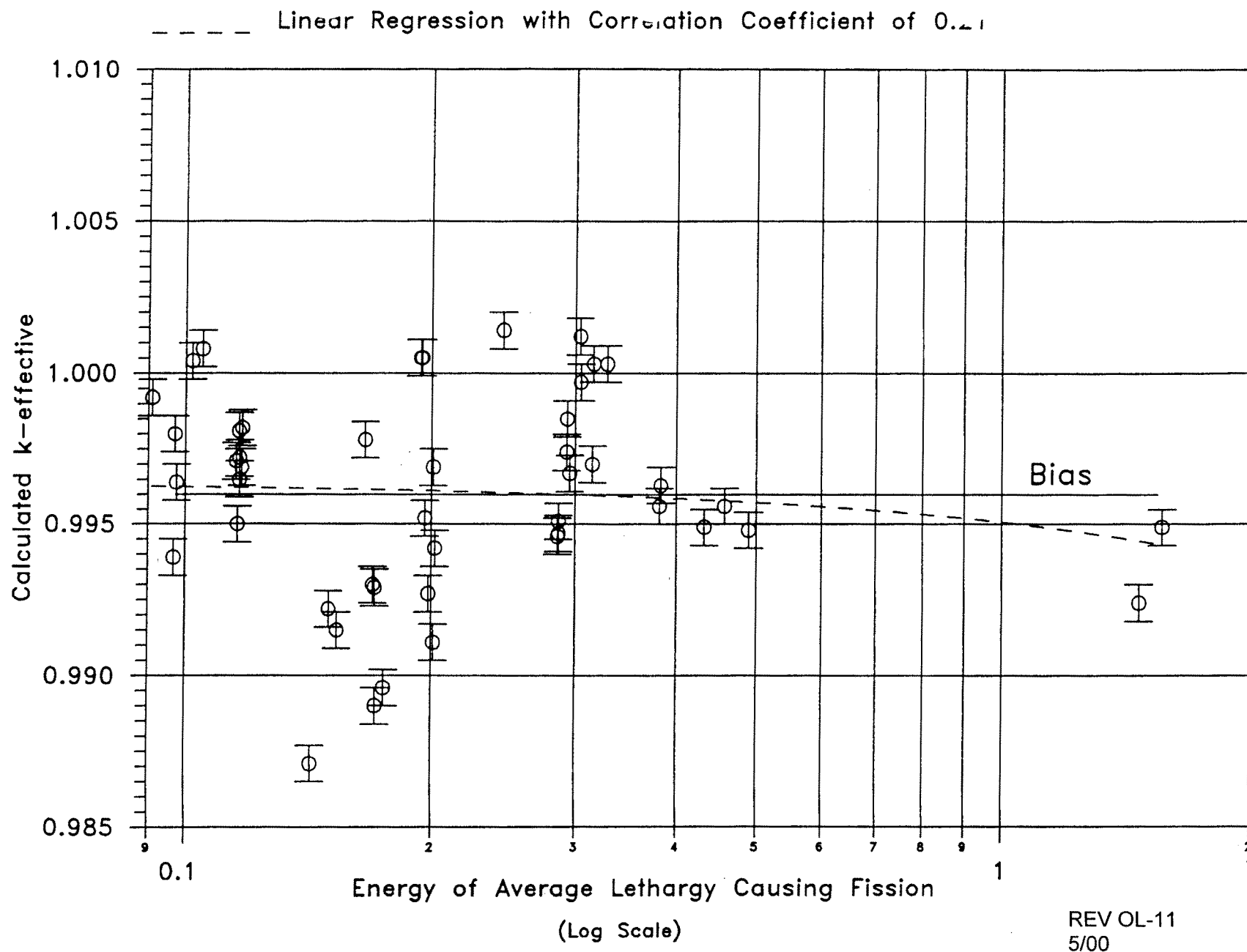
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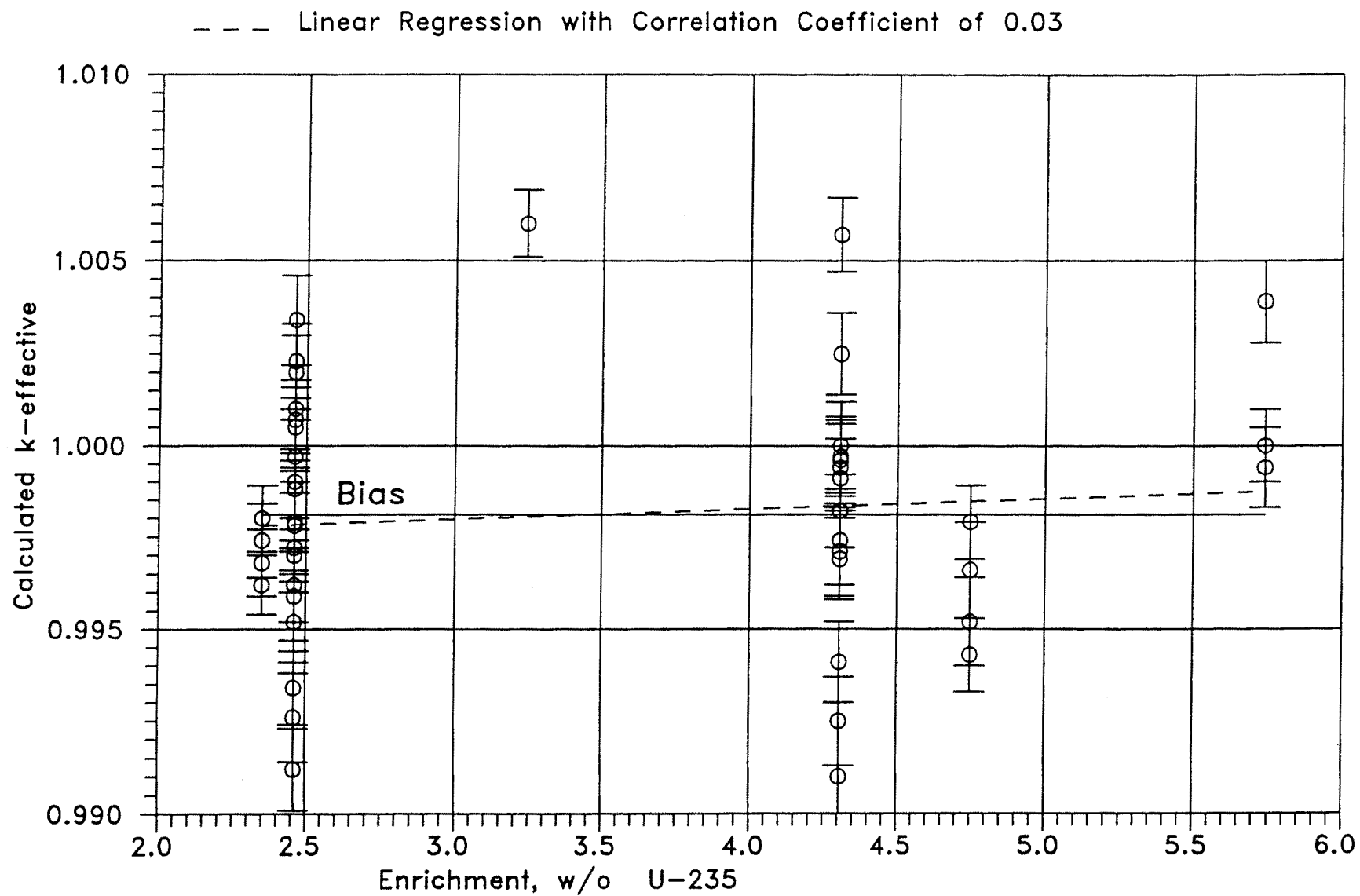


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FIGURE 9.1A-3 Minimum Required Fuel Assembly Burnup as a Function of Nominal Initial Enrichment to Permit Storage in Regions 2 and 3 (Fuel assemblies with enrichments less than 2.0 wt% ²³⁵U will conservatively be required to meet the burnup requirements of 2.0 wt% ²³⁵U assemblies).

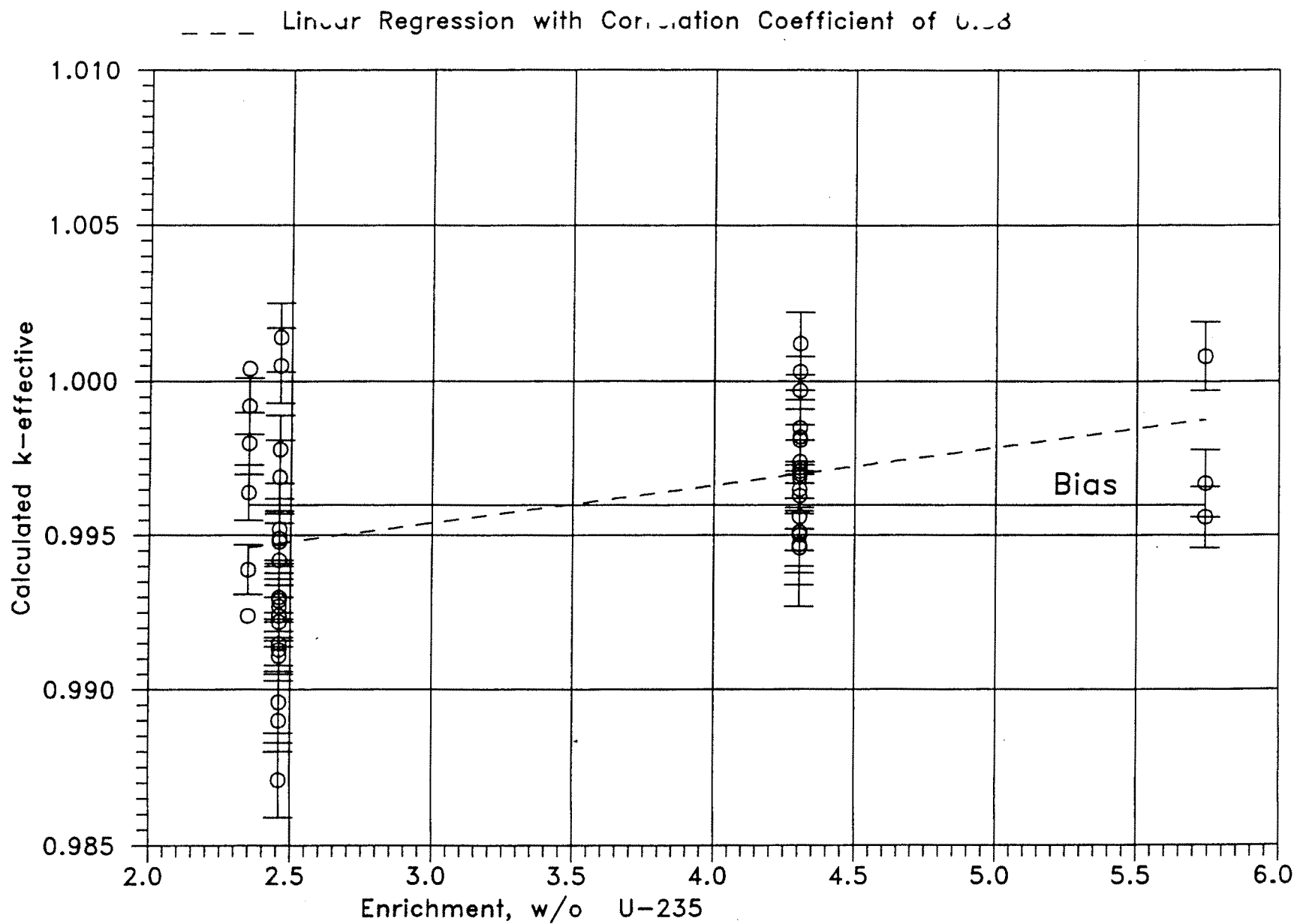






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FIGURE 9.1A-6 MCNP CALCULATED k-eff VALUES
AT VARIOUS U-235 ENRICHMENTS



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FIGURE 9.1A-7 KENO CALCULATED k -eff VALUES
AT VARIOUS U-235 ENRICHMENTS

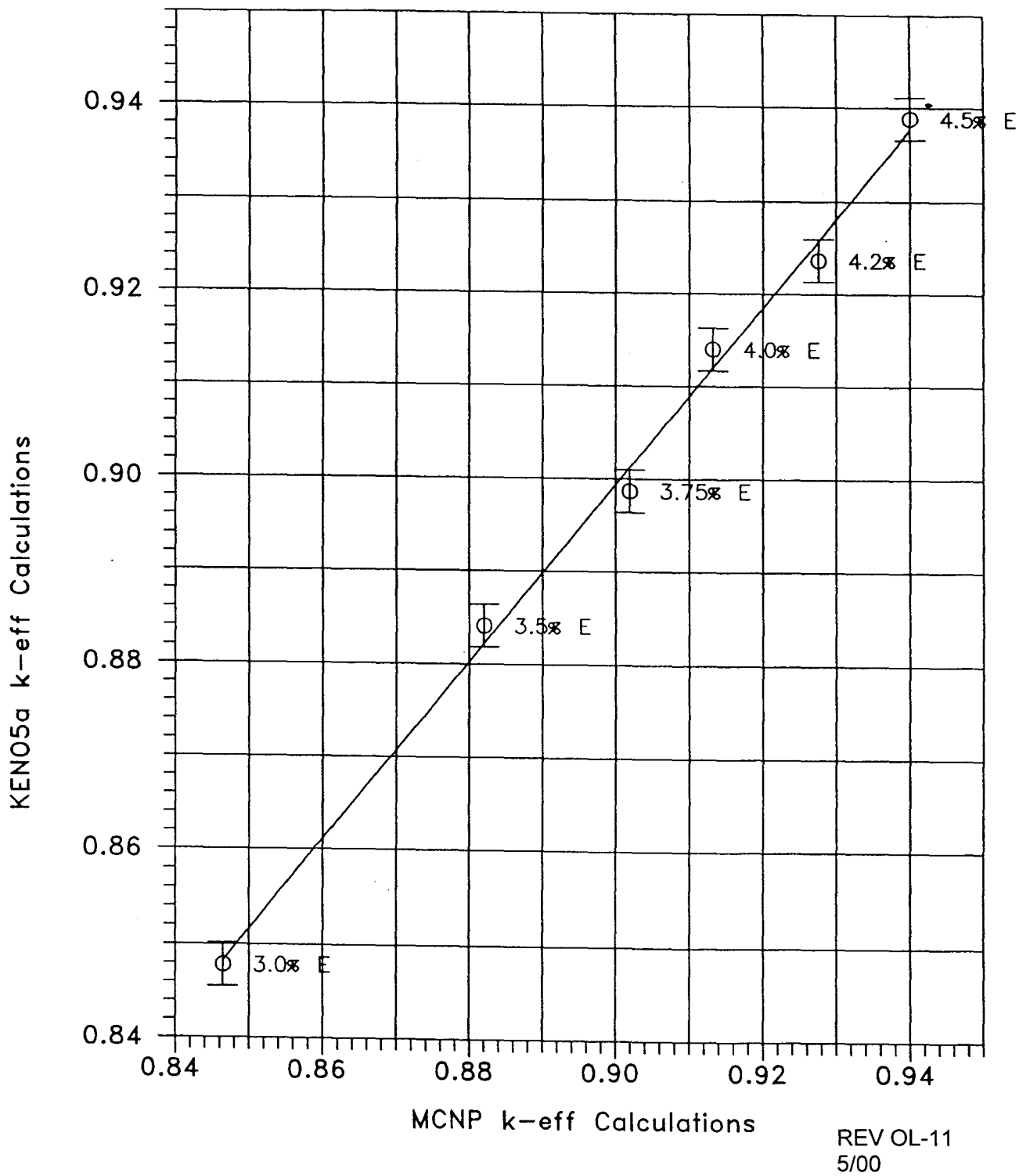


FIGURE 9.1A-8 COMPARISON OF MCNP AND KENO5A CALCULATIONS FOR VARIOUS FUEL ENRICHMENTS

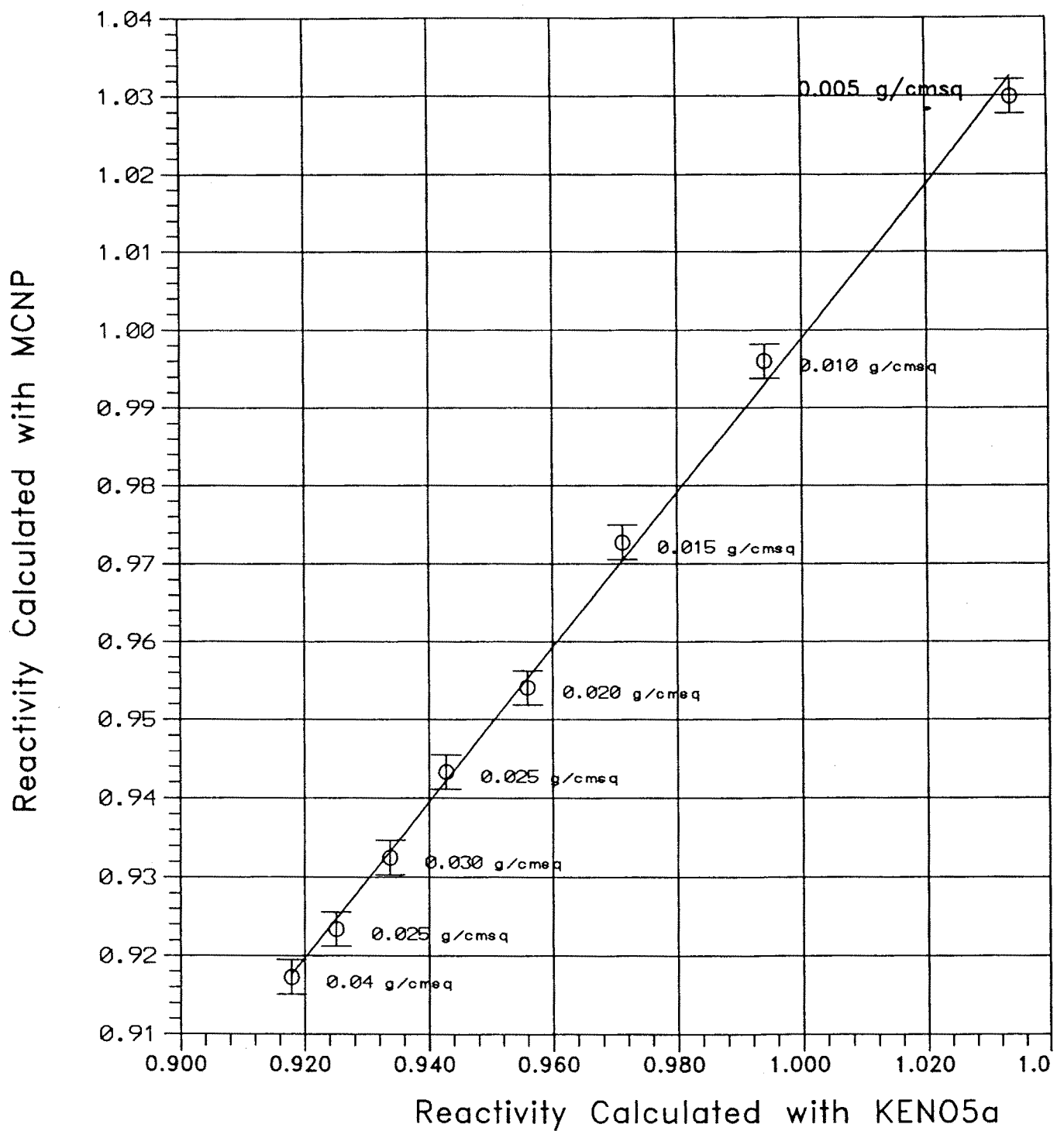


FIGURE 9.1A-9 COMPARISON OF MCNP AND KENO5a
CALCULATIONS FOR VARIOUS BORON-10
AREAL DENSITIES

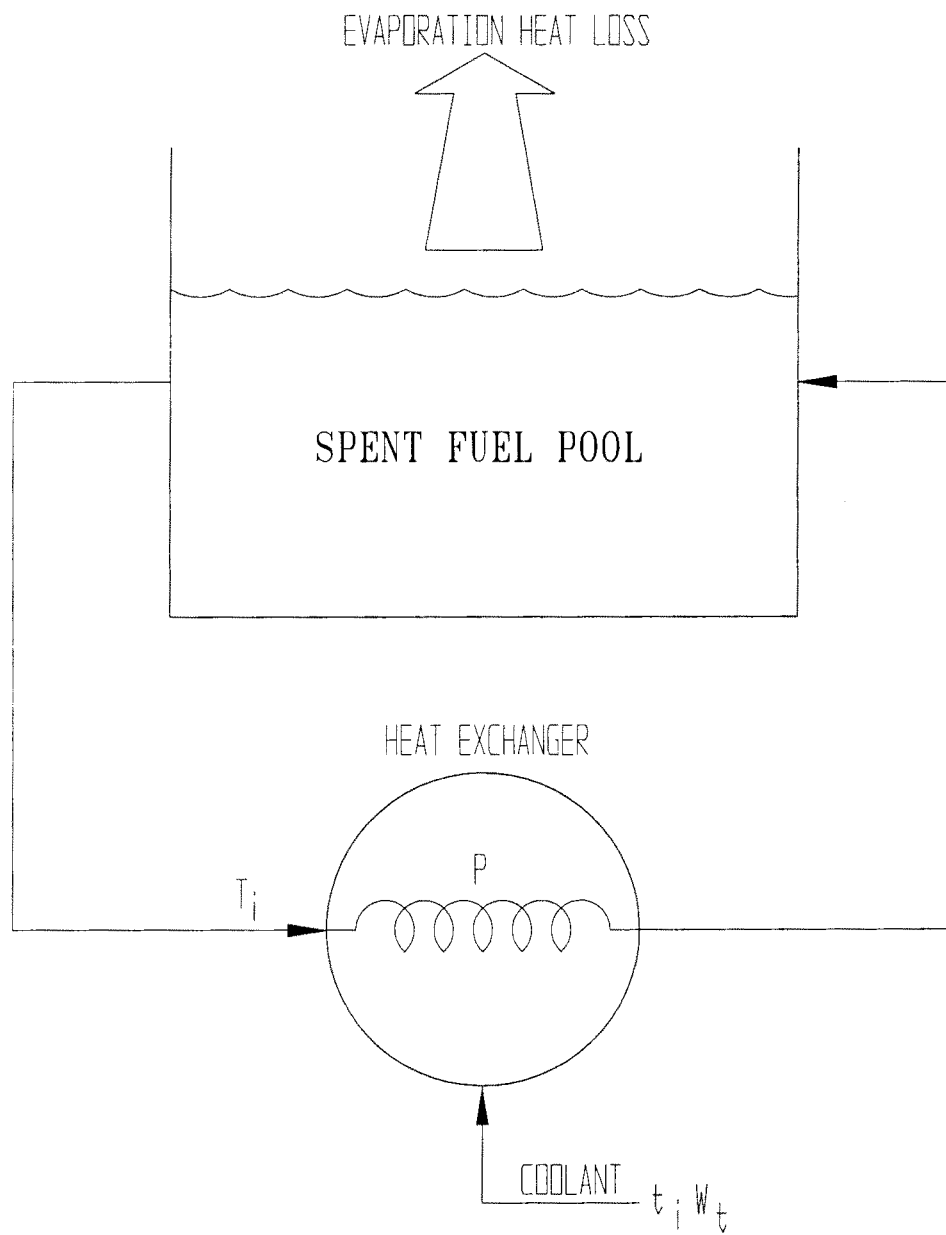
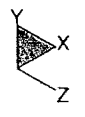
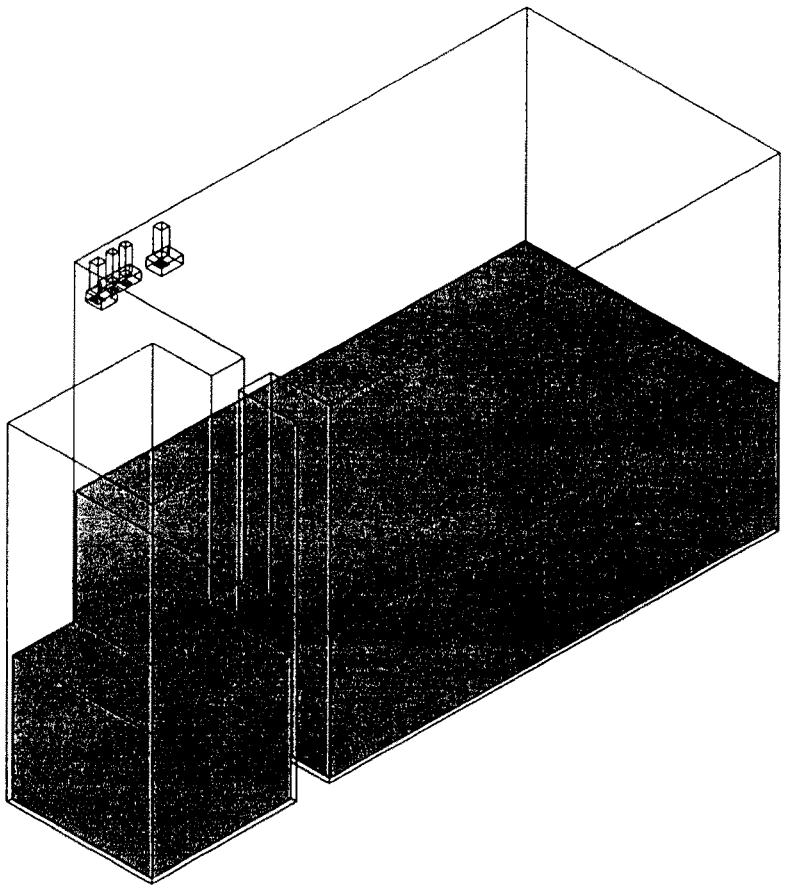


FIGURE 9.1A-10; SPENT FUEL COOLING MODEL

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CALLAWAY 3-D CFD MODEL

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FIGURE 9.1A-11

Isometric View of Spent Fuel Pool CFD Model

Figure 9.1A-12 Callaway Elevation 2007'
Spent Fuel Pool Time History Accelerogram
X Direction Bounding OBE Spectra (2% Damping)

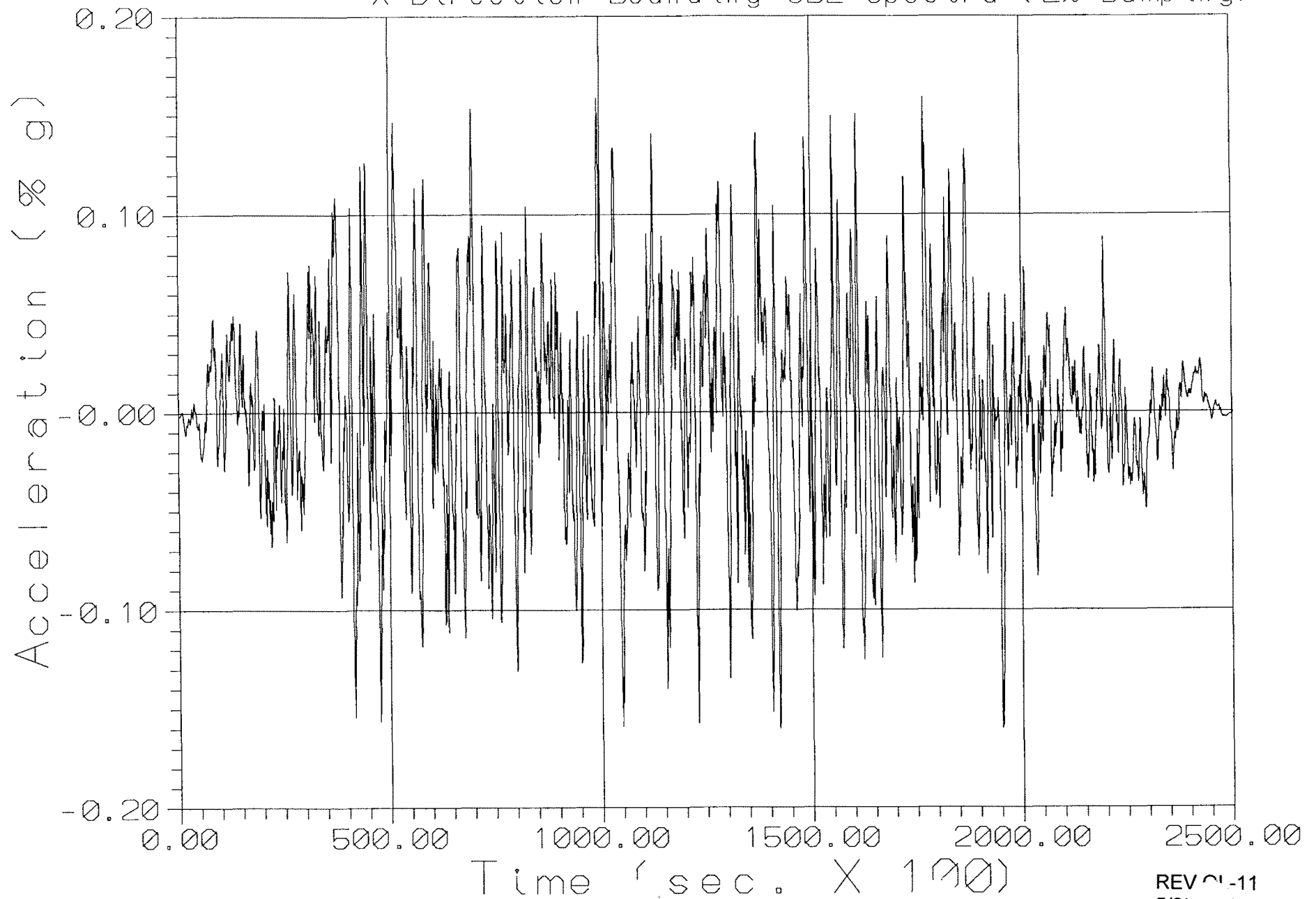


Figure 9.1A-13 Callaway Elevation 2007'
Spent Fuel Pool Time History Accelerogram
Y Direction Bounding OBE Spectra (2% Damping)

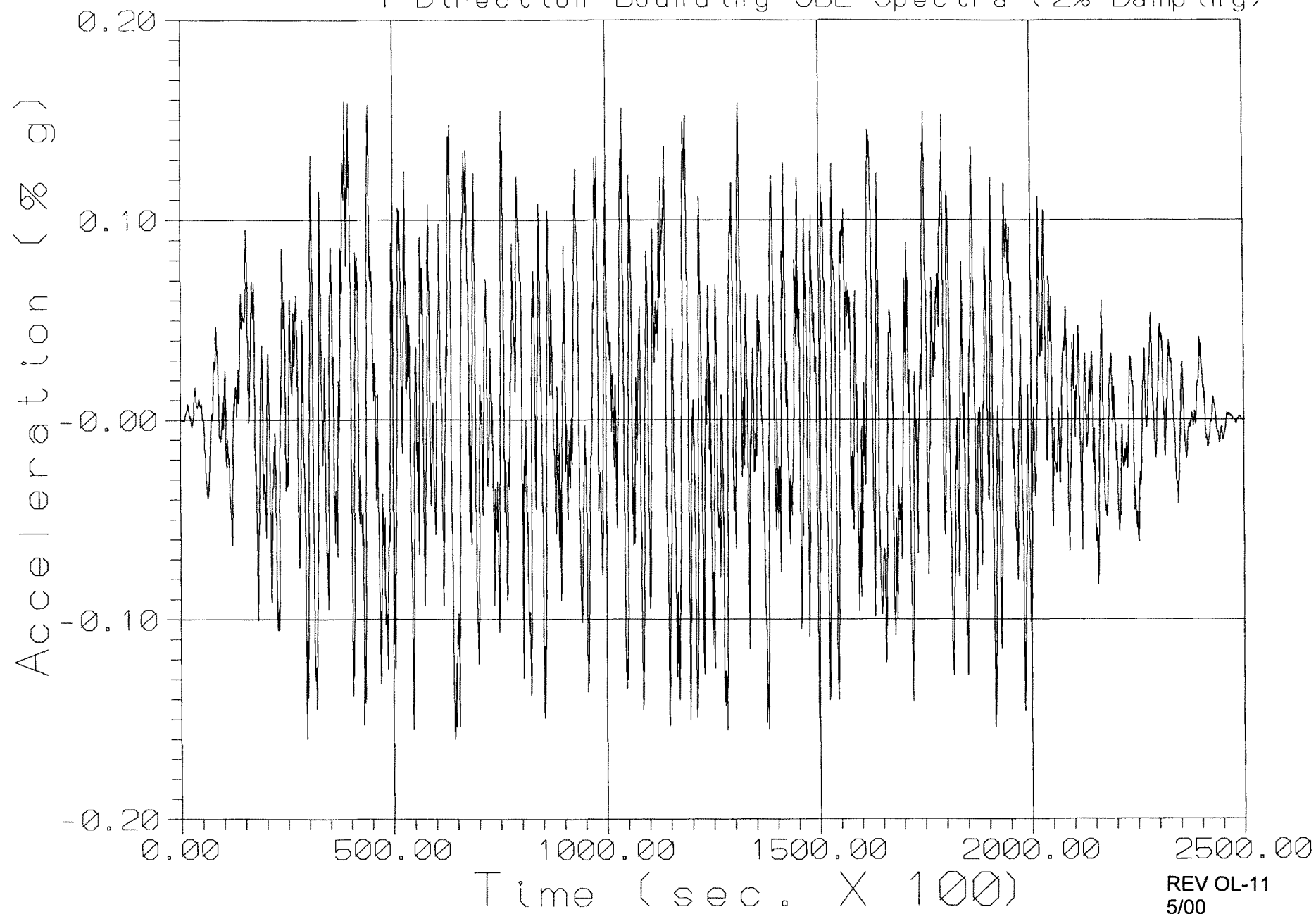


Figure 9.1A-14 Callaway Elevation 2007'
Spent Fuel Pool Time History Accelerogram
Z Direction Bounding OBE Spectra (2% Damping)

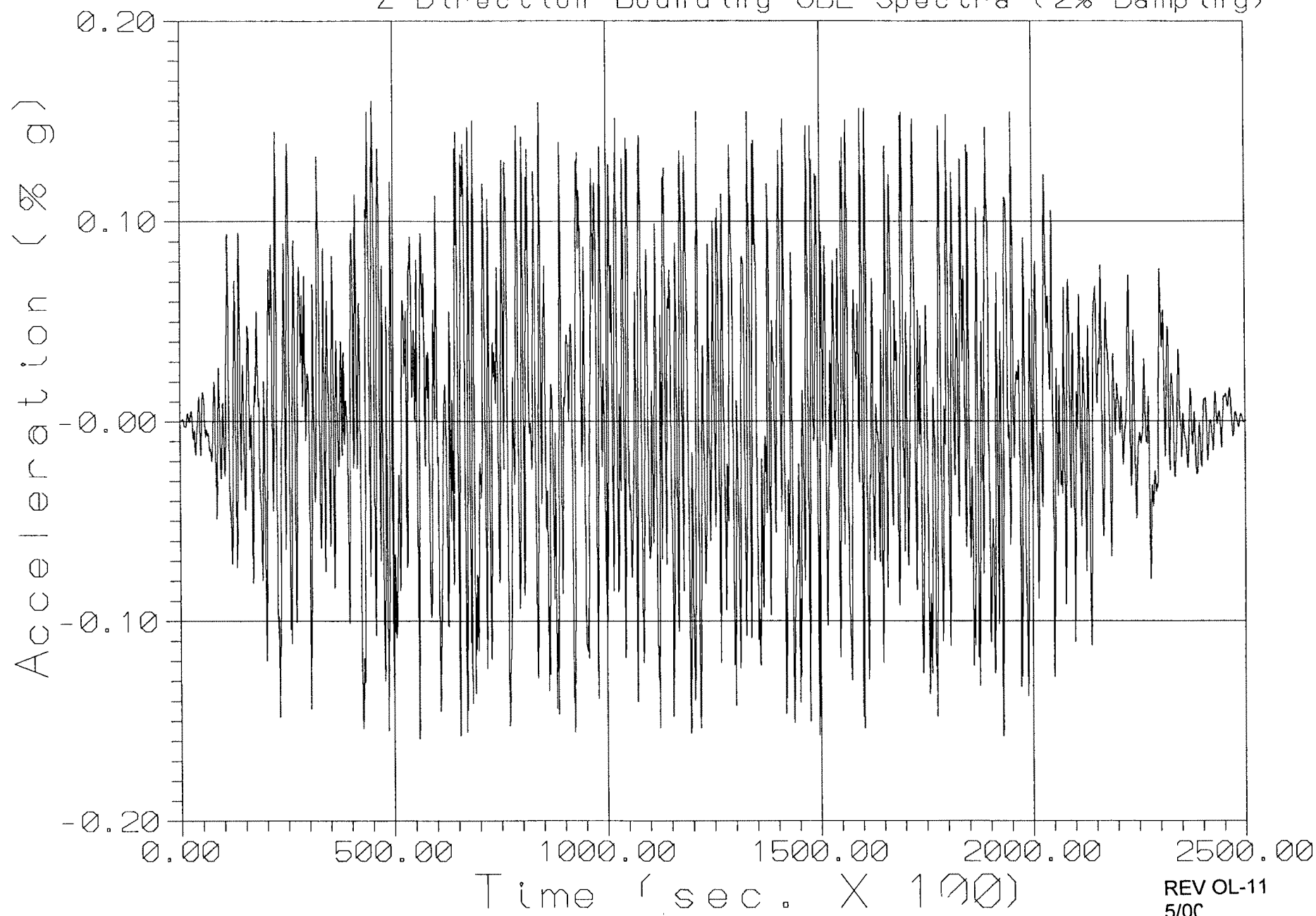


Figure 9.1A-15 Callaway Elevation 2007'
Spent Fuel Pool Time History Accelerogram
X Direction Bounding DBE Spectra (4% Damping)

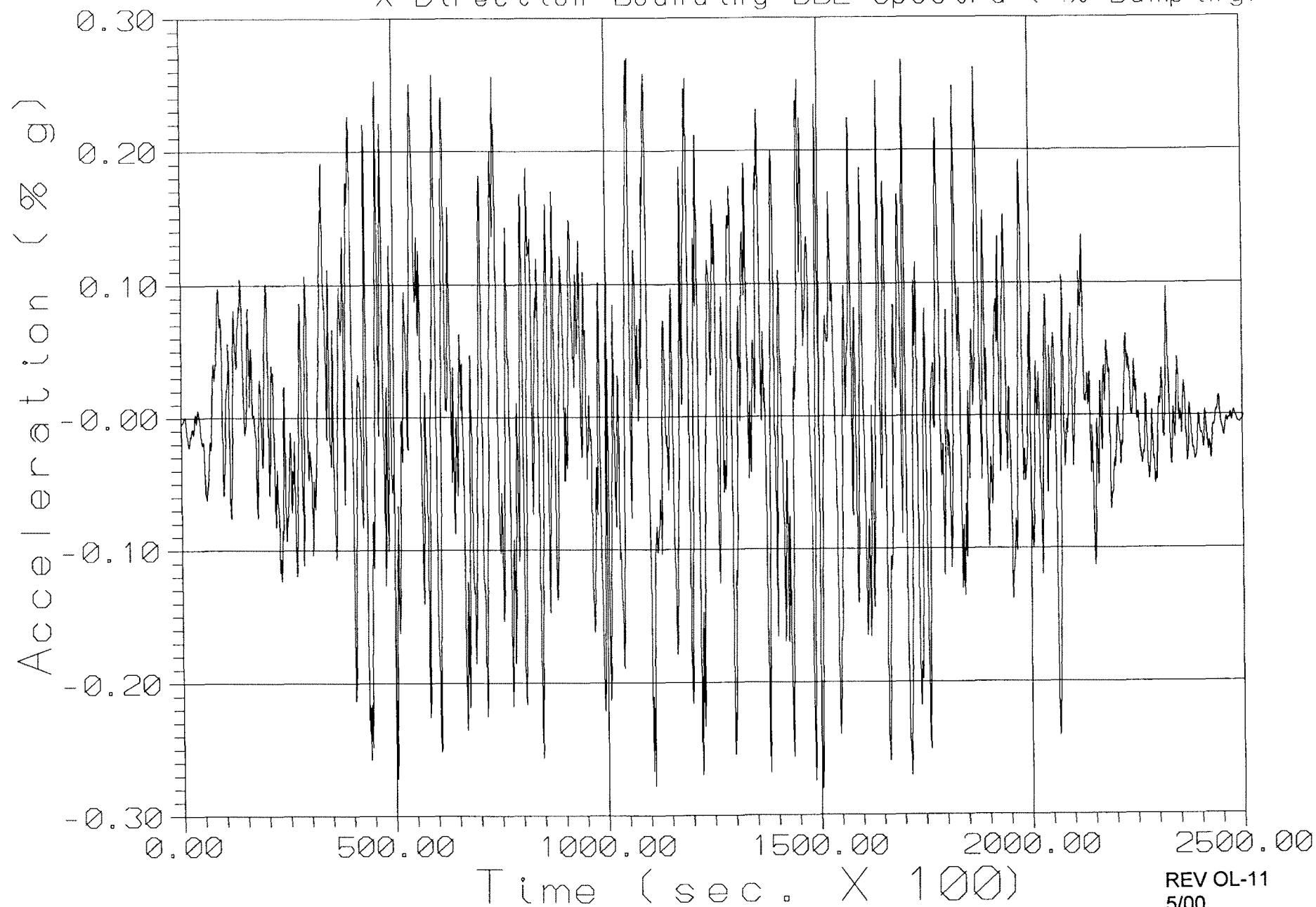


Figure 9.1A-15a Callaway Elevation 2007'
Spent Fuel Pool Time History Accelerogram
Y Direction Bounding DBE Spectra (4% Damping)

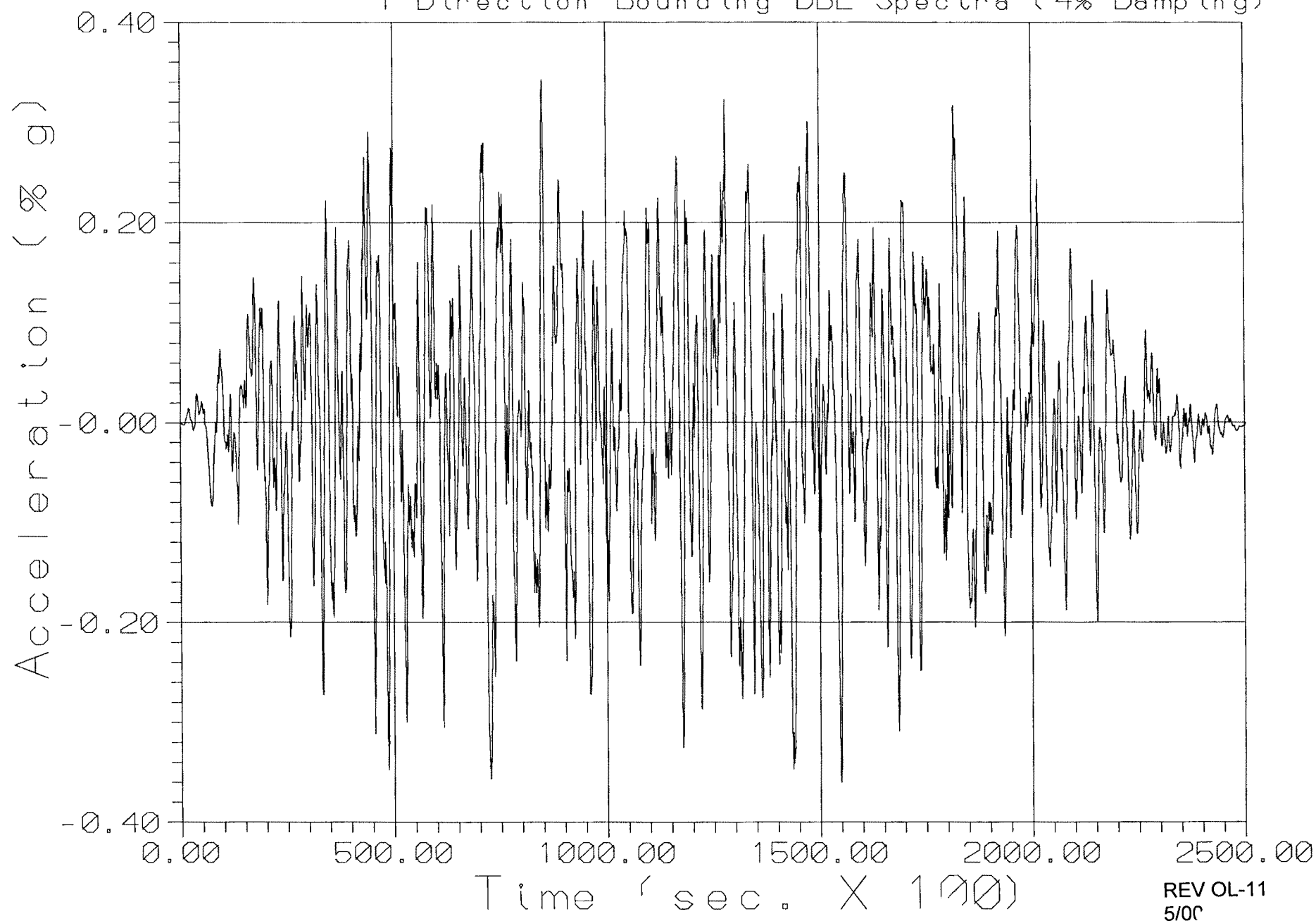
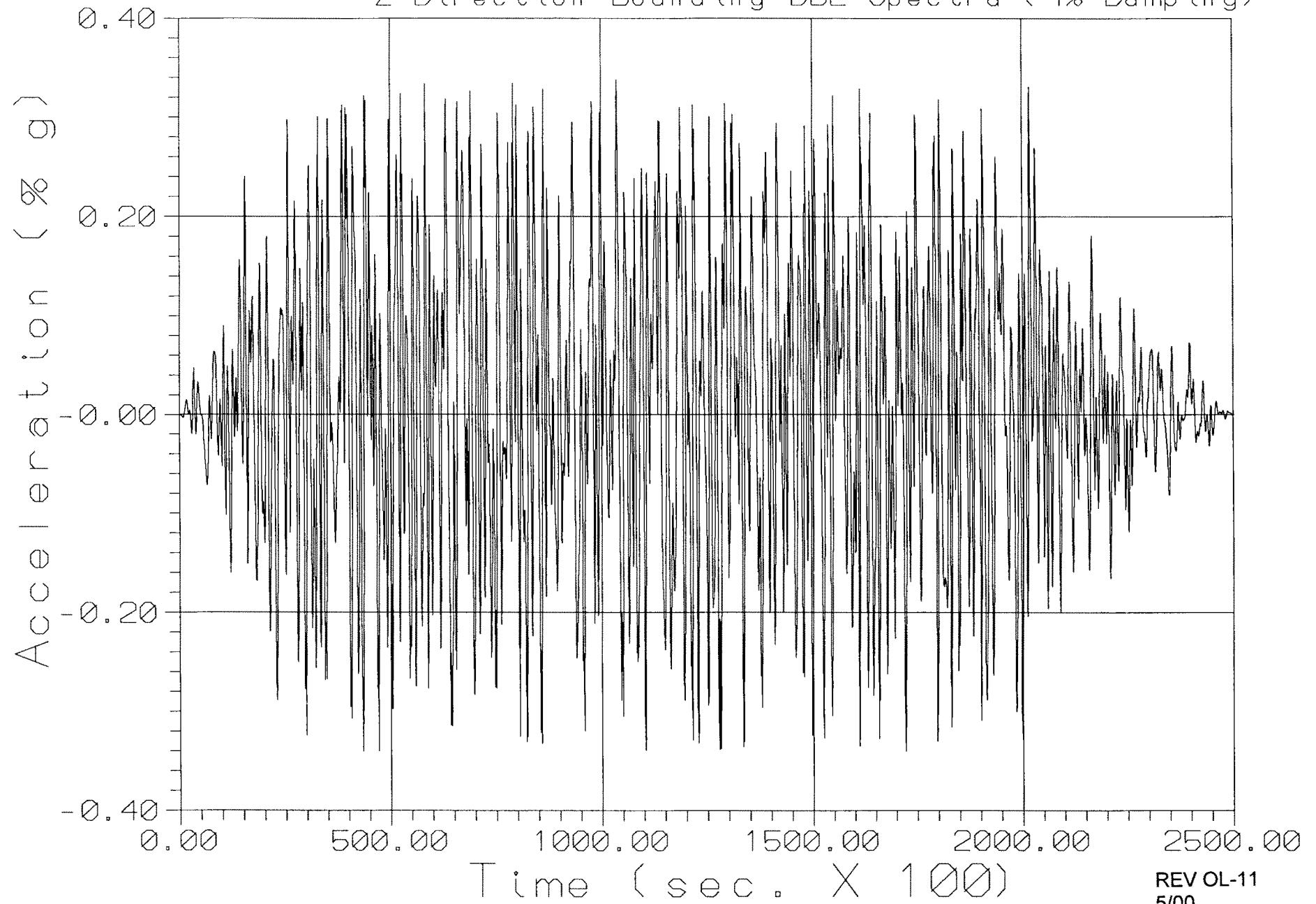
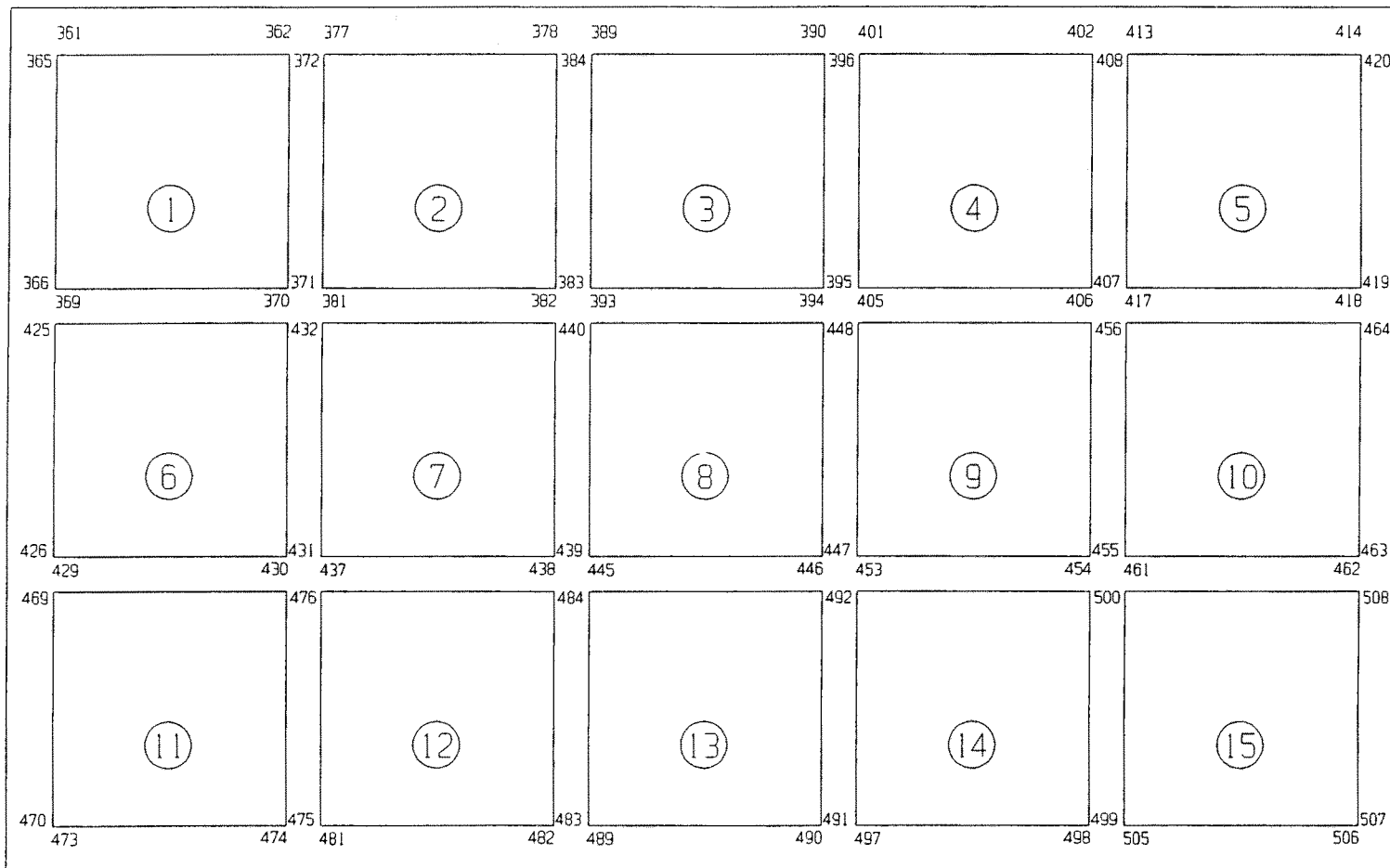


Figure 9.1A-16 Callaway Elevation 2007'
Spent Fuel Pool Time History Accelerogram
Z Direction Bounding DBE Spectra (4% Damping)



+

→ NORTH

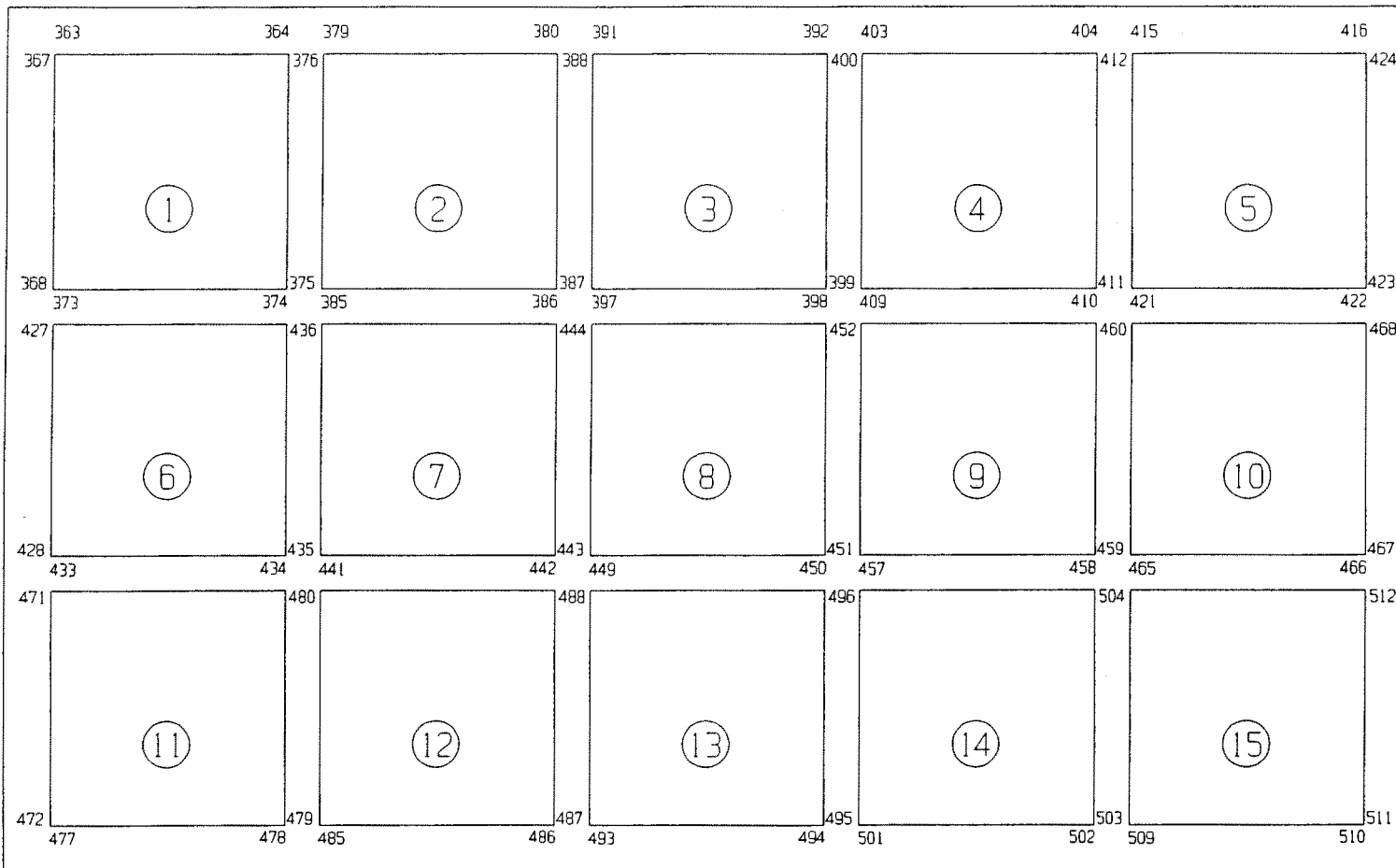


Y
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MODEL
COORDINATE
AXES

CALLAWAY FUEL STORAGE POOL

FIGURE 9.1A-17 RACK IMPACT SPRING NUMBERING SCHEME (BOTTOM)

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Y
↑
X
MODEL
COORDINATE
AXES

CALLAWAY FUEL STORAGE POOL
FIGURE 9.1A-18 RACK IMPACT SPRING NUMBERING SCHEME (TOP)

REV OL-11
5/00

+

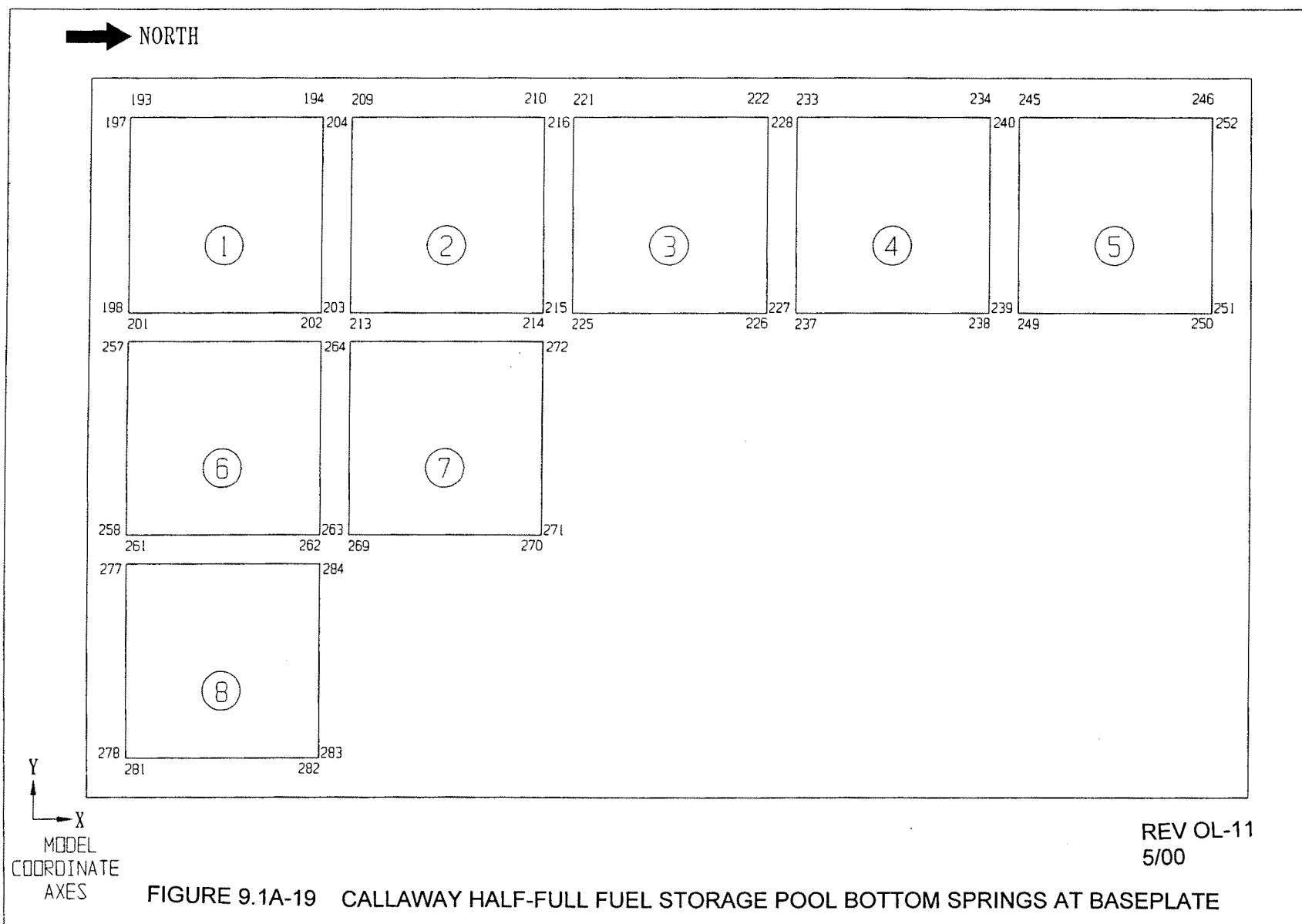
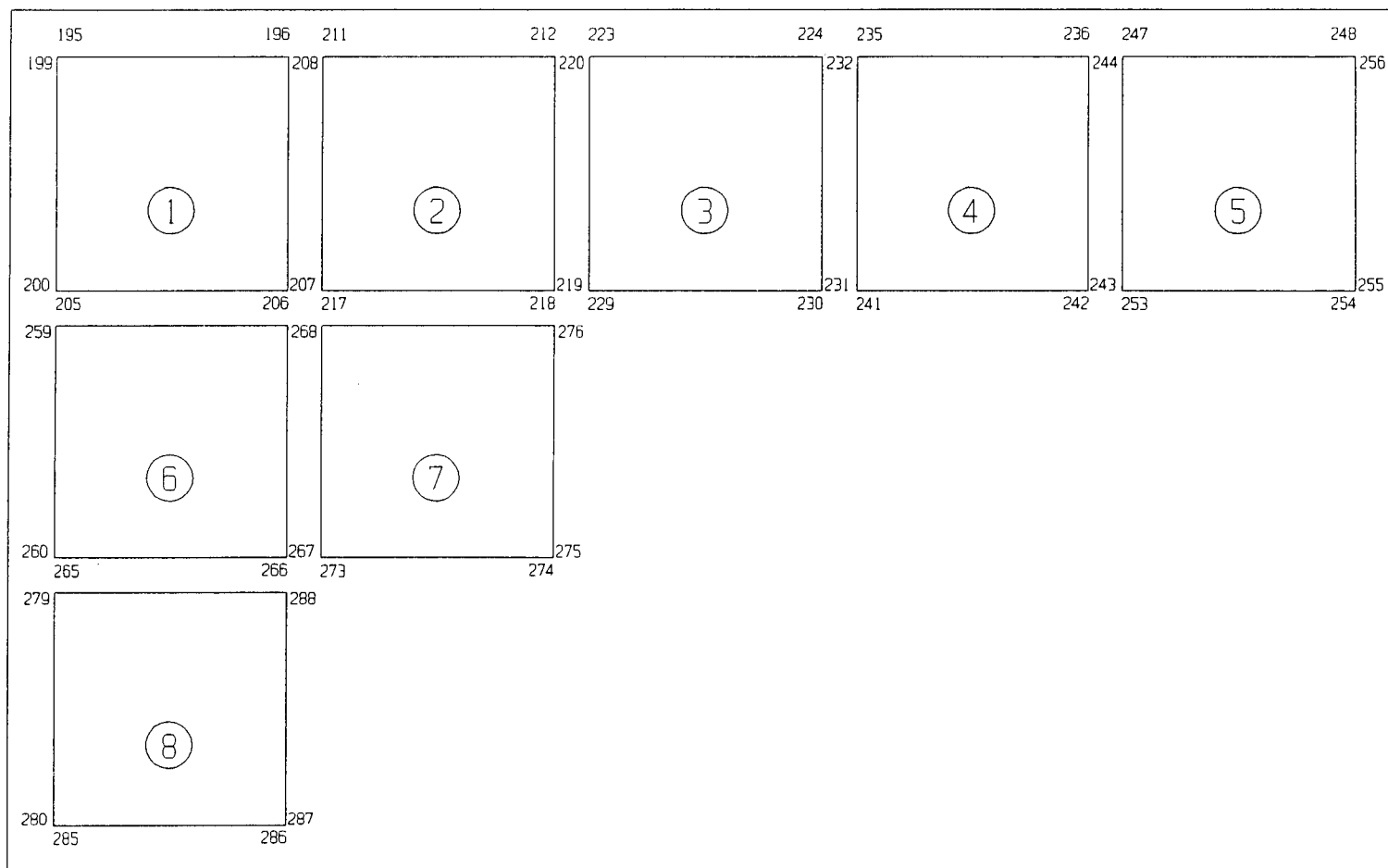


FIGURE 9.1A-19 CALLAWAY HALF-FULL FUEL STORAGE POOL BOTTOM SPRINGS AT BASEPLATE

REV OL-11
5/00

→ NORTH



Y
↑
X
MODEL
COORDINATE
AXES

FIGURE 9.1A-20 CALLAWAY HALF-FULL FUEL STORAGE POOL TOP SPRINGS

REV OL-11
5/00

+

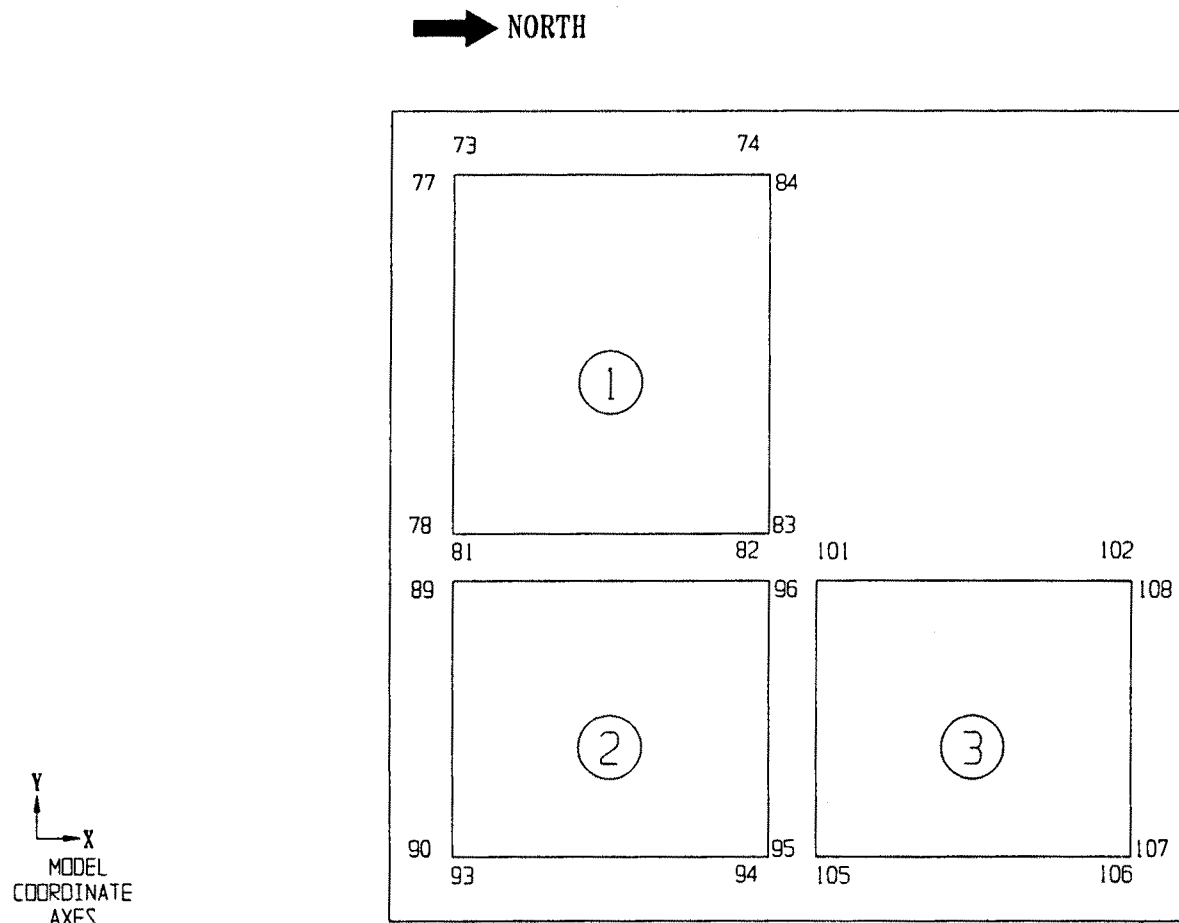
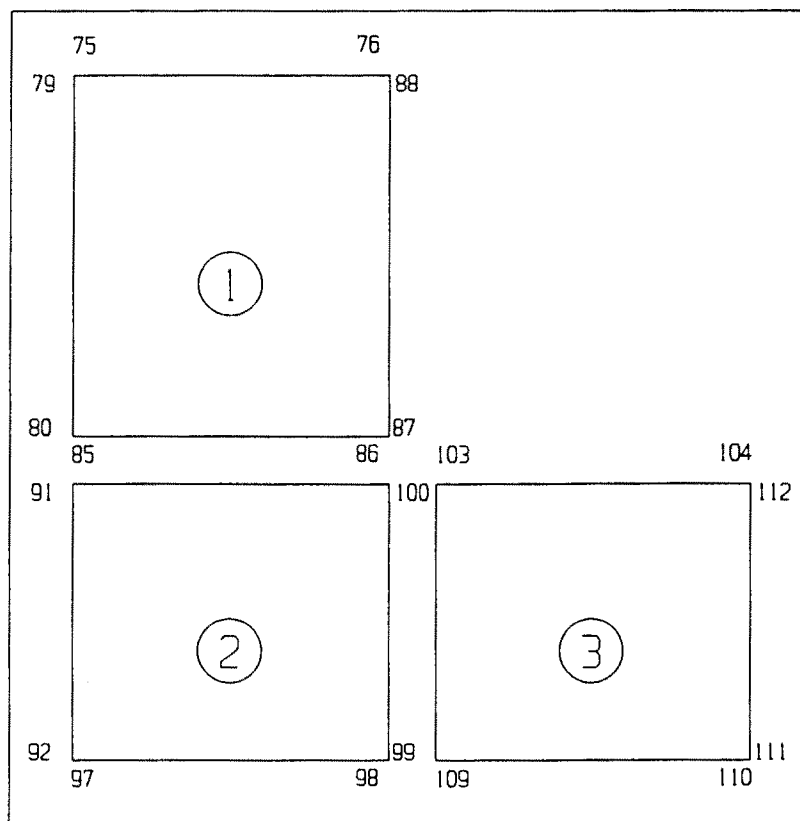


FIGURE 9.1A-21 CALLAWAY CASK LOADING POOL BOTTOM SPRINGS

REV OL-11
5/00

→ NORTH



Y
↑
X
MODEL
COORDINATE
AXES

FIGURE 9.1A-22 CALLAWAY CASK LOADING POOL TOP SPRINGS

REV OL-11
5/00

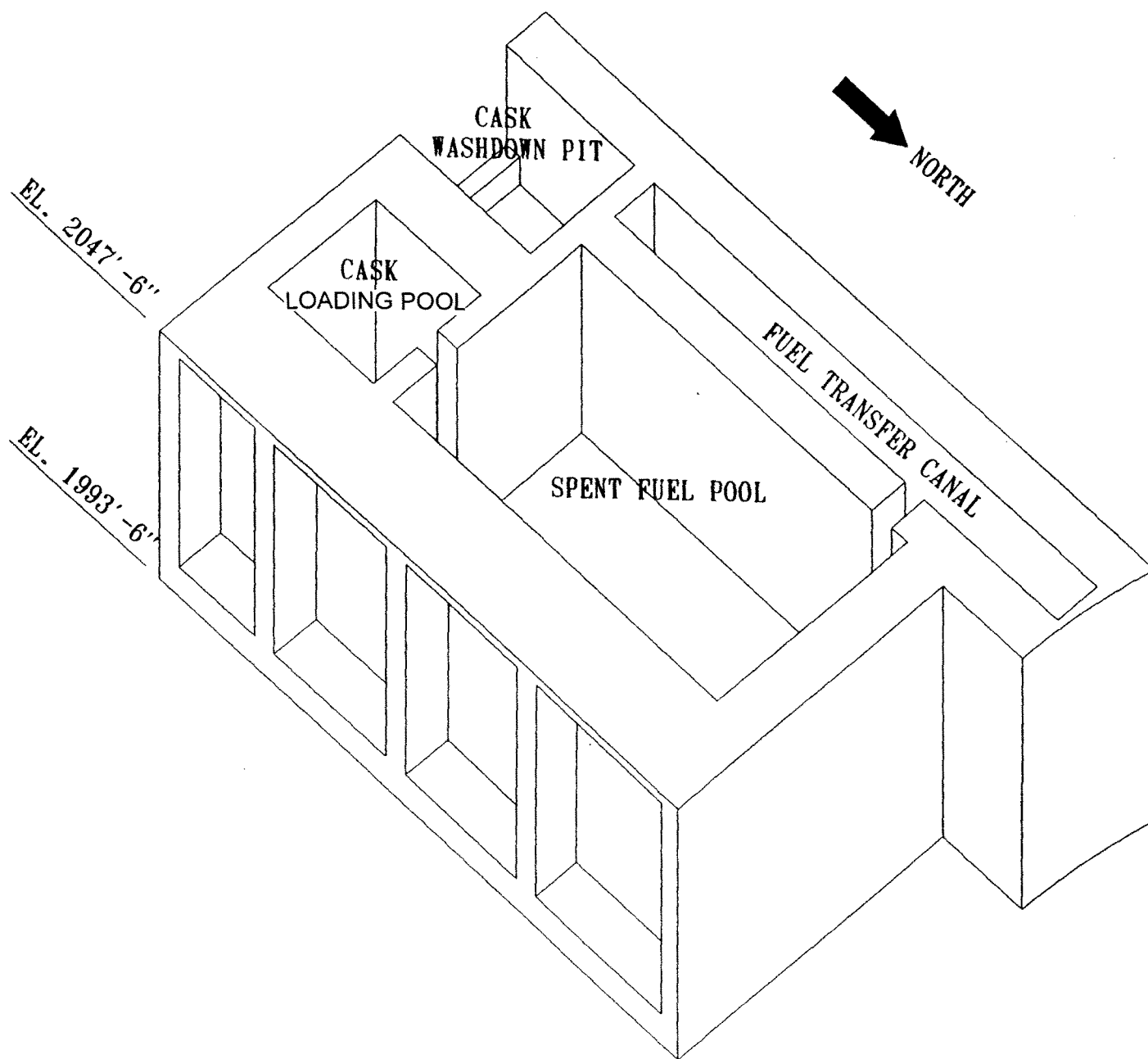


FIGURE 9.1A-23 Isometric View of the Spent Fuel Pool Area

REV OL-11
5/00

FIGURE 9.1A-24 Plan View and Dimensions of the Spent Fuel Pool Area

REV OL-11
5/00

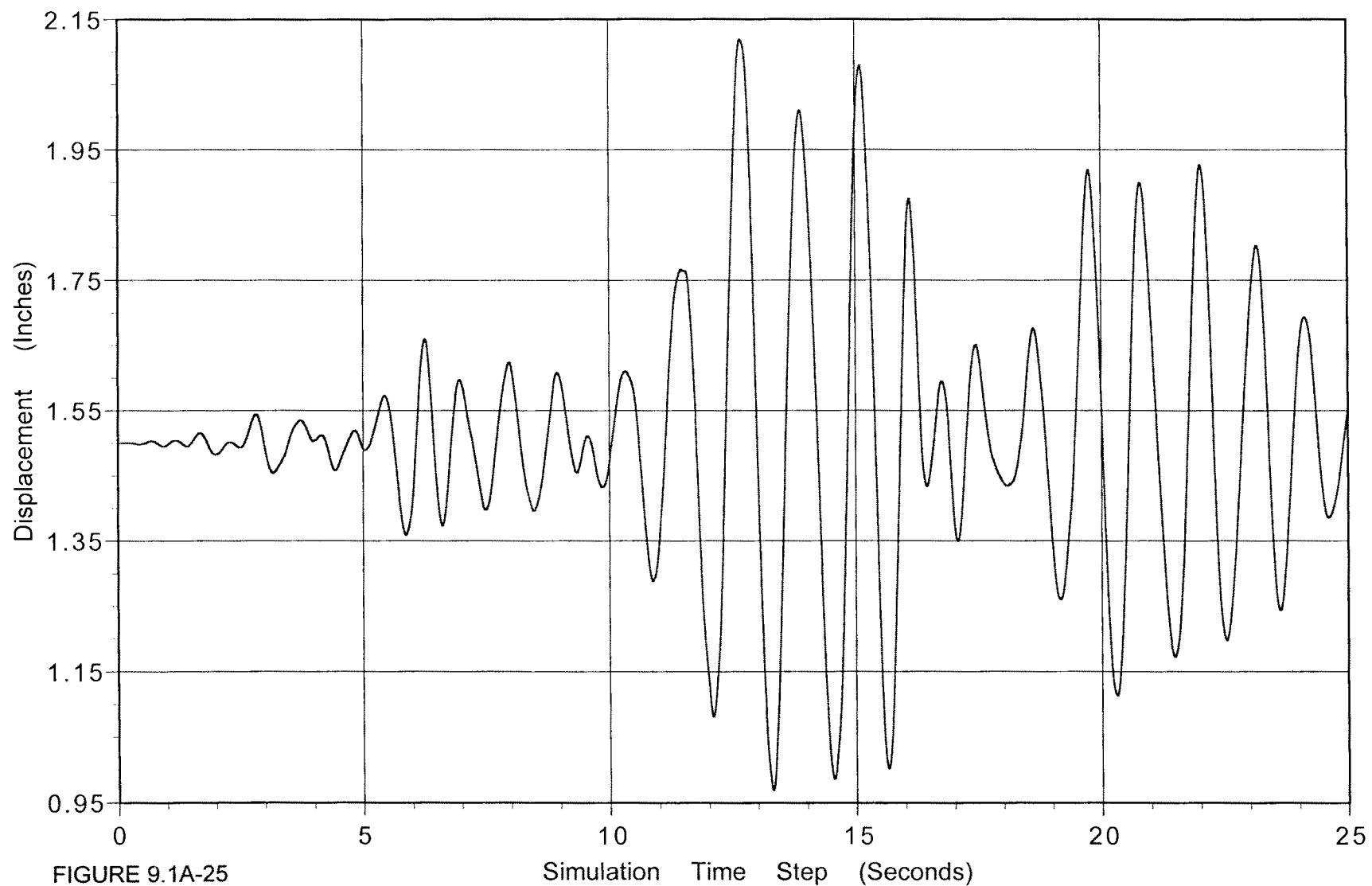


FIGURE 9.1A-25

Simulation Time Step (Seconds)
Plot of Gap Between Racks 13 and 14 at Spring No. 496 in Full SFP Model

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5/00

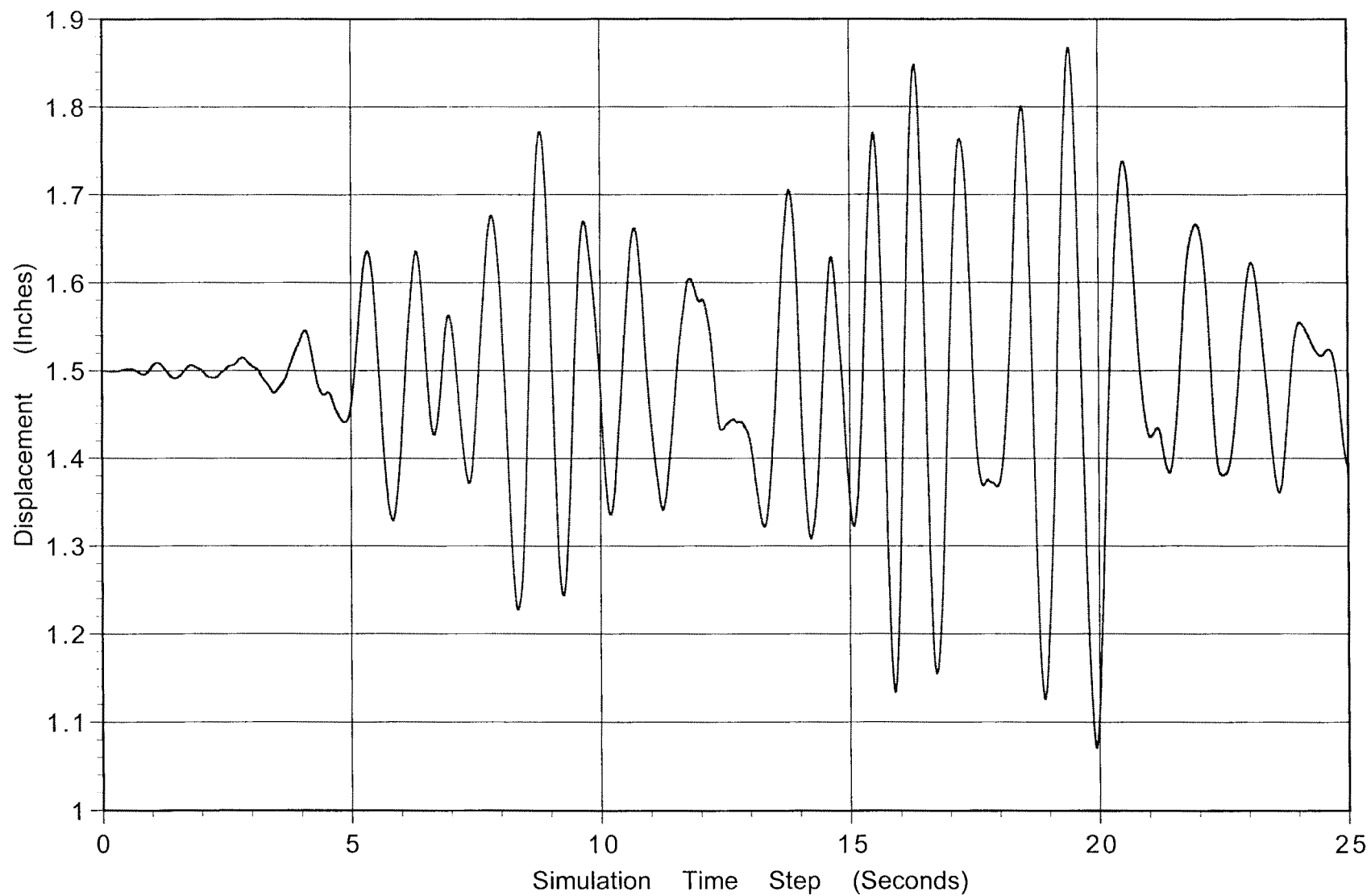


FIGURE 9.1A-26

Plot of Gap Between Racks 14 and 15 at Spring No. 504 in Full SFP Model

REV OL-11
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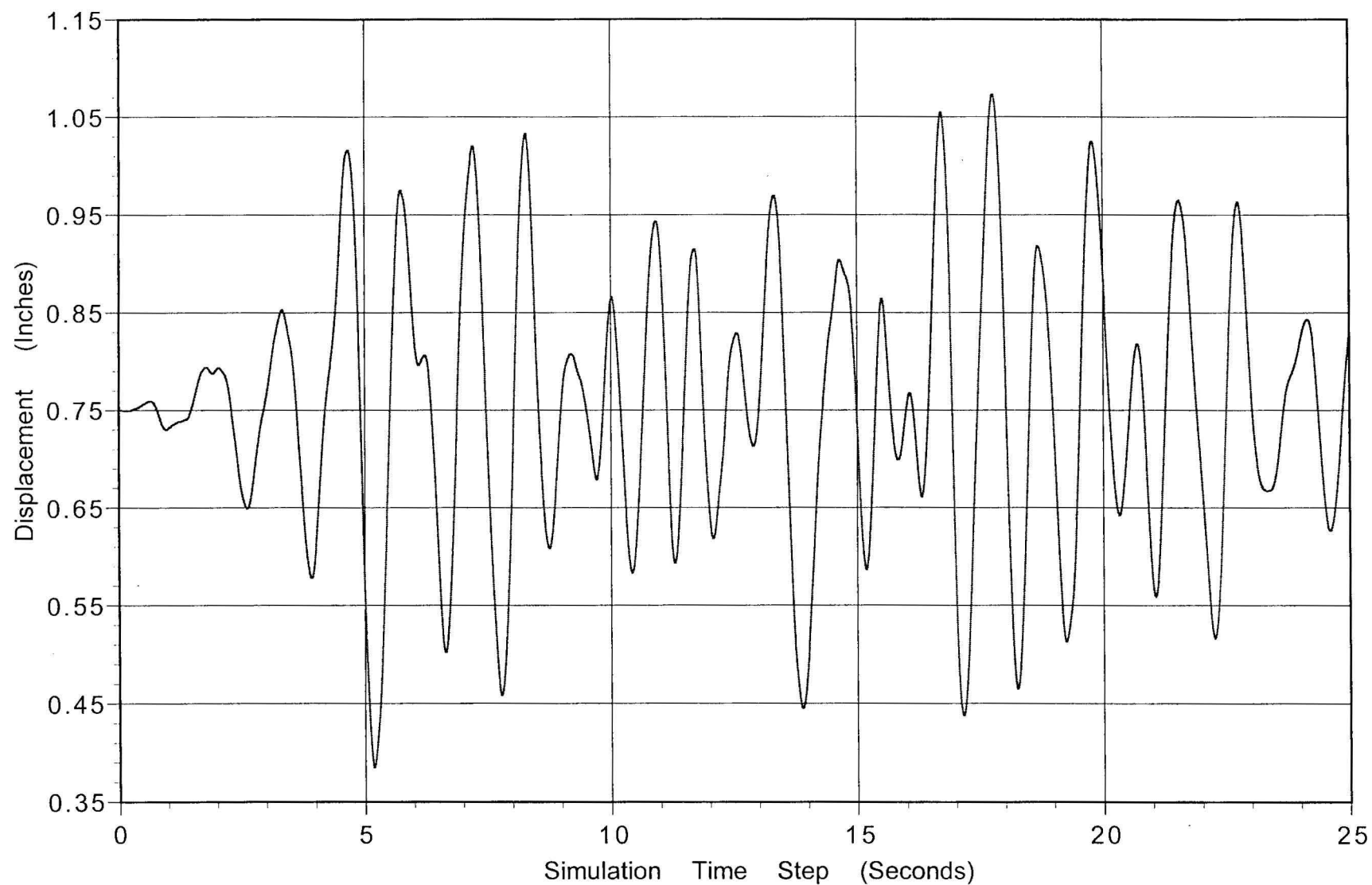
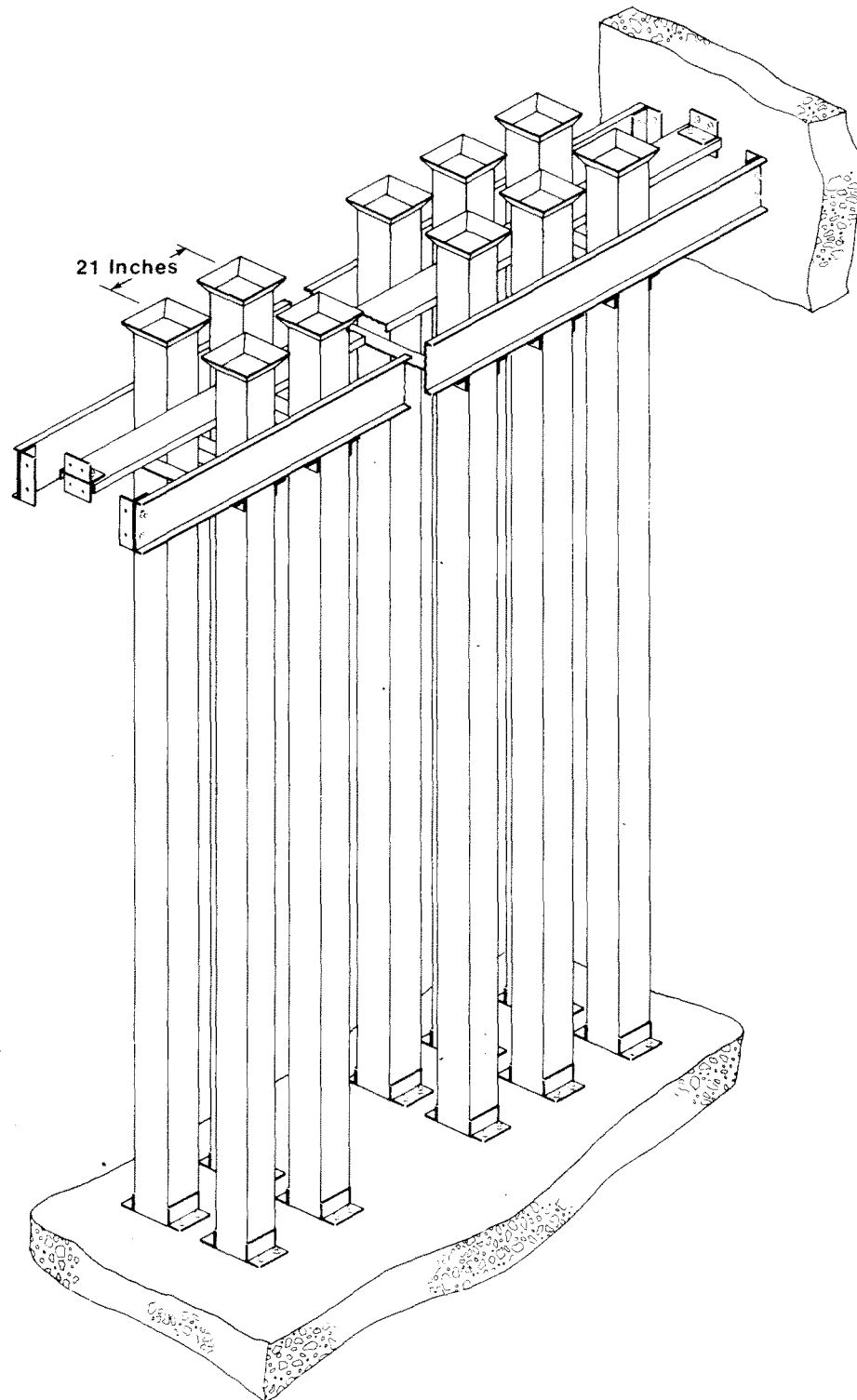


FIGURE 9.1A-27

Plot of Gap Between Rack 14 and the wall at Spring No. 501 in Full SFP Model

REV OL-11
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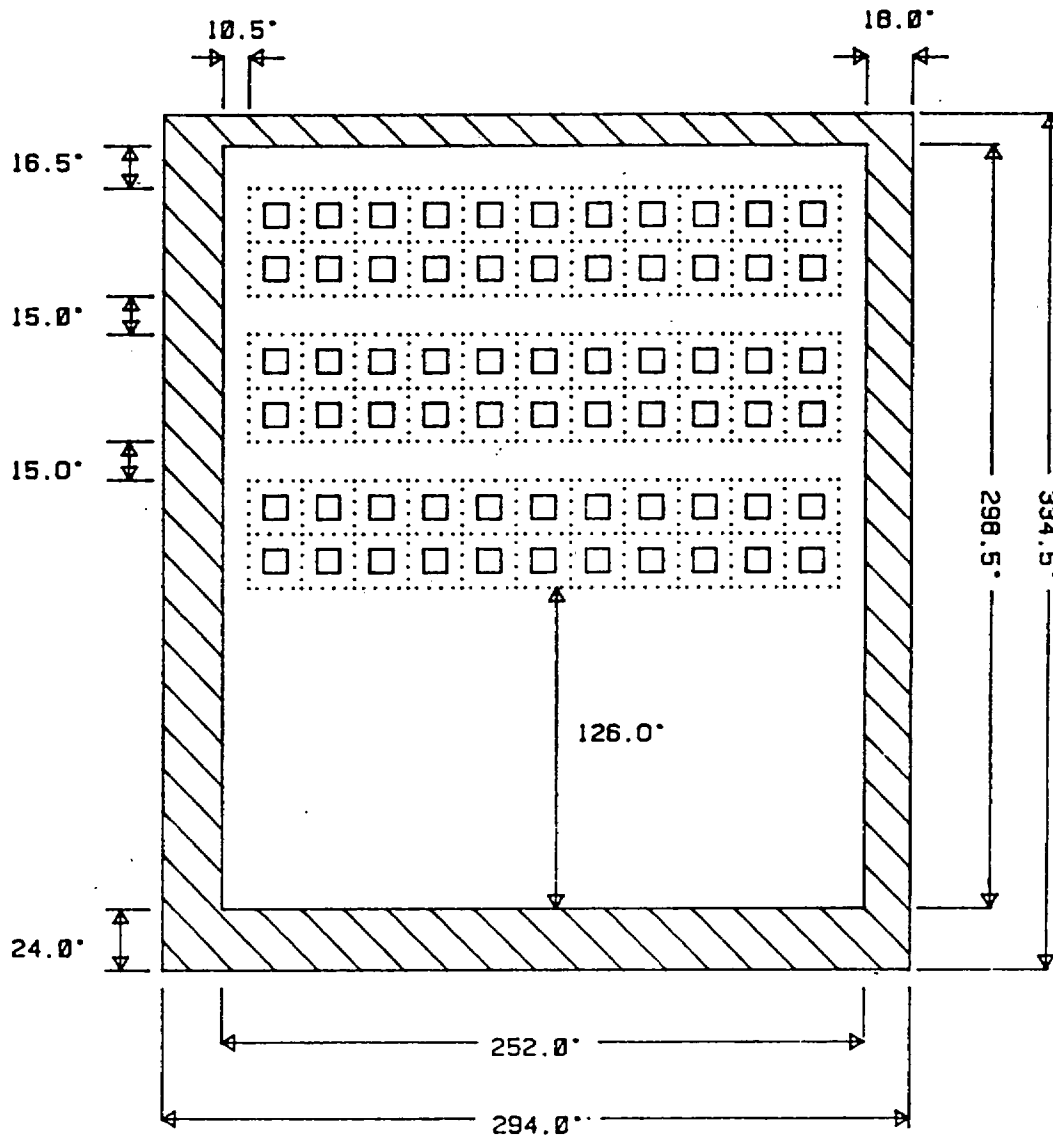


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CALLAWAY PLANT

FIGURE 9.1-1

NEW FUEL STORAGE RACK



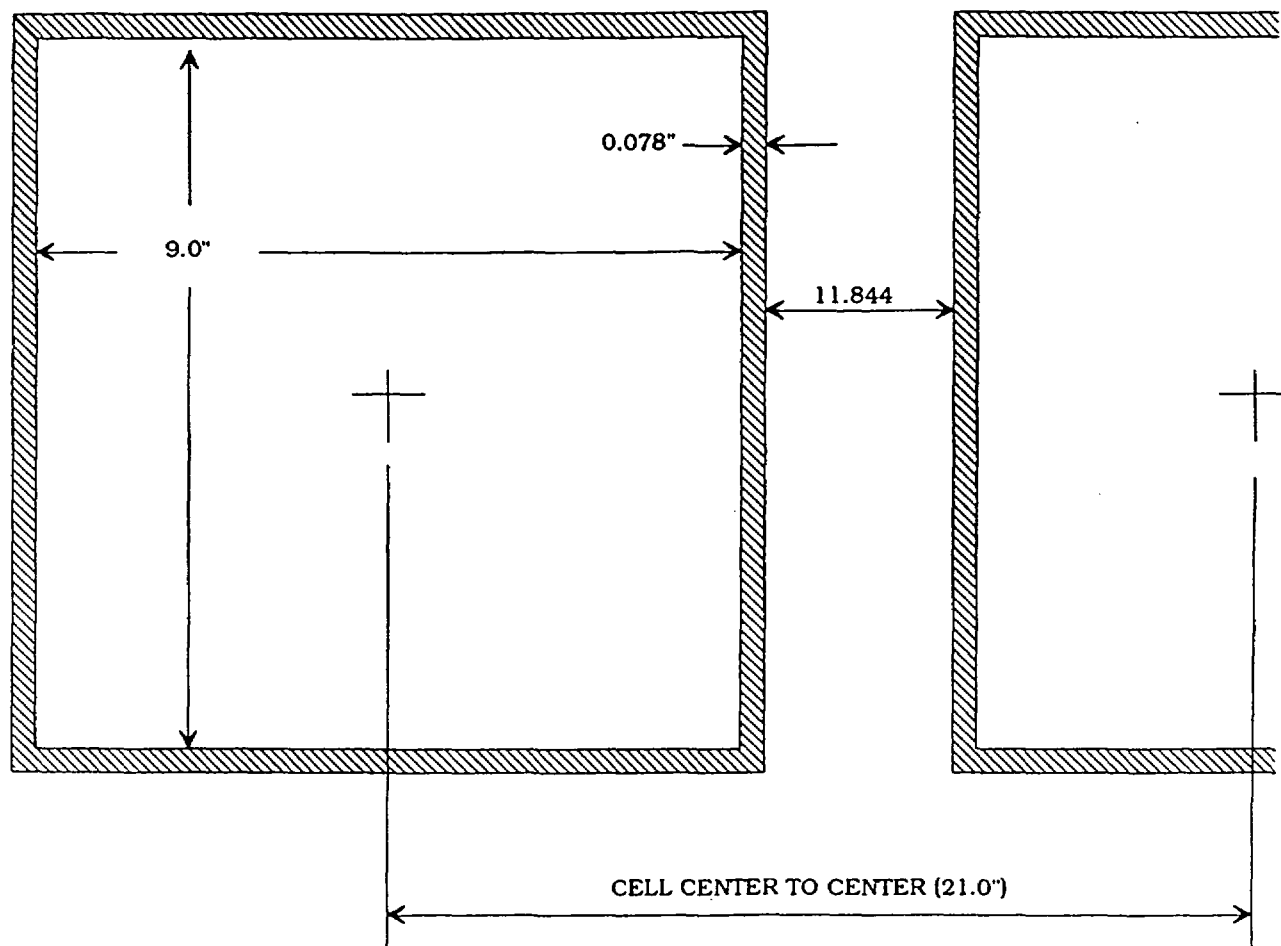
□ BASIC CELL 21" X 21"

REV OL-4
6/90

CALLAWAY PLANT

FIGURE 9.1-1a

CALLAWAY FRESH FUEL STORAGE ARRAY LAYOUT



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6/90

CALLAWAY PLANT

FIGURE 9.1-1b
CALLAWAY FRESH FUEL STORAGE CELL
NOMINAL DIMENSIONS

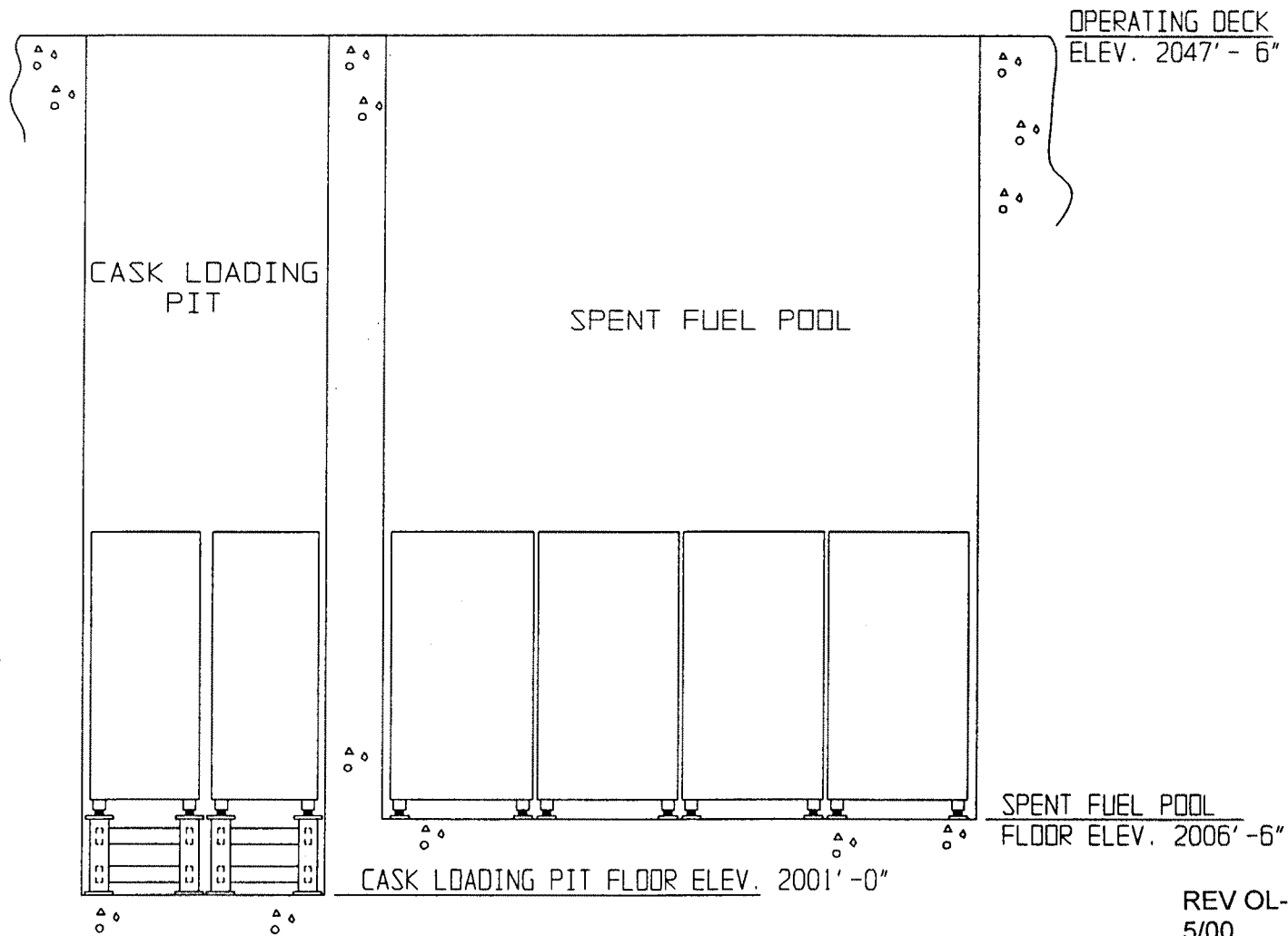


FIGURE 9.1-2 ELEVATION VIEW OF RACK LAYOUT

REV OL-11
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SHEET 1

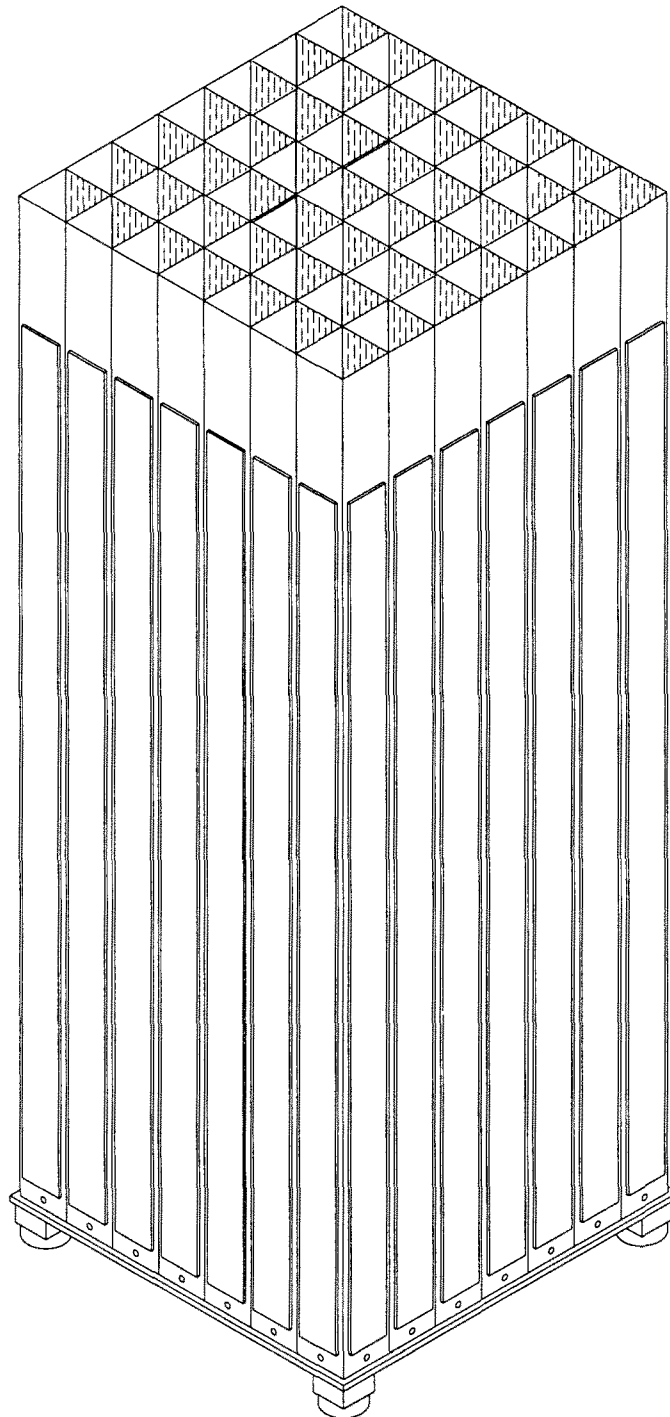
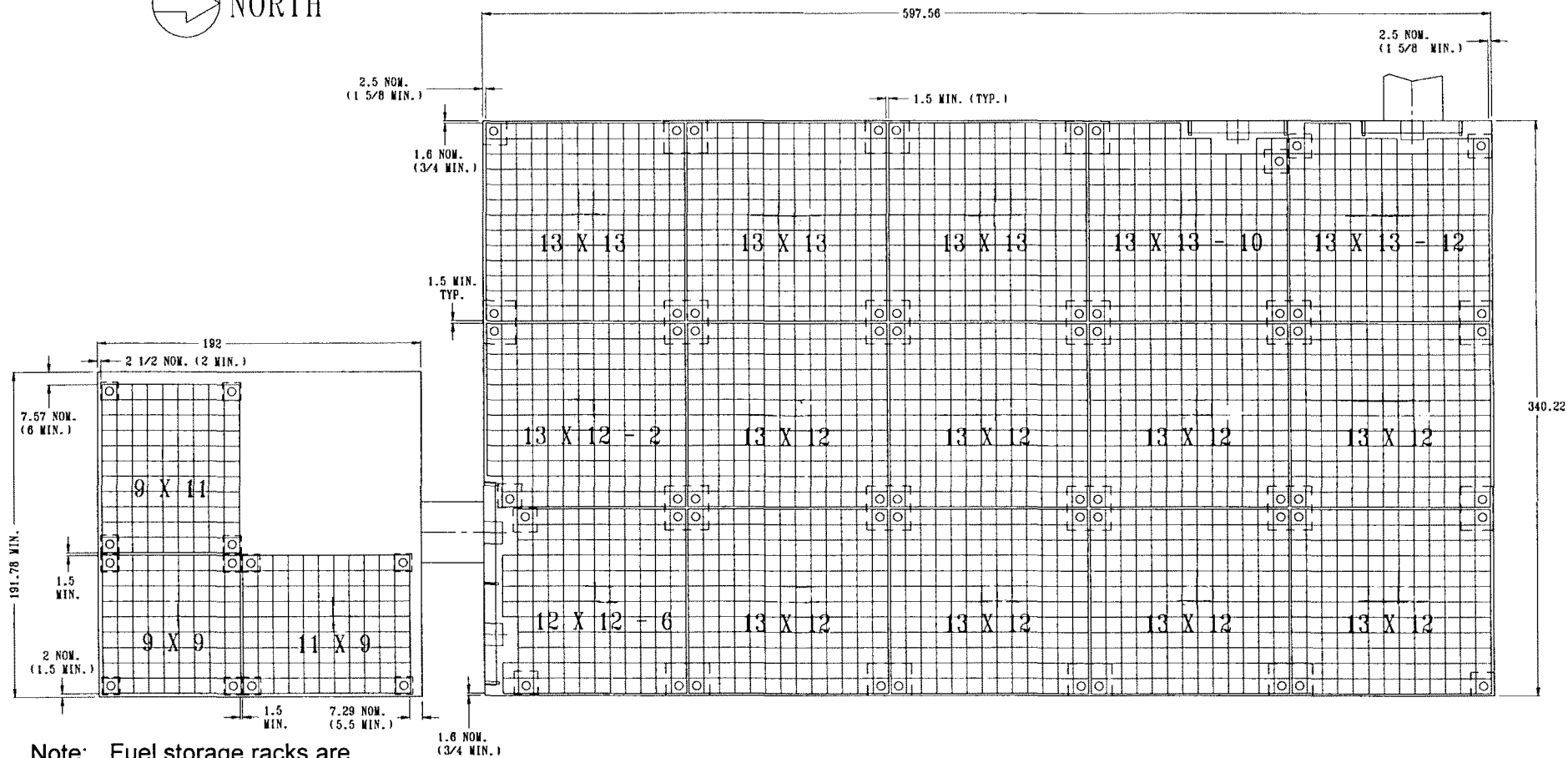


FIGURE 9.1-2 PICTORIAL VIEW OF TYPICAL RACK STRUCTURE

REV OL-11
5/00

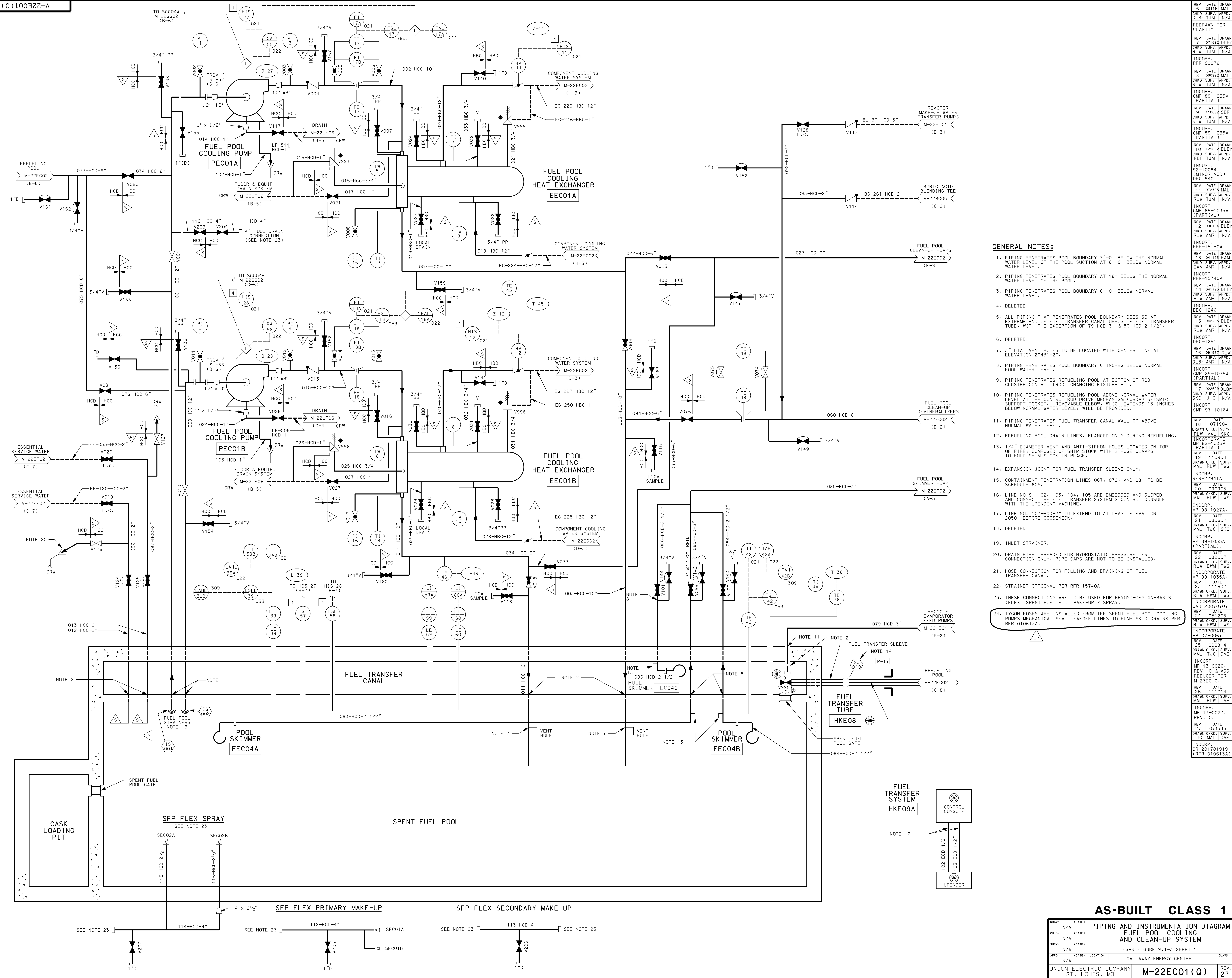
SHEET 2



Note: Fuel storage racks are currently not installed in the cask loading pool.

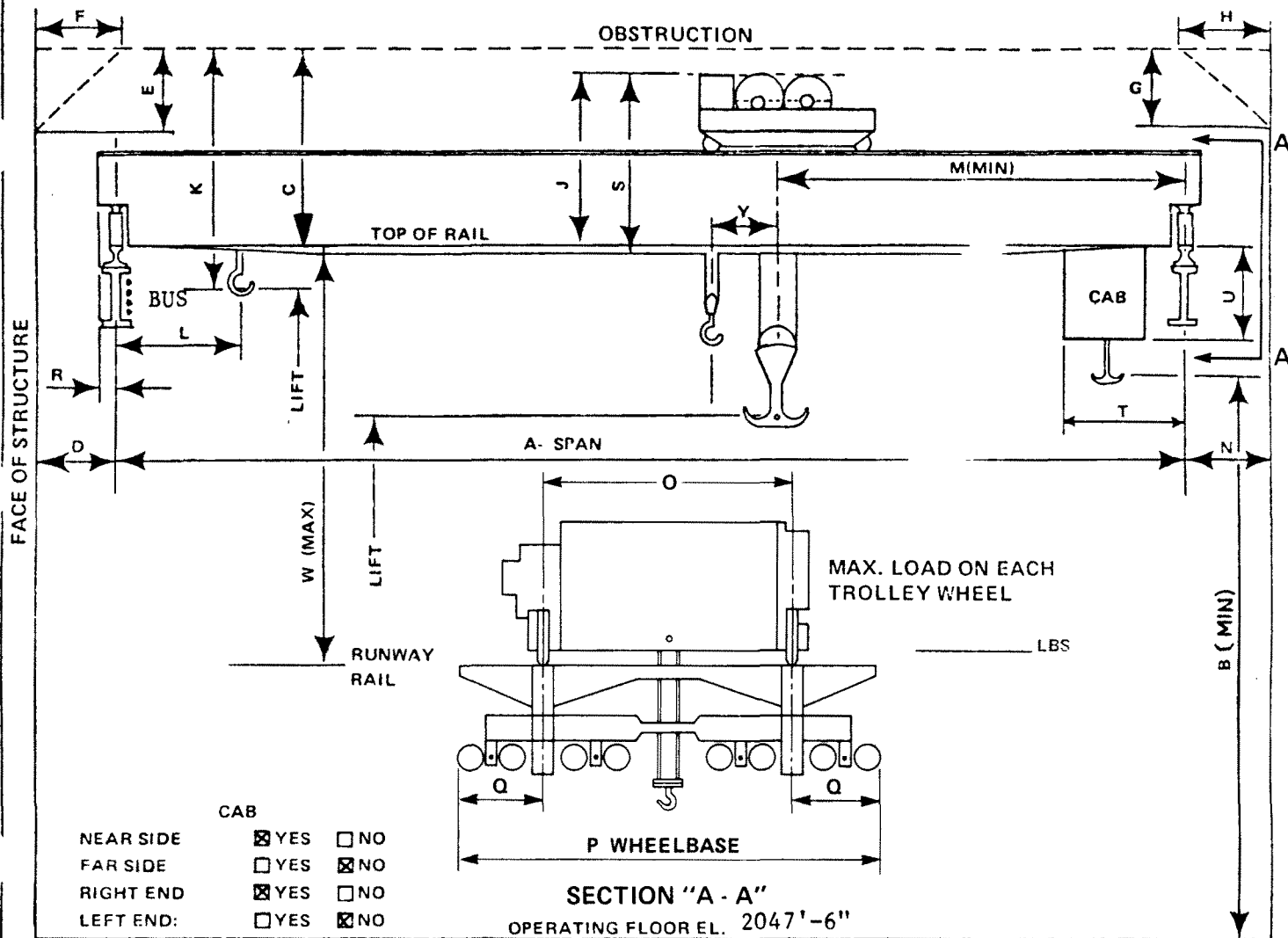
FIGURE 9.1-2: POOL LAYOUT FOR CALLAWAY

REV OL-11
5/00
SHEET 3



AS-BUILT CLASS 1

DRAWN (DATE)			
CHD	N/A	DATE	
SUPV. (DATE)			
CHD	N/A	DATE	
APP. (DATE)			
CHD	N/A	DATE	
LOC	LOCATION	CLASS	
UNION ELECTRIC COMPANY	ST. LOUIS, MO	M-22EC01 (Q)	REV. 27



NOTE: "NEAR SIDE" & "LEFT/RIGHT" - FACING CRANE DRIVE SIDE.

Top of Rail Elevation 2122'-6"

"N" is 1'-8" to Obstruction

NOTE : Not as-built; information only

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CALLAWAY PLANT

FIGURE 9.14

ARRANGEMENT DRAWING
CONTAINMENT BUILDING
POLAR CRANE

FIGURE 9.1-5
HOOK LIMITS FOR
CONTAINMENT BUILDING
POLAR CRANE

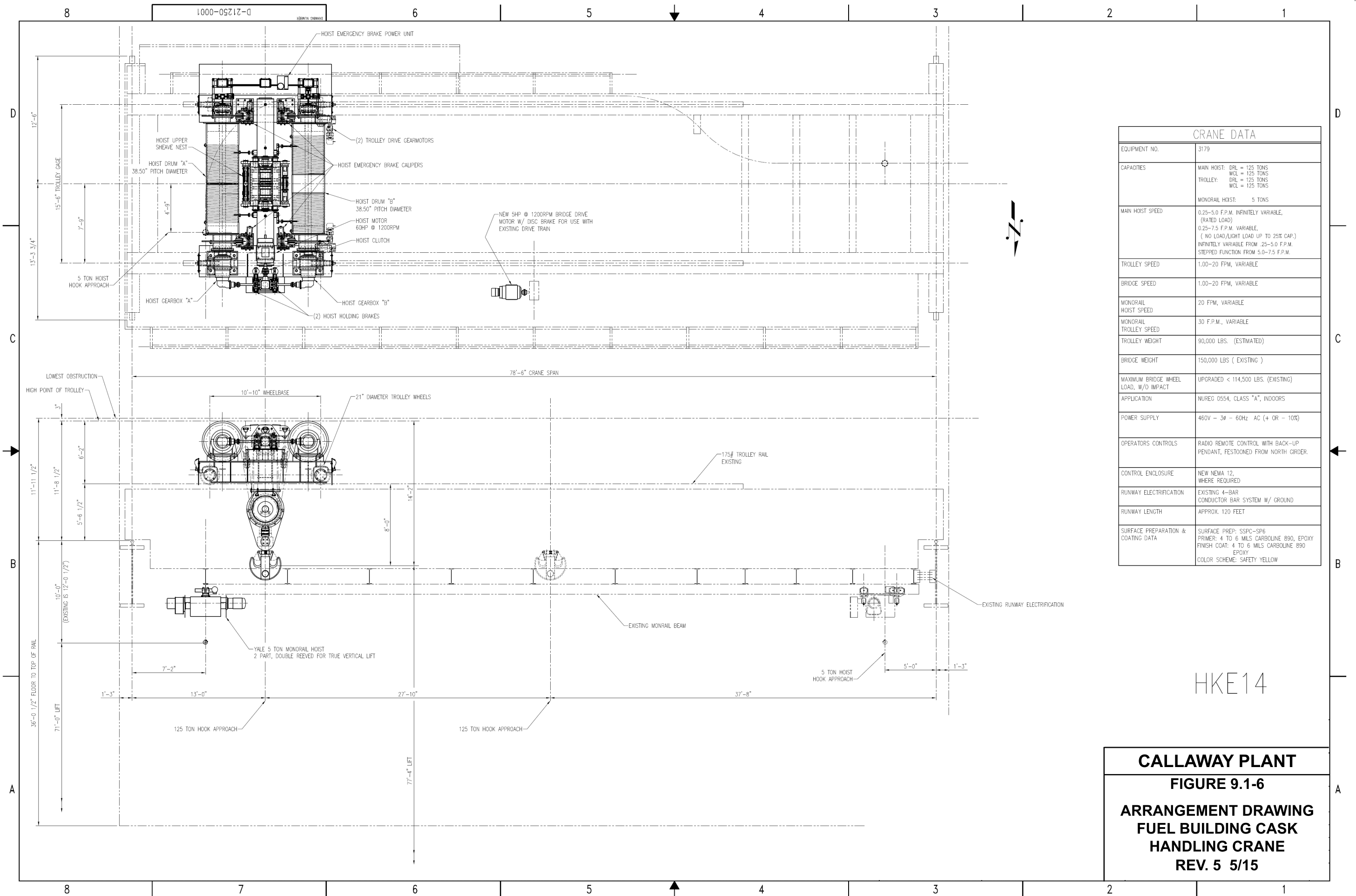
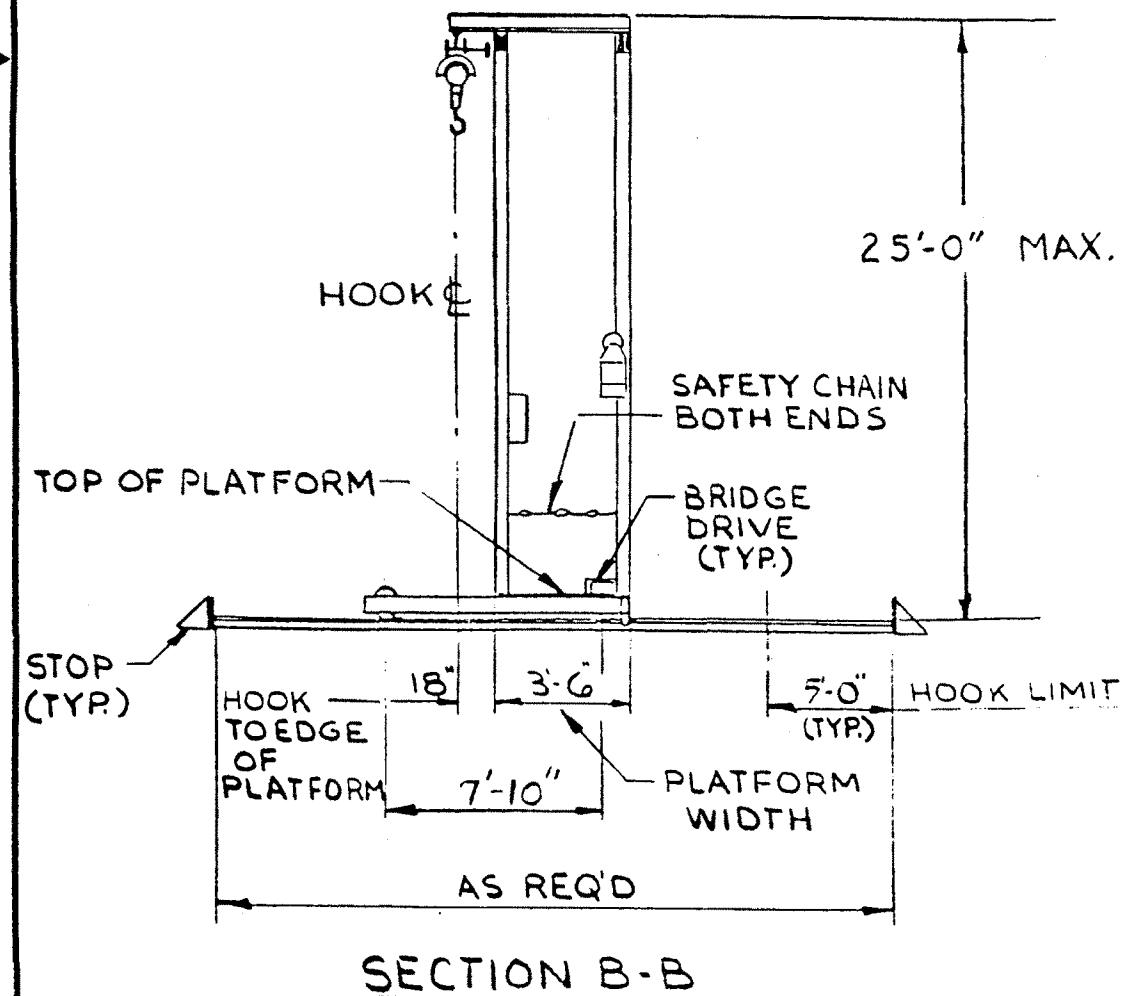
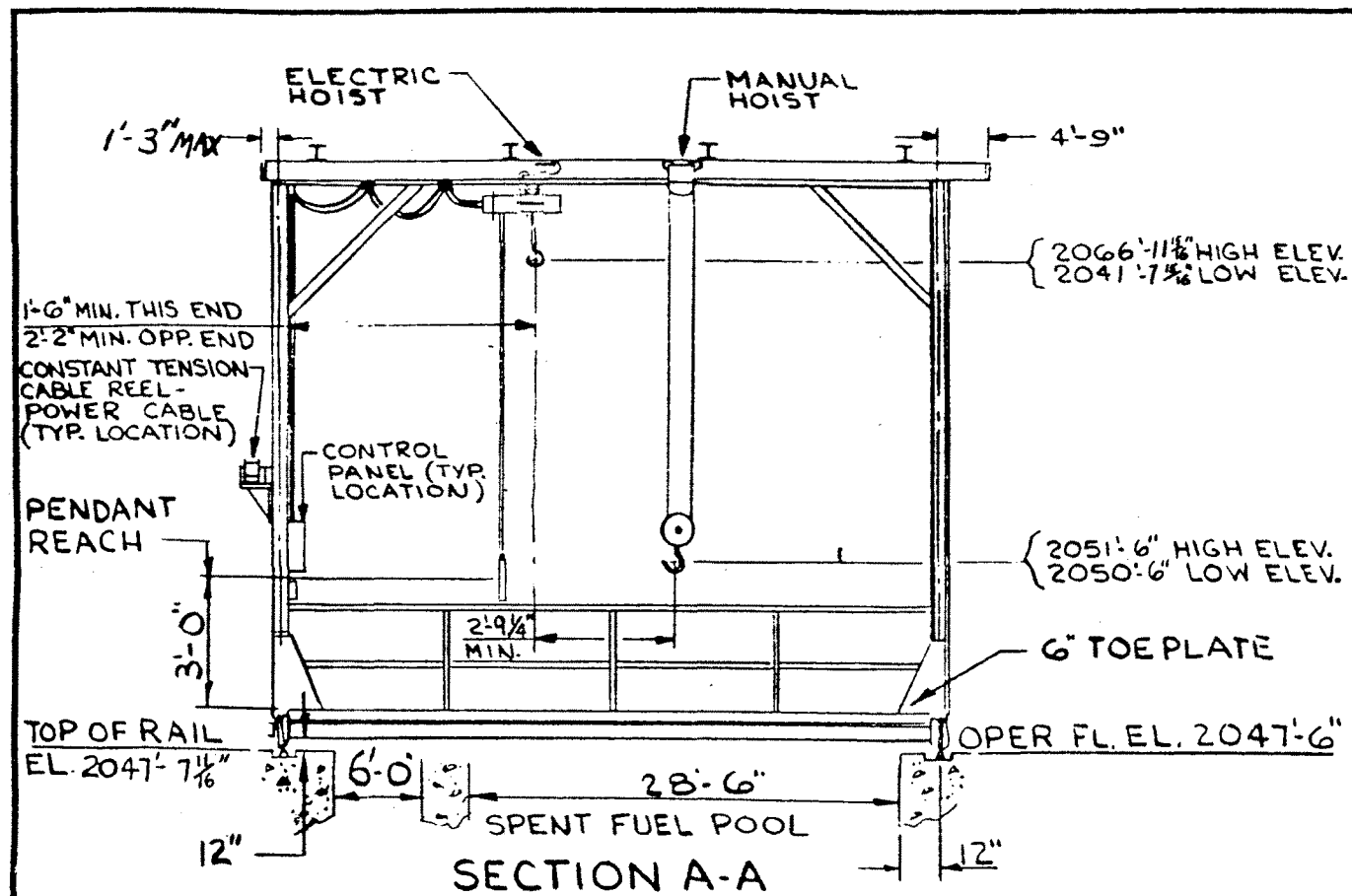
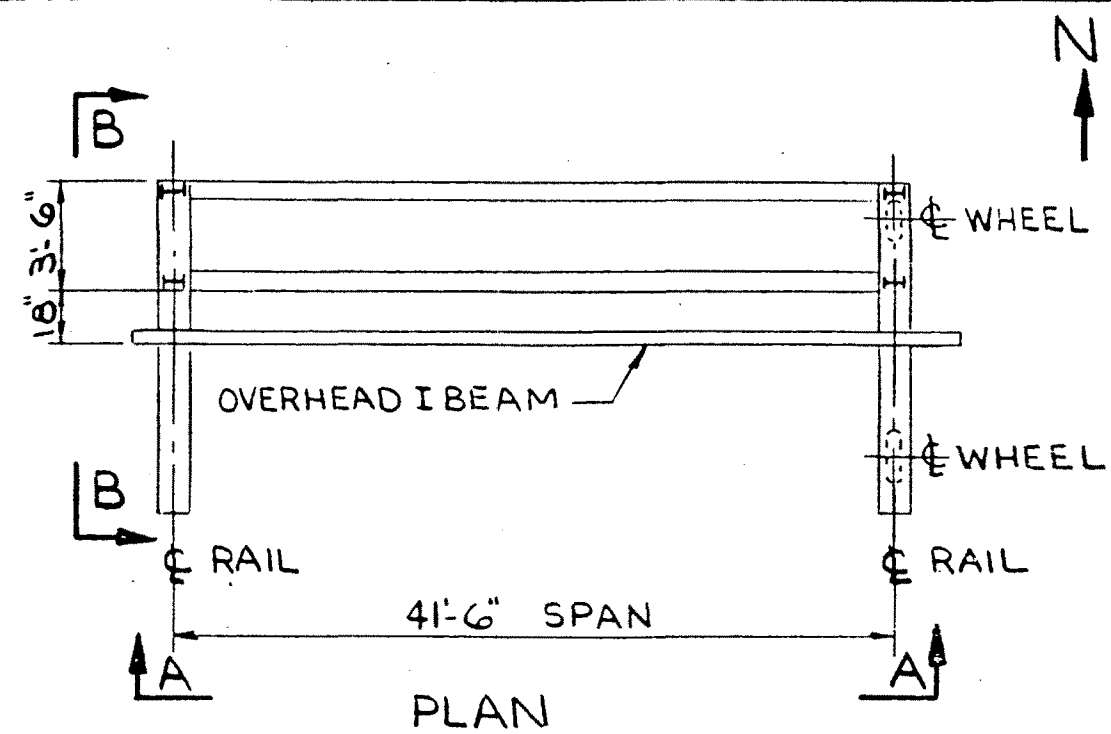


Figure 9.1-7 has been deleted.



CAPACITY:	BRIDGE	- 5 TON
	ELEC. HOIST	- 2 TON
	MANUAL HOIST	- 5 TON
MAX. LIFT SPEED		- 21 FPM $\pm 10\%$
MIN. LIFT SPEED		- 7 FPM $\pm 10\%$
MAX. BRIDGE SPEED		- 30 FPM $\pm 10\%$
MIN. BRIDGE SPEED		- 10 FPM $\pm 10\%$
MAX. TROLLEY SPEED		30 FPM $\pm 10\%$
MIN. TROLLEY SPEED		10 FPM $\pm 10\%$

MAINTENANCE PLATFORM - NOT SHOWN
TOP OF RAIL ELEVATION 2047'-7 1/8"



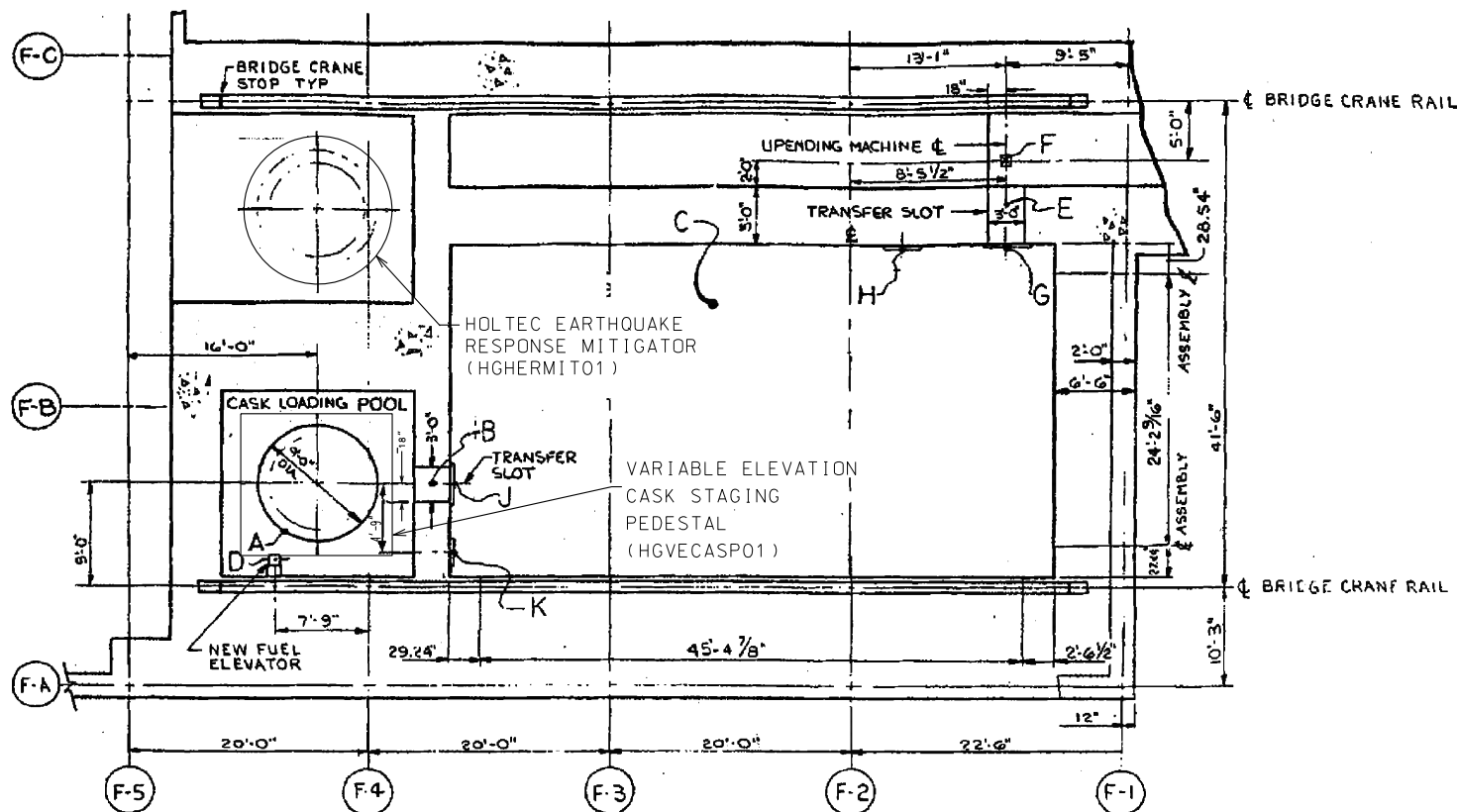
NOTE:
1. DOES NOT SHOW OFFSET HANDLING TOOL TO BE USED TO ACCESS CELLS BEYOND THE NORMAL HOIST TRAVEL RANGE.

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CALLAWAY PLANT

FIGURE 9.1-8

ARRANGEMENT DRAWING
SPENT FUEL BRIDGE CRANE



NOTES:

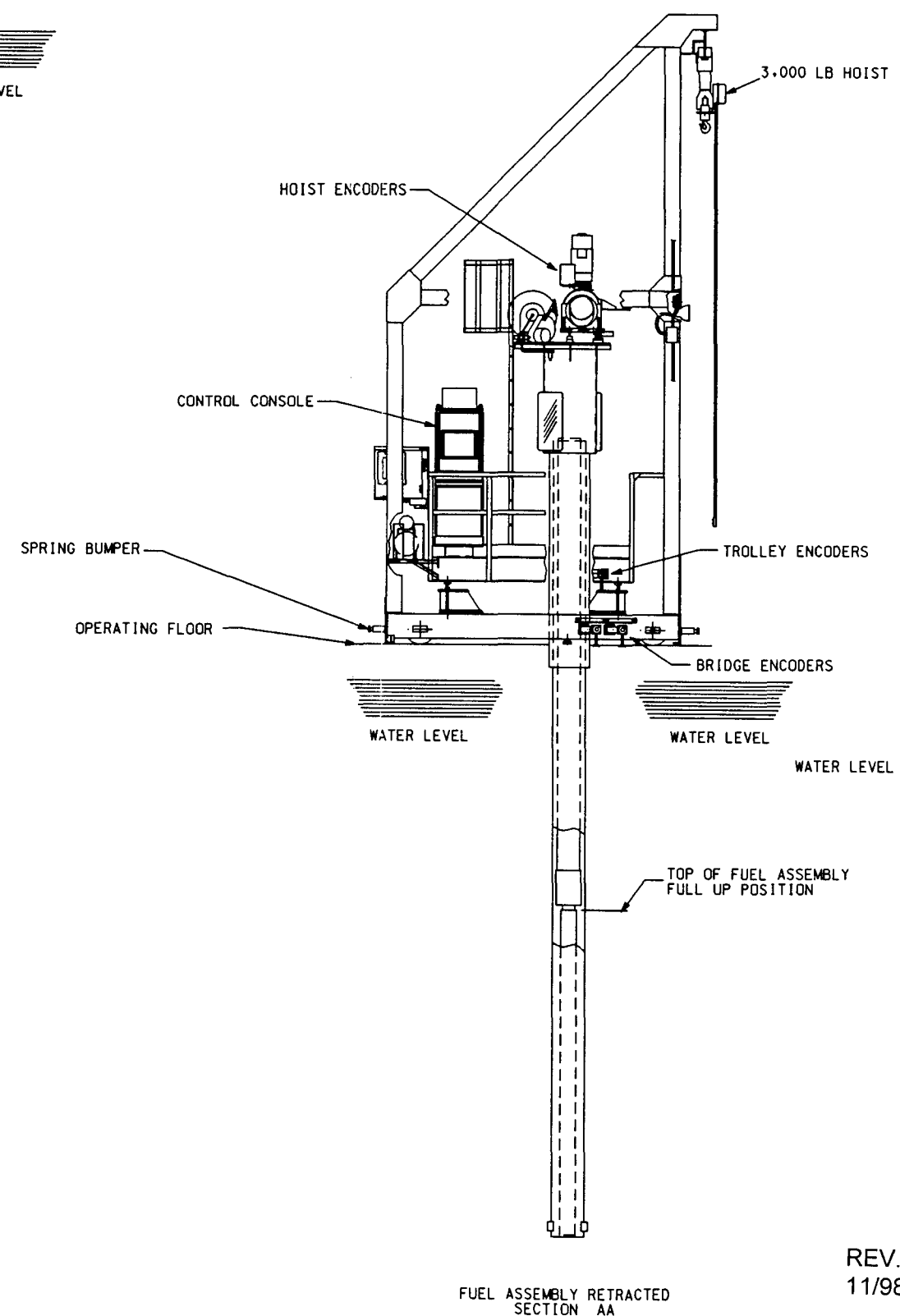
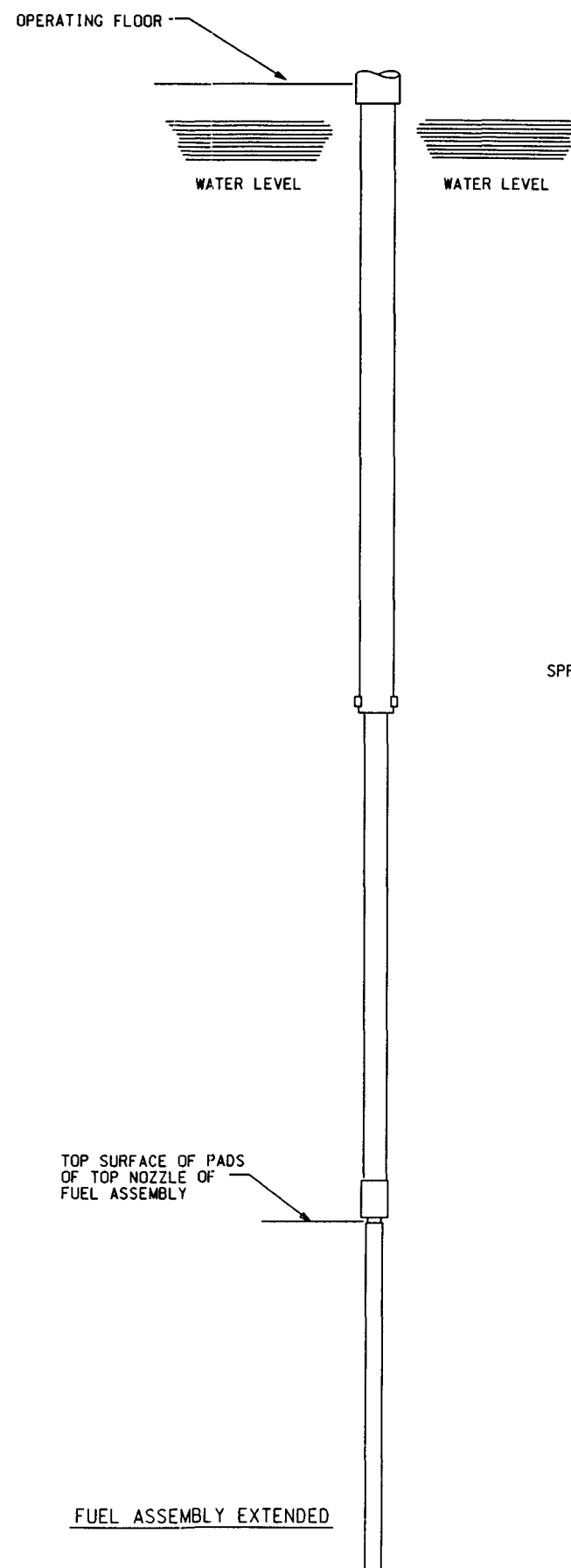
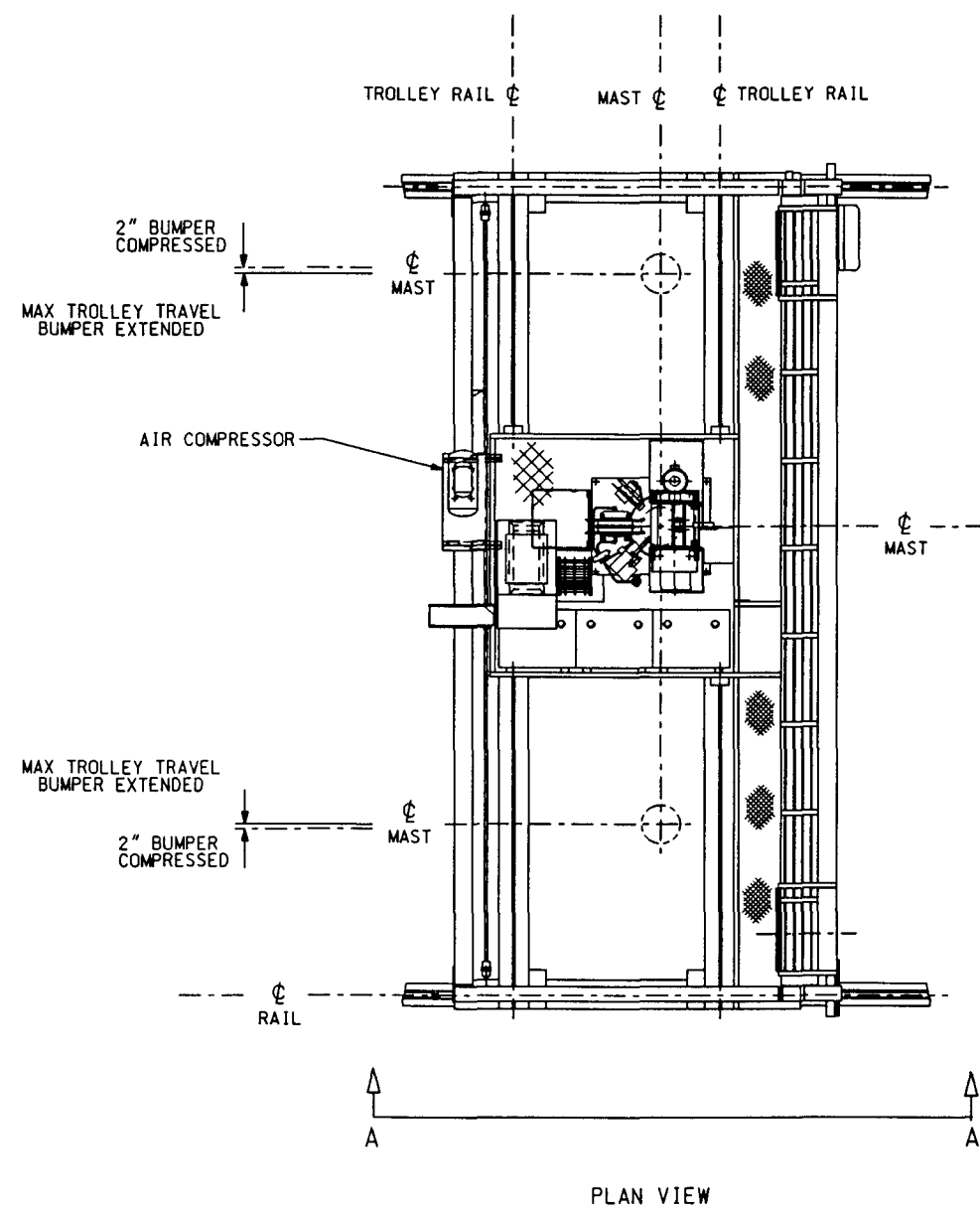
1. SPACING BETWEEN FUEL ELEMENT ASSEMBLIES TO BE 8.99" ON CENTER. INDEX POSITIONING OF CRANE TO BE DESIGNED TO HANDLE ASSEMBLIES.
2. DOES NOT SHOW RACKS IN CASK LOADING POOL.
3. SHOWS NORMAL CRANE TRAVEL LIMITS. THESE LIMITS ARE NOT APPLICABLE WHEN ACCESSING CELLS LOCATED NEAR THE PERIPHERY OF THE FUEL STORAGE POOL WALLS.

REV. OL-12
11/16

CALLAWAY PLANT

FIGURE 9.1-9

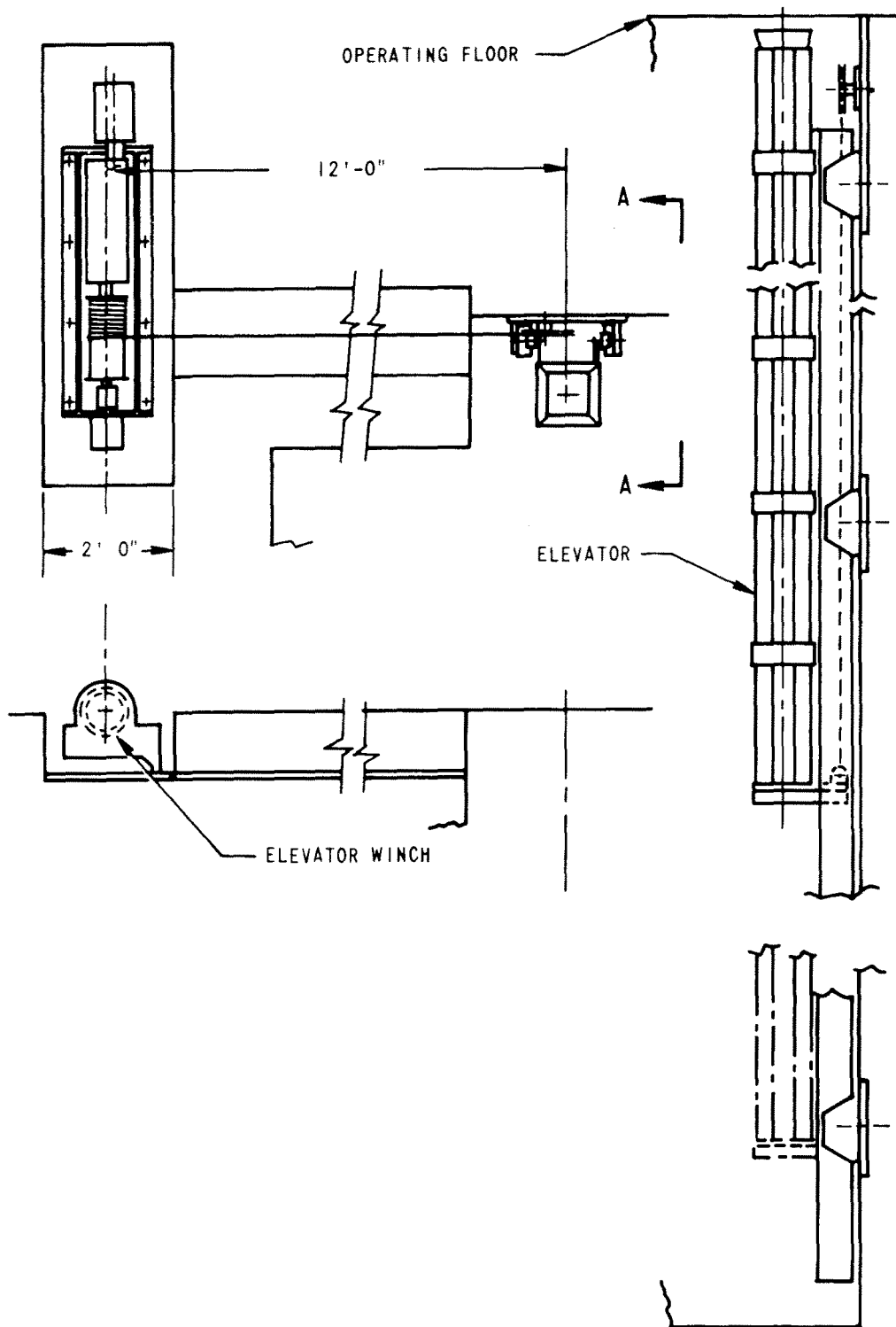
**HOOK LIMITS FOR
SPENT FUEL POOL
BRIDGE CRANE**



REV. OL-10
11/98

CALLAWAY PLANT

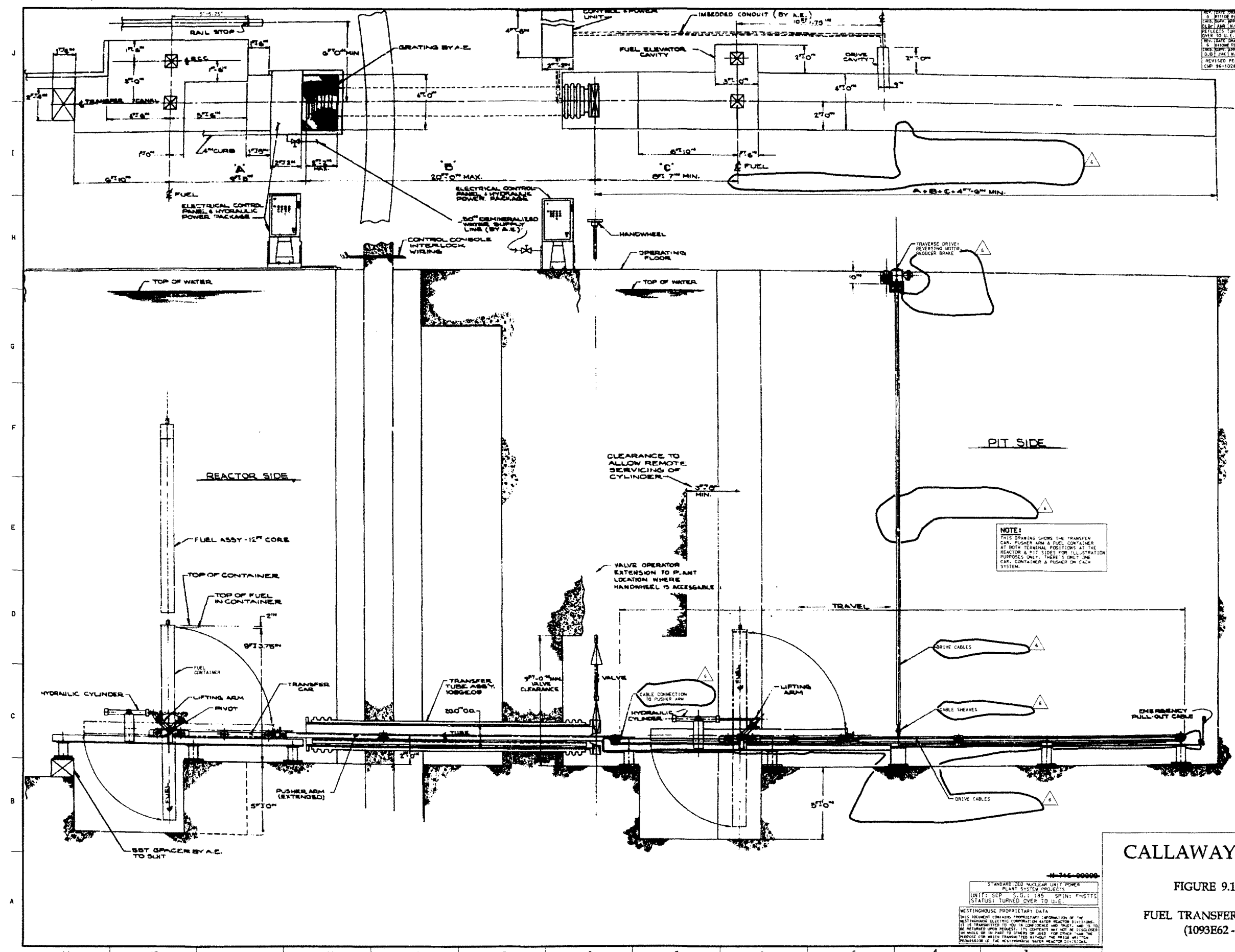
FIGURE 9.1-10
REFUELING MACHINE



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CALLAWAY PLANT

FIGURE 9.1-11
NEW FUEL ELEVATOR



REV. DATE DRAWN
 5. 8/80 JLM
 6. 8/80 JLM
 7. 8/80 JLM
 8. 8/80 JLM
 9. 8/80 JLM
 10. 8/80 JLM
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 12. 8/80 JLM
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 97. 8/80 JLM
 98. 8/80 JLM
 99. 8/80 JLM
 100. 8/80 JLM

NOTE:
 THIS DRAWING SHOWS THE TRANSFER
 CAR, PUSHER ARM & FUEL CONTAINER
 AT BOTH TERMINAL POSITIONS AT THE
 REACTOR & PIT SIDES FOR ILLUSTRATION
 PURPOSES ONLY. THERE IS ONLY ONE
 CAR, CONTAINER & PUSHER ON EACH
 SYSTEM.

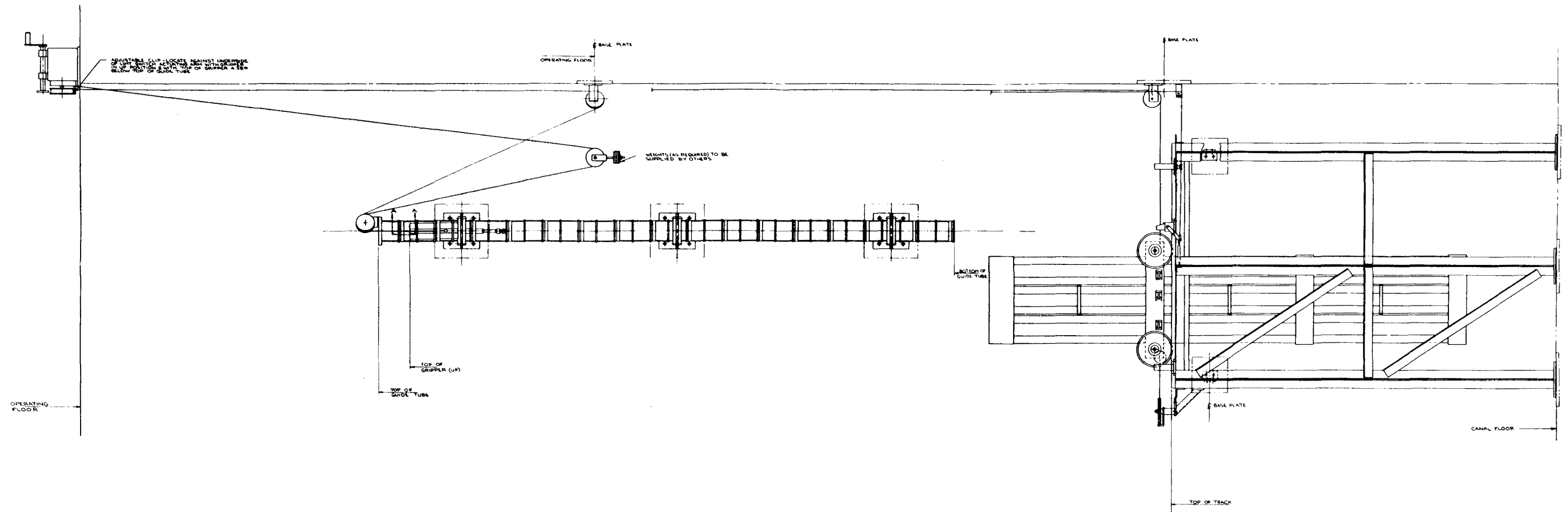
CALLAWAY PLANT

FIGURE 9.1-12

FUEL TRANSFER SYSTEM
 (1093B62-6)

REV OL-10 11/98

STANDARDIZED NUCLEAR UNIT POWER
 PLANT SYSTEM PROJECTS
 UNIT: SCP 3.0: 195 SPIN: FHSTTS
 STATUS: TURNED OVER TO U.E.
 WESTINGHOUSE PROPRIETARY DATA
 THIS DOCUMENT CONTAINS PROPRIETARY INFORMATION OF THE
 WESTINGHOUSE ELECTRIC CORPORATION AND IS NOT TO BE
 REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY
 MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING,
 RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL
 SYSTEM, WITHOUT THE WRITTEN PERMISSION OF THE WESTINGHOUSE
 ELECTRIC CORPORATION.

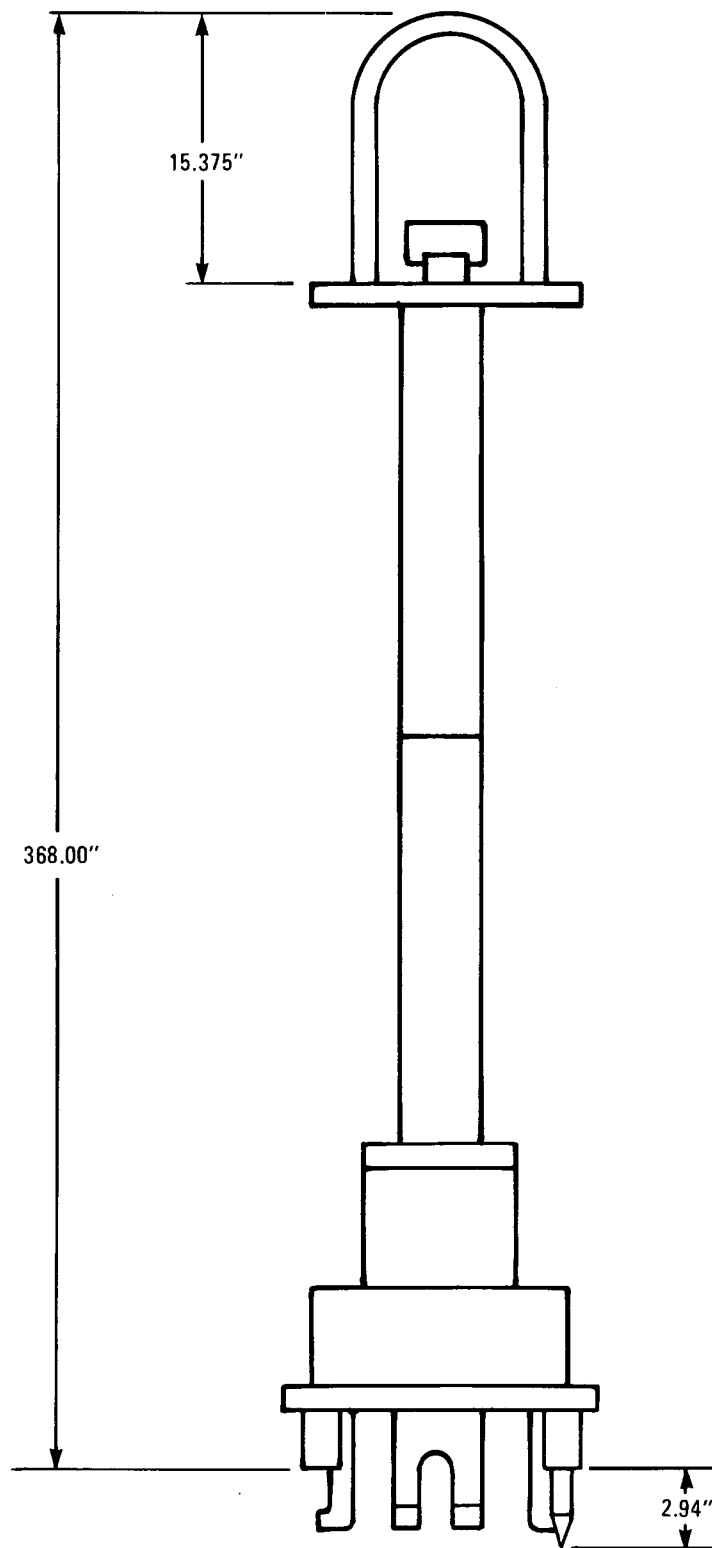


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CALLAWAY PLANT

FIGURE 9.1-13

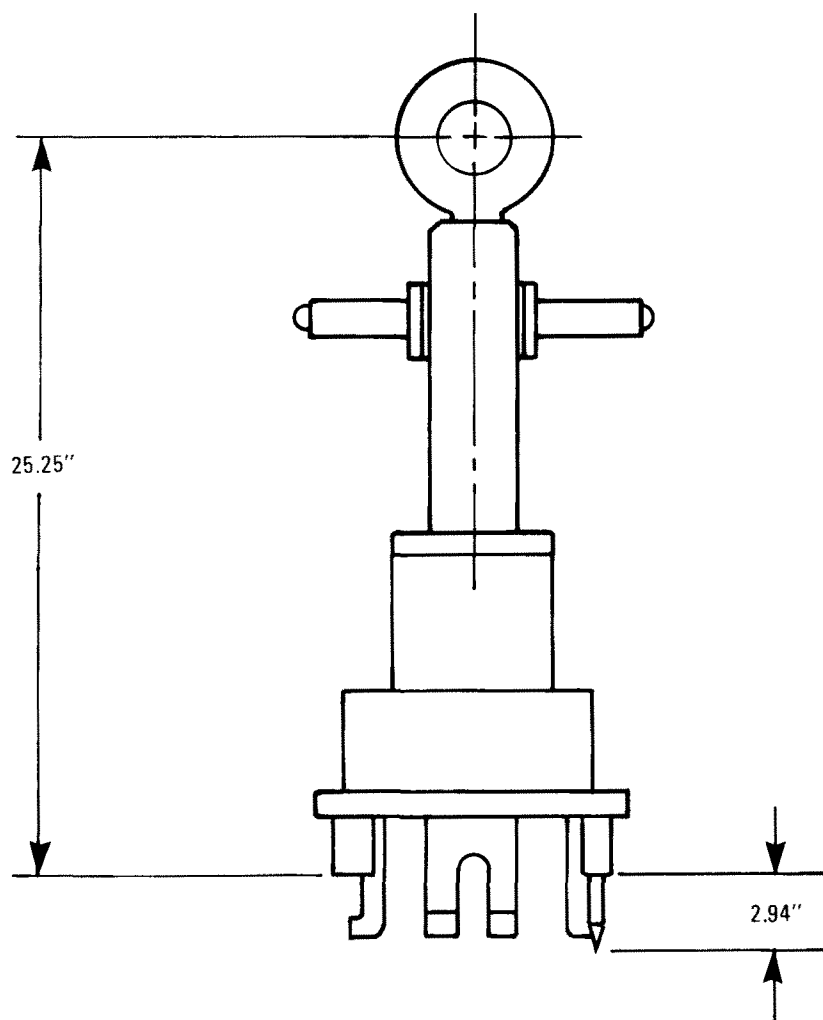
ROD CLUSTER CONTROL
CHANGING FIXTURE



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6/86

CALLAWAY PLANT

**FIGURE 9.1-14
SPENT FUEL HANDLING TOOL**



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CALLAWAY PLANT

**FIGURE 9.1-15
NEW FUEL HANDLING TOOL**

Figure 9.1-16 Deleted

Figure 9.1-17a Deleted

Figure 9.1-18 has been deleted.

Figure 9.1-19 has been deleted.

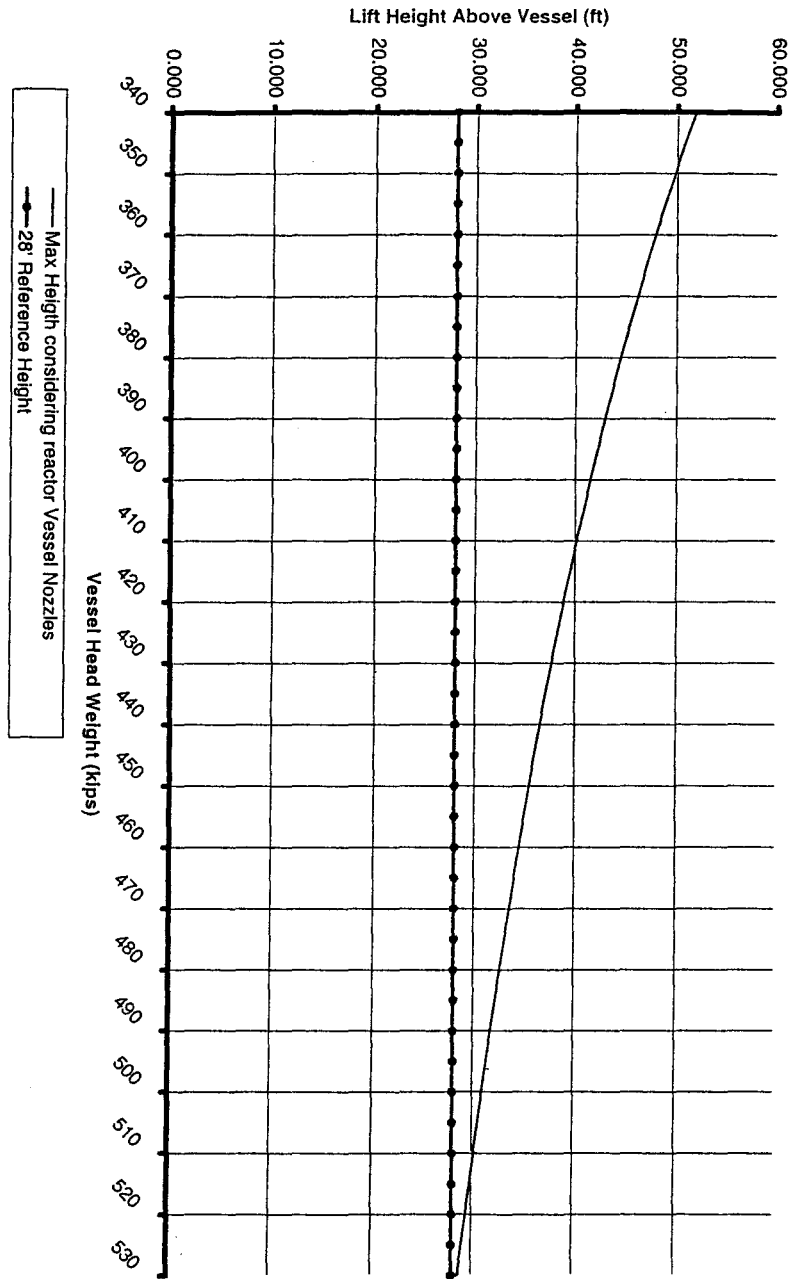
Figure 9.1-20 has been deleted.

Figure 9.1-21 has been deleted.

Figure 9.1-22 has been deleted.

Figure 9.1-23 has been deleted.

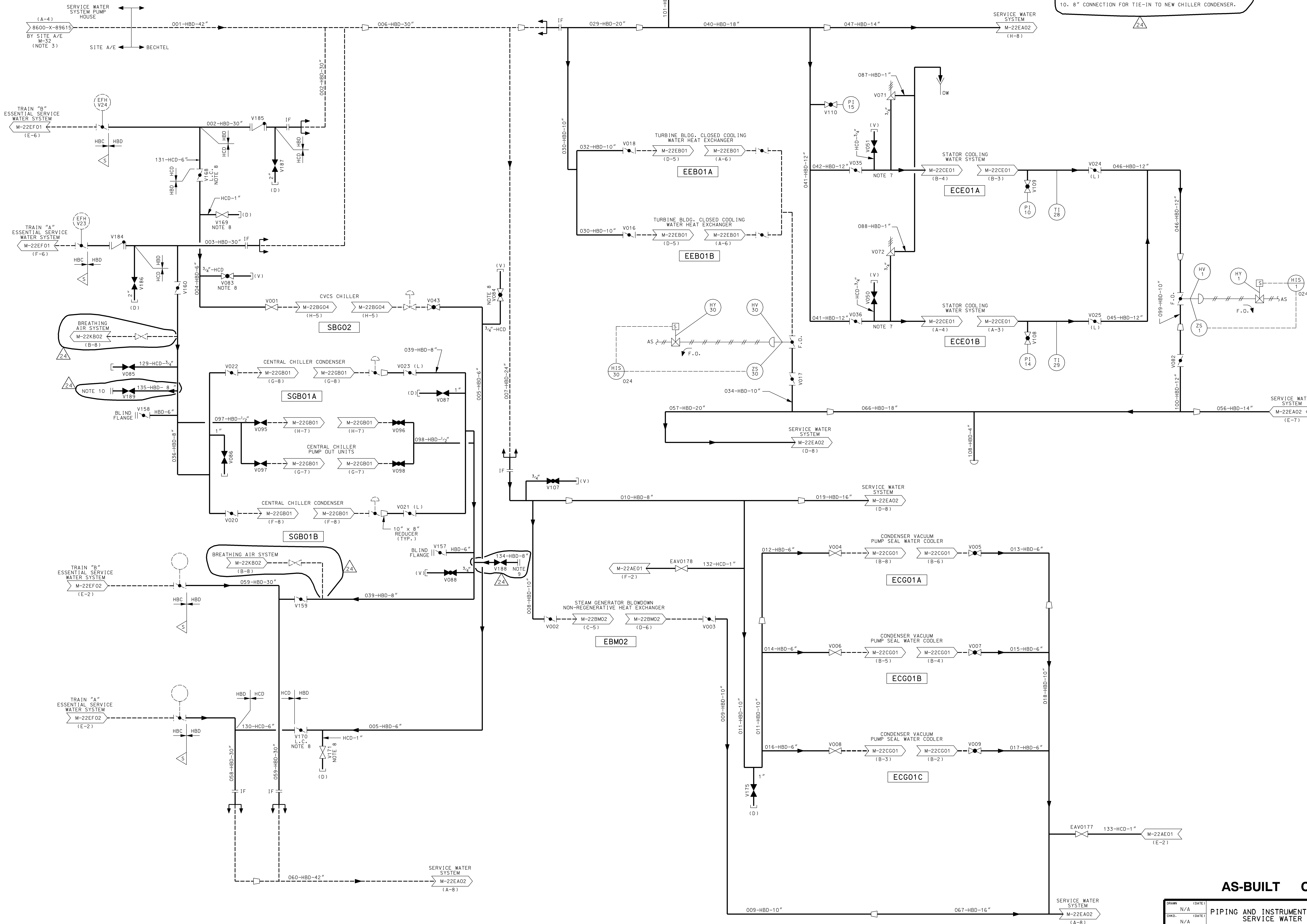
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5/03

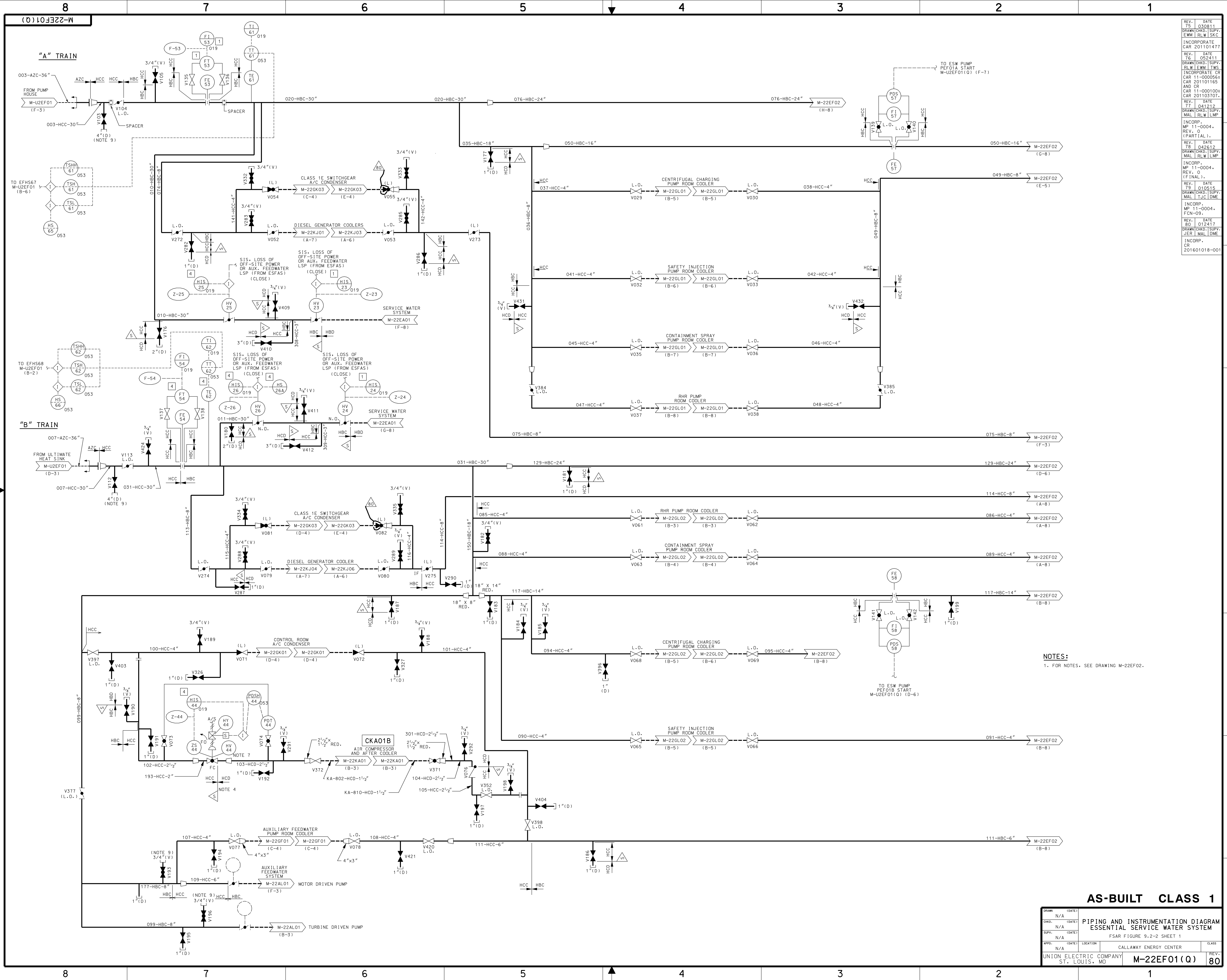
CALLAWAY PLANT
FIGURE 9.1-25
Head Weight vs. Lift Height

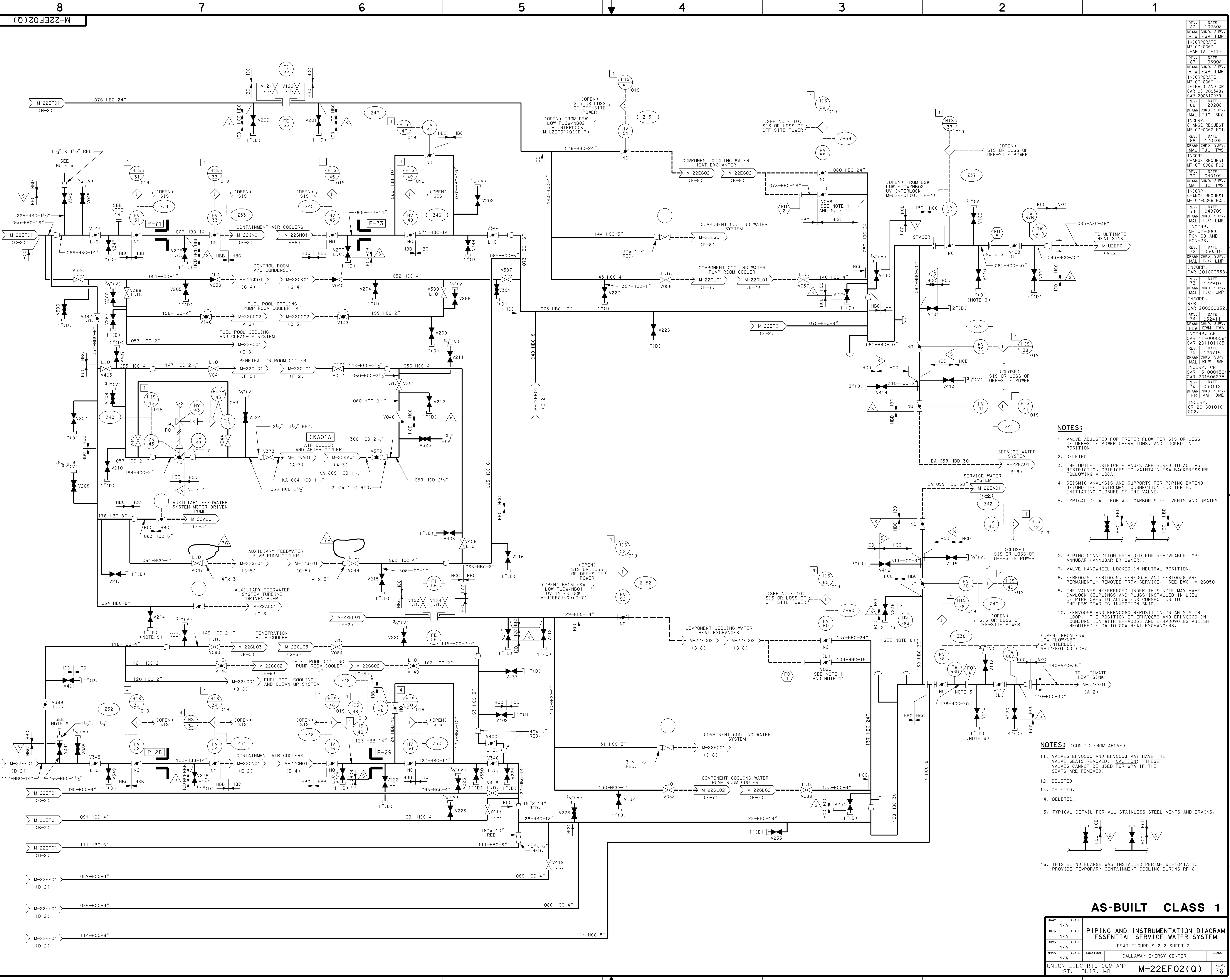
- NOTES:
1. DELETED
 2. DELETED
 3. MECHANICAL DESIGNATION PER M-26001.
 4. DELETED
 5. DELETED.
 6. DELETED.
 7. 3/4" RELIEF LINES UP TO RELIEF VALVES EAV071 AND EAV072 MAY BE HBD OR HCD.
 8. THE VALVE POSITIONS SHOWN ARE FOR DRY LAYUP OF THE SERVICE WATER TO CVCS CHILLER UNIT SUPPLY AND RETURN PIPING.
 9. 8" CONNECTION FOR TIE-IN FROM NEW CHILLER CONDENSER.
 10. 8" CONNECTION FOR TIE-IN TO NEW CHILLER CONDENSER.



AS-BUILT CLASS 1

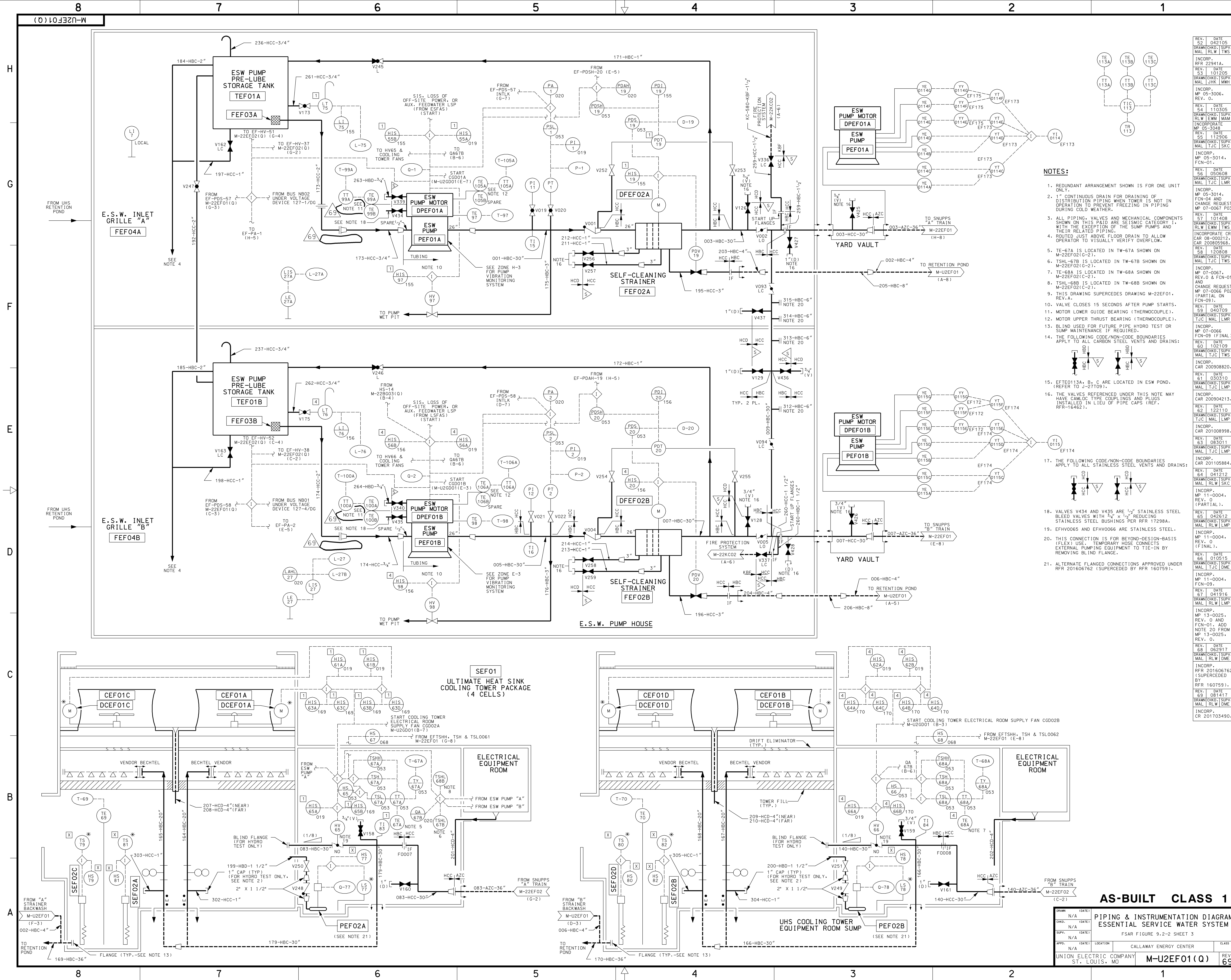
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DRAWN	N/A	DATE	
CHKD.	N/A	DATE	
SUPV.	N/A	DATE	
APPD.	N/A	DATE	
UNION ELECTRIC COMPANY		ST. LOUIS, MO	
M-22EA01		REV. 24	

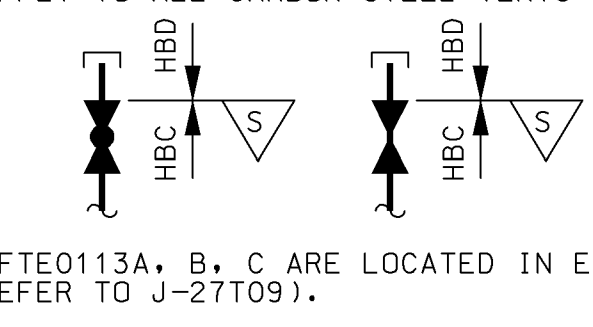
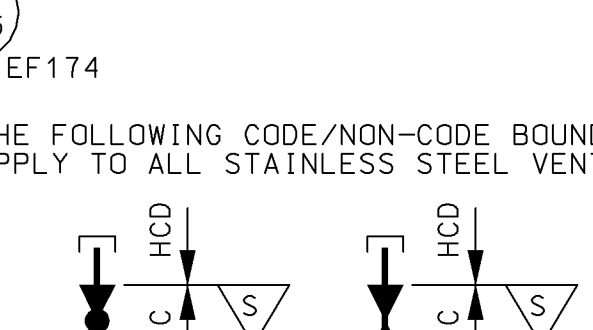




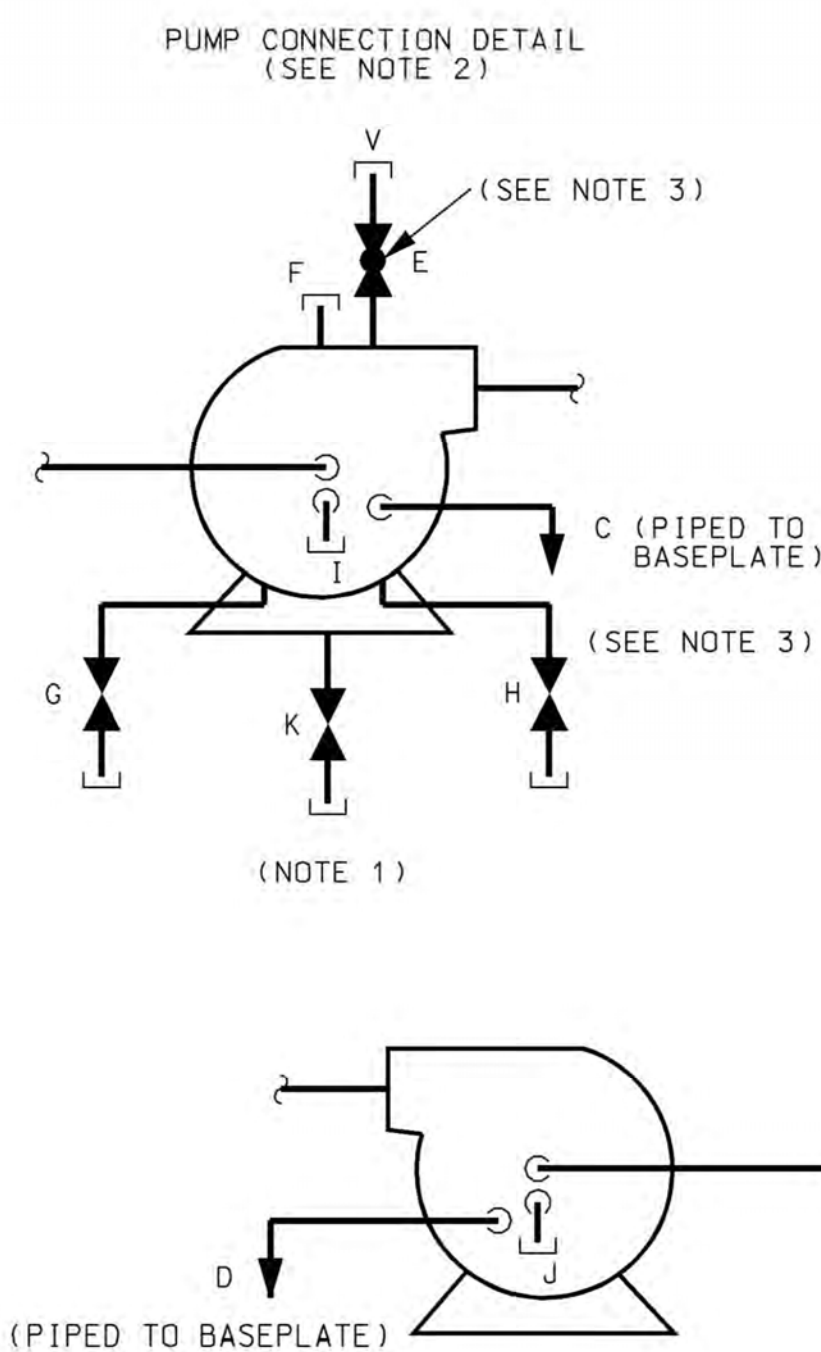
- NOTES:**
1. VALVE ADJUSTED FOR PROPER FLOW FOR SIS OR LOSS POSITION.
 2. DELETED
 3. THE OUTLET ORIFICE FLANGES ARE BORED TO ACT AS RESTRICTION ORIFICES TO MAINTAIN ESW BACKPRESSURE FOLLOWING A LOCA.
 4. SEISMIC ANALYSIS AND SUPPORTS FOR PIPING EXTEND BEYOND THE INSTRUMENT CONNECTION FOR THE PDT INITIATING CLOSURE OF THE VALVE.
 5. TYPICAL DETAIL FOR ALL CARBON STEEL VENTS AND DRAINS.
 6. PIPING CONNECTION PROVIDED FOR REMOVEABLE TYPE ANNUBAR (ANNUBAR BY OWNER).
 7. VALVE HANDWHEEL LOCKED IN NEUTRAL POSITION.
 8. EFR0035, EFR0036, EFR0037 AND EFR0038 ARE PERMANENTLY REMOVED FROM SERVICE. SEE DWG. M-20050.
 9. THE VALVES REFERENCED UNDER THIS NOTE MAY HAVE CAMLOCK COUPLERS AND PLUGS INSTALLED IN LIEU OF PIPE CAPS TO ALLOW FOR CONNECTION TO THE ESW DEADLEG INJECTION SKID.
 10. EFW0059 AND EFW0060 DEPOSITION ON AN SIS OR LOOP. THE POSITION OF EFW0059 AND EFW0060 IN CONJUNCTION WITH EFW0058 AND EFW0060 ESTABLISH REQUIRED FLOW TO CW HEAT EXCHANGERS.
 11. VALVES EFW0090 AND EFW0058 MAY HAVE THE VALVE SEATS REMOVED. CAUTION: THESE VALVES CANNOT BE USED FOR WPA IF THE SEATS ARE REMOVED.
 12. DELETED
 13. DELETED.
 14. DELETED.
 15. TYPICAL DETAIL FOR ALL STAINLESS STEEL VENTS AND DRAINS.
 16. THIS BLIND FLANGE WAS INSTALLED PER MP 92-1041A TO PROVIDE TEMPORARY CONTAINMENT COOLING DURING RF-6.

AS-BUILT CLASS 1			
PIPING AND INSTRUMENTATION DIAGRAM ESSENTIAL SERVICE WATER SYSTEM			
DRWN	N/A	DATE	
CHG	N/A	DATE	
SUPV	N/A	DATE	
APP	N/A	DATE	
LOC	N/A	LOCATION	CALLAWAY ENERGY CENTER
CLASS	N/A	CLASS	
UNION ELECTRIC COMPANY ST. LOUIS, MO			REV. 76



- NOTES:**
1. REDUNDANT ARRANGEMENT SHOWN IS FOR ONE UNIT ONLY.
 2. 1" CONTINUOUS DRAIN FOR DRAINING OF DISTRIBUTION PIPING WHEN TOWER IS NOT IN OPERATION TO PREVENT FREEZING IN PIPING DURING COLD WEATHER.
 3. ALL PIPING, VALVES AND MECHANICAL COMPONENTS SHOWN ON THIS PAID ARE SEISMIC CATEGORY I, WITH THE EXCEPTION OF THE PUMP PUMPS AND THEIR RELATED PIPING.
 4. ROUTED JUST ABOVE FLOOR DRAIN TO ALLOW OPERATOR TO VISUALLY VERIFY OVERFLOW.
 5. TE-67A IS LOCATED IN TW-67A SHOWN ON M-22EF02(G-2).
 6. TSHL-67B IS LOCATED IN TW-67B SHOWN ON M-22EF02(G-2).
 7. TE-68A IS LOCATED IN TW-68A SHOWN ON M-22EF02(G-2).
 8. TSHL-68B IS LOCATED IN TW-68B SHOWN ON M-22EF02(G-2).
 9. THIS DRAWING SUPERCEDES DRAWING M-22EF01, REV. A.
 10. VALVE CLOSING 15 SECONDS AFTER PUMP STARTS.
 11. MOTOR LOWER GUIDE BEARING (THERMOCOUPLE).
 12. MOTOR UPPER THRUST BEARING (THERMOCOUPLE).
 13. BLIND USED FOR FUTURE PIPE HYDRO TEST OR PUMP MAINTENANCE IF REQUIRED.
 14. THE FOLLOWING CODE/NON-CODE BOUNDARIES APPLY TO ALL CARBON STEEL VENTS AND DRAINS:

 15. EFE0113A, B, C ARE LOCATED IN ESW POND. (REFER TO J-27109).
 16. THE VALVES REFERENCED UNDER THIS NOTE MAY HAVE CAMLOC TYPE COUPLINGS AND PLUGS INSTALLED IN LIEU OF PIPE CAPS (REF. RFR-16462).
 17. THE FOLLOWING CODE/NON-CODE BOUNDARIES APPLY TO ALL STAINLESS STEEL VENTS AND DRAINS:

 18. VALVES V434 AND V435 ARE 1/2" STAINLESS STEEL BLEED VALVES WITH 3/4" X 1/2" REDUCING STAINLESS STEEL BUSHINGS PER RFR 17298A.
 19. EFHV006S AND EFHV006G ARE STAINLESS STEEL.
 20. THIS CONNECTION IS FOR BEYOND-DESIGN-BASIS (FLEX) USE. TEMPORARY HOSE CONNECTS EXTERNAL PUMPING EQUIPMENT TO TIE-IN BY REMOVING BLIND FLANGE.
 21. ALTERNATE FLANGED CONNECTIONS APPROVED UNDER RFR 201606762 (SUPERCEDED BY RFR 160759).

AS-BUILT CLASS 1			
PIPING & INSTRUMENTATION DIAGRAM ESSENTIAL SERVICE WATER SYSTEM			
FSAR FIGURE 9.2-2 SHEET 3			
DRWN	N/A	DATE	
CHGO	N/A	DATE	
SUPV	N/A	DATE	
APPD	N/A	LOCATION	CALLAWAY ENERGY CENTER
UNION ELECTRIC COMPANY			REV. 69
ST. LOUIS, MO			M-U2EF01(Q)



NOTES:

1. ALL CAPPED DRAINS : DRAIN TO PORTABLE CONTAINER OR TO THE COMPONENT COOLING WATER SURGE TANK VIA PORTABLE PUMP.
2. THE FOLLOWING APPLIES TO ALL VENTS, DRAINS, LOCAL SAMPLES-FLUSH CONNECTIONS, TEST CONNECTIONS AND FLOW TAPS:

3. USE THIS DETAIL FOR PUMPS PEG01B & D ONLY.

4. PUMP MOTOR DRIVING END BEARING TEMPERATURE (THERMOCOUPLE).

5. PUMP MOTOR OUTBOARD END BEARING TEMPERATURE (THERMOCOUPLE).

6. DEFLECTED

7. FIELD TO PROCURE 1/8" THICK ORIFICE PLATE WITH 3/16" BORE TO MINIMIZE FLOW TO RE.

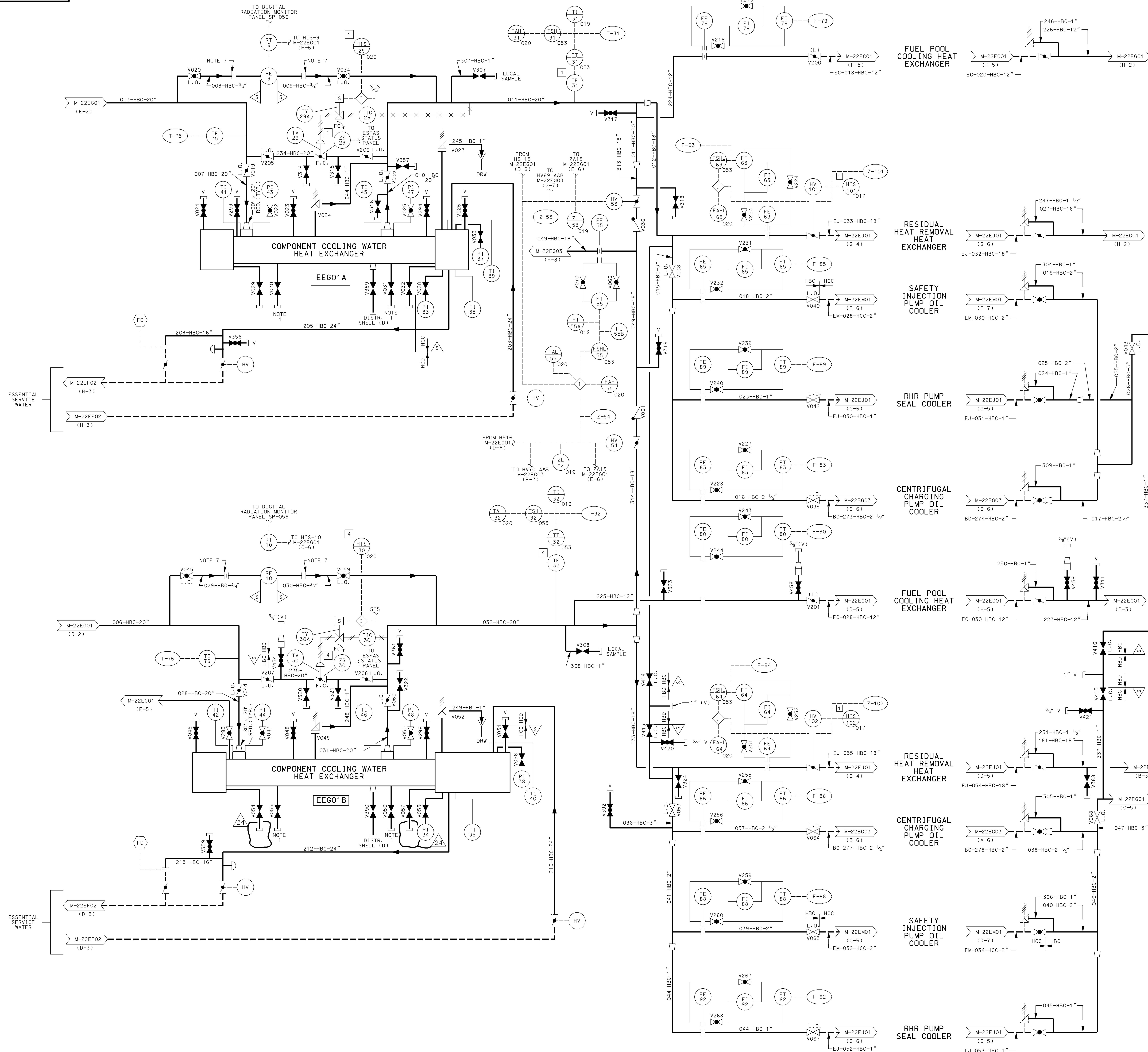
8. CORROSION TEST COUPON RACK SEG01B IS INSTALLED IN REMOVABLE SPOOL PIECE.

9. VALVE TO BE INSTALLED IN EITHER DIRECTION.

10. VALVE HANDWHEEL LOCKED IN NEUTRAL POSITION.

AS-BUILT CLASS 1

DRAWN	(DATE)	PIPING AND INSTRUMENTATION DIAGRAM COMPONENT COOLING WATER SYSTEM FAR FIGURE 9.2-3 SHEET 1			
N/A					
CHKD.	(DATE)				
N/A					
SUPV.	(DATE)	FAR FIGURE 9.2-3 SHEET 1			
N/A					
APPD.	(DATE)	LOCATION	CALLAWAY ENERGY CENTER	11	CLASS
N/A					
UNION ELECTRIC COMPANY			M-22EG01(Q)		REV. 11
ST. LOUIS, MO					



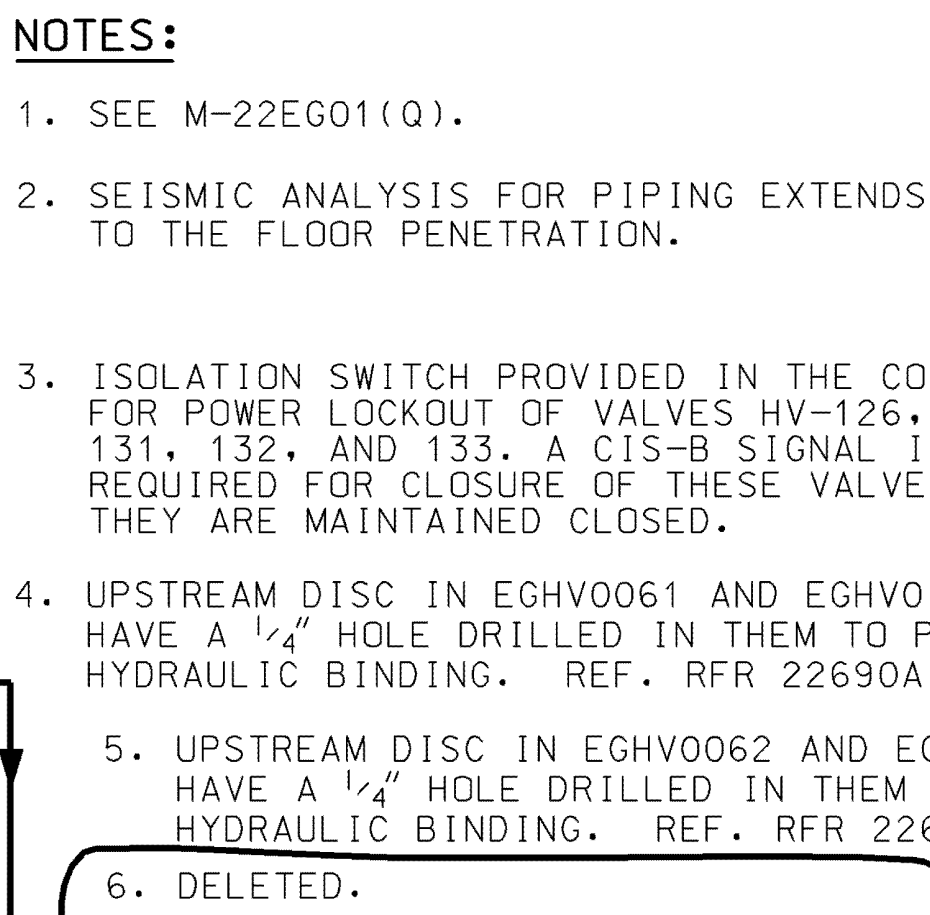
NOTES:

1. SEE M-22EG01 (Q) FOR ALL NOTES.

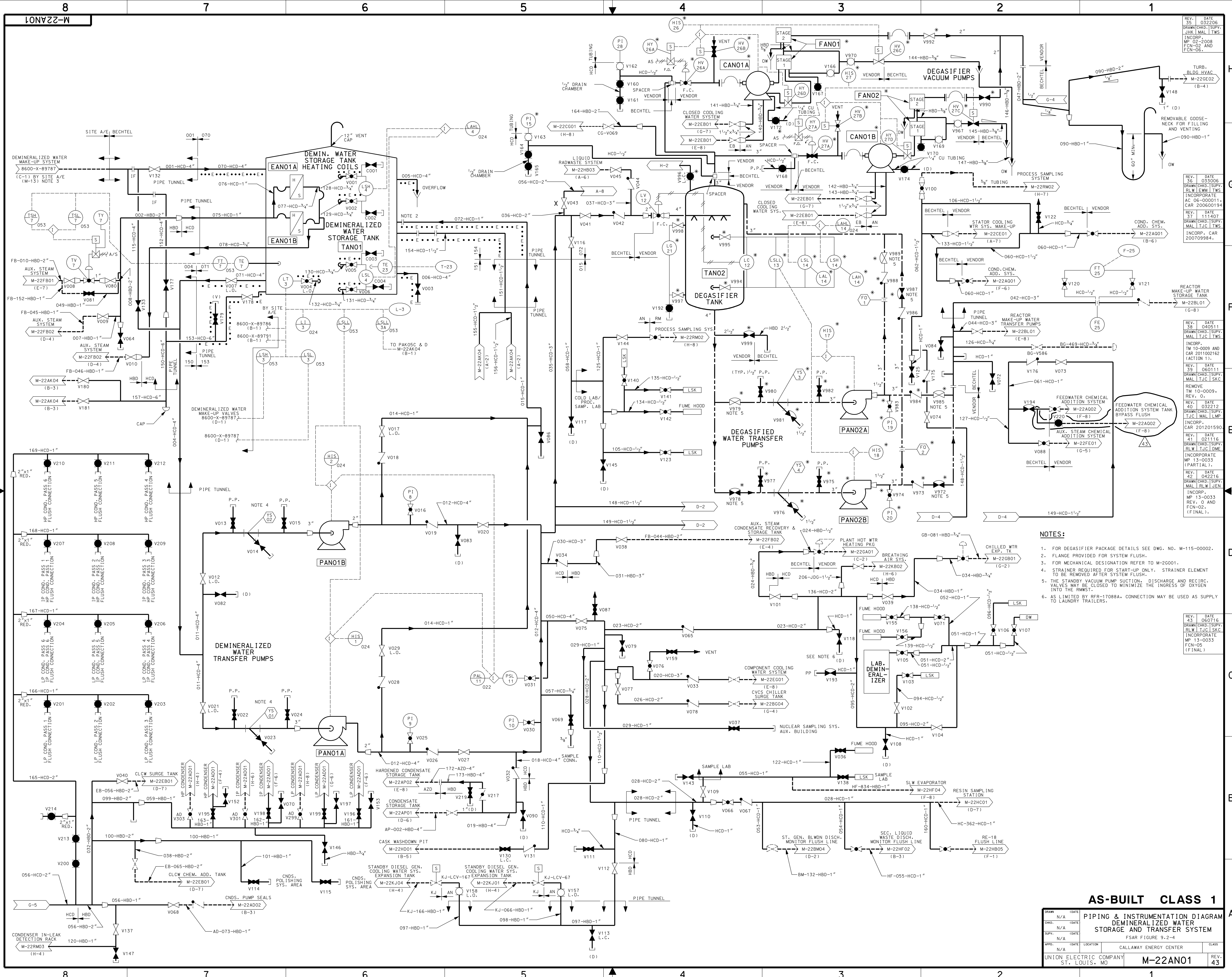
AS-BUILT CLASS

DRWN	(DATE)	N/A			PIPING & INSTRUMENTATION DIAGRAM COMPONENT COOLING WATER SYSTEM FSAR FIGURE 9.2-3 SHEET 2
CHKD	(DATE)	N/A			
SUPV	(DATE)	N/A			
APPD	(DATE)	LOCATION	CALLAWAY ENERGY CENTER		
UNION ELECTRIC COMPANY ST. LOUIS, MO		M-22EG02 (Q)			REV

REV. DATE DRAWN
4 022692 GDC
CHKD. SUPV. APPD.
DLM AMR N/A
REDRAWN FOR
CLARITY
REV. DATE DRAWN
5 012894 DLM
DLM AMR N/A
R/LW TJC N/A
INCORP.
RFR-10274
REV. DATE DRAWN
6 091494 DLM
DLM AMR APPD.
HLP AMR N/A
INCORP.
RFR-150034
REV. DATE DRAWN
7 091508 R/LW
CHKD. SUPV. APPD.
DLM AMR N/A
INCORP.
DEC-1250
REV. DATE DRAWN
8 091598 R/LW
CHKD. SUPV. APPD.
DLM AMR N/A
INCORP.
DEC-1418
REV. DATE DRAWN
9 063039 DLM
DLM AMR APPD.
R/LW AMR N/A
INCORP.
DEC-1418
REV. DATE DRAWN
10 063039 R/LW
CHKD. SUPV. APPD.
DLM AMR N/A
INCORP.
RFR-189324
REV. DATE DRAWN
11 062598 R/LW
CHKD. SUPV. APPD.
SKC AMR N/A
INCORP.
DEC-1222A
REV. DATE DRAWN
12 041901 R/LW
CHKD. SUPV. APPD.
MAL DTW N/A
INCORP.
MP-01-1012A
(PARTIAL)
REV. DATE DRAWN
13 080804 R/LW
CHKD. SUPV. APPD.
MAL DTW N/A
INCORP.
MP-00-1012A
REV. DATE DRAWN
14 080804 R/LW
CHKD. SUPV. APPD.
EWM TWS N/A
INCORP.
MP-01-1002
F-06
REV. DATE
15 042005
DRAWN CHKD. SUPV.
TJC MAL TWS
INCORP.
RFR 229414
REV. DATE
16 101005
DRAWN CHKD. SUPV.
TJC MAL TWS
INCORPORATE
MP-04-1009A
(PARTIAL)
REV. DATE
17 102005
DRAWN CHKD. SUPV.
TJC MAL SKC
INCORP.
MP-04-1009A.
REV. DATE
18 123008
DRAWN CHKD. SUPV.
MAL TJC TWS
INCORP. REQUEST
MP-07-0067 P3
REV. DATE
19 041009
DRAWN CHKD. SUPV.
MAL TJC TWS
INCORP.
MP-00-0067
(FINAL).
REV. DATE
20 070512
DRAWN CHKD. SUPV.
MAL R/LW TWS
INCORP.
CAR 20110800
REV. DATE
21 032912
DRAWN CHKD. SUPV.
MAL LMP
INCORP.
CAR 20120027
REV. DATE
22 043165
DRAWN CHKD. SUPV.
R/LW MAL LMP
INCORPORATE
MP-00-0032
REV. DATE
23 071117
DRAWN CHKD. SUPV.
MAL R/LW DME
REV. DATE
24 071817
DRAWN CHKD. SUPV.
R/LW DME
INCORP.
MP-06-0036,
(PARTIAL).
REV. DATE
25 071817
DRAWN CHKD. SUPV.
R/LW DME
INCORP.
MP-06-0036,
(FINAL).



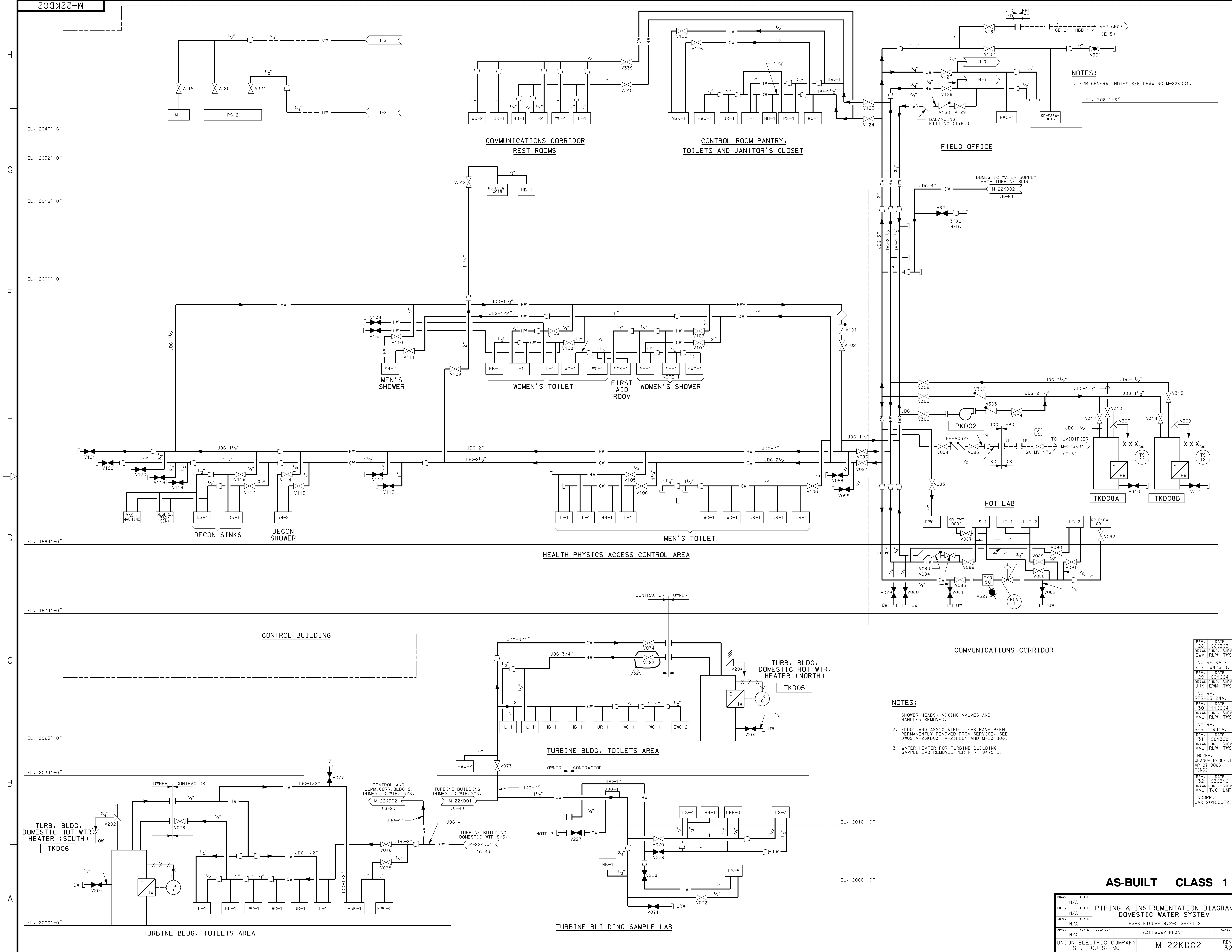
DRWN	(DATE)	PIPING AND INSTRUMENTATION DIAGRAM COMPONENT COOLING WATER SYSTEM PSAR FIGURE 9.2-3 SHEET 3		
N/A				
CHKD	(DATE)			
N/A				
SUPV	(DATE)	FSAR FIGURE 9.2-3 SHEET 3 CALLAWAY PLANT		
N/A				
APFD	(DATE)			
N/A		LOCATION		CLASS
UNION ELECTRIC COMPANY		M-22EG03 (Q)		REV. 24
ST. LOUIS, MO				



- NOTES:**
1. FOR DEGASIFIER PACKAGE DETAILS SEE DWG. NO. M-115-00002.
 2. FLANGE PROVIDED FOR SYSTEM FLUSH.
 3. FOR MECHANICAL DESIGNATION REFER TO M-20001.
 4. STRAINER REQUIRED FOR START-UP ONLY. STRAINER ELEMENT TO BE REMOVED AFTER SYSTEM FLUSH.
 5. THE STANDBY VACUUM PUMP SUCTION, DISCHARGE AND RECIRC. VALVES MAY BE CLOSED TO MINIMIZE THE INGRESS OF OXYGEN INTO THE RMWSI.
 6. AS LIMITED BY RFR-17088A, CONNECTION MAY BE USED AS SUPPLY TO LAUNDRY TRAILERS.

REV.	DATE	DRAWN	CHKD.	DATE	DATE
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AS-BUILT CLASS 1									
PIPING & INSTRUMENTATION DIAGRAM									
DEMINERALIZED WATER STORAGE AND TRANSFER SYSTEM									
FSAR FIGURE 9.2-4									
APPD.	DATE	LOCATION	CLASS						
UNION ELECTRIC COMPANY									
ST. LOUIS, MO									
M-22AN01				REV. 43					



NOTES:
1. FOR GENERAL NOTES SEE DRAWING M-22KD01.
EL. 2061'-6"

NOTES:
1. SHOWER HEADS, MIXING VALVES AND HANDLES REMOVED.
2. EKD01 AND ASSOCIATED ITEMS HAVE BEEN PERMANENTLY REMOVED FROM SERVICE. SEE DWGS M-23KD03, M-23FB01 AND M-23FB06.
3. WATER HEATER FOR TURBINE BUILDING SAMPLE LAB REMOVED PER RFR 19475 B.

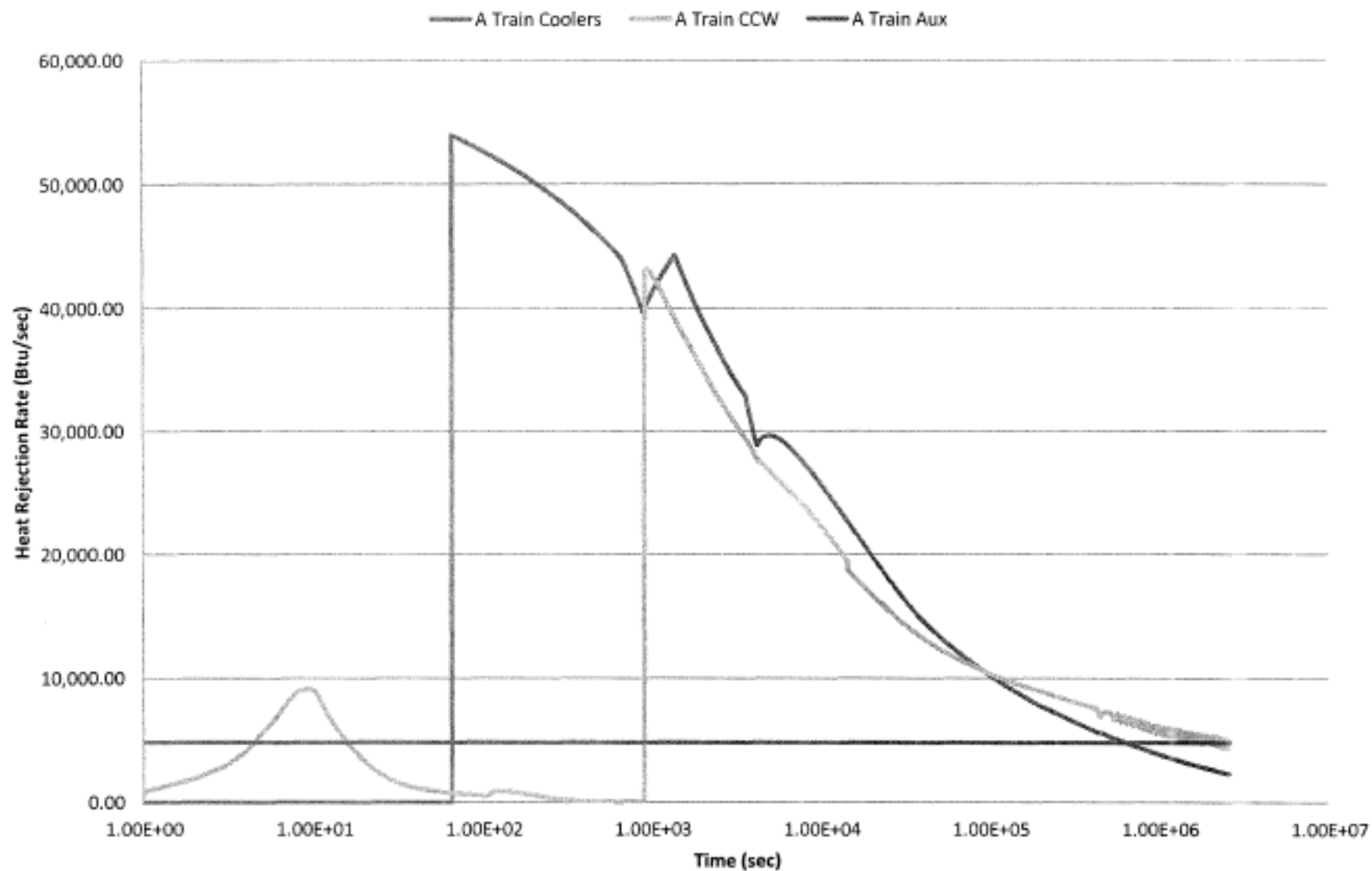
REV.	DATE	DESCRIPTION
28	060503	DRAWN CHD. SUPV. EWM RLW TWS
29	091004	INCORPORATE RFR 19475 B.
30	110904	DRAWN CHD. SUPV. JHK EWM TWS
31	081308	INCORP. RFR-23124A.
32	030310	INCORP. RFR 22941A.
33	070066	DRAWN CHD. SUPV. MAL TJJC LMP
34	01000728	INCORP. CHANGE REQUEST MP 07-0066 FCN02.

AS-BUILT CLASS 1

DRAWN	N/A	DATE	DATE	LOCATION	CLASS
CHD.	N/A	(DATE)	(DATE)		
SUPV.	N/A	(DATE)	(DATE)		
APPD.	N/A	(DATE)	(DATE)		
UNION ELECTRIC COMPANY					
ST. LOUIS, MO					
M-22KD02					
REV.	32				

Figure 9.2-6 replaced with Figures 9.2-6(a) thru 9.2-6(f)

CALLAWAY PLANT
FIGURE 9.2-6
DELETED
REV. 16 9/14

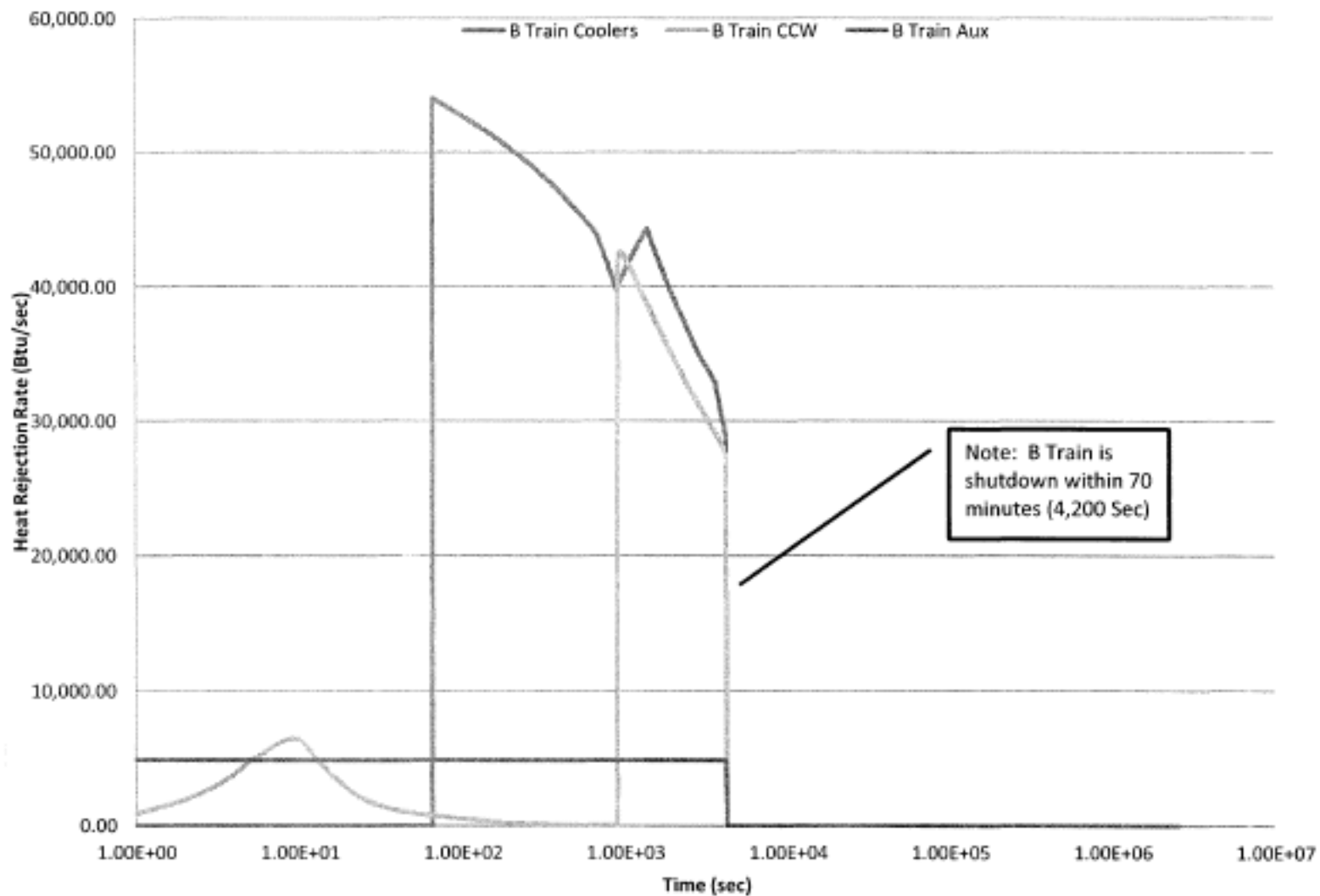


CALLAWAY PLANT

FIGURE 9.2-6(a)

A TRAIN HEAT LOADS TO UHS LBLOCA
(MAXEVAP MODEL W/ VALVE FAILURE)

REV. 0 9/14

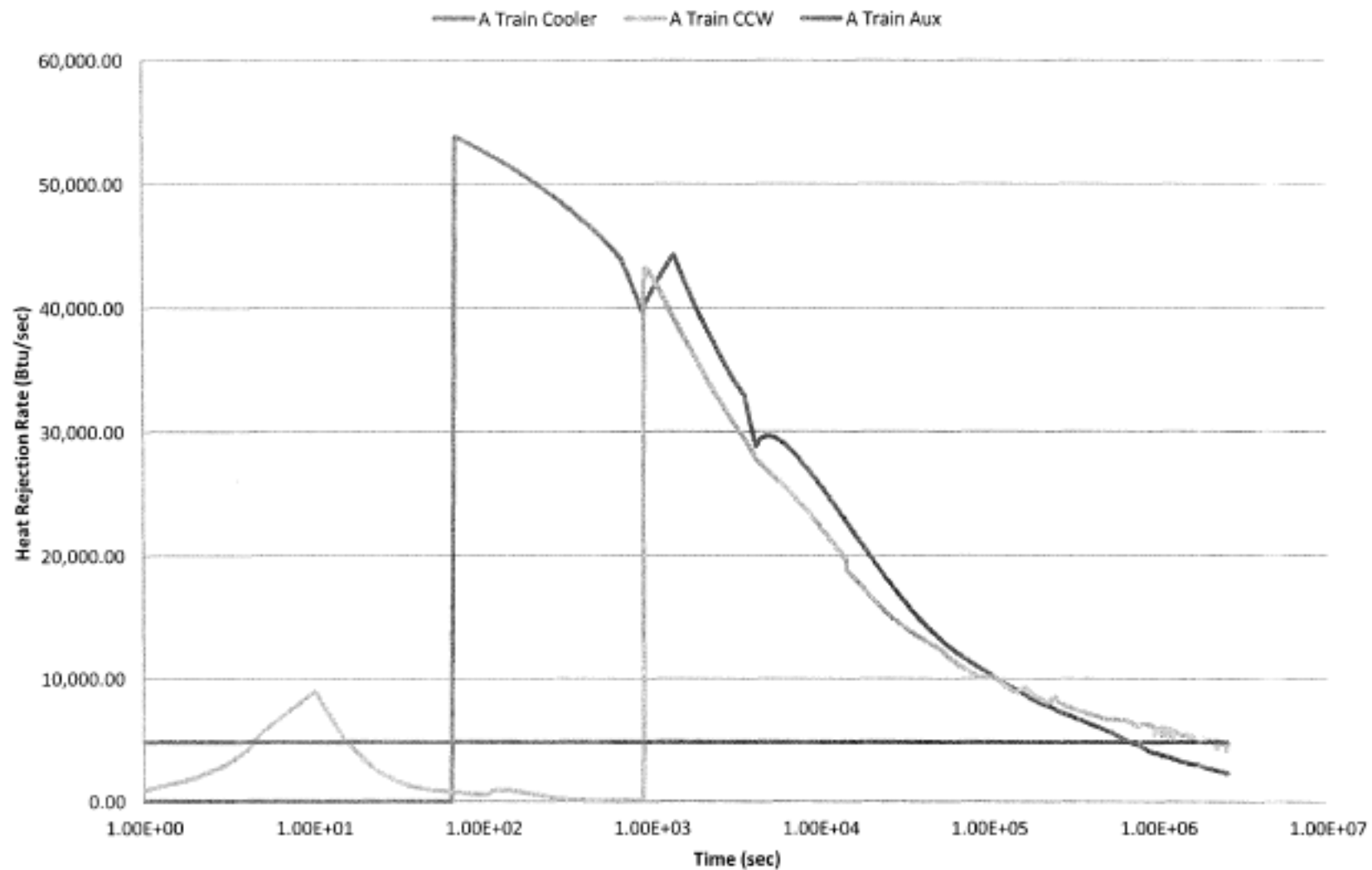


CALLAWAY PLANT

FIGURE 9.2-6(b)

B TRAIN HEAT LOADS TO UHS LBLOCA
(MAXEVAP MODEL W/ VALVE FAILURE)

REV. 0 9/14

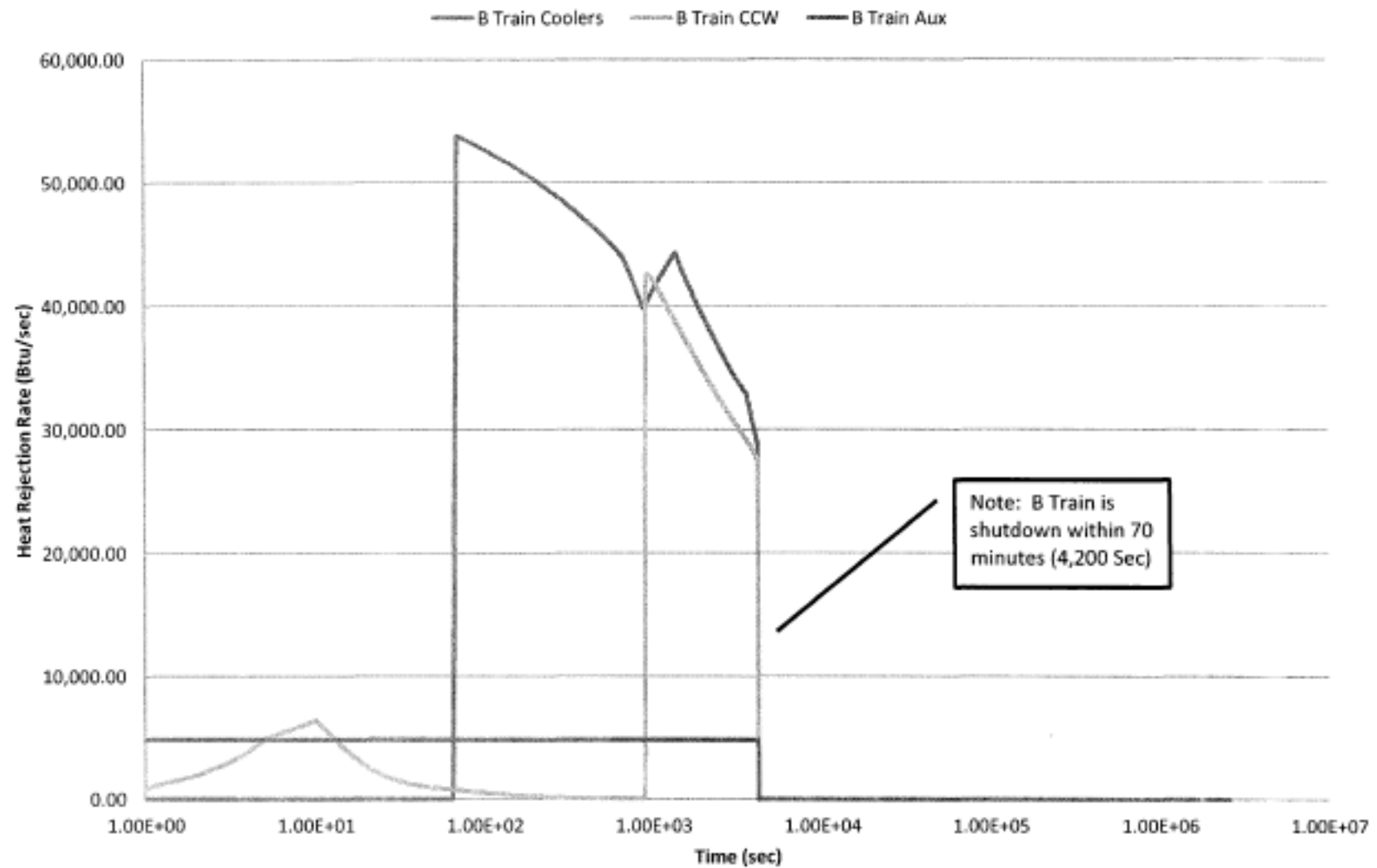


CALLAWAY PLANT

FIGURE 9.2-6(c)

A TRAIN HEAT LOADS TO UHS LBLOCA
(MINHT MODEL W/ VALVE FAILURE)

REV. 0 9/14

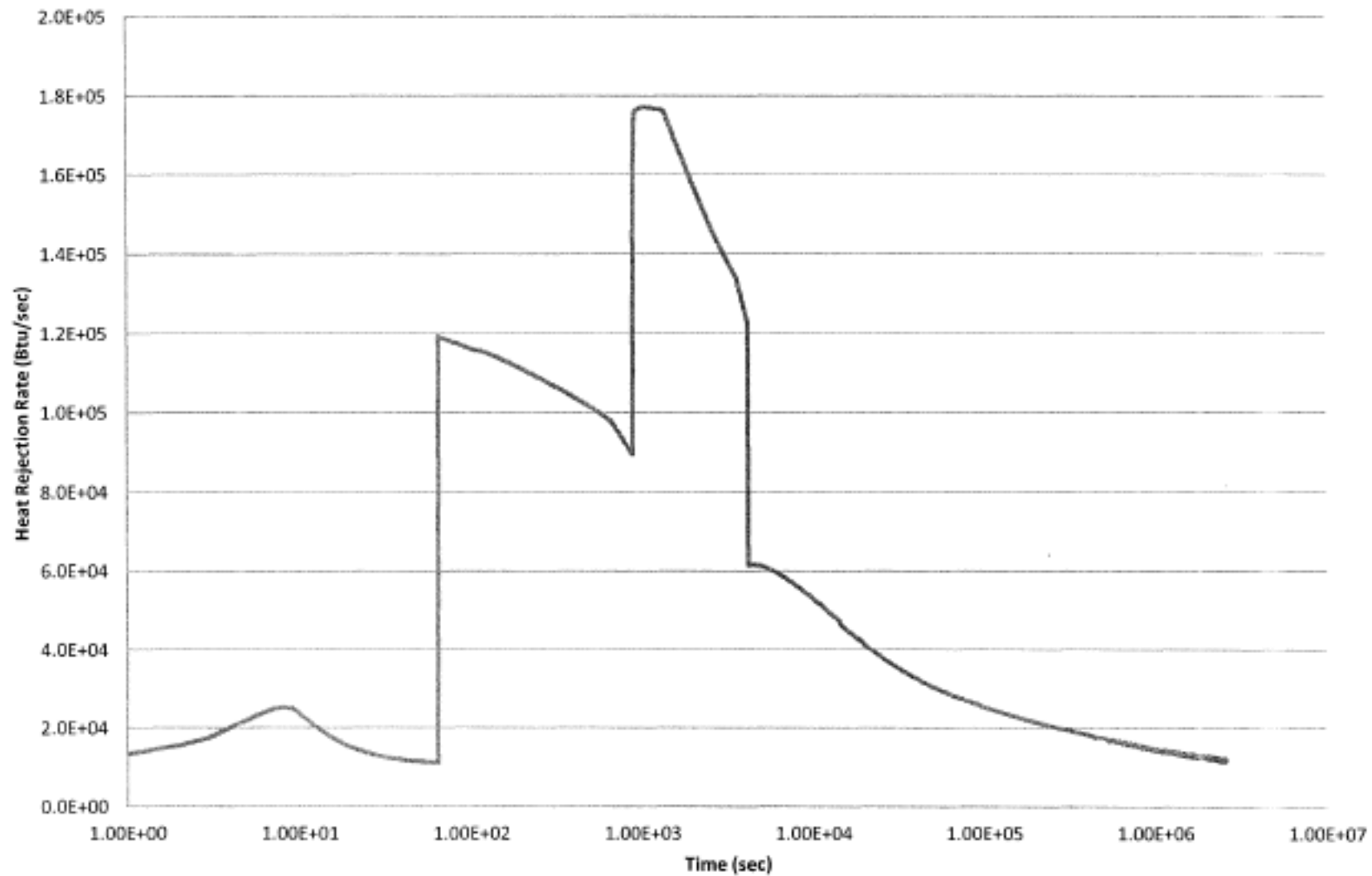


CALLAWAY PLANT

FIGURE 9.2-6(d)

B TRAIN HEAT LOADS TO UHS LBLOCA
(MINHT MODEL W/ VALVE FAILURE)

REV. 0 9/14

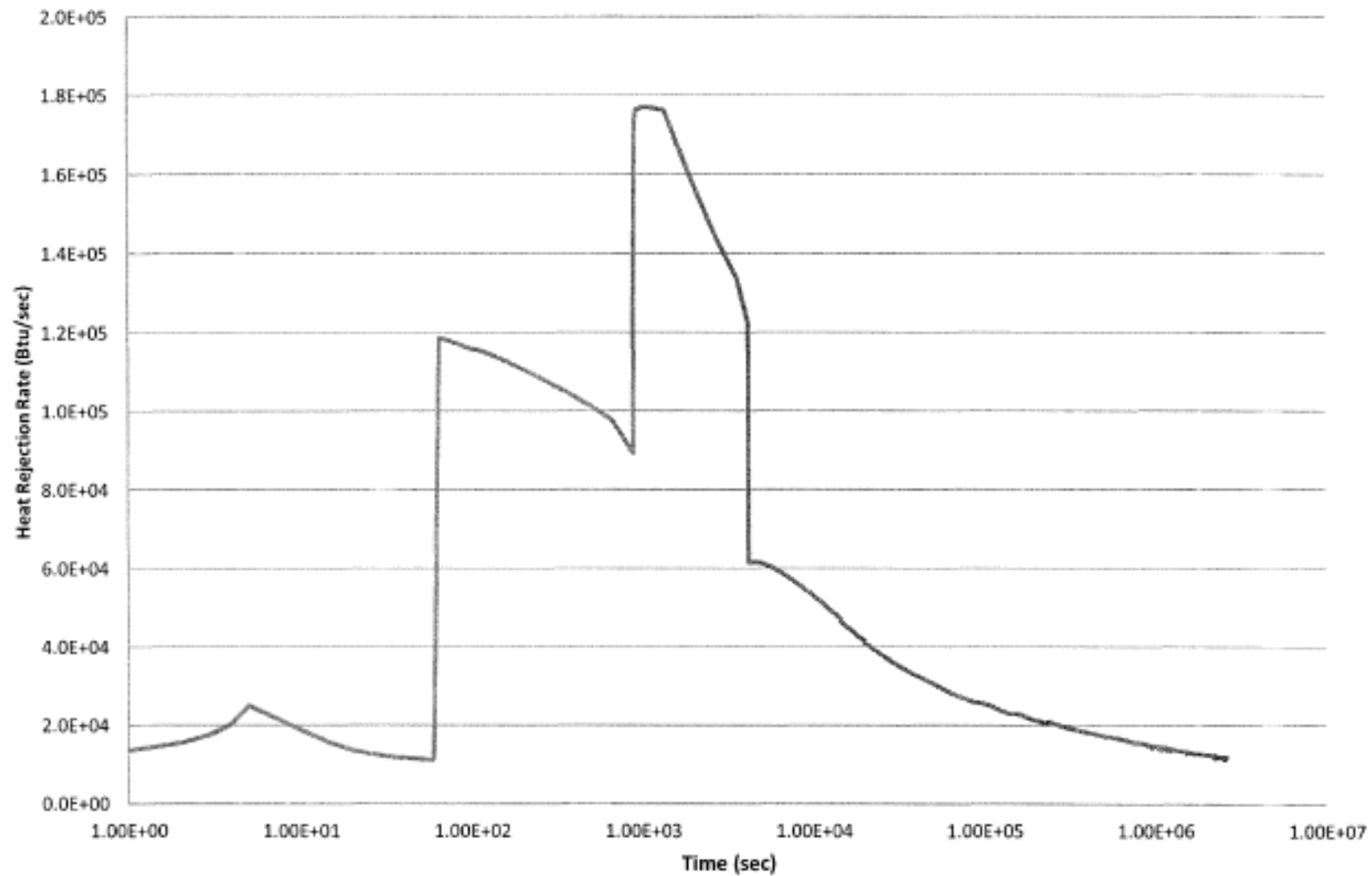


CALLAWAY PLANT

FIGURE 9.2-6(e)

TOTAL HEAT REJECTION RATE TO THE UHS
LBLOCA
(MAXEVAP MODEL W/ VALVE FAILURE)

REV. 0 9/14



CALLAWAY PLANT

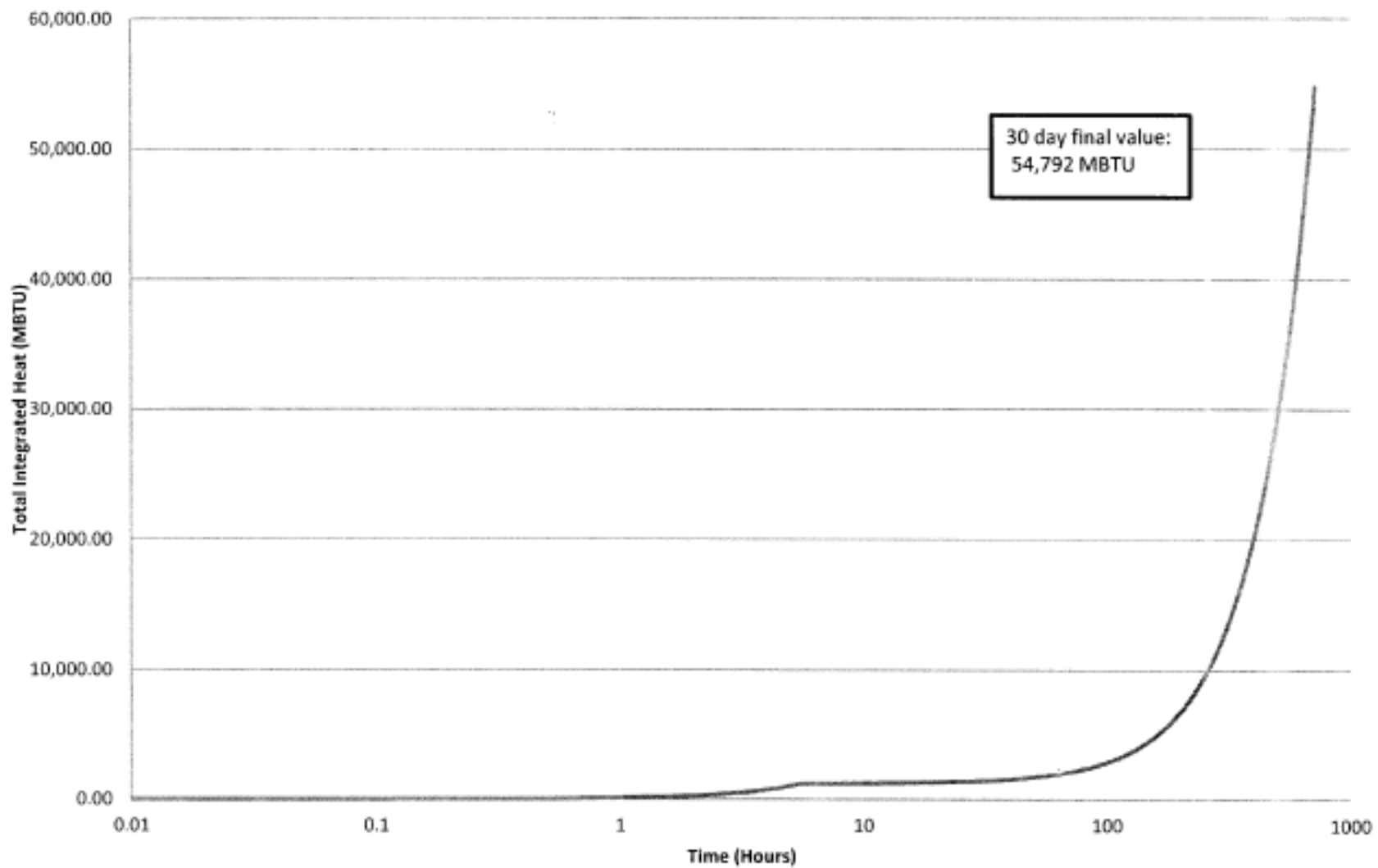
FIGURE 9.2-6(f)

TOTAL HEAT REJECTION RATE TO THE UHS
LBLOCA
(MINHT MODEL W/ VALVE FAILURE)

REV. 0 9/14

Figure 9.2-7 replaced with Figure 9.2-7(a) and 9.2-7(b)

CALLAWAY PLANT
FIGURE 9.2-7
DELETED
REV. 16 9/14

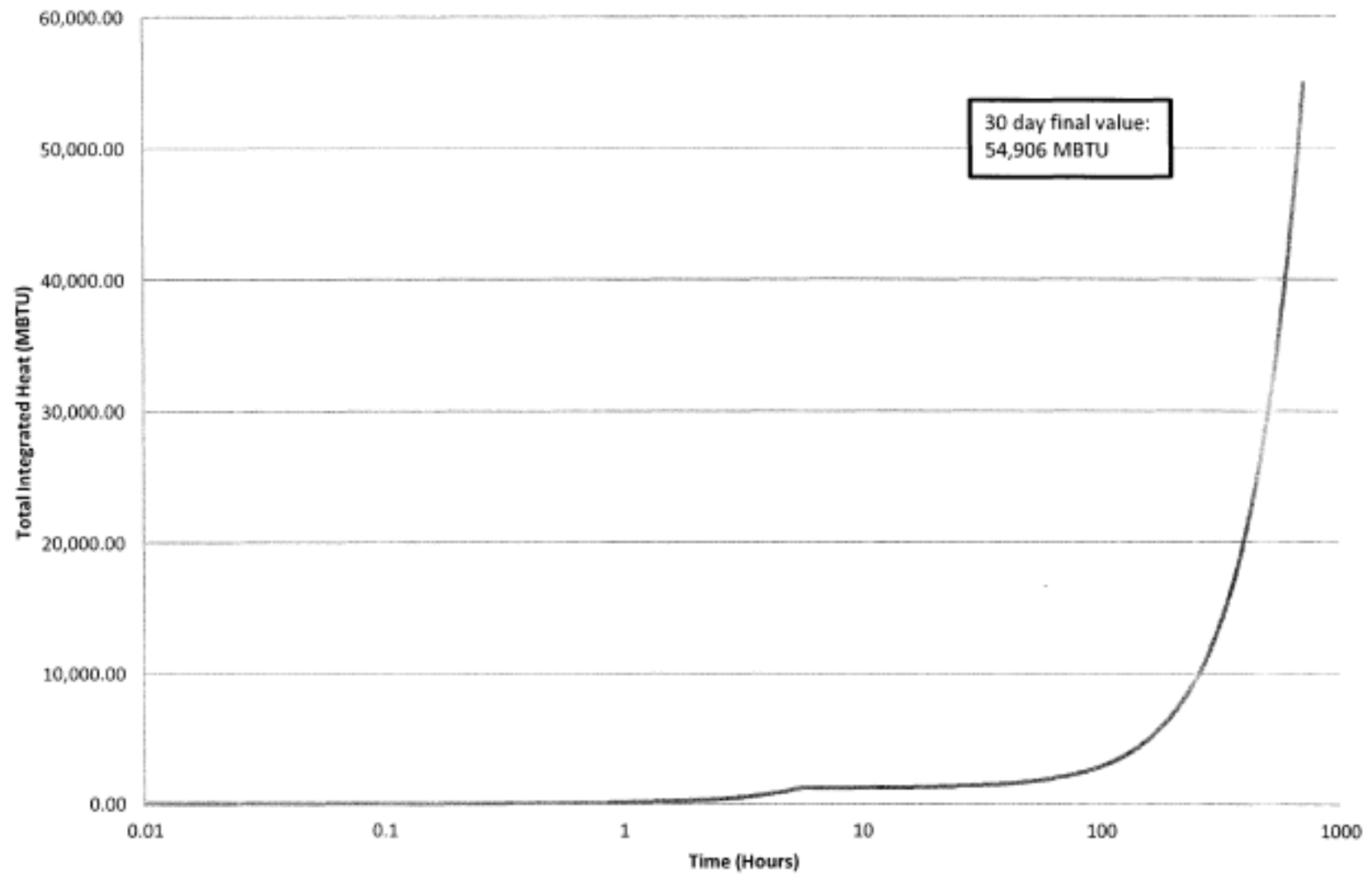


CALLAWAY PLANT

FIGURE 9.2-7(a)

30 DAY TOTAL INTEGRATED HEAT TO UHS
LBLOCA
(MAXEVAP MODEL W/ VALVE FAILURE)

REV. 0 9/14

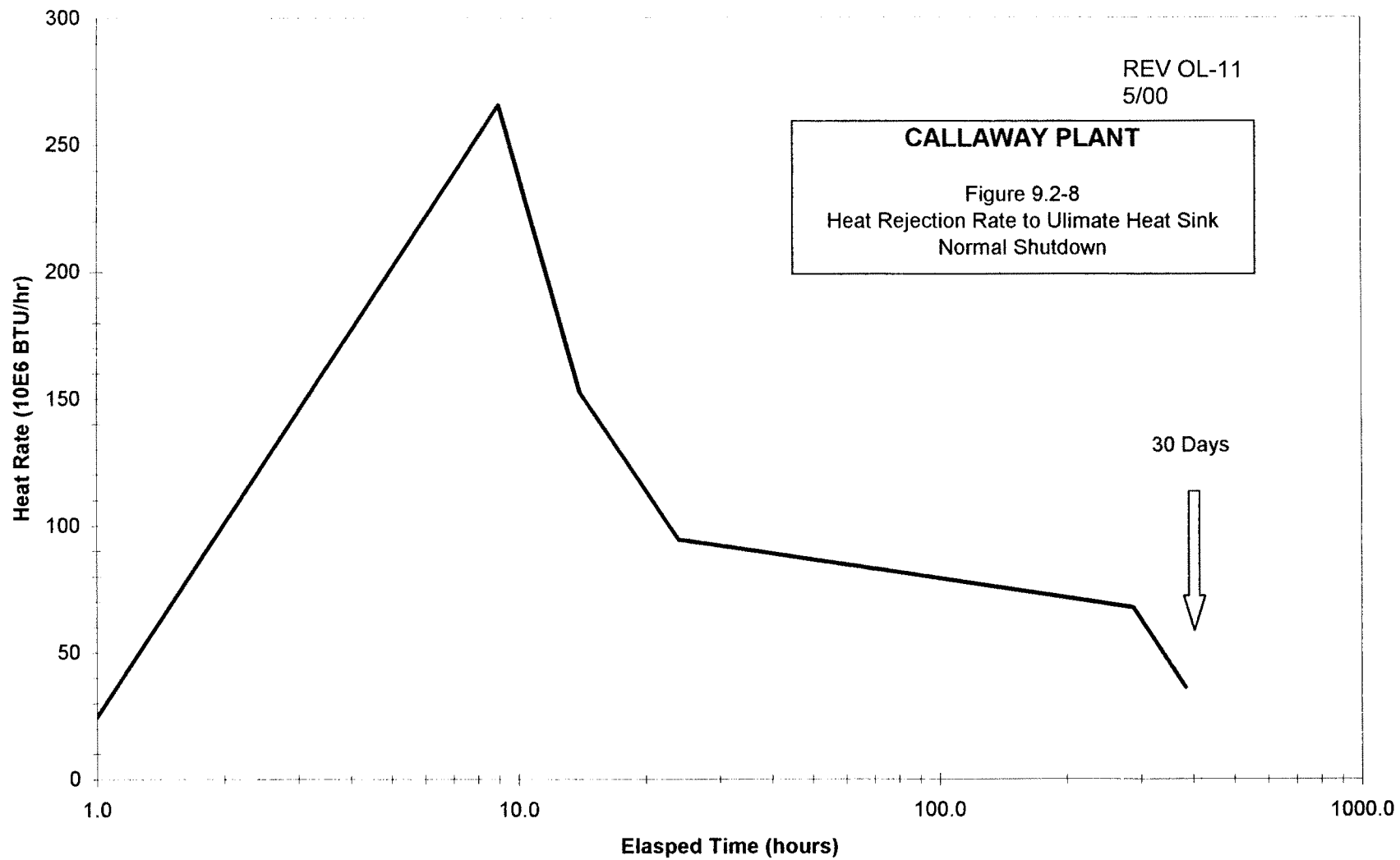


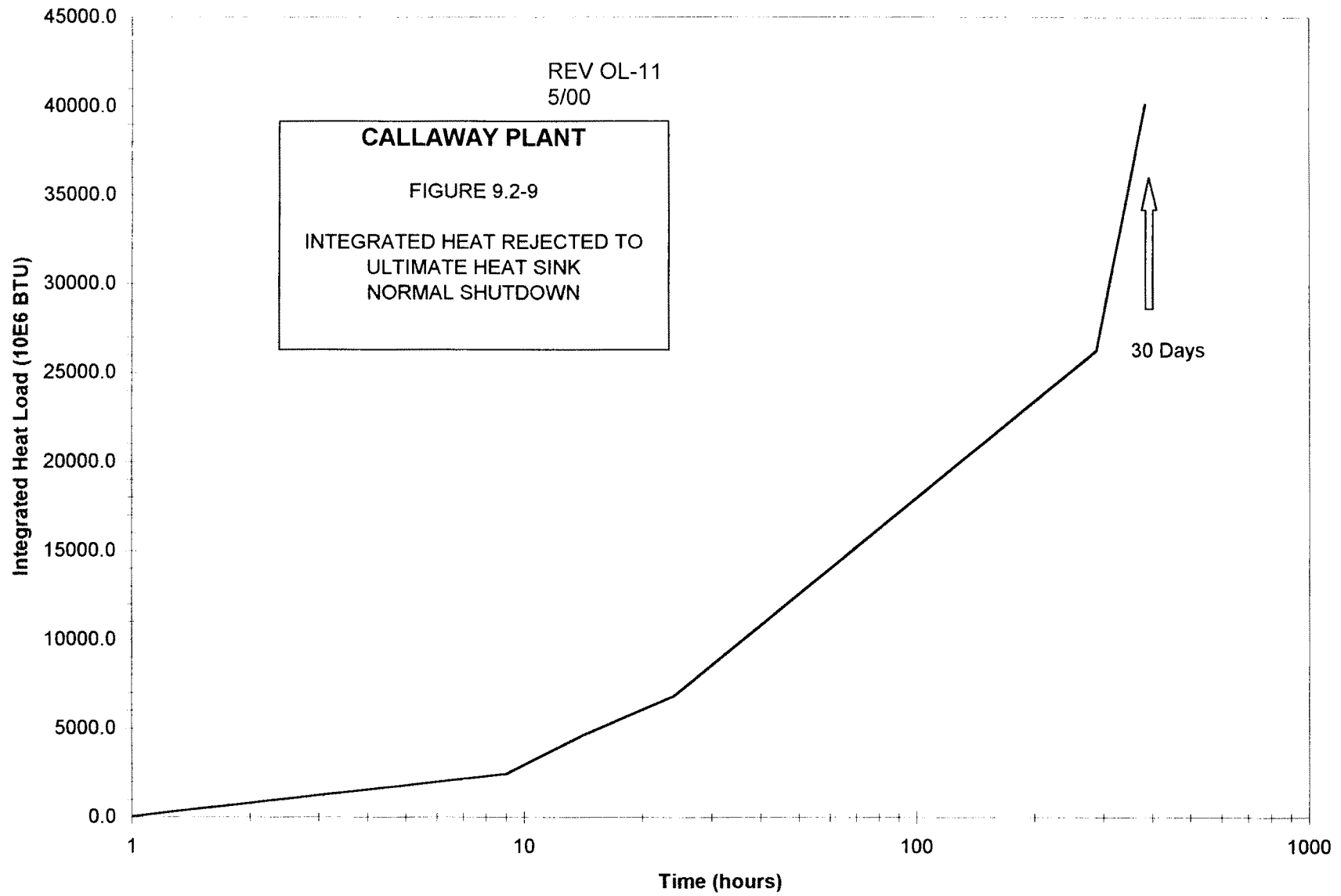
CALLAWAY PLANT

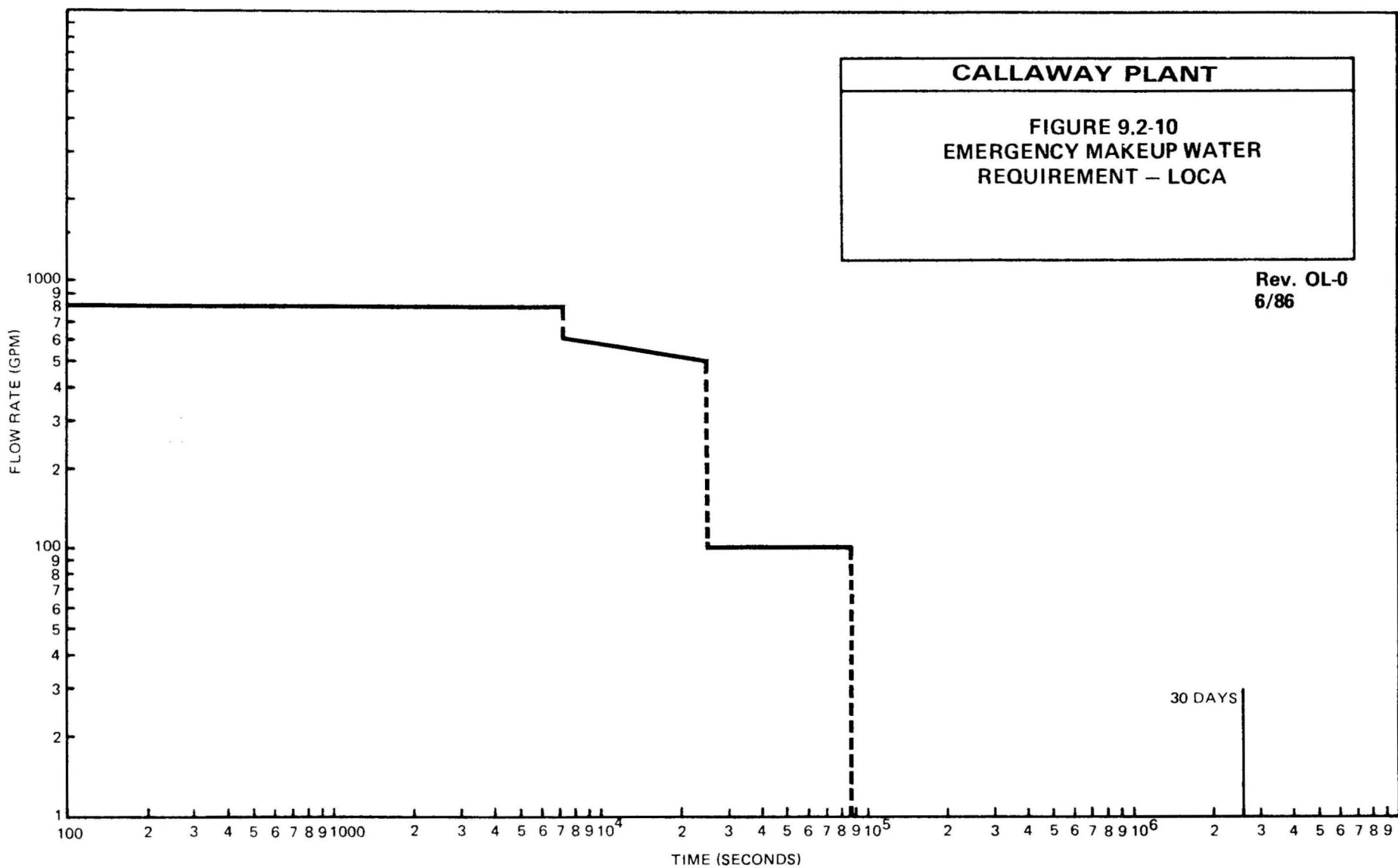
FIGURE 9.2-7(b)

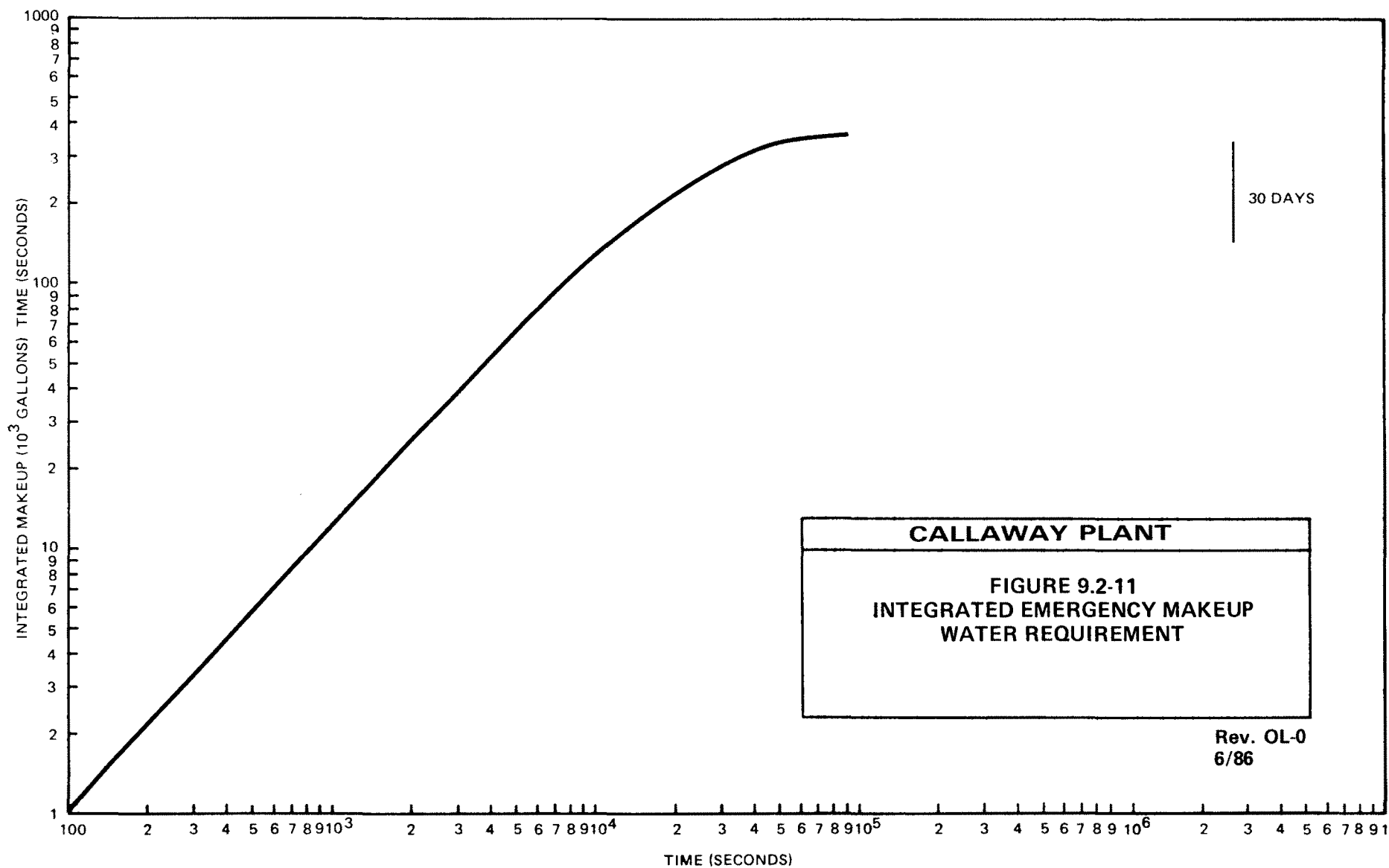
30 DAY TOTAL INTEGRATED HEAT TO UHS
LBLOCA
(MINHT MODEL W/ VALVE FAILURE)

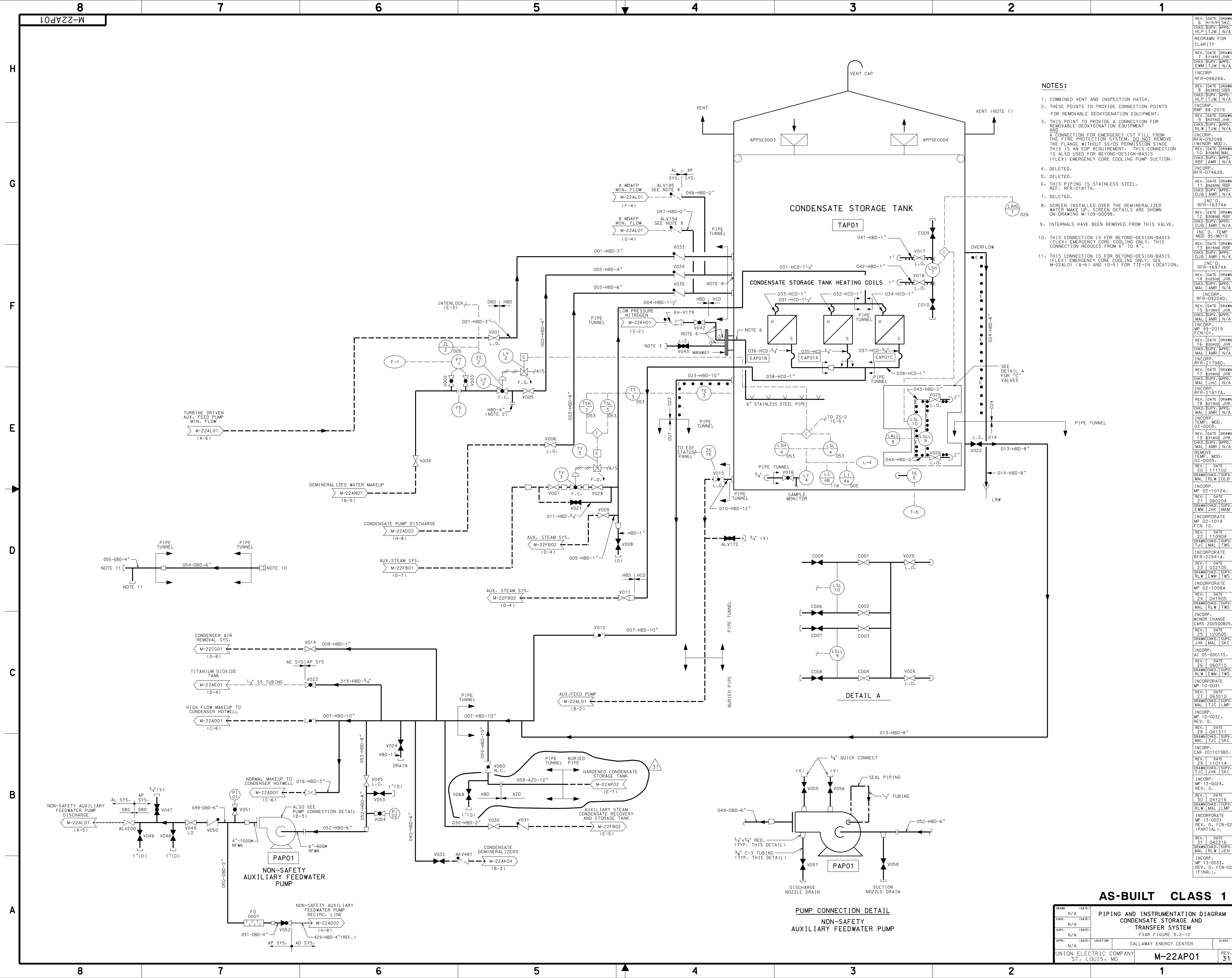
REV. 0 9/14











- NOTES:**
1. COMBINED VENT AND INSPECTION HATCH.
 2. THESE POINTS TO PROVIDE CONNECTION POINTS FOR REMOVABLE DEOXYGENATION EQUIPMENT.
 3. THIS POINT TO PROVIDE A CONNECTION FOR REMOVABLE DEOXYGENATION EQUIPMENT AND A CONNECTION FOR EMERGENCY CST FILL FROM THE FIRE PROTECTION SYSTEM. DO NOT REMOVE THE FLANGE WITHOUT S/S/O'S PERMISSION SINCE THIS IS AN EOP REQUIREMENT. THIS CONNECTION IS ALSO USED FOR BEYOND-DESIGN-BASIS (FLEX) EMERGENCY CORE COOLING PUMP SUCTION.
 4. DELETED.
 5. DELETED.
 6. THIS PIPING IS STAINLESS STEEL. REF. RFR-21817A.
 7. DELETED.
 8. SCREEN INSTALLED OVER THE DEMINERALIZED WATER MAKE UP. SCREEN DETAILS ARE SHOWN ON DRAWING M-109-00098.
 9. INTERNALS HAVE BEEN REMOVED FROM THIS VALVE.
 10. THIS CONNECTION IS FOR BEYOND-DESIGN-BASIS (FLEX) EMERGENCY CORE COOLING ONLY. THIS CONNECTION REDUCES FROM 6" TO 4".
 11. THIS CONNECTION IS FOR BEYOND-DESIGN-BASIS (FLEX) EMERGENCY CORE COOLING ONLY. SEE M-22AL01 (A-6) AND (C-5) FOR TIE-IN LOCATION.

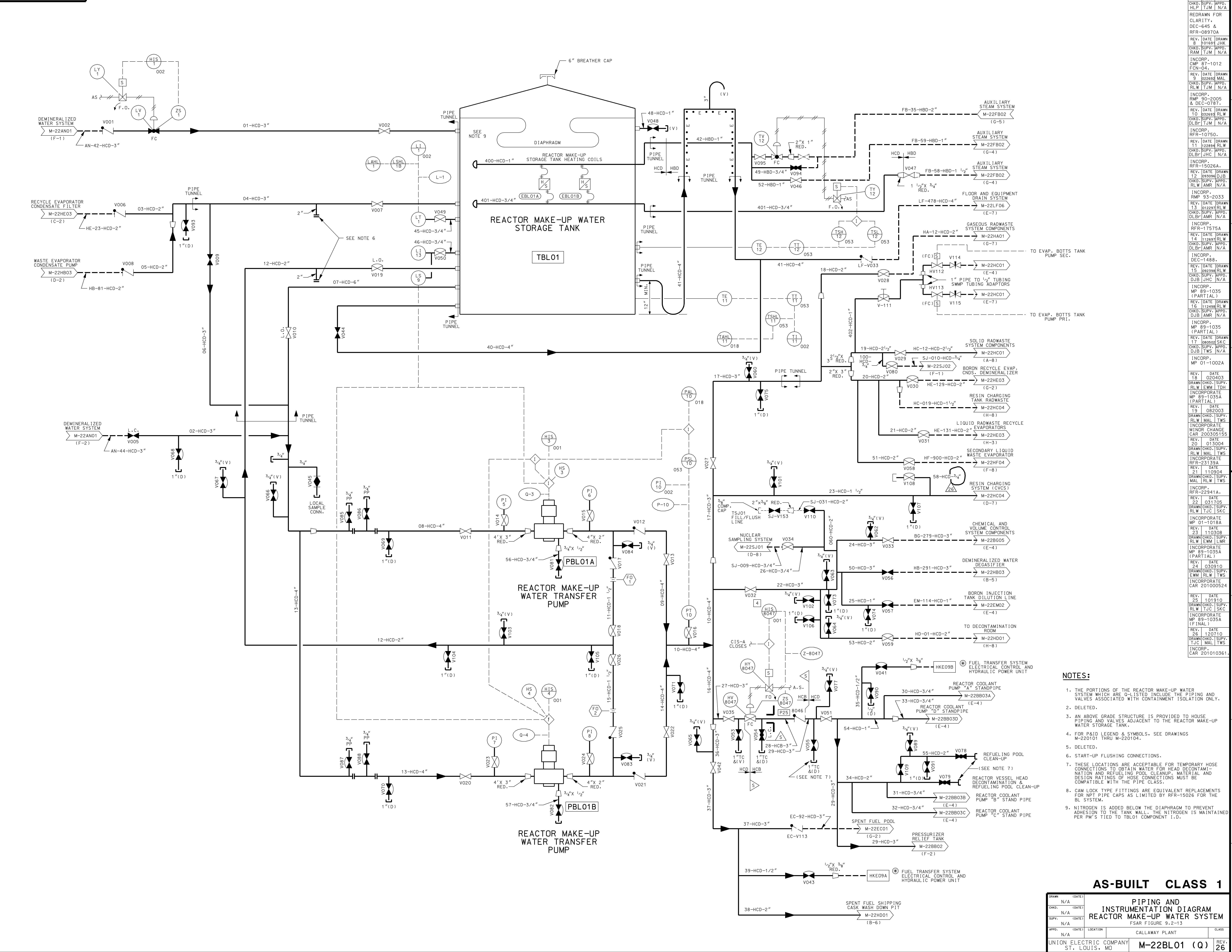
DETAIL A

PUMP CONNECTION DETAIL
NON-SAFETY
AUXILIARY FEEDWATER PUMP

AS-BUILT CLASS 1

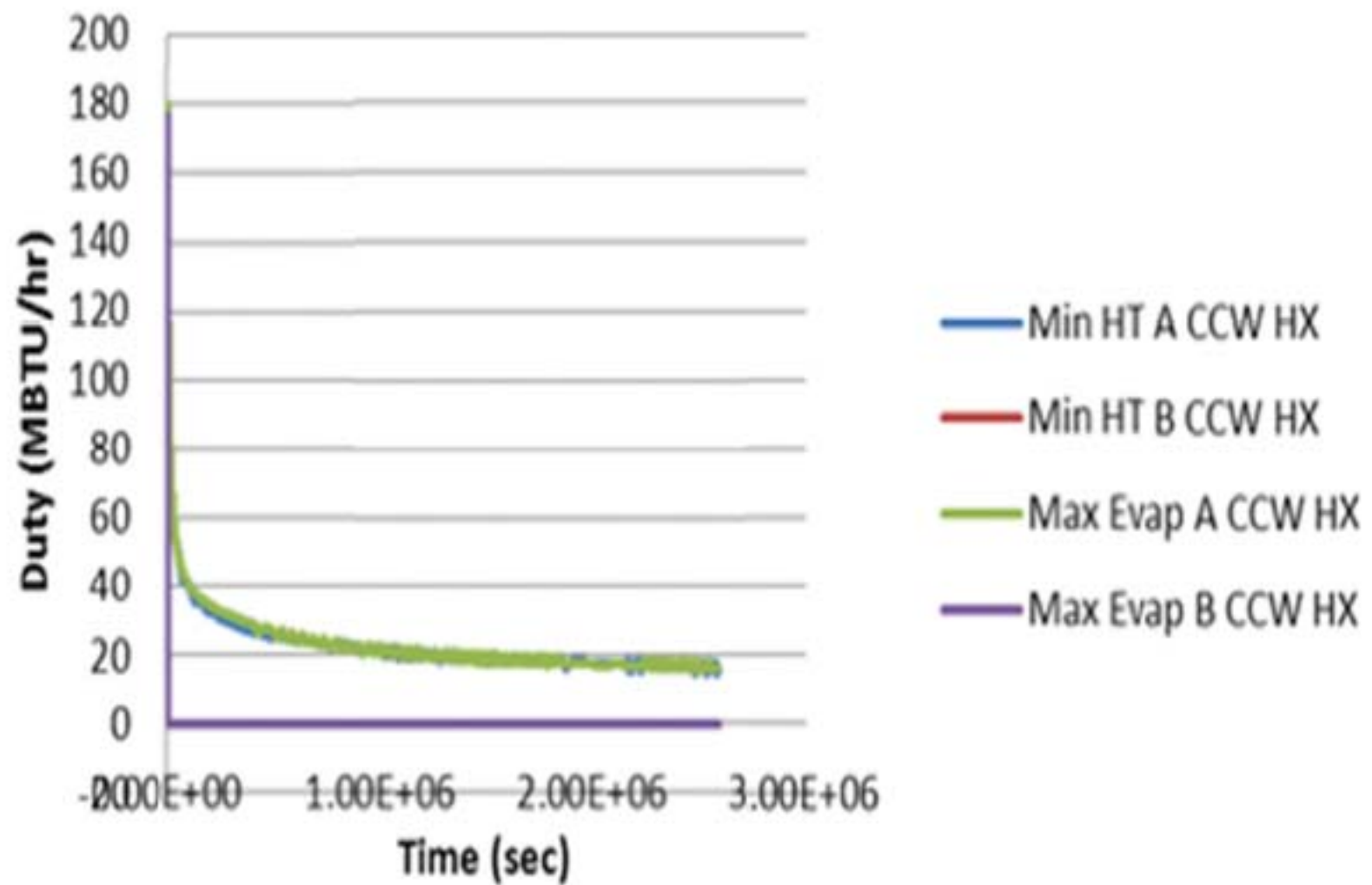
DRWN	N/A	(DATE)			
CHKD	N/A	(DATE)			
SUPV	N/A	(DATE)			
APPD	N/A	(DATE)	LOCATION	CLASS	
UNION ELECTRIC COMPANY ST. LOUIS, MO				M-22AP01	REV. 31

REV.	DATE	DRWN	CHKD	SUPV	APPD	REASON
6	11/01/14	SJC				
7	12/16/14	JHK				
8	02/26/15	SR				
9	05/27/15	JHK				
10	08/20/16	JHK				
11	09/20/16	JHK				
12	09/20/16	JHK				
13	09/20/16	JHK				
14	09/20/16	JHK				
15	09/20/16	JHK				
16	09/20/16	JHK				
17	09/20/16	JHK				
18	09/20/16	JHK				
19	09/20/16	JHK				
20	11/11/16	JHK				
21	06/02/17	JHK				
22	10/09/17	JHK				
23	03/21/18	JHK				
24	04/19/18	JHK				
25	12/05/18	JHK				
26	06/07/19	JHK				
27	06/30/19	JHK				
28	04/13/21	JHK				
29	11/01/21	JHK				
30	04/12/21	JHK				
31	04/22/21	JHK				
32	04/22/21	JHK				
33	04/22/21	JHK				
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35	04/22/21	JHK				
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37	04/22/21	JHK				
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97	04/22/21	JHK				
98	04/22/21	JHK				
99	04/22/21	JHK				
100	04/22/21	JHK				



- NOTES:
- THE PORTIONS OF THE REACTOR MAKE-UP WATER SYSTEM WHICH ARE O-LISTED INCLUDE THE PIPING AND VALVES ASSOCIATED WITH CONTAINMENT ISOLATION ONLY.
 - DELETED.
 - AN ABOVE GRADE STRUCTURE IS PROVIDED TO HOUSE PIPING AND VALVES ADJACENT TO THE REACTOR MAKE-UP WATER STORAGE TANK.
 - FOR PAID LEGEND & SYMBOLS, SEE DRAWINGS M-220101 THRU M-220104.
 - DELETED.
 - START-UP FLUSHING CONNECTIONS.
 - THESE LOCATIONS ARE ACCEPTABLE FOR TEMPORARY HOSE CONNECTIONS TO OBTAIN WATER FOR HEAD DECONTAMINATION AND REFUELING POOL CLEANUP. MATERIAL AND DESIGN RATINGS OF HOSE CONNECTIONS MUST BE COMPATIBLE WITH THE PIPE CLASS.
 - CAM LOCK TYPE FITTINGS ARE EQUIVALENT REPLACEMENTS FOR NPT PIPE CAPS AS LIMITED BY RFR-15026 FOR THE BL SYSTEM.
 - NITROGEN IS ADDED BELOW THE DIAPHRAGM TO PREVENT ADHESION TO THE TANK WALL. THE NITROGEN IS MAINTAINED PER PM'S TIED TO TBL01 COMPONENT I.D.

AS-BUILT CLASS 1				PIPING AND INSTRUMENTATION DIAGRAM REACTOR MAKE-UP WATER SYSTEM			
DRAWN	N/A	(DATE)		PSAR FIGURE 3.2-13			
CHKD.	N/A	(DATE)					
SUPV.	N/A	(DATE)					
APPD.	N/A	(DATE)					
UNION ELECTRIC COMPANY ST. LOUIS, MO				CALLAWAY PLANT			
				REV. 26			

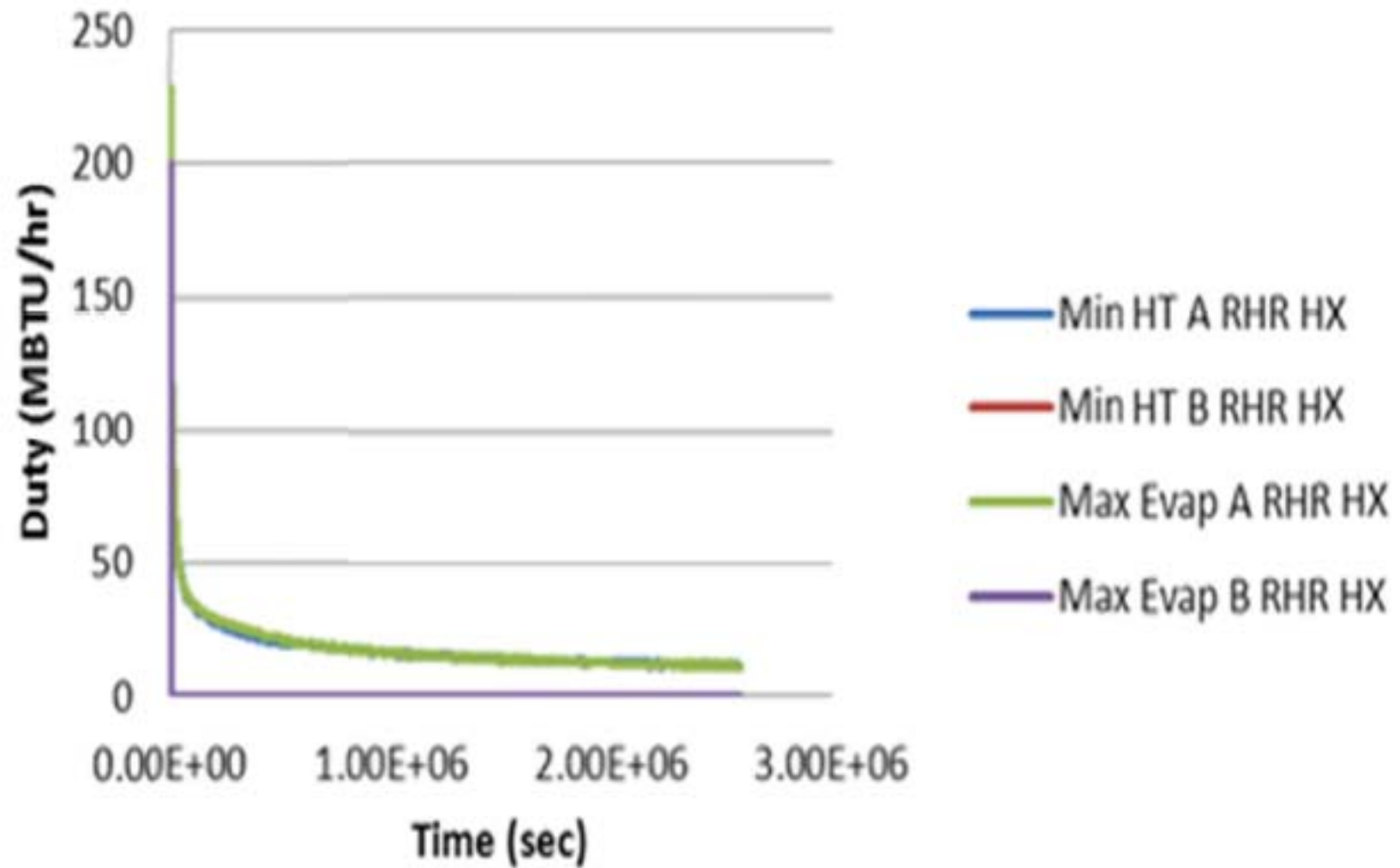


CALLAWAY PLANT

FIGURE 9.2-15

CLOSED COOLING WATER HEAT
EXCHANGER LOCA DUTY

Rev. 0 3/13

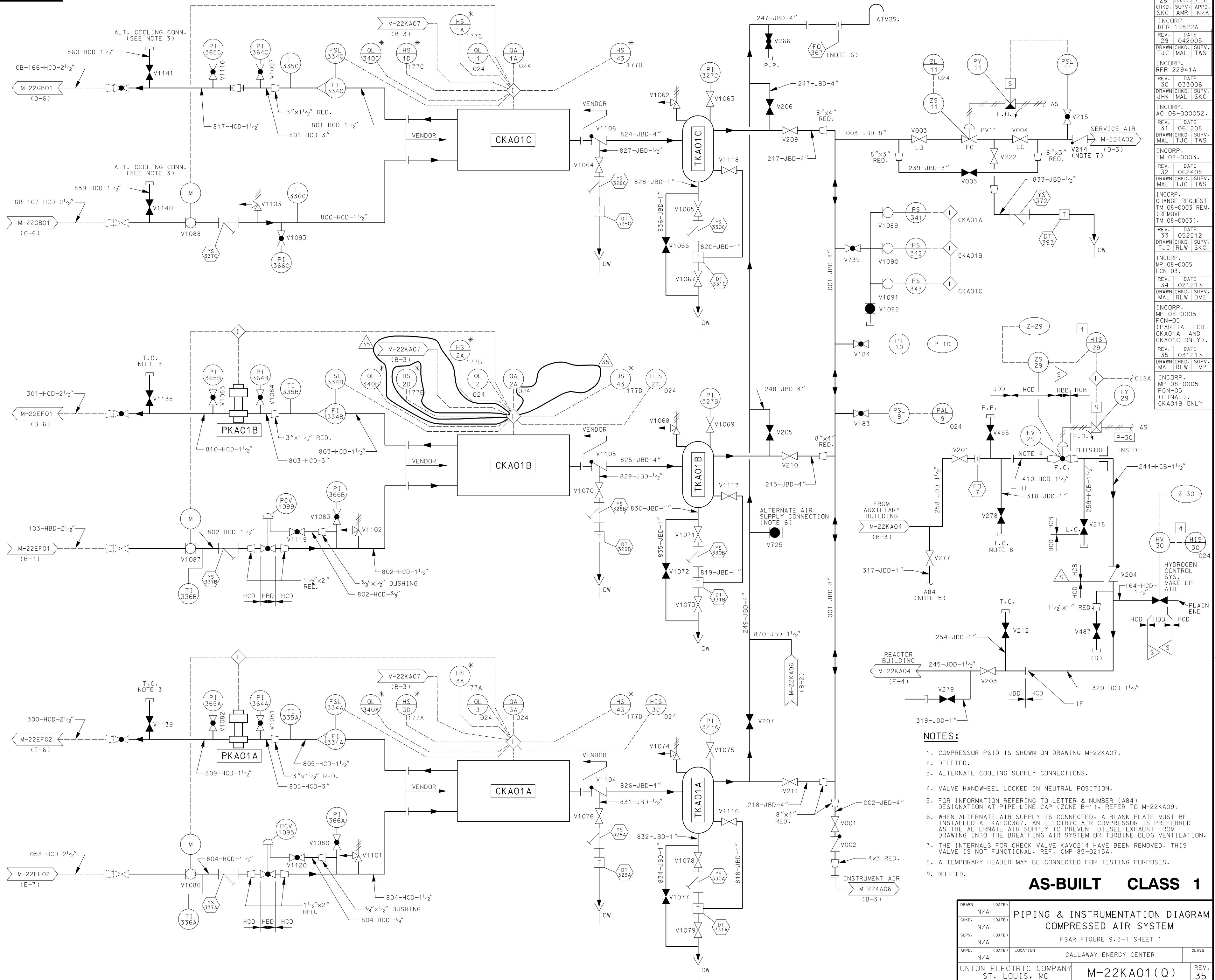


CALLAWAY PLANT

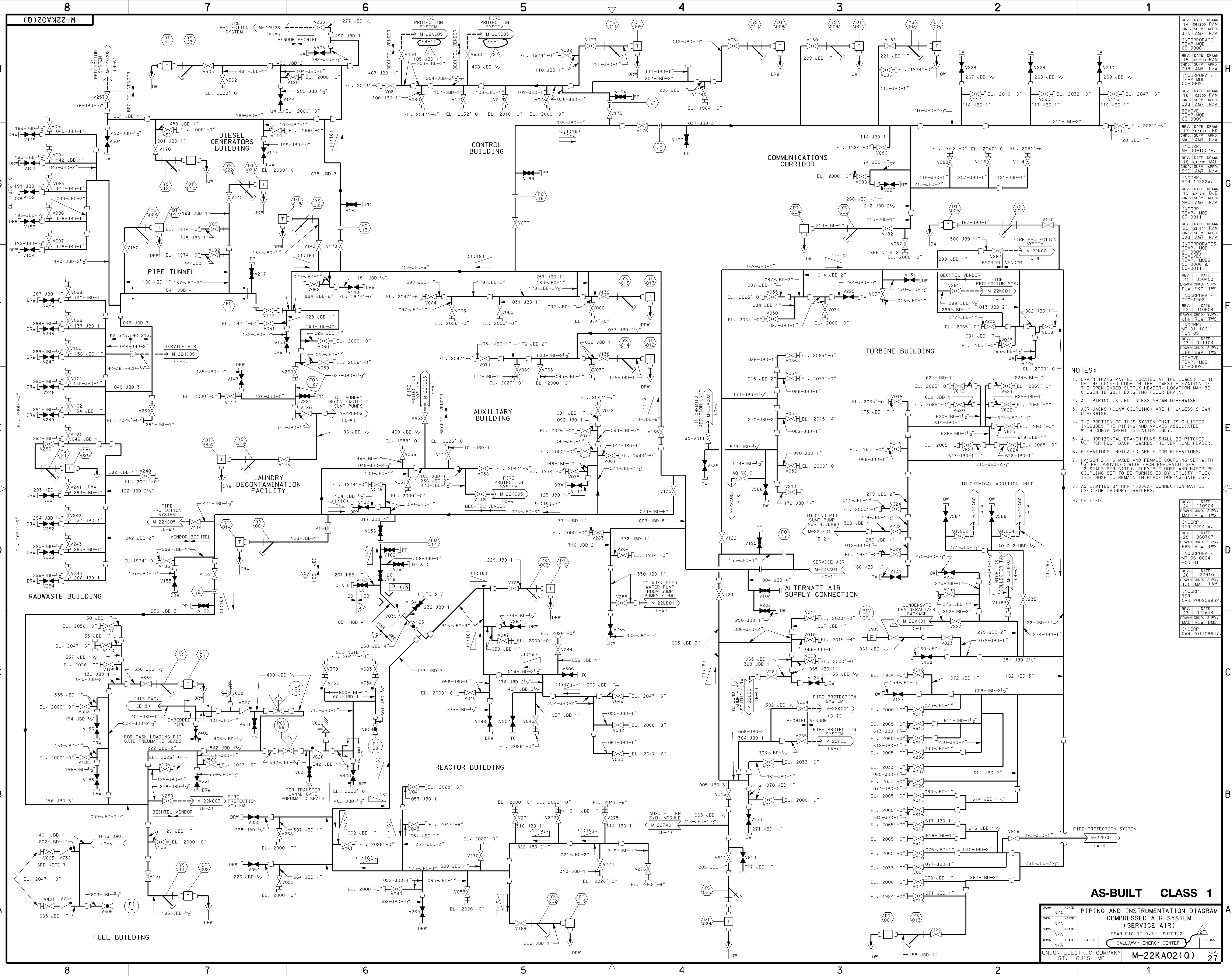
FIGURE 9.2-16

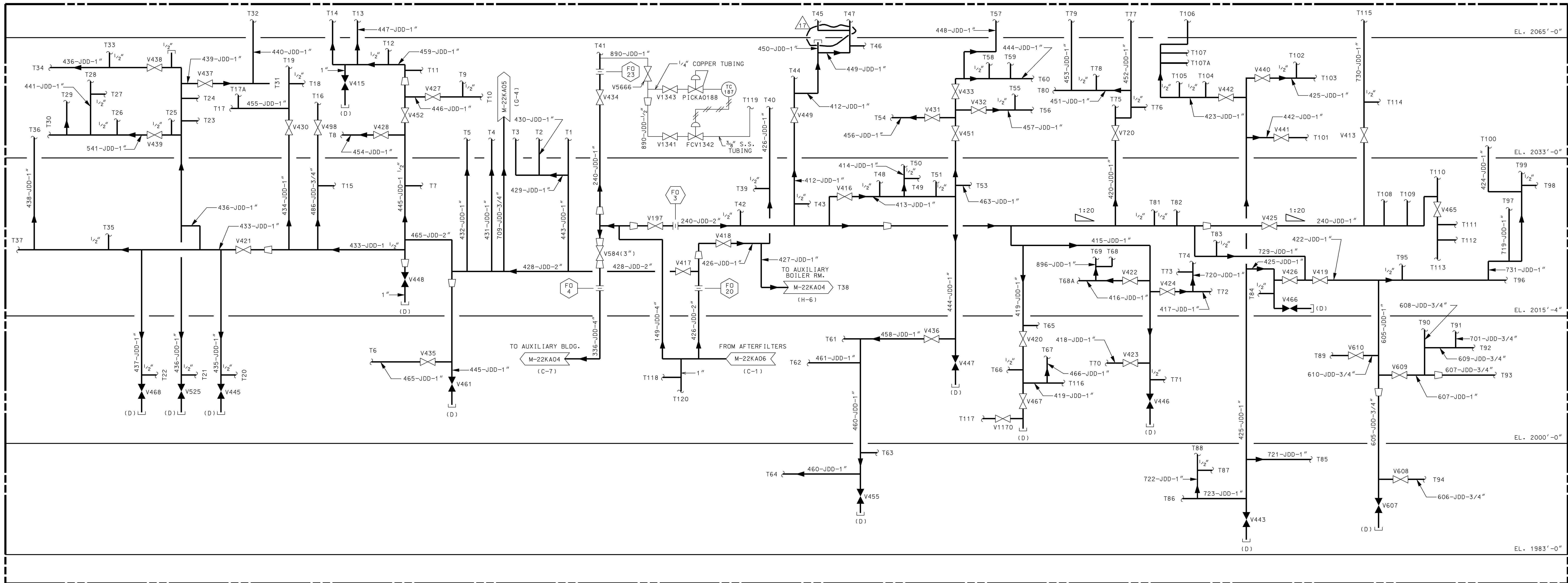
RESIDUAL HEAT REMOVAL HEAT
EXCHANGER LOCA DUTY

Rev. 0 3/13

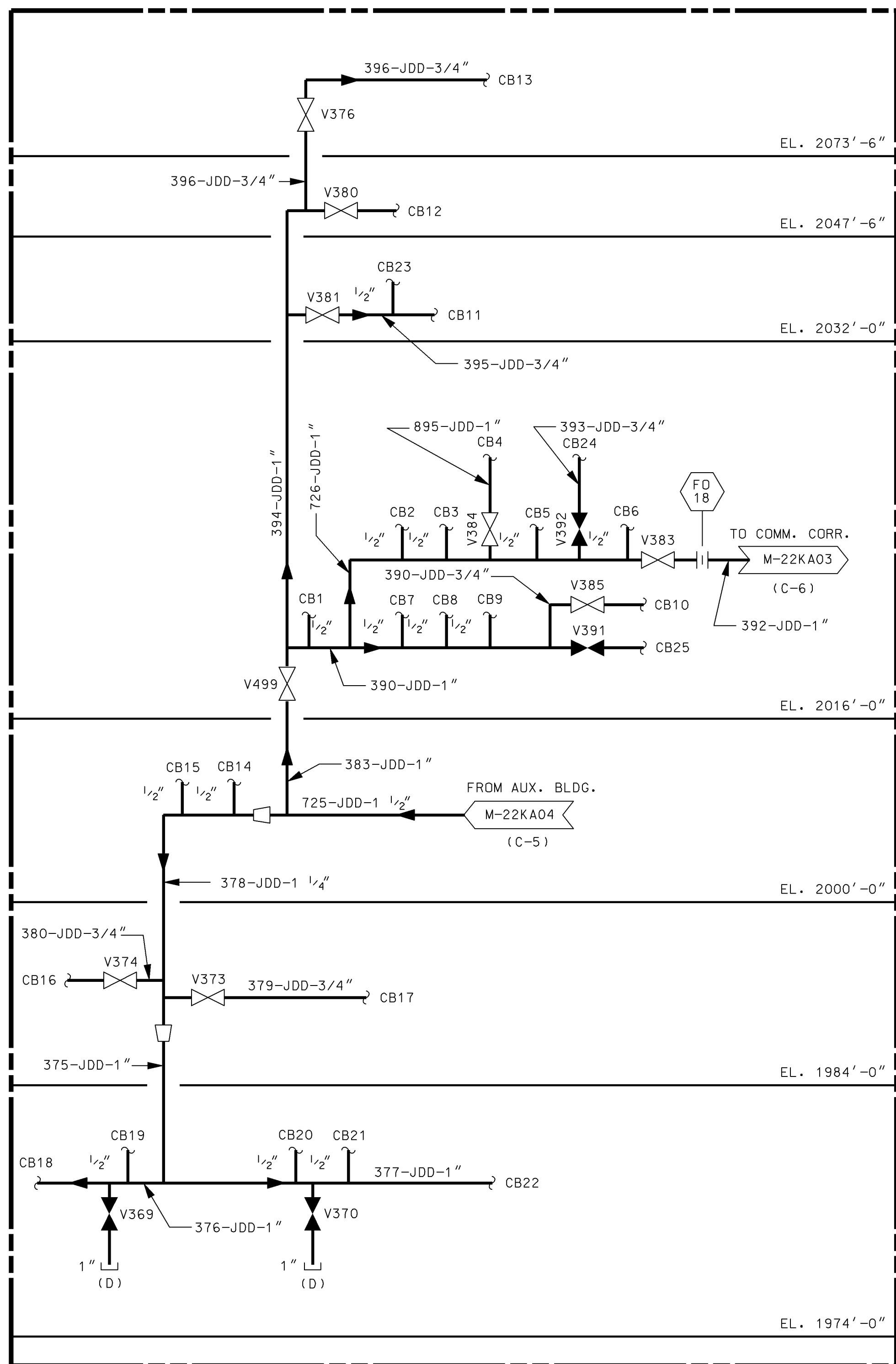


REV.	DATE	DRWN
28	062999	DLB
CHKD.	SUPV.	APPD.
SKC	AMR	N/A
INCORP.	RFR	19822A
REV.	DATE	DRWN
29	042005	JHK
CHKD.	SUPV.	TWS
SKC	MAL	SKC
INCORP.	RFR	22941A
REV.	DATE	DRWN
30	033006	JHK
CHKD.	SUPV.	TWS
SKC	MAL	SKC
INCORP.	AC	06-000052.
REV.	DATE	DRWN
31	061208	JHK
CHKD.	SUPV.	TWS
SKC	MAL	SKC
INCORP.	TM	08-0003.
REV.	DATE	DRWN
32	062408	JHK
CHKD.	SUPV.	TWS
SKC	MAL	SKC
INCORP.	CHANGE REQUEST	TM 08-0003 REM.
		(REMOVE TM 08-0003).
REV.	DATE	DRWN
33	052512	JHK
CHKD.	SUPV.	TWS
SKC	MAL	SKC
INCORP.	MP	08-0005 FCN-03.
REV.	DATE	DRWN
34	021213	JHK
CHKD.	SUPV.	TWS
SKC	MAL	SKC
INCORP.	MP	08-0005 FCN-05
		(PARTIAL FOR CKA01A AND CKA01C ONLY).
REV.	DATE	DRWN
35	031213	JHK
CHKD.	SUPV.	TWS
SKC	MAL	SKC
INCORP.	MP	08-0005 FCN-05
		(FINAL). CKA01B ONLY

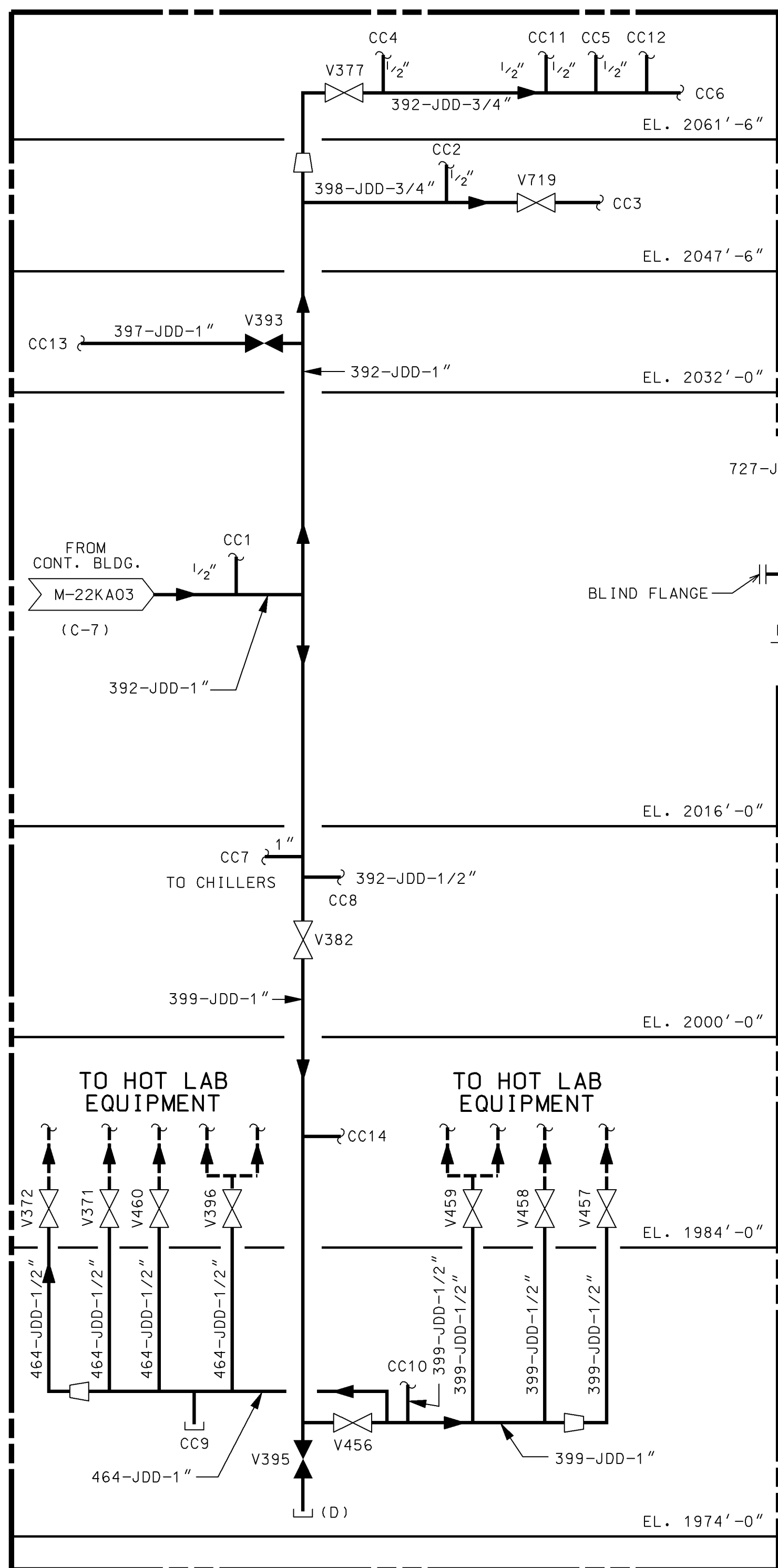




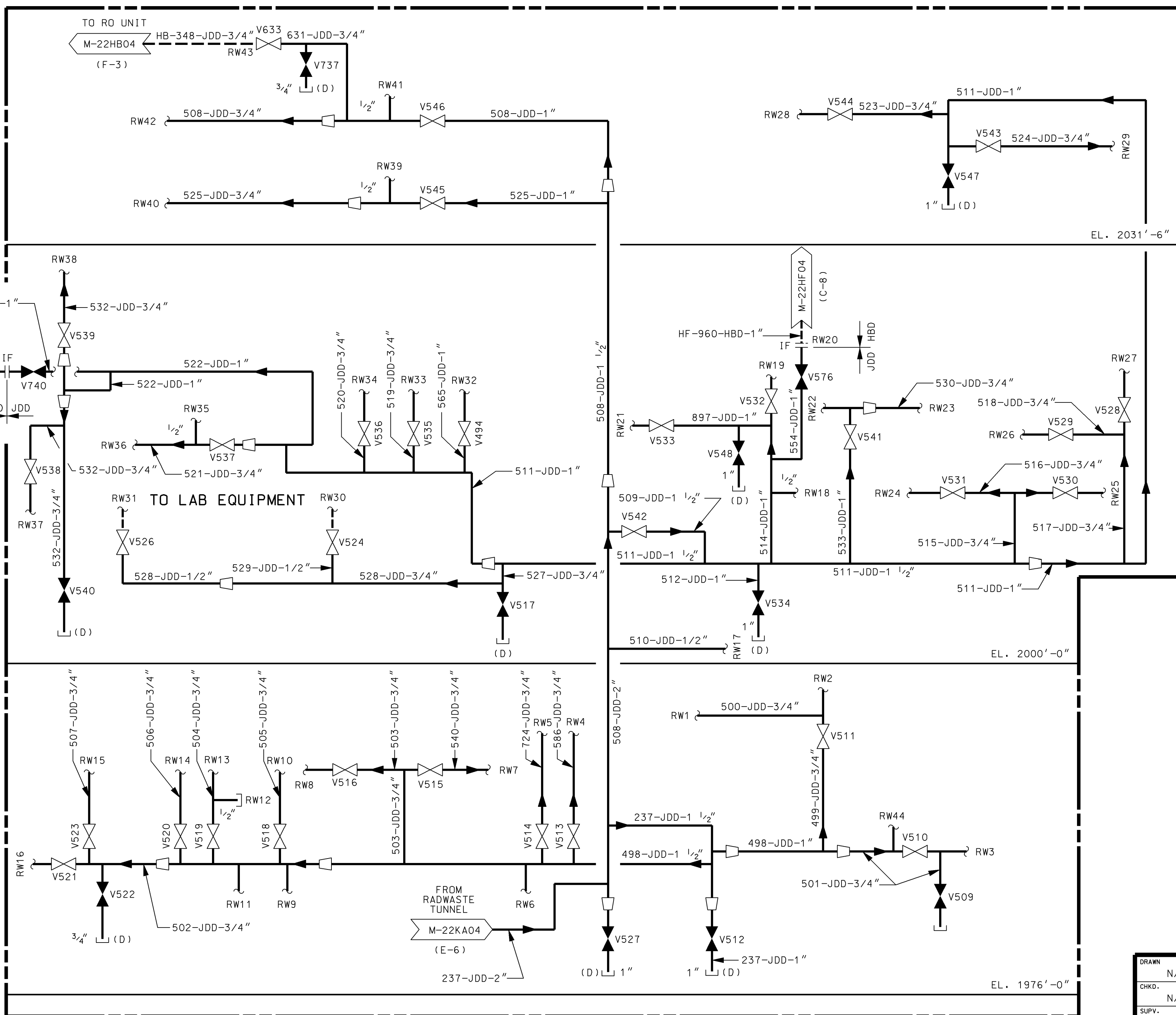
TURBINE BUILDING



CONTROL BUILDING



COMMUNICATIONS CORRIDOR



RADWASTE BUILDING

NOTES:

1. THE INSTRUMENT AIR SYSTEM P & ID'S DEPICT THE INSTRUMENT AIR HEADERS & BRANCHES. TUBING TO THE VARIOUS SERVICES SHALL BE FIELD ROUTED IN ACCORDANCE WITH THE APPROPRIATE INSTALLATION DETAIL DWGS. J-27G10 AND J-27N01.
2. THE HORIZONTAL PIPE RUNS SHALL SLOPE AT A MINIMUM OF 1/16" PER FOOT UNLESS OTHERWISE NOTED.
3. ALL BRANCH LINES AND TEES ARE CAPPED DURING SYSTEM INSTALLATION TO PROVIDE THE SYSTEM PRESSURE BOUNDARY AND TO PROMOTE SYSTEM CLEANLINESS. CAPS ARE REMOVED AS REQUIRED WHEN INSTRUMENT AIR TUBING IS FIELD ROUTED AND CONNECTED TO THE INSTRUMENT AIR SYSTEM.
4. BRANCHES WITHOUT LINE SEQUENCE NUMBERS ARE CAPPED TEES ONLY.
5. DRAIN LINES CARRY THE LINE SEQUENCE NUMBER OF THE LINE THEY ARE BRANCHING FROM UNLESS OTHERWISE INDICATED.
6. FOR INFORMATION REFERRING TO LETTER(S) & NUMBER DESIGNATIONS AT PIPE LINE CONTINUATION ~, REFER TO M-22KA08.

AS-BUILT CLASS 1

DATE	REV.	CLASS
05/01/11	17	AS-BUILT
05/01/11	16	AS-BUILT
05/01/11	15	AS-BUILT
05/01/11	14	AS-BUILT
05/01/11	13	AS-BUILT
05/01/11	12	AS-BUILT
05/01/11	11	AS-BUILT
05/01/11	10	AS-BUILT
05/01/11	9	AS-BUILT
05/01/11	8	AS-BUILT
05/01/11	7	AS-BUILT
05/01/11	6	AS-BUILT
05/01/11	5	AS-BUILT
05/01/11	4	AS-BUILT
05/01/11	3	AS-BUILT
05/01/11	2	AS-BUILT
05/01/11	1	AS-BUILT

PIPING AND INSTRUMENTATION DIAGRAM
INSTRUMENT AIR SYSTEM

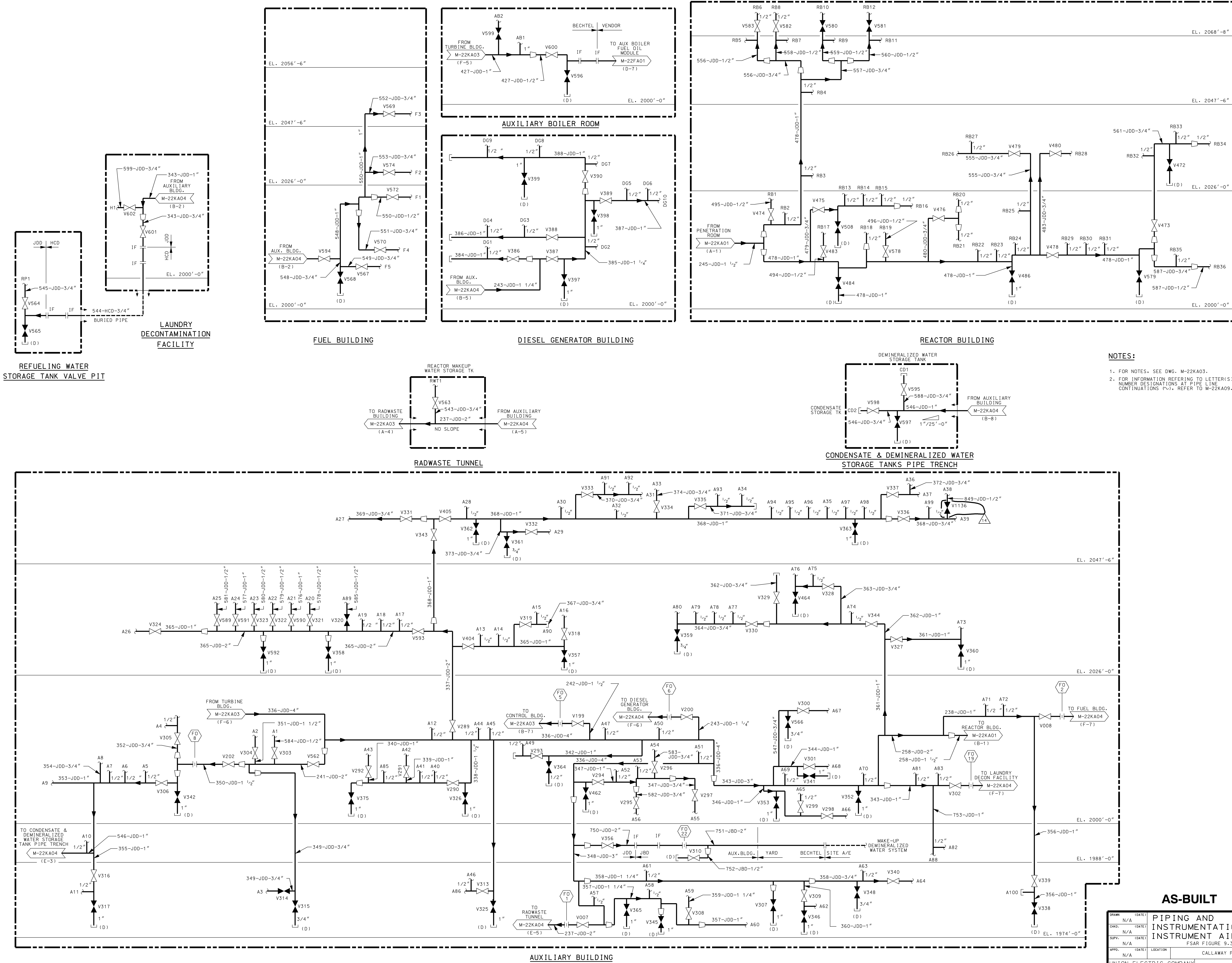
FSAR FIGURE 9.3-1 SHEET 3

CALLAWAY PLANT

UNION ELECTRIC COMPANY
ST. LOUIS, MO

M-22KA03

REV. 17

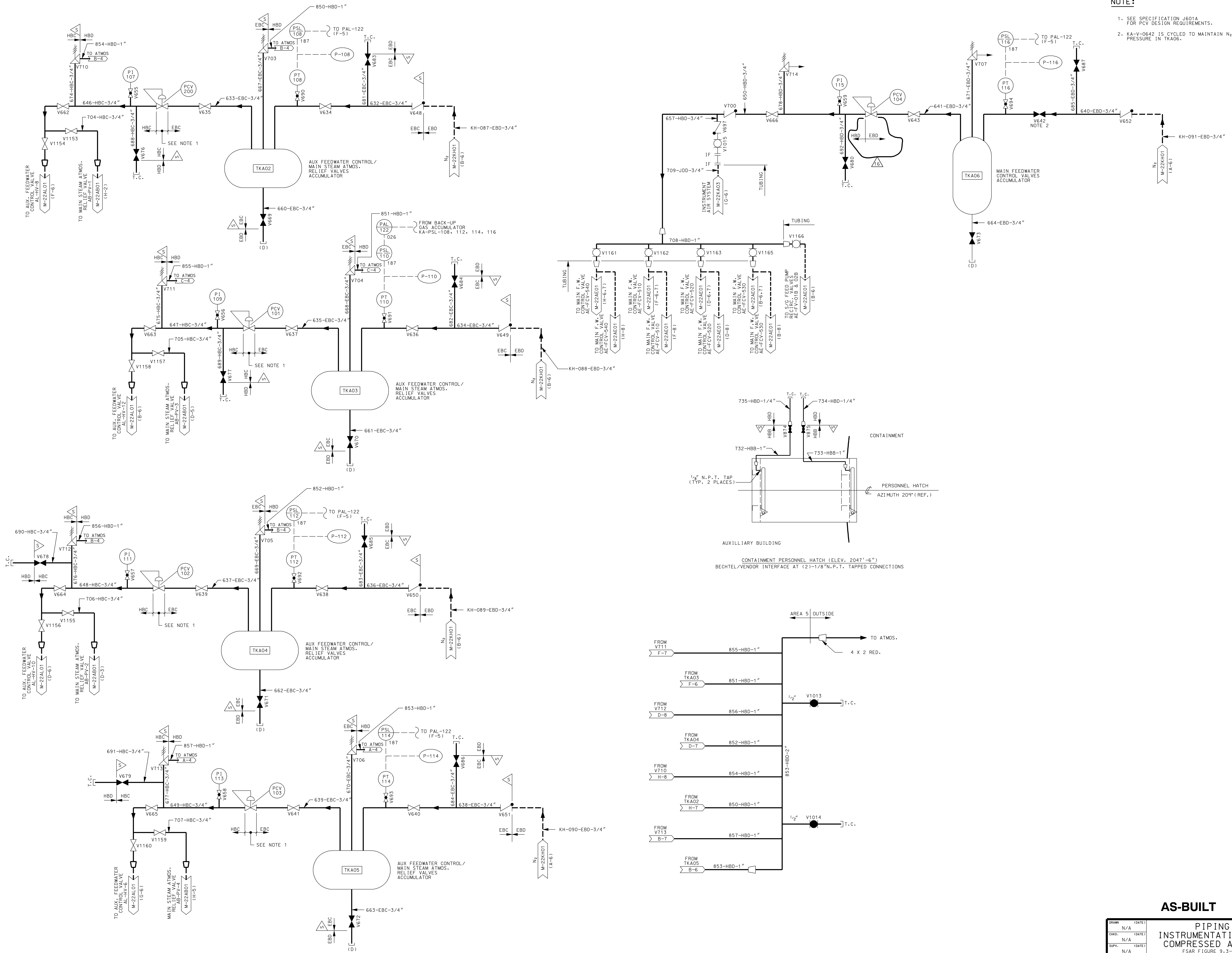


- NOTES:
- FOR NOTES, SEE DWG. M-22KA03.
 - FOR INFORMATION REFERRING TO LETTER(S) & NUMBER DESIGNATIONS AT PIPE LINE CONTINUATIONS (~), REFER TO M-22KA09.

AS-BUILT CLASS 1			
PIPING AND INSTRUMENTATION DIAGRAM			
INSTRUMENT AIR SYSTEM			
FSAR FIGURE 9.3-1 SHEET 4			
DRWN	N/A	(DATE)	
CHKD	N/A	(DATE)	
SUPV	N/A	(DATE)	
APPD	N/A	(DATE)	
LOC	N/A	(DATE)	
CALLAWAY PLANT			
UNION ELECTRIC COMPANY			
ST. LOUIS, MO			
M-22KA04			
REV. 14			

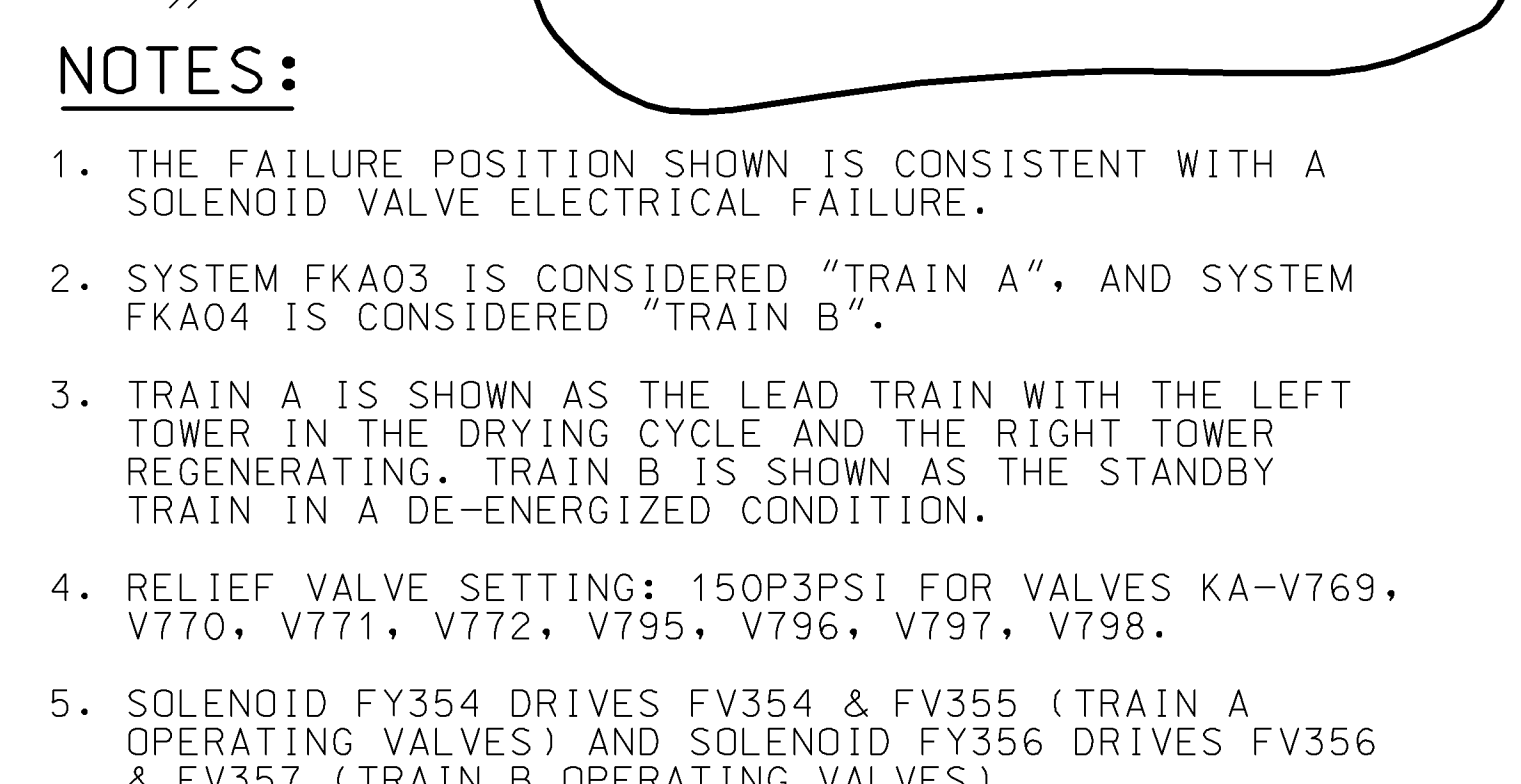
NOTE:

- SEE SPECIFICATION J601A FOR PCV DESIGN REQUIREMENTS.
- KA-V-0642 IS CYCLED TO MAINTAIN N₂ PRESSURE IN TKA06.



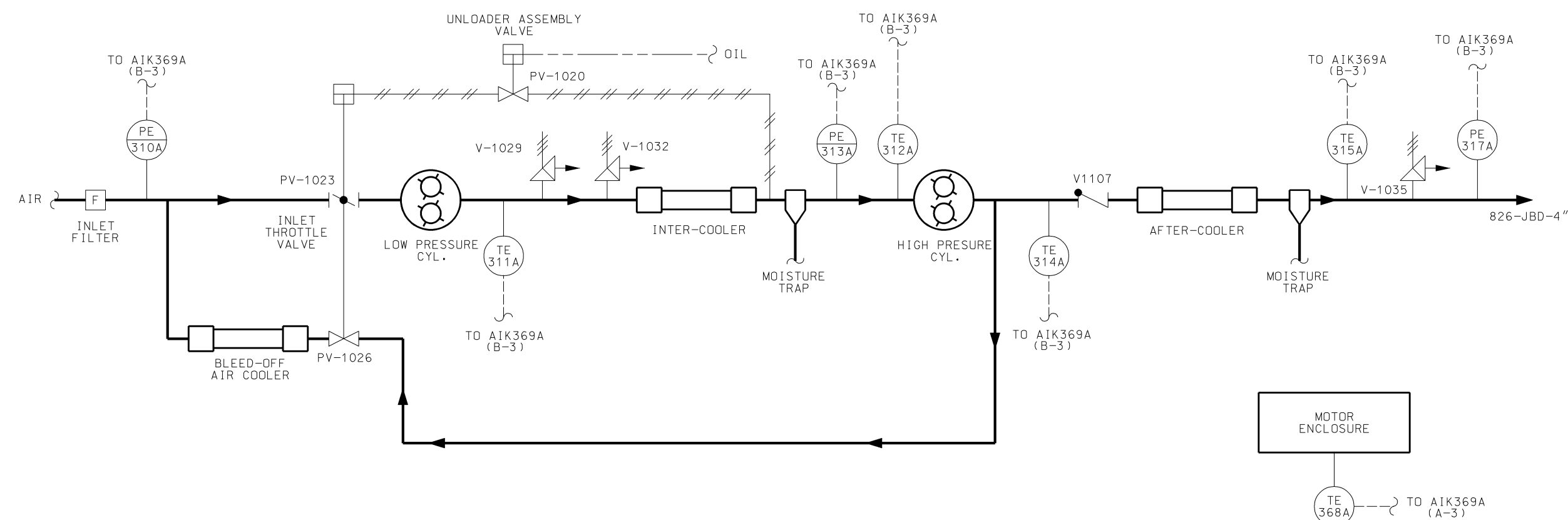
AS-BUILT CLASS 1

DRWN	N/A	(DATE)	PIPING AND INSTRUMENTATION DIAGRAM
CHKD	N/A	(DATE)	COMPRESSED AIR SYSTEM
SUPV	N/A	(DATE)	FSAR FIGURE 9.3-1 SHEET 5
APPR	N/A	(DATE)	LOCATION
UNION ELECTRIC COMPANY			ST. LOUIS, MO
M-22KA05(Q)			REV. 16

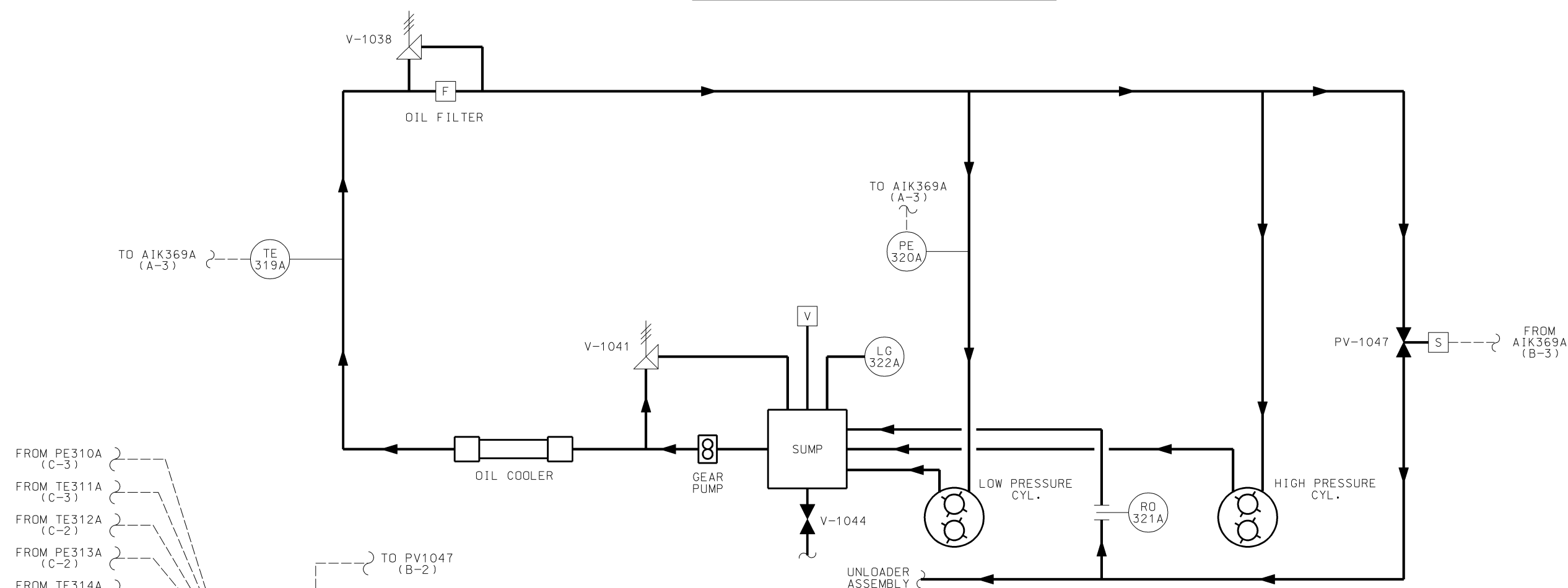


DRWN	(DATE)	PIPING & INSTRUMENTATION DIAGRAM INSTRUMENT AIR FILTER/DRYER TURBINE BUILDING
N/A		
CHKD.	(DATE)	
N/A		

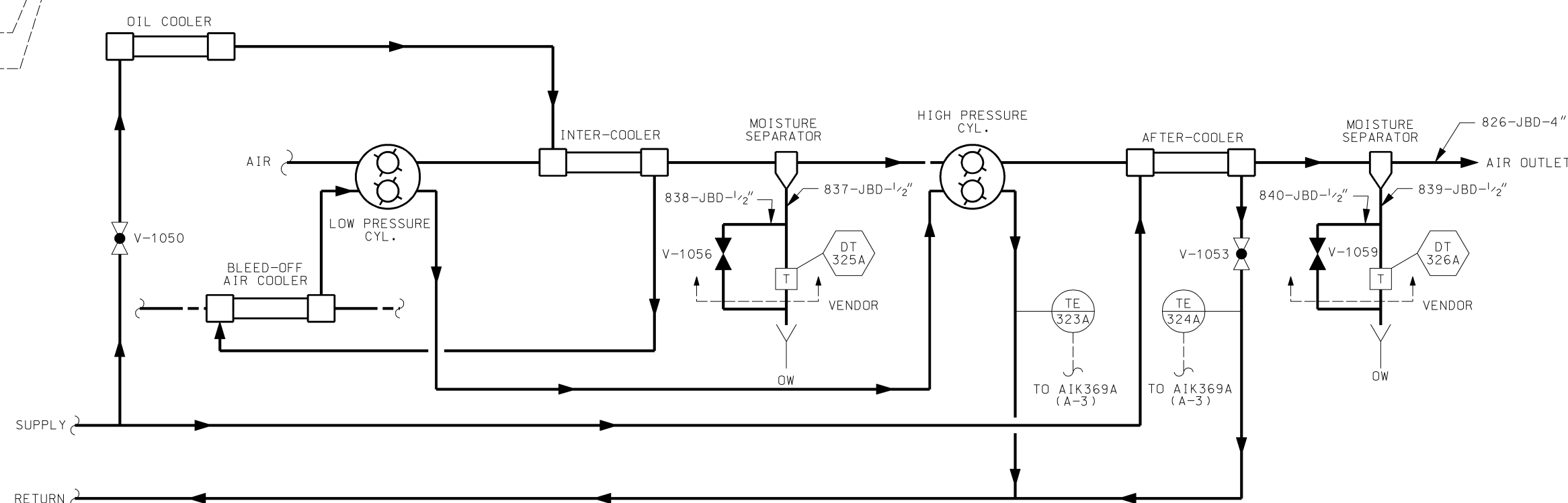
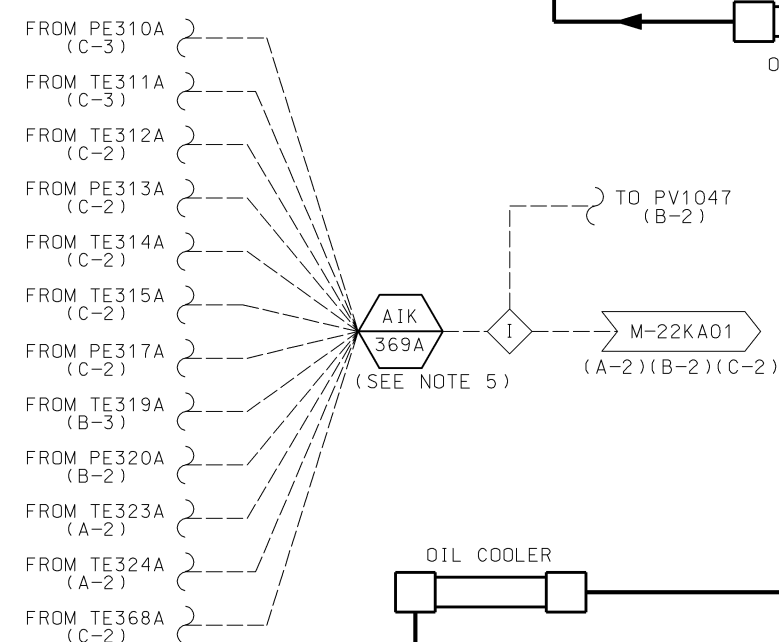
SUPV.	(DATE)	FSAR FIGURE 9.3-1 SHEET 6		
N/A				
APPD.	(DATE)	LOCATION	CALLAWAY PLANT	CLASS
N/A				
UNION ELECTRIC COMPANY ST. LOUIS, MO		M-22KA06		REV. 18



AIR COMPRESSOR - AIR SIDE



AIR COMPRESSOR - LUBRICATING OIL SYSTEM



AIR COMPRESSOR COOLING WATER SYS. & DRAIN TRAPS

DEVICE TABLE

DEVICE	CKA01A	CKA01B	CKA01C
INTAKE AIR FILTER PRESSURE	PE-310A	PE-310B	PE-310C
UNLOADER ASSEMBLY VALVE	PV-1020	PV-1021	PV-1022
INLET THROTTLE VALVE	PV-1023	PV-1024	PV-1025
HP UNLOADING VALVE	PV-1026	PV-1027	PV-1028
INTERCOOLER RELIEF VALVE	V-1029	V-1030	V-1031
INTERCOOLER RELIEF VALVE	V-1032	V-1033	V-1034
LOW PRESSURE OUTLET AIR TEMP.	TE-311A	TE-311B	TE-311C
HIGH PRESSURE INLET AIR TEMP.	TE-312A	TE-312B	TE-312C
INTERCOOLER AIR PRESSURE IND.	PE-313A	PE-313B	PE-313C
HIGH PRESSURE OUTLET AIR TEMP.	TE-314A	TE-314B	TE-314C
DELIVERY AIR TEMP.	TE-315A	TE-315B	TE-315C
UNLOADER PRESSURE	PE-317A	PE-317B	PE-317C
SECOND STAGE DISCH. CK. VALVE	V-1107	V-1108	V-1109
AFTERCOOLER RELIEF VALVE	V-1035	V-1036	V-1037
MOTOR ENCLOSURE TEMP.	TE-368A	TE-368B	TE-368C
OIL PRESSURE	PE-320A	PE-320B	PE-320C
OIL TEMPERATURE	TE-319A	TE-319B	TE-319C
UNLOADER ASS'Y OIL RELIEF ORIFICE	RO-321A	RO-321B	RO-321C
OIL FILTER BY-PASS VALVE	V-1038	V-1039	V-1040
OIL PUMP BY-PASS VALVE	V-1041	V-1042	V-1043
OIL SUMP DRAIN VALVE	V-1044	V-1045	V-1046
UNLOADING SOLENOID VALVE	PV-1047	PV-1048	PV-1049
OIL SUMP LEVEL GAUGE	LG-322A	LG-322B	LG-322C
OIL COOLER COOLING WATER SUPPLY	V-1050	V-1051	V-1052
AFTER COOLER COOLING WATER RETURN	V-1053	V-1054	V-1055
COMPRESSOR COOLING WATER RETURN TEMP.	TE-323A	TE-323B	TE-323C
AFTERCOOLER COOLING WATER RETURN TEMP.	TE-324A	TE-324B	TE-324C
INTERCOOLER MOIST. SEPARATOR DRAIN TRAP	DT-325A	DT-325B	DT-325C
AFTERCOOLER MOIST. SEPARATOR DRAIN TRAP	DT-326A	DT-326B	DT-326C
INTERCOOLER DRAIN TRAP BY-PASS	V-1056	V-1057	V-1058
AFTERCOOLER DRAIN TRAP BY-PASS	V-1059	V-1060	V-1061
AIR OUTLET	826-JBD-4"	825-JBD-4"	824-JBD-4"
INTERCOOLER CONDENSATE DRAIN	837-JBD-1/2"	841-JBD-1/2"	845-JBD-1/2"
AFTERCOOLER CONDENSATE DRAIN	839-JBD-1/2"	843-JBD-1/2"	847-JBD-1/2"
INTERCOOLER COND. TRAP BY-PASS	838-JBD-1/2"	842-JBD-1/2"	846-JBD-1/2"
AFTERCOOLER COND. TRAP BY-PASS	840-JBD-1/2"	844-JBD-1/2"	848-JBD-1/2"
AIR CMPSR. CONTROLLER/HMI	AIK-369A	AIK-369B	AIK-369C

NOTES

- P & ID SHOWN IS COMPRESSOR CKA01A. COMPRESSORS CKA01B & CKA01C ARE IDENTICAL EXCEPT FOR DEVICE IDENTIFICATION. FOR DEVICE IDENTIFICATION, REFER TO THE DEVICE TABLE.
- FOR DETAILED AIR COMPRESSOR SKID PIPING, REFER TO M-1047-00003.
- ALL VALVES AND INSTRUMENTATION SHOWN ARE VENDOR FURNISHED.
- DELETED.
- CONFIGURABLE CONTROLLER ALARMS INCLUDE HIGH LP OUTLET AIRTEMP (311A), HIGH HP INLET AIRTEMP (312A), HIGH HP OUTLET AIRTEMP (314A), DISCHARGE AIR TEMP (315A), HIGH OIL TEMP (319A) AND HIGH MOTOR ENCLOSURE TEMP (368A).
- ENGINEERING CONTROLLED (DIRECTOR) CONTROLLER COMPRESSOR TRIPS INCLUDE HIGH LP OUTLET TEMP (311A), HIGH HP INLET TEMP (312A), HIGH HP OUTLET TEMP (314A), DISCHARGE AIRTEMP (315A), HIGH HIGH DISCHARGE AIR PRESSURE (REMOTE LOAD OVERRIDE)(317A), HIGH OIL TEMP (319A), LOW OIL PRESSURE (320A), LOW COOLING WATER FLOW (334A), HIGH MAIN DRIVE MOTOR CURRENT, HIGH FAN MOTOR CURRENT AND EMERGENCY STOP.

CLASS 1 AS-BUILT

DRAWN	N/A	(DATE)	FSAR FIGURE 9.3-1 SHEET 7
CHKD.	N/A	(DATE)	
SUPV.	N/A	(DATE)	
APPD.	N/A	(DATE)	
LOCATION	CALLAWAY ENERGY CENTER	CLASS	
UNION ELECTRIC COMPANY	ST. LOUIS, MO	M-22KA07	REV. 8

DRWN	N/A	(DATE)	PIPING AND INSTRUMENTATION DIAGRAM INSTRUMENT AIR SYSTEM FSAR FIGURE 9.3-1 SHEET 8		
CHKD.	N/A	(DATE)			
SUPV.	N/A	(DATE)			
APPD.	N/A	(DATE)			
LOCATION		CALLAWAY ENERGY CENTER			CLASS
UNION ELECTRIC COMPANY ST. LOUIS, MO			M-22KA08		REV. 27

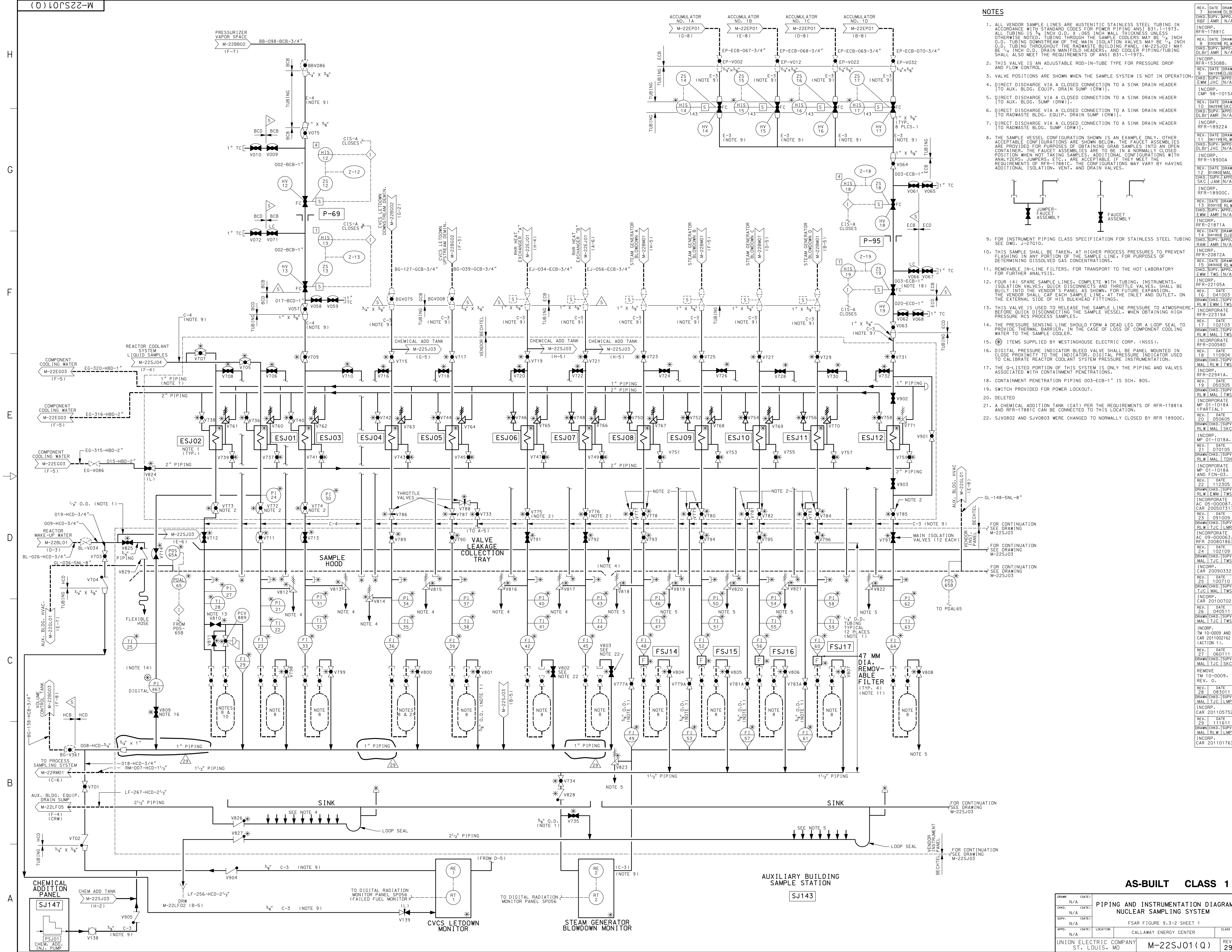
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NOTES:

- ① VALVE SHOWN ON M-22KA04.
- ② VALVE SUPPLIES GKTC0011 AND GKTC0012.
- ③ USE THIS DWG. WITH M-22KA04.
- ④ INSIDE OF BIOSHIELD.
- ⑤ COMPONENT HAS THREE AIR SUPPLIES.
- ⑥ COMPONENT HAS TWO AIR SUPPLIES.
- ⑦ TO LOCATE A COMPONENT ON THIS DRAWING, CHECK DRAWING LIST ON CEL FOR DESIGNATOR.
- ⑧ VALVE IS A DRAIN FOR THE INSTRUMENT AIR LINE.
- ⑨ DOWNSTREAM ISO VALVES

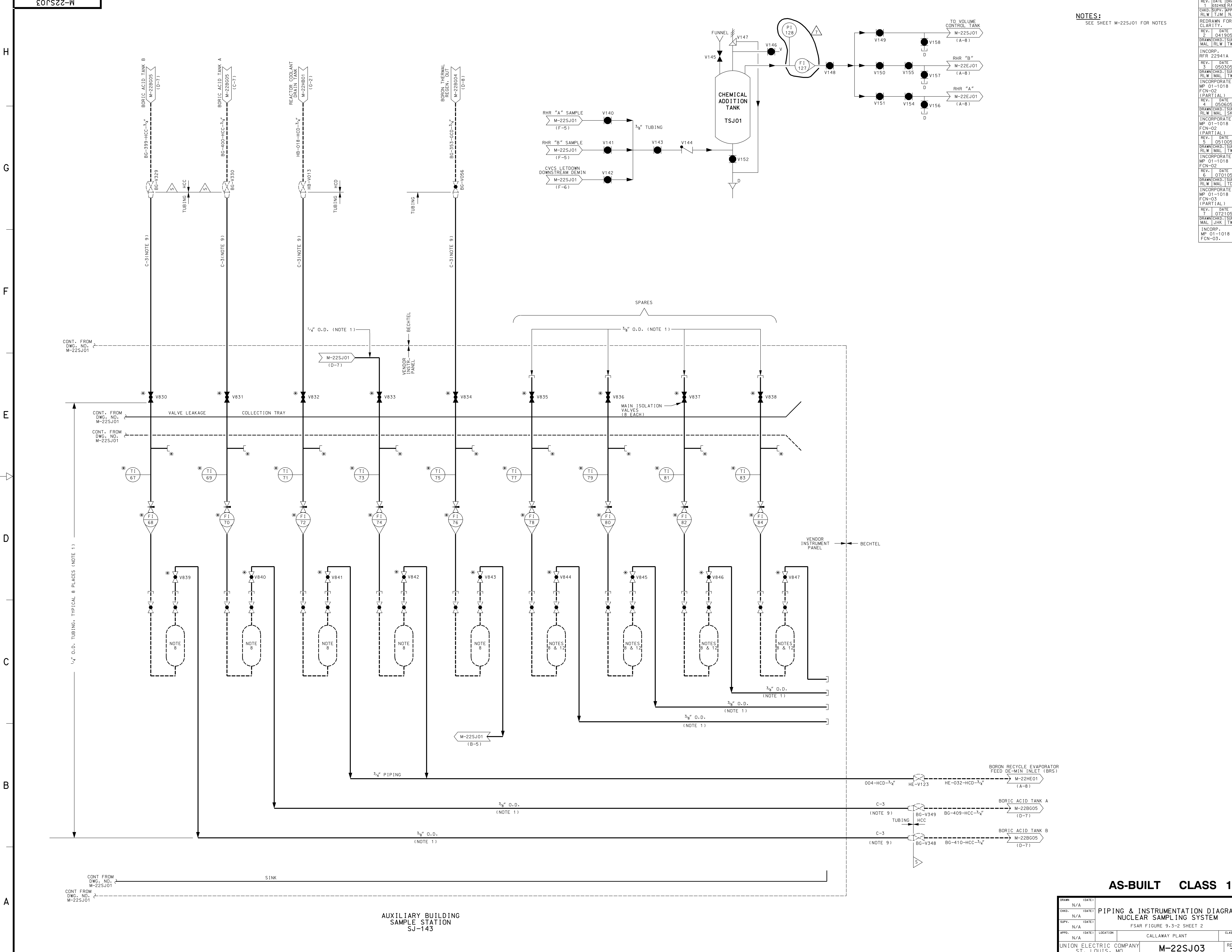
AS-BUILT CLASS 1

OWNER	N/A	(DATE)		PIPING AND INSTRUMENTATION DIAGRAM						A
CHRG.	N/A	(DATE)		INSTRUMENT AIR SYSTEM						
SUPP.	N/A	(DATE)		FSAR FIGURE 9.3-1 SHEET 9						25
APPR.	N/A	(DATE)		LOCATION	CALLAWAY ENERGY CENTER					CLASS
UNION ELECTRIC COMPANY ST. LOUIS, MO				M-22KA09				REV:	25	



- NOTES**
- ALL VENDOR SAMPLE LINES ARE AUSTENITIC STAINLESS STEEL TUBING IN ACCORDANCE WITH STANDARD CODES FOR POWER PIPING ANSI B31.1-1973. ALL TUBING IS 3/4" INCH O.D. X .065 INCH WALL THICKNESS UNLESS OTHERWISE NOTED. TUBING THROUGH THE SAMPLE COOLERS MAY BE 1/2" INCH O.D. TUBING DOWNSTREAM OF THE MAIN ISOLATION VALVES MAY BE 1/2" INCH O.D. TUBING THROUGHOUT THE RADWASTE BUILDING PANEL (M-22SJO2) MAY BE 1/2" INCH O.D. DRAIN MANIFOLD HEADERS, AND COOLER PIPING/TUBING SHALL ALSO MEET THE REQUIREMENTS OF ANSI B31.1-1973.
 - THIS VALVE IS AN ADJUSTABLE ROD-IN-TUBE TYPE FOR PRESSURE DROP AND FLOW CONTROL.
 - VALVE POSITIONS ARE SHOWN WHEN THE SAMPLE SYSTEM IS NOT IN OPERATION.
 - DIRECT DISCHARGE VIA A CLOSED CONNECTION TO A SINK DRAIN HEADER [TO AUX. BLDG. EQUIP. DRAIN SUMP (CRW)].
 - DIRECT DISCHARGE VIA A CLOSED CONNECTION TO A SINK DRAIN HEADER [TO AUX. BLDG. SUMP (DRW)].
 - DIRECT DISCHARGE VIA A CLOSED CONNECTION TO A SINK DRAIN HEADER [TO RADWASTE BLDG. EQUIP. DRAIN SUMP (CRW)].
 - DIRECT DISCHARGE VIA A CLOSED CONNECTION TO A SINK DRAIN HEADER [TO RADWASTE BLDG. SUMP (DRW)].
 - THE SAMPLE VESSEL CONFIGURATION SHOWN IS AN EXAMPLE ONLY. OTHER ACCEPTABLE CONFIGURATIONS ARE SHOWN BELOW. THE FAUCET ASSEMBLIES ARE PROVIDED FOR PURPOSES OF OBTAINING GRAB SAMPLES INTO AN OPEN CONTAINER. THE FAUCET ASSEMBLIES ARE TO BE IN A NORMALLY CLOSED POSITION WHEN NOT TAKING SAMPLES. ADDITIONAL CONFIGURATIONS WITH ANALYZERS, JUMPERS, ETC., ARE ACCEPTABLE IF THEY MEET THE REQUIREMENTS OF RFR-17881C. THE CONFIGURATIONS MAY VARY BY HAVING ADDITIONAL ISOLATION, VENT, AND DRAIN VALVES.
 - FOR INSTRUMENT PIPING CLASS SPECIFICATION FOR STAINLESS STEEL TUBING SEE DWG. J-27610.
 - THIS SAMPLE SHALL BE TAKEN, AT HIGHER PROCESS PRESSURES TO PREVENT FLASHING IN ANY PORTION OF THE SAMPLE LINE, FOR PURPOSES OF DETERMINING DISSOLVED GAS CONCENTRATIONS.
 - REMOVABLE IN-LINE FILTERS, FOR TRANSPORT TO THE HOT LABORATORY FOR FURTHER ANALYSIS.
 - FOUR (4) SPARE SAMPLE LINES, COMPLETE WITH TUBING, INSTRUMENTS, ISOLATION VALVES, QUICK DISCONNECTS AND THROTTLE VALVES, SHALL BE BUILT INTO THE VENDOR'S PANEL AS SHOWN. THE FAUCET ASSEMBLIES ARE TO BE IN A NORMALLY CLOSED POSITION WHEN NOT TAKING SAMPLES. ADDITIONAL CONFIGURATIONS WITH ANALYZERS, JUMPERS, ETC., ARE ACCEPTABLE IF THEY MEET THE REQUIREMENTS OF RFR-17881C. THE CONFIGURATIONS MAY VARY BY HAVING ADDITIONAL ISOLATION, VENT, AND DRAIN VALVES.
 - THIS VALVE IS USED TO RELEASE THE SAMPLE LINE PRESSURE TO ATMOSPHERE, BEFORE QUICK DISCONNECTING THE SAMPLE VESSEL, WHEN OBTAINING HIGH PRESSURE RCS PROCESS SAMPLES.
 - THE PRESSURE SENSING LINE SHOULD FORM A DEAD LEG OR A LOOP SEAL TO PROVIDE THERMAL BARRIER, IN THE CASE OF LOSS OF COMPONENT COOLING WATER TO THE SAMPLE COOLER.
 - ITEMS SUPPLIED BY WESTINGHOUSE ELECTRIC CORP. (NSSS).
 - DIGITAL PRESSURE INDICATOR BLEED VALVE SHALL BE PANEL MOUNTED IN CLOSE PROXIMITY TO THE INDICATOR. DIGITAL PRESSURE INDICATOR USED TO CALIBRATE REACTOR COOLANT SYSTEM PRESSURE INSTRUMENTATION.
 - THE O-LISTED PORTION OF THIS SYSTEM IS ONLY THE PIPING AND VALVES ASSOCIATED WITH CONTAINMENT PENETRATIONS.
 - CONTAINMENT PENETRATION PIPING 003-ECB-1" IS SCH. 80S.
 - SWITCH PROVIDED FOR POWER LOCKOUT.
 - DELETED
 - A CHEMICAL ADDITION TANK (CAT) PER THE REQUIREMENTS OF RFR-17881A AND RFR-17881C CAN BE CONNECTED TO THIS LOCATION.
 - SJV0802 AND SJV0803 WERE CHANGED TO NORMALLY CLOSED BY RFR 18900C.

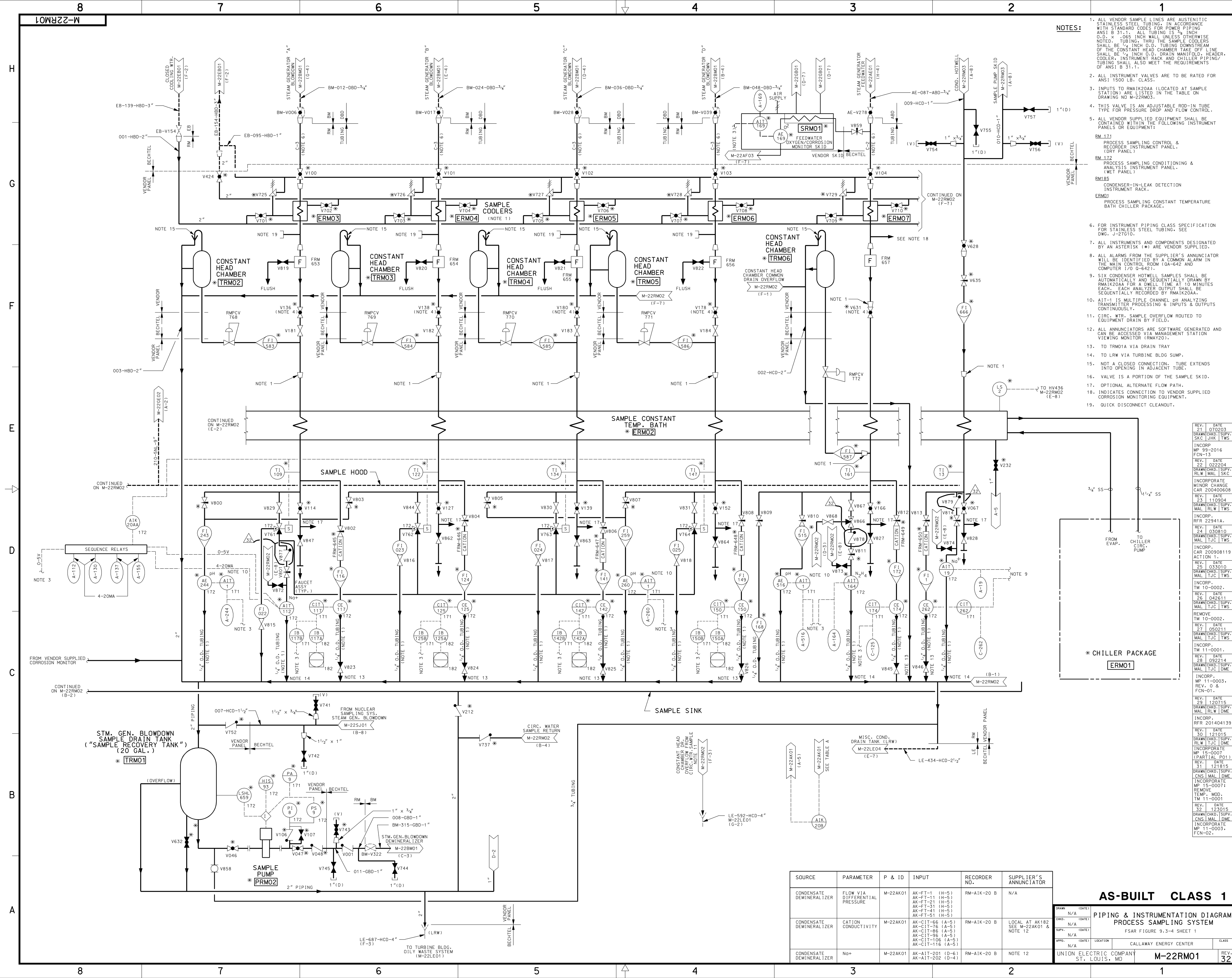
AS-BUILT CLASS 1			
PIPING AND INSTRUMENTATION DIAGRAM			
NUCLEAR SAMPLING SYSTEM			
DRWN	N/A	DATE	
CHKD	N/A	DATE	
SUPV	N/A	DATE	
APPD	N/A	DATE	
UNION ELECTRIC COMPANY	ST. LOUIS, MO	M-22SJO1(Q)	REV. 29



NOTES:
SEE SHEET M-22SJ01 FOR NOTES

REV.	DATE	DRAWN	CHKD.	SUPV.	APPR.	RLW	TJM	N/A
1	041905	032492	RAM					
2	041905	032492	RAM					
3	050305	032492	RAM					
4	050305	032492	RAM					
5	051005	032492	RAM					
6	070105	032492	RAM					
7	072105	032492	RAM					
8	072105	032492	RAM					
9	072105	032492	RAM					
10	072105	032492	RAM					
11	072105	032492	RAM					
12	072105	032492	RAM					
13	072105	032492	RAM					
14	072105	032492	RAM					
15	072105	032492	RAM					
16	072105	032492	RAM					
17	072105	032492	RAM					
18	072105	032492	RAM					
19	072105	032492	RAM					
20	072105	032492	RAM					

AS-BUILT CLASS 1		PIPING & INSTRUMENTATION DIAGRAM		NUCLEAR SAMPLING SYSTEM	
FSAR FIGURE 9.3-2 SHEET 2		CALLAWAY PLANT		CLASS	
UNION ELECTRIC COMPANY		ST. LOUIS, MO		REV. 7	
M-22SJ03					



- NOTES:**
1. ALL VENDOR SAMPLE LINES ARE AUSTENITIC STAINLESS STEEL TUBING, IN ACCORDANCE WITH STANDARD CODES FOR POWER PIPING ANSI B 31.1. ALL TUBING IS 3/4" I.D. X .065" WALL UNLESS OTHERWISE NOTED. TUBING THRU THE SAMPLE COOLERS SHALL BE 1/4" I.D. TUBING DOWNSTREAM OF THE CONSTANT HEAD CHAMBER TAKE OFF LINE SHALL BE 1/4" I.D. DRAIN MANIFOLD, HEADER, COOLER, INSTRUMENT RACK AND CHILLER PIPING TUBING SHALL ALSO MEET THE REQUIREMENTS OF ANSI B 31.1.
 2. ALL INSTRUMENT VALVES ARE TO BE RATED FOR ANSI 1500 LB. CLASS.
 3. INPUTS TO RMAIK20AA (LOCATED AT SAMPLE STATION) ARE LISTED IN THE TABLE ON DRAWING NO. M-22RM03.
 4. THIS VALVE IS AN ADJUSTABLE ROD-IN-TUBE TYPE FOR PRESSURE DROP AND FLOW CONTROL.
 5. ALL VENDOR SUPPLIED EQUIPMENT SHALL BE CONTAINED WITHIN THE FOLLOWING INSTRUMENT PANELS OR EQUIPMENT:
RM-171 PROCESS SAMPLING CONTROL & RECORDER INSTRUMENT PANEL (DRY PANEL)
RM-172 PROCESS SAMPLING CONDITIONING & ANALYSIS INSTRUMENT PANEL (WET PANEL)
RM-185 CONDENSER-IN-LEAK DETECTION INSTRUMENT RACK
ERM01 PROCESS SAMPLING CONSTANT TEMPERATURE BATH CHILLER PACKAGE.
 6. FOR INSTRUMENT PIPING CLASS SPECIFICATION FOR STAINLESS STEEL TUBING, SEE DWG. J-27610.
 7. ALL INSTRUMENTS AND COMPONENTS DESIGNATED BY AN ASTERISK (*) ARE VENDOR SUPPLIED.
 8. ALL ALARMS FROM THE SUPPLIER'S ANNUNCIATOR WILL BE IDENTIFIED BY A COMMON ALARM IN THE MAIN CONTROL ROOM (0A-642 AND COMPUTER I/O Q-642).
 9. SIX CONDENSER HOTWELL SAMPLES SHALL BE AUTOMATICALLY AND SEQUENTIALLY DRAWN BY RMAIK20AA FOR A DWELL TIME AT 10 MINUTES EACH. EACH ANALYZER OUTPUT SHALL BE SEQUENTIALLY RECORDED BY RMAIK20AA.
 10. AIT-1 IS MULTIPLE CHANNEL PH ANALYZING TRANSMITTER PROCESSING 6 INPUTS & OUTPUTS CONTINUOUSLY.
 11. CIRC. WTR. SAMPLE OVERFLOW ROUTED TO EQUIPMENT DRAIN BY FIELD.
 12. ALL ANNUNCIATORS ARE SOFTWARE GENERATED AND CAN BE ACCESSED VIA MANAGEMENT STATION VIEWING MONITOR (RMAY20).
 13. TO TRM01A VIA DRAIN TRAY
 14. TO LRW VIA TURBINE BLDG SUMP.
 15. NOT A CLOSED CONNECTION. TUBE EXTENDS INTO OPENING IN ADJACENT TUBE.
 16. VALVE IS A PORTION OF THE SAMPLE SKID.
 17. OPTIONAL ALTERNATE FLOW PATH.
 18. INDICATES CONNECTION TO VENDOR SUPPLIED CORROSION MONITORING EQUIPMENT.
 19. QUICK DISCONNECT CLEANOUT.

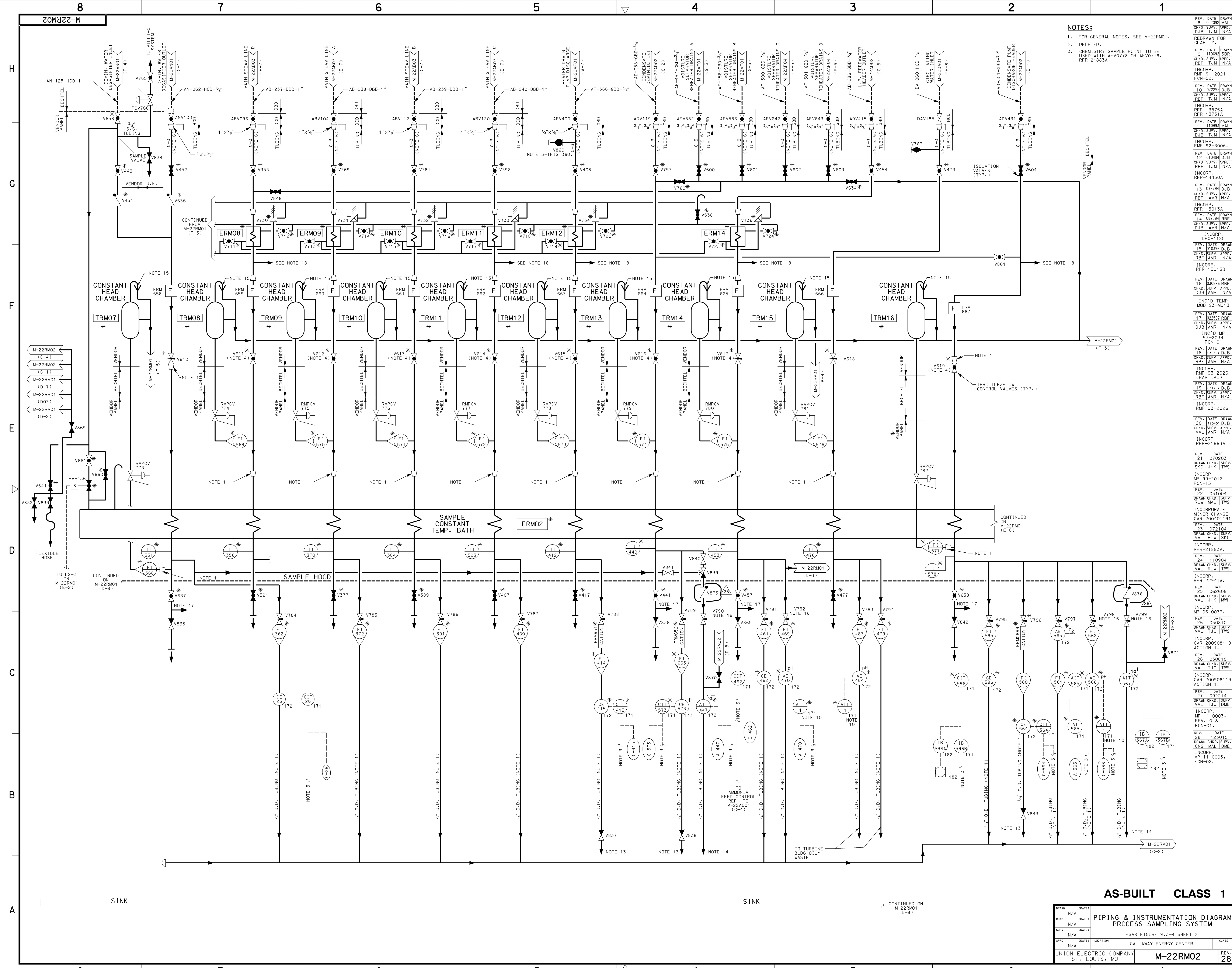
REV.	DATE	DESCRIPTION
21	070203	DRAWING: SUPV. SKC JHK TWS
22	022204	DRAWING: SUPV. RLM MAL LSK
23	030810	DRAWING: SUPV. RLM MAL LSK
24	030810	DRAWING: SUPV. RLM MAL LSK
25	033010	DRAWING: SUPV. RLM MAL LSK
26	042611	DRAWING: SUPV. RLM MAL LSK
27	050211	DRAWING: SUPV. RLM MAL LSK
28	092214	DRAWING: SUPV. RLM MAL LSK
29	120115	DRAWING: SUPV. RLM MAL LSK
30	121815	DRAWING: SUPV. RLM MAL LSK
31	121815	DRAWING: SUPV. RLM MAL LSK
32	123015	DRAWING: SUPV. RLM MAL LSK
33	123015	DRAWING: SUPV. RLM MAL LSK
34	123015	DRAWING: SUPV. RLM MAL LSK
35	123015	DRAWING: SUPV. RLM MAL LSK
36	123015	DRAWING: SUPV. RLM MAL LSK
37	123015	DRAWING: SUPV. RLM MAL LSK
38	123015	DRAWING: SUPV. RLM MAL LSK
39	123015	DRAWING: SUPV. RLM MAL LSK
40	123015	DRAWING: SUPV. RLM MAL LSK

SOURCE	PARAMETER	P & ID	INPUT	RECORDER NO.	SUPPLIER'S ANNUNCIATOR
CONDENSATE DEMINERALIZER	FLOW VIA DIFFERENTIAL PRESSURE	M-22AK01	AK-FT-1 (H-5) AK-FT-11 (H-5) AK-FT-21 (H-5) AK-FT-31 (H-5) AK-FT-41 (H-5) AK-FT-51 (H-5)	RM-AIK-20 B	N/A
CONDENSATE DEMINERALIZER	CATION CONDUCTIVITY	M-22AK01	AK-CIT-66 (A-5) AK-CIT-76 (A-5) AK-CIT-86 (A-5) AK-CIT-96 (A-5) AK-CIT-106 (A-5) AK-CIT-116 (A-5)	RM-AIK-20 B	LOCAL AT AK182 SEE M-22AK01 & NOTE 12
CONDENSATE DEMINERALIZER	Nd+	M-22AK01	AK-AIT-201 (D-6) AK-AIT-202 (D-4)	RM-AIK-20 B	NOTE 12

AS-BUILT CLASS 1

**PIPING & INSTRUMENTATION DIAGRAM
PROCESS SAMPLING SYSTEM**

UNION ELECTRIC COMPANY ST. LOUIS, MO	CALLAWAY ENERGY CENTER	CLASS	M-22RM01	REV. 32
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- NOTES:
- FOR GENERAL NOTES, SEE M-22RM01.
 - DELETED.
 - CHEMISTRY SAMPLE POINT TO BE USED WITH AFV0778 OR AFV0779. RFR 21883A.

REV.	DATE	DRAWN	CHKD.	SUPV.	APPD.	DJB	TJM	N/A
8	030998	MAL						
9	110698	SAR						
10	072398	DJB						
11	110998	MAL						
12	010498	DJB						
13	072798	DJB						
14	082598	RBF						
15	010398	DJB						
16	030998	RBF						
17	022598	RBF						
18	030498	DJB						
19	031198	DJB						
20	120400	DJB						
21	070203	DJB						
22	031004	DJB						
23	072104	DJB						
24	110904	DJB						
25	062606	DJB						
26	030810	DJB						
27	022114	DJB						
28	123015	DJB						
29	030303	DJB						
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100	030303	DJB						

AS-BUILT CLASS 1

PIPING & INSTRUMENTATION DIAGRAM
PROCESS SAMPLING SYSTEM

FSAR FIGURE 9.3-4 SHEET 2

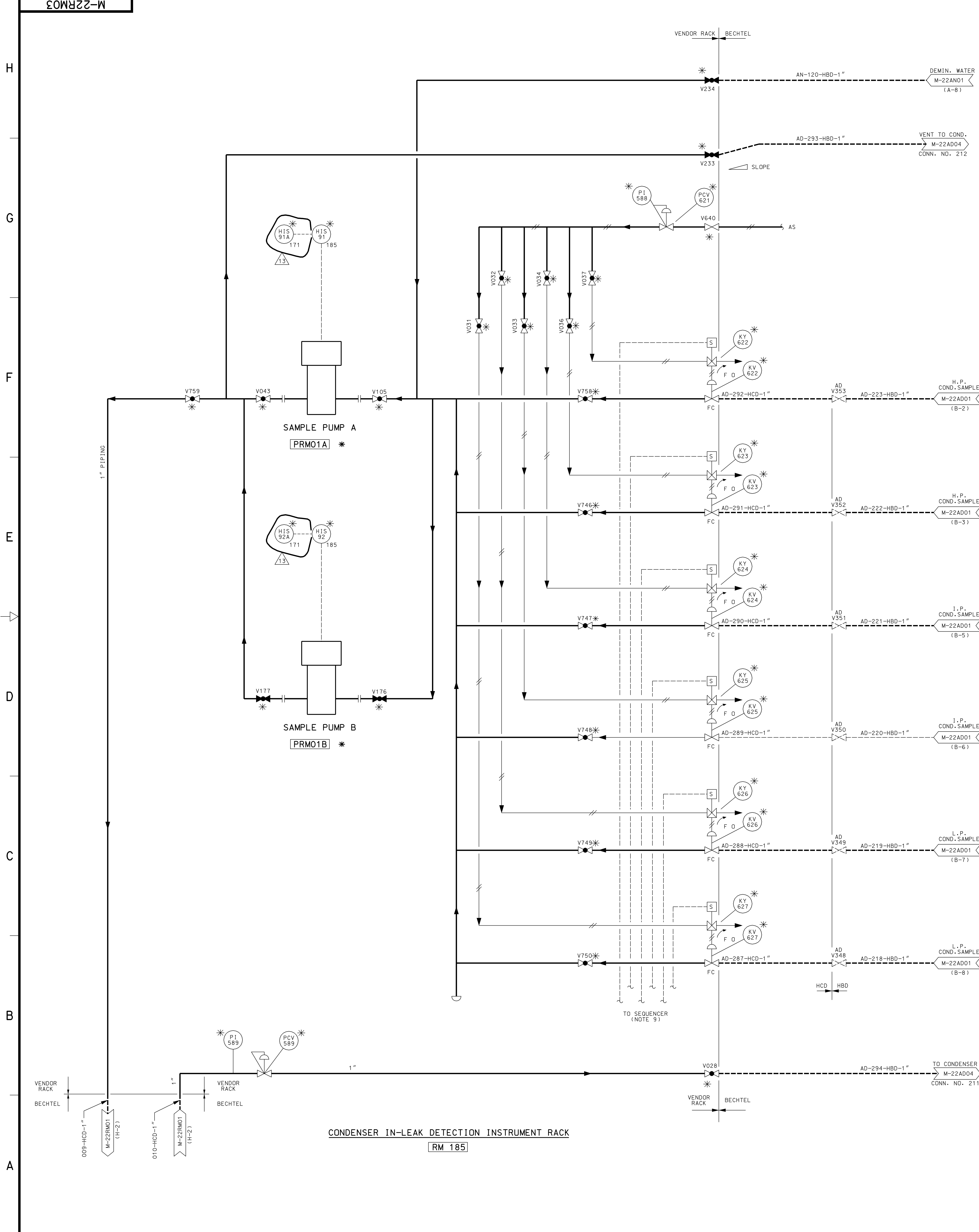
CALLAWAY ENERGY CENTER

CLASS

UNION ELECTRIC COMPANY

M-22RM02

REV. 28



NOTES:
FOR GENERAL NOTES SEE DRAWING M-22RM01.

REFERENCE NOTE 3:

SOURCE	PARAMETER	P&ID	INPUT	RECORDER NO.	SUPPLIER'S ANNUNCIATOR (NOTE 8)
STM. GEN. BLOWDOWN	pH	M-22RM01	AE-244(C-7)	RM-A1K20AA	(NOTE 12)
LP. F.W. HTR. OUT	pH	M-22RM01	AE-516(C-3)		
CIRC. HTR. COND. PUMP DISCH.	pH	M-22RM02	AE-470(D-4)		
	---	M-22RM02	PHL-4016-CH		
	---	M-22RM02	AE-566(D-2)		SPARES (9)
STM. GEN. BLOWDOWN	CAT. COND.	M-22RM01	CE-117(C-7), CE-125(C-6)	RM-A1K20AA	(NOTE 12)
STM. GEN. BLOWDOWN	CAT. COND.	M-22RM01	CE-142(C-5), CE-150(C-4)		
HTR. DR. PUMP DISCH.	CAT. COND.	M-22RM02	CE-415(C-5)		
COND. DEMIN. OUT	CAT. COND.	M-22RM02	CE-573(C-5)		
COND. PUMP DISCH.	CAT. COND.	M-22RM02	CE-564(C-2)		SPARES (7)
DEMINERALIZED WATER	SPEC. COND.	M-22RM02	CE-26(C-7)		
COND. PUMP DISCH.	SPEC. COND.	M-22RM02	CE-596(C-2)		
LP. F.W. HTR. OUT	SPEC. COND.	M-22RM02	CE-462(B-4)		SPARES (8)
STM. GEN. BLOWDOWN	Na+	M-22RM01	AE/A1T-112(C-7) (4 INPUTS)	RM-A1K20AA	(NOTE 12)
STM. GEN. F.W.	N ₂ H ₄	M-22RM01	AE/A1T-164(C-3)		
COND. DEMIN. OUT	Na+	M-22RM02	AE-447(B-4)		
COND. PUMP DISCH.	Na+	M-22RM02	AE-567(C-1)		SPARES (8)
STM. GEN. F.W.	O ₂	M-22RM01	AE/A1T-169(H-3)	RM-A1K20AA	(NOTE 12)
COND. PUMP DISCH.	O ₂	M-22RM02	AE-565(C-2)		SPARES (13)
CONDENSER HOT WELL	CAT. COND.	M-22RM01	CE-262(SEQ. SEL. 6 SAMP) (C-2)	RM-A1K20AA	(NOTE 12)
CONDENSER HOT WELL	Na+	M-22RM01	AE19(SEQ. SEL. 6 SAMP) (C-2)	RM-A1K20AA	(NOTE 12)
SAMPLE RETURN OVERPRESSURE	PRESSURE	M-22RM02	N/A	N/A	RM-PA-9
HOTWELL SECTION 1 SPECIFIC COND.	SPEC. COND.	M-22AD01	C1T-34	RM-A1K20AB	(NOTE 12)
HOTWELL SECTION 2 SPECIFIC COND.	SPEC. COND.	M-22AD01	C1T-34		
HOTWELL SECTION 3 SPECIFIC COND.	SPEC. COND.	M-22AD01	C1T-32		
HOTWELL SECTION 4 SPECIFIC COND.	SPEC. COND.	M-22AD01	C1T-32		
HOTWELL SECTION 5 SPECIFIC COND.	SPEC. COND.	M-22AD01	C1T-30		
HOTWELL SECTION 6 SPECIFIC COND.	SPEC. COND.	M-22AD01	C1T-30		

AS-BUILT CLASS 1

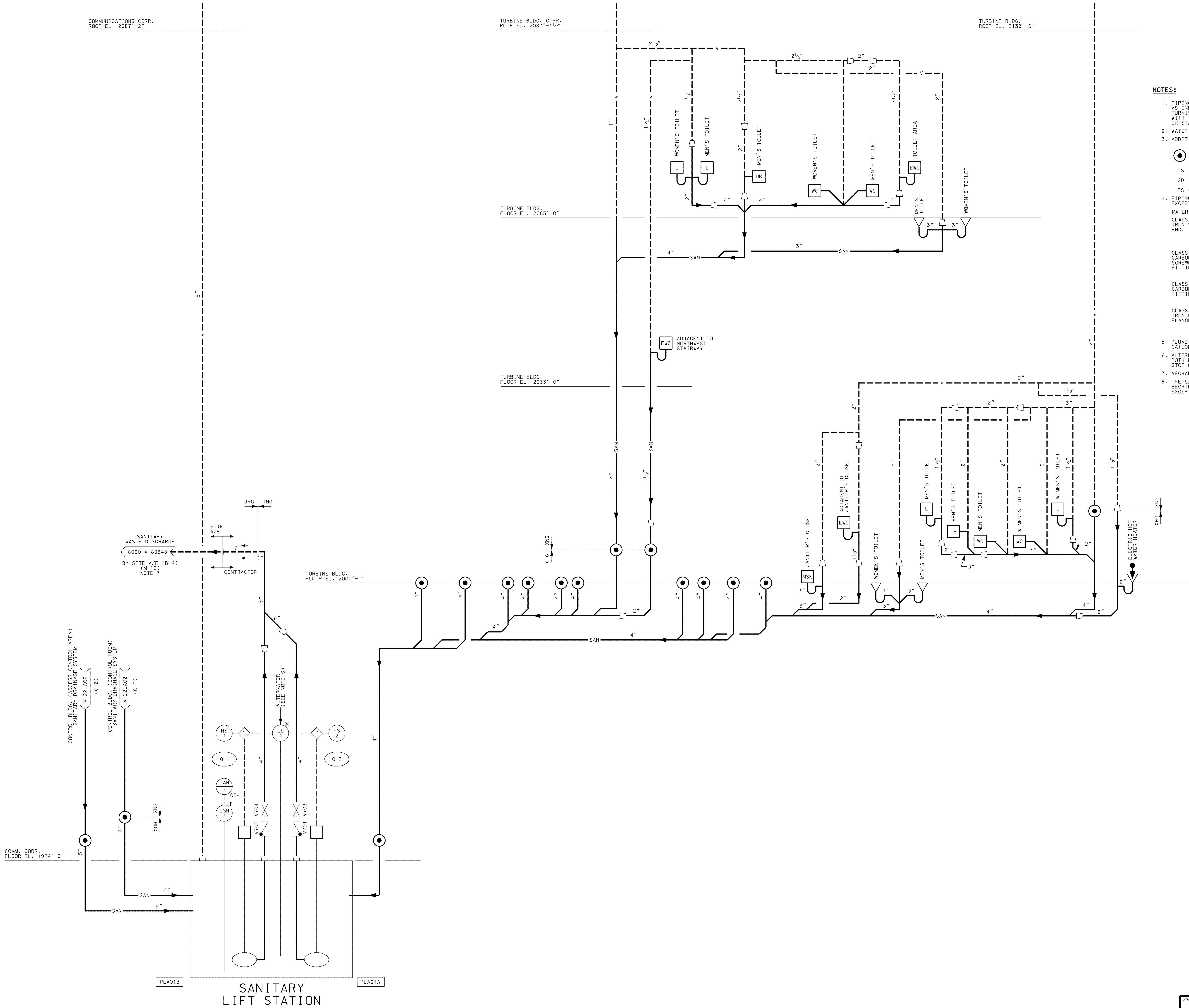
DRAWN	N/A	DATE		PIPING AND INSTRUMENTATION DIAGRAM PROCESS SAMPLING SYSTEM FSAR FIGURE 9.3-4 SHEET 3 CALLAWAY PLANT	CLASS
CHKD.	N/A	DATE			
SUPV.	N/A	DATE			
APPR.	N/A	DATE			
UNION ELECTRIC COMPANY ST. LOUIS, MO	M-22RM03	REV.	13		

REV.	DATE	DRAWN
2	7-22-14	JSR
CHKD.	SUPV.	WPPR
GDC	TJM	N/A
REDRAWN FOR CLARITY		
REV.	DATE	DRAWN
3	041905	JSR
CHKD.	SUPV.	WPPR
GDC	TJM	N/A
INCORP. RFR 22941A		

- NOTES:**
1. PIPING, FITTINGS, VALVES, FIXTURES AND OTHER COMPONENTS, AS INDICATED, FOR THE SANITARY DRAINAGE SYSTEM SHALL BE FURNISHED, INSTALLED, CLEANED AND TESTED IN ACCORDANCE WITH THE UNIFORM PLUMBING CODE AND/OR THE APPLICABLE LOCAL OR STATE CODES.
 2. WATER CLOSETS AND URINALS ARE PROVIDED WITH INTEGRAL TRAPS.
 3. ADDITIONAL SYMBOLS NOT SHOWN ON DWG. M-220103 ARE AS FOLLOWS:

● = CLEANOUT
DS = DEEP SINK
GD = GARBAGE DISPOSAL
PS = PANTRY SINK
 4. PIPING CLASS FOR THE SANITARY WASTE SYSTEM SHALL BE AS FOLLOWS: EXCEPT AS NOTED.

MATERIAL	SERVICE
CLASS "XHG" EXTRA HEAVY CAST IRON SOIL PIPE, HUB AND PLAIN END.	SANITARY WASTE PIPE, CONTROL BLDG. & COMM. CORR., EL. 1984'-0" & BELOW, AND TURBINE BLDG. EL. 2000'-0" & BELOW.
CLASS "XNG" GALVANIZED CARBON STEEL PIPING AND SCREWED CAST IRON DRAINAGE FITTINGS.	OTHER SANITARY WASTE AND ALL VENT PIPING.
CLASS "JNG" GALVANIZED CARBON STEEL WITH FLANGED FITTINGS.	DISCHARGE PIPING FROM THE SANITARY LIFT STATION EXCEPT AS NOTED BELOW.
CLASS "JRG" DUCTILE IRON PRESSURE PIPING WITH FLANGED CONNECTIONS.	SANITARY LIFT STATION DISCHARGE PIPING PENETRATING THE EXTERIOR WALL OF THE COMM. CORR.
 5. PLUMBING FIXTURES SHALL BE PER THE REQUIREMENTS OF SPECIFICATION A-220.
 6. ALTERNATOR ALTERNATES PUMP OPERATION WHEN SUMP LEVEL IS HIGH. BOTH PUMPS RUN WHEN SUMP LEVEL IS HIGH-HIGH, AND BOTH PUMPS STOP ON LOW LEVEL.
 7. MECHANICAL DESIGNATION PER M-20001.
 8. THE SANITARY LIFT STATION PUMPS AND COVER ARE PROCURED BY BECHTEL. ALL OTHER EQUIPMENT IN THIS SYSTEM IS OWNER PROCURED EXCEPT WHERE INDICATED.



AS-BUILT CLASS 1

DRAWN	(DATE)	PIPING AND INSTRUMENTATION		
N/A	(DATE)	DIAGRAM SANITARY LIFT STATION		
CHKD.	(DATE)	& TURB. BLDG. SANITARY		
N/A	(DATE)	DRAINAGE SYSTEM		
SUPV.	(DATE)	FSAR FIGURE 9.3-5 SHEET 1		
N/A	(DATE)	3		
APPD.	(DATE)	LOCATION	CALLAWAY PLANT	CLASS
N/A	(DATE)			
UNION ELECTRIC COMPANY		M-22LA01		REV. 3
ST. LOUIS, MO				

CONTROL BLDG.
ROOF EL. 2087'-2"

SEE NOTE 2

FLOOR EL. 2032'-0"

CONTROL BLDG.
AND COMM. CORRIDOR
FLOOR EL. 2047'-6"

COMMUNICATIONS CORRIDOR
ROOF EL. 2087'-2"

NOTES:

1. FOR GENERAL NOTES SEE DWG. M-22LA01
2. ALL THE JOINTS ON VENT PIPING PASSING THRU CONTROL BUILDING EL. 2032'-0" TO EL. 2087'-2" SHALL BE THREADED, FORGED 3000# STEEL FITTINGS.
3. * DENOTES PIPE PERMANENTLY SEALED AT FLOOR.

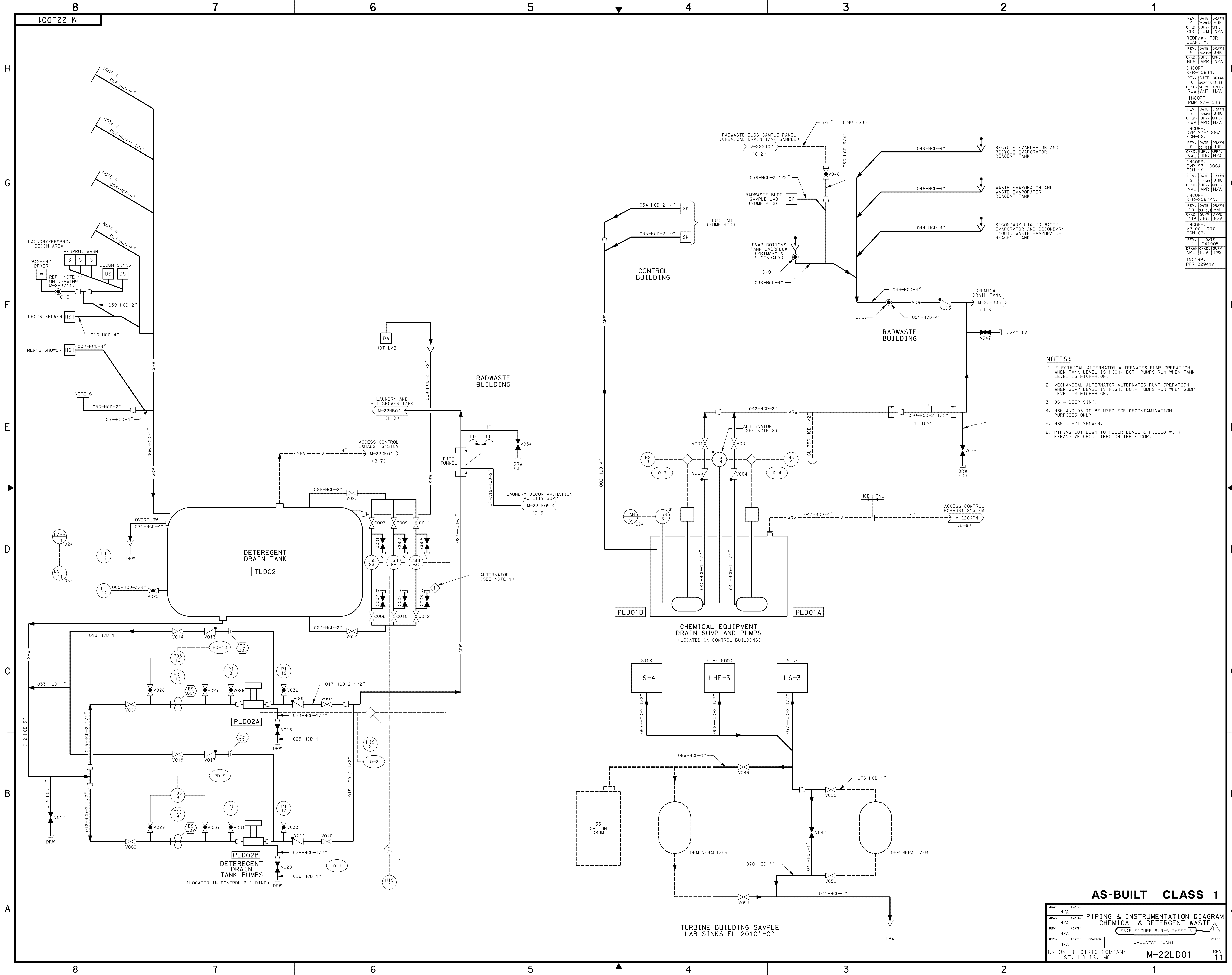
ALL VENT LINES ARE PIPING CLASS "XNG" EXCEPT AS NOTED

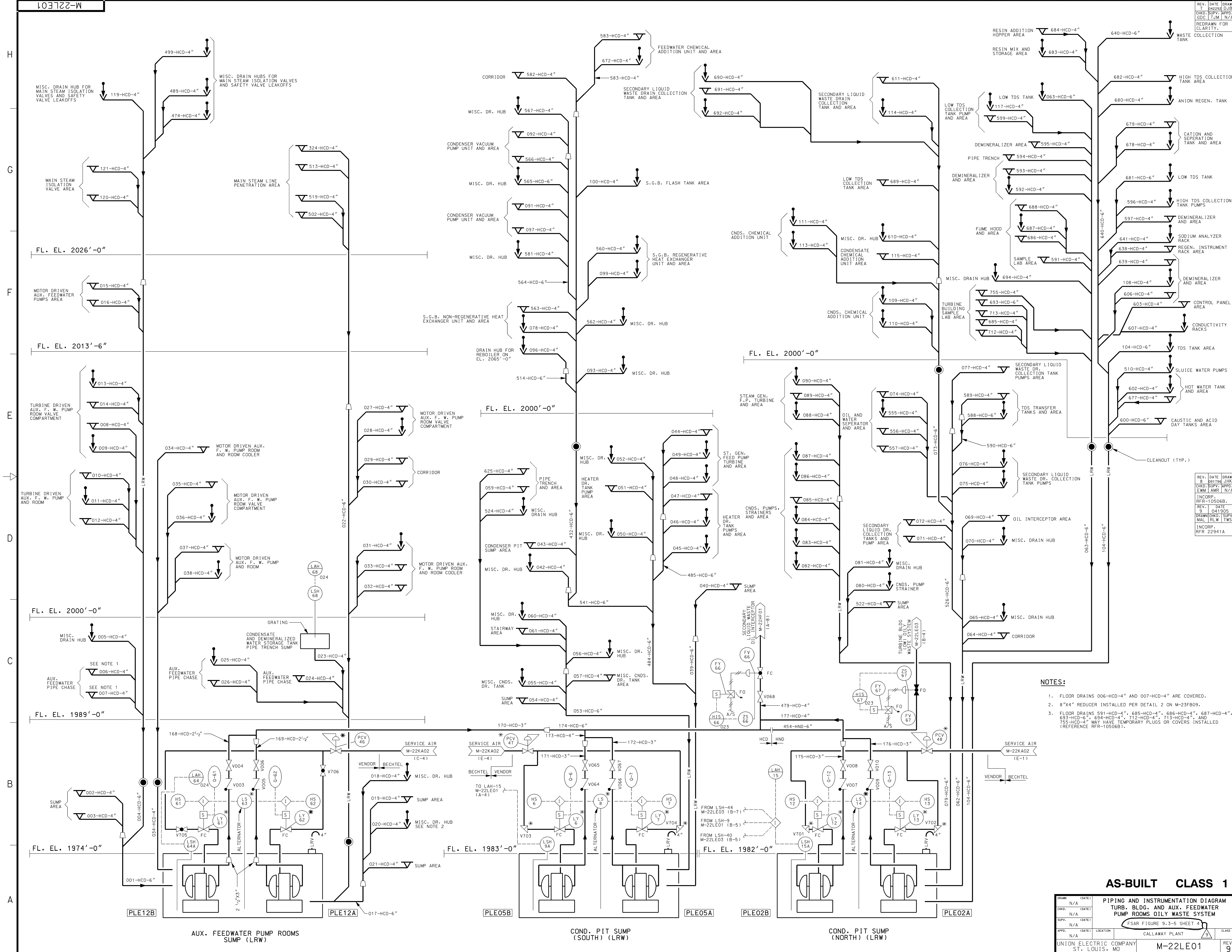
CONTROL BLDG. (ACCESS CONT. AREA)
AND COMM. CORRIDOR
FLOOR EL. 1984'-0"

AS-BUILT CLASS 1

DRAWN	N/A	(DATE)	PIPING AND INSTRUMENTATION DIAGRAM
CHKD.	N/A	(DATE)	COMMUNICATIONS CORRIDOR
SUPV.	N/A	(DATE)	AND CONTROL BLDG.
APPD.	N/A	(DATE)	SANITARY DRAINAGE SYSTEM
UNION ELECTRIC COMPANY			FSAR FIGURE 9.3-5 SHEET 2
ST. LOUIS, MO			CALLAWAY PLANT
M-22LA02			REV. 6

REV.	DATE	DRAWN	CHKD.	SUPV.	APPD.	GDC	TJM	N/A
1	1/20/14	MA						
2	02/19/18	MA						
3	05/03/19	JHK						
4	03/13/21	MAL						
5	04/19/25	MAL						
6	07/23/28	MAL						
7	07/23/28	MAL						
8	07/23/28	MAL						
9	07/23/28	MAL						
10	07/23/28	MAL						
11	07/23/28	MAL						
12	07/23/28	MAL						
13	07/23/28	MAL						
14	07/23/28	MAL						
15	07/23/28	MAL						
16	07/23/28	MAL						
17	07/23/28	MAL						
18	07/23/28	MAL						
19	07/23/28	MAL						
20	07/23/28	MAL						
21	07/23/28	MAL						
22	07/23/28	MAL						
23	07/23/28	MAL						
24	07/23/28	MAL						
25	07/23/28	MAL						
26	07/23/28	MAL						
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43	07/23/28	MAL						
44	07/23/28	MAL						
45	07/23/28	MAL						
46	07/23/28	MAL						
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93	07/23/28	MAL						
94	07/23/28	MAL						
95	07/23/28	MAL						
96	07/23/28	MAL						
97	07/23/28	MAL						
98	07/23/28	MAL						
99	07/23/28	MAL						
100	07/23/28	MAL						





- NOTES:**
- FLOOR DRAINS 006-HCD-4" AND 007-HCD-4" ARE COVERED.
 - 8"x4" REDUCER INSTALLED PER DETAIL 2 ON M-23FB09.
 - FLOOR DRAINS 591-HCD-4", 685-HCD-4", 686-HCD-4", 687-HCD-4", 693-HCD-6", 694-HCD-4", 712-HCD-4", 713-HCD-4", AND 755-HCD-4" MAY HAVE TEMPORARY PLUGS OR COVERS INSTALLED (REFERENCE RFR-10506B).

AS-BUILT CLASS 1

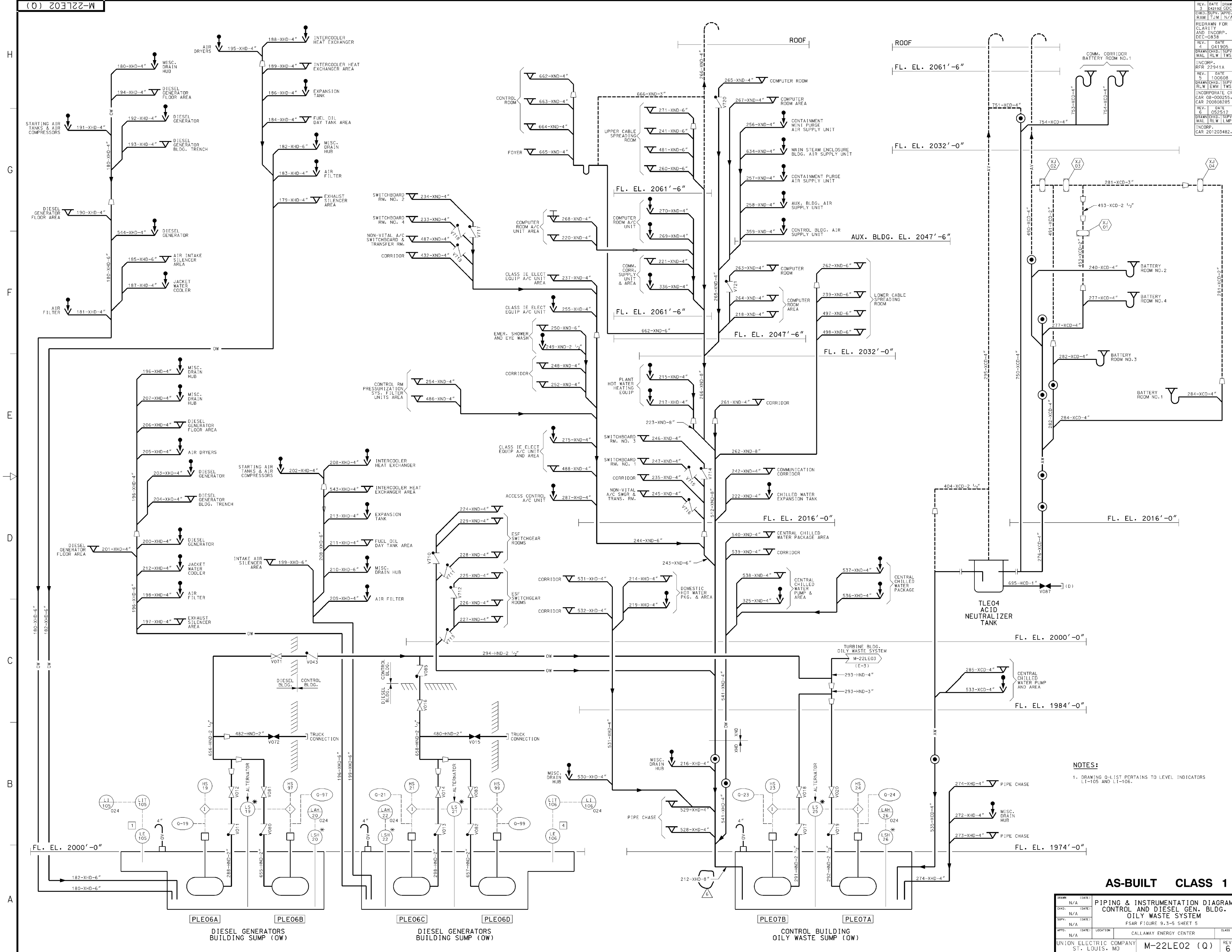
DRAWN	N/A	(DATE)	
CHKD.	N/A	(DATE)	
SUPV.	N/A	(DATE)	
APPD.	N/A	(DATE)	

LOCATION: CALLAWAY PLANT

UNITED ELECTRIC COMPANY
ST. LOUIS, MO

M-22LE01

REV. 9



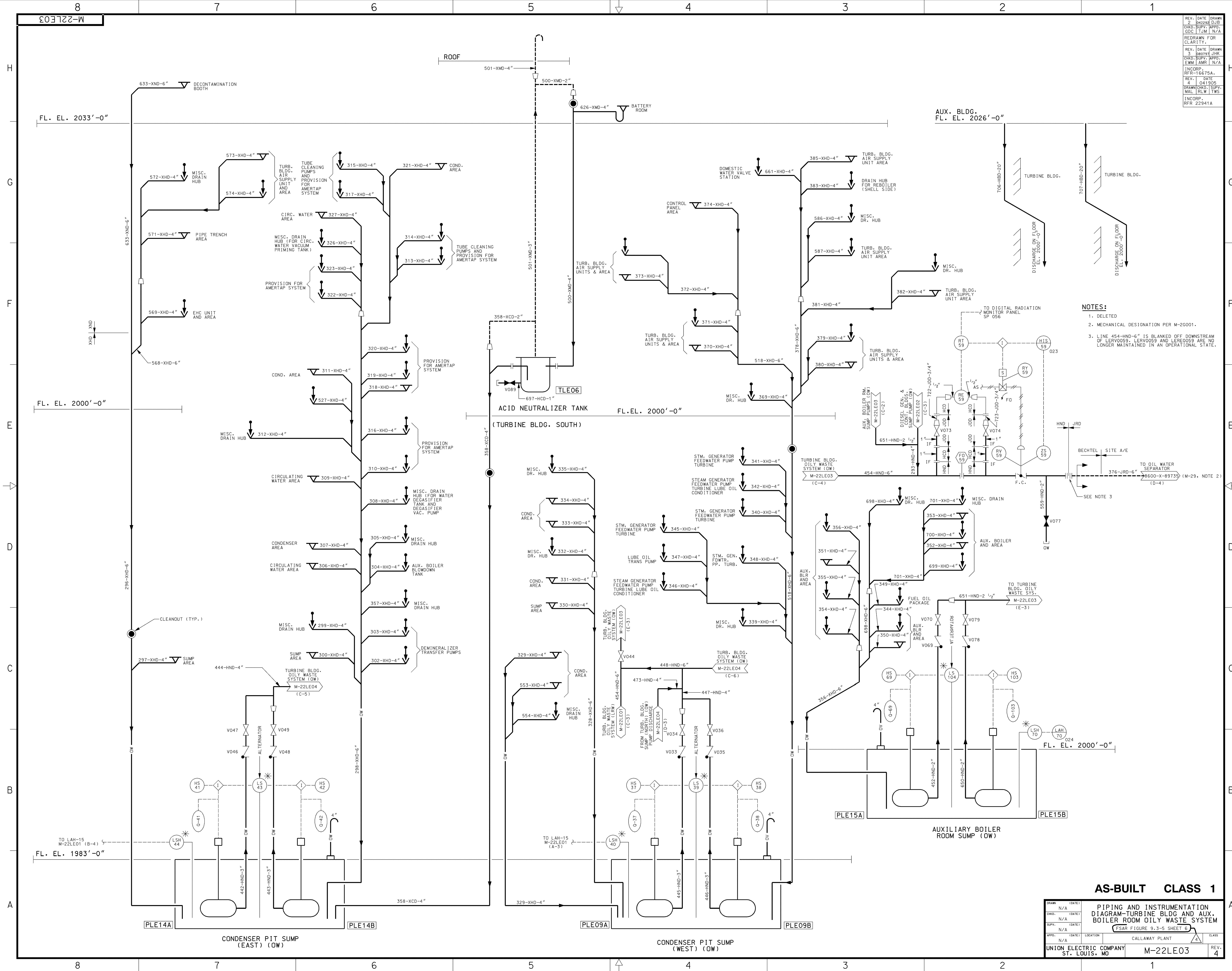
REV.	DATE	BY	CHKD.	APPD.	REV.	DATE	BY	CHKD.	APPD.
1	041905				1	041905			
2	041905				2	041905			
3	041905				3	041905			
4	041905				4	041905			
5	041905				5	041905			
6	041905				6	041905			
7	041905				7	041905			
8	041905				8	041905			
9	041905				9	041905			
10	041905				10	041905			

NOTES:
 1. DRAWING Q-LIST PERTAINS TO LEVEL INDICATORS LI-105 AND LI-106.

AS-BUILT CLASS 1

SYMBOL	DESCRIPTION	DATE	BY	CHKD.	APPD.	LOCATION	CLASS	REV.
LI-105	LEVEL INDICATOR	041905						
LI-106	LEVEL INDICATOR	041905						
LI-107	LEVEL INDICATOR	041905						
LI-108	LEVEL INDICATOR	041905						
LI-109	LEVEL INDICATOR	041905						
LI-110	LEVEL INDICATOR	041905						
LI-111	LEVEL INDICATOR	041905						
LI-112	LEVEL INDICATOR	041905						
LI-113	LEVEL INDICATOR	041905						
LI-114	LEVEL INDICATOR	041905						
LI-115	LEVEL INDICATOR	041905						

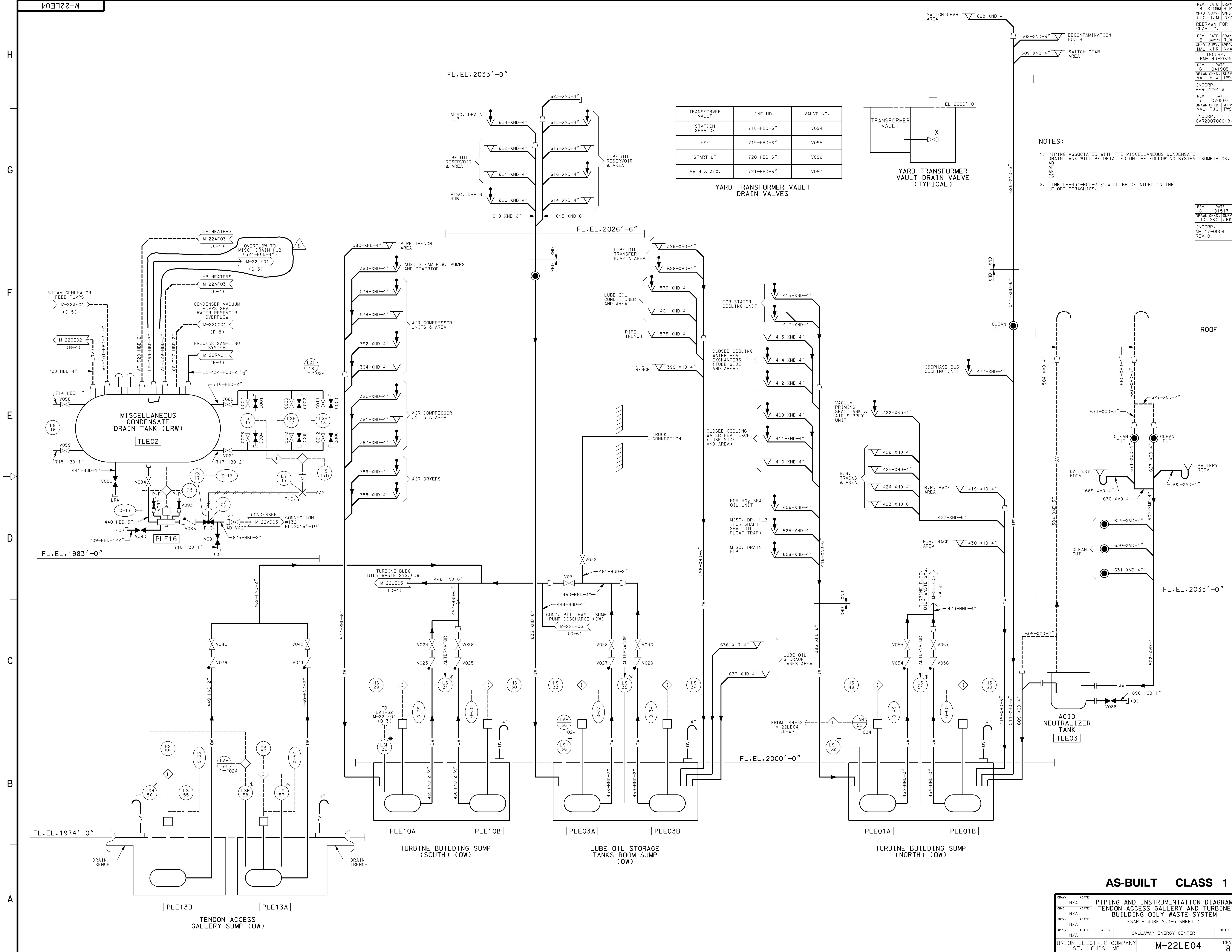
PIPING & INSTRUMENTATION DIAGRAM
CONTROL AND DIESEL GEN. BLDG.
OILY WASTE SYSTEM
 FSAR FIGURE 9-3-5 SHEET 5
 CALLAWAY ENERGY CENTER
 UNION ELECTRIC COMPANY
 ST. LOUIS, MO
 M-22LE02 (Q)
 REV. 6



REV.	DATE	DRAWN
2	042392	DJB
CHKD.	SUPV.	APPD.
GDC	TJM	N/A
REV.	DATE	DRAWN
3	080791	JHK
CHKD.	SUPV.	APPD.
EWM	AMR	N/A
INCORP.	REF	16675A.
REV.	DATE	DRAWN
4	041905	DJB
CHKD.	SUPV.	APPD.
MAI	RLW	TWS
INCORP.	REF	22941A

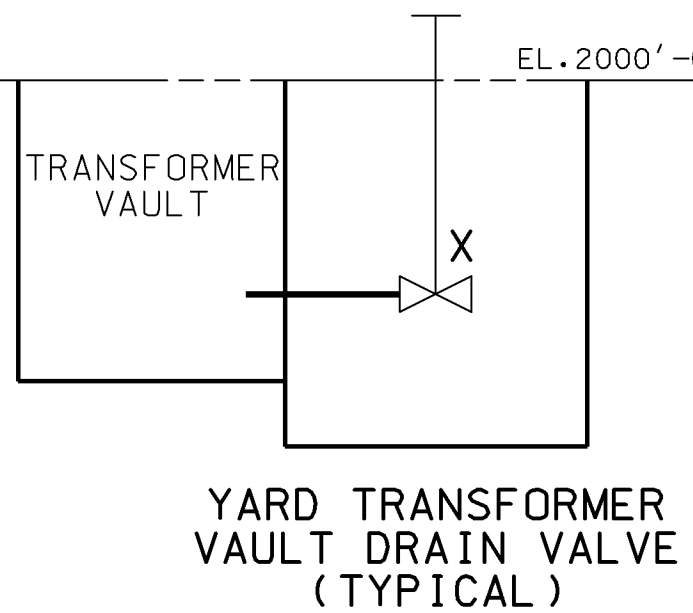
- NOTES:**
1. DELETED
 2. MECHANICAL DESIGNATION PER M-2G001.
 3. LINE 454-HND-6" IS BLANKED OFF DOWNSTREAM OF LERV0059. LERV0059 AND LERE0059 ARE NO LONGER MAINTAINED IN AN OPERATIONAL STATE.

AS-BUILT CLASS 1			
DRAWN	N/A	(DATE)	
CHKD.	N/A	(DATE)	
SUPV.	N/A	(DATE)	
APPD.	N/A	(DATE)	
LOCATION	CALLAWAY PLANT		
UNION ELECTRIC COMPANY			REV. 4
ST. LOUIS, MO			
M-22LE03			



TRANSFORMER VAULT	LINE NO.	VALVE NO.
STATION SERVICE	718-HBD-6"	V094
ESF	719-HBD-6"	V095
START-UP	720-HBD-6"	V096
MAIN & AUX.	721-HBD-6"	V097

YARD TRANSFORMER VAULT DRAIN VALVES

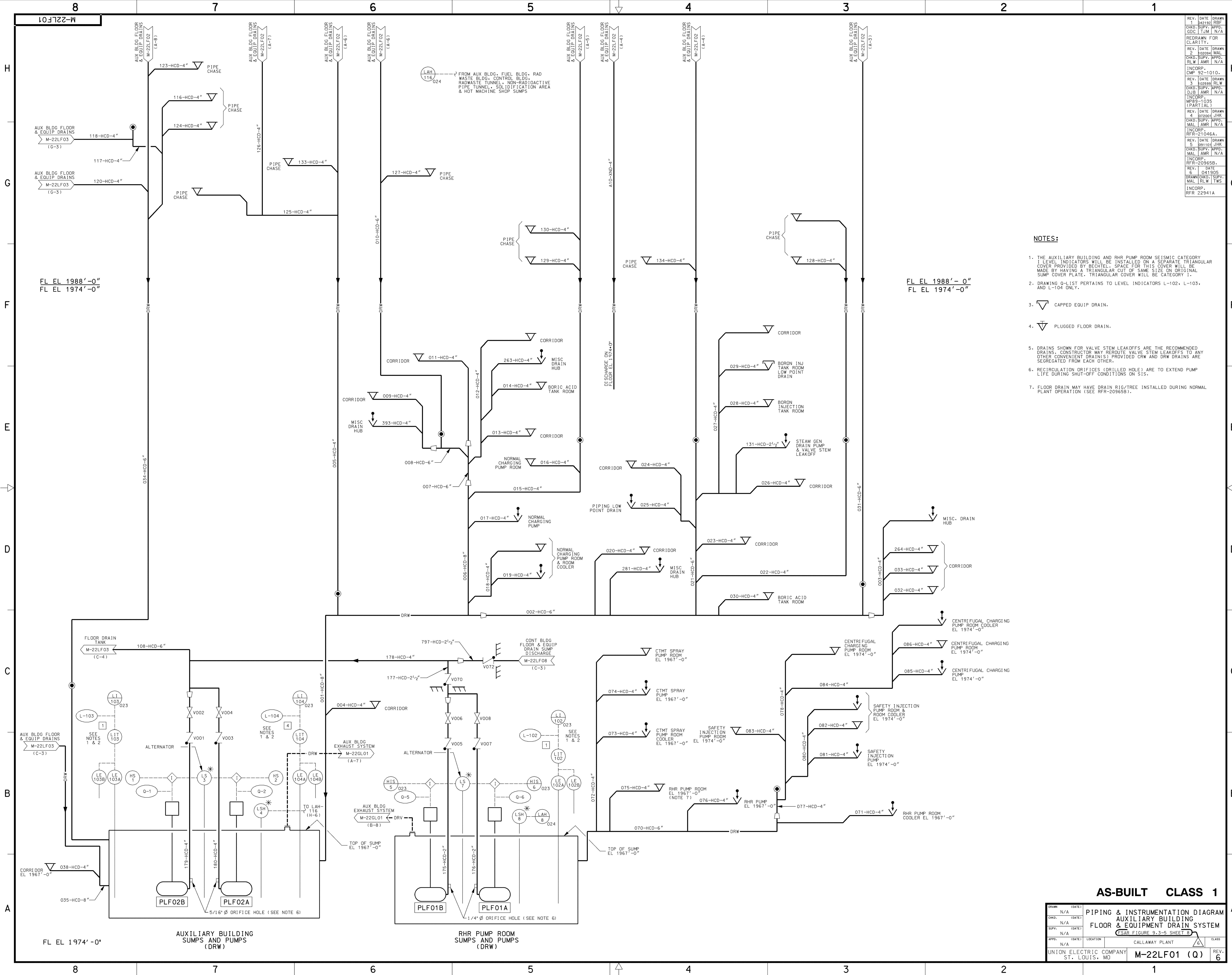


NOTES:

1. PIPING ASSOCIATED WITH THE MISCELLANEOUS CONDENSATE DRAIN TANK WILL BE DETAILED ON THE FOLLOWING SYSTEM ISOMETRICS.
2. LINE LE-434-HCD-2 1/2" WILL BE DETAILED ON THE LE ORTHOGRAPHICS.

AS-BUILT CLASS 1

DRWN	N/A	DATE		PIPING AND INSTRUMENTATION DIAGRAM	
CHKD	N/A	DATE		TENDON ACCESS GALLERY AND TURBINE BUILDING OILY WASTE SYSTEM	
SUPV	N/A	DATE		FSAR FIGURE 9.3-5 SHEET 7	
APPD	N/A	DATE		LOCATION	CALLAWAY ENERGY CENTER
UNION ELECTRIC COMPANY ST. LOUIS, MO				M-22LE04	REV. 8



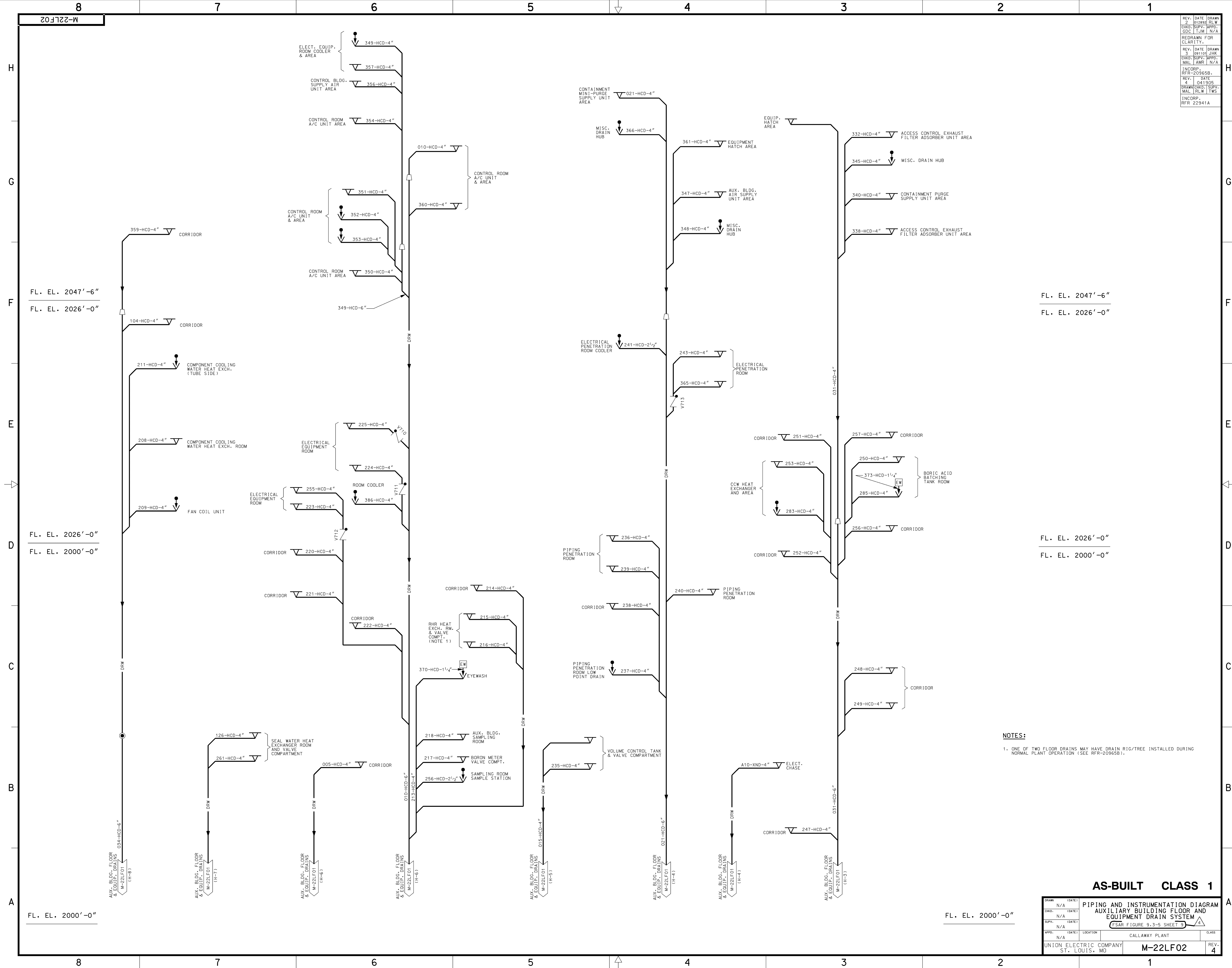
REV.	DATE	DRAWN	CHKD.	SUPV.	APPD.	REV.	DATE	DRAWN	CHKD.	SUPV.	APPD.
1	04/19/05	TWS	AMR	N/A		2	10/29/04	MAL	AMR	N/A	
2	10/29/04	MAL	AMR	N/A		3	10/29/04	RLW	AMR	N/A	
3	10/29/04	RLW	AMR	N/A		4	07/20/01	JHK	AMR	N/A	
4	07/20/01	JHK	AMR	N/A		5	09/10/01	JHK	AMR	N/A	
5	09/10/01	JHK	AMR	N/A		6	04/19/05	TWS	AMR	N/A	

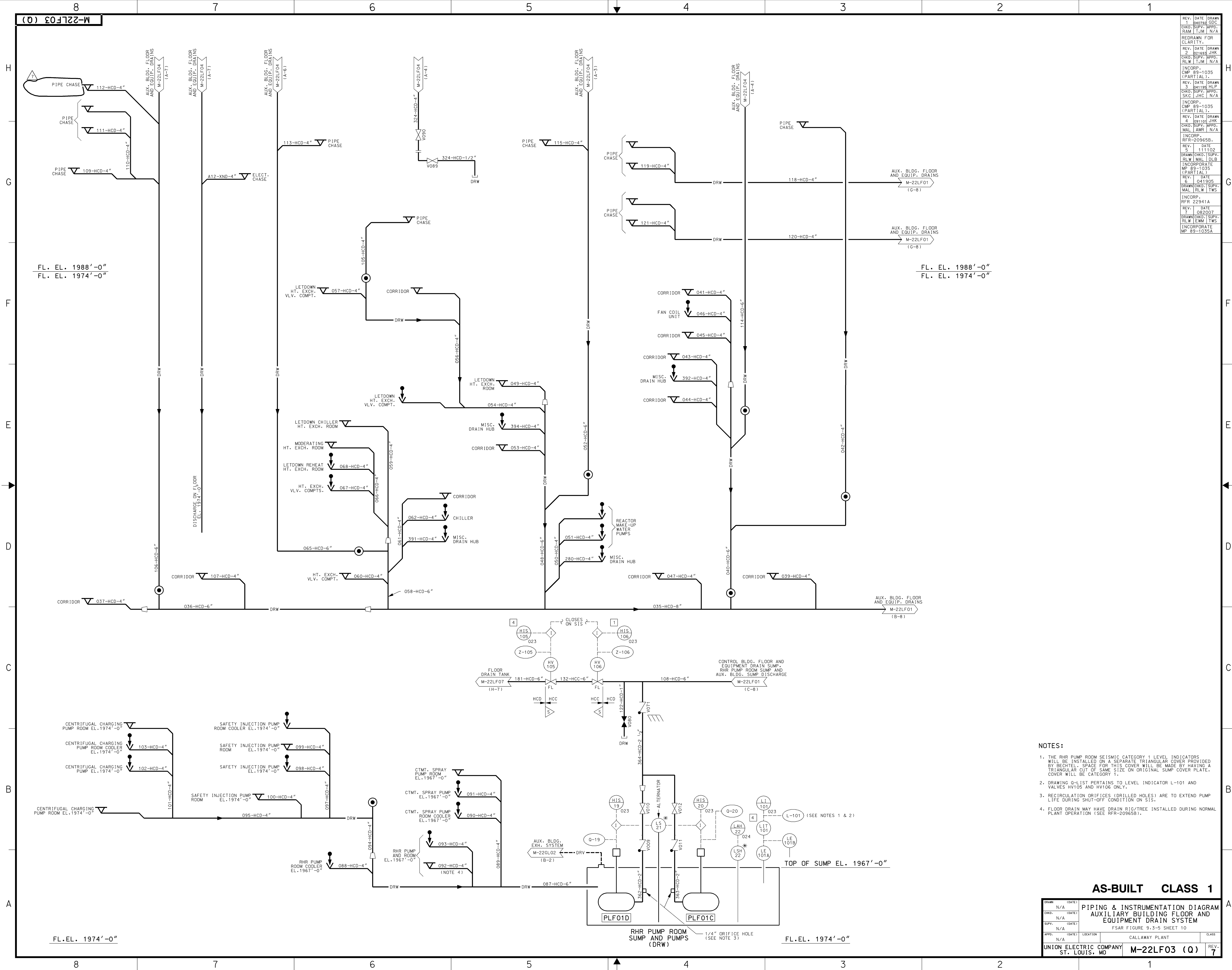
NOTES:

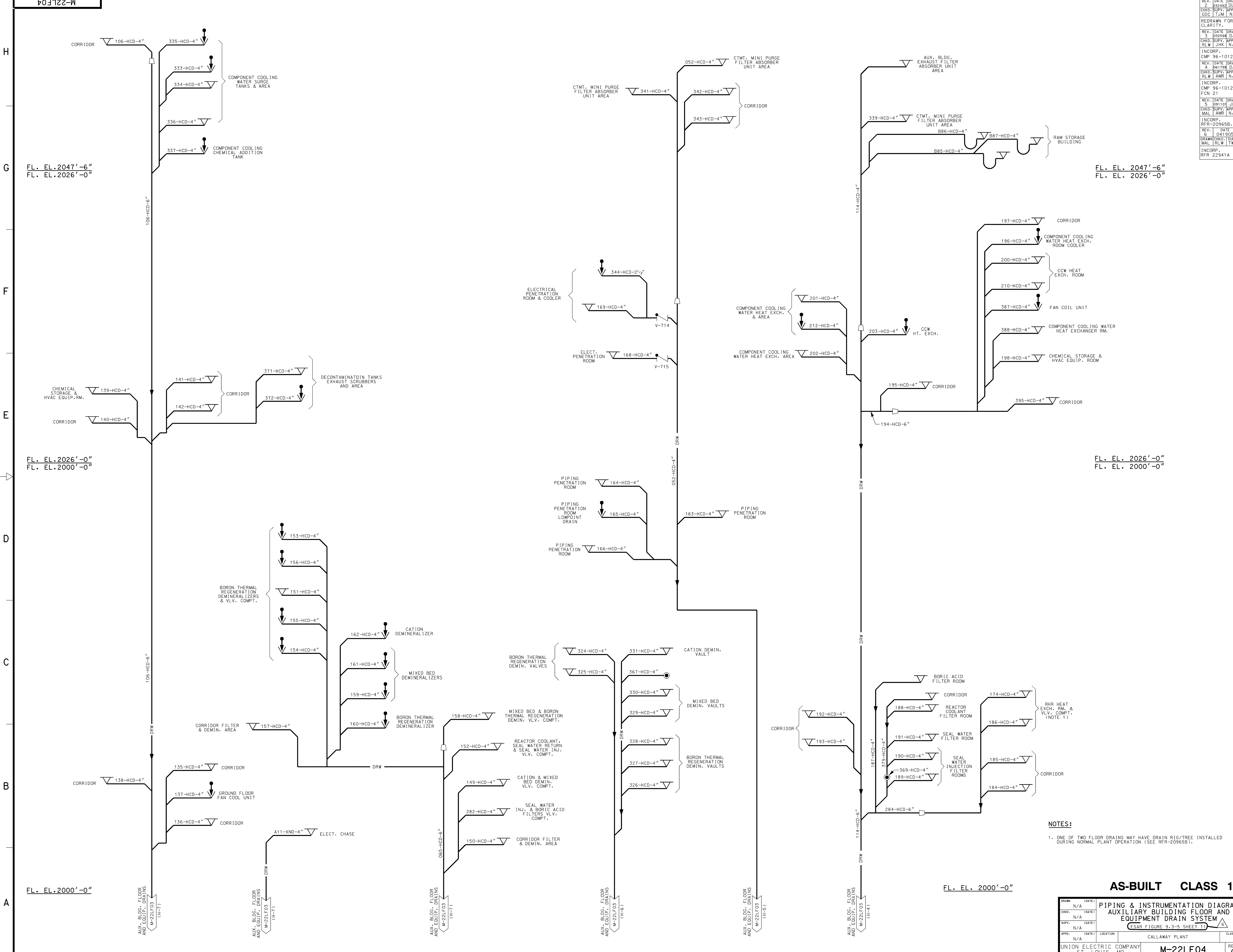
1. THE AUXILIARY BUILDING AND RHR PUMP ROOM SEISMIC CATEGORY I LEVEL INDICATORS WILL BE INSTALLED ON A SEPARATE TRIANGULAR COVER PROVIDED BY BECHTEL. SPACE FOR THIS COVER WILL BE MADE BY HAVING A TRIANGULAR CUT OF SAME SIZE ON ORIGINAL SUMP COVER PLATE. TRIANGULAR COVER WILL BE CATEGORY I.
2. DRAWING Q-LIST PERTAINS TO LEVEL INDICATORS L-102, L-103, AND L-104 ONLY.
3. CAPPED EQUIP DRAIN.
4. PLUGGED FLOOR DRAIN.
5. DRAINS SHOWN FOR VALVE STEM LEAKOFFS ARE THE RECOMMENDED DRAINS. CONSTRUCTOR MAY ROUTE VALVE STEM LEAKOFFS TO ANY OTHER CONVENIENT DRAIN(S) PROVIDED CRW AND DRW DRAINS ARE SEGREGATED FROM EACH OTHER.
6. RECIRCULATION ORIFICES (DRILLED HOLE) ARE TO EXTEND PUMP LIFE DURING SHUT-OFF CONDITIONS ON SIS.
7. FLOOR DRAIN MAY HAVE DRAIN RIG/TREE INSTALLED DURING NORMAL PLANT OPERATION (SEE RFR-20965B).

AS-BUILT CLASS 1

DRAWN	(DATE)	PIPING & INSTRUMENTATION DIAGRAM			
N/A		AUXILIARY BUILDING			
CHKD.	(DATE)	FLOOR & EQUIPMENT DRAIN SYSTEM			
N/A		CSAR FIGURE 9.3-5 SHEET 8			
SUPV.	(DATE)				
N/A					
APPD.	(DATE)	LOCATION	CALLAWAY PLANT		CLASS
N/A					6
UNION ELECTRIC COMPANY		M-22LF01 (Q)			REV.
ST. LOUIS, MO					6







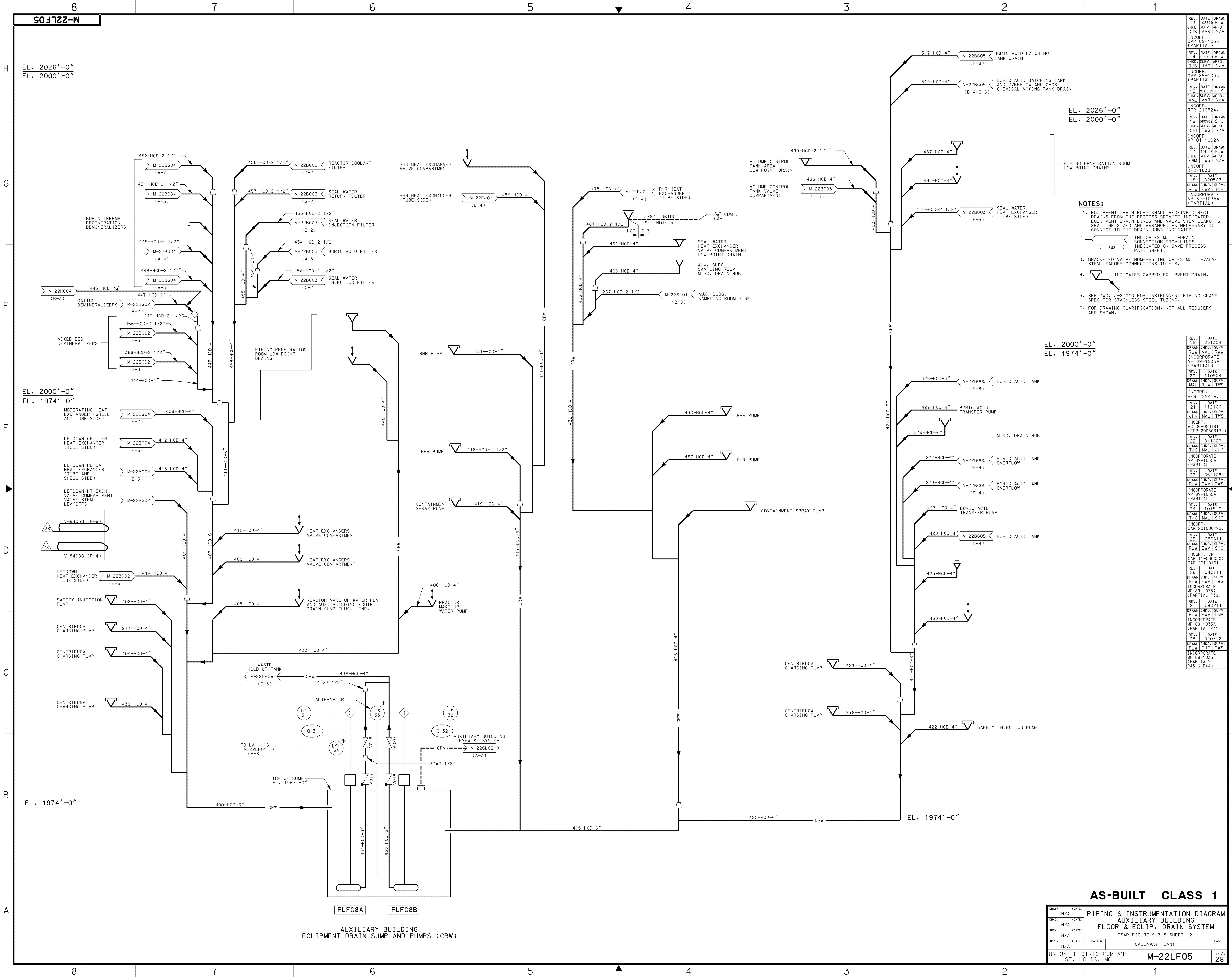
REV.	DATE	DRAWN
2	03/24/92	DLB
CHKD.	SUPV.	APPD.
GDC	TJM	N/A
REDRAWN FOR CLARITY.		
REV.	DATE	DRAWN
3	03/25/98	DJB
CHKD.	SUPV.	APPD.
RLW	JHK	N/A
INCORP.		
CMP	96-1012A	
REV.	DATE	DRAWN
4	06/19/98	DJB
CHKD.	SUPV.	APPD.
RLW	JHK	N/A
INCORP.		
CMP	96-1012A	
FCN	21	
REV.	DATE	DRAWN
5	08/10/98	JHK
CHKD.	SUPV.	APPD.
MAL	JMR	N/A
INCORP.		
RFR	20965B.	
REV.	DATE	DRAWN
6	04/15/05	TWS
CHKD.	SUPV.	APPD.
MAL	JMR	N/A
INCORP.		
RFR	22941A	

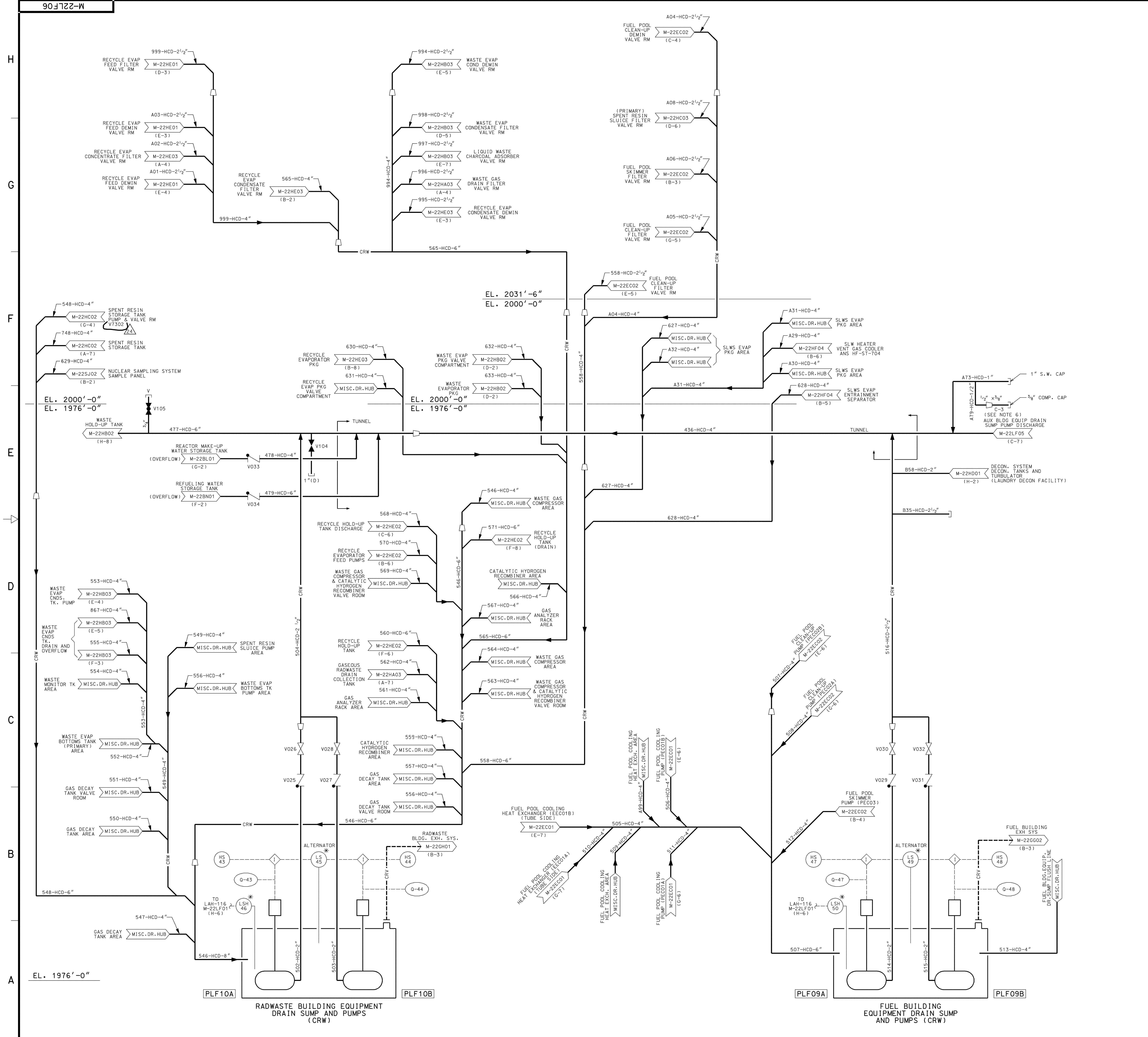
NOTES:
1. ONE OF TWO FLOOR DRAINS MAY HAVE DRAIN RIG/TREE INSTALLED DURING NORMAL PLANT OPERATION (SEE RFR-20965B).

AS-BUILT CLASS 1

DRAWN	N/A	(DATE)	
CHKD.	N/A	(DATE)	
SUPV.	N/A	(DATE)	
APPD.	N/A	(DATE)	
LOCATION	CALLAWAY PLANT		CL-455
UNION ELECTRIC COMPANY ST. LOUIS, MO			REV. 6

PIPING & INSTRUMENTATION DIAGRAM
AUXILIARY BUILDING FLOOR AND
EQUIPMENT DRAIN SYSTEM
(ESAR FIGURE 9.3-5 SHEET 1)
M-22LF04





NOTES:

1. THE PROCESS SYSTEM DRAIN LINE ISOMETRIC SHALL BEAR THE LINE NUMBER OF THE DRAIN HUB TO WHICH THEY ARE CONNECTED. REFER TO PROCESS SYSTEM ISOMETRICS FOR EQUIPMENT DRAIN LINE ROUTING AND CONFIGURATION.
2.  INDICATES MULTI-DRAIN CONNECTIONS FROM LINES INDICATED ON THE SAME PROCESS PAID SHEET.
3. DELETED
4. CRW MISCELLANEOUS DRAIN HUBS TO BE CAPPED WITH A STAINLESS STEEL BODY AND PLUG ASSEMBLY, CO-1 AS SHOWN IN DETAIL 5 OF M-27LF02.
5. FOR GENERAL NOTES SEE DRAWING M-22LF01(0).
6. SEE DWG. J-27G10 FOR INSTRUMENT PIPING CLASS SPEC. FOR STAINLESS STEEL TUBING.

REV.	DATE	DRAWN
1	042292	HL
2	042292	HL
3	042292	HL
4	042292	HL
5	042292	HL
6	042292	HL
7	042292	HL
8	042292	HL
9	042292	HL
10	042292	HL
11	042292	HL
12	042292	HL
13	042292	HL
14	042292	HL
15	042292	HL
16	042292	HL
17	042292	HL
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19	042292	HL
20	042292	HL
21	042292	HL
22	042292	HL
23	042292	HL
24	042292	HL

AS-BUILT CLASS 1

PIPING AND INSTRUMENTATION DIAGRAM

RADWASTE AND FUEL BUILDINGS

FLOOR AND EQUIPMENT DRAIN SYSTEM

FSAR FIGURE 9.3-5 SHEET 13

CALLAWAY PLANT

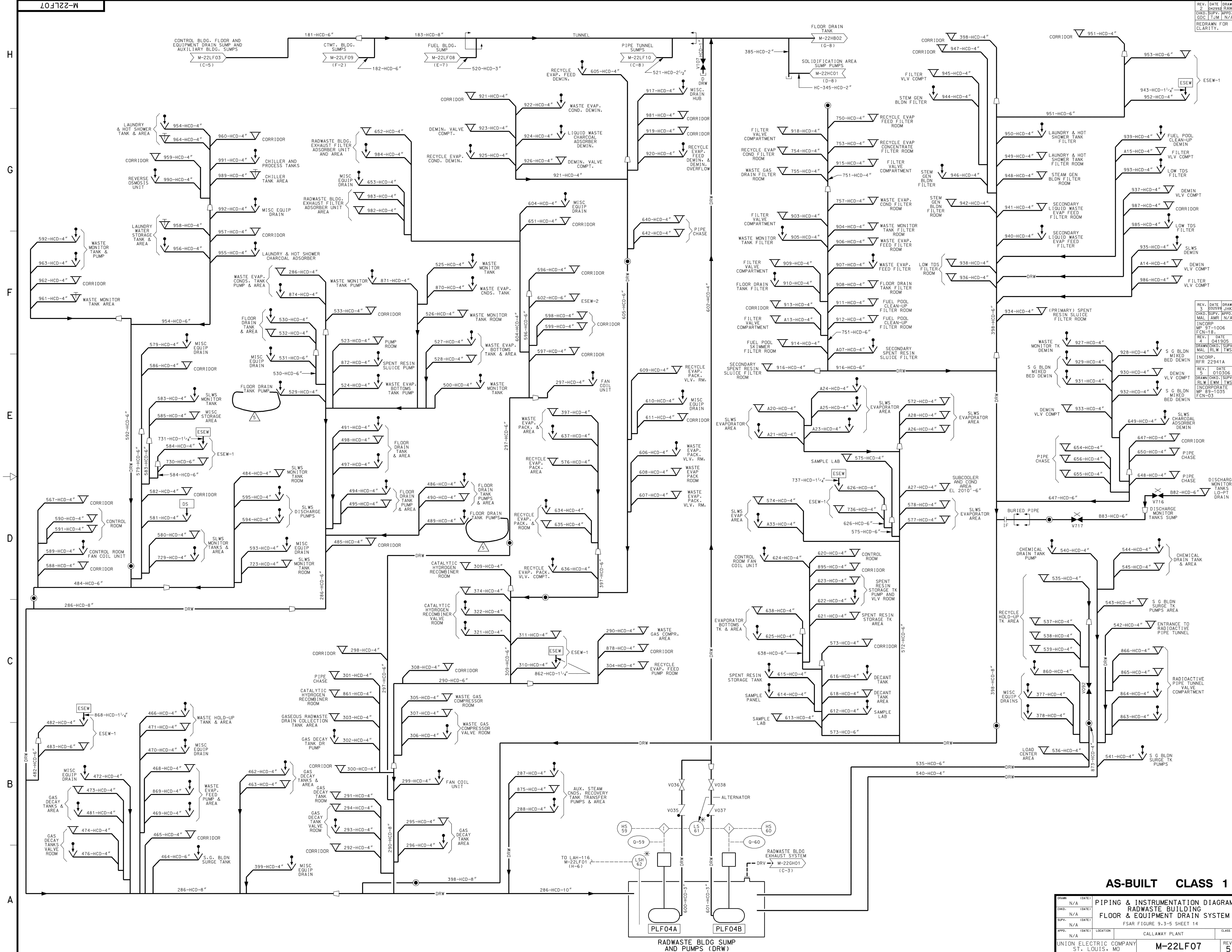
CL455

UNION ELECTRIC COMPANY

ST. LOUIS, MO

M-22LF06

REV. 24

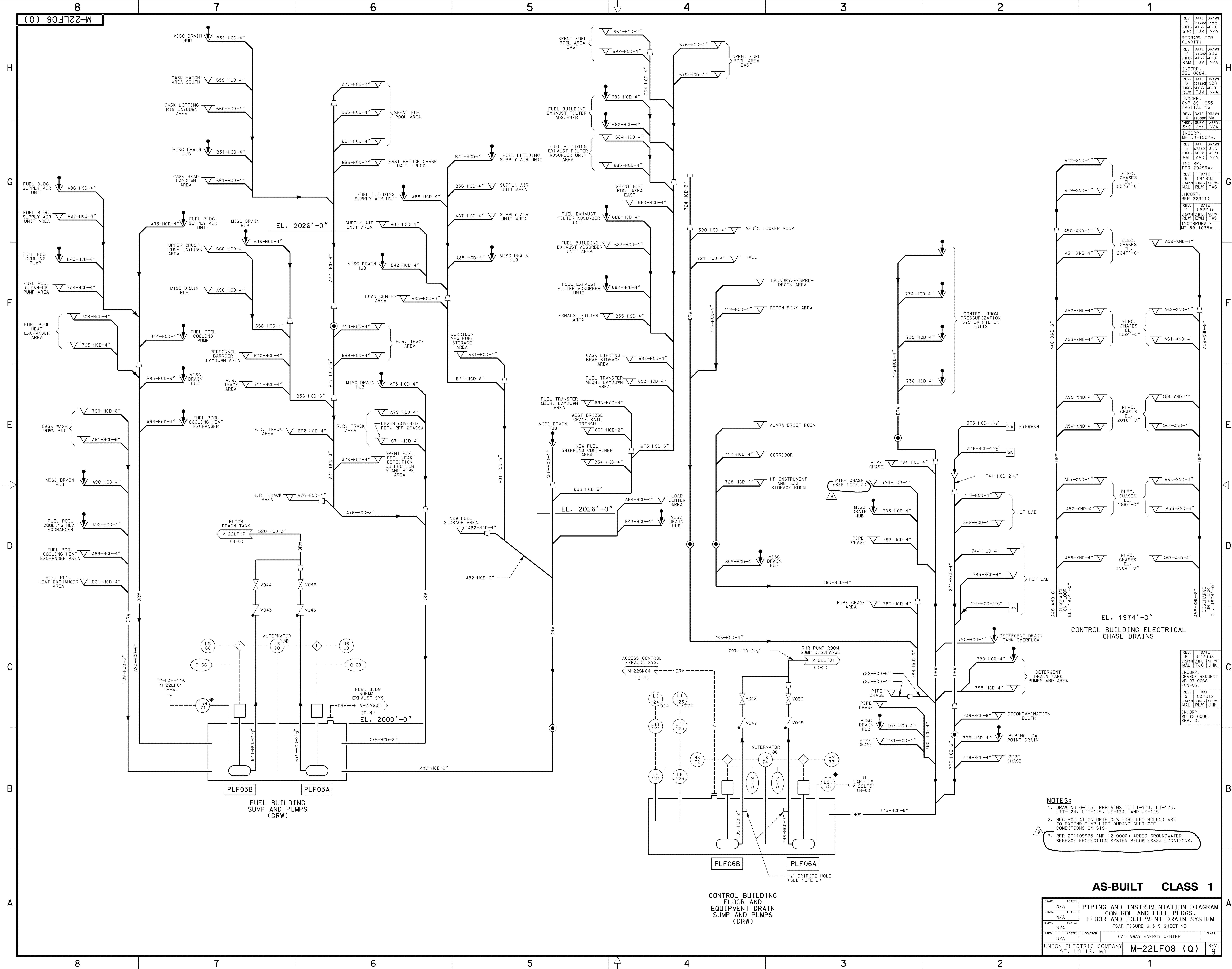


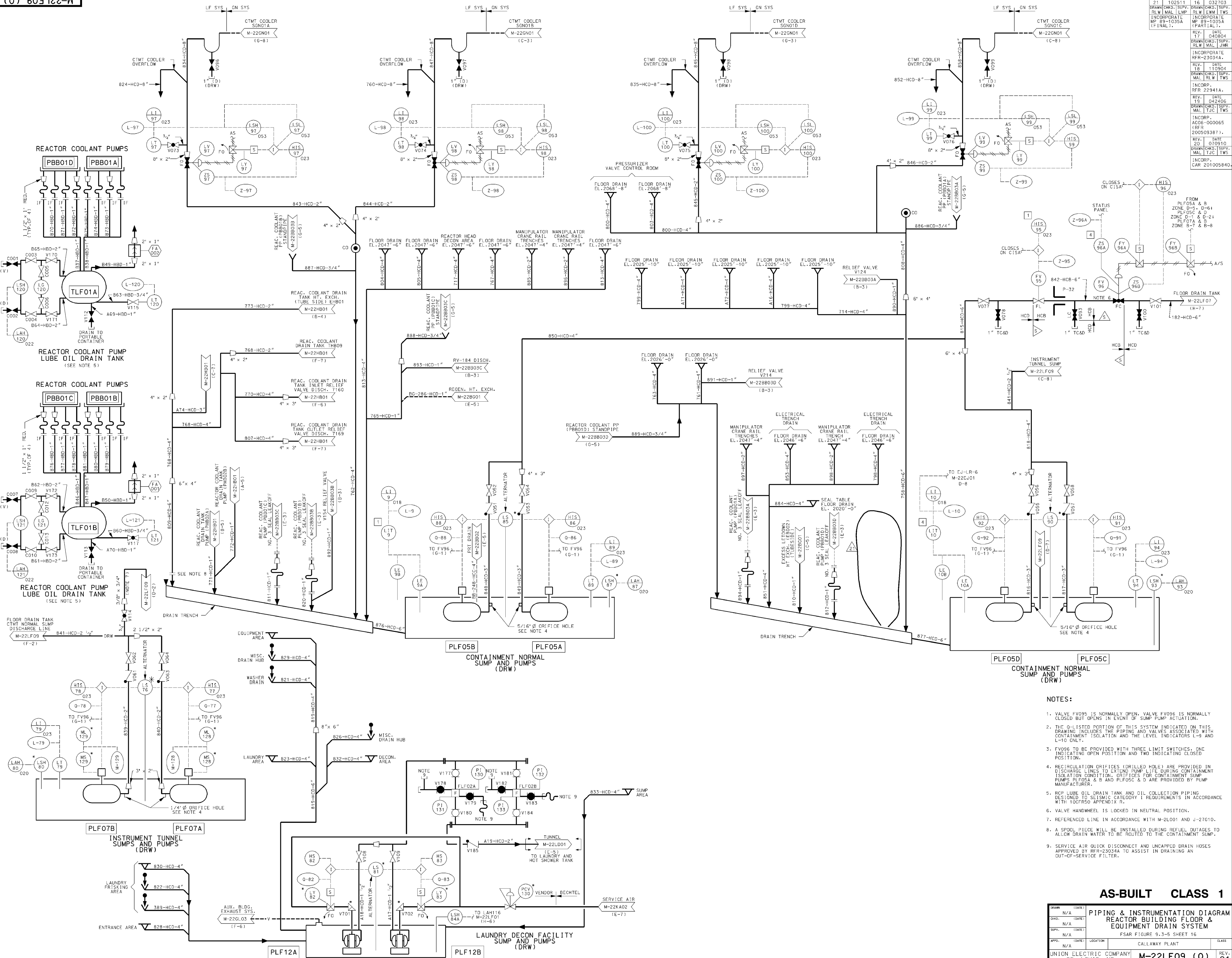
REV. DATE DRAWN
CHKD. SUPV. APPR. GDC TUM N/A
REDRAWN FOR CLARITY.

REV. DATE DRAWN
CHKD. SUPV. APPR. MAL LMR N/A
INCORP. MP 97-1006 FCN-18
REV. DATE
4 041305
DRAWN/CHKD. SUPV. MAL RLW TWS
INCORP. RFR 22941A
REV. DATE
5 010306
DRAWN/CHKD. SUPV. RLW LEM TWS
INCORP. MP 89-1035 FCN-33

AS-BUILT CLASS 1

DRAWN	(DATE)	N/A
CHKD.	(DATE)	N/A
SUPV.	(DATE)	N/A
APPD.	(DATE)	N/A
UNION ELECTRIC COMPANY	ST. LOUIS, MO	M-22LF07
FSAR FIGURE 9.3-5 SHEET 14	CALLAWAY PLANT	CL455
REV. 5		





AS-BUILT CLASS 1

FE3	PIPING & INSTRUMENTATION DIAGRAM REACTOR BUILDING FLOOR & EQUIPMENT TRAIN SYSTEM
FE1	

EQUIPMENT DRAIN SYSTEM

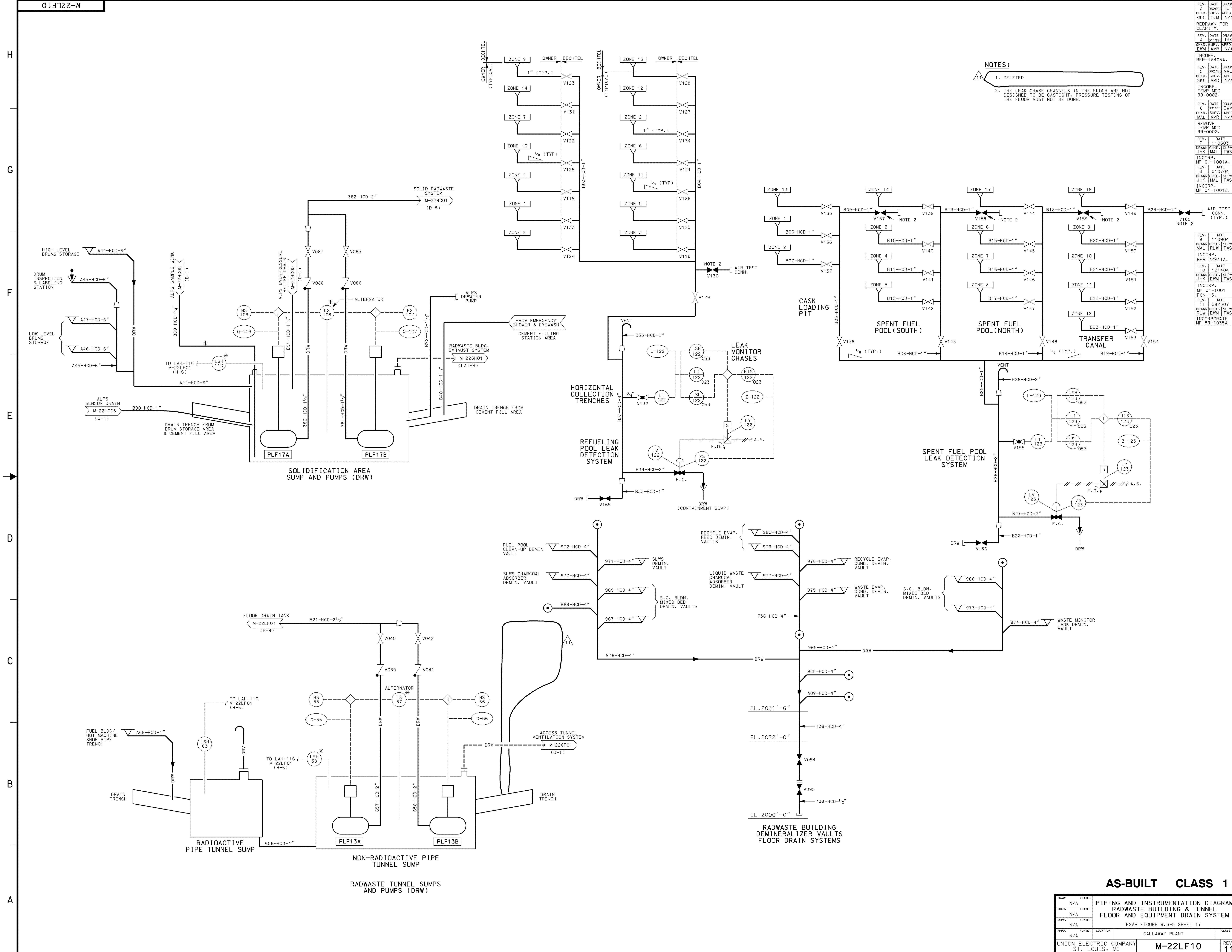
ESAB FIGURE 9.3-5 SHEET 16

DATE	LOCATION	CLASS
	CALLAWAY PLANT	

ELECTRIC COMPANY		M 001 500 (0)	REV.
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CHRIS CUMMANT LOUIS, MO	M-22LF09 (Q)	21
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	1
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NOTES:

1. DELETED

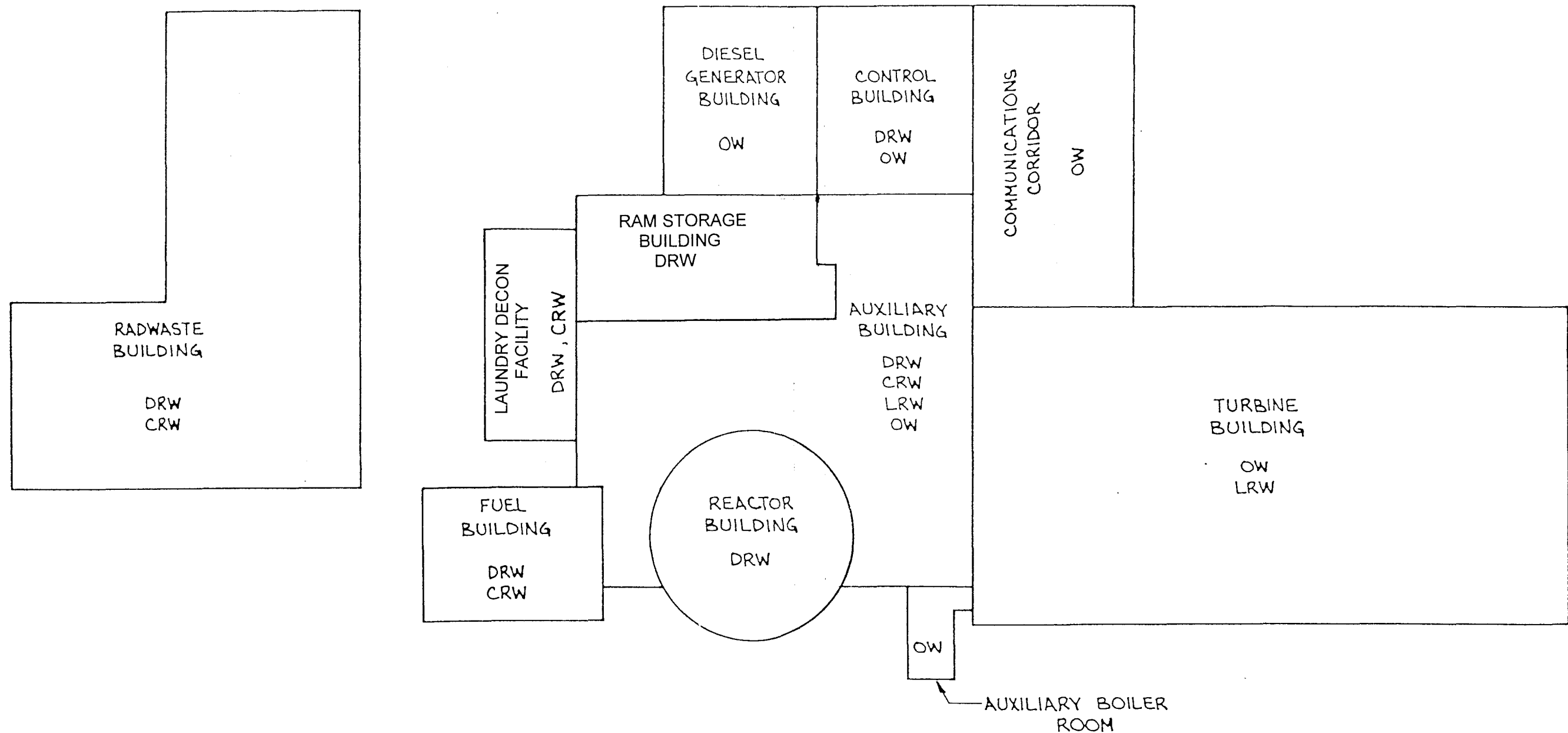
2. THE LEAK CHASE CHANNELS IN THE FLOOR ARE NOT DESIGNED TO BE GASTIGHT. PRESSURE TESTING OF THE FLOOR MUST NOT BE DONE.

REV.	DATE	DRAWN
032692	03/26/92	JHL
CHKD.	SUPV.	APPR.
GDC	TJM	N/A
REDRAWN FOR CLARITY.		
REV.	DATE	DRAWN
011896	01/18/96	JHK
CHKD.	SUPV.	APPR.
EMM	AMR	N/A
INCORP.		
REFR-16405A.		
REV.	DATE	DRAWN
082798	08/27/98	MAL
CHKD.	SUPV.	APPR.
SKC	AMR	N/A
INCORP.		
TEMP. MOD 99-0002.		
REV.	DATE	DRAWN
091938	09/19/98	EW
CHKD.	SUPV.	APPR.
MAL	AMR	N/A
INCORP.		
TEMP. MOD 99-0002.		
REV.	DATE	DRAWN
110603	11/06/03	JHK
CHKD.	SUPV.	APPR.
MAL	TWS	
INCORP.		
MP 01-1001A.		
REV.	DATE	DRAWN
010704	01/07/04	JHK
CHKD.	SUPV.	APPR.
MAL	TWS	
INCORP.		
MP 01-1001B.		
[AIR TEST (TYP.)]		
REV.	DATE	DRAWN
03110904	03/11/04	JHK
CHKD.	SUPV.	APPR.
EMM	TWS	
INCORP.		
REFR 22341A.		
REV.	DATE	DRAWN
01102307	01/10/07	EW
CHKD.	SUPV.	APPR.
EMM	TWS	
INCORP.		
REFR 100101		
REV.	DATE	DRAWN
01102307	01/10/07	EW
CHKD.	SUPV.	APPR.
EMM	TWS	
INCORP.		
REFR 100101		
REV.	DATE	DRAWN
01102307	01/10/07	EW
CHKD.	SUPV.	APPR.
EMM	TWS	
INCORP.		
REFR 100101		

REV.	DATE	DRAWN
110904	11/09/04	JHK
CHKD.	SUPV.	APPR.
MAL	RLW	TWS
INCORP.		
REFR 22341A.		
REV.	DATE	DRAWN
121404	12/14/04	JHK
CHKD.	SUPV.	APPR.
MAL	RLW	TWS
INCORP.		
MP 01-1001		
REV.	DATE	DRAWN
082307	08/23/07	JHK
CHKD.	SUPV.	APPR.
RLW	EW	TWS
INCORPORATE		
MP 89-1035A		

AS-BUILT CLASS 1

DRAWN	N/A	(DATE)	PIPING AND INSTRUMENTATION DIAGRAM		
CHKD.	N/A	(DATE)	RADWASTE BUILDING & TUNNEL		
SUPV.	N/A	(DATE)	FLOOR AND EQUIPMENT DRAIN SYSTEM		
APPR.	N/A	(DATE)	FSAR FIGURE 9.3-5 SHEET 17		
LOCATION	CALLAWAY PLANT		CLASS		
UNION ELECTRIC COMPANY			REV. 11		
ST. LOUIS, MO			M-22LF10		

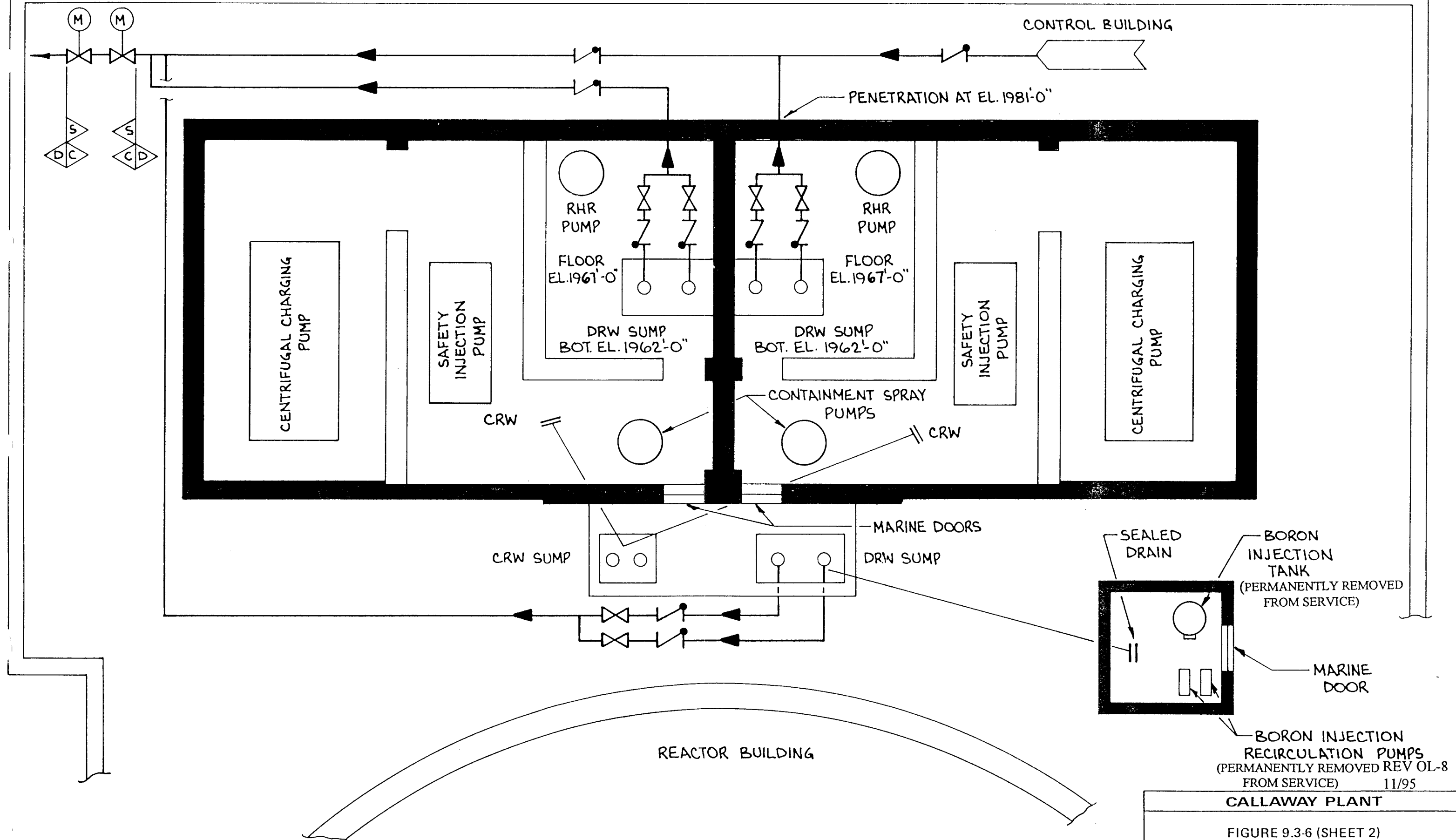


REV OL-11
5/00

CALLAWAY PLANT

FIGURE 9.3-6 (SHEET 1)

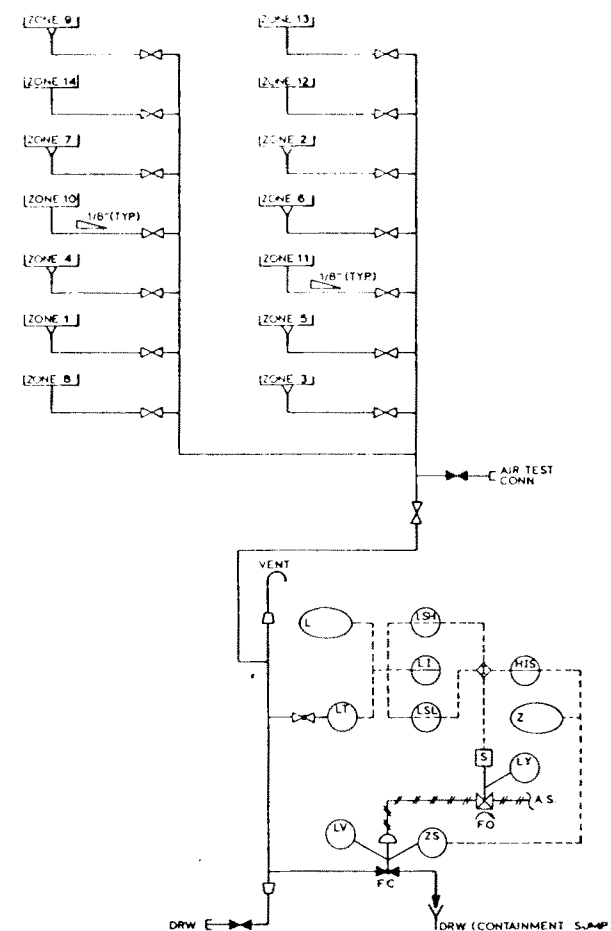
MAJOR DRAINAGE
AREAS



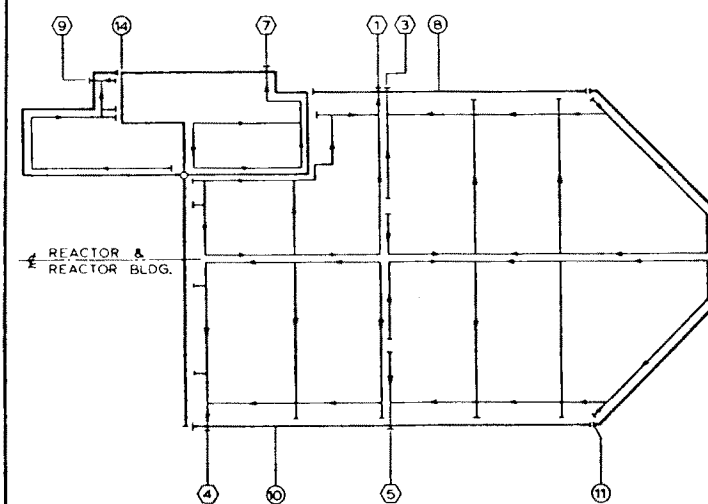
CALLAWAY PLANT

FIGURE 9.3-6 (SHEET 2)

FLOOR DRAIN FOR
SAFETY-RELATED ROOMS
AUX. BUILDING BASEMENT

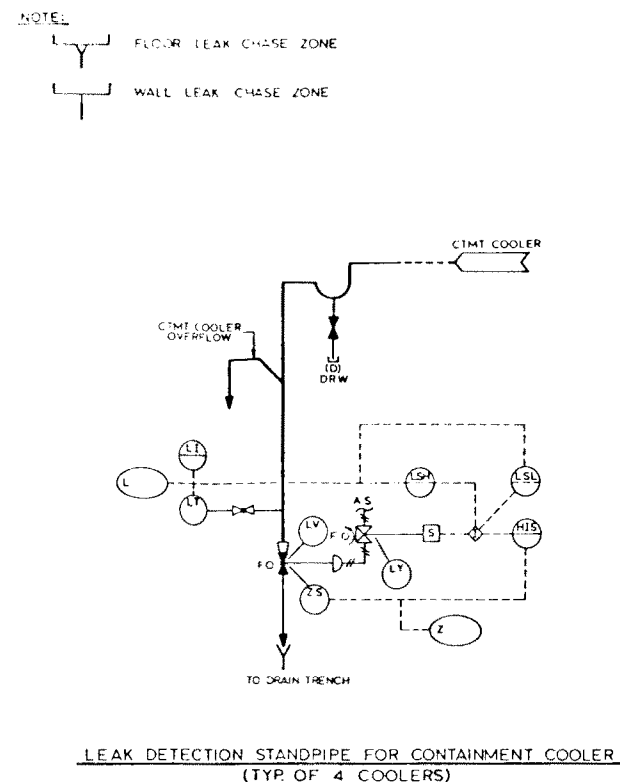


REFUELING POOL LEAK DETECTION SYSTEM

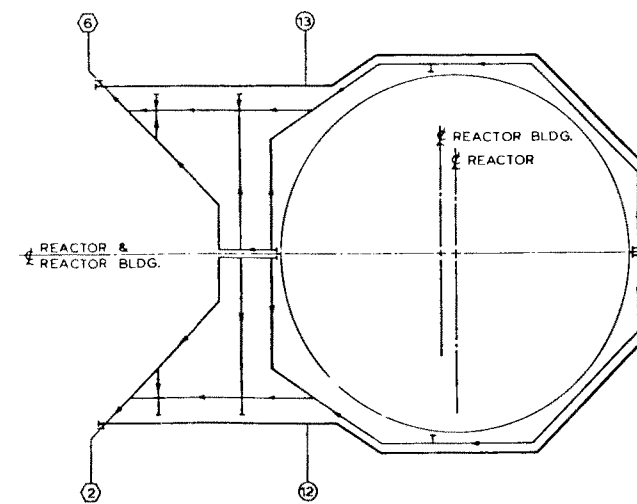


LEAK CHASE AND COLLECTION TRENCH PLAN

REFUELING POOL LEAK CHASE ZONE CONFIGURATION

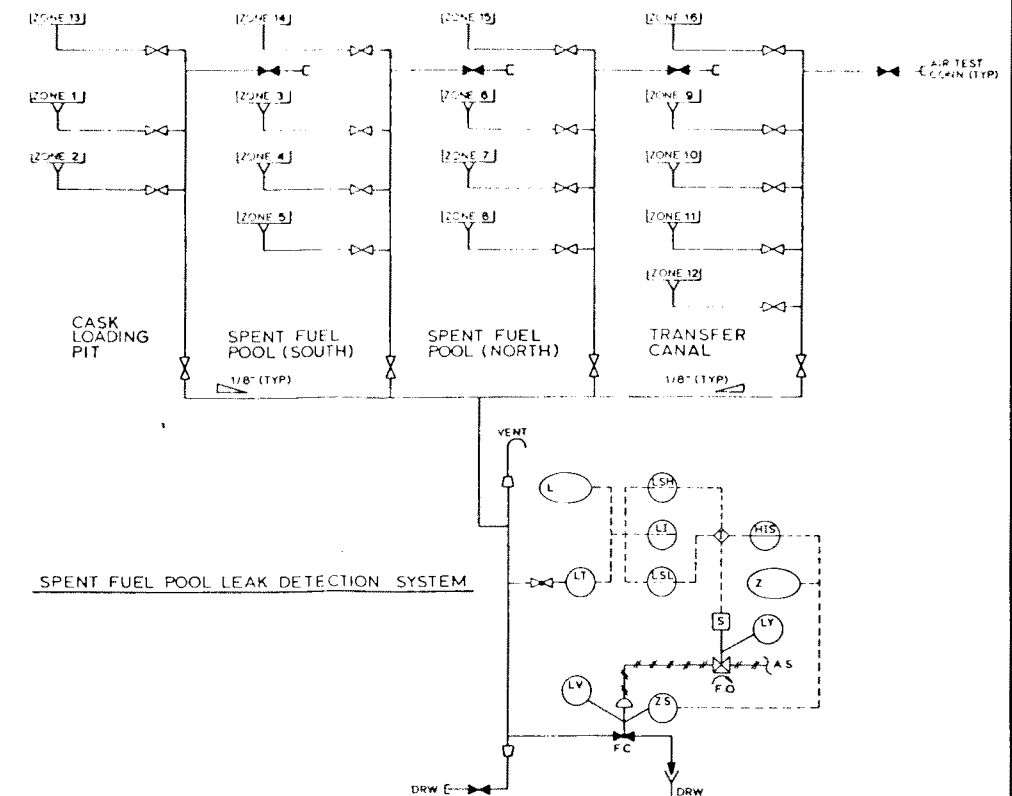


LEAK DETECTION STANDPIPE FOR CONTAINMENT COOLER
(TYP. OF 4 COOLERS)

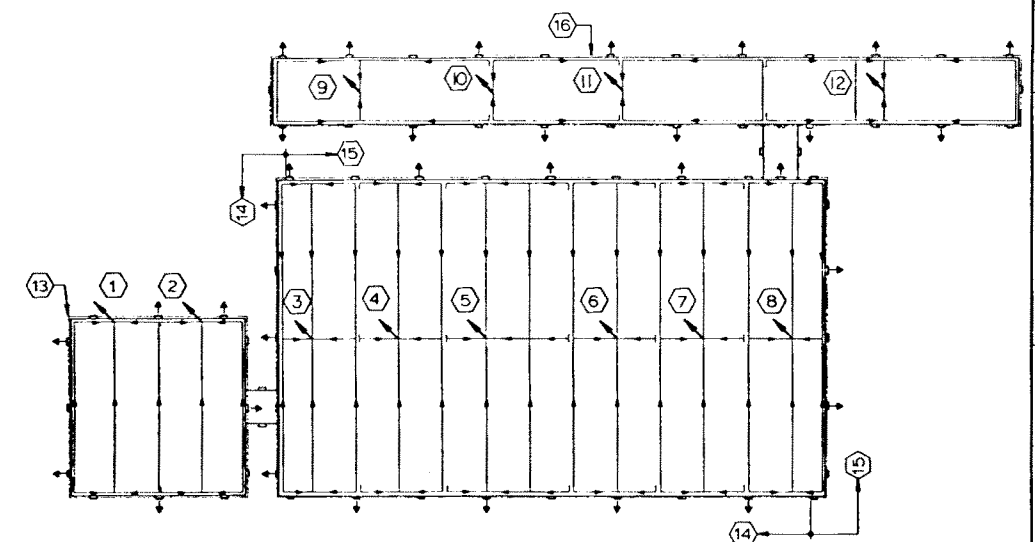


LEAK CHASE AND COLLECTION TRENCH PLAN

NOTE:
 ○ COLLECTOR TRENCH
 ○ LEAK CHASE



SPENT FUEL POOL LEAK DETECTION SYSTEM

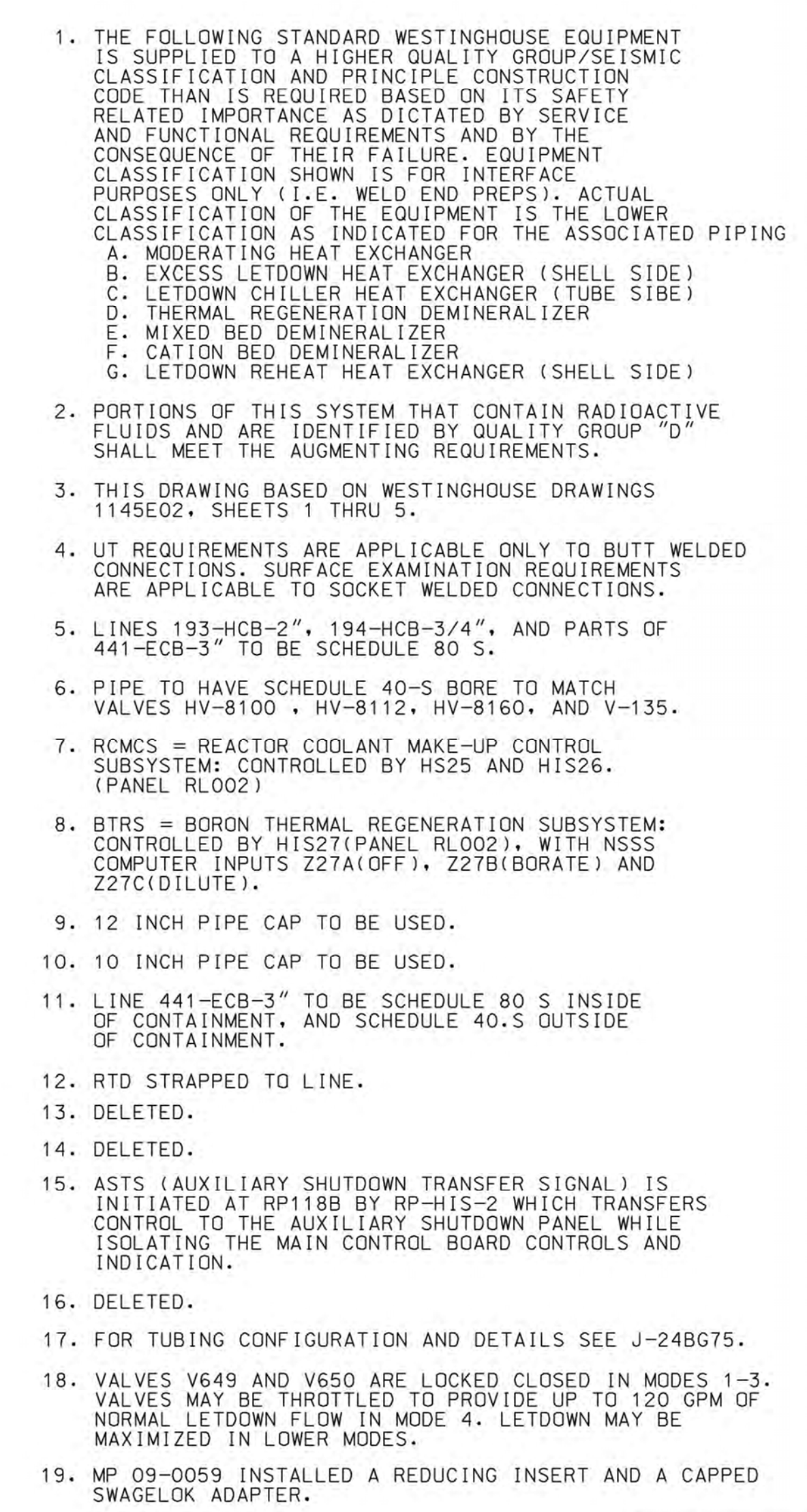


PLAN OF LEAK CHASE ZONES

SPENT FUEL POOL LEAK CHASE ZONE CONFIGURATION

CALLAWAY PLANT
FIGURE 9.3-7
FUEL POOL AND
CONTAINMENT COOLER LEAK
DETECTION SYSTEMS
(C-OL2931-7)
(C-OL6111)

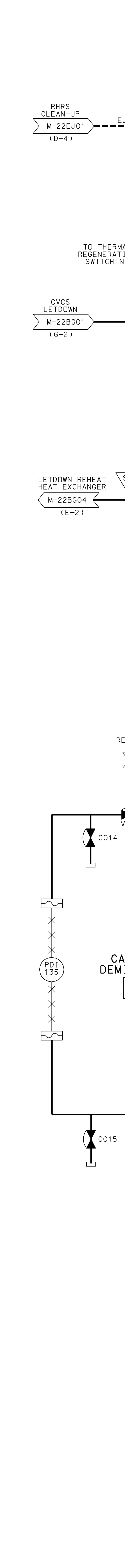
Rev. OL-0
 6/86



REV. DATE DRAWN
23 022601 R/W
CORR. SUPV. APPROV.
RFR-133110
(PARTIAL)
REV. DATE
24 111502
DRAWN (CORR.) SUPV.
MP 05-10354
INCORPORATE
RFR-221304
REV. DATE
25 0510
DRAWN (CORR.) SUPV.
MP 05-10354
INCORPORATE
RFR-221304
(PARTIAL)
REV. DATE
25 0804
DRAWN (CORR.) SUPV.
JHK EWM MAM
(CORR.)
RFR-223108
REV. DATE
25 0804
DRAWN (CORR.) SUPV.
JHK EWM MAM
(CORR.)
RFR-229414
REV. DATE
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DRAWN (CORR.) SUPV.
JHK EWM MAM
(CORR.)
MP 05-10303
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REV. DATE
29 042610
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MP 05-10354
INCORPORATE
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REV. DATE
09 09159
DRAWN (CORR.) SUPV.
JHK EWM MAM
(CORR.)
MP 05-10359
REV. DATE
10 0707
DRAWN (CORR.) SUPV.
TJC MAM LWS
ACTION 7
REV. DATE
12 033011
DRAWN (CORR.) SUPV.
TJC MAM LWS
INCORP.
RFR 201005564
REV. DATE
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DRAWN (CORR.) SUPV.
MAM LRLW LMP
REV. DATE
14-0010, 10

AS-BUILT CLASS 1

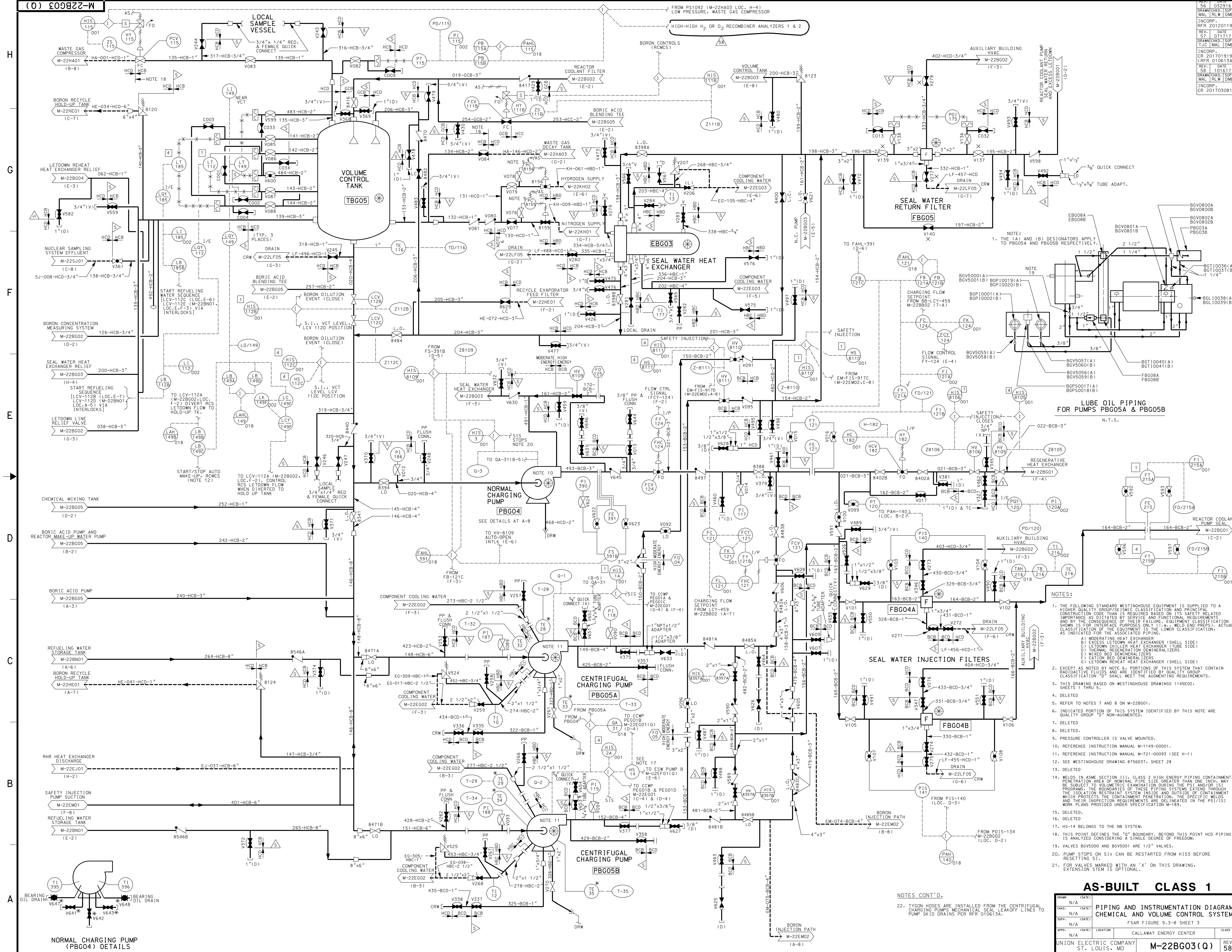
DRAWN	(DATE)						
N/A							
CHECKED	(DATE)	PIPING AND INSTRUMENTATION DIAGRAM					
N/A		CHEMICAL AND VOLUME CONTROL SYSTEM					
SUPV.	(DATE)	FSAR FIGURE 9.3-8 SHEET 1					
N/A							
APPROD.	(DATE)	LOCATION	CALLAWAY ENERGY CENTER				CLASS
N/A							
UNION ELECTRIC COMPANY ST. LOUIS, MO			M-22BG01(Q)				REV 33



- NOTES:**
- THE FOLLOWING STANDARD WESTINGHOUSE EQUIPMENT IS SUPPLIED TO A HIGHER QUALITY GROUP/SEISMIC CLASSIFICATION AND PRINCIPLE CONSTRUCTION CODE THAN IS REQUIRED BASED ON ITS SAFETY RELATED IMPORTANCE, AS DICTATED BY SERVICE AND FUNCTIONAL REQUIREMENTS, AND BY THE CONSEQUENCE OF THEIR FAILURE. EQUIPMENT CLASSIFICATION SHOWN IS FOR INTERFACE PURPOSE ONLY (I.E. WELD END PREPS). ACTUAL CLASSIFICATION OF THE EQUIPMENT IS THE LOWER CLASSIFICATION AS INDICATED FOR THE ASSOCIATED PIPING.
 - PORTIONS OF THIS SYSTEM THAT CONTAIN RADIOACTIVE FLUIDS AND ARE IDENTIFIED BY QUALITY GROUP CLASSIFICATION "D" SHALL MEET THE AUGMENTING REQUIREMENTS.
 - THIS DRAWING BASED ON WESTINGHOUSE DRAWINGS 1145E02 SHTS.1 THRU 5.
 - REFER TO NOTES 7 AND 8 ON M-22BG01.
 - PROCESSOR MEASURES NEUTRON FLUX, COMPENSATES FOR TEMPERATURE AND GIVES READ-OUT IN BORON CONCENTRATION.
 - DELETED
 - SEE WESTINGHOUSE DRAWING 6081097 SHT.2.
 - FBG01 IS NOT AVAILABLE FOR USE DUE TO A FAILED RETENTION ELEMENT. CATION RESIN IS IN BTR DEMIN. FBG02B.
 - FOR VALVES MARKED WITH AN 'X' ON THIS DRAWING, EXTENSION STEM IS OPTIONAL.

AS-BUILT CLASS 1

DRWN	N/A	(DATE)			
CHG.	N/A	(DATE)			
SUPV.	N/A	(DATE)			
APP.	N/A	(DATE)			
LOC.	N/A	(DATE)			
CLASS	N/A	(DATE)			
UNION ELECTRIC COMPANY	ST. LOUIS, MO	M-22BG02(Q)	30		



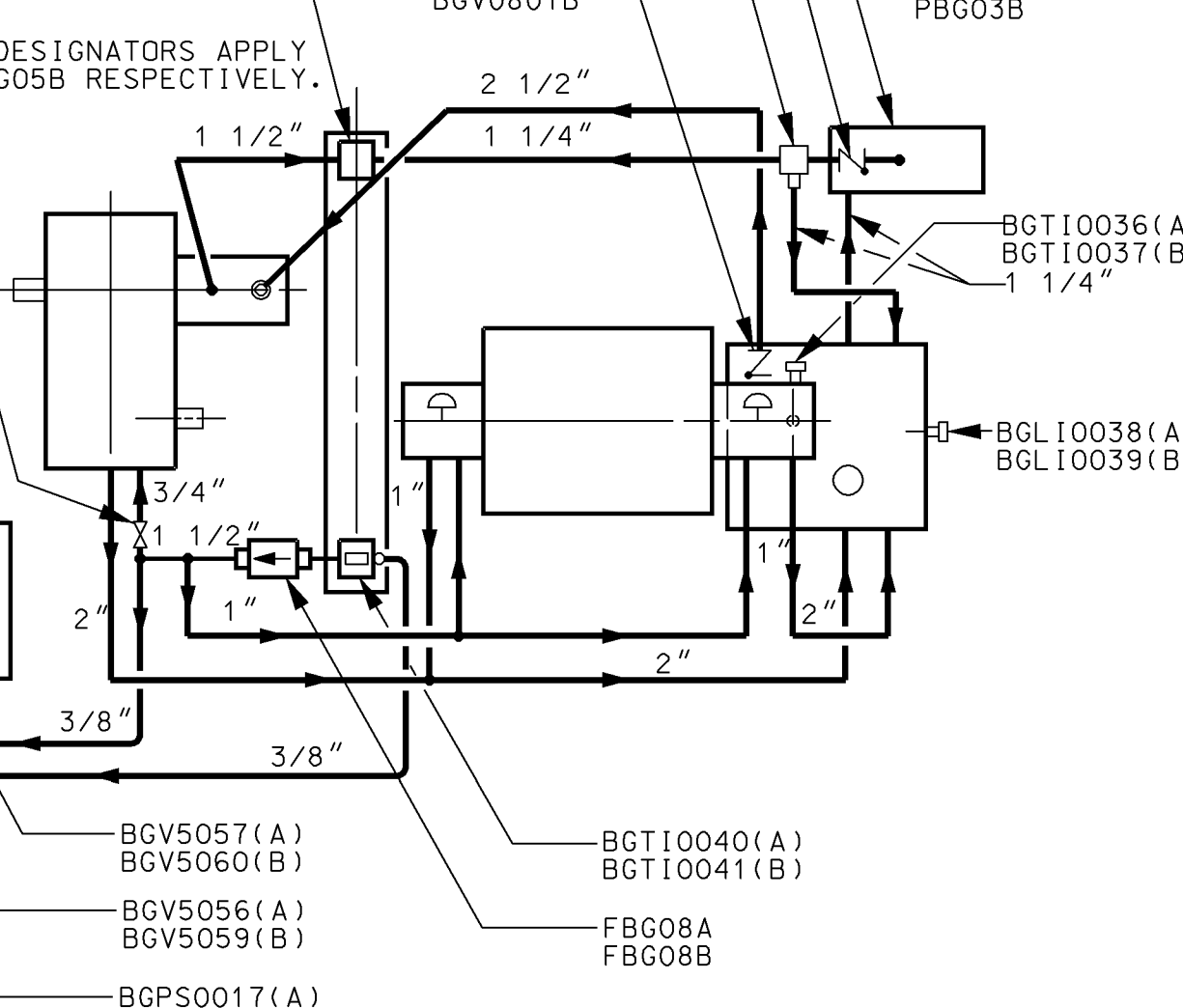
8
7
6
5
4
3
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1

H
G
F
E
D
C
B
A

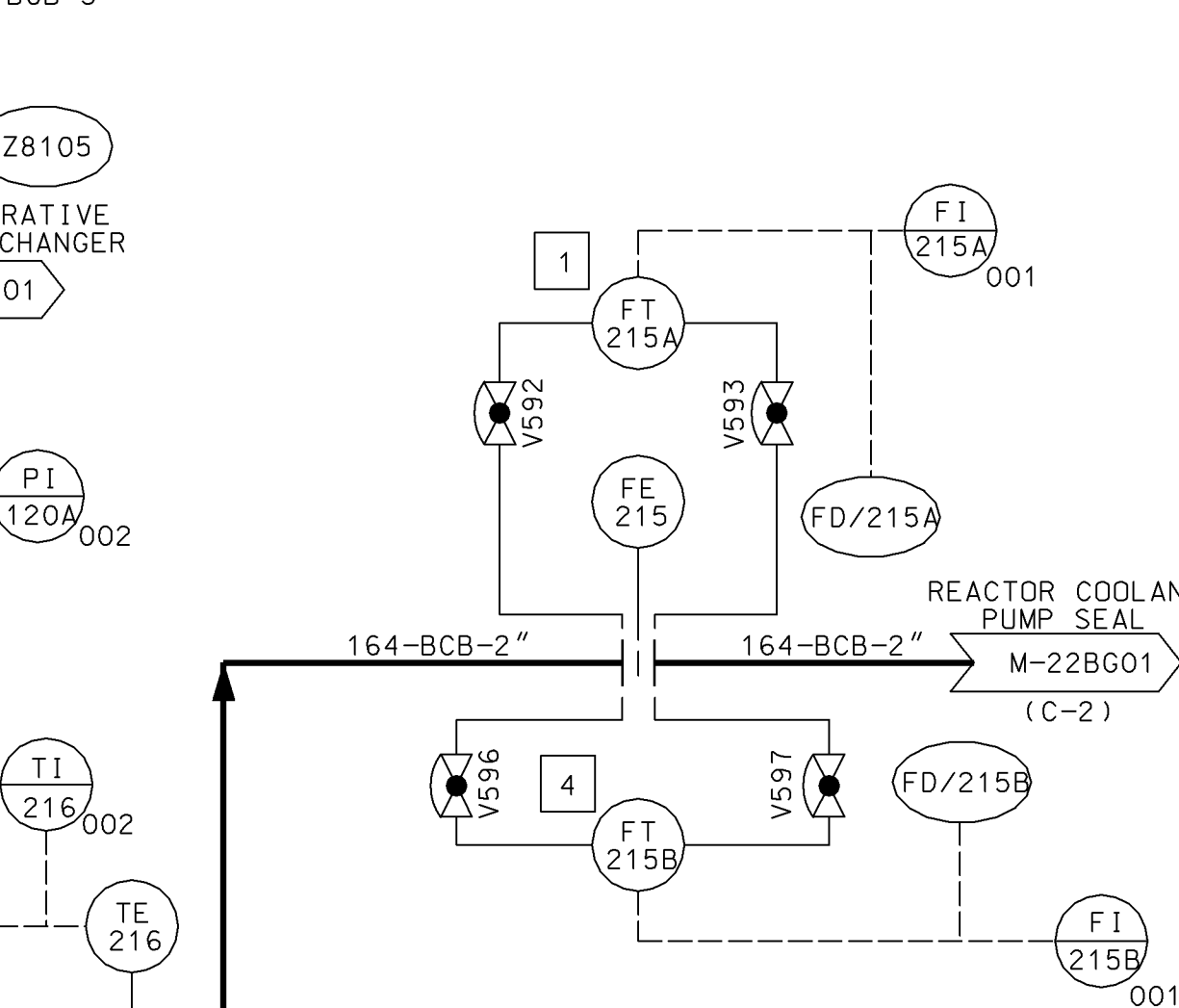
(D) 009B22-M

WASTE GAS COMPRESSOR
M-22HA01 (B-8)
HA-001-HCD-1
135-HCB-1
317-HCB-3/4
135-HCB-1
V083
NOTE 18
BORON RECYCLE HOLD-UP TANK
M-22HE01 (C-7)
HE-034-HCD-6
6"x4"
8120
LETDOWN REHEAT HEAT EXCHANGER RELIEF
M-22BG04 (E-3)
HCD HCB
3/4" (V) V559
NUCLEAR SAMPLING SYSTEM EFFLUENT
M-22S001 (C-8)
SJ-008-HCD-3/4
138-HCB-3/4
BORON CONCENTRATION MEASURING SYSTEM
M-22BG02 (D-2)
126-HCB-3/4
SEAL WATER HEAT EXCHANGER RELIEF
M-22BG03 (H-4)
200-HCB-3
START REFUELING WATER SEQUENCE
LCV-112B (LOC-E-7)
LCV-112D (M-22BN01)
LOC-A-5) VIA INTERLOCKS
LETDOWN LINE RELIEF VALVE
M-22BG02 (G-3)
038-HCB-3
CHEMICAL MIXING TANK
M-22BG05 (D-2)
BORIC ACID PUMP AND REACTOR MAKE-UP WATER PUMP
M-22BG05 (B-2)
242-HCB-2
BORIC ACID PUMP
M-22BG05 (A-3)
240-HCB-3
REFUELING WATER STORAGE TANK
M-22BN01 (A-6)
BORON RECYCLE HOLD-UP TANK
M-22HE01 (A-7)
HE-041-HCD-1
RHR HEAT EXCHANGER DISCHARGE
M-22E01 (H-2)
SAFETY INJECTION PUMP STORAGE TANK
M-22BN01 (E-2)
REFUELING WATER STORAGE TANK
M-22BN01 (E-2)
BEARING OIL DRAIN
V647
V648
V642
NORMAL CHARGING PUMP (PB004) DETAILS

56 032916
DRAWN: N/A
CHKD: N/A
REV: 011117
DATE: 011617
INCORP: CR 201701919
TJC MAL DNE
REV: 010613A
DATE: 011617
INCORP: CR 201703081
MAL DNE



SEAL WATER RETURN FILTER
FBG05



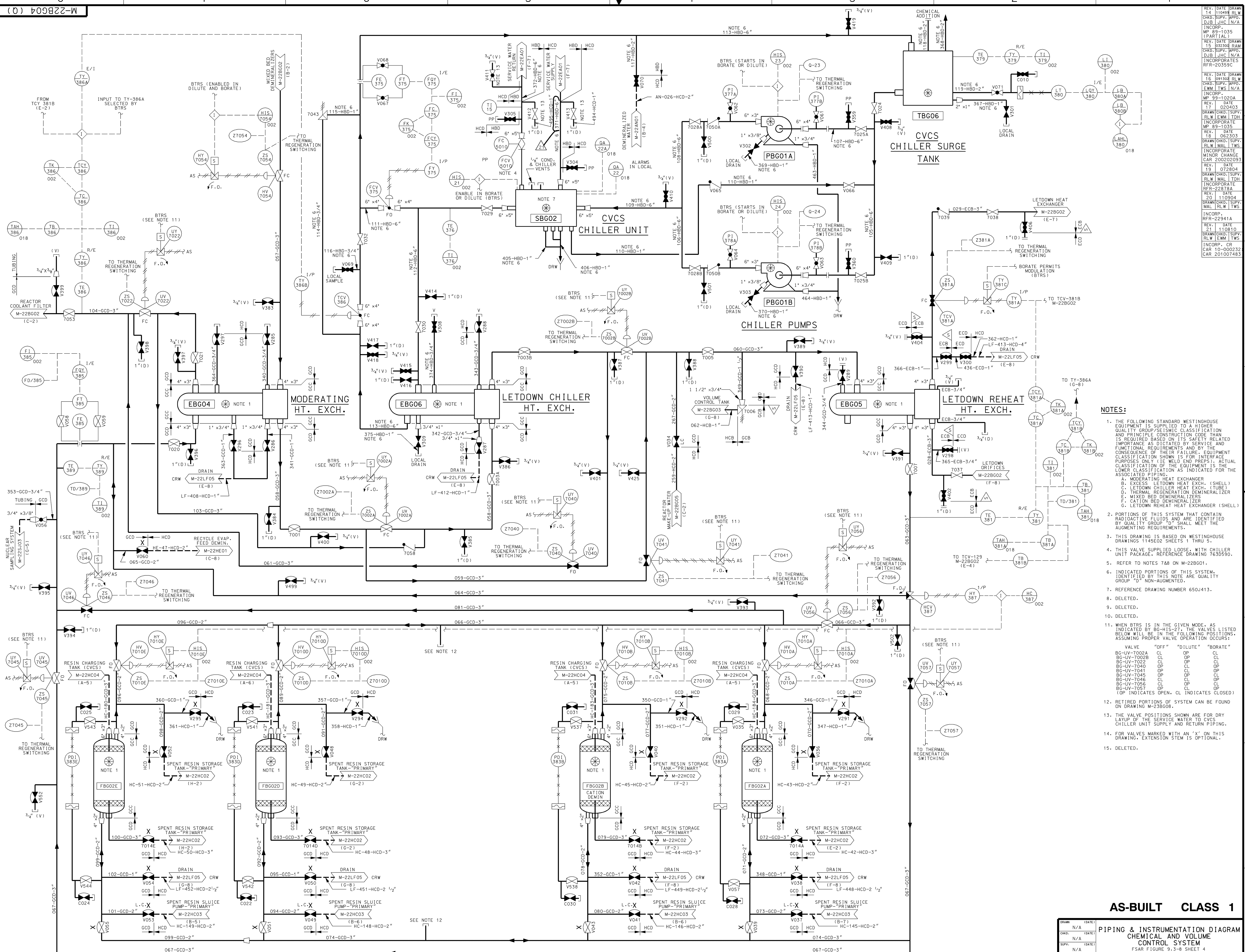
LUBE OIL PIPING FOR PUMPS PB005A & PB005B
N.T.S.

- NOTES:
- THE FOLLOWING STANDARD WESTINGHOUSE EQUIPMENT IS SUPPLIED TO A HIGHER QUALITY GROUP/SEISMIC CLASSIFICATION AND PRINCIPAL CONSTRUCTION CODE THAN IS REQUIRED BASED ON ITS SAFETY RELATED IMPORTANCE AS DICTATED BY SERVICE AND FUNCTIONAL REQUIREMENTS AND BY THE CONSEQUENCE OF FAILURE. EQUIPMENT CLASSIFICATION SHOWN IS FOR INTERFERENCE PURPOSES ONLY (I.E., WELD END PREPS). ACTUAL CLASSIFICATION OF THE EQUIPMENT IS THE LOWER CLASSIFICATION, AS INDICATED FOR THE ASSOCIATED PIPING.
 - EXCEPT AS NOTED BY NOTE 6, PORTIONS OF THIS SYSTEM THAT CONTAIN RADIOACTIVE FLUIDS AND ARE IDENTIFIED BY QUALITY GROUP CLASSIFICATION "Q" SHALL MEET THE AUGMENTING REQUIREMENTS.
 - THIS DRAWING BASED ON WESTINGHOUSE DRAWINGS 1145E02, SHEETS 1 THRU 5.
 - DELETED.
 - REFER TO NOTES 7 AND 8 ON M-22BG01.
 - INDICATED PORTION OF THIS SYSTEM IDENTIFIED BY THIS NOTE ARE QUALITY GROUP "Q" NON-AUGMENTED.
 - DELETED.
 - DELETED.
 - PRESSURE CONTROLLER IS VALVE MOUNTED.
 - REFERENCE INSTRUCTION MANUAL M-1149-00001.
 - REFERENCE INSTRUCTION MANUAL M-721-00093 (SEE H-1).
 - SEE WESTINGHOUSE DRAWING 8756037, SHEET 28.
 - DELETED.
 - WELDS IN ASME SECTION III, CLASS 2 HIGH ENERGY PIPING CONTAINMENT PENETRATION AREA OF NOMINAL PIPE SIZE GREATER THAN ONE INCH, MAY BE SUBJECT TO VOLUME/STRESS EXAMINATION DURING THE PSI AND/OR ISI PROGRAMS. THE BOUNDARIES OF THESE PIPING SYSTEMS EXTEND THROUGH THE ISOLATION RESTRAINT SYSTEM INSIDE AND OUTSIDE OF CONTAINMENT WHICH PROTECTS THE CONTAINMENT PENETRATION. THE SPECIFIC WELDS AND THEIR INSPECTION REQUIREMENTS ARE DELINEATED IN THE PSI/ISI WORK PANS PROVIDED UNDER SPECIFICATION M-189.
 - DELETED.
 - DELETED.
 - HS-14 BELONGS TO THE NB SYSTEM.
 - THIS POINT DEFINES THE "Q" BOUNDARY. BEYOND THIS POINT HCD PIPING IS ANALYZED CONSIDERING A SINGLE DEGREE OF FREEDOM.
 - VALVES BGV5000 AND BGV5001 ARE 1/2" VALVES.
 - PUMP STOPS ON S1; CAN BE RESTARTED FROM HIS3 BEFORE RESETTING S1.
 - FOR VALVES MARKED WITH AN "X" ON THIS DRAWING, EXTENSION STEM IS OPTIONAL.

AS-BUILT CLASS 1			
PIPING AND INSTRUMENTATION DIAGRAM CHEMICAL AND VOLUME CONTROL SYSTEM			
DRWN	N/A	DATE	
CHKD	N/A	DATE	
SUPV	N/A	DATE	
APPD	N/A	LOCATION	
CALLAWAY ENERGY CENTER			CLASS
UNION ELECTRIC COMPANY ST. LOUIS, MO			REV. 58

NOTES CONT'D.

22. TYGON HOSES ARE INSTALLED FROM THE CENTRIFUGAL CHARGING PUMPS MECHANICAL SEAL LEAKOFF LINES TO PUMP SKID DRAINS PER RFR 010613A.



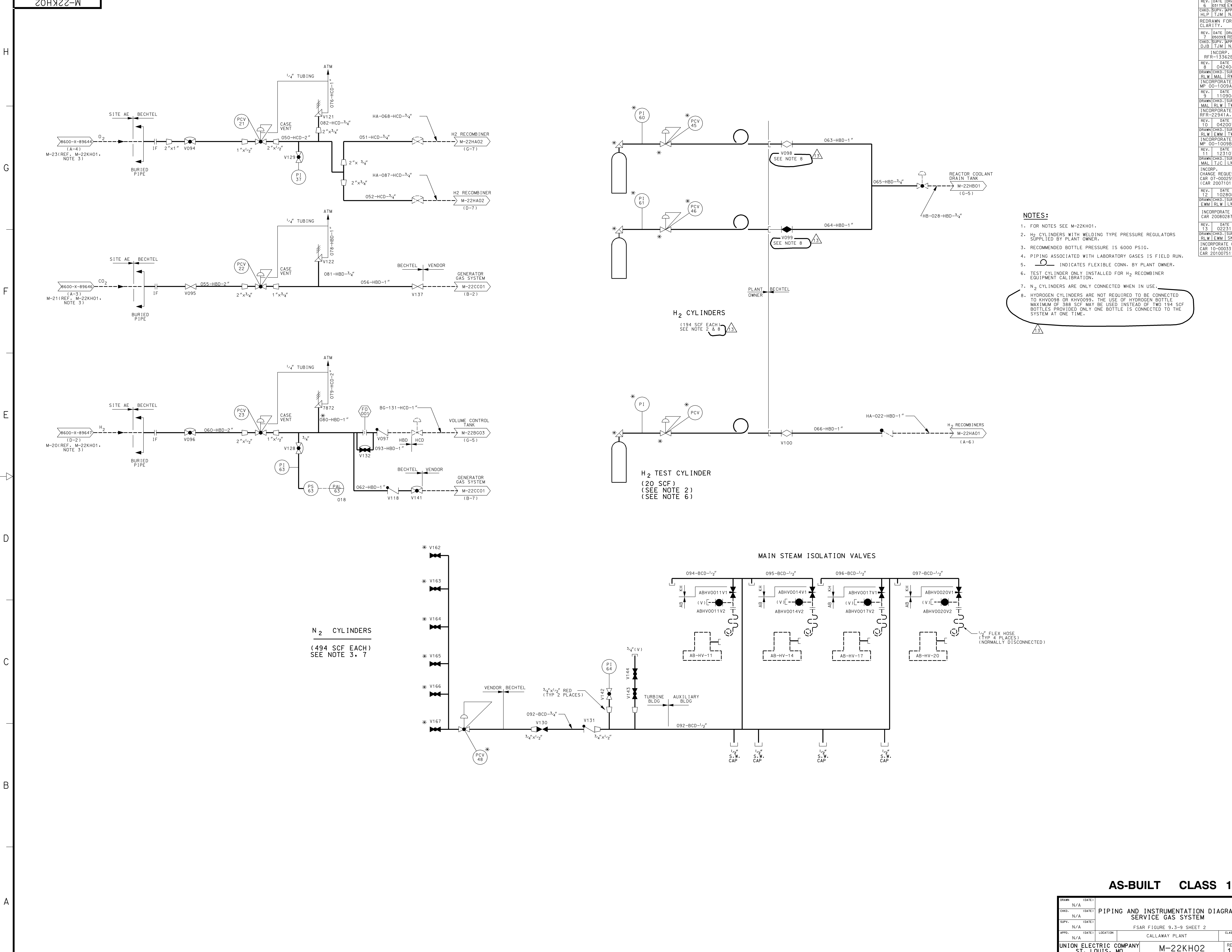
- NOTES:**
- THE FOLLOWING STANDARD WESTINGHOUSE EQUIPMENT IS SUPPLIED TO A HIGHER QUALITY GROUP/SEISMIC CLASSIFICATION AND PRINCIPLE CONSTRUCTION CODE THAN IS REQUIRED BASED ON ITS SAFETY RELATED IMPORTANCE AS DICTATED BY SERVICE AND FUNCTIONAL REQUIREMENTS AND BY THE CONSEQUENCE OF THEIR FAILURE. EQUIPMENT CLASSIFICATION SHOWN IS FOR INTERFACE PURPOSES ONLY (IE WELD END PREPS). ACTUAL CLASSIFICATION OF THE EQUIPMENT IS THE LOWER CLASSIFICATION AS INDICATED FOR THE ASSOCIATED PIPING.
A. MODERATING HEAT EXCHANGER
B. EXCESS LETDOWN HEAT EXCH. (SHELL)
C. LETDOWN CHILLER HEAT EXCH. (TUBE)
D. THERMAL REGENERATION DEMINERALIZER
E. MIXED BED DEMINERALIZER
F. CATION BED DEMINERALIZER
G. LETDOWN REHEAT HEAT EXCHANGER (SHELL)
 - PORTIONS OF THIS SYSTEM THAT CONTAIN RADIOACTIVE FLUIDS AND ARE IDENTIFIED BY QUALITY GROUP "D" SHALL MEET THE AUGMENTING REQUIREMENTS.
 - THIS DRAWING IS BASED ON WESTINGHOUSE DRAWINGS 1145E02 SHEETS 1 THRU 5.
 - THIS VALVE SUPPLIED LOOSE, WITH CHILLER UNIT PACKAGE, REFERENCE DRAWING 763D590.
 - REFER TO NOTES 7&8 ON M-22BG01.
 - INDICATED PORTIONS OF THIS SYSTEM, IDENTIFIED BY THIS NOTE ARE QUALITY GROUP "D" NON-AUGMENTED.
 - REFERENCE DRAWING NUMBER 650J413.
 - DELETED.
 - DELETED.
 - DELETED.
 - WHEN BTR IS IN THE GIVEN MODE, AS INDICATED BY BG-HIS-21, THE VALVES LISTED BELOW WILL BE IN THE FOLLOWING POSITIONS, ASSUMING PROPER VALVE OPERATION OCCURS:

VALVE	"OFF"	"DILUTE"	"BORATE"
BG-UV-7002A	CL	OP	CL
BG-UV-7002B	CL	OP	CL
BG-UV-7022	CL	OP	CL
BG-UV-7040	CL	OP	CL
BG-UV-7041	CL	OP	CL
BG-UV-7045	CL	OP	CL
BG-UV-7046	CL	OP	CL
BG-UV-7056	CL	OP	CL
BG-UV-7057	CL	OP	CL

(OP INDICATES OPEN, CL INDICATES CLOSED)
 - RETIRED PORTIONS OF SYSTEM CAN BE FOUND ON DRAWING M-23BG08.
 - THE VALVE POSITIONS SHOWN ARE FOR DRY LAYOUT OF THE SERVICE WATER TO CVCS CHILLER UNIT SUPPLY AND RETURN PIPING.
 - FOR VALVES MARKED WITH AN 'X' ON THIS DRAWING, EXTENSION STEM IS OPTIONAL.
 - DELETED.

AS-BUILT CLASS 1

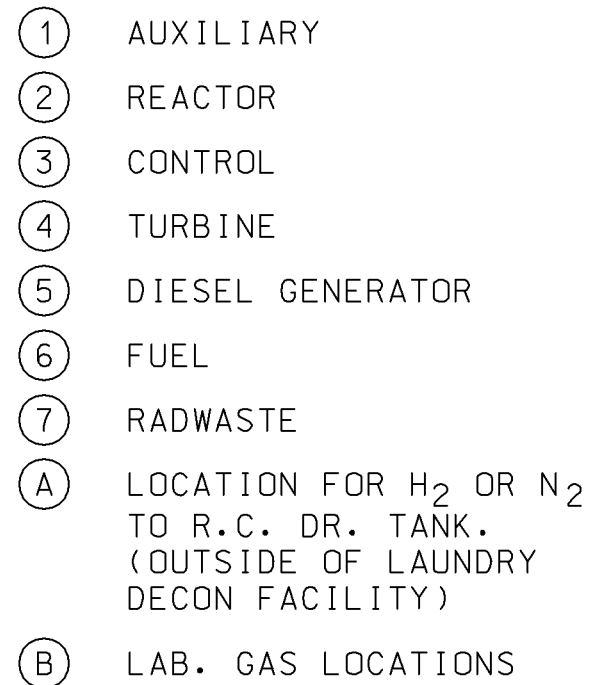
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CHKD.	N/A	(DATE)	
SUPV.	N/A	(DATE)	
APPD.	N/A	(DATE)	
UNION ELECTRIC COMPANY		ST. LOUIS, MO	REV. 21
M-22BG04 (Q)		CALLAWAY PLANT	CLASS
FSAR FIGURE 9.3-8 SHEET 4			
PIPING & INSTRUMENTATION DIAGRAM			
CHEMICAL AND VOLUME			
CONTROL SYSTEM			



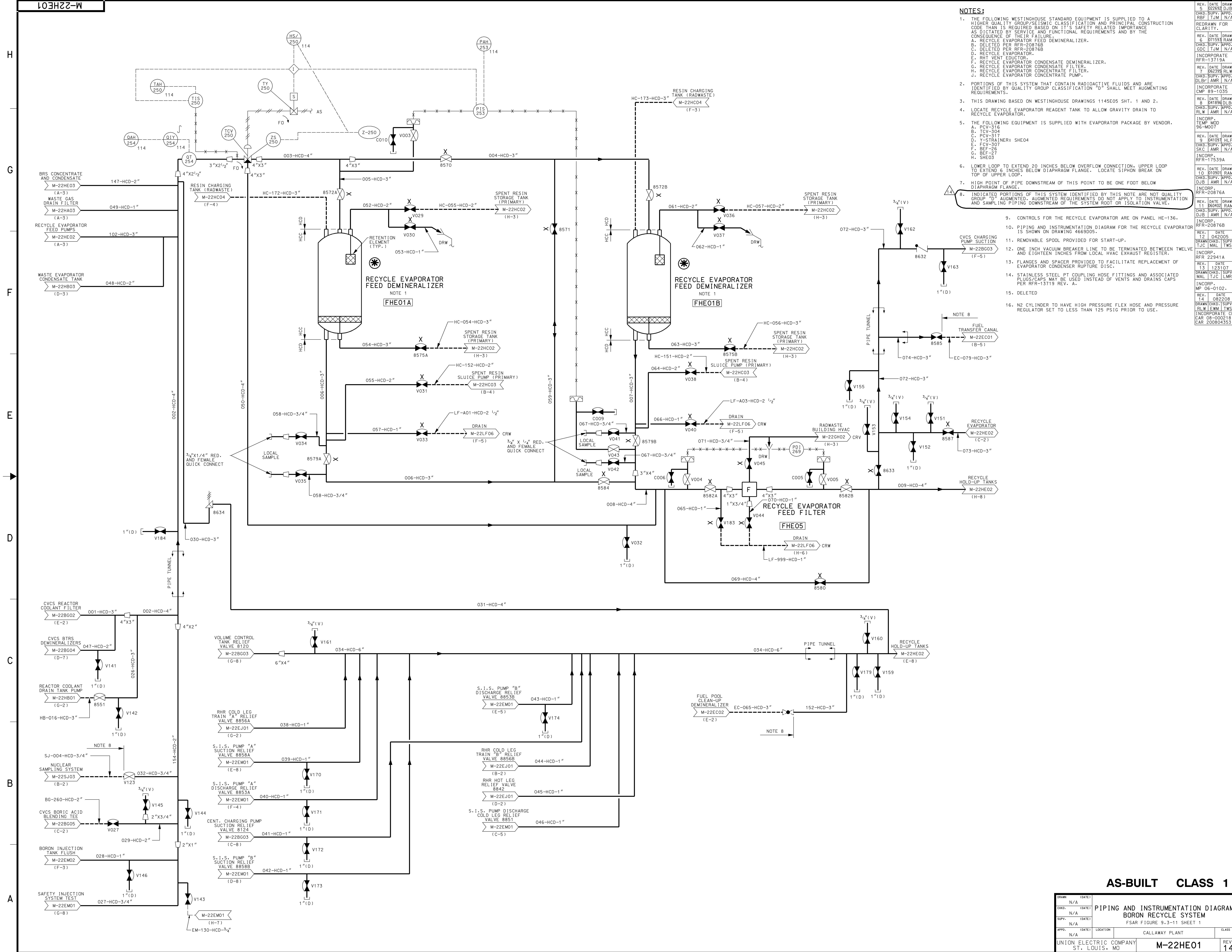
- NOTES:**
- FOR NOTES SEE M-22KH01.
 - H₂ CYLINDERS WITH WELDING TYPE PRESSURE REGULATORS SUPPLIED BY PLANT OWNER.
 - RECOMMENDED BOTTLE PRESSURE IS 6000 PSIG.
 - PIPING ASSOCIATED WITH LABORATORY GASES IS FIELD RUN.
 - INDICATES FLEXIBLE CONN. BY PLANT OWNER.
 - TEST CYLINDER ONLY INSTALLED FOR H₂ RECOMBINER EQUIPMENT CALIBRATION.
 - N₂ CYLINDERS ARE ONLY CONNECTED WHEN IN USE.
 - HYDROGEN CYLINDERS ARE NOT REQUIRED TO BE CONNECTED TO KHV0098 OR KHV0099. THE USE OF HYDROGEN BOTTLE MAXIMUM OF 388 SCF MAY BE USED INSTEAD OF TWO 194 SCF BOTTLES PROVIDED ONLY ONE BOTTLE IS CONNECTED TO THE SYSTEM AT ONE TIME.

AS-BUILT CLASS 1

DRWN	N/A	DATE		PIPING AND INSTRUMENTATION DIAGRAM
CHKD	N/A	DATE		SERVICE GAS SYSTEM
SURV	N/A	DATE		FSAR FIGURE 9.3-9 SHEET 2
APPR	N/A	DATE	LOCATION	CALLAWAY PLANT
UNION ELECTRIC COMPANY				REV. 13
ST. LOUIS, MO				M-22KH02



REV OL-23 6/18



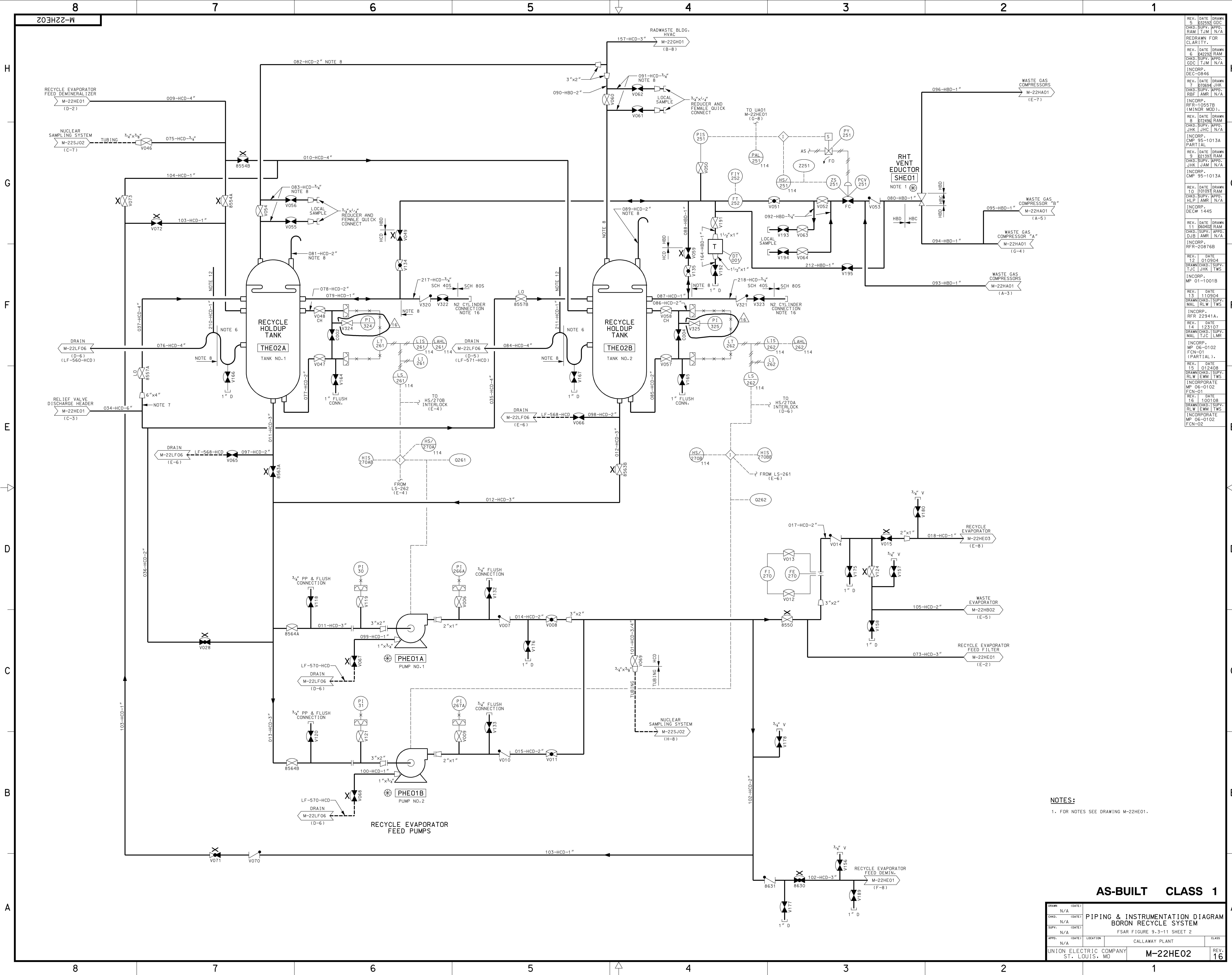
- NOTES:**
- THE FOLLOWING WESTINGHOUSE STANDARD EQUIPMENT IS SUPPLIED TO A HIGHER QUALITY GROUP/SEISMIC CLASSIFICATION AND PRINCIPAL CONSTRUCTION CODE THAN IS REQUIRED BASED ON ITS SAFETY RELATED IMPORTANCE AS DICTATED BY SERVICE AND FUNCTIONAL REQUIREMENTS AND BY THE CONSEQUENCE OF THEIR FAILURE.
A. RECYCLE EVAPORATOR FEED DEMINERALIZER.
B. DELETED PER RFR-20876B.
C. DELETED PER RFR-20876B.
D. RECYCLE EVAPORATOR.
E. RHT VENT EJECTOR.
F. RECYCLE EVAPORATOR CONDENSATE DEMINERALIZER.
G. RECYCLE EVAPORATOR CONDENSATE FILTER.
H. RECYCLE EVAPORATOR CONCENTRATE FILTER.
J. RECYCLE EVAPORATOR CONCENTRATE PUMP.
 - PORTIONS OF THIS SYSTEM THAT CONTAIN RADIOACTIVE FLUIDS AND ARE IDENTIFIED BY QUALITY GROUP CLASSIFICATION "D" SHALL MEET AUGMENTING REQUIREMENTS.
 - THIS DRAWING BASED ON WESTINGHOUSE DRAWINGS 1145E05 SHT. 1 AND 2.
 - LOCATE RECYCLE EVAPORATOR REAGENT TANK TO ALLOW GRAVITY DRAIN TO RECYCLE EVAPORATOR.
 - THE FOLLOWING EQUIPMENT IS SUPPLIED WITH EVAPORATOR PACKAGE BY VENDOR.
A. PCV-316
B. TCV-304
C. PCV-317
D. Y-STRAINER: SHE04
E. FCV-307
F. BEF-26
G. BEF-27
H. SHE03
 - LOWER LOOP TO EXTEND 20 INCHES BELOW OVERFLOW CONNECTION. UPPER LOOP TO EXTEND 6 INCHES BELOW DIAPHRAGM FLANGE. LOCATE SIPHON BREAK ON TOP OF UPPER LOOP.
 - HIGH POINT OF PIPE DOWNSTREAM OF THIS POINT TO BE ONE FOOT BELOW DIAPHRAGM FLANGE.
 - INDICATED PORTIONS OF THIS SYSTEM IDENTIFIED BY THIS NOTE ARE NOT QUALITY GROUP "D" AUGMENTED. AUGMENTED REQUIREMENTS DO NOT APPLY TO INSTRUMENTATION AND SAMPLING PIPING DOWNSTREAM OF THE SYSTEM ROOT OR ISOLATION VALVE.
 - CONTROLS FOR THE RECYCLE EVAPORATOR ARE ON PANEL HE-136.
 - PIPING AND INSTRUMENTATION DIAGRAM FOR THE RECYCLE EVAPORATOR IS SHOWN ON DRAWING 4669005.
 - REMOVABLE SPOOL PROVIDED FOR START-UP.
 - ONE INCH VACUUM BREAKER LINE TO BE TERMINATED BETWEEN TWELVE AND EIGHTEEN INCHES FROM LOCAL HVAC EXHAUST REGISTER.
 - FLANGES AND SPACER PROVIDED TO FACILITATE REPLACEMENT OF EVAPORATOR CONDENSER RUPTURE DISC.
 - STAINLESS STEEL PT COUPLING HOSE FITTINGS AND ASSOCIATED PLUGS/CAPS MAY BE USED INSTEAD OF VENTS AND DRAINS CAPS PER RFR-13719 REV. A.
 - DELETED
 - N2 CYLINDER TO HAVE HIGH PRESSURE FLEX HOSE AND PRESSURE REGULATOR SET TO LESS THAN 125 PSIG PRIOR TO USE.

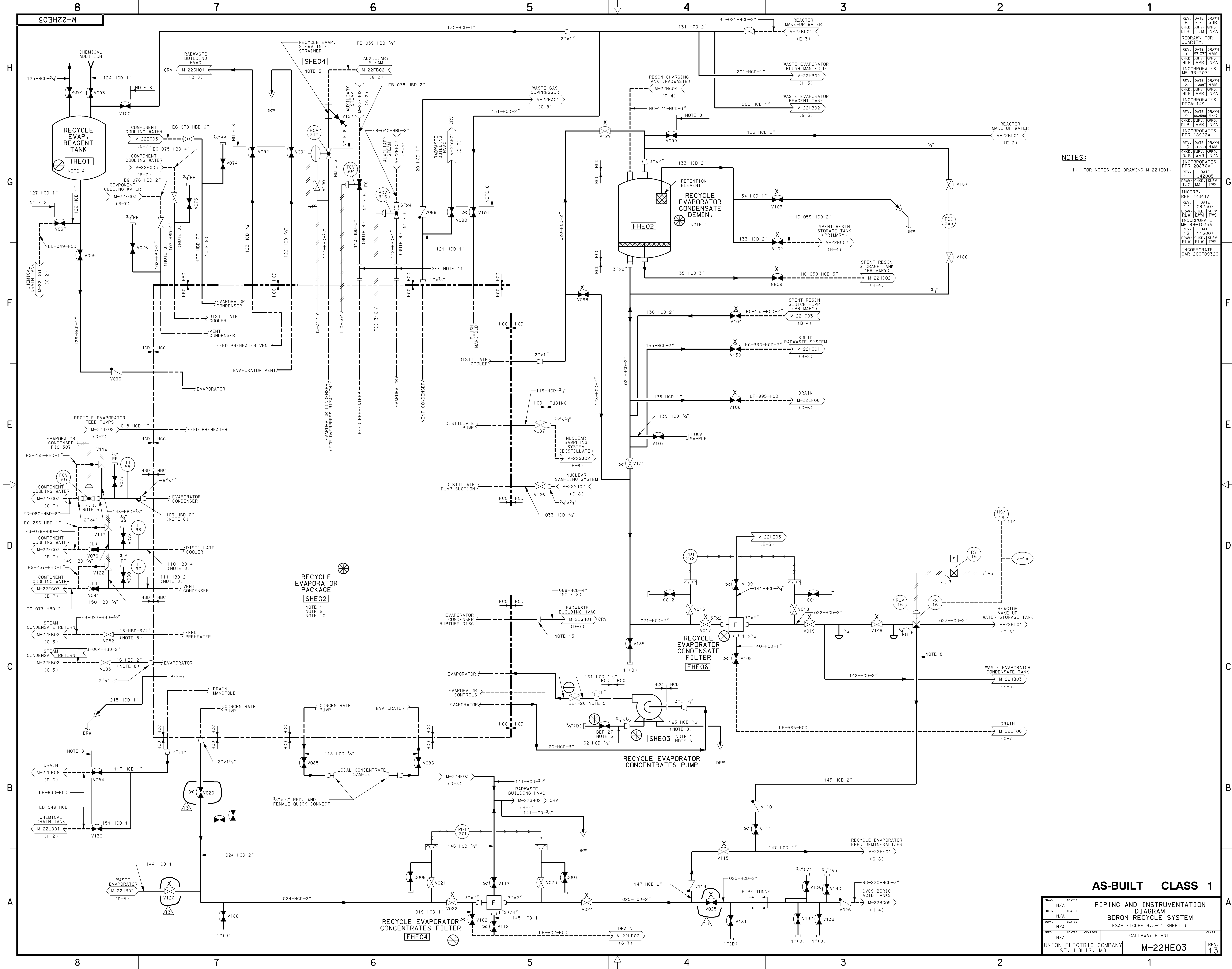
AS-BUILT CLASS 1

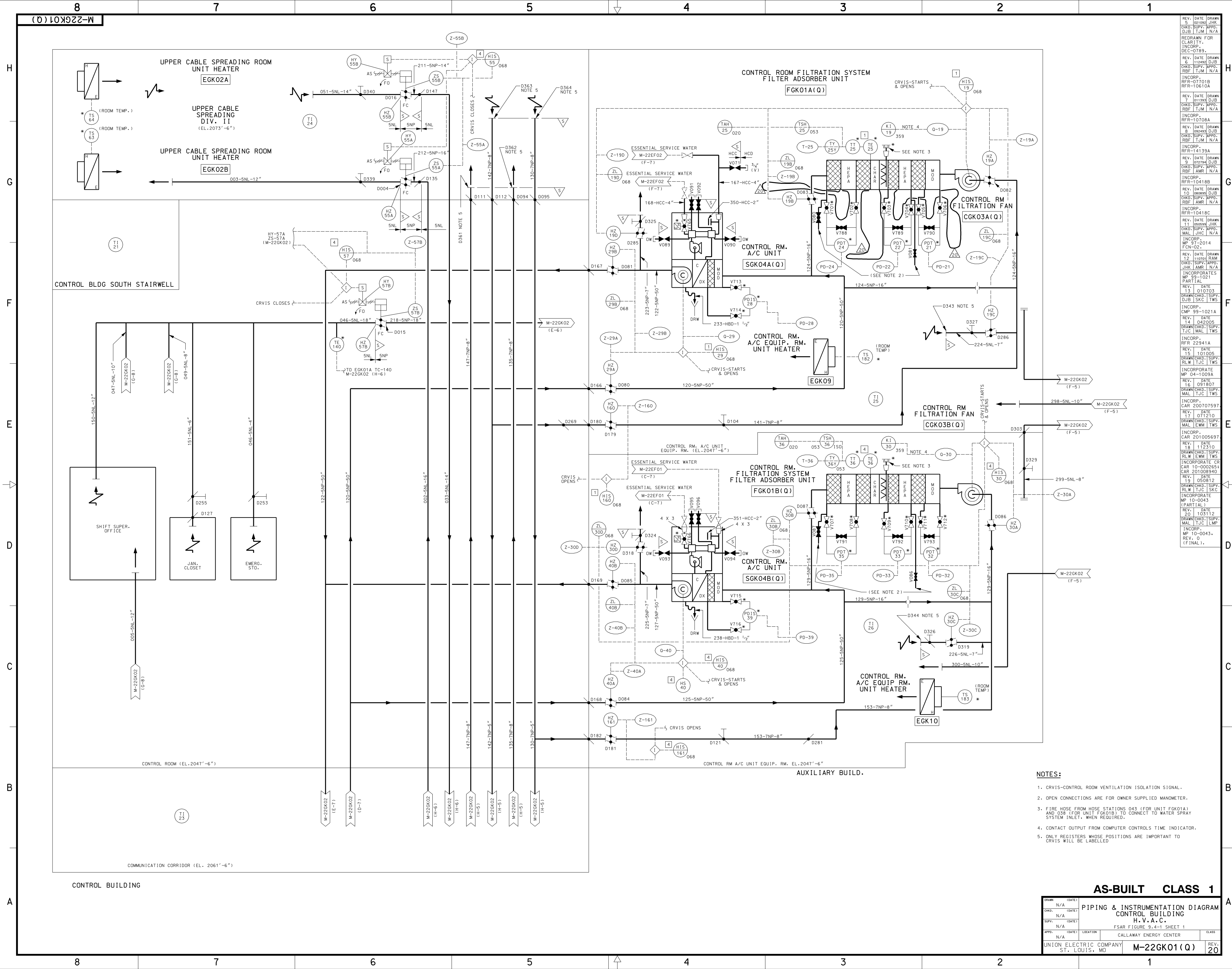
DRWN	N/A	DATE	
CHKD	N/A	DATE	
SUPV	N/A	DATE	
APPD	N/A	DATE	
LOC		LOCATION	
CALLAWAY PLANT			
CLASS			
UNION ELECTRIC COMPANY			
ST. LOUIS, MO			
REV.	14		

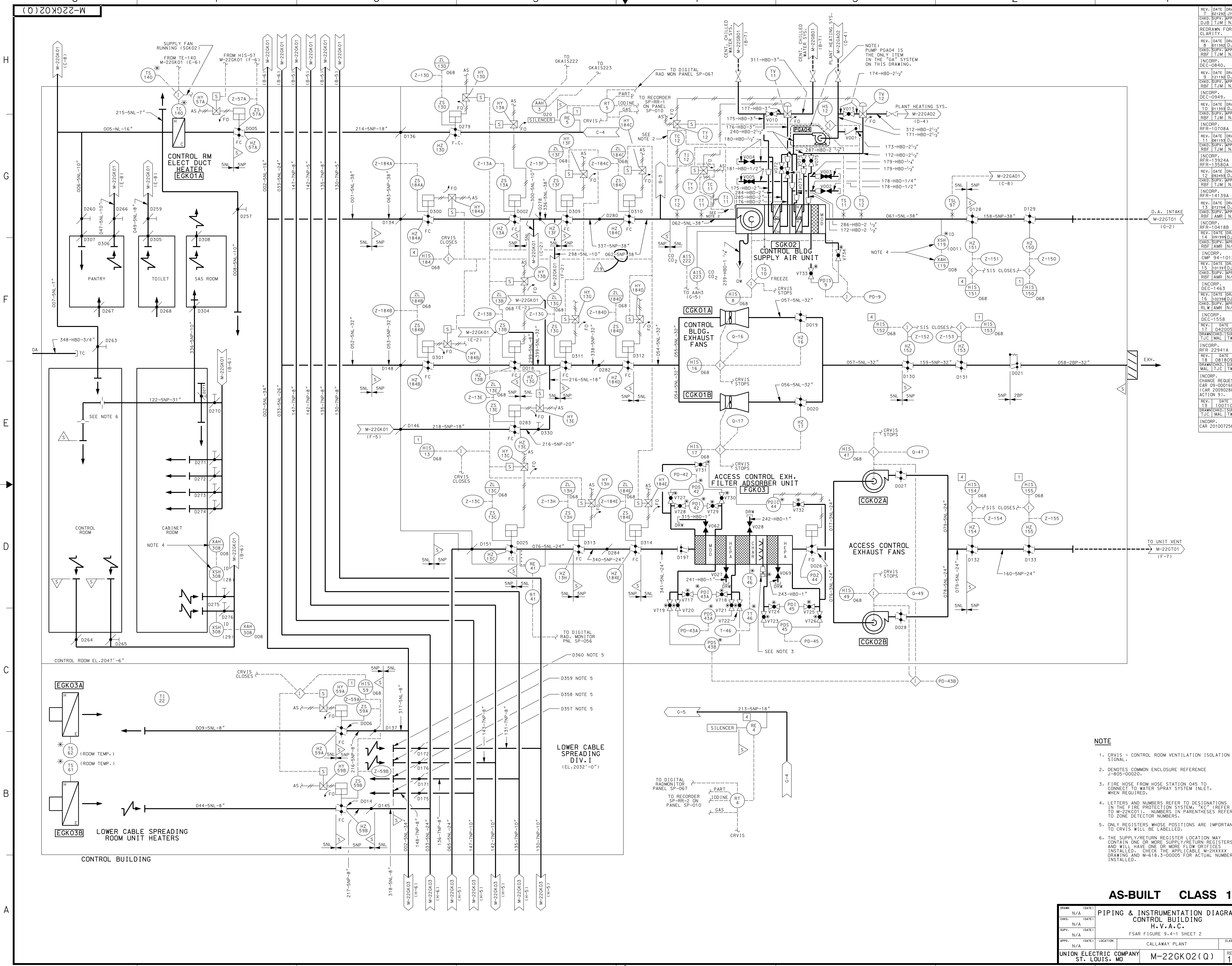
PIPING AND INSTRUMENTATION DIAGRAM
BORON RECYCLE SYSTEM
FSAR FIGURE 9.3-11 SHEET 1

M-22HE01



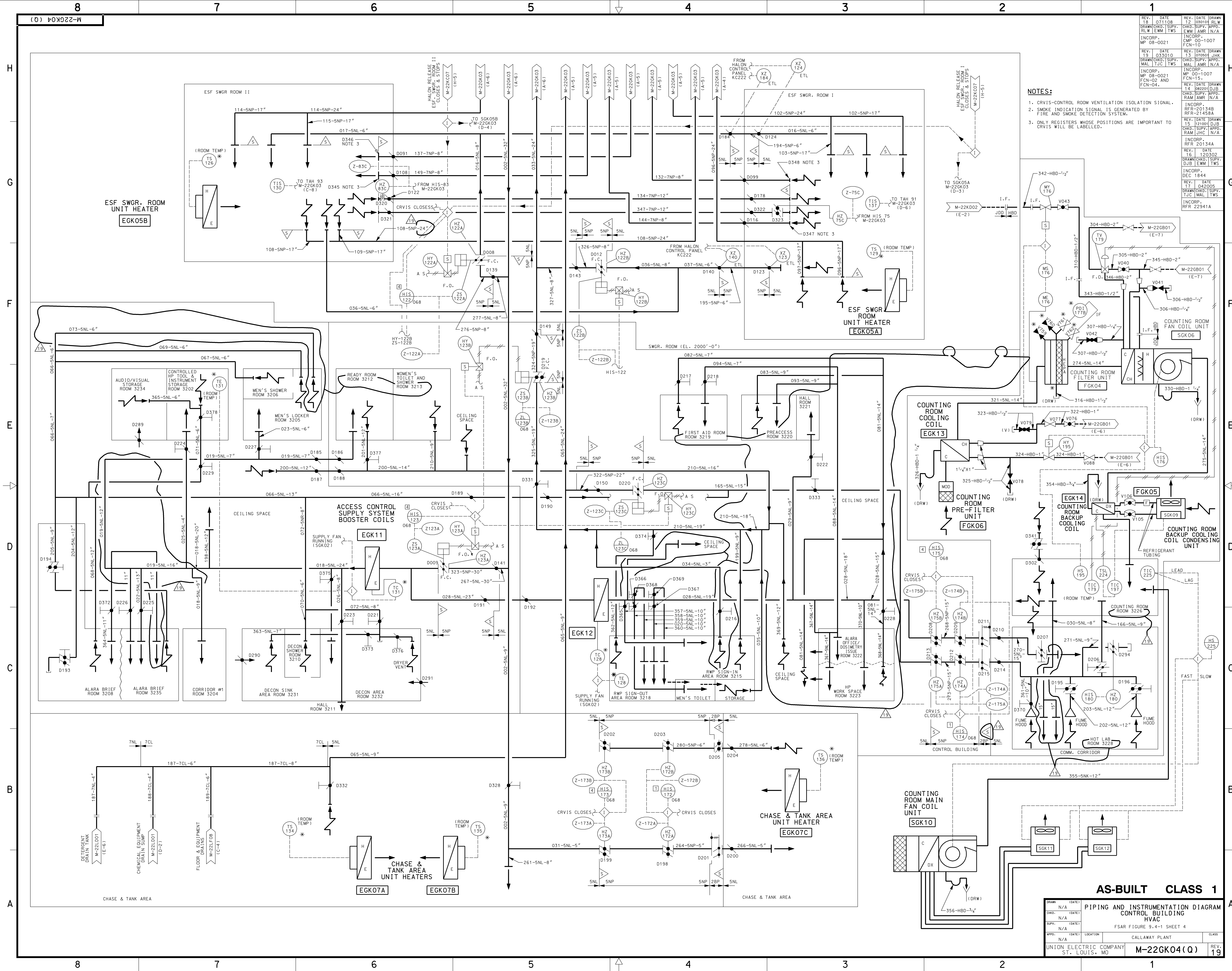






- NOTE**
1. CRVIS - CONTROL ROOM VENTILATION ISOLATION SIGNAL.
 2. DENOTES COMMON ENCLOSURE REFERENCE J-805-00020.
 3. FIRE HOSE FROM HOSE STATION 045 TO CONNECT TO WATER SPRAY SYSTEM INLET, WHEN REQUIRED.
 4. LETTERS AND NUMBERS REFER TO DESIGNATIONS IN THE FIRE PROTECTION SYSTEM, "KC" (REFER TO M-22GK01). NUMBERS IN PARENTHESES REFER TO ZONE DETECTOR NUMBERS.
 5. ONLY REGISTERS WHOSE POSITIONS ARE IMPORTANT TO CRVIS WILL BE LABELLED.
 6. THE SUPPLY/RETURN REGISTER LOCATION MAY CONTAIN ONE OR MORE SUPPLY/RETURN REGISTERS AND WILL HAVE ONE OR MORE FLOW ORIFICES INSTALLED. CHECK THE APPLICABLE M-22XXXX DRAWING AND M-618.3-00005 FOR ACTUAL NUMBER INSTALLED.

AS-BUILT CLASS 1			
DRAWING			
DATE	N/A	DATE	N/A
CHKD.	N/A	DATE	N/A
SUPV.	N/A	DATE	N/A
APPD.	N/A	LOCATION	CALLAWAY PLANT
UNION ELECTRIC COMPANY		ST. LOUIS, MO	
M-22GK02(Q)		REV. 19	



- NOTES:**
1. CRVIS-CONTROL ROOM VENTILATION ISOLATION SIGNAL.
 2. SMOKE INDICATION SIGNAL IS GENERATED BY FIRE AND SMOKE DETECTION SYSTEM.
 3. ONLY REGISTERS WHOSE POSITIONS ARE IMPORTANT TO CRVIS WILL BE LABELLED.

AS-BUILT CLASS 1

PIPING AND INSTRUMENTATION DIAGRAM HVAC

FSAR FIGURE 9.4-1 SHEET 4

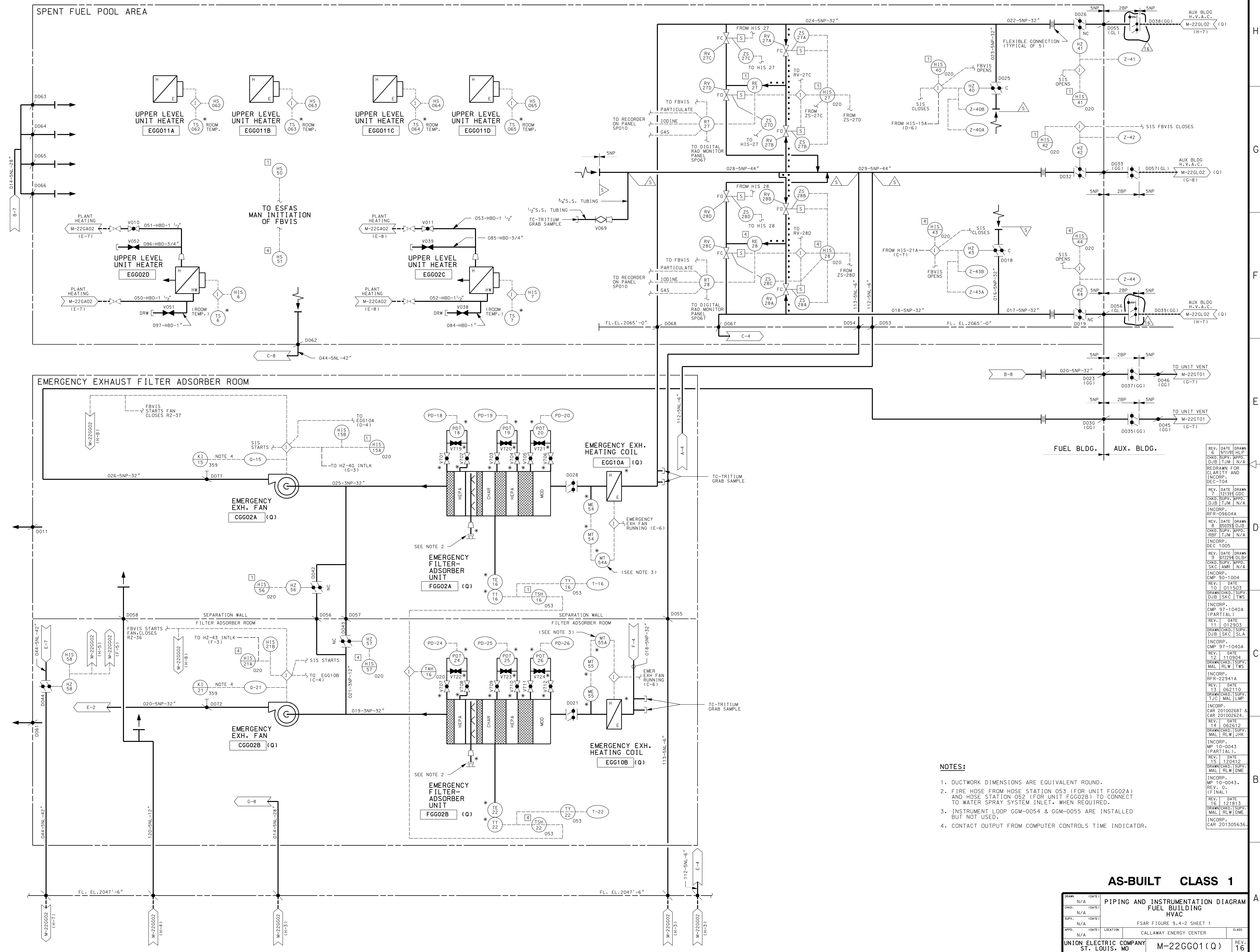
CALLAWAY PLANT

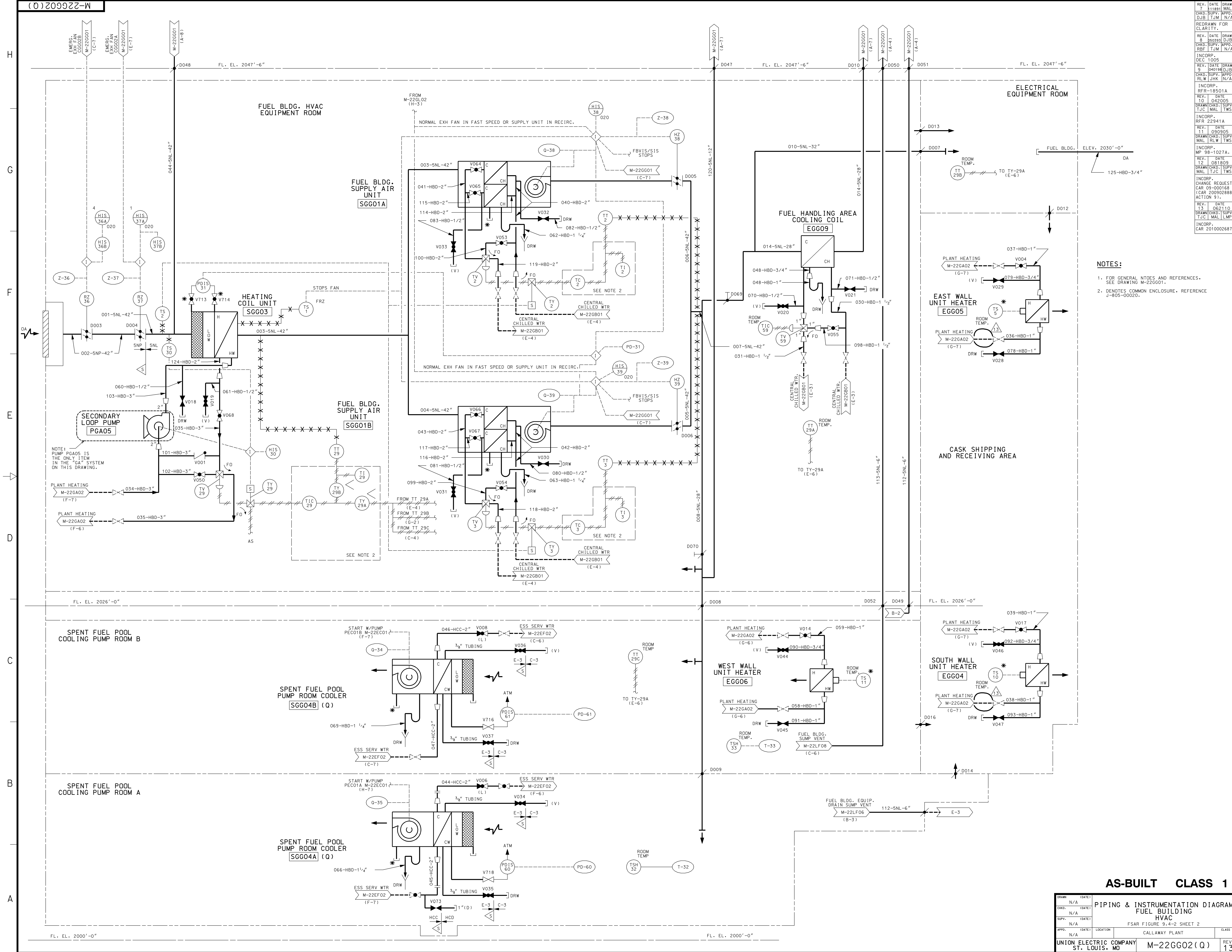
UNION ELECTRIC COMPANY ST. LOUIS, MO

M-22GK04(Q)

REV. 19

REV. DATE	REV. DATE
18 071108	12 030101
DRN CHKO, SUPV	DRN CHKO, SUPV
LMK TJC WMS	LMK AMG N/A
INCORP.	INCORP.
MP 08-0021	MP 08-0021
	FCN-10
REV. DATE	REV. DATE
19 033010	13 020205
DRN CHKO, SUPV	CHKO, SUPV
LMK TJC WMS	LMK AMG N/A
INCORP.	INCORP.
MP 08-0021	MP 08-0021
FCN-02	FCN-15
FCN-04.	
COLATION SIGNAL.	REV. DATE
ED BY	14 020101
RE IMPORTANT TO	DRN CHKO, SUPV
	RAM AMG N/A
	INCORP.
	RFR-201348
	RFR-214584
	REV. DATE
	15 121001
	CHKO, SUPV
	RAM JHC N/A
	INCORP.
	RFR 20134A
	REV. DATE
	16 120302
	DRN CHKO, SUPV
	JHC DWM EWS
	INCORP.
	DEC 1844
	REV. DATE
	17 042005
	DRN CHKO, SUPV
	TJC MLK WMS
	INCORP.
	RFR 22341A

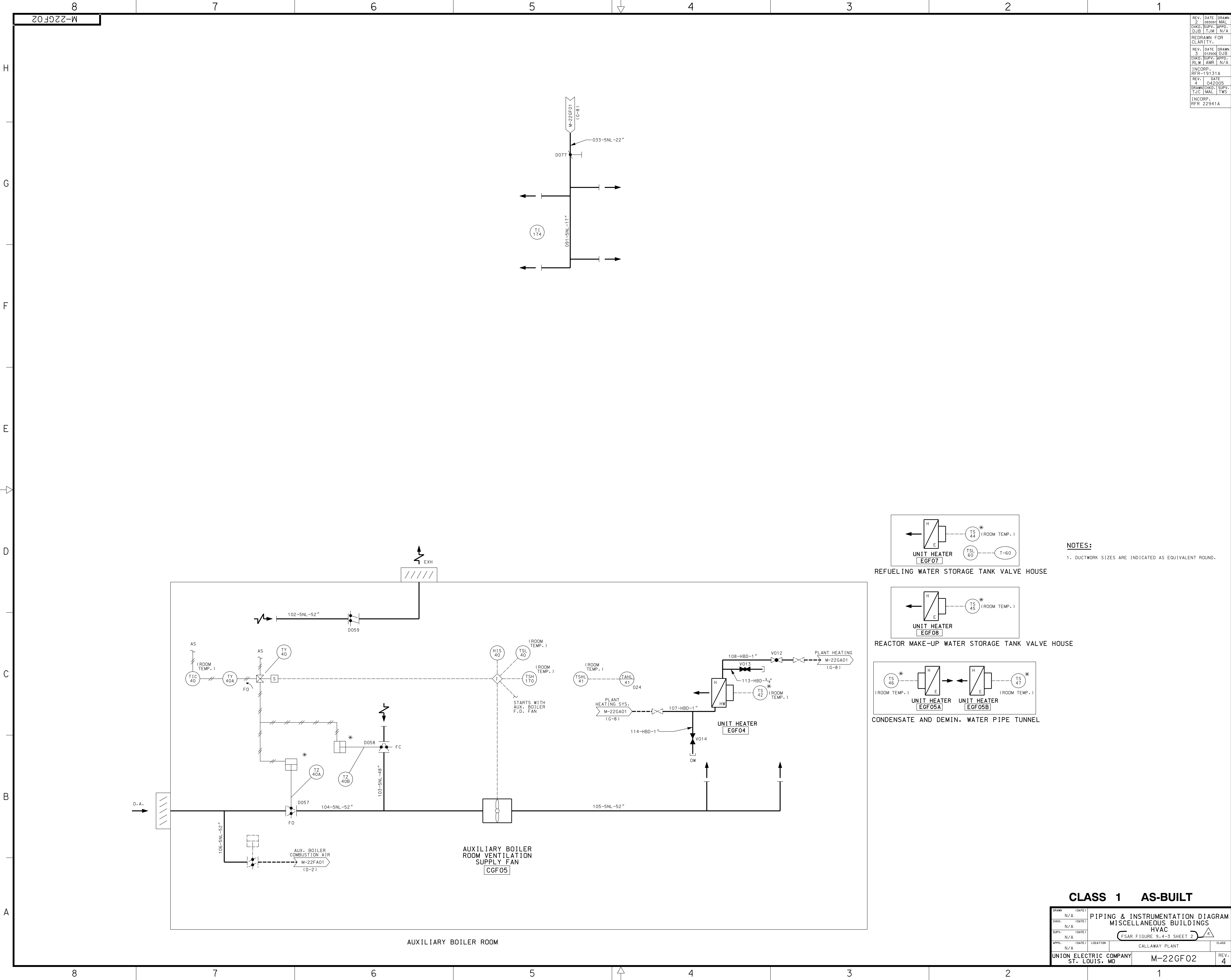




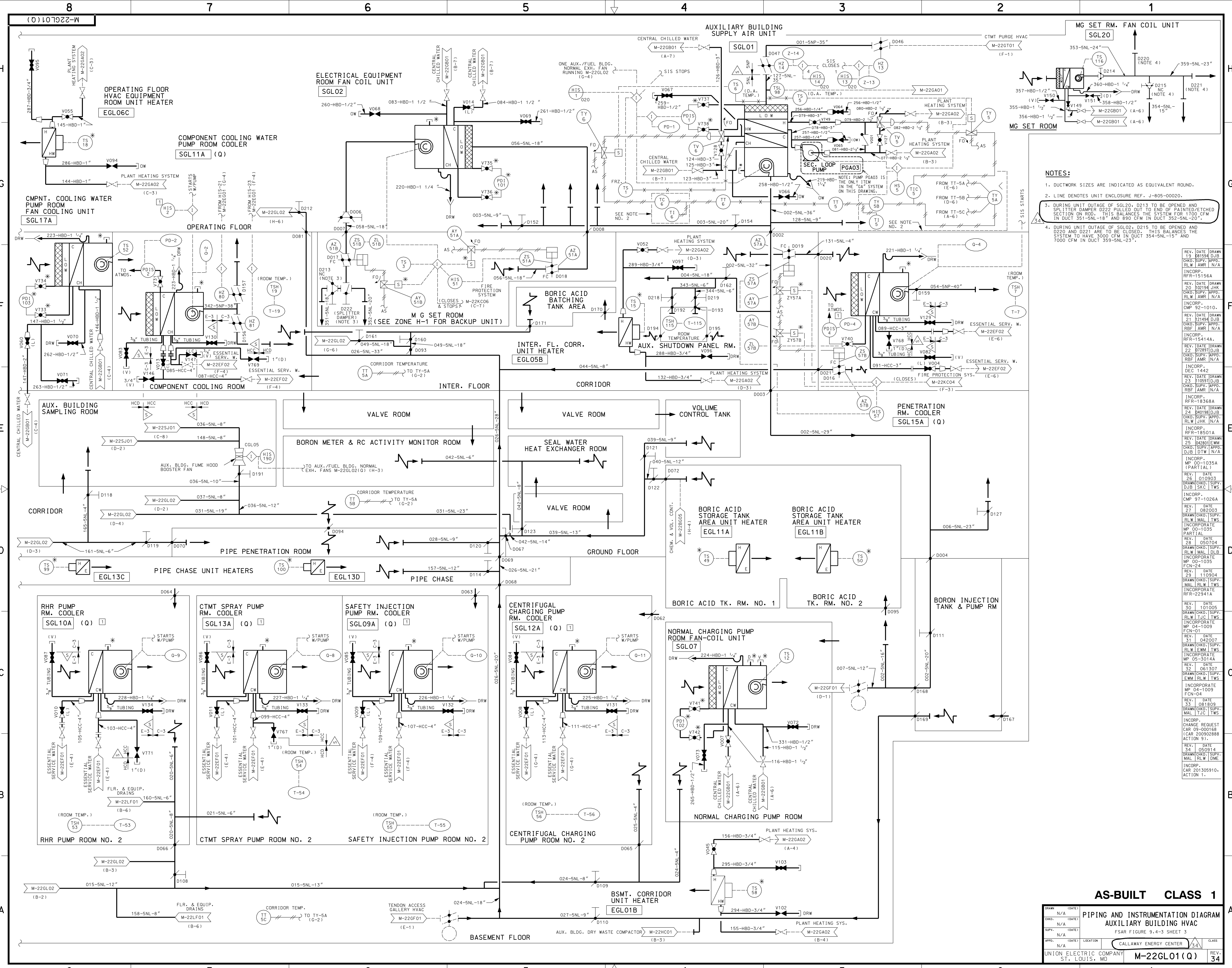
- NOTES:**
- 1. FOR GENERAL NOTES AND REFERENCES, SEE DRAWING M-22GG01.
 - 2. DENOTES COMMON ENCLOSURE, REFERENCE J-805-00020.

AS-BUILT CLASS 1

DRWN	N/A	DATE	
CHKD	N/A	DATE	
SUPV	N/A	DATE	
APPD	N/A	DATE	
LOCATION		LOCATION	
CALLAWAY PLANT		CLASS	
UNION ELECTRIC COMPANY			
ST. LOUIS, MO			
M-22GG02(Q)			
REV.	13		

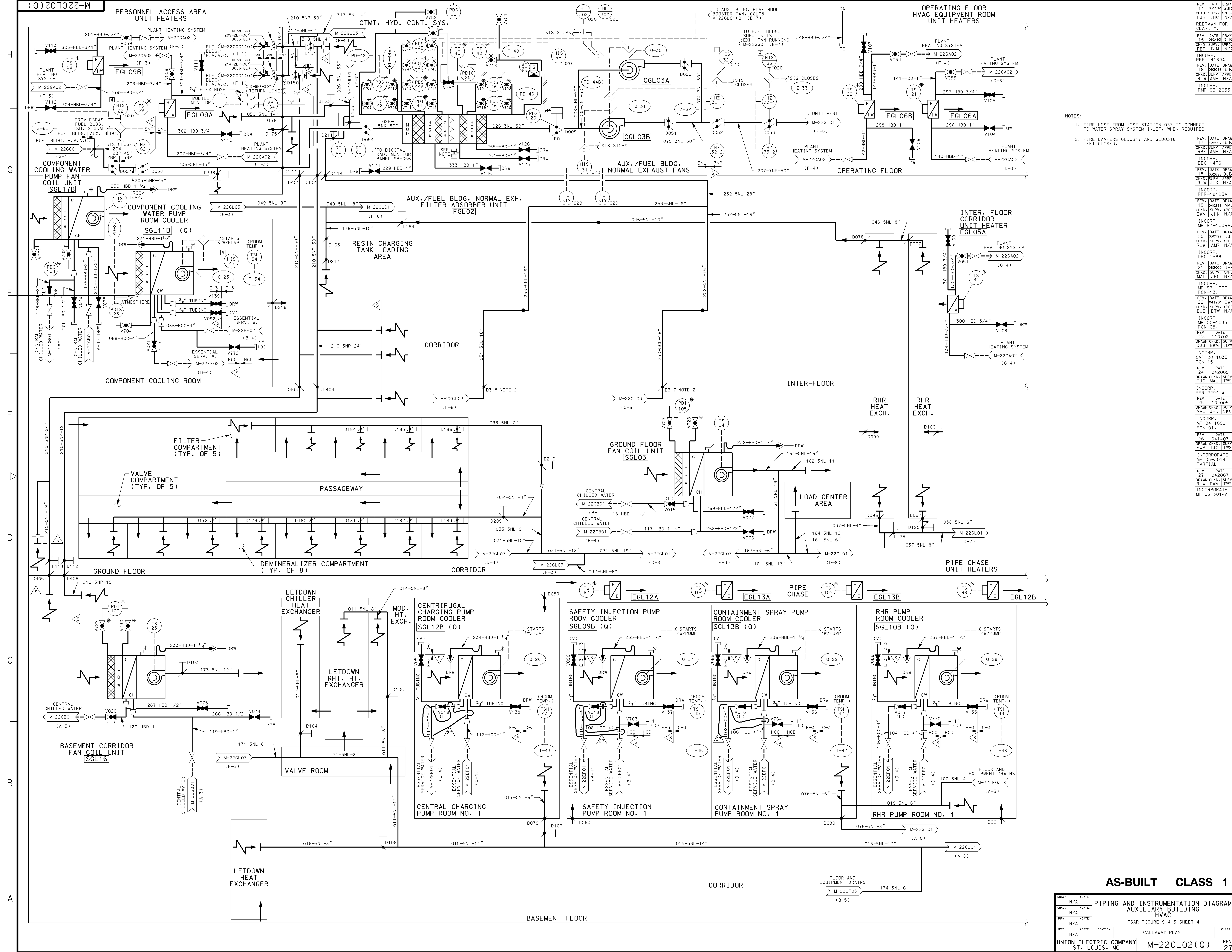


REV.	DATE	DRAWN
2	093091	MAL
CHKD.	SUPV.	APPR.
DJB	TJM	N/A
REDRAWN FOR CLARITY.		
REV.	DATE	DRAWN
3	012500	DJB
CHKD.	SUPV.	APPR.
RLW	AMR	N/A
INCORP. RFR-19131A		
REV.	DATE	DRAWN
4	042005	TWS
CHKD.	SUPV.	APPR.
TIC	MAL	TWS
INCORP. RFR 22941A		



- NOTES:
- DUCTWORK SIZES ARE INDICATED AS EQUIVALENT ROUND.
 - LINE DENOTES UNIT ENCLOSURE REF. J-805-00020.
 - DURING UNIT OUTAGE OF SGL20, D213 TO BE OPENED AND SPLITTER DAMPER D222 PULLED OUT TO END OF PAINTED/ETCHED SECTION ON ROD. THIS BALANCES THE SYSTEM FOR 1700 CFM IN DUCT 351-5NL-18" AND 890 CFM IN DUCT 352-5NL-20".
 - DURING UNIT OUTAGE OF SGL02, D215 TO BE OPENED AND D220 AND D221 ARE TO BE CLOSED. THIS BALANCES THE SYSTEM TO HAVE 3000 CFM IN DUCT 354-5NL-15" AND 7000 CFM IN DUCT 359-5NL-23".

REV.	DATE	DRAWN	CHKD.	SUPV.	APPV.	RLW	AMR	N/A
1	08/19/84	DJB						
2	02/19/85	JHK						
3	02/19/85	JHK						
4	02/19/85	JHK						
5	02/19/85	JHK						
6	02/19/85	JHK						
7	02/19/85	JHK						
8	02/19/85	JHK						
9	02/19/85	JHK						
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96	02/19/85	JHK						
97	02/19/85	JHK						
98	02/19/85	JHK						
99	02/19/85	JHK						
100	02/19/85	JHK						



NOTES:
1. FIRE HOSE FROM HOSE STATION 033 TO CONNECT TO WATER SPRAY SYSTEM INLET, WHEN REQUIRED.
2. FIRE DAMPERS GLD0317 AND GLD0318 LEFT CLOSED.

REV.	DATE	DRAWN	CHKD.	SUPV.	APPD.	INCORP.
17	12/22/91	SBR	DJB	JHC	N/A	
15	09/24/93	DJB	DJB	JHC	N/A	
16	09/29/96	DJB	DJB	JHC	N/A	
14	11/13/94	DJB	DJB	JHC	N/A	
13	03/20/95	DJB	DJB	JHC	N/A	
12	03/20/95	DJB	DJB	JHC	N/A	
11	03/20/95	DJB	DJB	JHC	N/A	
10	03/20/95	DJB	DJB	JHC	N/A	
9	03/20/95	DJB	DJB	JHC	N/A	
8	03/20/95	DJB	DJB	JHC	N/A	
7	03/20/95	DJB	DJB	JHC	N/A	
6	03/20/95	DJB	DJB	JHC	N/A	
5	03/20/95	DJB	DJB	JHC	N/A	
4	03/20/95	DJB	DJB	JHC	N/A	
3	03/20/95	DJB	DJB	JHC	N/A	
2	03/20/95	DJB	DJB	JHC	N/A	
1	03/20/95	DJB	DJB	JHC	N/A	

AS-BUILT CLASS 1

DRWN	N/A	DATE	
CHKD	N/A	DATE	
SUPV	N/A	DATE	
APPD	N/A	DATE	
UNION ELECTRIC COMPANY ST. LOUIS, MO			

PIPING AND INSTRUMENTATION DIAGRAM
AUXILIARY BUILDING
HVAC

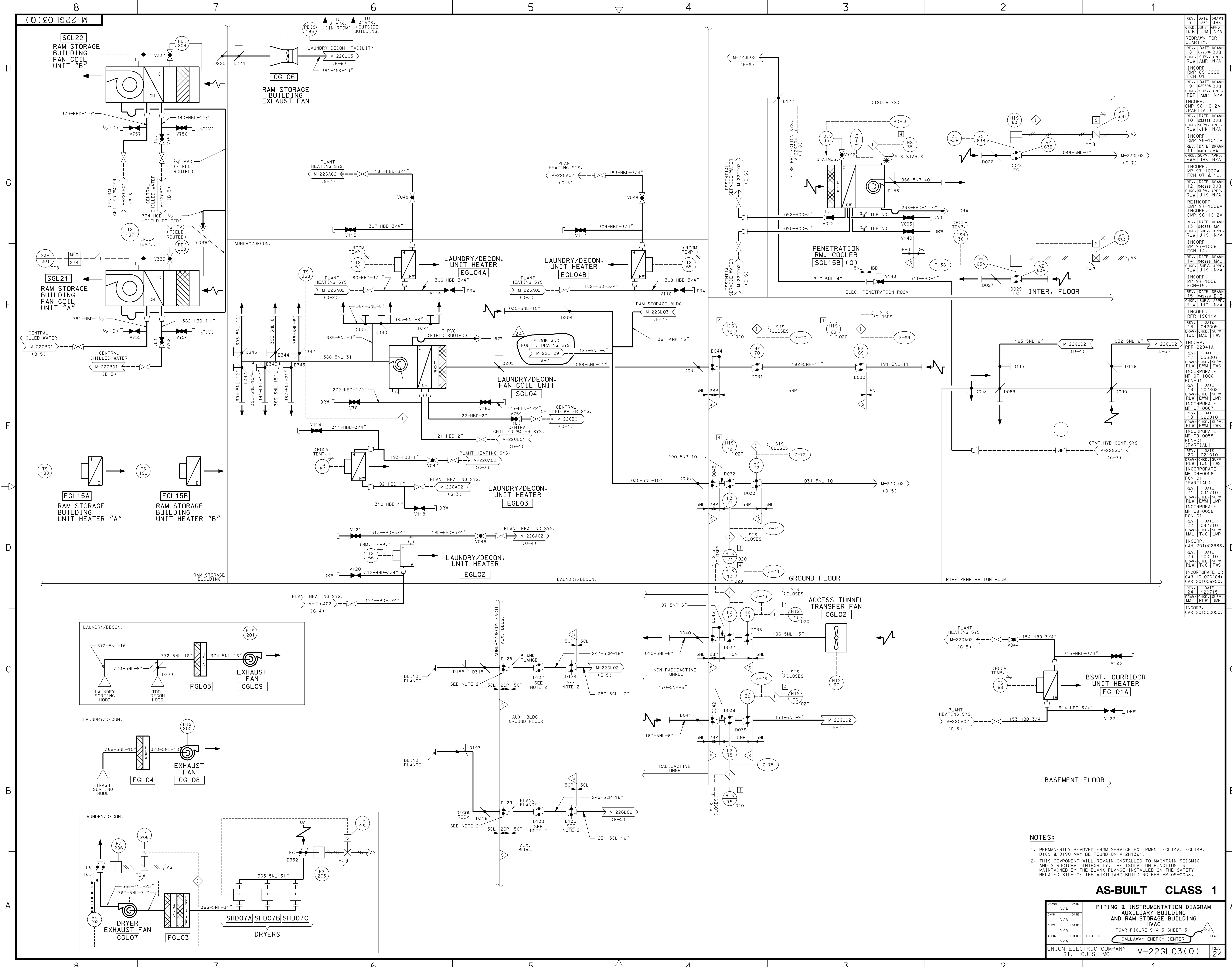
FSAR FIGURE 9.4-3 SHEET 4

CALLAWAY PLANT

CLASS

M-22GL02(Q)

REV. 27

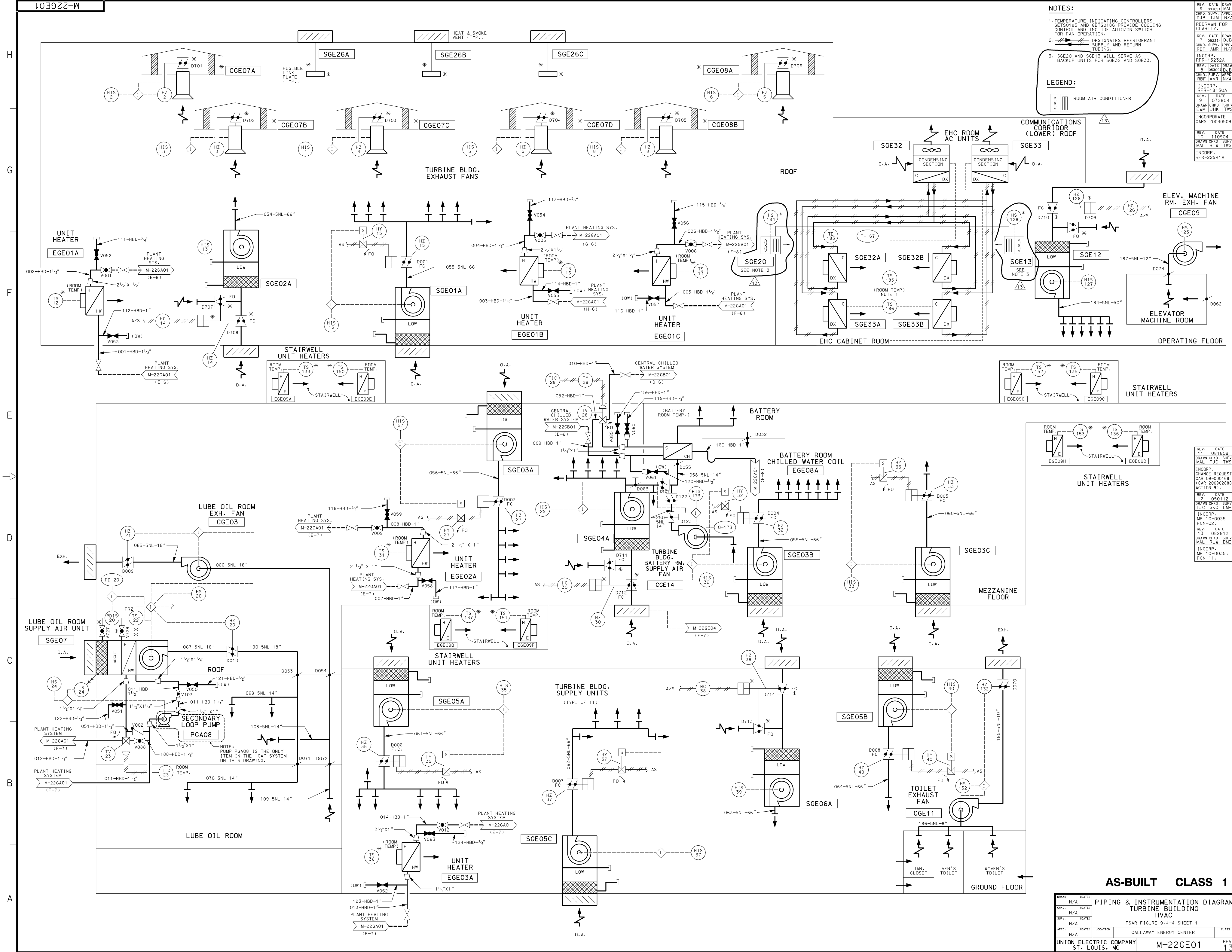


NOTES:

- PERMANENTLY REMOVED FROM SERVICE EQUIPMENT EGL14A, EGL14B, D189 & D190 MAY BE FOUND ON M-2H1361.
- THIS COMPONENT WILL REMAIN INSTALLED TO MAINTAIN SEISMIC AND STRUCTURAL INTEGRITY. THE ISOLATION FUNCTION IS MAINTAINED BY THE BLANK FLANGE INSTALLED ON THE SAFETY-RELATED SIDE OF THE AUXILIARY BUILDING PER MP 09-0058.

AS-BUILT CLASS 1

DRAWN	N/A	(DATE)	
CHKD.	N/A	(DATE)	
SUPV.	N/A	(DATE)	
APPD.	N/A	(DATE)	
LOCATION	FSAR FIGURE 9-4-3	SHEET 5	24
CLASS	CALLAWAY ENERGY CENTER		
UNION ELECTRIC COMPANY	ST. LOUIS, MO	M-22GL03(Q)	REV. 24



NOTES:

- TEMPERATURE INDICATING CONTROLLERS GETS0185 AND GETS0186 PROVIDE COOLING CONTROL AND INCLUDE AUTO/ON SWITCH FOR FAN OPERATION.
- DESIGNATES REFRIGERANT SUPPLY AND RETURN TUBING.
- SGE20 AND SGE13 WILL SERVE AS BACKUP UNITS FOR SGE32 AND SGE33.

LEGEND:

ROOM AIR CONDITIONER

COMMUNICATIONS CORRIDOR (LOWER) ROOF

ELEV. MACHINE RM. EXH. FAN

OPERATING FLOOR

STAIRWELL UNIT HEATERS

STAIRWELL UNIT HEATERS

STAIRWELL UNIT HEATERS

BATTERY ROOM

BATTERY ROOM CHILLED WATER COIL EGE08A

MEZZANINE FLOOR

TOILET EXHAUST FAN CGE11

JAN. CLOSET

MEN'S TOILET

WOMEN'S TOILET

AS-BUILT CLASS 1

PIPEING & INSTRUMENTATION DIAGRAM

TURBINE BUILDING

HVAC

FSAR FIGURE 9.4-4 SHEET 1

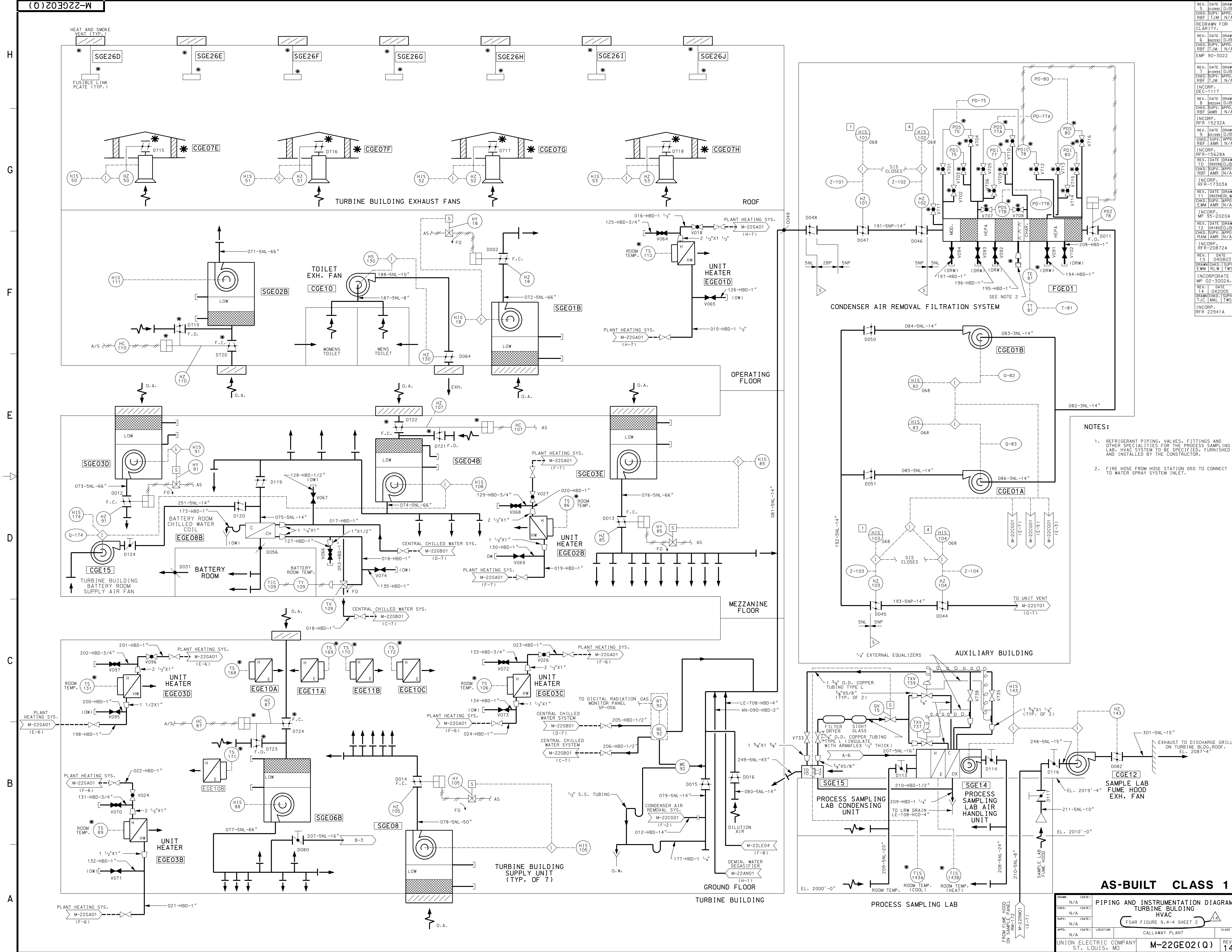
CALLAWAY ENERGY CENTER

UNION ELECTRIC COMPANY

ST. LOUIS, MO

M-22GE01

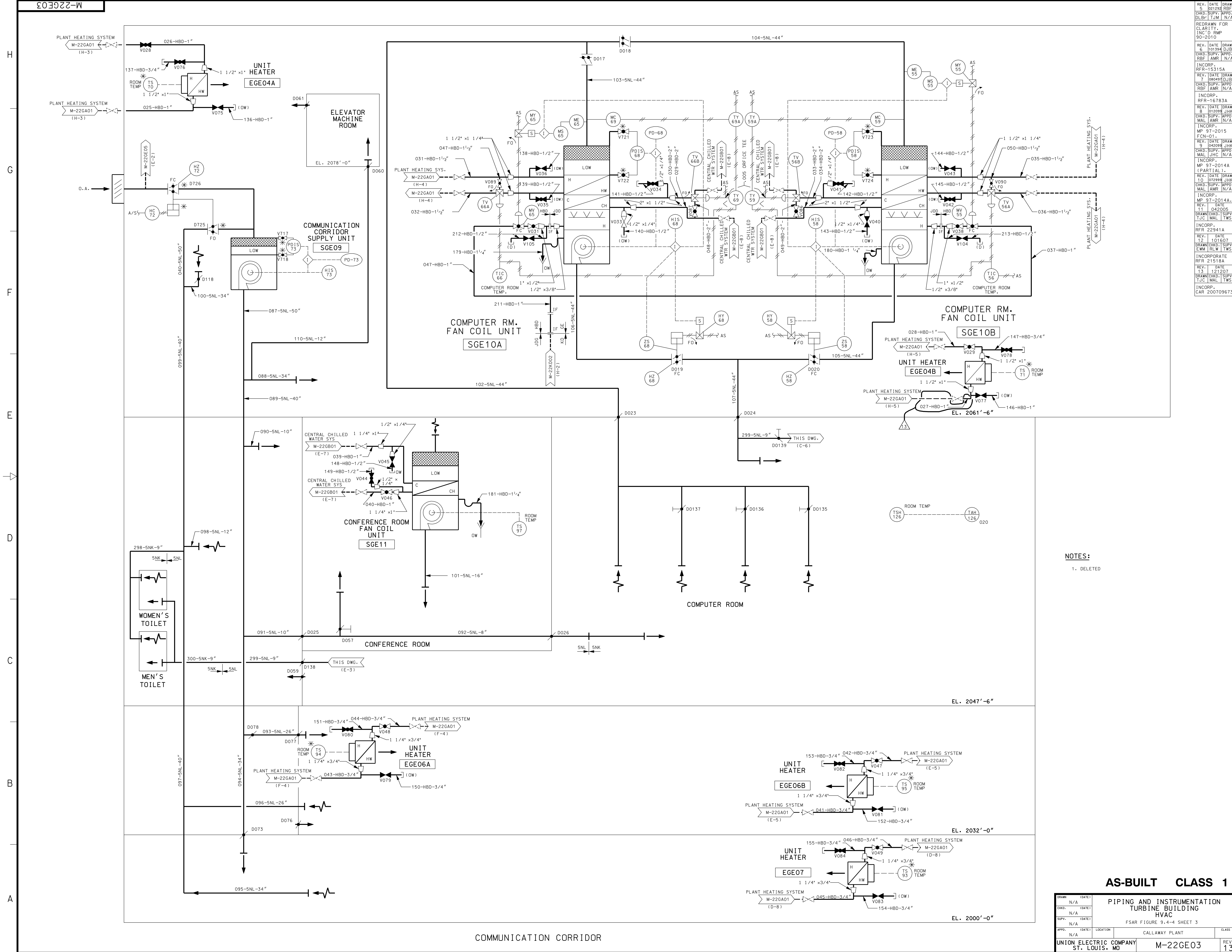
REV. 13



- NOTES:
1. REFRIGERANT PIPING, VALVES, FITTINGS AND OTHER SPECIALTIES FOR THE PROCESS SAMPLING LAB, HVAC SYSTEM TO BE SPECIFIED, FURNISHED AND INSTALLED BY THE CONSTRUCTOR.
 2. FIRE HOSE FROM HOSE STATION 050 TO CONNECT TO WATER SPRAY SYSTEM INLET.

AS-BUILT CLASS 1			
PIPING AND INSTRUMENTATION DIAGRAM			
TURBINE BUILDING HVAC			
FSAR FIGURE 9.4-4 SHEET 2			
UNION ELECTRIC COMPANY	ST. LOUIS, MO	CLASS	REV. 14
M-22GE02(Q)			

REV.	DATE	DRAWN	CHKD.	SRV.	APPD.	RFB	TJM	N/A
1	012992	DJB						
2	010494	DJB						
3	062592	DJB						
4	062592	DJB						
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6	062592	DJB						
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99	062592	DJB						
100	062592	DJB						



NOTES:
1. DELETED

AS-BUILT CLASS 1

PIPING AND INSTRUMENTATION BUILDING HVAC

FSAR FIGURE 9.4-4 SHEET 3

CALLAWAY PLANT

UNION ELECTRIC COMPANY ST. LOUIS, MO

M-22GE03

REV. 13

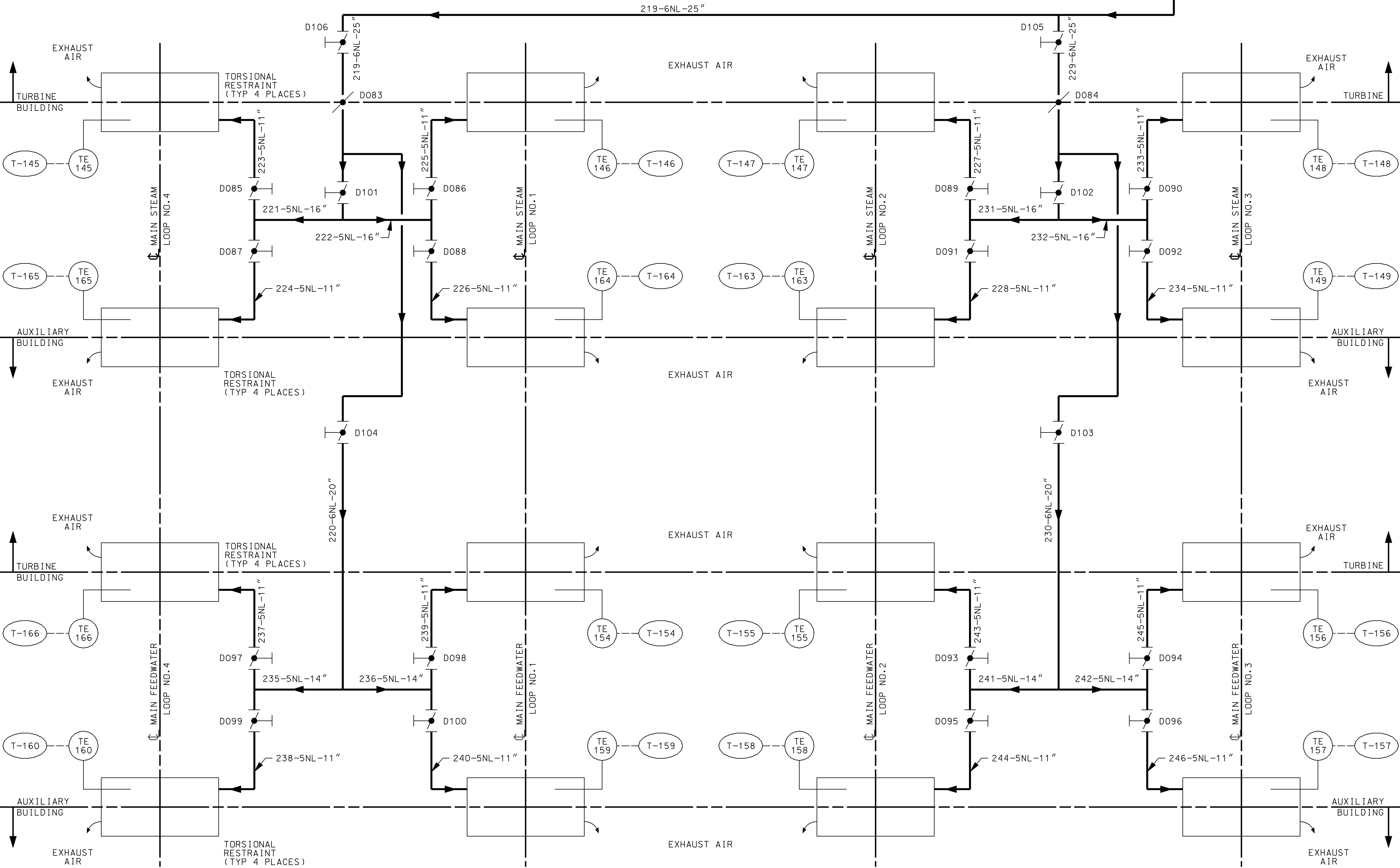
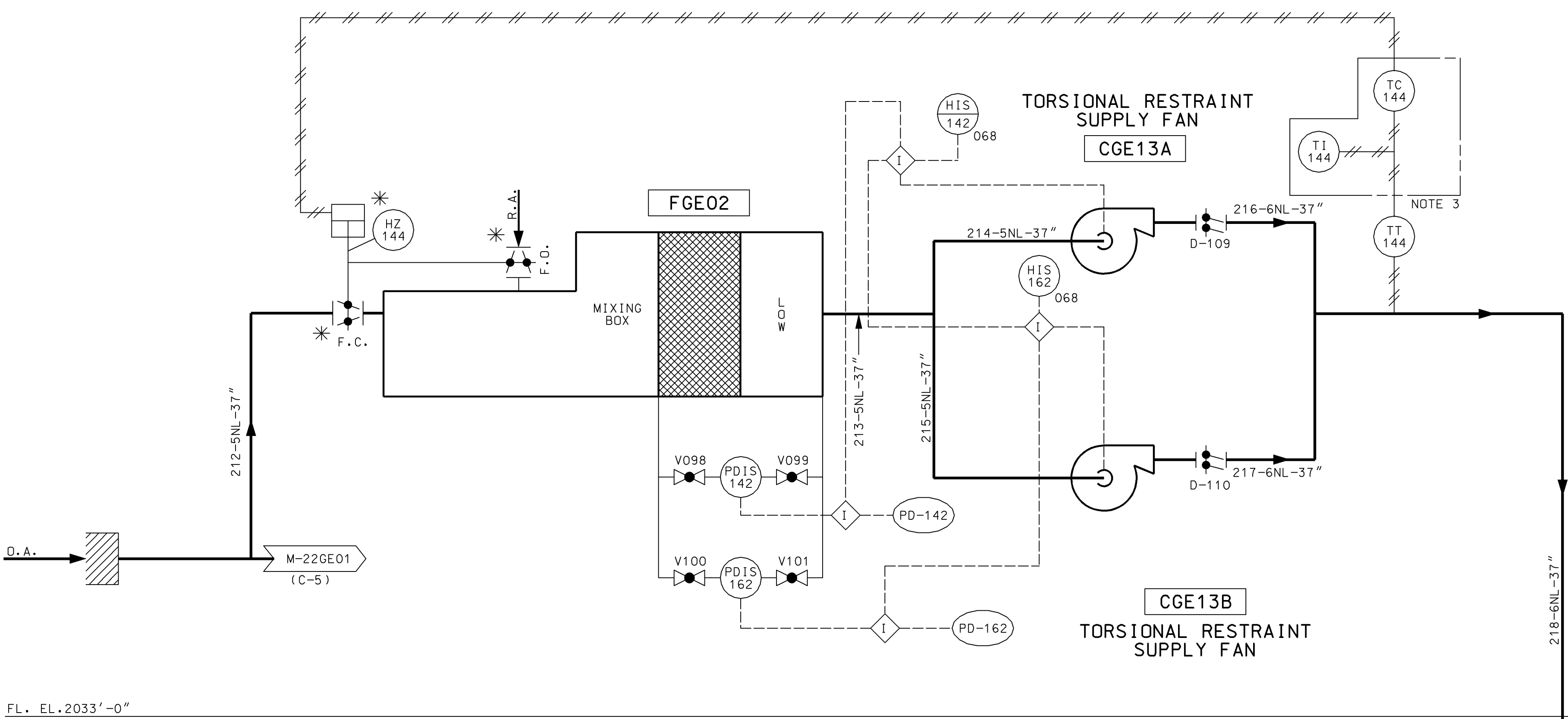
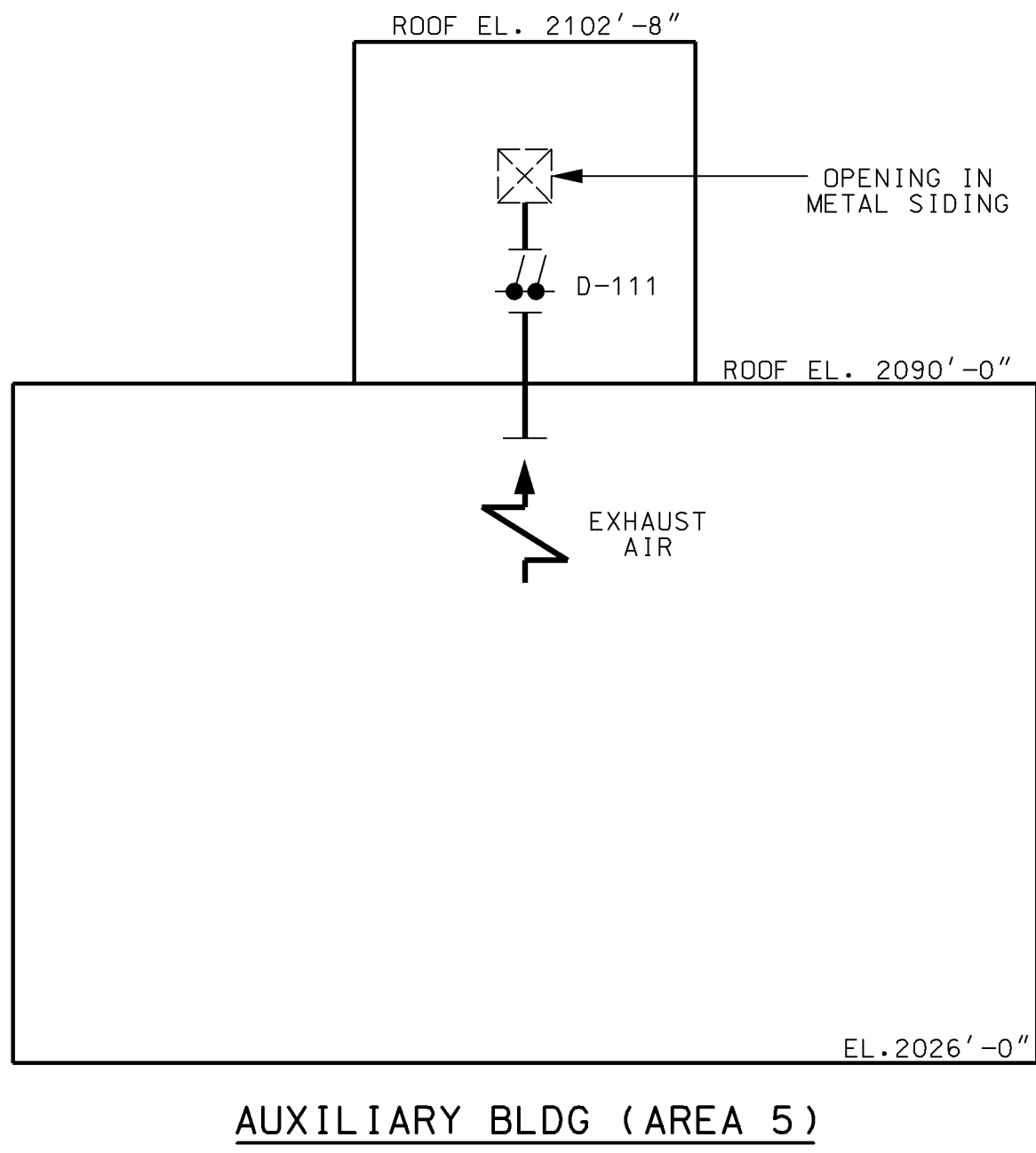
DRWN	N/A	DATE	
CHKD	N/A	DATE	
SUPV	N/A	DATE	
APPR	N/A	DATE	
LOC		LOCATION	
CLASS			

REV.	DATE	DRWN	CHKD	SUPV	APPR	LOC	CLASS
1	02/29/92	DJB					
2	04/29/93	JHK					
3	04/29/93	JHK					
4	04/29/93	JHK					
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100	04/29/93	JHK					

REV.	DATE	DRAWN
1	1/2/99	JHK
CHKD.	SUPV.	APPR.
DJB	TJM	N/A
REDRAWN	FOR	CLARITY.
REV.	DATE	
2	04/20/05	
DRAWN	CHKD.	SUPV.
TJC	MAL	TWS
INCORP.		
REFR	22541A	

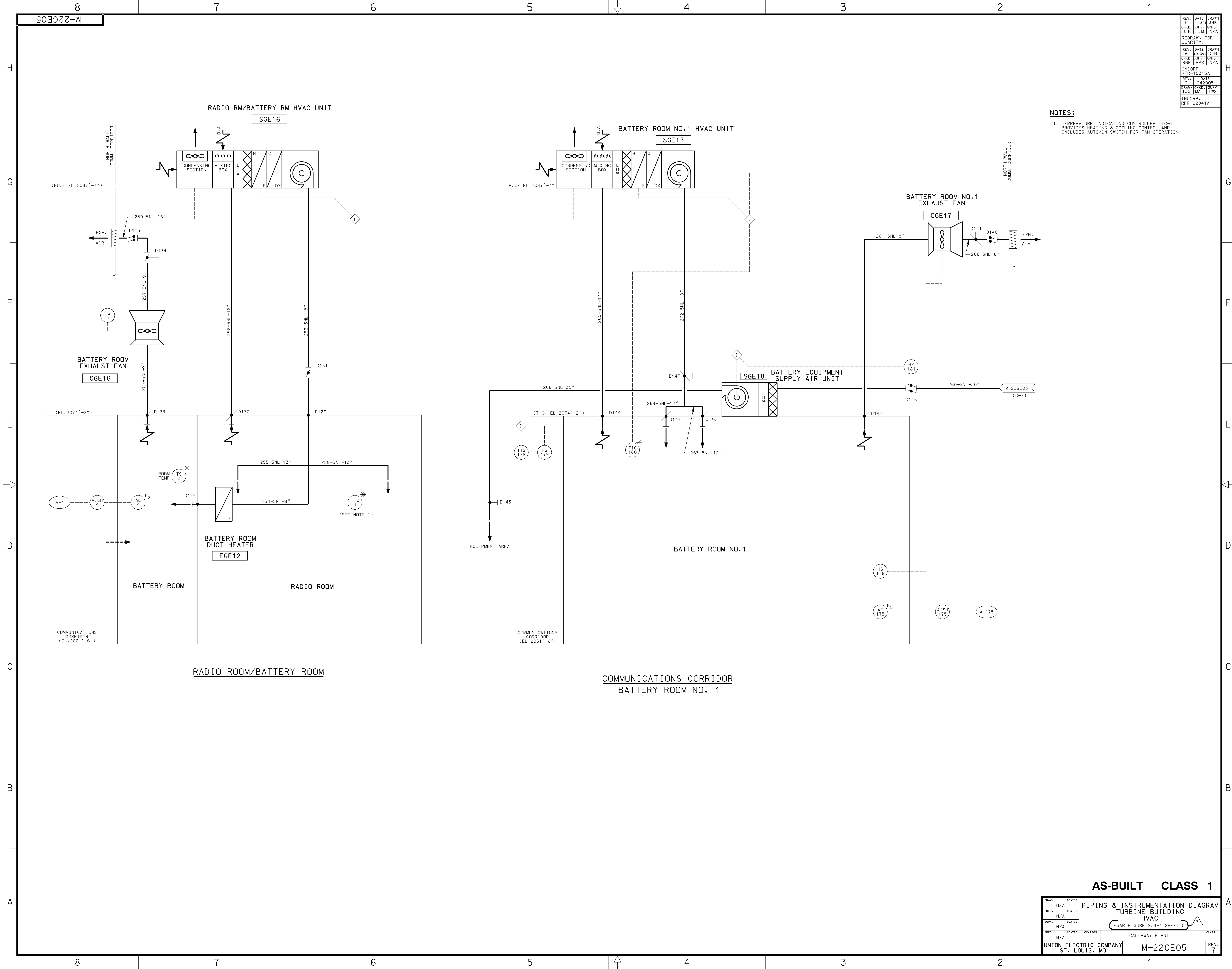
NOTE:

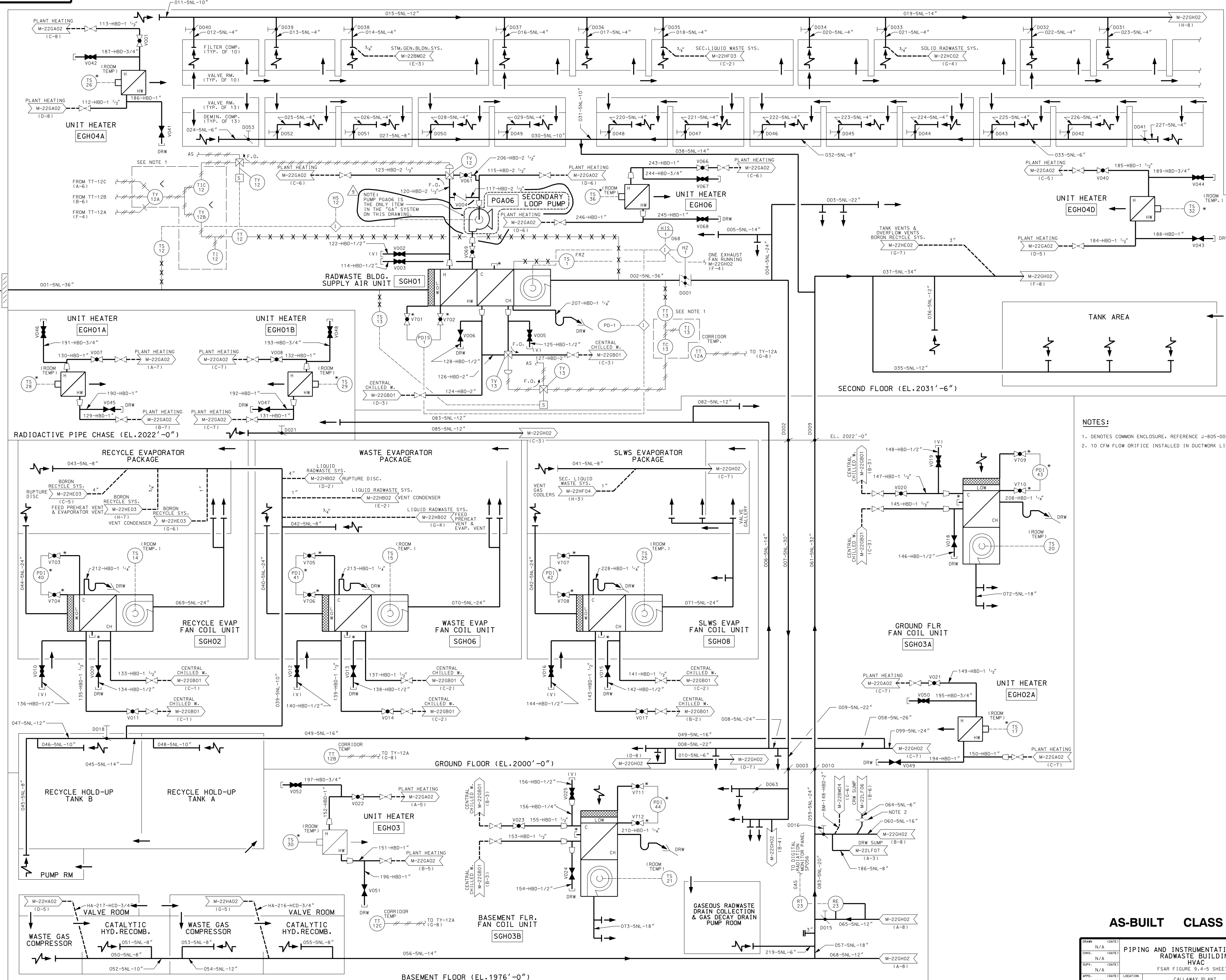
1. ALL TE'S ARE MONITORING CONCRETE TEMPERATURE.
2. DUCTWORK SIZES ARE INDICATED AS EQUIVALENT ROUND.
3. DENOTES COMMON ENCLOSURE REFERENCE J-805-00020.



AS-BUILT CLASS 1

DRWN	N/A	DATE		PIPING & INSTRUMENTATION DIAGRAM	
CHKD.	N/A	DATE		TURBINE BUILDING	
SUPV.	N/A	DATE		HVAC	
APPR.	N/A	DATE		FSAR FIGURE 9.4-4 SHEET 4	
LOCATION	CALLAWAY PLANT		CLASS		
UNION ELECTRIC COMPANY			M-22GE04		REV. 2
ST. LOUIS, MO					

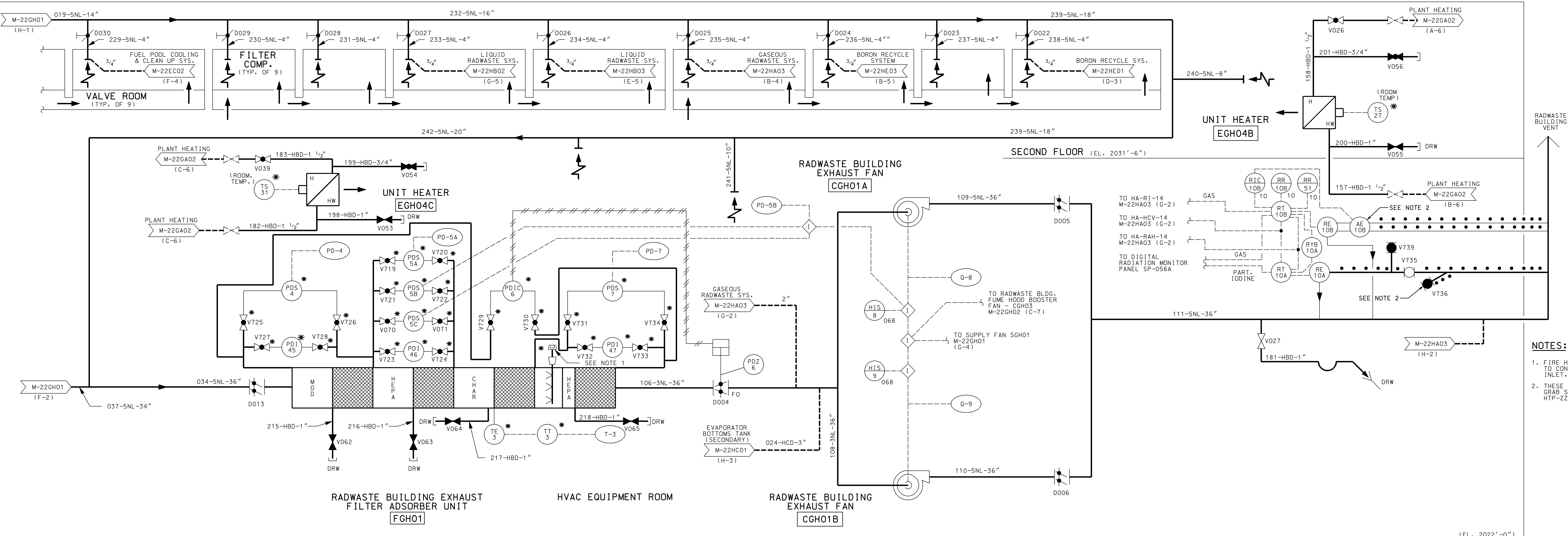




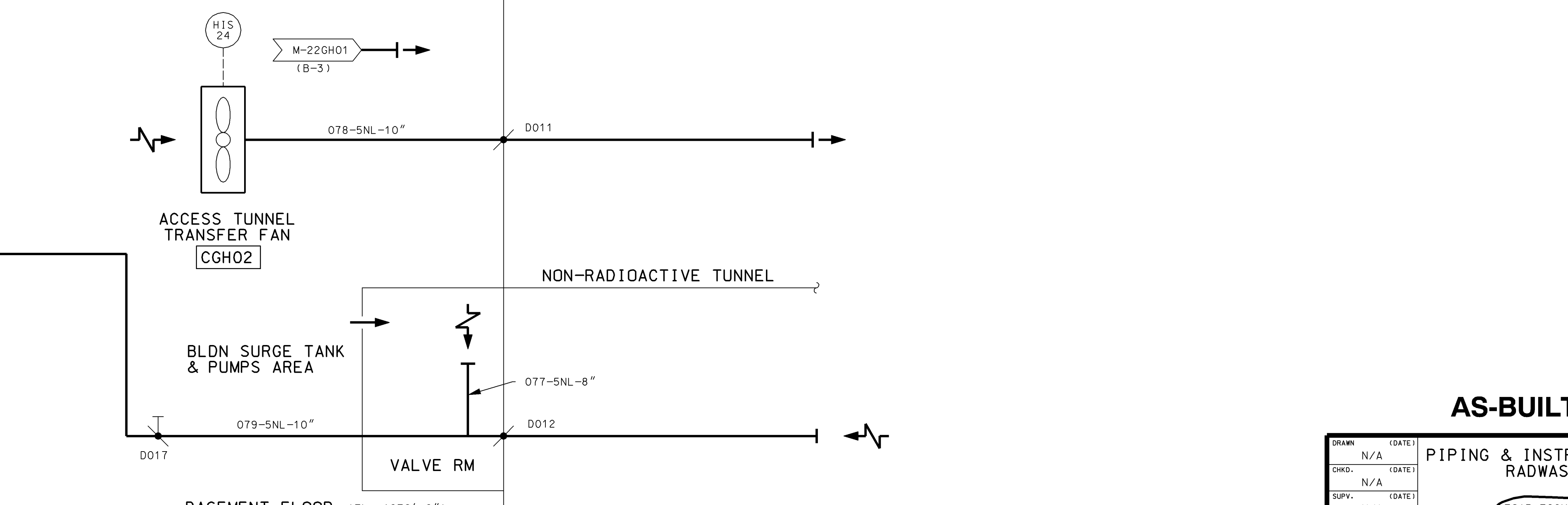
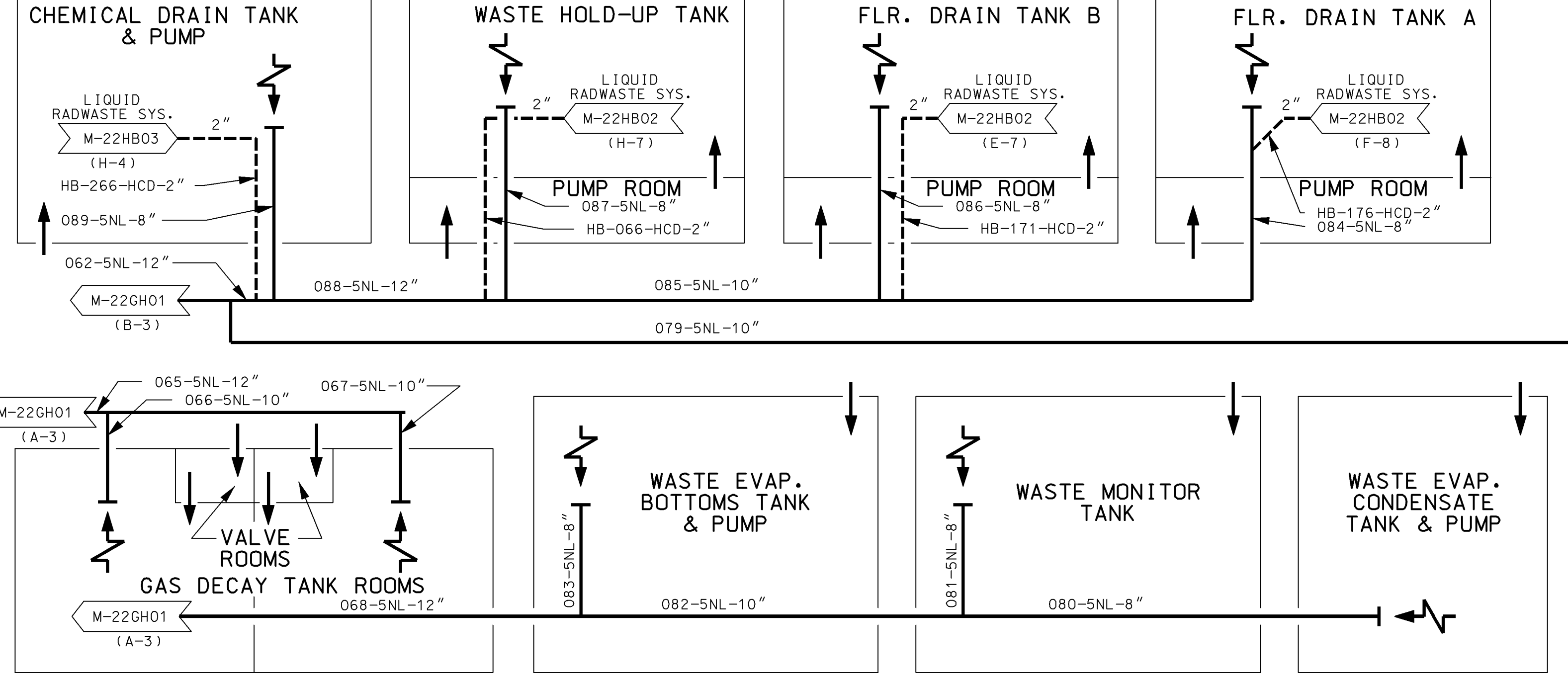
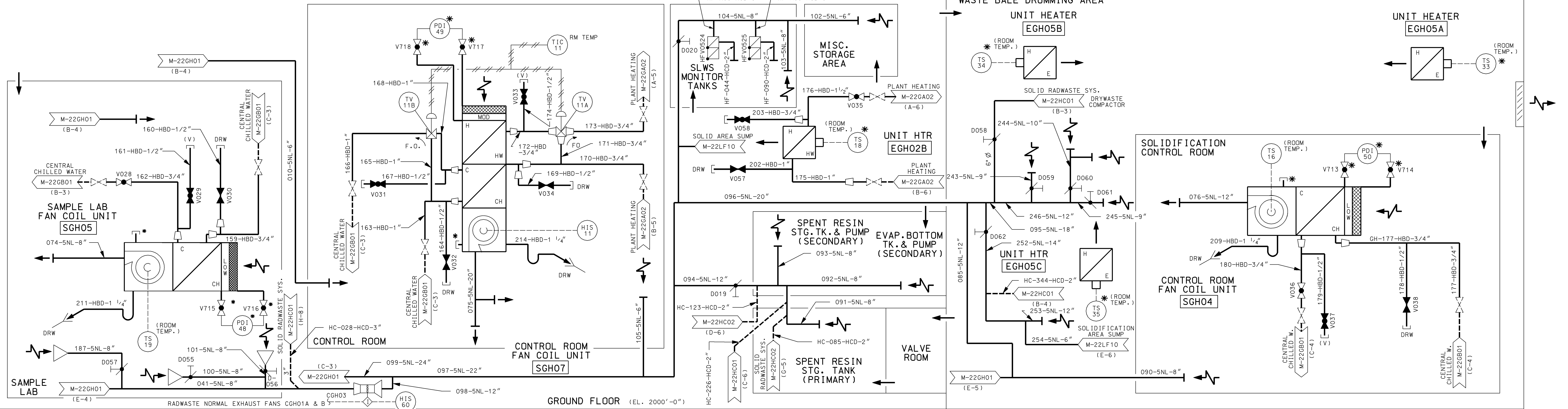
NOTES:
1. DENOTES COMMON ENCLOSURE, REFERENCE J-805-00020.
2. 10 CFM FLOW ORIFICE INSTALLED IN DUCTWORK LINE OFF PUMP.

REV.	DATE	DRAWN	CHKD.	DATE	REV.	DATE	DRAWN	CHKD.	DATE
1	04/20/05	04/20/05	04/20/05	04/20/05	2	04/20/05	04/20/05	04/20/05	04/20/05
3	04/20/05	04/20/05	04/20/05	04/20/05	4	04/20/05	04/20/05	04/20/05	04/20/05
5	04/20/05	04/20/05	04/20/05	04/20/05	6	04/20/05	04/20/05	04/20/05	04/20/05
7	04/20/05	04/20/05	04/20/05	04/20/05	8	04/20/05	04/20/05	04/20/05	04/20/05
9	04/20/05	04/20/05	04/20/05	04/20/05	10	04/20/05	04/20/05	04/20/05	04/20/05
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13	04/20/05	04/20/05	04/20/05	04/20/05	14	04/20/05	04/20/05	04/20/05	04/20/05
15	04/20/05	04/20/05	04/20/05	04/20/05	16	04/20/05	04/20/05	04/20/05	04/20/05
17	04/20/05	04/20/05	04/20/05	04/20/05	18	04/20/05	04/20/05	04/20/05	04/20/05
19	04/20/05	04/20/05	04/20/05	04/20/05	20	04/20/05	04/20/05	04/20/05	04/20/05
21	04/20/05	04/20/05	04/20/05	04/20/05	22	04/20/05	04/20/05	04/20/05	04/20/05
23	04/20/05	04/20/05	04/20/05	04/20/05	24	04/20/05	04/20/05	04/20/05	04/20/05
25	04/20/05	04/20/05	04/20/05	04/20/05	26	04/20/05	04/20/05	04/20/05	04/20/05
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43	04/20/05	04/20/05	04/20/05	04/20/05	44	04/20/05	04/20/05	04/20/05	04/20/05
45	04/20/05	04/20/05	04/20/05	04/20/05	46	04/20/05	04/20/05	04/20/05	04/20/05
47	04/20/05	04/20/05	04/20/05	04/20/05	48	04/20/05	04/20/05	04/20/05	04/20/05
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99	04/20/05	04/20/05	04/20/05	04/20/05	100	04/20/05	04/20/05	04/20/05	04/20/05

AS-BUILT CLASS 1		PIPING AND INSTRUMENTATION DIAGRAM	
RADWASTE BUILDING		HVAC	
FSAR FIGURE 9.4-5 SHEET 1		CLASS	
UNION ELECTRIC COMPANY		M-22GH01	
ST. LOUIS, MO		REV. 9	



NOTES:
1. FIRE HOSE FROM HOSE STATION 101 TO CONNECT TO WATER SPRAY SYSTEM INLET, WHEN REQUIRED.
2. THESE LOCATIONS MAY BE USED AS GRAB SAMPLE POINTS SEE HTP-ZZ-03006.



AS-BUILT CLASS 1

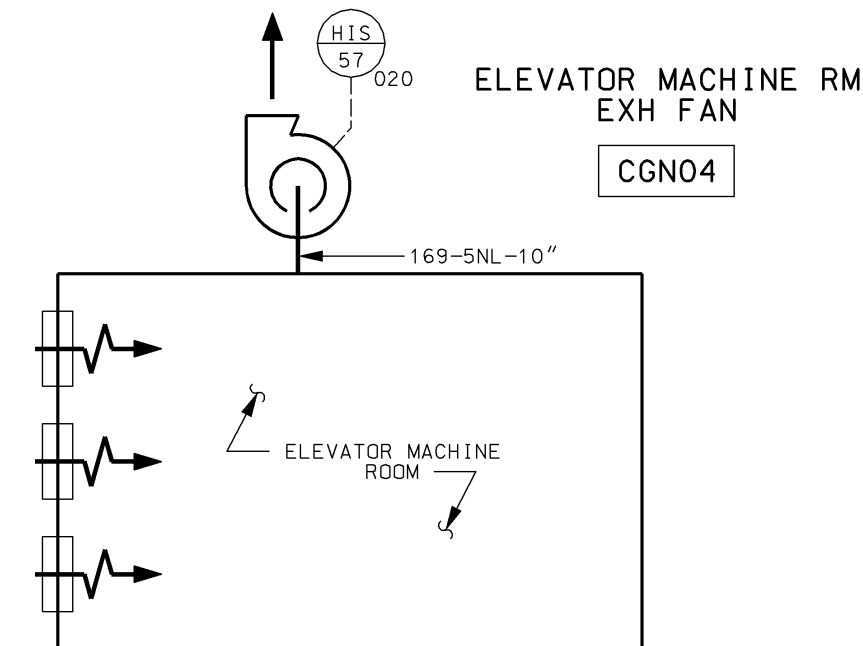
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01/10/04	4	011004	JHK	EW	CALLAWAY PLANT	REV. 12
01/10/04	5	011004	JHK	EW	CALLAWAY PLANT	REV. 12
01/10/04	6	011004	JHK	EW	CALLAWAY PLANT	REV. 12
01/10/04	7	011004	JHK	EW	CALLAWAY PLANT	REV. 12
01/10/04	8	011004	JHK	EW	CALLAWAY PLANT	REV. 12
01/10/04	9	011004	JHK	EW	CALLAWAY PLANT	REV. 12
01/10/04	10	011004	JHK	EW	CALLAWAY PLANT	REV. 12
01/10/04	11	011004	JHK	EW	CALLAWAY PLANT	REV. 12
01/10/04	12	011004	JHK	EW	CALLAWAY PLANT	REV. 12
01/10/04	13	011004	JHK	EW	CALLAWAY PLANT	REV. 12
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01/10/04	15	011004	JHK	EW	CALLAWAY PLANT	REV. 12
01/10/04	16	011004	JHK	EW	CALLAWAY PLANT	REV. 12
01/10/04	17	011004	JHK	EW	CALLAWAY PLANT	REV. 12
01/10/04	18	011004	JHK	EW	CALLAWAY PLANT	REV. 12
01/10/04	19	011004	JHK	EW	CALLAWAY PLANT	REV. 12
01/10/04	20	011004	JHK	EW	CALLAWAY PLANT	REV. 12

UNION ELECTRIC COMPANY
ST. LOUIS, MO

M-22GH02

8	RECEIVED	DATE	DRM
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97	RECEIVED	DATE	DRM
98	RECEIVED	DATE	DRM
99	RECEIVED	DATE	DRM
100	RECEIVED	DATE	DRM

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CHD.	SUPV.	APPD.
DJB	TJM	N/A
REDRAWN FOR		
CLARITY.		
REV.	DATE	DRAWN
3	060393	DJB
CHD.	SUPV.	APPD.
RBF	TJM	N/A
INCORP.	DEC	1005
REV.	DATE	DRAWN
4	041198	DJB
CHD.	SUPV.	APPD.
RBF	AMR	N/A
INCORP.	CMP	33-1029
REV.	DATE	DRAWN
5	042598	DJB
CHD.	SUPV.	APPD.
RBF	AMR	N/A
INCORP.	CMP	34-2003
REV.	DATE	DRAWN
6	042005	DJB
CHD.	SUPV.	APPD.
TJC	MAL	TWS
INCORP.	RFR	22941A
REV.	DATE	DRAWN
7	02814	DJB
CHD.	SUPV.	APPD.
RLW	MAL	DWE
INCORPORATE	WP	10-0001
FCN	01	



NOTE:
1. DUCTWORK SIZE ARE INDICATED AS EQUIVALENT ROUND.
2. THESE DAMPERS ARE USED TO ISOLATE THE PLENUM FOR FAN REMOVAL.

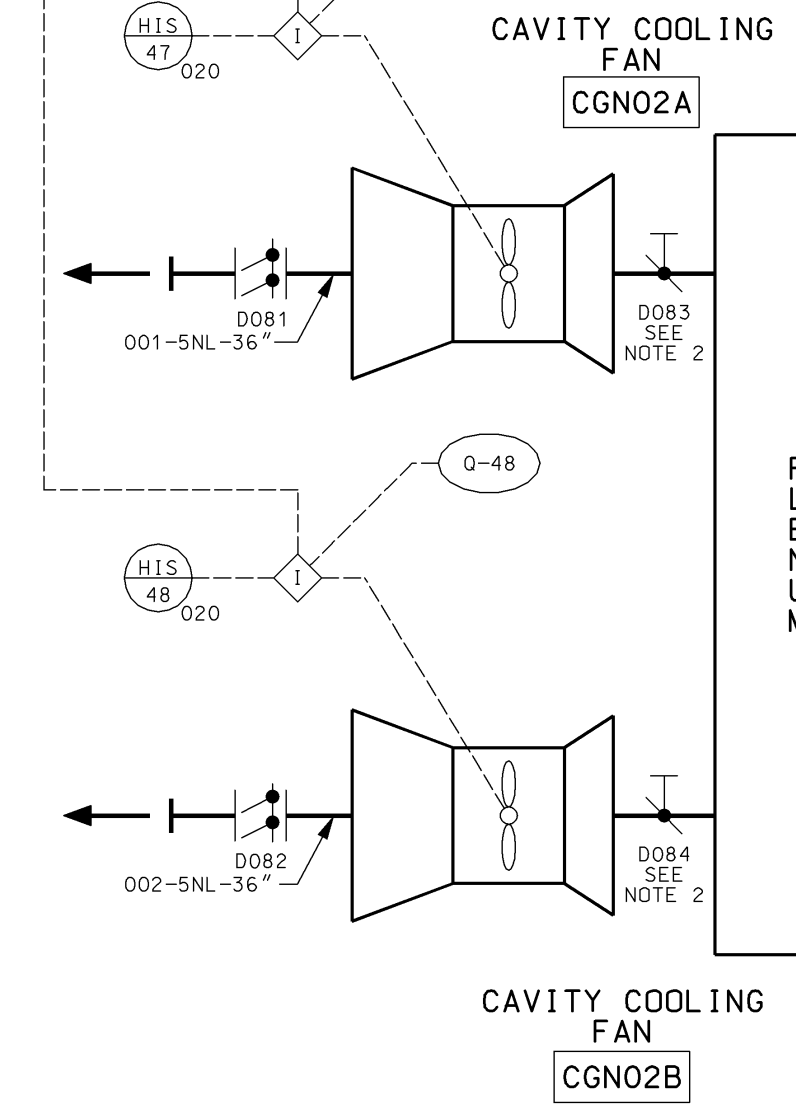
AS-BUILT CLASS 1

DATE	10/01/01
CHD.	N/A
SUPV.	N/A
APPD.	N/A
LOCATION	CALLAWAY ENERGY CENTER
ST. LOUIS, MO	
REV.	7

PIPING & INSTRUMENTATION DIAGRAM
CONTAINMENT COOLING SYSTEM
FSAR FIGURE 9.4-6 SHEET 2

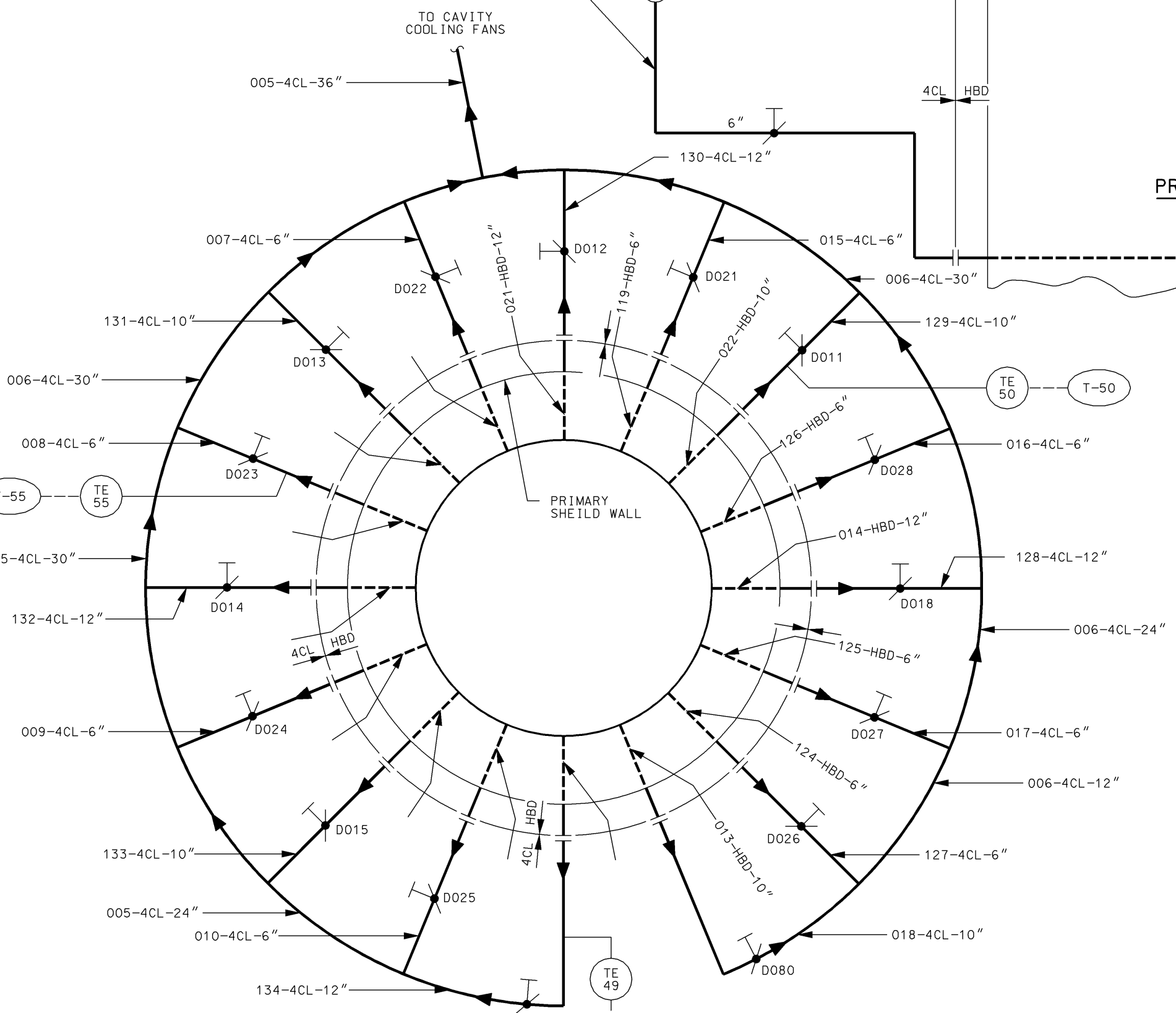
M-22GN02

ZON02Z-W

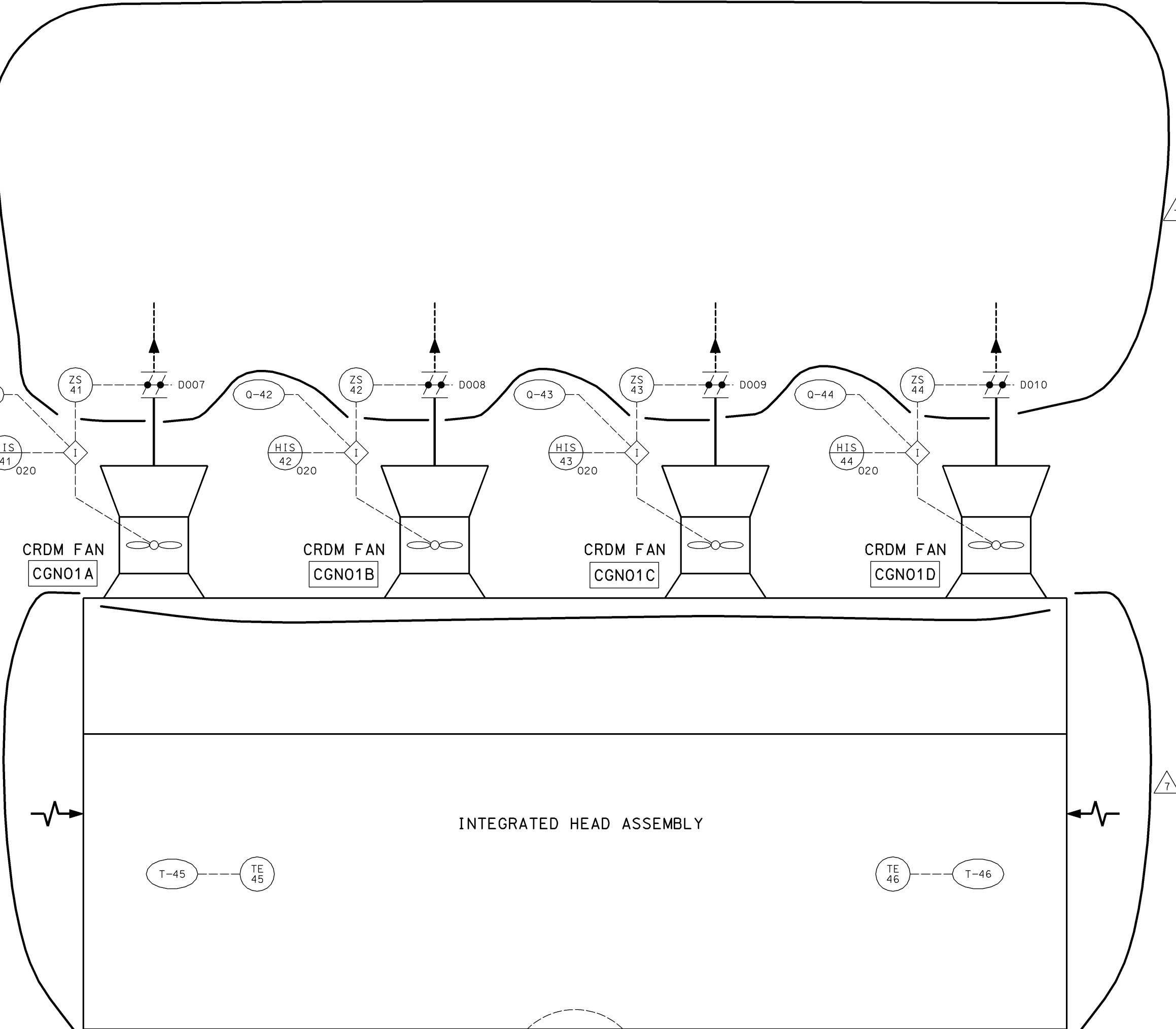


CAVITY COOLING SYSTEM

FOR DUCTWORK AND PIPING
CLASSIFICATION AND ARRANGEMENT
REFER TO DETAIL A BELOW



DETAIL A
(PLAN VIEW)



PRIMARY SHIELD WALL

REACTOR VESSEL

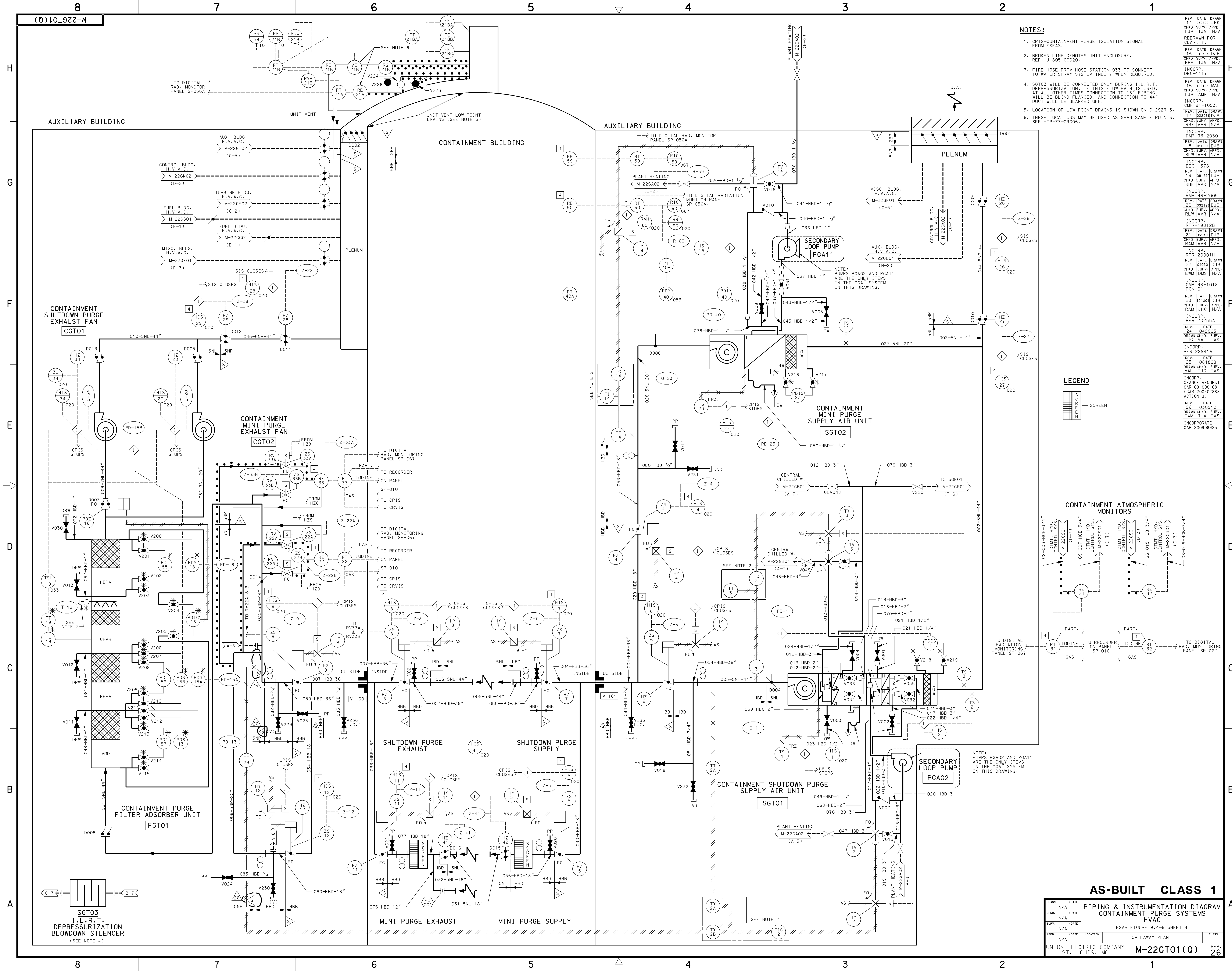
TYPICAL AT EACH UNSUPPORTED NOZZLE

TYPICAL AT EACH RV SUPPORT

TYPICAL AT EACH DETECTOR WELL

FOR DUCTWORK AND PIPING
CLASSIFICATION AND ARRANGEMENT
REFER TO DETAIL A BELOW

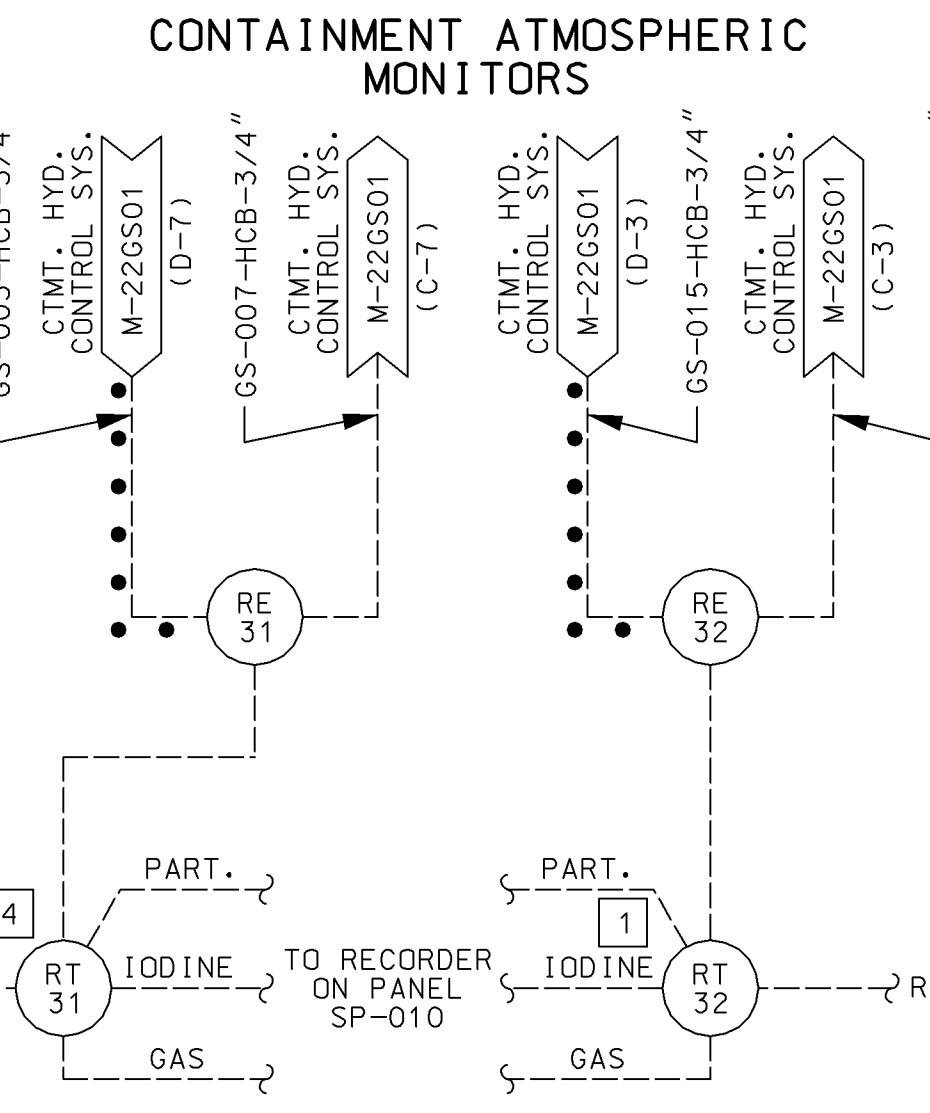
Figure 9.4-6 Sheet 3 Deleted



- NOTES:**
1. CPIS-CONTAINMENT PURGE ISOLATION SIGNAL FROM ESPAS.
 2. BROKEN LINE DENOTES UNIT ENCLOSURE. REF. J-805-00020.
 3. FIRE HOSE FROM HOSE STATION 033 TO CONNECT TO WATER SPRAY SYSTEM INLET, WHEN REQUIRED.
 4. SGT03 WILL BE CONNECTED ONLY DURING I.L.R.T. DEPRESSURIZATION. IF THIS FLOW PATH IS USED, AT ALL OTHER TIMES CONNECTION TO 18" PIPING WILL BE BLIND FLANGED, AND CONNECTION TO 44" DUCT WILL BE BLANKED OFF.
 5. LOCATION OF LOW POINT DRAINS IS SHOWN ON C-252915.
 6. THESE LOCATIONS MAY BE USED AS GRAB SAMPLE POINTS. SEE HTP-ZZ-03006.

LEGEND

SCREEN



AS-BUILT CLASS 1

PIPING & INSTRUMENTATION DIAGRAM

CONTAINMENT PURGE SYSTEMS

HVAC

FSAR FIGURE 9.4-6 SHEET 4

CALLAWAY PLANT

CLASS

UNION ELECTRIC COMPANY

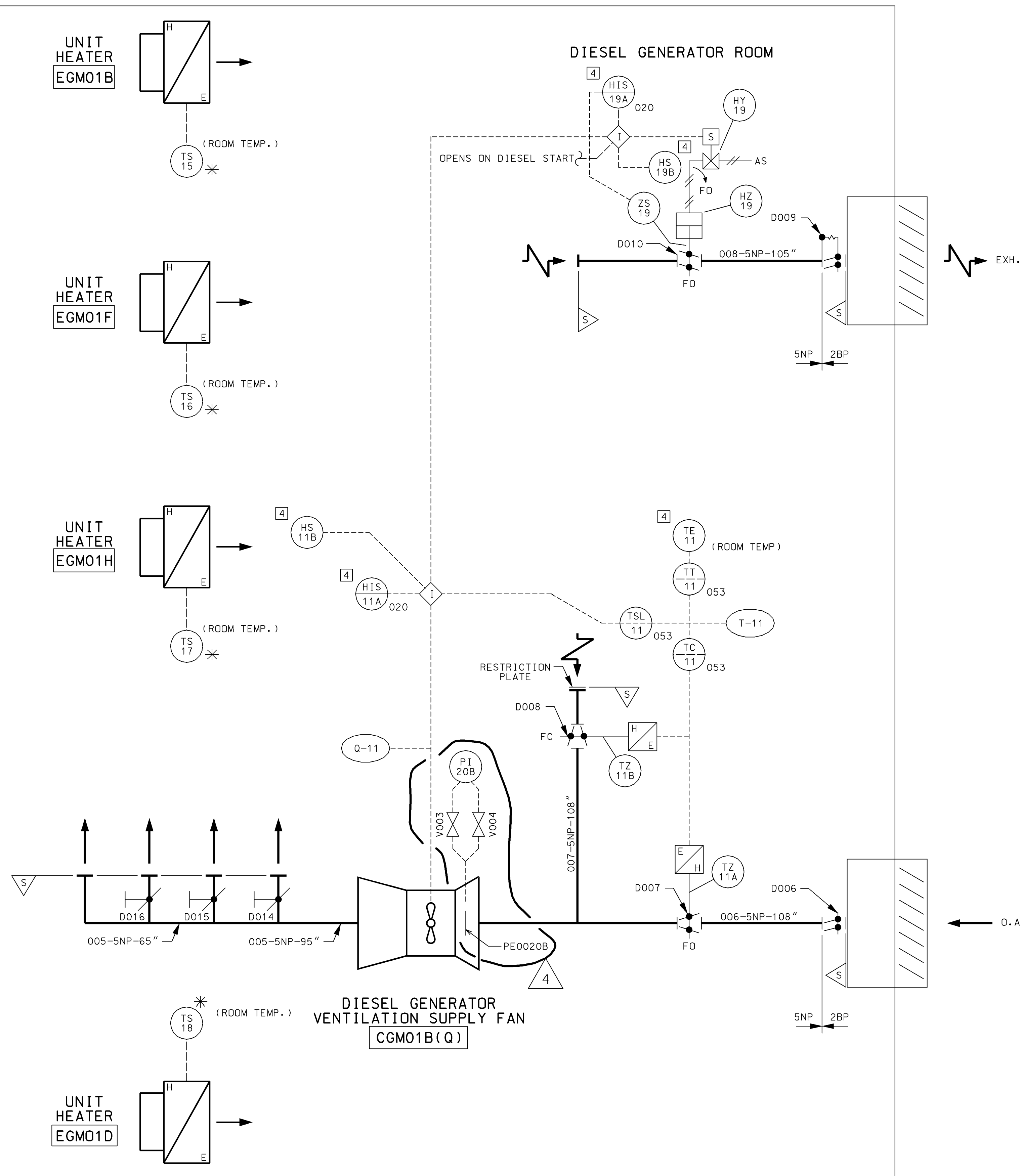
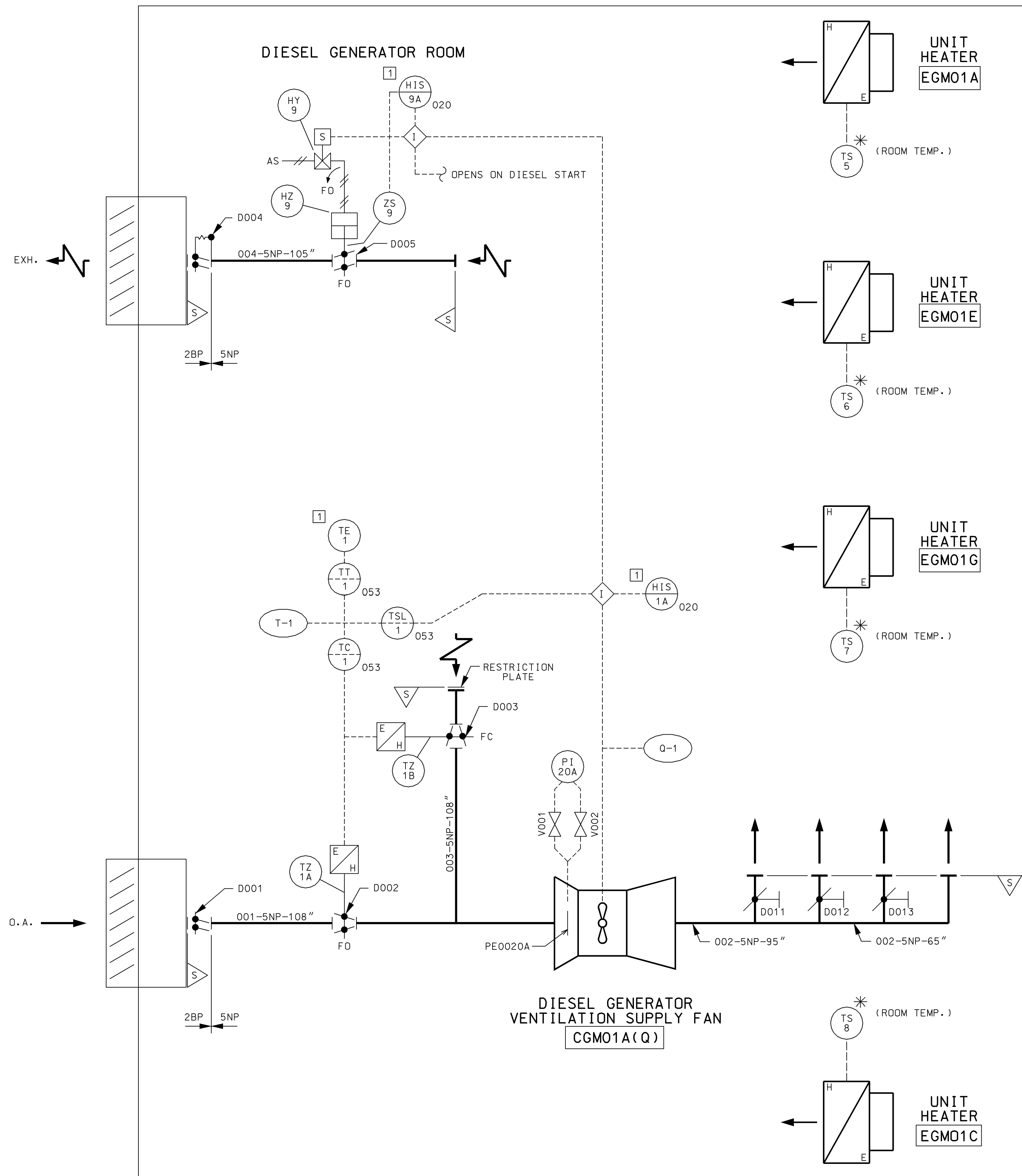
ST. LOUIS, MO

M-22GT01(Q)

REV. 26

H
G
F
E
D
C
B
A

M-22GM1(Q)



CLASS 1 AS-BUILT

DRWN	N/A	DATE	1/1/2011
CHKD	N/A	DATE	1/1/2011
SUPV	N/A	DATE	1/1/2011
APPD	N/A	DATE	1/1/2011
LOCATION	CALLAWAY ENERGY CENTER		CLASS
UNION ELECTRIC COMPANY		ST. LOUIS, MO	REV. 4

PIPING & INSTRUMENTATION DIAGRAM
DIESEL GENERATOR BUILDING
HVAC

FSAR FIGURE 9.4-7

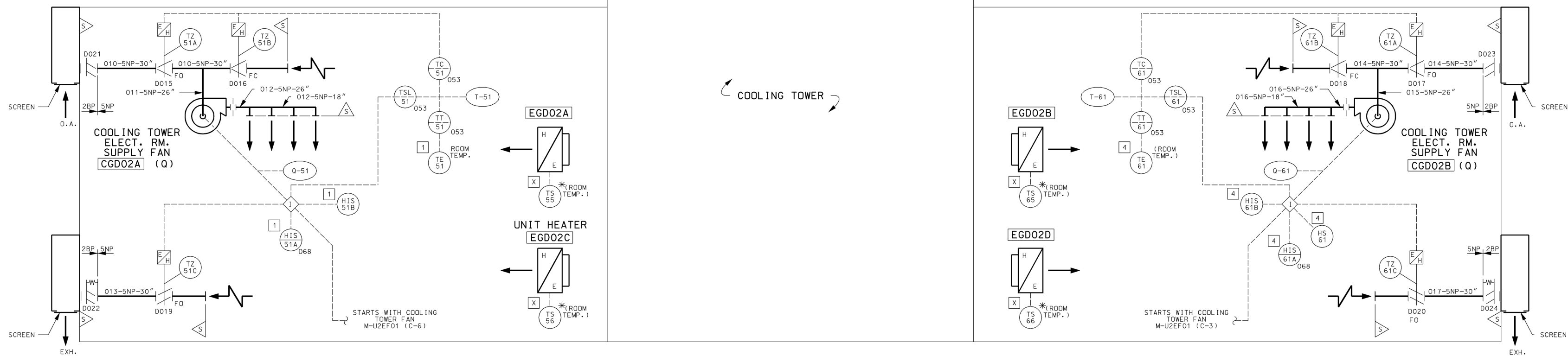
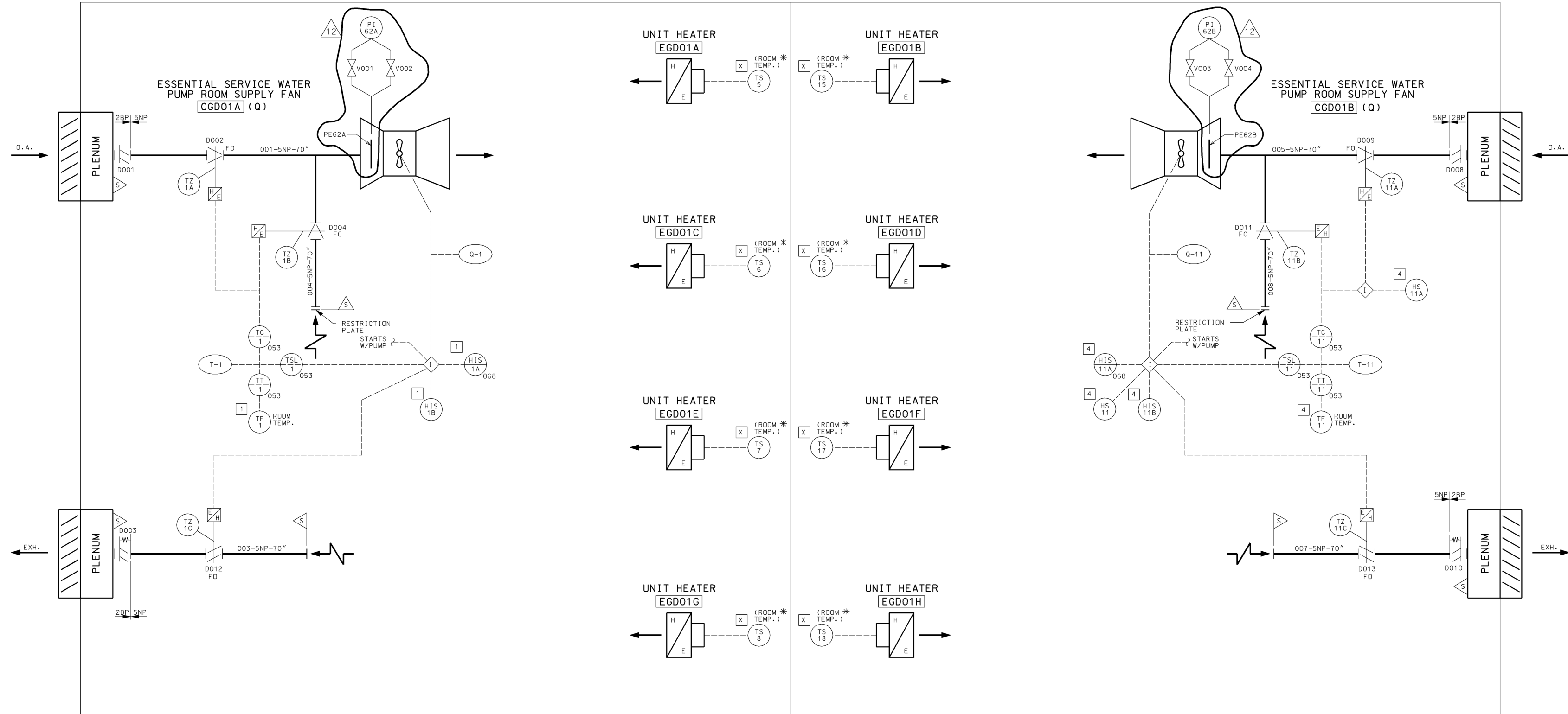
M-22GM1(Q)

REV. 4

REV.	DATE	DRWN
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2	04/20/05	TJM
3	04/22/15	TJM
4	11/14/16	LMP
5	03/02/17	LMP
6	03/02/17	LMP

Figure 9.4-8 (Sheet 1) Deleted

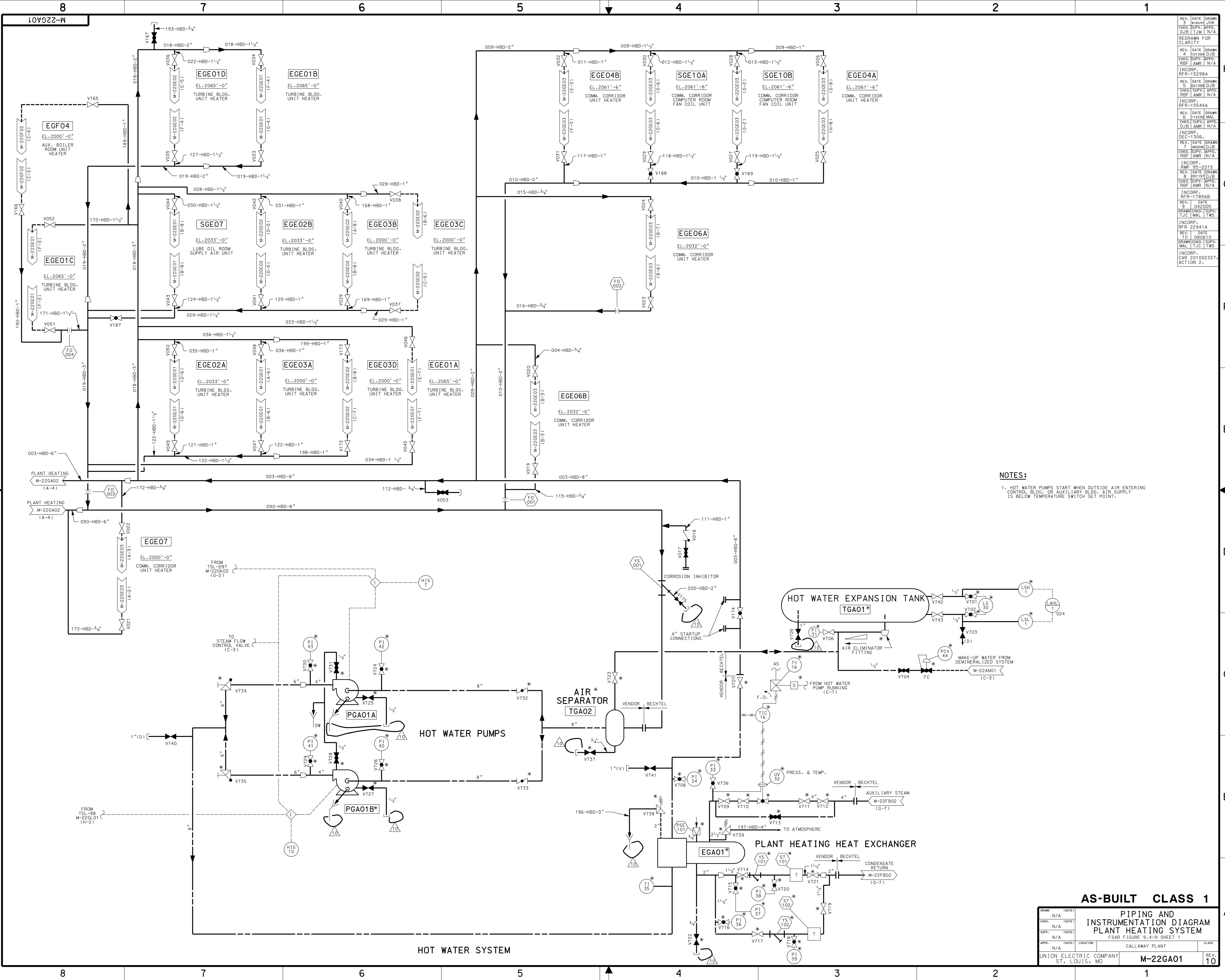
ESSENTIAL SERVICE WATER
PUMPHOUSE H.V.A.C.



ULTIMATE HEAT SINK ELECT. RM.
H.V.A.C.

AS-BUILT CLASS 1

DRWN	N/A	DATE		PIPING AND INSTRUMENTATION DIAGRAM
CHKD	N/A	DATE		ESSENTIAL SERVICE WATER PUMPHOUSE
SUPV	N/A	DATE		& ULTIMATE HEAT SINK ELEC. RM.
APPD	N/A	DATE	LOCATION	FSAR FIGURE 9.4-8 SHEET 2
UNION ELECTRIC COMPANY				CALLAWAY ENERGY CENTER
ST. LOUIS, MO				M-U2GD01 (Q)
				REV. 12



AS-BUILT CLASS 1				
PIPING AND INSTRUMENTATION DIAGRAM				
PLANT HEATING SYSTEM				
FSAR FIGURE 9.4-9 SHEET 1				
DRWN	N/A	(DATE)		
CHKD	N/A	(DATE)		
SUPV	N/A	(DATE)		
APPD	N/A	(DATE)	LOCATION	CLASS
UNION ELECTRIC COMPANY			CALLAWAY PLANT	
ST. LOUIS, MO			M-22GA01	REV. 10



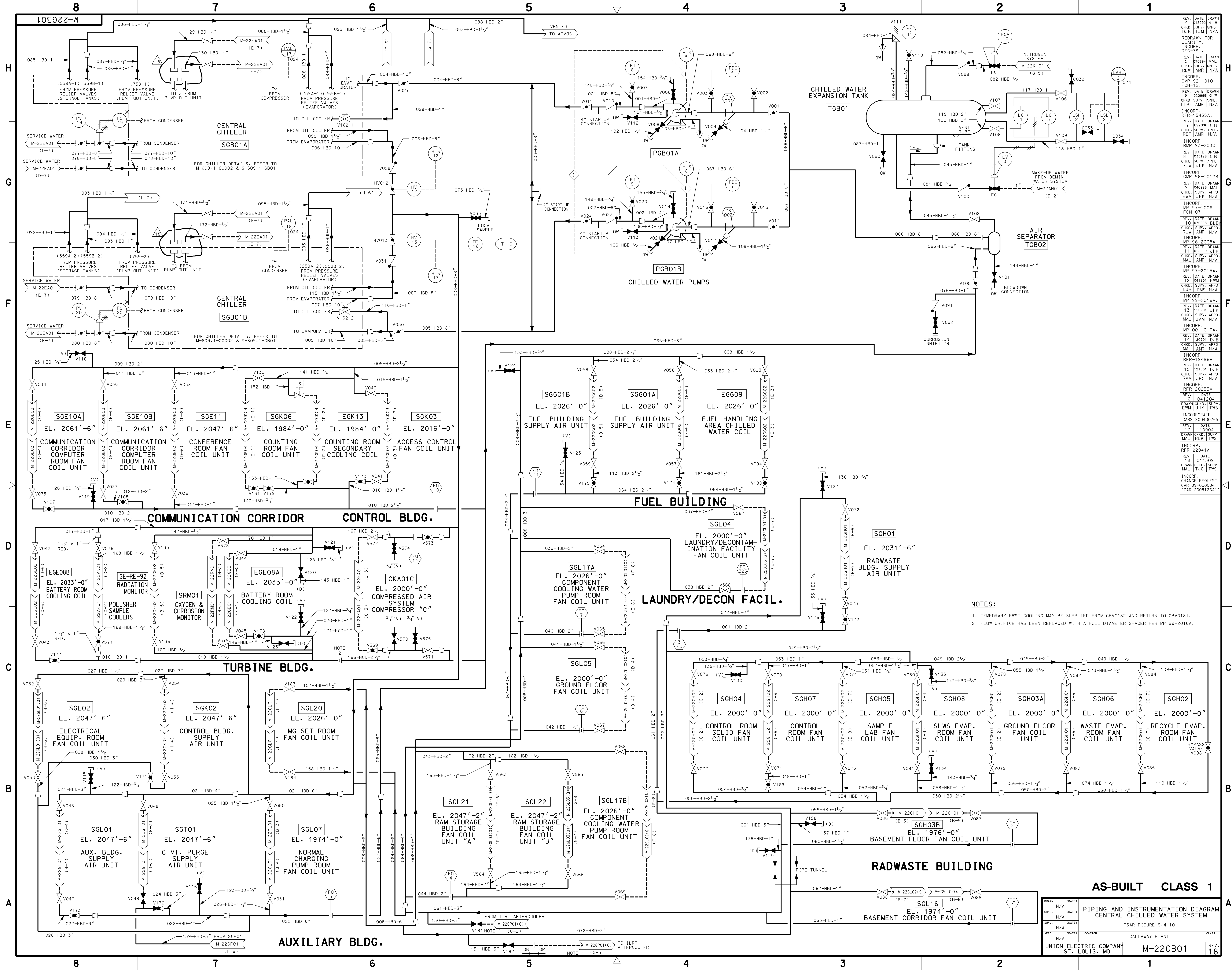
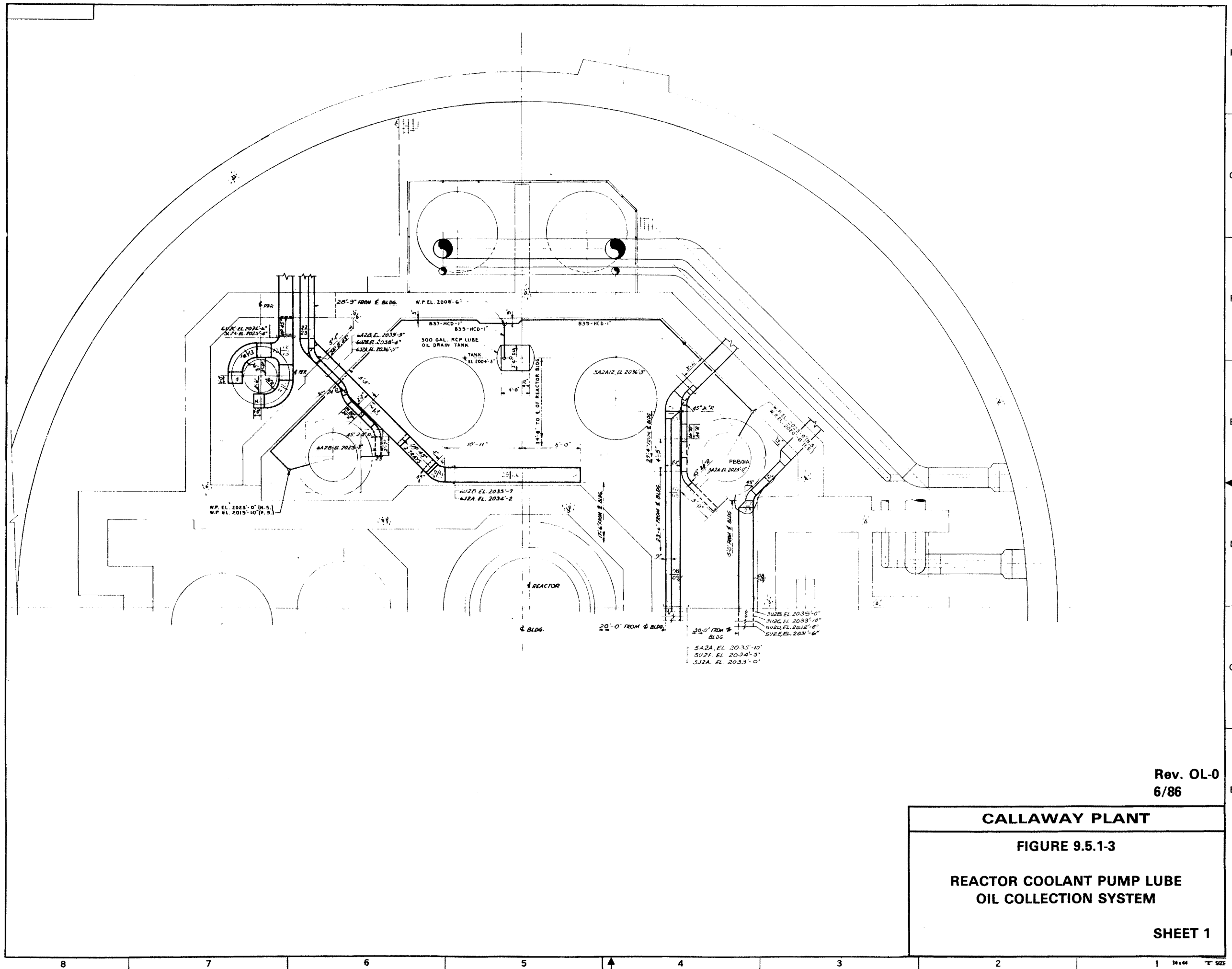


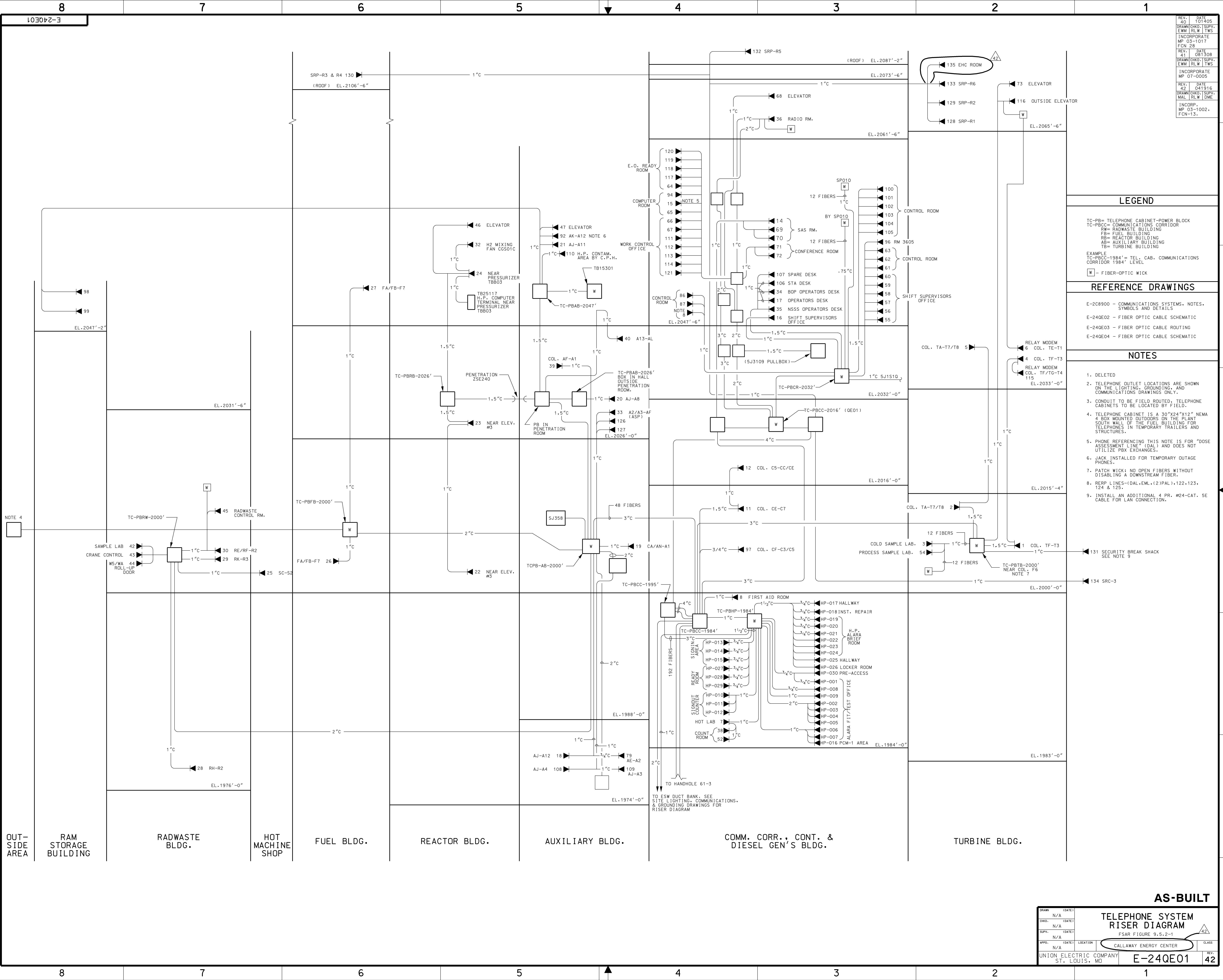
Figure 9.5.1-1 has been deleted.

Figure 9.5.1-2 has been deleted.



Rev. OL-0
6/86

CALLAWAY PLANT
FIGURE 9.5.1-3
REACTOR COOLANT PUMP LUBE OIL COLLECTION SYSTEM
SHEET 1



REV.	DATE	BY	CHKD.	DATE	BY	CHKD.	DATE	BY	CHKD.	DATE	BY
REV. 40	03/05										
INCORPORATE											
MP 03-1017											
FCN 28											
REV. 41	08/308										
INCORPORATE											
MP 07-0005											
REV. 42	04/1916										
INCORPORATE											
MP 03-1002											
FCN-13											

LEGEND

TC-PB= TELEPHONE CABINET-POWER BLOCK
TC-PBCC= COMMUNICATIONS CORRIDOR
PB= RADWASTE BUILDING
FB= FUEL BUILDING
RB= REACTOR BUILDING
AB= AUXILIARY BUILDING
TB= TURBINE BUILDING

EXAMPLE
TC-PBCC-1984'= TEL. CAB. COMMUNICATIONS CORRIDOR 1984' LEVEL

W- FIBER-OPTIC WICK


REFERENCE DRAWINGS

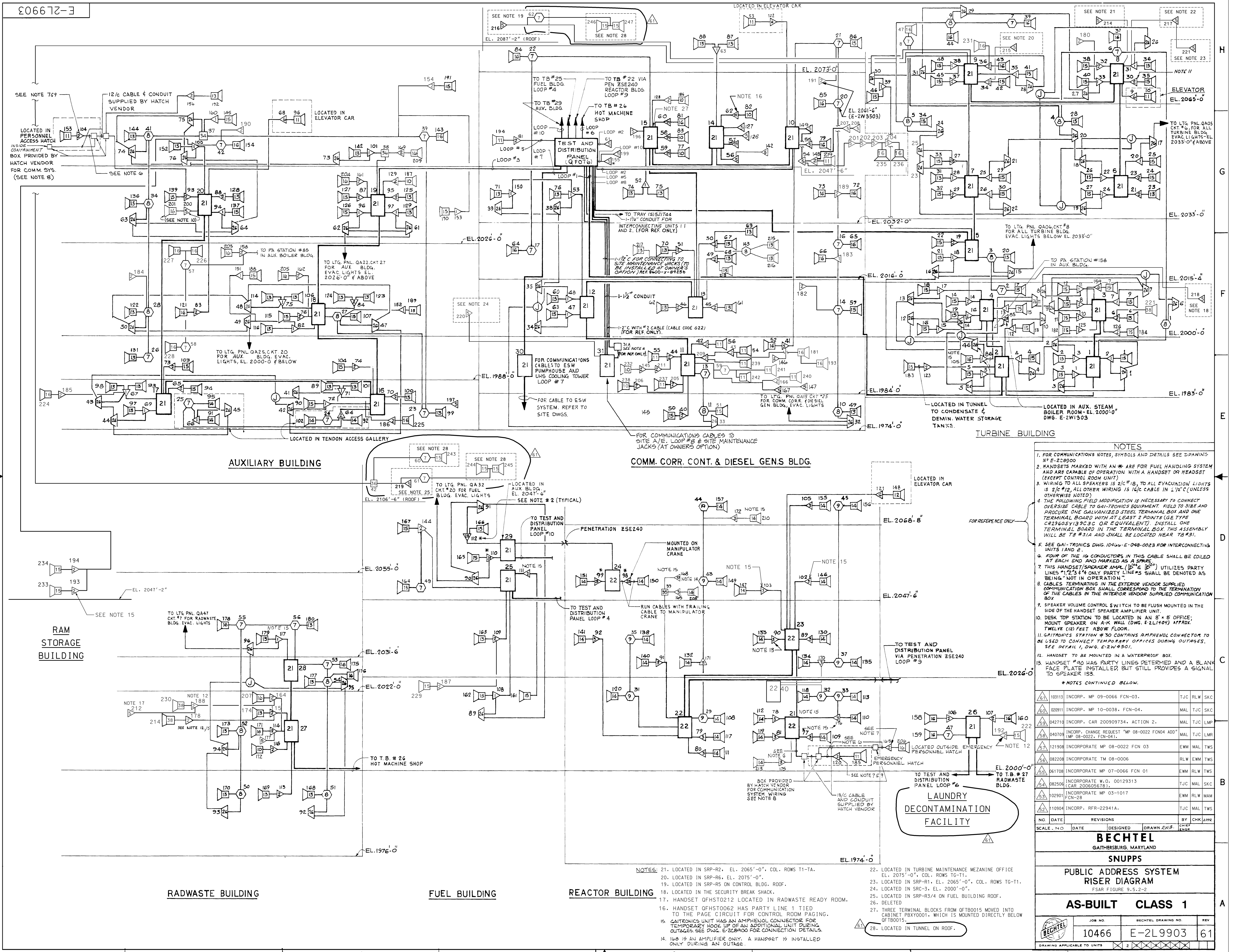
- E-2C8900 - COMMUNICATIONS SYSTEMS, NOTES, SYMBOLS AND DETAILS
- E-24QE02 - FIBER OPTIC CABLE SCHEMATIC
- E-24QE03 - FIBER OPTIC CABLE ROUTING
- E-24QE04 - FIBER OPTIC CABLE SCHEMATIC

NOTES

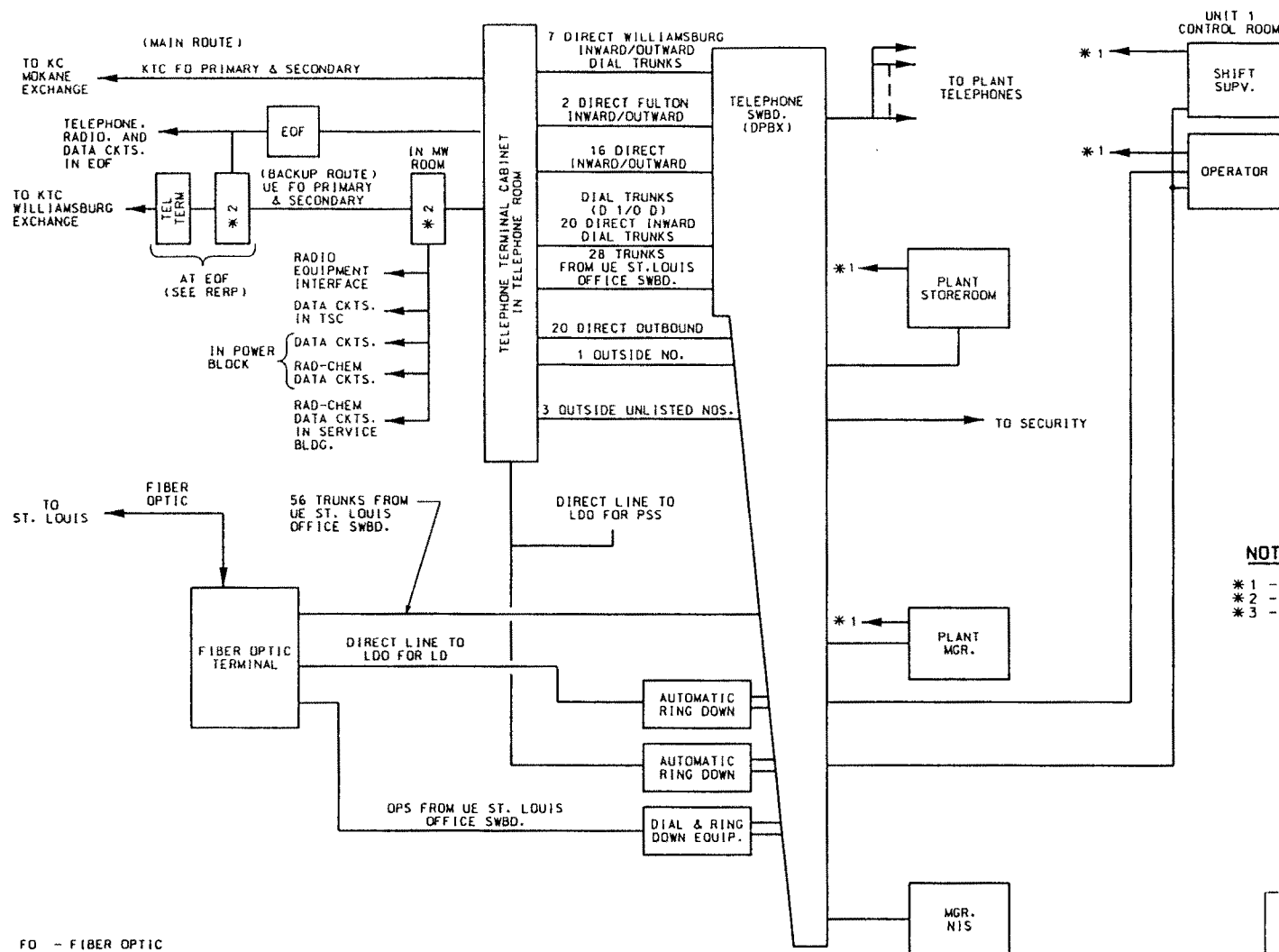
- DELETED
- TELEPHONE OUTLET LOCATIONS ARE SHOWN ON THE LIGHTING, GROUNDING, AND COMMUNICATIONS DRAWINGS ONLY.
- CONDUIT TO BE FIELD ROUTED, TELEPHONE CABINETS TO BE LOCATED BY FIELD.
- TELEPHONE CABINET IS A 30"x24"x12" NEMA 4 BOX MOUNTED OUTDOORS ON THE PLANT SOUTH WALL OF THE FUEL BUILDING FOR TELEPHONES IN TEMPORARY TRAILERS AND STRUCTURES.
- PHONE REFERENCING THIS NOTE IS FOR "DOSE ASSESSMENT LINE" (DAL) AND DOES NOT UTILIZE PBX EXCHANGES.
- JACK INSTALLED FOR TEMPORARY OUTAGE PHONES.
- PATCH WICK; NO OPEN FIBERS WITHOUT DISABLING A DOWNSTREAM FIBER.
- REPP LINES-(DAL,EML,(2)PAL),122,123,124 & 125.
- INSTALL AN ADDITIONAL 4 PR. #24-CAT. 5E CABLE FOR LAN CONNECTION.

AS-BUILT

DRWN	(DATE)	TELEPHONE SYSTEM RISER DIAGRAM										
CHKD.	(DATE)	FSAR FIGURE 9.5.2-1										
SUPV.	(DATE)	CALLAWAY ENERGY CENTER										
APPD.	(DATE)	LOCATION									CLASS	
N/A		UNION ELECTRIC COMPANY ST. LOUIS, MO										REV.
		E-24QE01										42



NOTES			
1.	FOR COMMUNICATIONS NOTES, SYMBOLS AND DETAILS SEE DRAWING AT E-219900.		
2.	HANDSETS MARKED WITH AN * ARE FOR FUEL HANDLING SYSTEM AND ARE CAPABLE OF OPERATION WITH A HANDSET OR HEADSET (EXCEPT CONTROL ROOM UNIT).		
3.	WIRING TO ALL SPEAKERS IS 12/10, TO ALL EVALUATION LIGHTS IS 12/12, ALL OTHER WIRING IS 12/10 CABLE IN 1 1/2" C (UNLESS OTHERWISE NOTED).		
4.	THE FOLLOWING FIELD MODIFICATION IS NECESSARY TO CONNECT OVERSIZED CABLE TO GAI-TRONICS EQUIPMENT. FIELD TO JIE AND PROCURE ONE GALVANIZED STEEL TERMINAL BOX AND ONE TERMINAL BOARD WITH AT LEAST 2 POINTS (SEE TYPE CR2960SV139C3C OR EQUIVALENT). INSTALL ONE TERMINAL BOARD IN THE TERMINAL BOX. THIS ASSEMBLY WILL BE TO 3/16" AND SHALL BE LOCATED NEAR TB#31.		
5.	SEE GAI-TRONICS DWG. 10446-E-048-0023 FOR INTERCONNECTING UNITS 1 AND 2.		
6.	FOUR OF THE 10 CONDUCTORS IN THIS CABLE SHALL BE COILED AT EACH END AND MARKED AS A SPARE.		
7.	THIS HANDSET (SPEAKER AMP. (8W, 80V)) UTILIZES PARTY LINES #1, 2, 3 & 4 ONLY PARTY LINE#5 SHALL BE DENOTED AS BEING "NOT IN OPERATION".		
8.	CABLES TERMINATING IN THE EXTERIOR VENDOR SUPPLIED COMMUNICATION BOX SHALL CORRESPOND TO THE TERMINATION OF THE CABLES IN THE INTERIOR VENDOR SUPPLIED COMMUNICATION BOX.		
9.	SPEAKER VOLUME CONTROL SWITCH TO BE FLUSH MOUNTED IN THE SIDE OF THE HANDSET SPEAKER AMPLIFIER UNIT.		
10.	DESK TOP STATION TO BE LOCATED IN AN 8' x 8' OFFICE; MOUNT SPEAKER ON A-K WALL (DWG. E-211401) APPROX. TWELVE (12) FEET ABOVE FLOOR.		
11.	GAI-TRONICS STATION #30 CONTAINS AMPHENOL CONNECTOR TO BE USED TO CONNECT TEMPORARY OFFICES DURING OUTAGES. SEE DETAIL 1, DWG. E-214501.		
12.	HANDSET TO BE MOUNTED IN A WATERPROOF BOX.		
13.	HANDSET #40 HAS PARTY LINES DETERMINED AND A BLANK FACE PLATE INSTALLED, BUT STILL PROVIDES A SIGNAL TO SPEAKER 135.		
*NOTES CONTINUED BELOW.			
61	103113	INCORP. MP 09-0066 FCN-03.	TJC RLW SKC
60	020911	INCORP. MP 10-0038, FCN-04.	MAL TJC SKC
59	042710	INCORP. CAR 200909734, ACTION 2.	MAL TJC LMP
58	040709	INCORP. CHANGE REQUEST "MP 08-0022 FCN04 ADD" (MP 08-0022, FCN-04).	MAL TJC LMR
57	121908	INCORPORATE MP 08-0022 FCN 03	EWL MAL TWS
56	082208	INCORPORATE TM 08-0006	RLW EWL TWS
55	061708	INCORPORATE MP 07-0066 FCN 01	EWL RLW TWS
54	082506	INCORPORATE W.O. 00129313 (CAR 200605878).	TJC MAL SKC
53	102901	INCORPORATE MP 03-1017 FCN-28	EWL RLW WAW
52	110904	INCORP. RFR-22941A.	TJC MAL TWS
NO DATE REVISIONS DESIGNED DRAWN BY CHK APPR			
SCALE: N.O. DATE			
BECHTEL			
GAITHERSBURG, MARYLAND			
SNUPPS			
PUBLIC ADDRESS SYSTEM RISER DIAGRAM			
FSAR FIGURE 9.5.2-2			
AS-BUILT CLASS 1			
JOB NO. BECHTEL DRAWING NO. REV			
10466 E-219903 61			
DRAWING APPLICABLE TO UNITS			
SITE A/E RELATED 1 34x44 "E" SIZE			



NOTES:

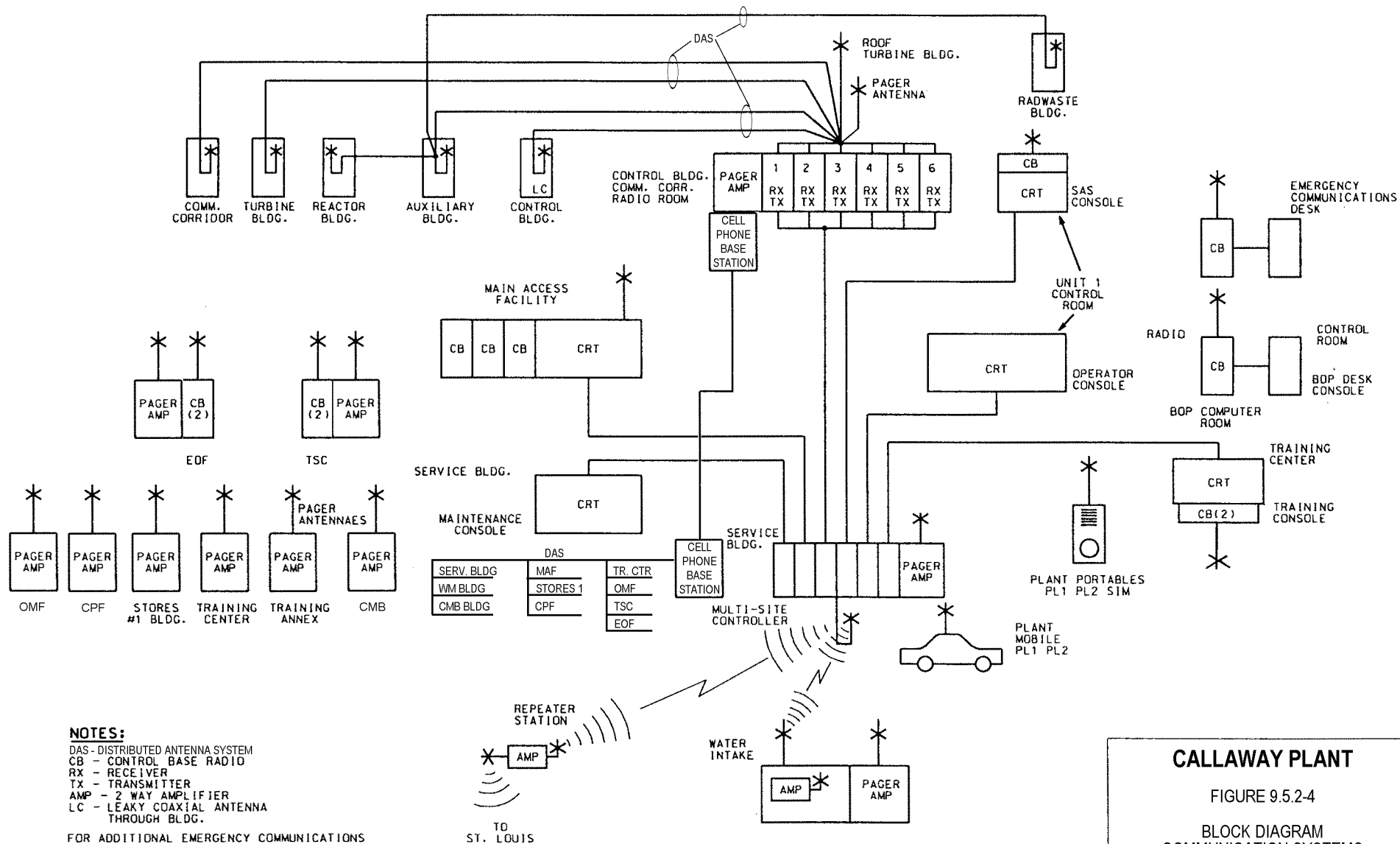
- * 1 - TO DPBX
- * 2 - UE FO EQUIPMENT
- * 3 - FOR ADDITIONAL EMERGENCY COMMUNICATIONS. SEE SECTION 7.2 IN THE RADIOLOGICAL EMERGENCY RESPONSE PLAN (RERP).

FO - FIBER OPTIC
OPS - OFF PREMISE STATION
LD - LOAD DISPATCHER
PSS - POWER SUPPLY SUPERVISOR
LDO - LOAD DISPATCH OFFICE
TSC - TECHNICAL SUPPORT CENTER
EOF - EMERGENCY OPERATIONS FACILITY
KTC - KINGDOM TELEPHONE COMPANY

CALLAWAY PLANT

FIGURE 9.5.2-3
BLOCK DIAGRAM
TELEPHONE SYSTEM
(EXCEPT SECURITY)

REV OL-11 05/00



NOTES:

DAS - DISTRIBUTED ANTENNA SYSTEM
 CB - CONTROL BASE RADIO
 RX - RECEIVER
 TX - TRANSMITTER
 AMP - 2 WAY AMPLIFIER
 LC - LEAKY COAXIAL ANTENNA
 THROUGH BLDG.

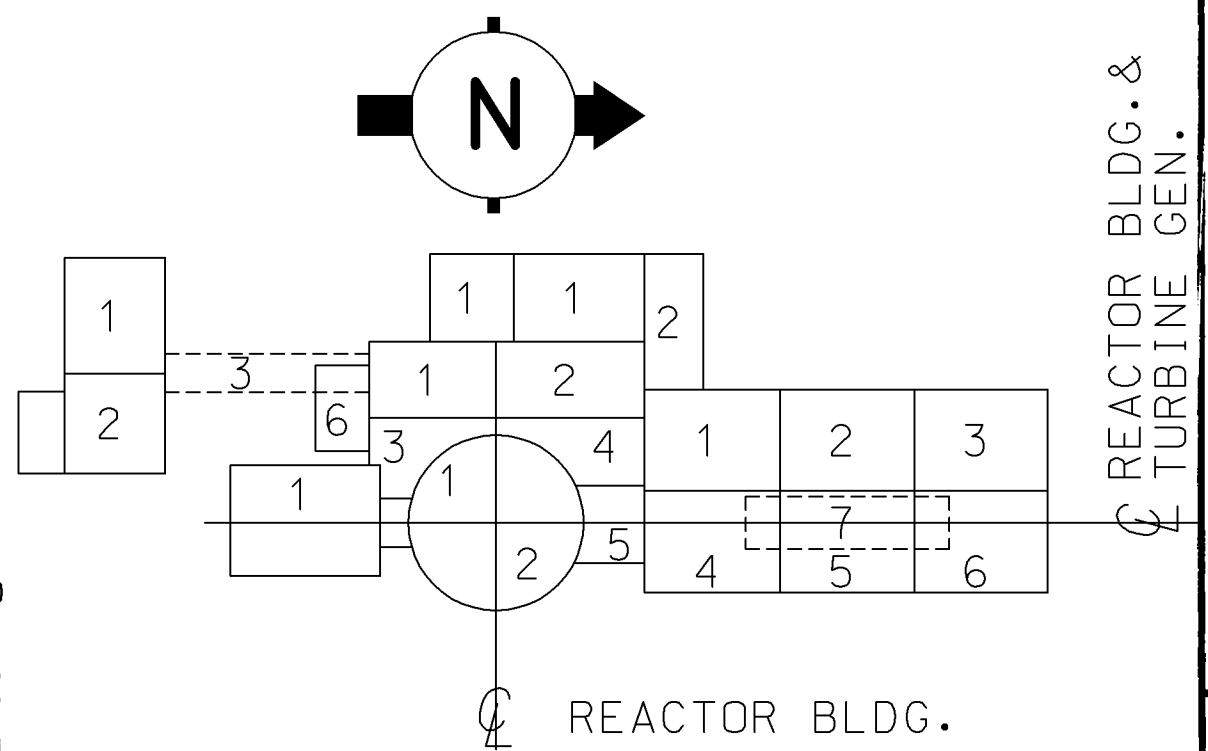
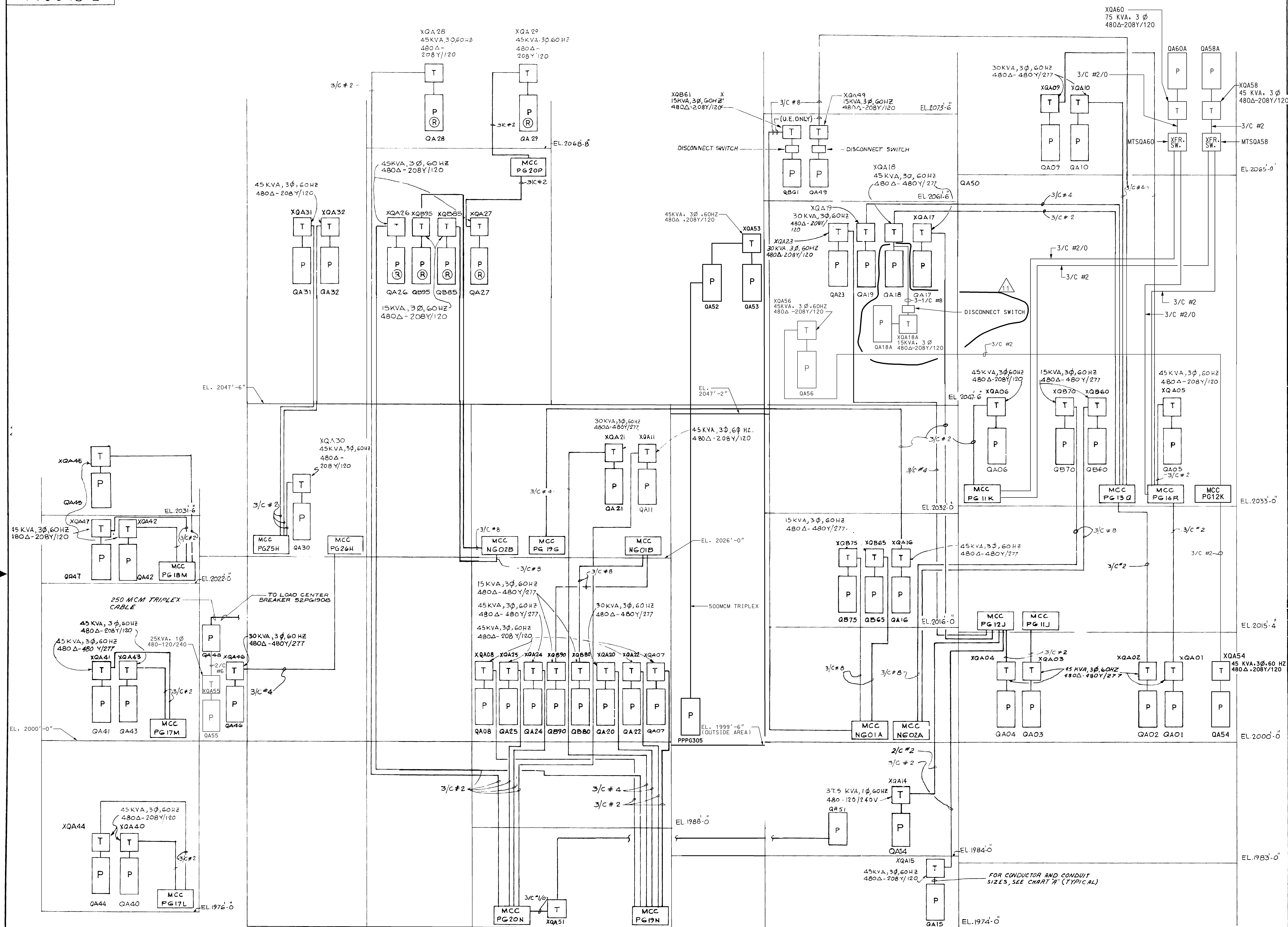
FOR ADDITIONAL EMERGENCY COMMUNICATIONS
 SEE SECTION 7.2 IN THE RADIOLOGICAL
 EMERGENCY RESPONSE PLAN (RERP).

CALLAWAY PLANT

FIGURE 9.5.2-4

BLOCK DIAGRAM
 COMMUNICATION SYSTEMS
 (EXCEPT SECURITY)

REV. 13 2/09



KEY PLAN

REFERENCE DRAWINGS

E-2L8900 LIGHTING NOTES SYMBOLS AND
DETAILS

PANEL SCHEDULE

NOTES

1. (R) INDICATES RAIN TIGHT ENCLOSURE, SEE
E-2L9900

TRANSFORMER TO PANEL WIRING INFO.			
TRANSFORMER RATING		CONDUCTOR SIZE (MM)	CONDUIT SIZE (MM)
45KVA (3Ø)	180Y/127	4/C 4	1 1/2"
	208Y/120	4/C 4	2"
	208Y/120	4-1/C #2/0	3"
30KVA (3Ø)	180Y/127	4/C 4	1"
	208Y/120	4/C 2	1 1/2"
	180Y/127	4/C 1/0	3/4"
15KVA (3Ø)	208Y/120	4/C 6	1"
	208Y/120	4-1/C #2	1 1/2"
	120/240	3/C 4/0	2"
75KVA (3Ø)	208Y/120	4/C 4/0	3"
	208Y/120	4-1/C 250KCM	3"
	120/240	3/C 1/0	2"

CHART A


1	092206	INCORPORATE MP 03-1017 FCN 23	EWM	RLW	---	MAM		
2	042105	INCORP. RFR-22941A	MAL	RLW	---	TWS		
3	010505	INCORP. MP 03-1017D (RED LINE.)	JHK	EWM	---	TWS		
4	102704	INCORPORATE MP 03-1017D	EWM	JHK	---	TWS		
5	121200	INCORP. MP 00-2010A.	MAL	SKC	---	AMR		
6	021198	INCORP. CMP 97-1006A.	JHK	EWM	---	AMR		
7	011498	INCORP. CMP 96-1012A	DJB	RFB	---	AMR		
8	110591	INCORP. EMP 97-3005A	EWM	JHK	---	AMR		
9	111100	INCORP RMP 93-204 B	EWM	201	---	AMR		
10	111400	INCORP RFR-1046 B (MINOR MOD)	MAL	HP	---	AMR		
11	111600	INCORP RFR-0244A	Sg	201	---	AMR		
12	160100	INITIAL ISSUE, REFLECTS TURN IN OF 100% OF CORP MP 85-0054A	201	201	---	AMR		
NO	DATE	REVISIONS	BY	CHK	DES SUPV	ENGR CHIEF	PROJ ENGR	APPR
SCALE	N.S.	DATE	DESIGNED	JSG	DRAWN	CHIEF	ENGR	

BECHTEL
GAITHERSBURG, MARYLAND

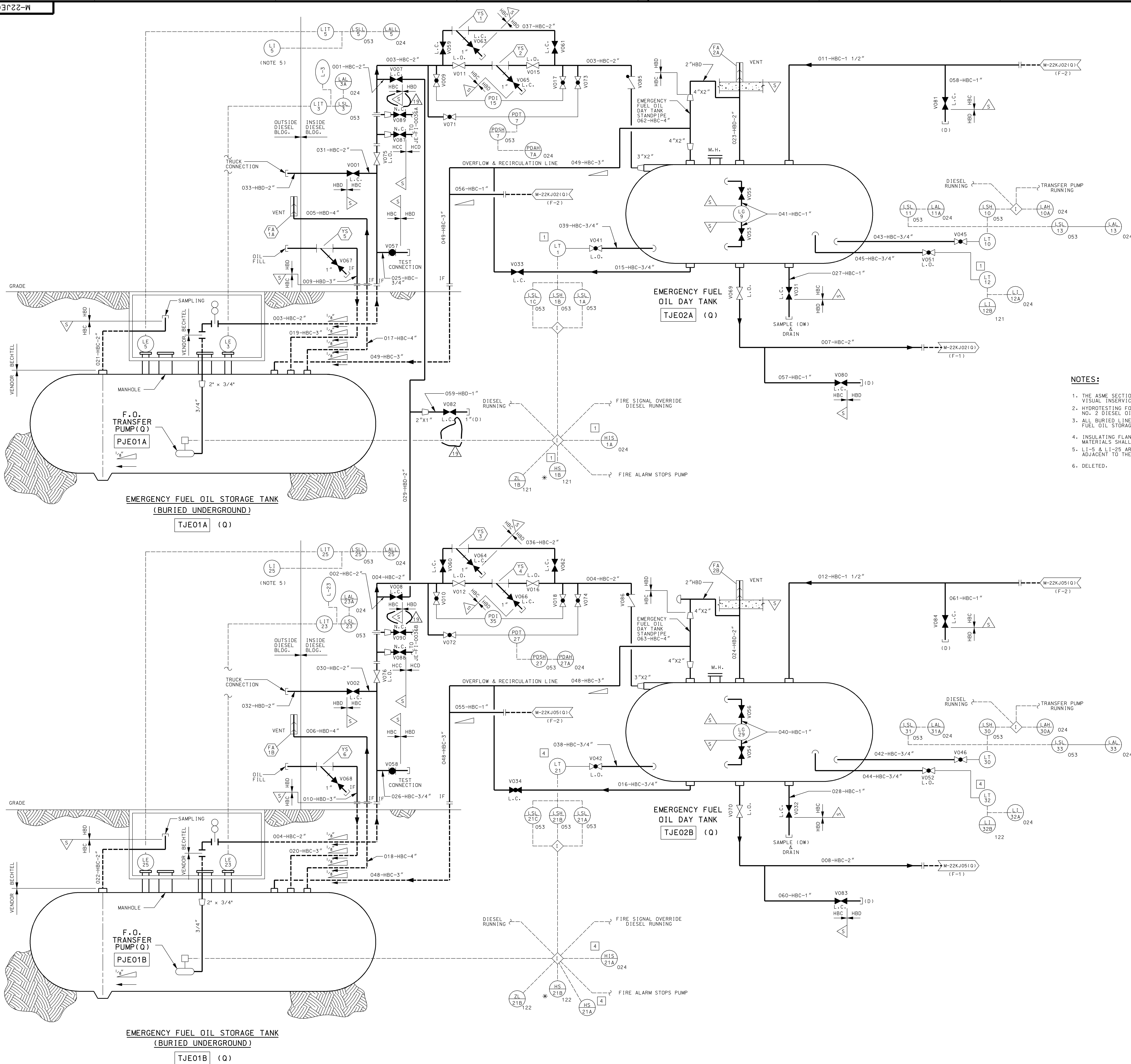
SNUPPS

**LIGHTING DISTRIBUTION
RISER DIAGRAM**
FSAR FIGURE 9.5.3-1

FSAR FIGURE 9.5.3-1

		UTILITY DRAWING NO.		REV		
			BECHTEL DRAWING NO.		REV	
			E-2L9901		11	
DRAWING APPLICABLE TO UNITS		<input checked="" type="checkbox"/> 2 <input checked="" type="checkbox"/> 3 <input checked="" type="checkbox"/> 4 <input checked="" type="checkbox"/> 5 <input checked="" type="checkbox"/> 6 <input checked="" type="checkbox"/> 7 <input checked="" type="checkbox"/> 8 <input checked="" type="checkbox"/> 9 <input checked="" type="checkbox"/> 10 <input checked="" type="checkbox"/> 11 <input checked="" type="checkbox"/> 12 <input checked="" type="checkbox"/> 13 <input checked="" type="checkbox"/> 14 <input checked="" type="checkbox"/> 15 <input checked="" type="checkbox"/> 16 <input checked="" type="checkbox"/> 17 <input checked="" type="checkbox"/> 18 <input checked="" type="checkbox"/> 19 <input checked="" type="checkbox"/> 20 <input checked="" type="checkbox"/> 21 <input checked="" type="checkbox"/> 22 <input checked="" type="checkbox"/> 23 <input checked="" type="checkbox"/> 24 <input checked="" type="checkbox"/> 25 <input checked="" type="checkbox"/> 26 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**CLASS 1
AS-BUILT**

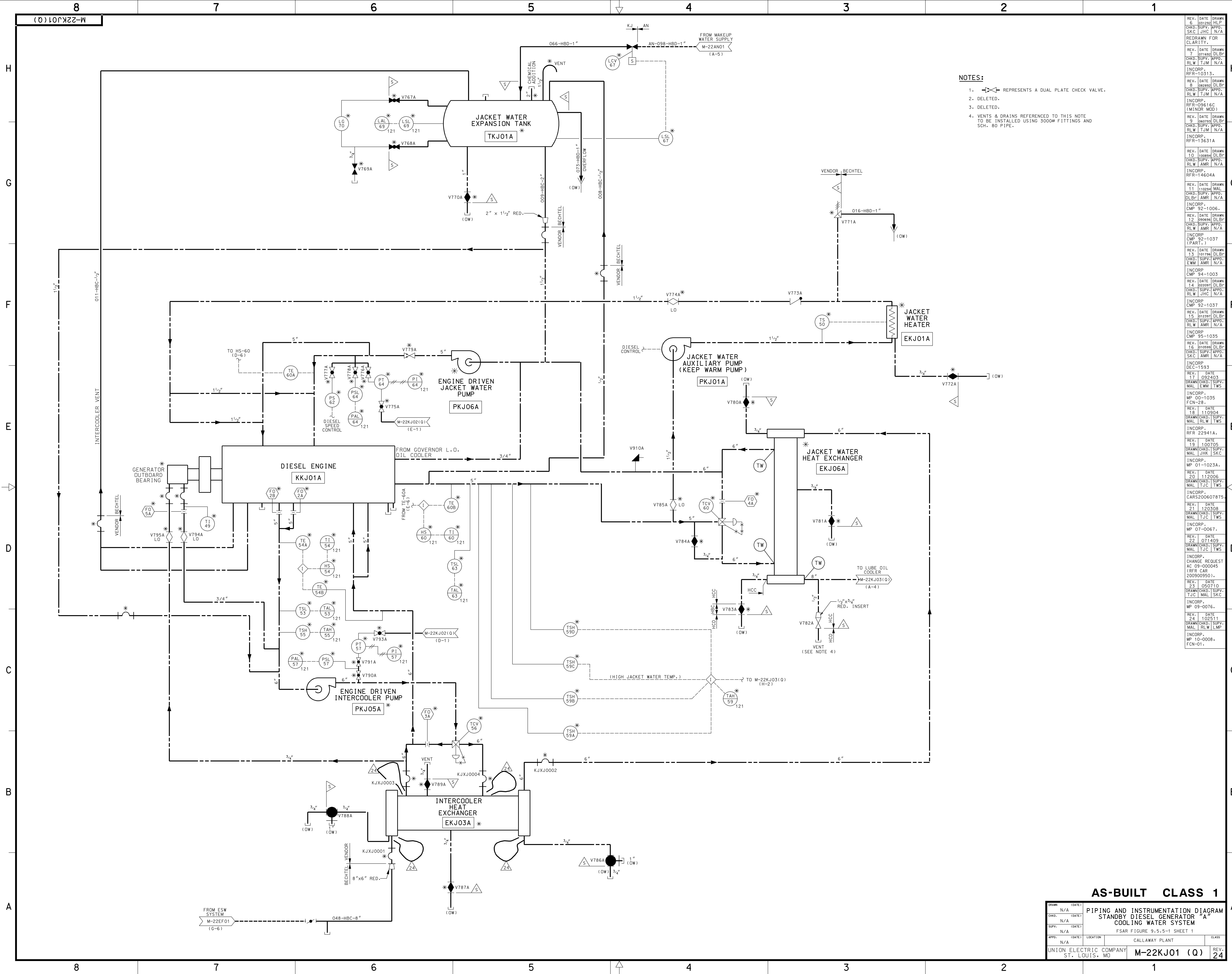


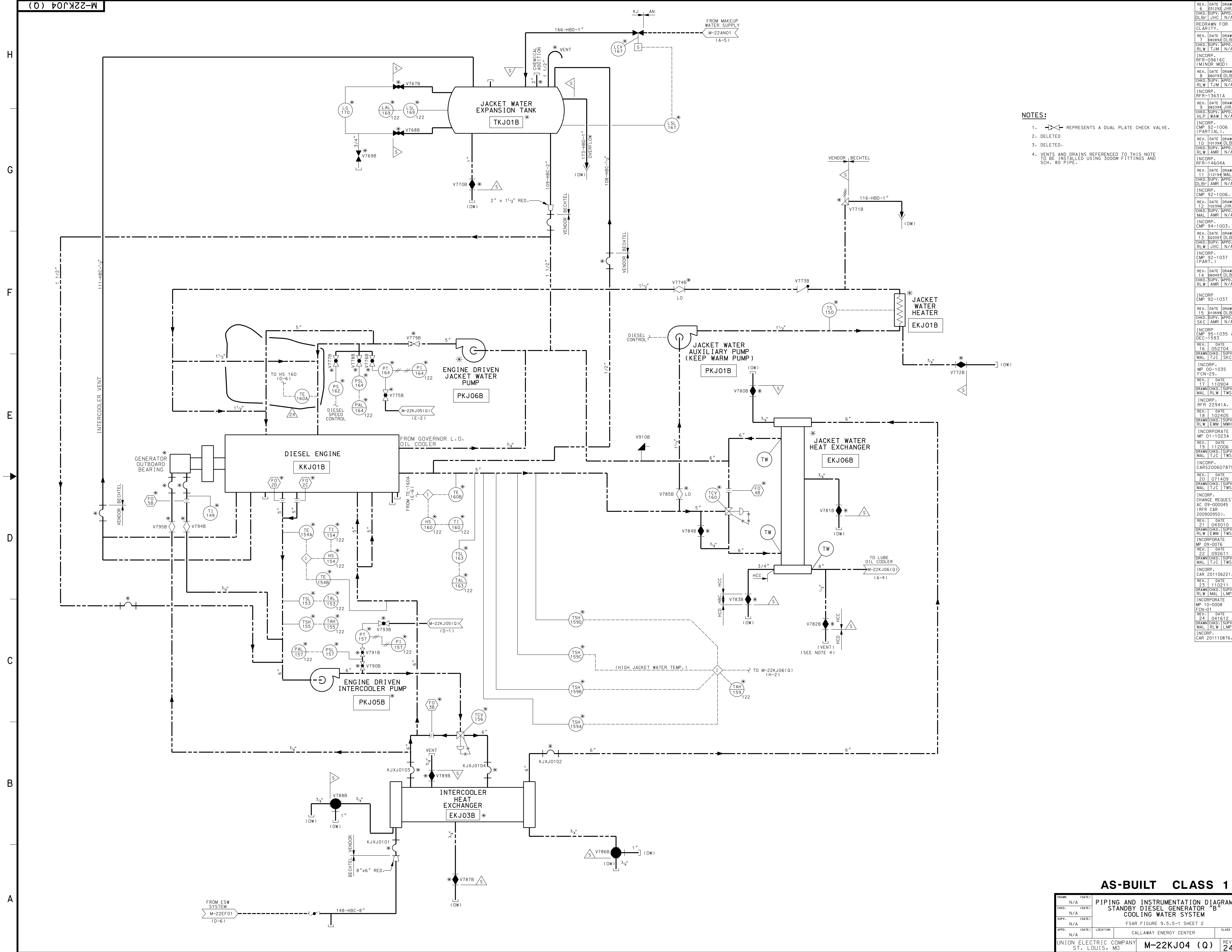
- NOTES:

1. THE ASME SECTION III, CLASS 3 COMPONENTS ARE SUBJECT TO VISUAL INSERVICE INSPECTION REQUIREMENTS.
2. HYDROTESTING FOR INSERVICE INSPECTION SHALL BE WITH NO. 2 DIESEL OIL.
3. ALL BURIED LINES TO SLOPE $\frac{1}{8}$ " PER FOOT TOWARD EMERGENCY FUEL OIL STORAGE TANKS.
4. INSULATING FLANGES ARE PROVIDED FOR CATHODIC PROTECTION. MATERIALS SHALL BE COMPATIBLE WITH NO. 2 DIESEL FUEL OIL
5. LI-5 & LI-25 ARE LOCATED OUTSIDE THE DIESEL BUILDING ADJACENT TO THE FILL CONNECTION.
6. DELETED.

AS-BUILT CLASS 1

DESIGN	(DATE)	PIPING AND INSTRUMENTATION DIAGRAM EMERGENCY FUEL OIL SYSTEM FSAR FIGURE 9.5.4-1				
N/A						
CHKD.	(DATE)					
N/A						
SUPV.	(DATE)	LOCATION				CLASS
N/A						
APPR.	(DATE)	COMPANY				REV.
N/A						
UNION ELECTRIC COMPANY ST. LOUIS, MO		M-22JE01(Q)				19

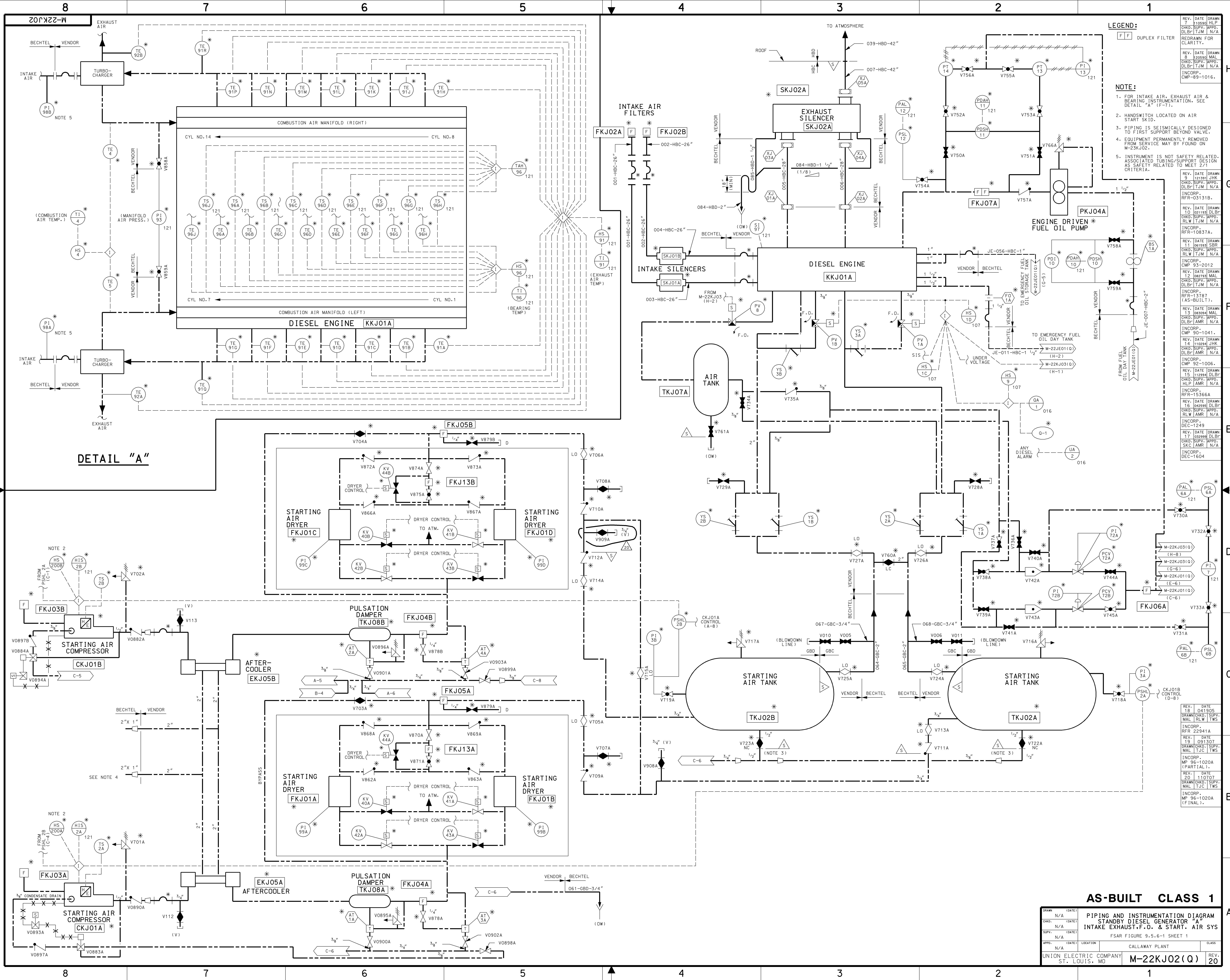




- NOTES:
- 1. REPRESENTS A DUAL PLATE CHECK VALVE.
 - 2. DELETED
 - 3. DELETED
 - 4. VENTS AND DRAINS REFERENCED TO THIS NOTE TO BE INSTALLED USING 3000W FITTINGS AND SCH. 80 PIPE.

AS-BUILT CLASS 1

DRWN	N/A	DATE		PIPING AND INSTRUMENTATION DIAGRAM	
CHKD	N/A	DATE		STANDBY DIESEL GENERATOR "B"	
SUPV	N/A	DATE		COOLING WATER SYSTEM	
APPR	N/A	DATE		FSAR FIGURE 9.5.5-1 SHEET 2	
UNION ELECTRIC COMPANY	ST. LOUIS, MO	M-22KJ04 (Q)	REV. 24		



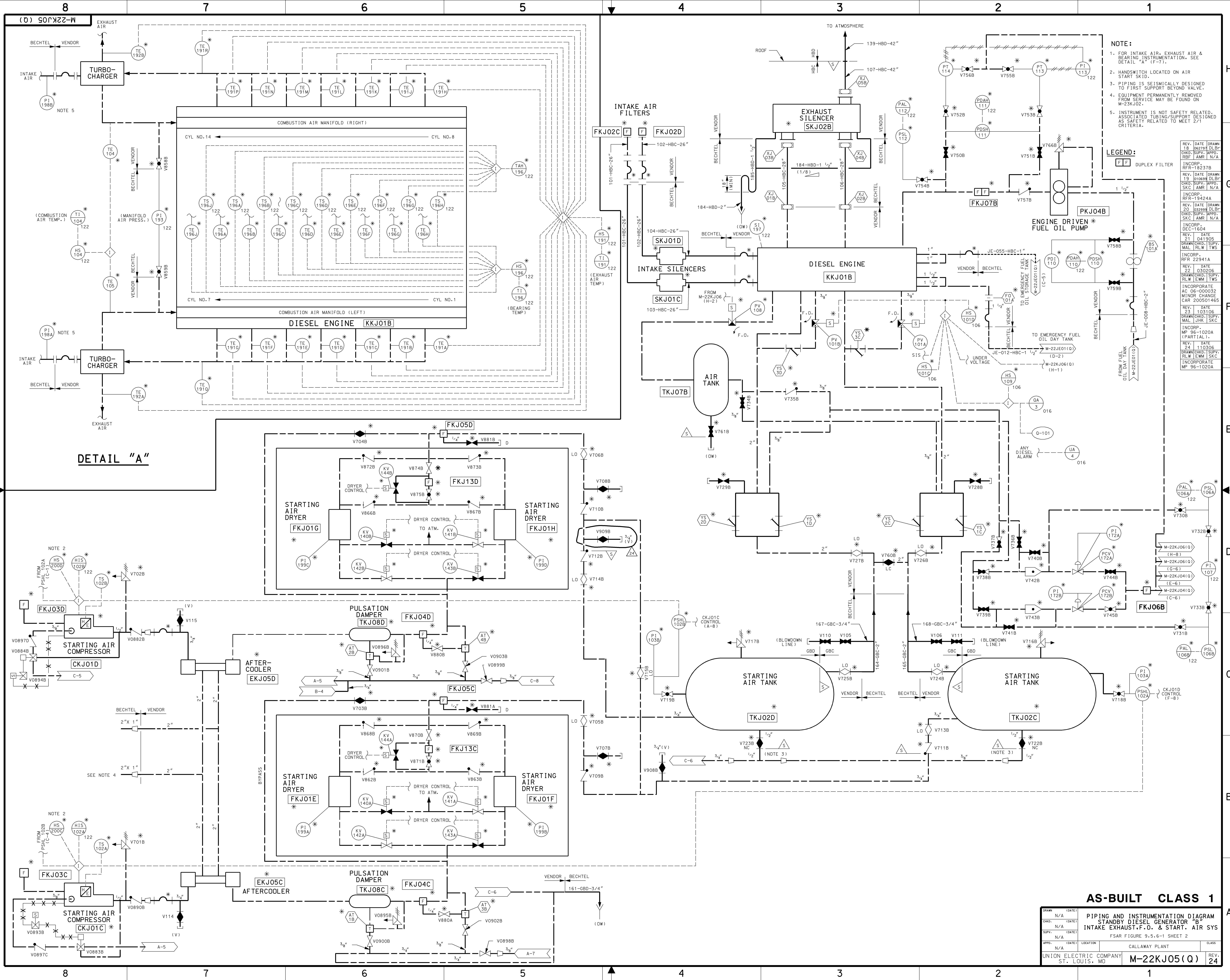
LEGEND:
[F F] DUPLEX FILTER

NOTE:
1. FOR INTAKE AIR, EXHAUST AIR & BEARING INSTRUMENTATION, SEE DETAIL "A" (F-7).
2. PIPING IS SEISMICALLY DESIGNED TO FIRST SUPPORT BEYOND VALVE.
3. HANDSWITCH LOCATED ON AIR START SKID.
4. EQUIPMENT PERMANENTLY REMOVED FROM SERVICE MAY BE FOUND ON M-23KJ02.
5. INSTRUMENT IS NOT SAFETY RELATED. ASSOCIATED TUBING/SUPPORT DESIGN AS SAFETY RELATED TO MEET Z/1 CRITERIA.

DETAIL "A"

AS-BUILT CLASS 1

DRAWN: N/A (DATE):		DATE: 04/19/05	
CHKD: N/A (DATE):		DATE: 04/19/05	
SUPV: N/A (DATE):		DATE: 04/19/05	
APPD: N/A (DATE):		DATE: 04/19/05	
UNION ELECTRIC COMPANY		ST. LOUIS, MO	
M-22KJ02(Q)		REV. 20	



- NOTE:
1. FOR INTAKE AIR, EXHAUST AIR & BEARING INSTRUMENTATION, SEE DETAIL "A" (F-7).
 2. HANDSWITCH LOCATED ON AIR START SKID.
 3. PIPING IS SEISMICALLY DESIGNED TO FIRST SUPPORT BEYOND VALVE.
 4. EQUIPMENT PERMANENTLY REMOVED FROM SERVICE MAY BE FOUND ON M-23KJ02.
 5. INSTRUMENT IS NOT SAFETY RELATED. ASSOCIATED TUBING/SUPPORT DESIGNED AS SAFETY RELATED TO MEET Z/T CRITERIA.

LEGEND:

FF DUPLEX FILTER

REV.	DATE	DRAWN	CHKD.	APPD.	REV.	DATE	DRAWN	CHKD.	APPD.
18	06/27/97	DLB	CHD	SRV	19	01/09/98	DLB	CHD	SRV
19	01/09/98	DLB	CHD	SRV	20	03/29/98	DLB	CHD	SRV
20	03/29/98	DLB	CHD	SRV	21	04/15/98	DLB	CHD	SRV
21	04/15/98	DLB	CHD	SRV	22	03/20/98	DLB	CHD	SRV
22	03/20/98	DLB	CHD	SRV	23	03/20/98	DLB	CHD	SRV
23	03/20/98	DLB	CHD	SRV	24	03/20/98	DLB	CHD	SRV
24	03/20/98	DLB	CHD	SRV	25	03/20/98	DLB	CHD	SRV
25	03/20/98	DLB	CHD	SRV	26	03/20/98	DLB	CHD	SRV
26	03/20/98	DLB	CHD	SRV	27	03/20/98	DLB	CHD	SRV
27	03/20/98	DLB	CHD	SRV	28	03/20/98	DLB	CHD	SRV
28	03/20/98	DLB	CHD	SRV	29	03/20/98	DLB	CHD	SRV
29	03/20/98	DLB	CHD	SRV	30	03/20/98	DLB	CHD	SRV

FROM FUEL OIL DAY TANK

TO EMERGENCY FUEL OIL STORAGE TANK

TO EMERGENCY FUEL OIL DAY TANK

TO EMERGENCY FUEL OIL STORAGE TANK

ANY DIESEL ALARM

0-101

0-101

FROM FUEL OIL DAY TANK

TO EMERGENCY FUEL OIL STORAGE TANK

TO EMERGENCY FUEL OIL DAY TANK

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TO EMERGENCY FUEL OIL STORAGE TANK

TO EMERGENCY FUEL OIL DAY TANK

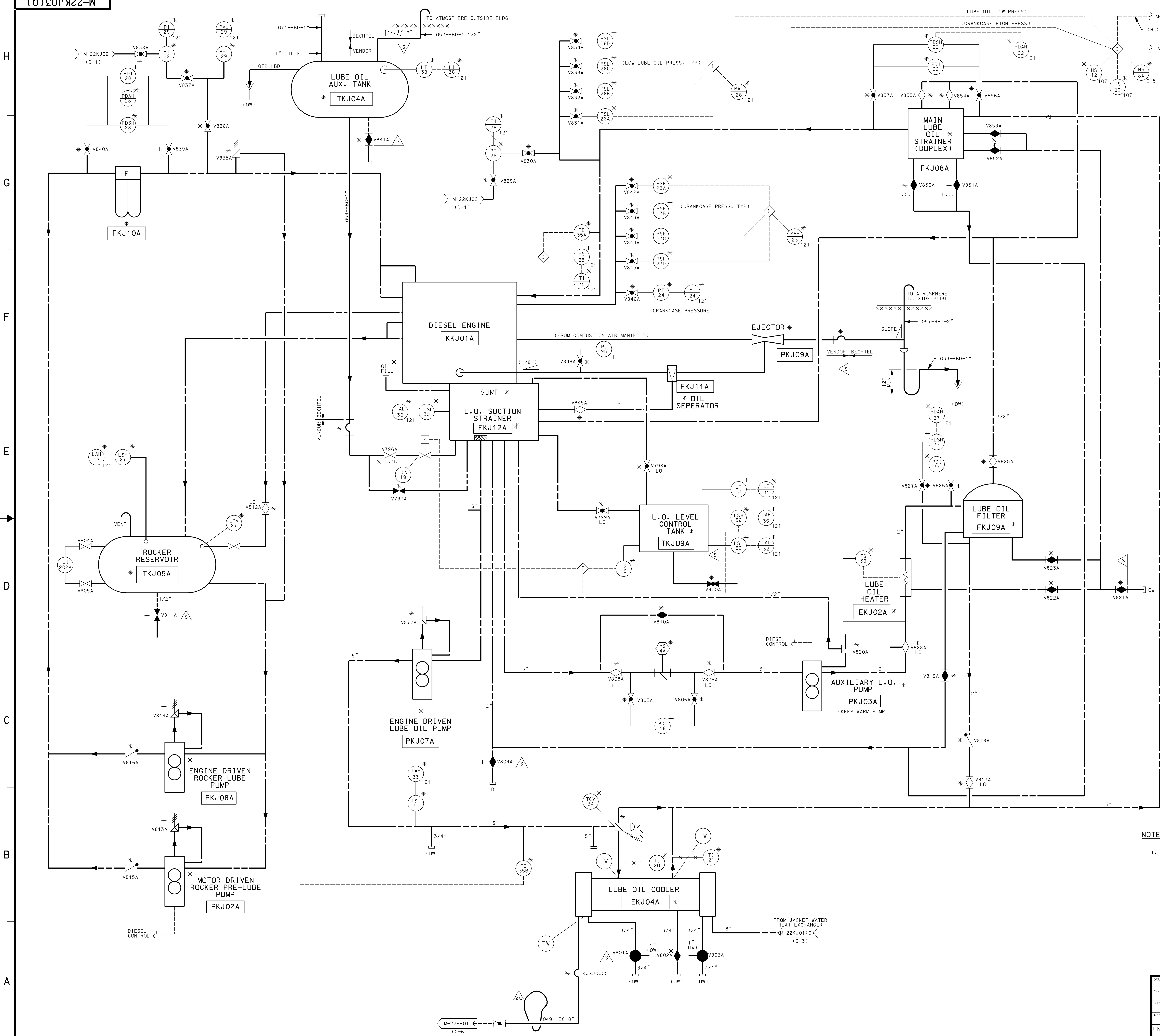
TO EMERGENCY FUEL OIL STORAGE TANK

FROM FUEL OIL DAY TANK

TO EMERGENCY FUEL OIL STORAGE TANK

TO EMERGENCY FUEL OIL DAY TANK

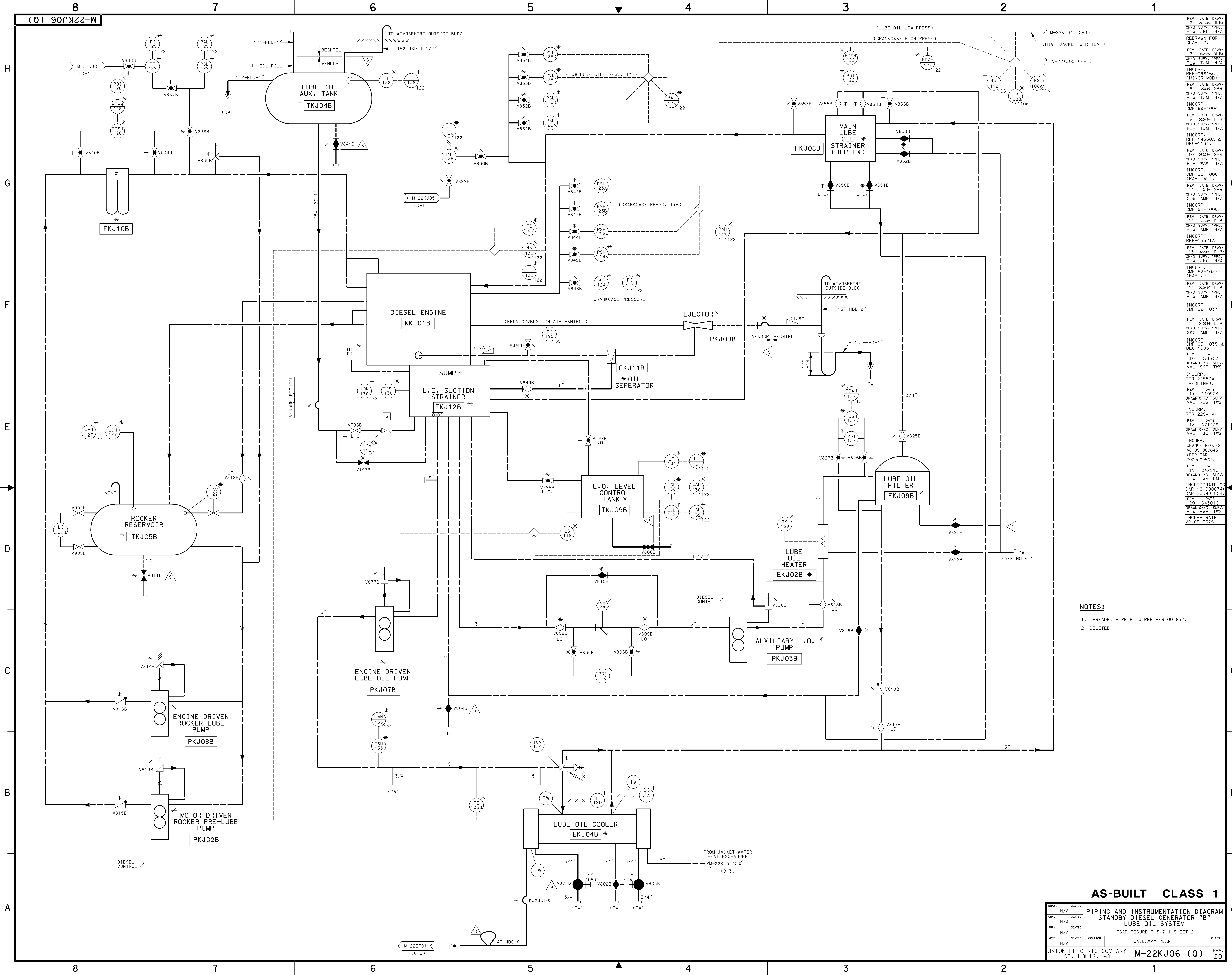
TO EMERGENCY FUEL OIL STORAGE TANK



NOTES:
1. DELETED.

AS-BUILT CLASS 1			
DRAWING INFORMATION			
DRWN	N/A	DATE	
CHKD	N/A	DATE	
SUPV	N/A	DATE	
APPR	N/A	LOCATION	
UNION ELECTRIC COMPANY ST. LOUIS, MO			
PROJECT INFORMATION			
PIPING AND INSTRUMENTATION DIAGRAM STANDBY DIESEL GENERATOR "A" LUBE OIL SYSTEM			
FSAR FIGURE 9.5.7-1 SHEET 1			
CALLAWAY PLANT			
REV. 20			

REV.	DATE	DRWN	CHKD	SUPV	APPR	LOCATION	CLASS
1	03/29/92	DLB					
2	08/28/92	DLB					
3	09/14/93	DLB					
4	11/09/04	DLB					
5	07/17/03	DLB					
6	07/17/03	DLB					
7	07/17/03	DLB					
8	07/17/03	DLB					
9	07/17/03	DLB					
10	07/17/03	DLB					
11	07/17/03	DLB					
12	07/17/03	DLB					
13	07/17/03	DLB					
14	07/17/03	DLB					
15	07/17/03	DLB					
16	07/17/03	DLB					
17	07/17/03	DLB					
18	07/17/03	DLB					
19	07/17/03	DLB					
20	07/17/03	DLB					

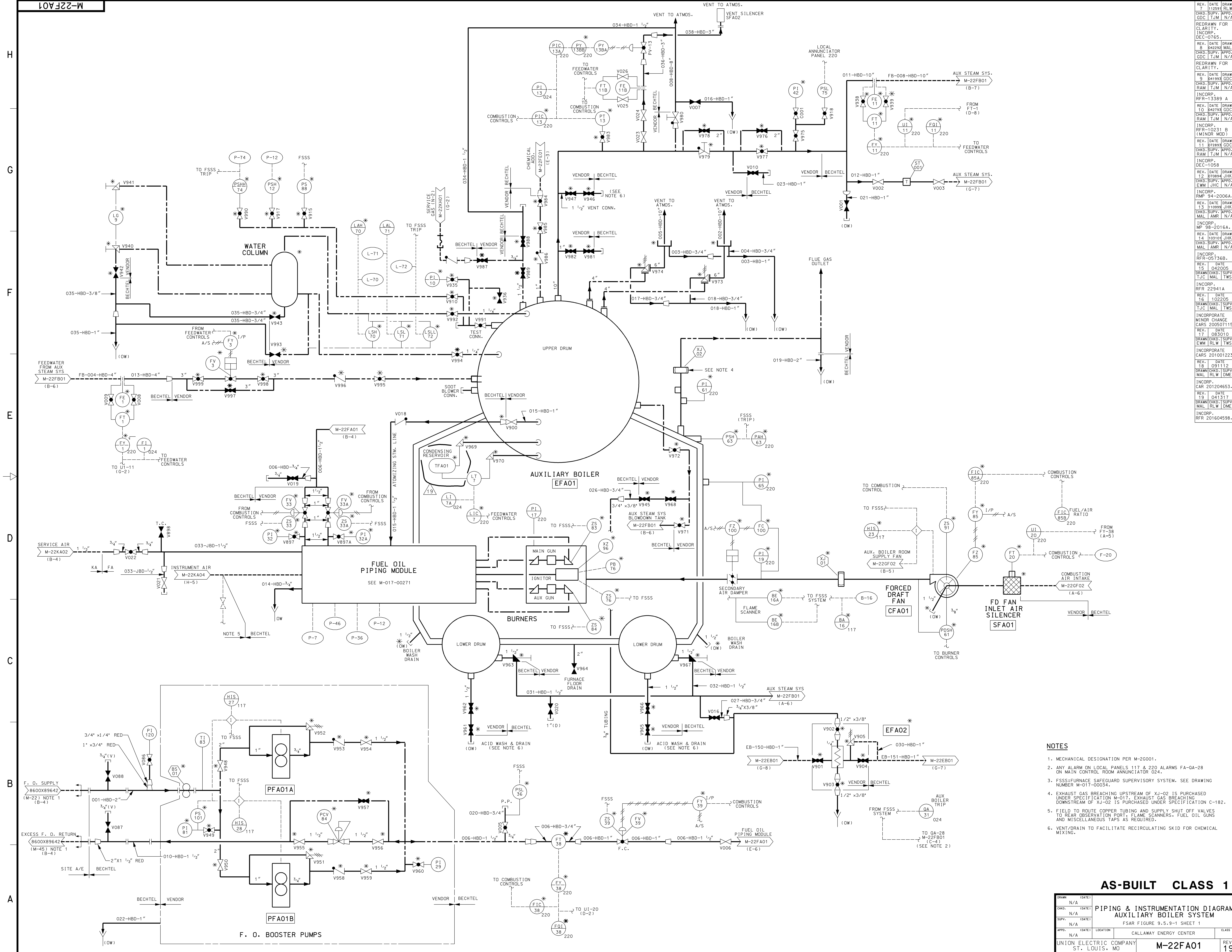


NOTES:

1. THREADED PIPE PLUG PER RFR 001652.
2. DELETED.

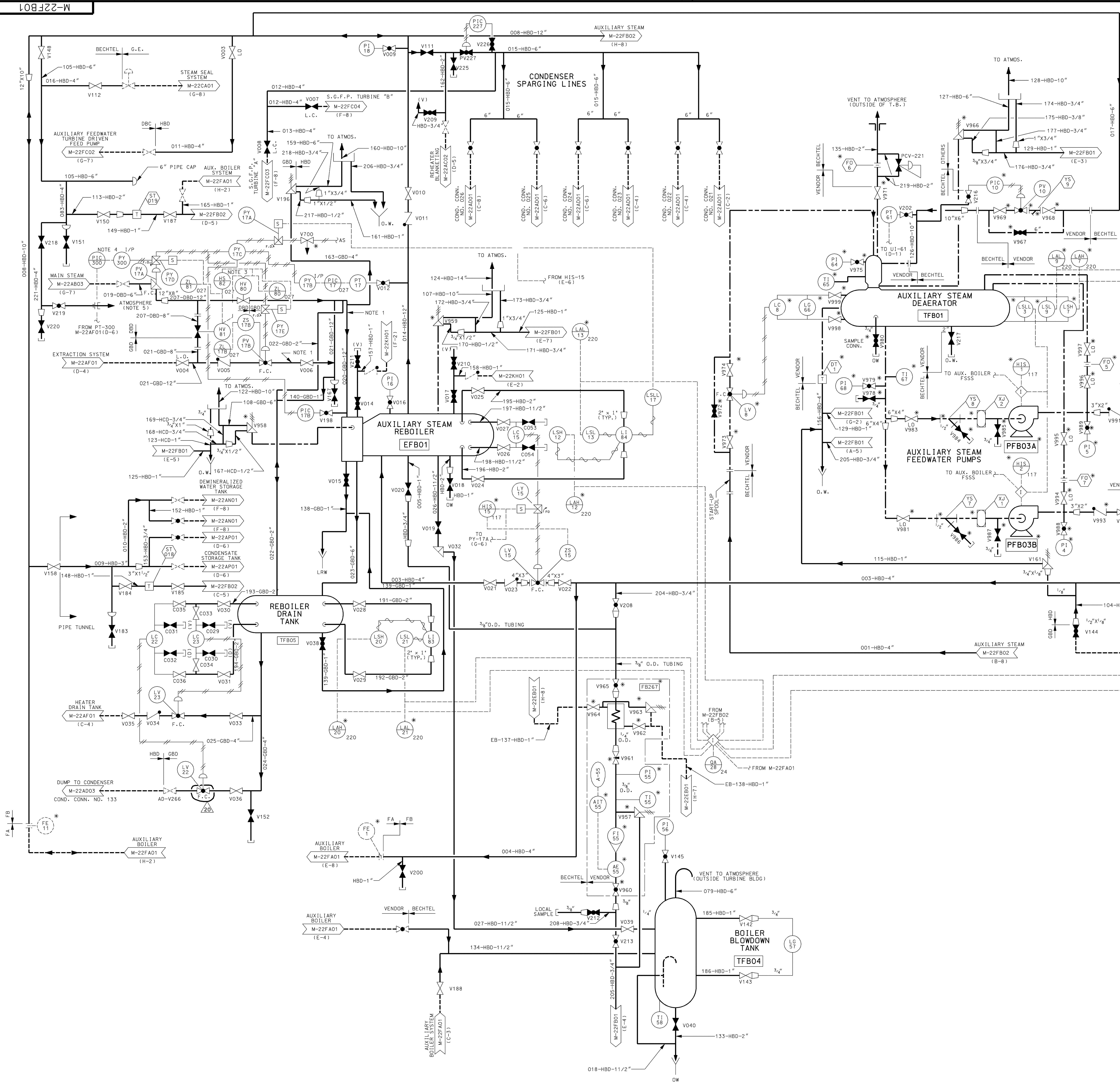
AS-BUILT CLASS 1

DRWN	N/A	DATE		PIPING AND INSTRUMENTATION DIAGRAM STANDBY DIESEL GENERATOR "B" LUBE OIL SYSTEM			
CHKD	N/A	DATE		FSAR FIGURE 9.5.7-1 SHEET 2			
SUPV	N/A	DATE		CLASS			
APPR	N/A	DATE	LOCATION	CALLAWAY PLANT	CLASS	REV.	20
UNION ELECTRIC COMPANY ST. LOUIS, MO				M-22KJ06 (Q)			



- NOTES**
1. MECHANICAL DESIGNATION PER M-20001.
 2. ANY ALARM ON LOCAL PANELS 117 & 220 ALARMS FA-0A-28 ON MAIN CONTROL ROOM ANNUNCIATOR 024.
 3. FSSS=FURNACE SAFEGUARD SUPERVISORY SYSTEM. SEE DRAWING NUMBER M-017-00034.
 4. EXHAUST GAS BREACHING UPSTREAM OF XU-02 IS PURCHASED UNDER SPECIFICATION M-017. EXHAUST GAS BREACHING DOWNSTREAM OF XU-02 IS PURCHASED UNDER SPECIFICATION C-182.
 5. FIELD TO ROUTE COPPER TUBING AND SUPPLY SHUT OFF VALVES TO REAR OBSERVATION PORT. FLAME SCANNERS, FUEL OIL GUNS AND MISCELLANEOUS TAPS AS REQUIRED.
 6. VENT/RAIN TO FACILITATE RECIRCULATING SKID FOR CHEMICAL MIXING.

AS-BUILT CLASS 1			
DRAWING			
CHG.	N/A	DATE	
SUPV.	N/A	DATE	
APP.	N/A	DATE	
LOCATION			
CLASS			
UNION ELECTRIC COMPANY			
ST. LOUIS, MO			
M-22FA01			
REV. 19			



NOTES:

- PIPE IS SCHEDULE 80 FOR NOISE AND VIBRATION SUPPRESSION.
- DELETED.
- ALIGNS MAIN STEAM TO FEEDWATER HEATERS 6A AND 6B THROUGH CONTROL VALVE FB-PV-17A.
- CONTROLS FINAL FEEDWATER TEMPERATURE DURING START-UP AND SHUTDOWN.
- AUXILIARY BOILER TEST CONNECTION.

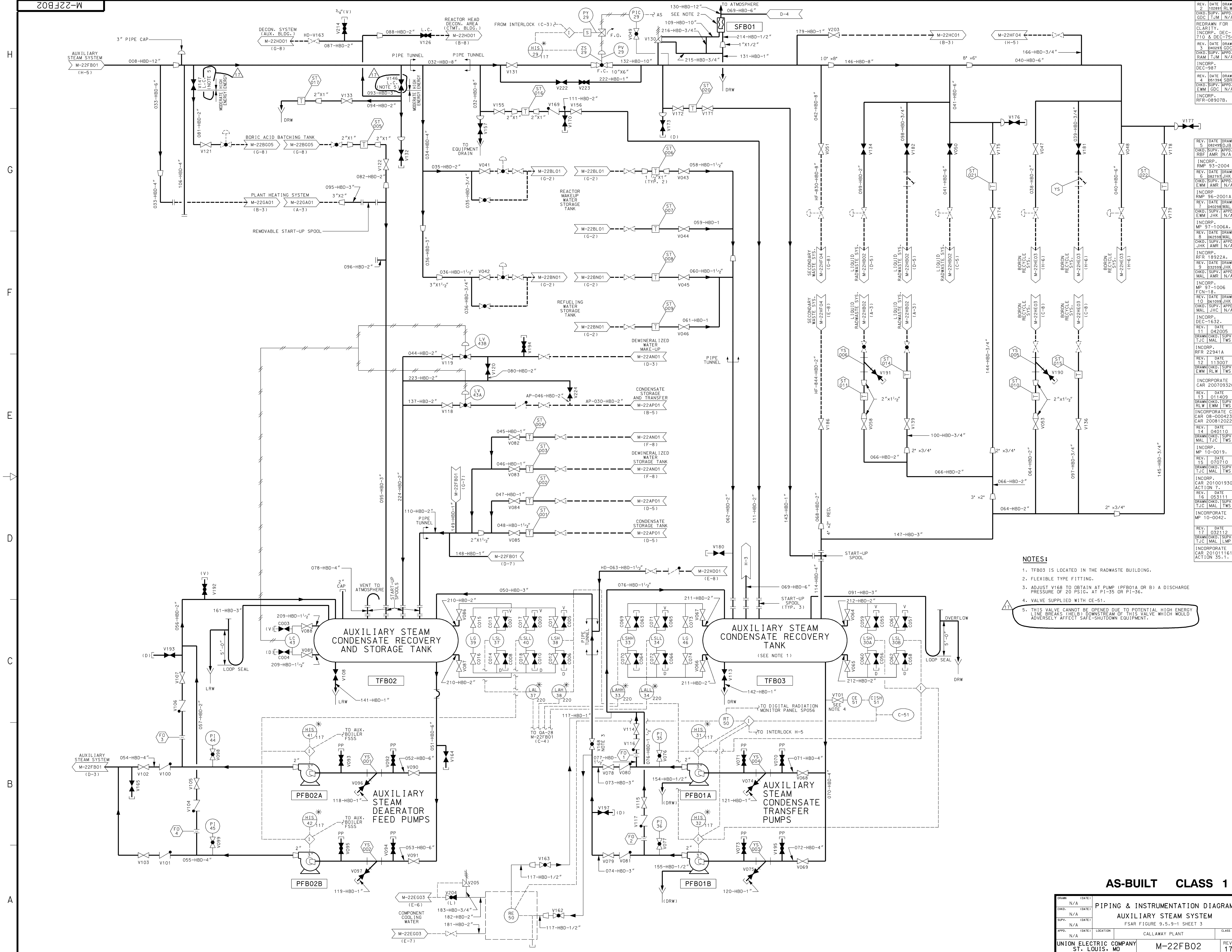
AS-BUILT CLASS 1

DRAWN	N/A	(DATE)	
CHKD.	N/A	(DATE)	
SUPV.	N/A	(DATE)	
APPD.	N/A	(DATE)	
LOCATION	CALLAWAY PLANT		
UNION ELECTRIC COMPANY	ST. LOUIS, MO		
REV.	20		

PIPING & INSTRUMENTATION DIAGRAM
AUXILIARY STEAM SYSTEM

FSAR FIGURE 9.5.9-1 SHEET 2

M-22FB01



- NOTES:**
- 1. TFB03 IS LOCATED IN THE RADWASTE BUILDING.
 - 2. FLEXIBLE TYPE FITTING.
 - 3. ADJUST V168 TO OBTAIN AT PUMP (PFB01A OR B) A DISCHARGE PRESSURE OF 20 PSIG. AT P1-35 OR P1-36.
 - 4. VALVE SUPPLIED WITH CE-51.
 - 5. THIS VALVE CANNOT BE OPENED DUE TO POTENTIAL HIGH ENERGY LINE BREAKS (HELB) DOWNSTREAM OF THIS VALVE WHICH WOULD ADVERSELY AFFECT SAFE SHUTDOWN EQUIPMENT.

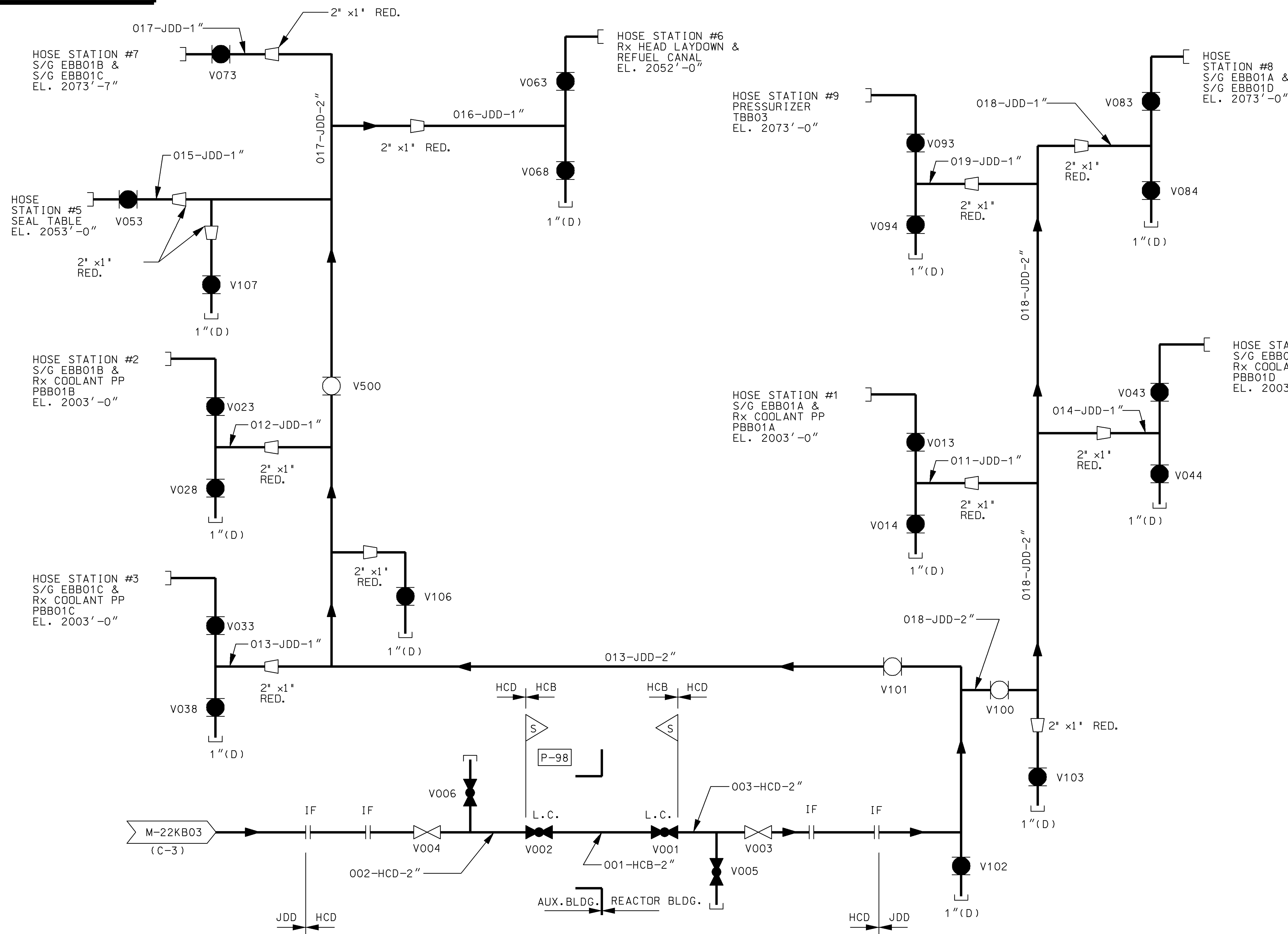
AS-BUILT CLASS 1

DRAWN	N/A	(DATE)	
CHKD.	N/A	(DATE)	
SUPV.	N/A	(DATE)	
APPD.	N/A	(DATE)	
UNION ELECTRIC COMPANY		ST. LOUIS, MO	
M-22FB02		REV.	17

PIPING & INSTRUMENTATION DIAGRAM
AUXILIARY STEAM SYSTEM
FSAR FIGURE 9.5.9-1 SHEET 3
CALLAWAY PLANT
CLASS 1

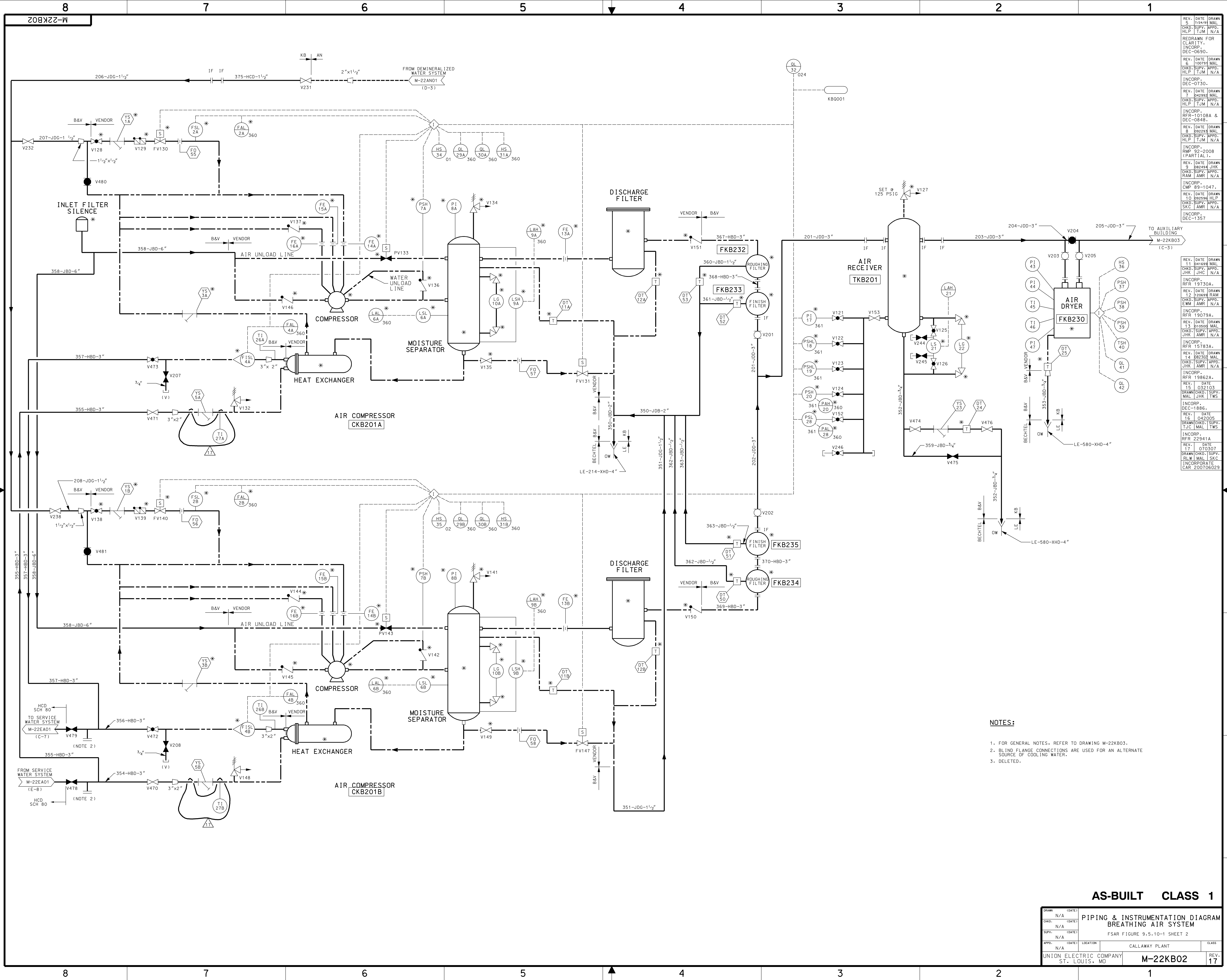
M-22KB01(Q)

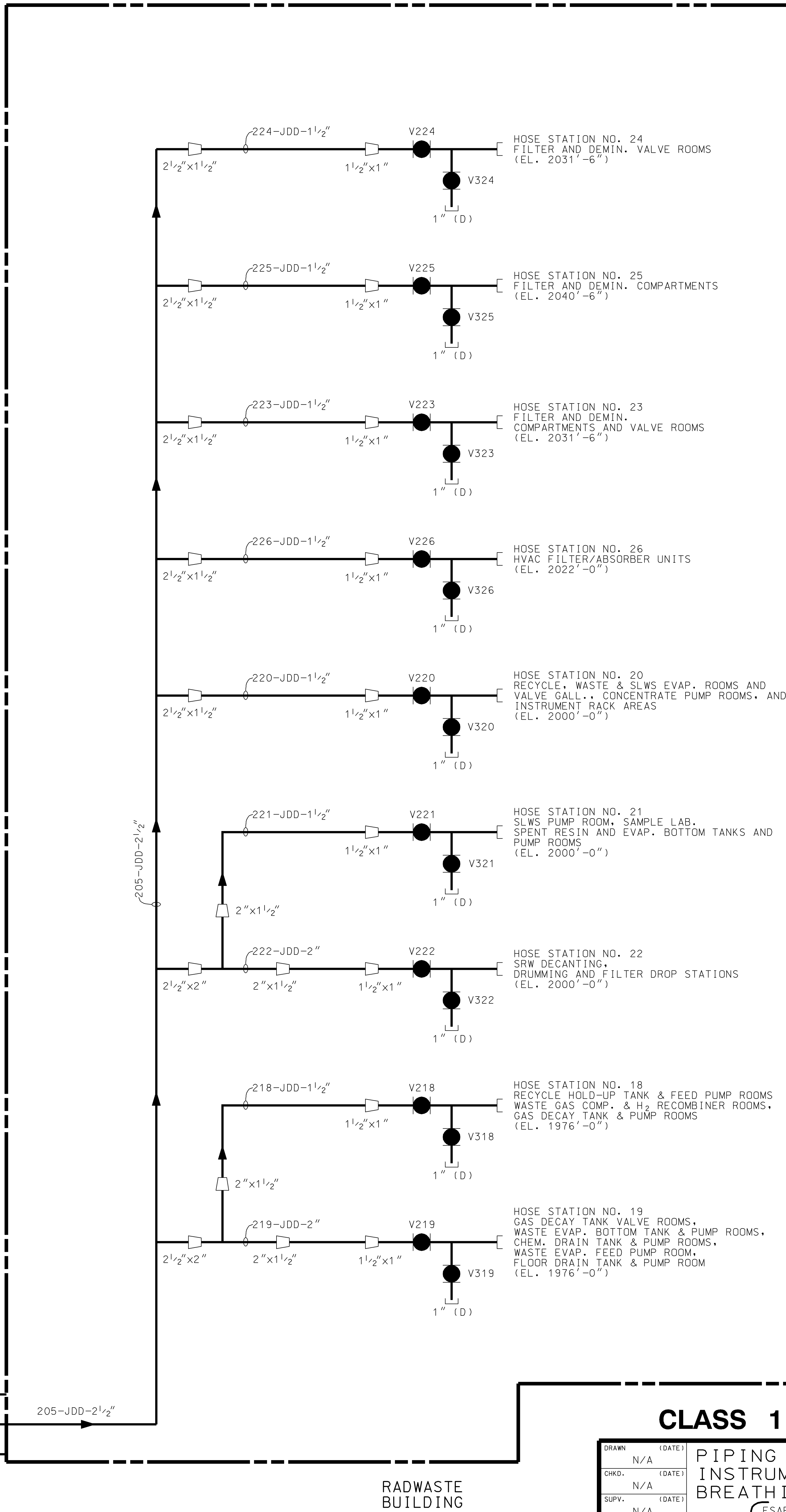
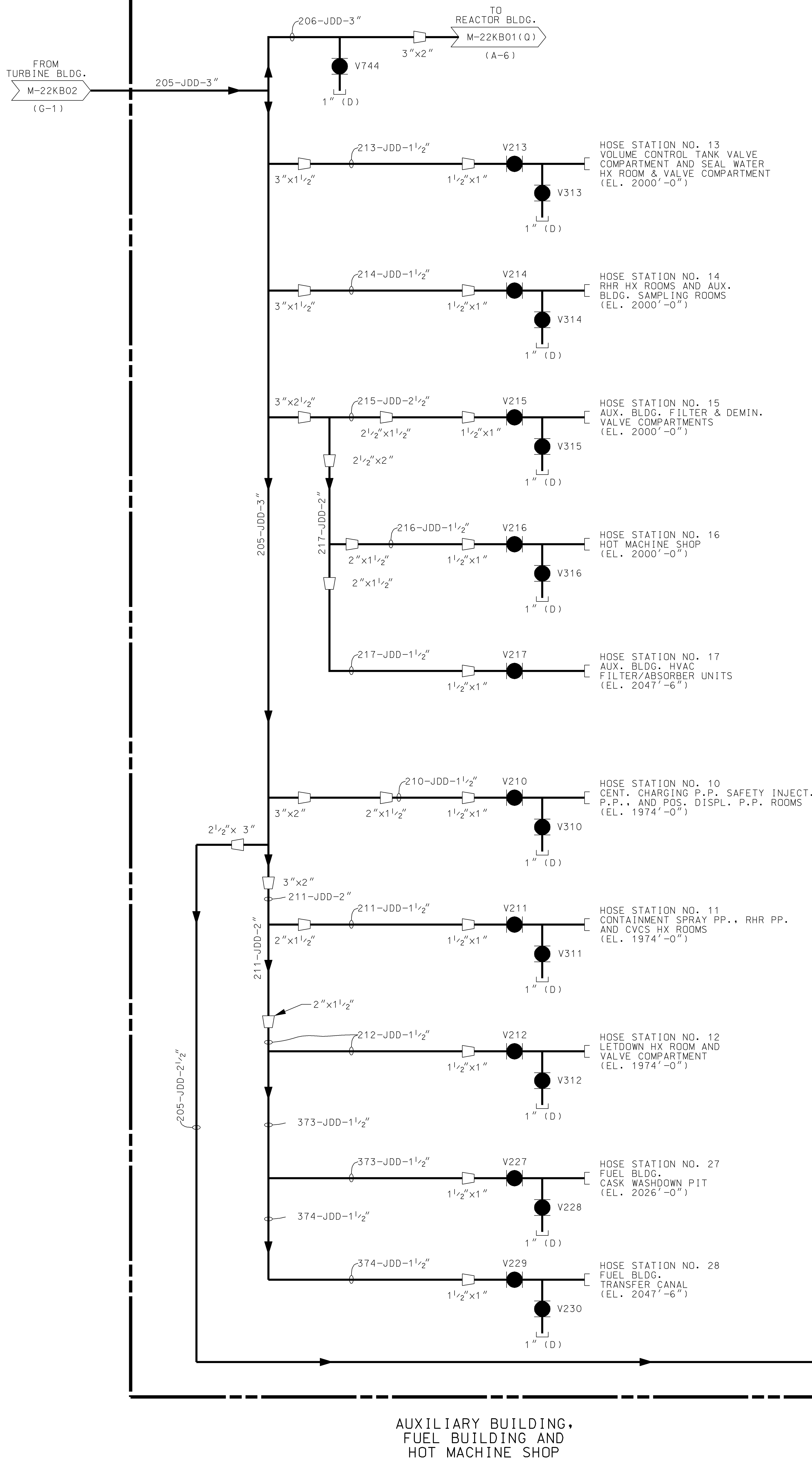
REV. 4	DATE 7/19/91	DRAWN MAL
CHKD. HLP	SUPV. TJM	APPD. N/A
REDRAWN FOR CLARITY.		
REV. 5	DATE 042005	
DRAWN TJC	CHKD. MAL	SUPV. TWS
INCORP. RFR 22941A		



AS-BUILT CLASS 1

DRAWN (DATE) N/A	PIPING & INSTRUMENTATION DIAGRAM BREATHING AIR SYSTEM FSAR FIGURE 9.5.10-1 SHEET 1		
CHKD. (DATE) N/A			
SUPV. (DATE) N/A			
APPD. (DATE) N/A			
LOCATION	CALLAWAY PLANT		CLASS
UNION ELECTRIC COMPANY ST. LOUIS, MO		M-22KB01(Q)	REV. 5





CLASS 1 AS-BUILT

DRAWN	N/A	(DATE)	PIPING AND INSTRUMENTATION DIAGRAM BREATHING AIR SYSTEM (FSAR FIGURE 9.5.10-1 SHEET 3)		
CHKD.	N/A	(DATE)			
SUPV.	N/A	(DATE)			
APPD.	N/A	(DATE)			
UNION ELECTRIC COMPANY ST. LOUIS, MO			CALLAWAY PLANT		CLASS
M-22KB03			REV. 8		