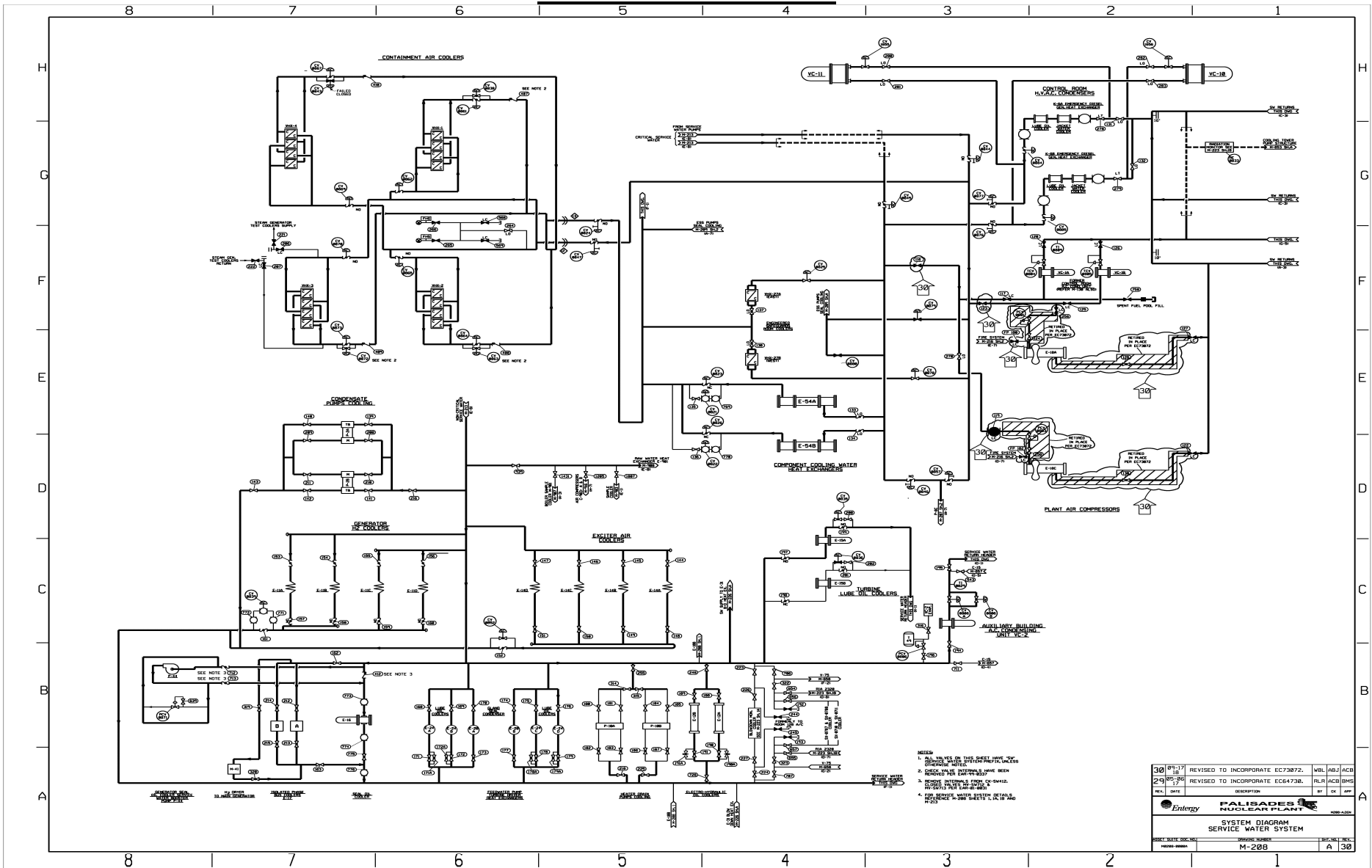
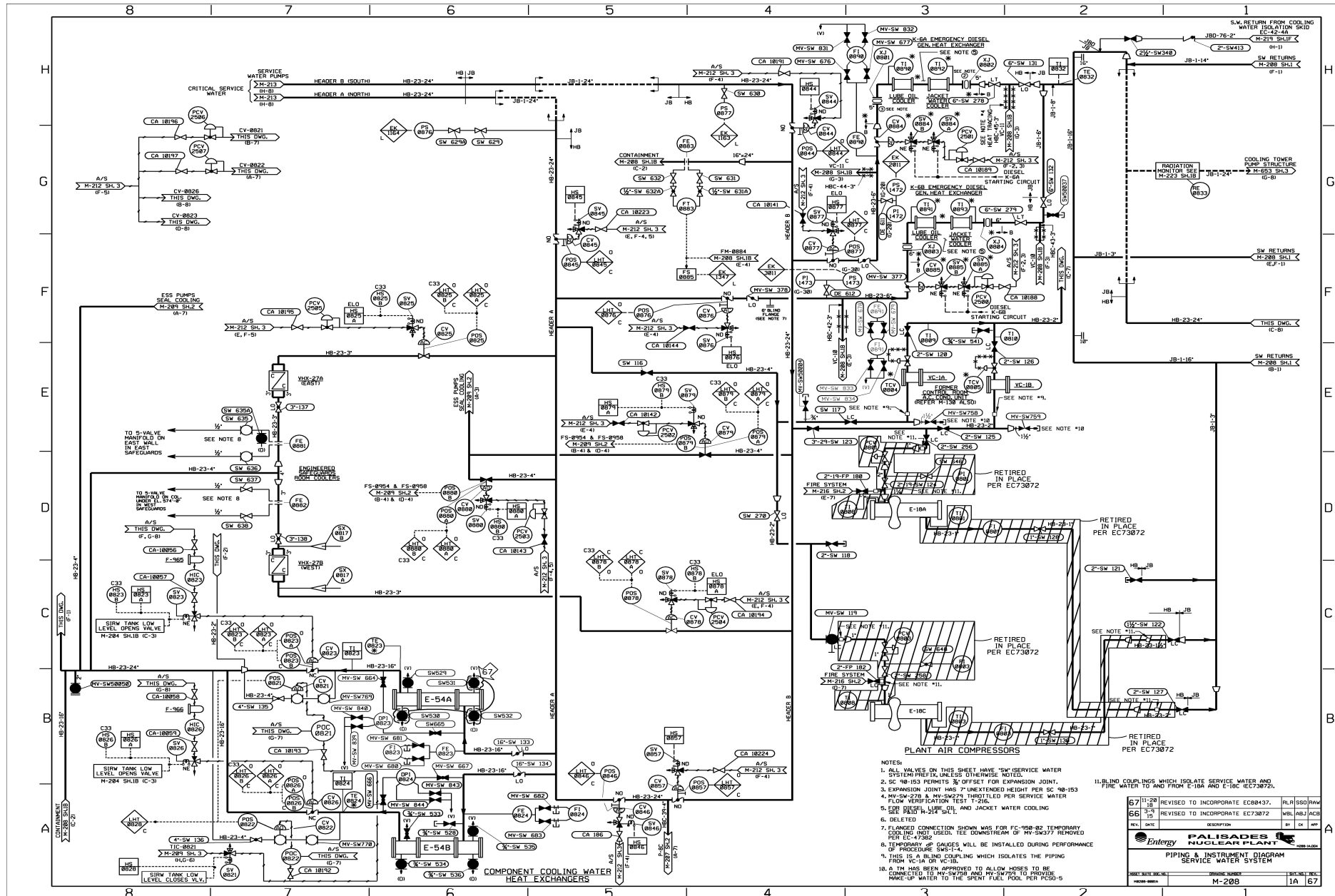


**SYSTEM DIAGRAM
SERVICE WATER SYSTEM**



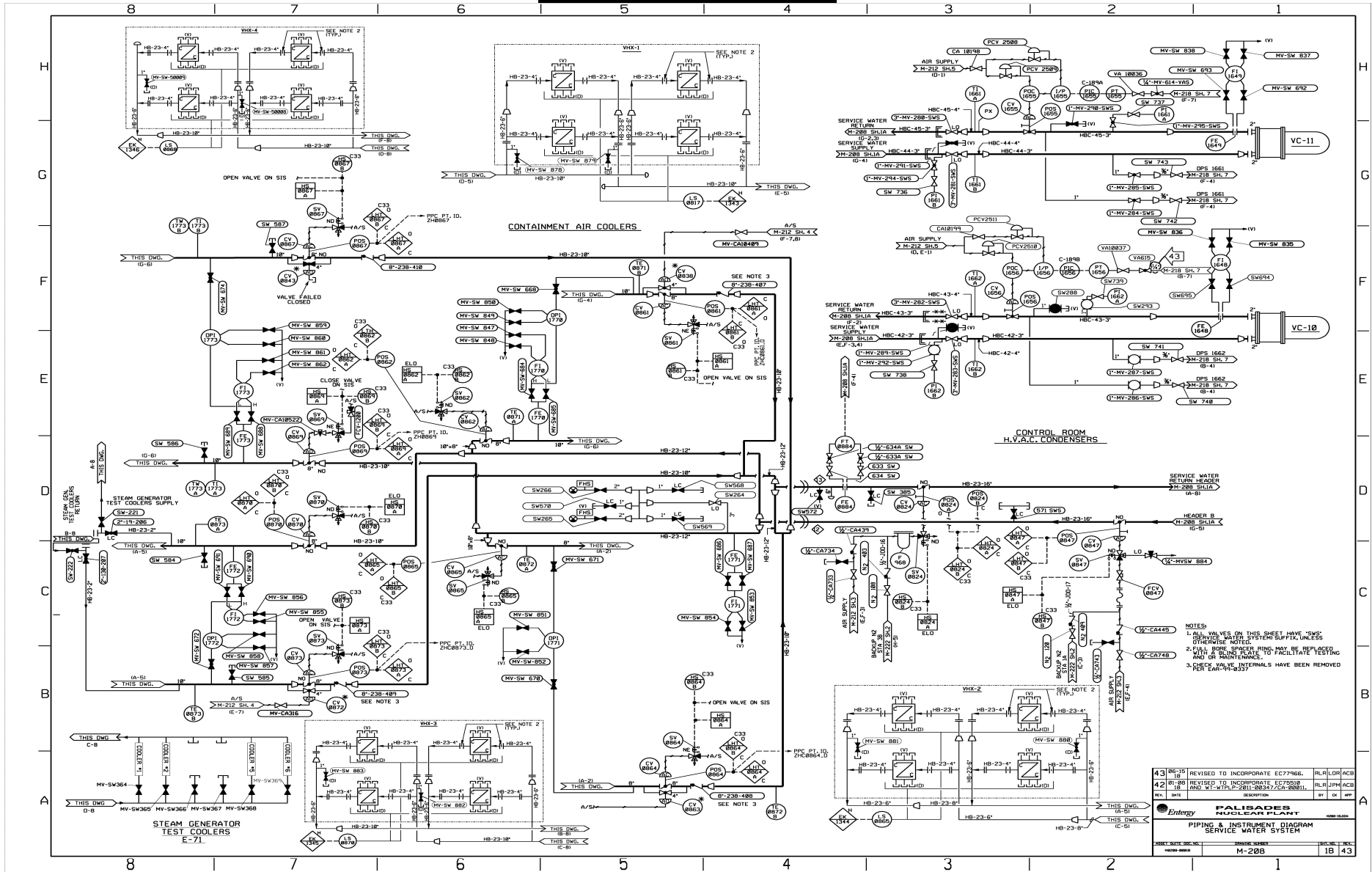
PIPING & INSTRUMENT DIAGRAM
SERVICE WATER SYSTEM



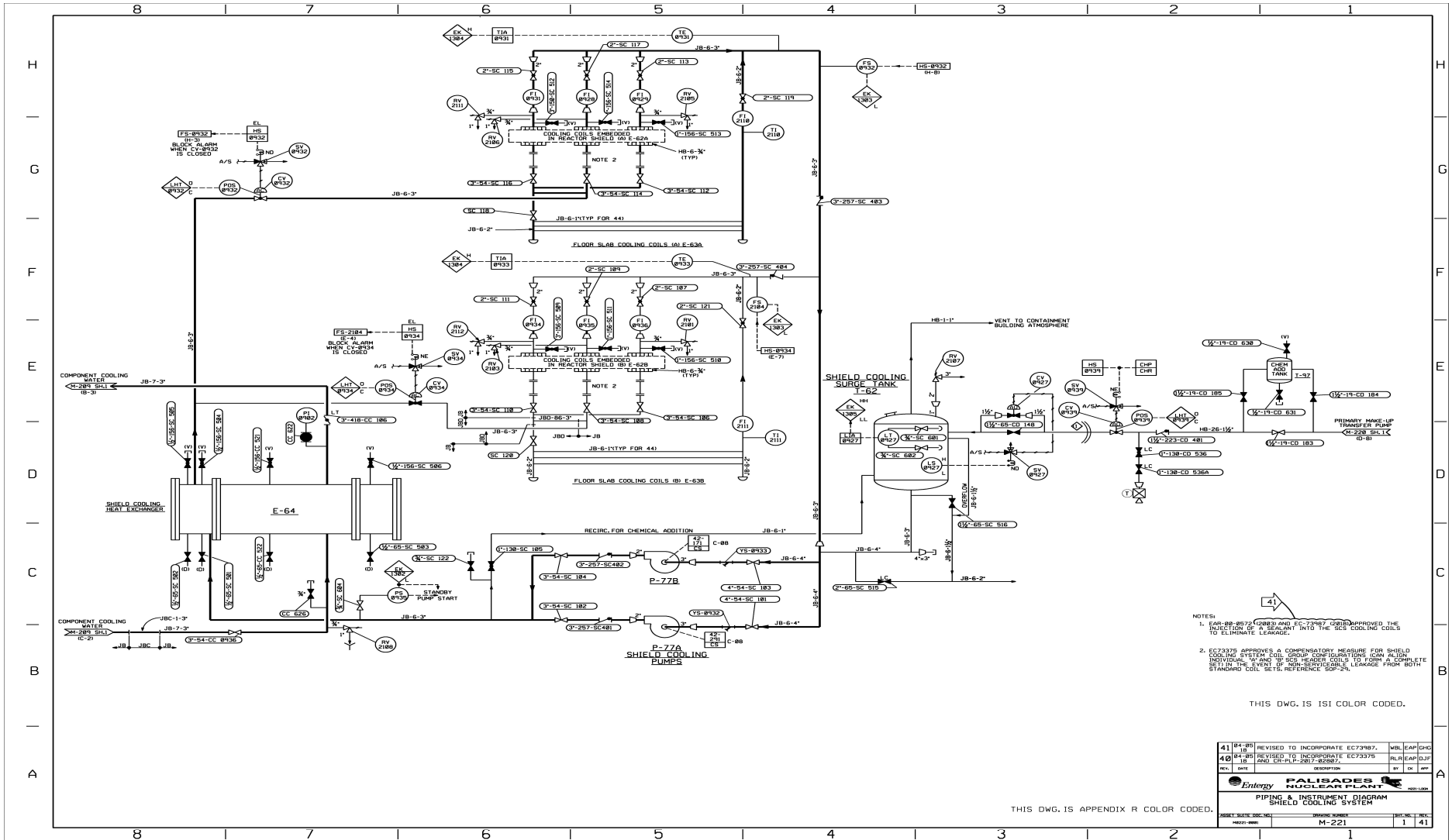
- NOTES:
1. ALL VALVES ON THIS SHEET HAVE "SW" SERVICE WATER SYSTEM PERMITS UNLESS OTHERWISE NOTED.
 2. SC 98-153 PERMITS 3/4" OFFSET FOR EXPANSION JOINT.
 3. EXPANSION JOINT HAS 2" UNEXTENDED HEIGHT PER SC 98-153.
 4. MV-SW-278 & MV-SW-279 ISHIBUTED FOR SERVICE WATER FLOW VERIFICATION TEST T-216.
 5. FSD DIESEL BEE OIL AND JACKET WATER COOLING. SEE P&ID N-314 SH-1.
 6. DELETED.
 7. FLANGED CONNECTION SHOWN WAS FOR EC-908-02 TEMPORARY COOLING (NOT USED). SEE DOWNSTREAM OF MV-SW377 REMOVED PER EC-47382.
 8. TEMPORARY SP GASKETS WILL BE INSTALLED DURING PERFORMANCE OF PROCEDURE SWS-T-4.
 9. THIS IS A BLIND COUPLING WHICH ISOLATES THE PIPING FROM VC-1A OR VC-1B.
 10. A 1/2" NPT FEMALE APPROXIMATELY 18" LONG SHOULD BE CONNECTED TO THE MV-SW-530 AND MV-SW-530 TO PROVIDE MAKE-UP WATER TO THE SPENT FUEL POOL PER PCSO-5.
 11. BLIND COUPLINGS WHICH ISOLATE SERVICE WATER AND FIRE WATER TO AND FROM E-10A AND E-10C EC73072.

67	REVISED TO INCORPORATE EC68437.	RLR/SSD/RAW
66	REVISED TO INCORPORATE EC73072	WBL/ABJ/ACB
REV. DATE	DESCRIPTION	BY
		CV
		MP
ENERGY		
FAISALSAD NUCLEAR PLANT		
PIPING & INSTRUMENT DIAGRAM SERVICE WATER SYSTEM		
DATE	DRAWING NUMBER	SHEET NO. / TOTAL
08/08/2011	M-208	1A / 67

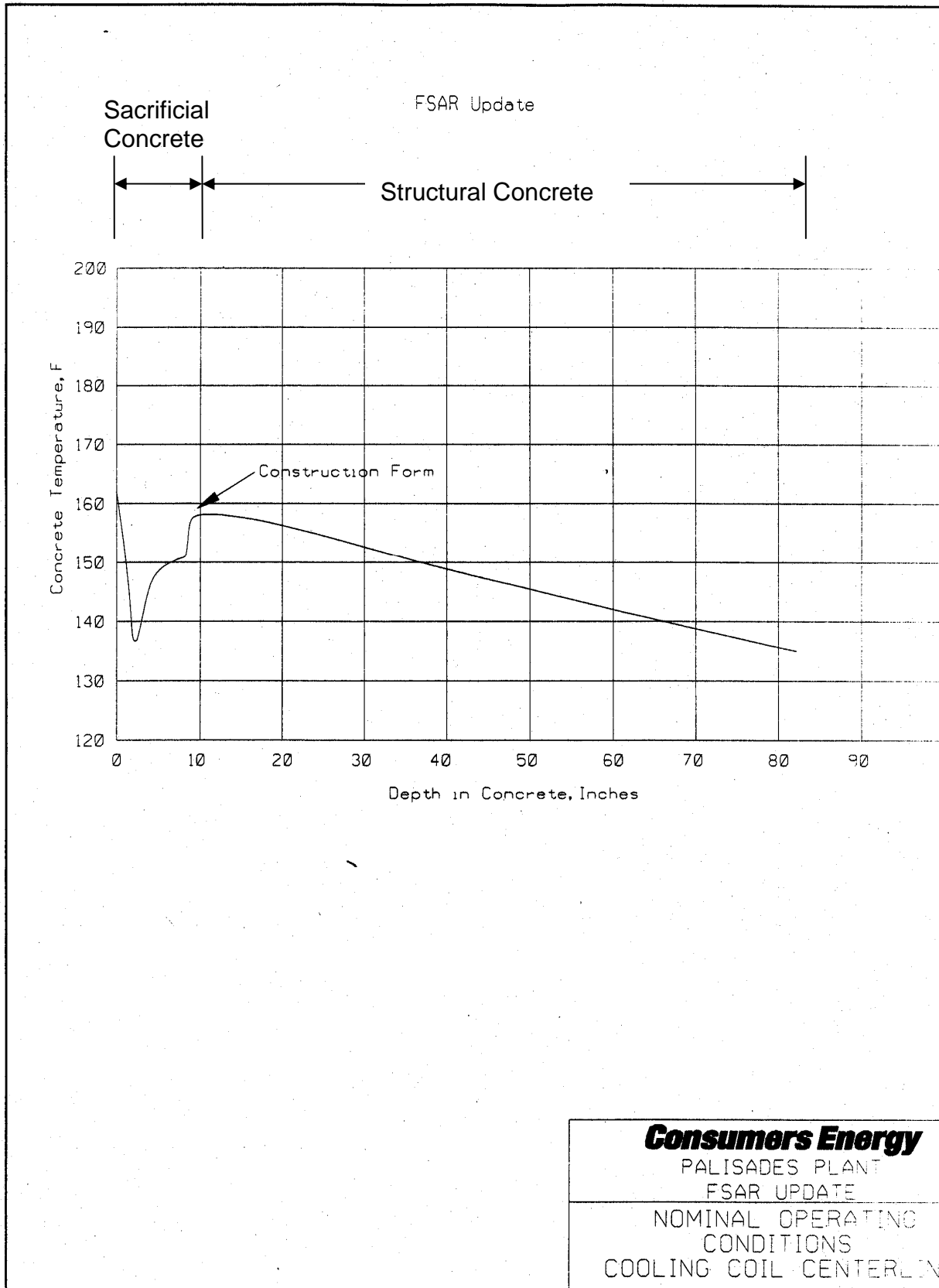
**PIPING & INSTRUMENT DIAGRAM
SERVICE WATER SYSTEM**



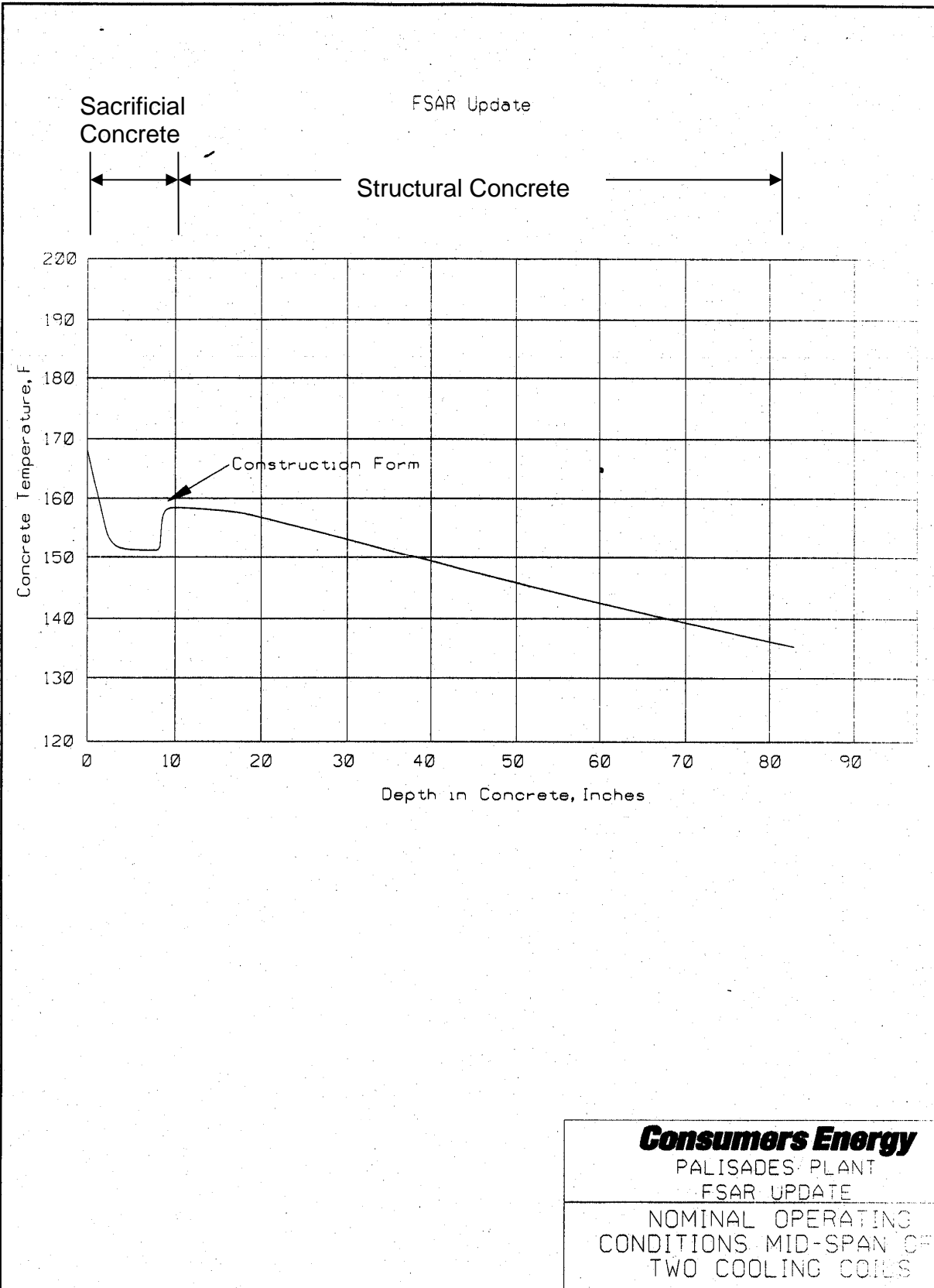
PIPING & INSTRUMENT DIAGRAM
SHIELD COOLING SYSTEM



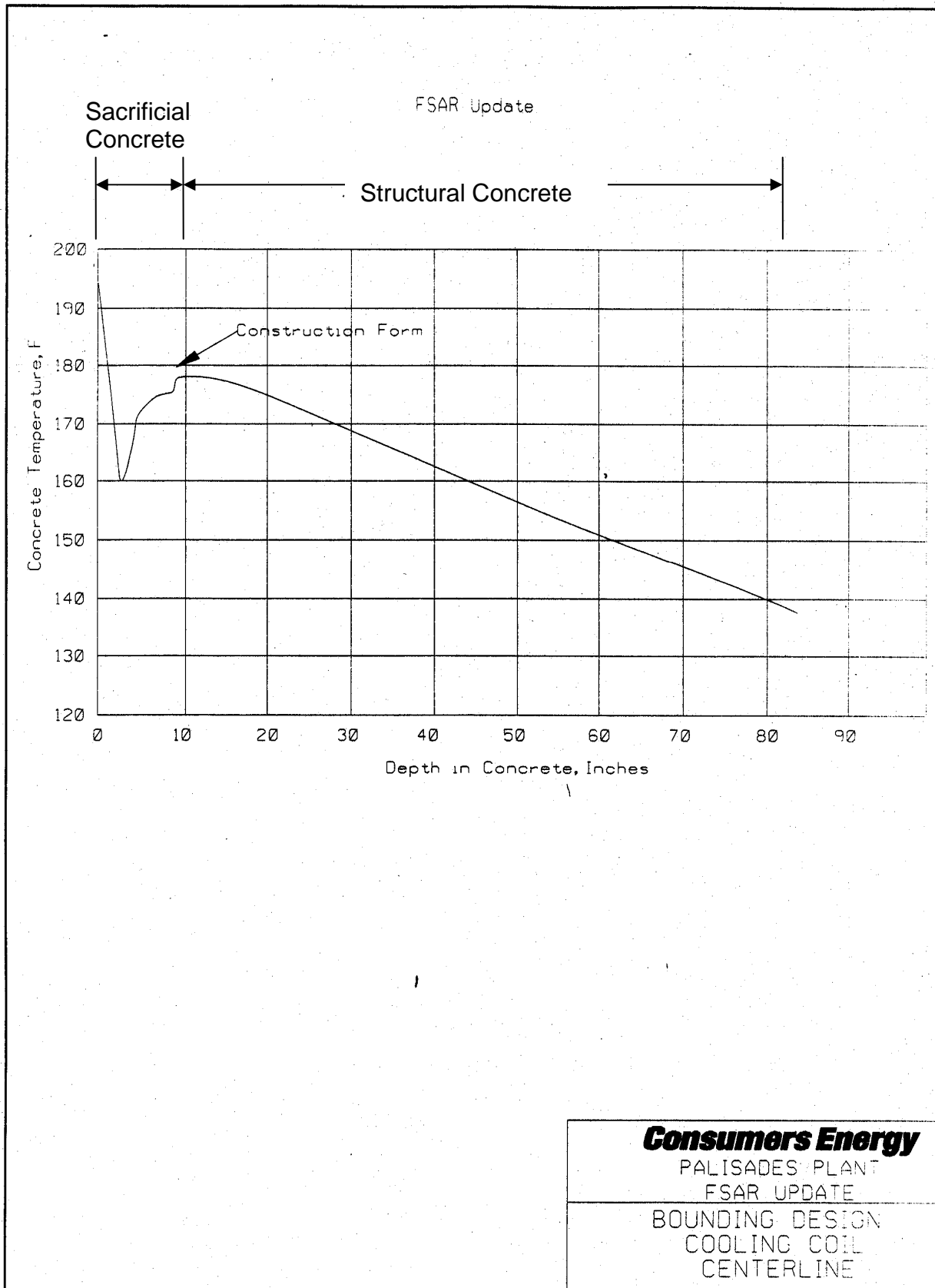
NORMAL OPERATING CONDITIONS COOLING COIL CENTERLINE



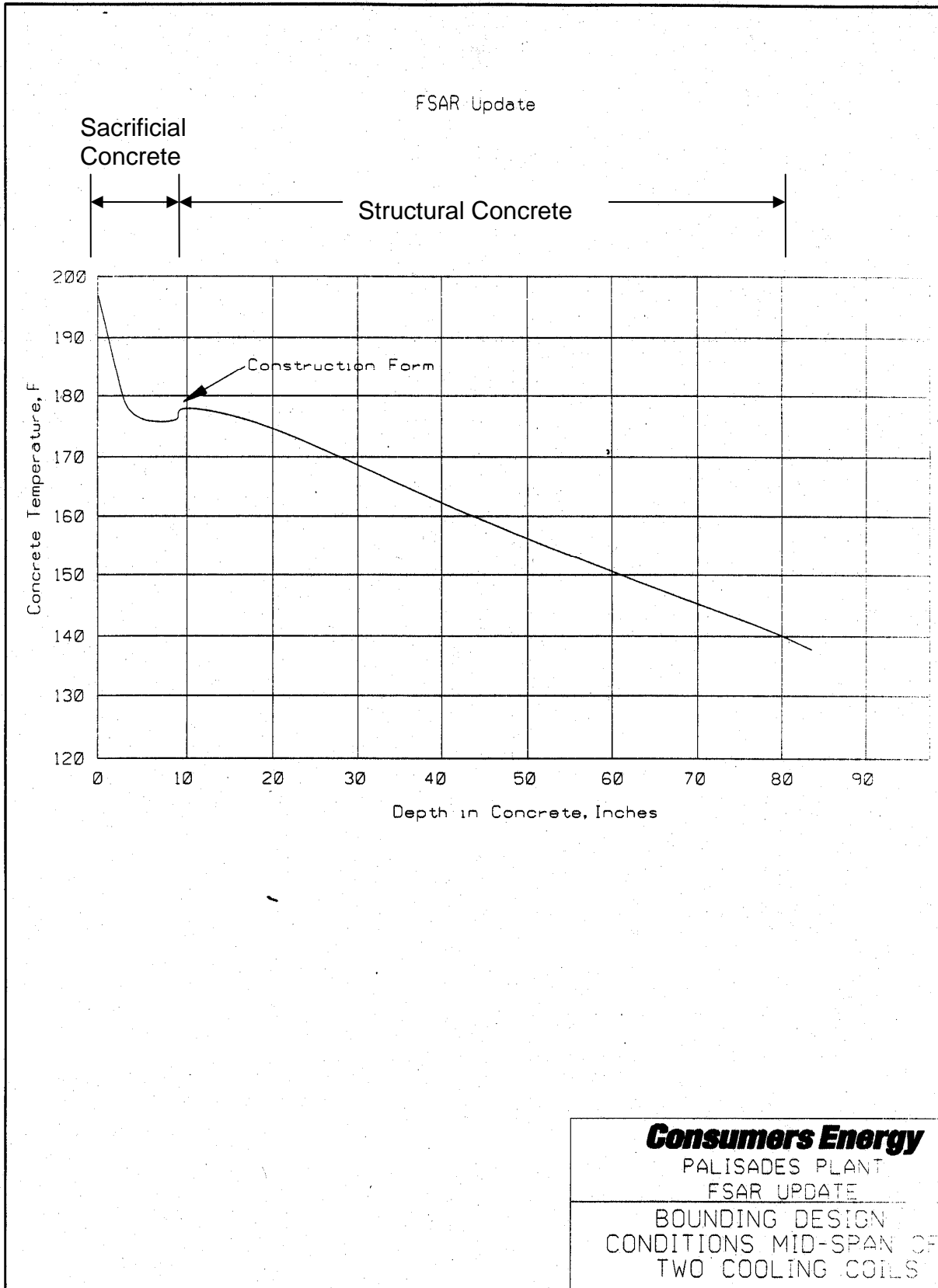
NORMAL OPERATING CONDITIONS MID-SPAN OF TWO COOLING COILS



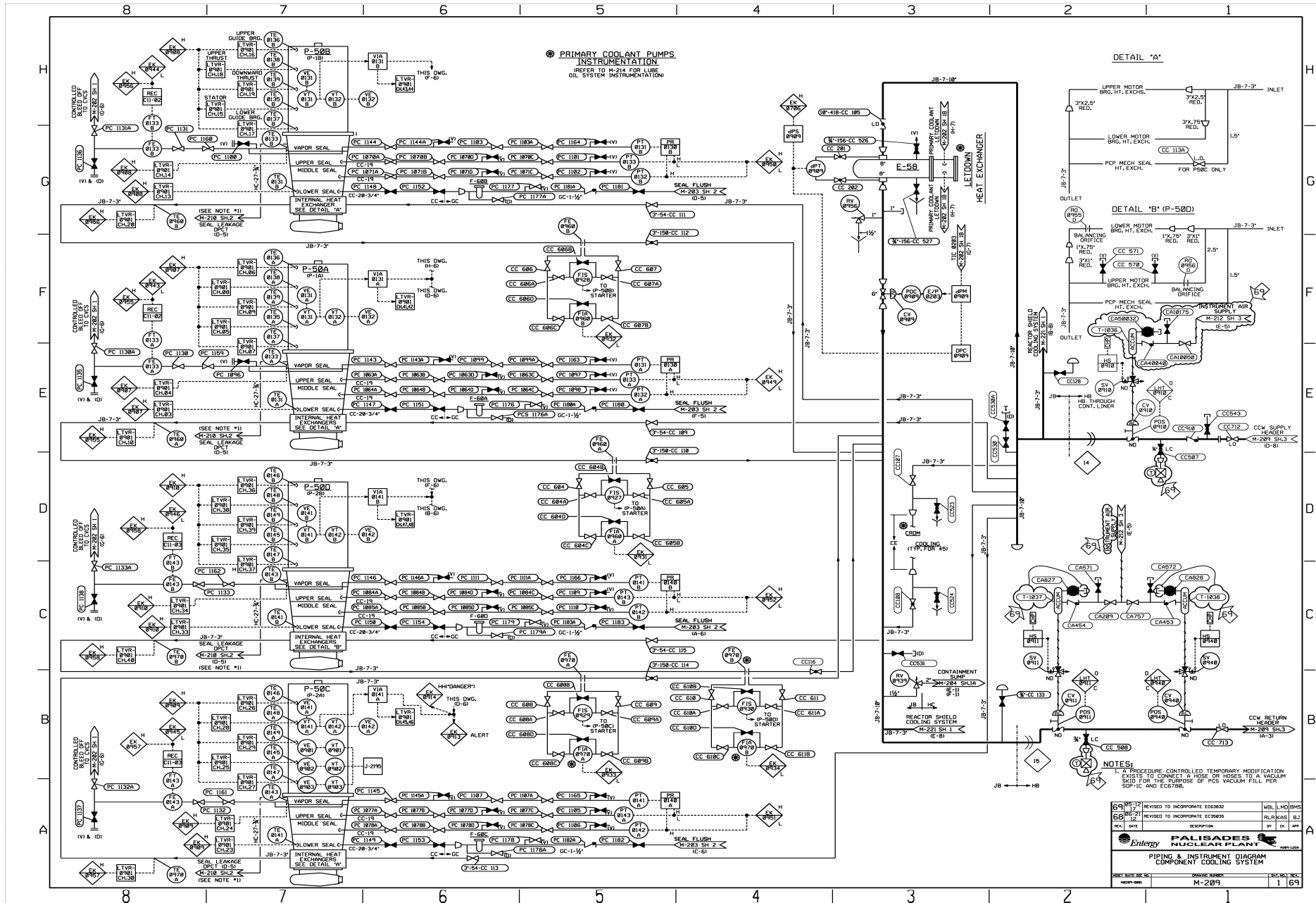
BOUNDING DESIGN COOLING COIL CENTERLINE



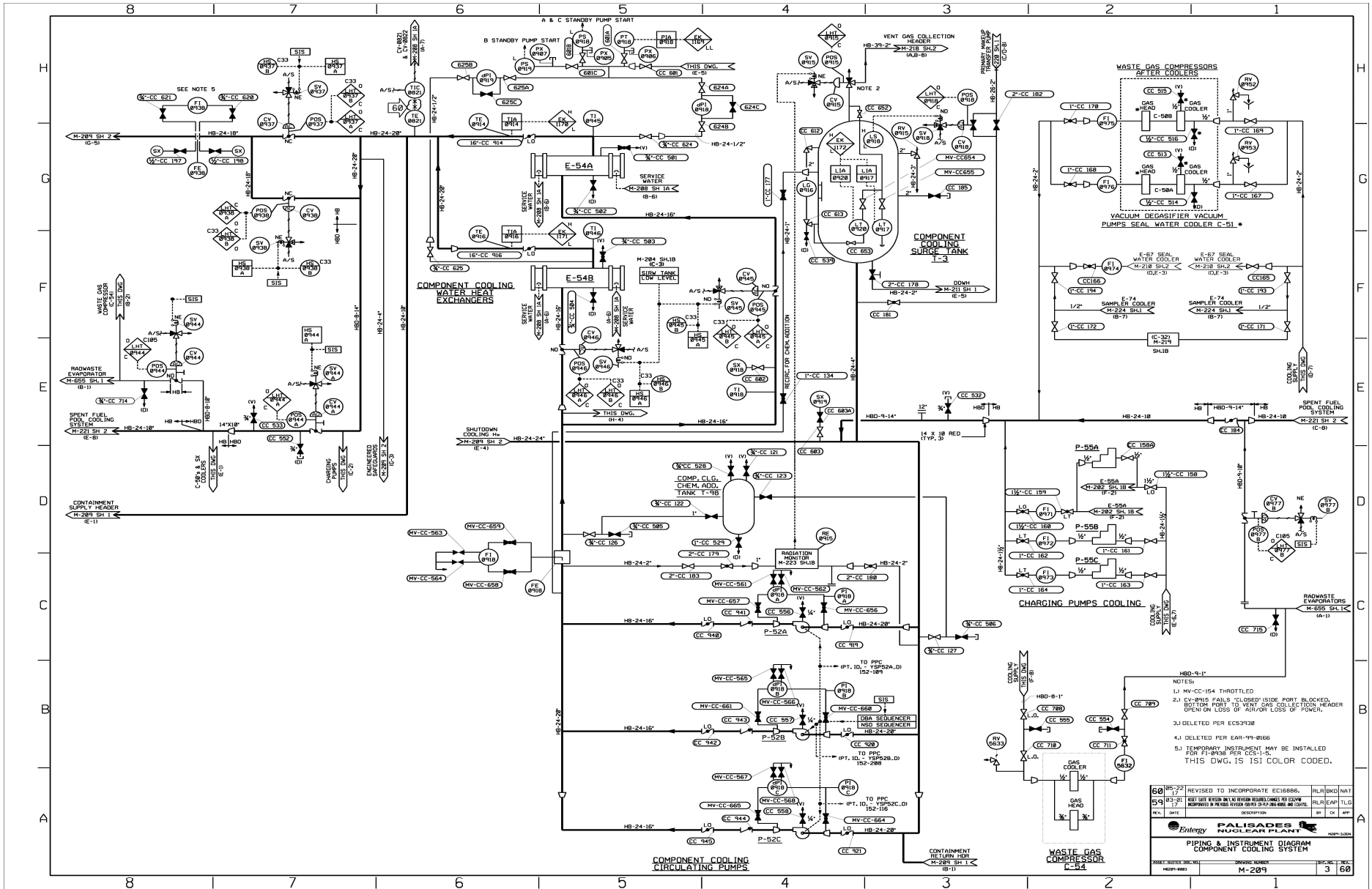
BOUNDING DESIGN CONDITIONS AND MID-SPAN OF TWO COOLING COILS



PIPING & INSTRUMENT DIAGRAM
COMPONENT COOLING SYSTEM



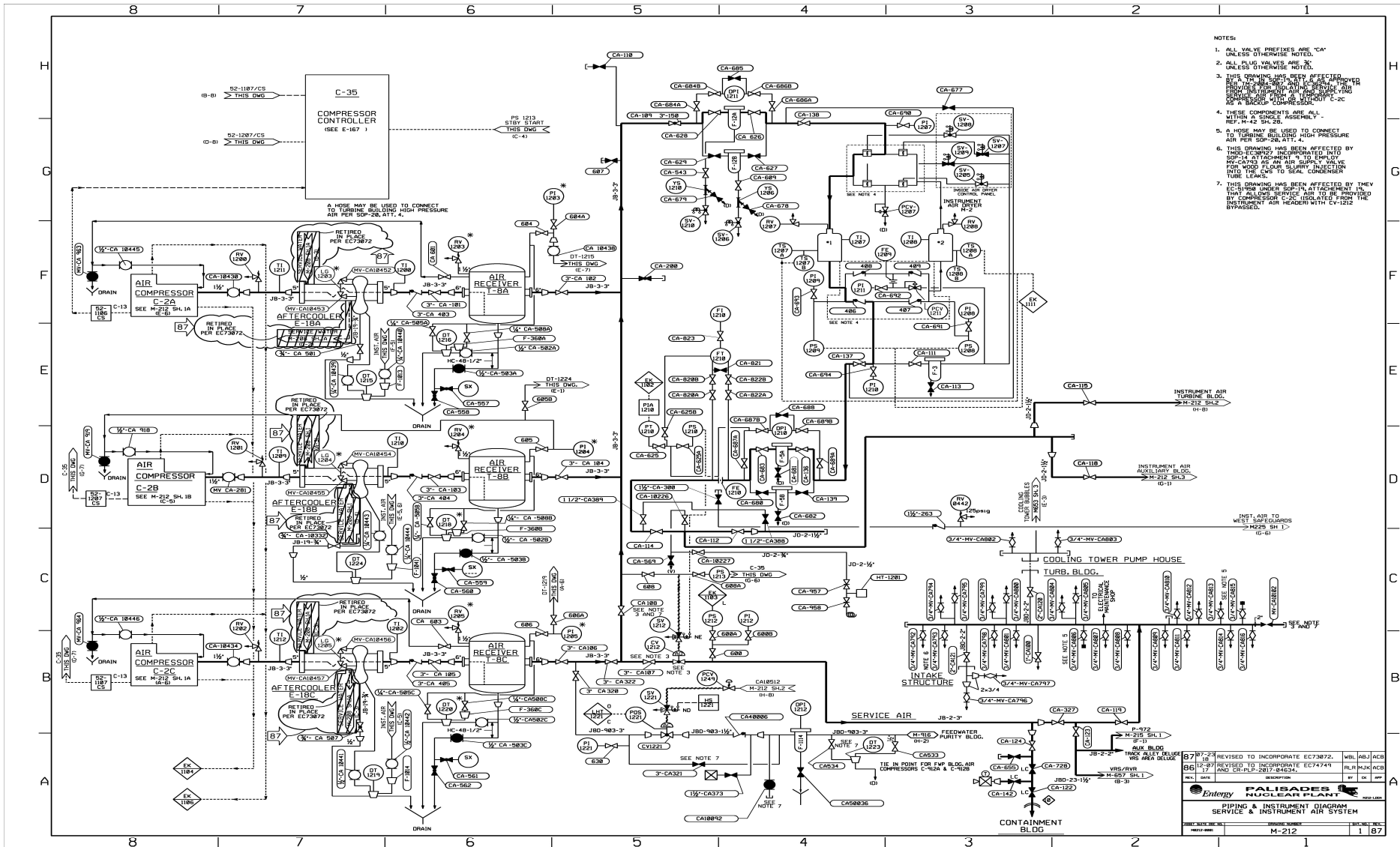
PIPING & INSTRUMENT DIAGRAM
COMPONENT COOLING SYSTEM



- NOTES:
- 1.) MV-CC-154 THROTTLED
 - 2.) CV-0915 FAILS CLOSED (SIDE PORT BLOCKED, BOTTOM PORT TO VENT GAS COLLECTION HEADER OPEN ON LOSS OF AIRFLOW LOSS OF POWER)
 - 3.) DELETED PER EC53730
 - 4.) DELETED PER EAR-91-866
 - 5.) TEMPORARY INSTRUMENT MAY BE INSTALLED FOR FI-0938 PER CCS-1-5.
- THIS DWG. IS 1ST COLOR CODED.

60	REVISED TO INCORPORATE EC1686.	RLR	DKD	NAT
59	REVISED TO INCORPORATE EC1686.	RLR	DKD	NAT
58	REVISED TO INCORPORATE EC1686.	RLR	DKD	NAT
REV.	DATE	DESCRIPTION	BY	CHK
 Palisades Energy PALISADES ENERGY PLANT PIPING & INSTRUMENT DIAGRAM COMPONENT COOLING SYSTEM SHEET NUMBER: M-209 SHEET TOTAL: 3 OF 60				

PIPING & INSTRUMENT DIAGRAM
SERVICE AND INSTRUMENT AIR SYSTEMS

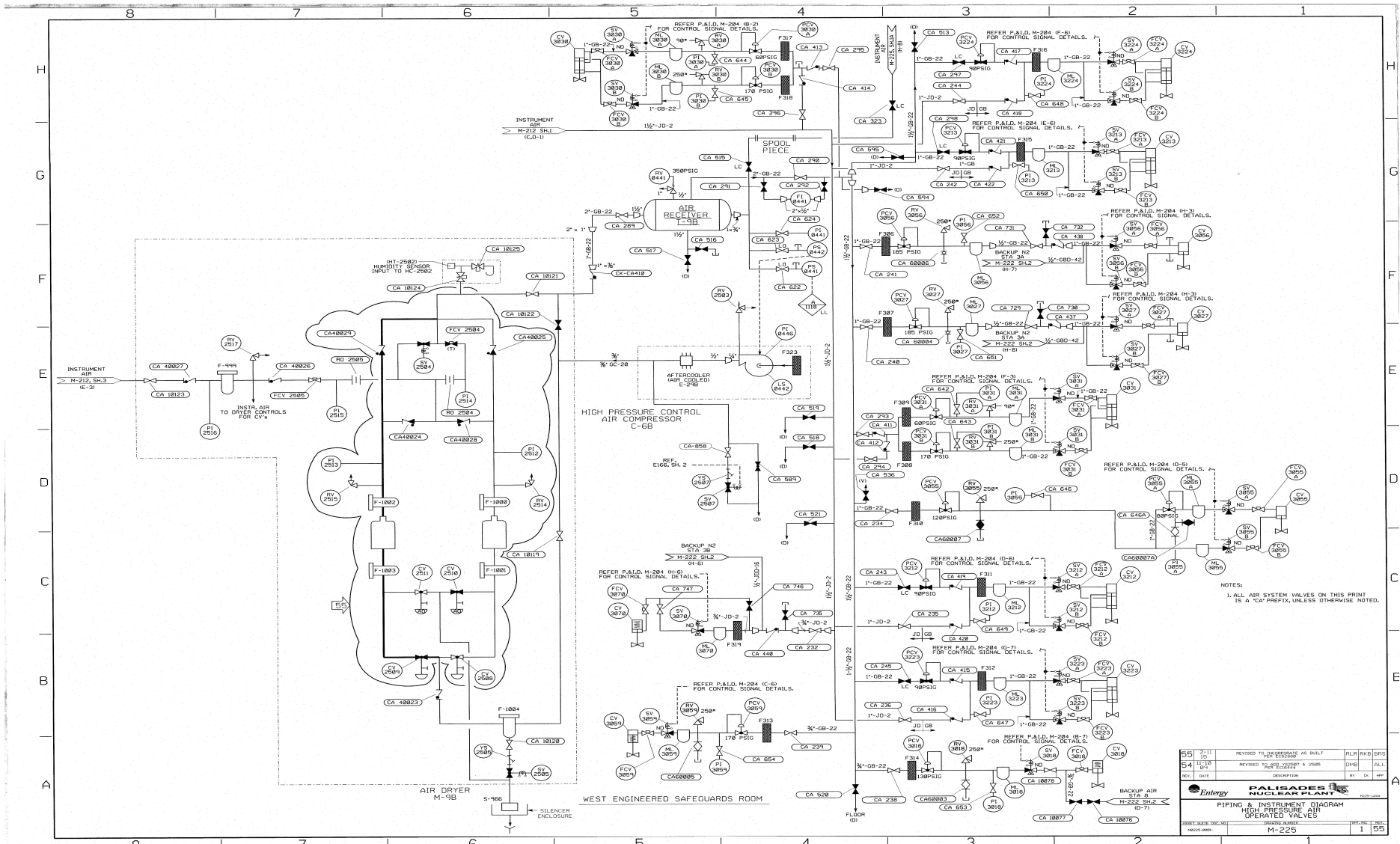


- NOTES:
1. ALL VALVE PREFIXES ARE 'CA' UNLESS OTHERWISE NOTED.
 2. ALL PLUG VALVES ARE 'K' UNLESS OTHERWISE NOTED.
 3. THIS DRAWING HAS BEEN AFFECTED BY THE FOLLOWING REVISIONS: EC73872, EC74744, EC74749, EC74750, EC74751, EC74752, EC74753, EC74754, EC74755, EC74756, EC74757, EC74758, EC74759, EC74760, EC74761, EC74762, EC74763, EC74764, EC74765, EC74766, EC74767, EC74768, EC74769, EC74770, EC74771, EC74772, EC74773, EC74774, EC74775, EC74776, EC74777, EC74778, EC74779, EC74780, EC74781, EC74782, EC74783, EC74784, EC74785, EC74786, EC74787, EC74788, EC74789, EC74790, EC74791, EC74792, EC74793, EC74794, EC74795, EC74796, EC74797, EC74798, EC74799, EC74800.
 4. THESE COMPONENTS ARE ALL WITHIN A SINGLE ASSEMBLY - REF. M-212 SH.26.
 5. A HOSE MAY BE USED TO CONNECT TO TURBINE BUILDING HIGH PRESSURE AIR PER SOP-28, ATT. 4.
 6. THIS DRAWING HAS BEEN AFFECTED BY INSTRUMENT AIR SYSTEMS INCORPORATED INTO THE CA-41 INSTRUMENT AIR SYSTEM FOR WOOD FLOUR SLURRY INJECTION INTO THE CA-1 TO SEAL CONDENSER TUBE LEAKS.
 7. THIS DRAWING HAS BEEN AFFECTED BY THE CA-118 UNDER SUPPLY ATTACHMENT TO INSTRUMENT AIR SYSTEMS TO BE ROUNDED INSTRUMENT AIR HEADERS WITH CV-1215 BYPASS.

REVISED TO INCORPORATE EC73872.	WBL	ABJ	ACB
REVISED TO INCORPORATE EC74744	RLR	NJK	ACH
REVISED TO INCORPORATE EC74749	WBL	ABJ	ACB
REVISED TO INCORPORATE EC74750	WBL	ABJ	ACB
REVISED TO INCORPORATE EC74751	WBL	ABJ	ACB
REVISED TO INCORPORATE EC74752	WBL	ABJ	ACB
REVISED TO INCORPORATE EC74753	WBL	ABJ	ACB
REVISED TO INCORPORATE EC74754	WBL	ABJ	ACB
REVISED TO INCORPORATE EC74755	WBL	ABJ	ACB
REVISED TO INCORPORATE EC74756	WBL	ABJ	ACB
REVISED TO INCORPORATE EC74757	WBL	ABJ	ACB
REVISED TO INCORPORATE EC74758	WBL	ABJ	ACB
REVISED TO INCORPORATE EC74759	WBL	ABJ	ACB
REVISED TO INCORPORATE EC74760	WBL	ABJ	ACB
REVISED TO INCORPORATE EC74761	WBL	ABJ	ACB
REVISED TO INCORPORATE EC74762	WBL	ABJ	ACB
REVISED TO INCORPORATE EC74763	WBL	ABJ	ACB
REVISED TO INCORPORATE EC74764	WBL	ABJ	ACB
REVISED TO INCORPORATE EC74765	WBL	ABJ	ACB
REVISED TO INCORPORATE EC74766	WBL	ABJ	ACB
REVISED TO INCORPORATE EC74767	WBL	ABJ	ACB
REVISED TO INCORPORATE EC74768	WBL	ABJ	ACB
REVISED TO INCORPORATE EC74769	WBL	ABJ	ACB
REVISED TO INCORPORATE EC74770	WBL	ABJ	ACB
REVISED TO INCORPORATE EC74771	WBL	ABJ	ACB
REVISED TO INCORPORATE EC74772	WBL	ABJ	ACB
REVISED TO INCORPORATE EC74773	WBL	ABJ	ACB
REVISED TO INCORPORATE EC74774	WBL	ABJ	ACB
REVISED TO INCORPORATE EC74775	WBL	ABJ	ACB
REVISED TO INCORPORATE EC74776	WBL	ABJ	ACB
REVISED TO INCORPORATE EC74777	WBL	ABJ	ACB
REVISED TO INCORPORATE EC74778	WBL	ABJ	ACB
REVISED TO INCORPORATE EC74779	WBL	ABJ	ACB
REVISED TO INCORPORATE EC74780	WBL	ABJ	ACB
REVISED TO INCORPORATE EC74781	WBL	ABJ	ACB
REVISED TO INCORPORATE EC74782	WBL	ABJ	ACB
REVISED TO INCORPORATE EC74783	WBL	ABJ	ACB
REVISED TO INCORPORATE EC74784	WBL	ABJ	ACB
REVISED TO INCORPORATE EC74785	WBL	ABJ	ACB
REVISED TO INCORPORATE EC74786	WBL	ABJ	ACB
REVISED TO INCORPORATE EC74787	WBL	ABJ	ACB
REVISED TO INCORPORATE EC74788	WBL	ABJ	ACB
REVISED TO INCORPORATE EC74789	WBL	ABJ	ACB
REVISED TO INCORPORATE EC74790	WBL	ABJ	ACB
REVISED TO INCORPORATE EC74791	WBL	ABJ	ACB
REVISED TO INCORPORATE EC74792	WBL	ABJ	ACB
REVISED TO INCORPORATE EC74793	WBL	ABJ	ACB
REVISED TO INCORPORATE EC74794	WBL	ABJ	ACB
REVISED TO INCORPORATE EC74795	WBL	ABJ	ACB
REVISED TO INCORPORATE EC74796	WBL	ABJ	ACB
REVISED TO INCORPORATE EC74797	WBL	ABJ	ACB
REVISED TO INCORPORATE EC74798	WBL	ABJ	ACB
REVISED TO INCORPORATE EC74799	WBL	ABJ	ACB
REVISED TO INCORPORATE EC74800	WBL	ABJ	ACB

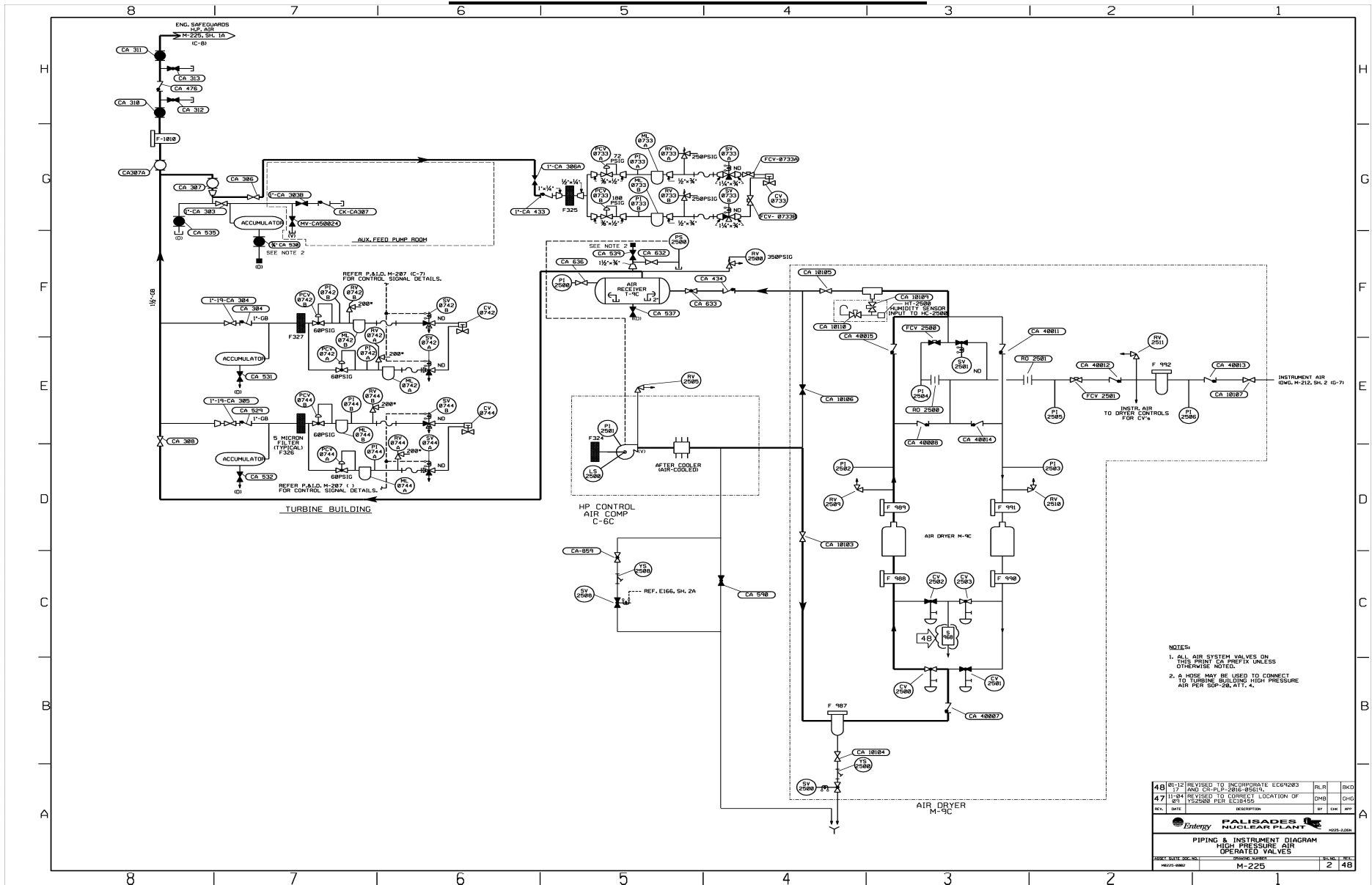
ENTEGRY
FALSADES
NUCLEAR PLANT
PIPING & INSTRUMENT DIAGRAM
SERVICE & INSTRUMENT AIR SYSTEM

**PIPING & INSTRUMENT DIAGRAM
HIGH PRESSURE AIR OPERATED VALVES**

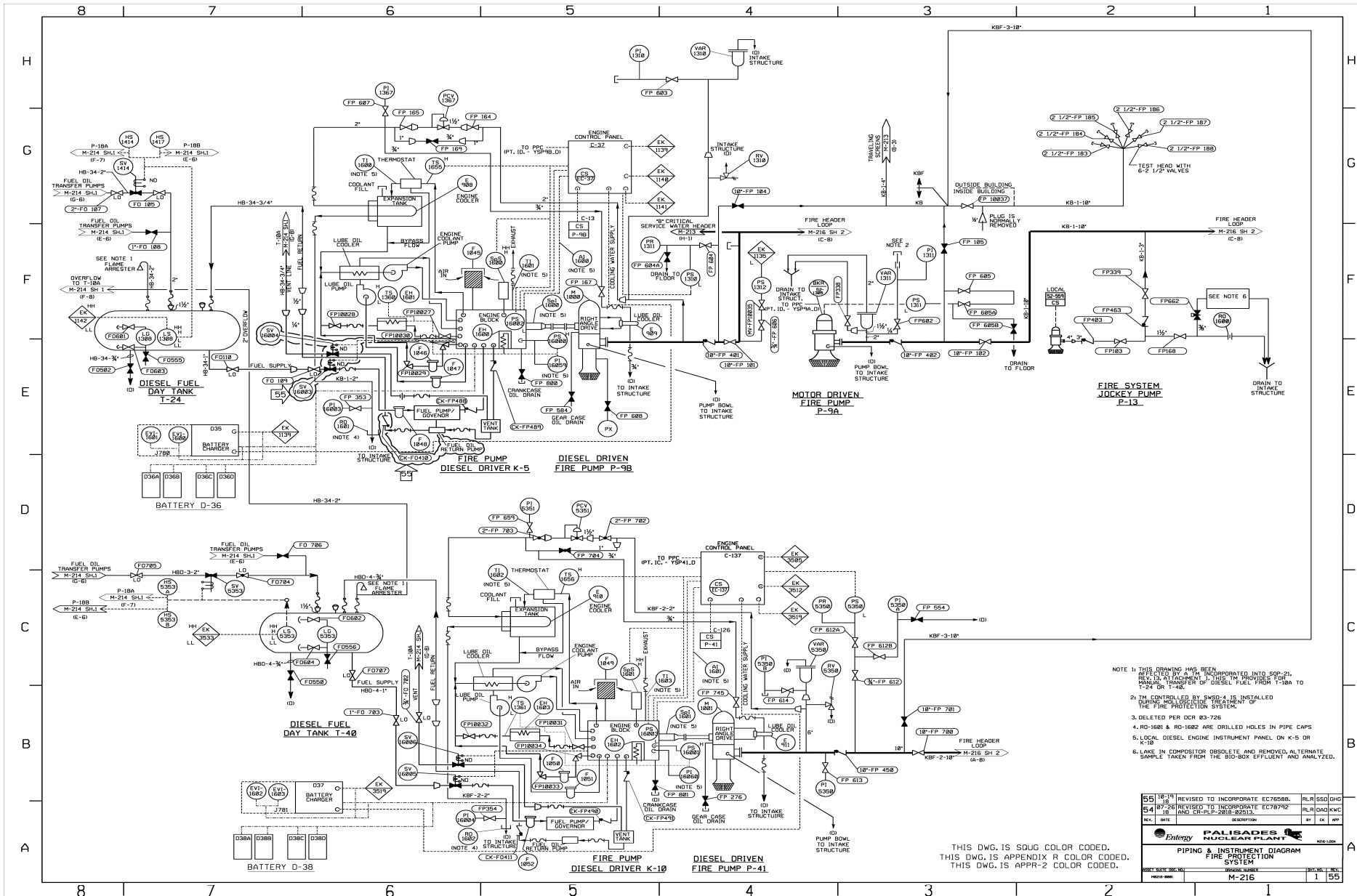


55	2-11	REVISED TO INCORPORATE AS BUILT	FILED	SHS
54	11-10	REVISED TO ADD 22227 AND 2986	(DNE)	ALL
REV.	DATE	DESCRIPTION	BY	CHK
PIPING & INSTRUMENT DIAGRAM HIGH PRESSURE AIR OPERATED VALVES				
		PROJECT: M-225 SHEET: 1 TOTAL: 55		

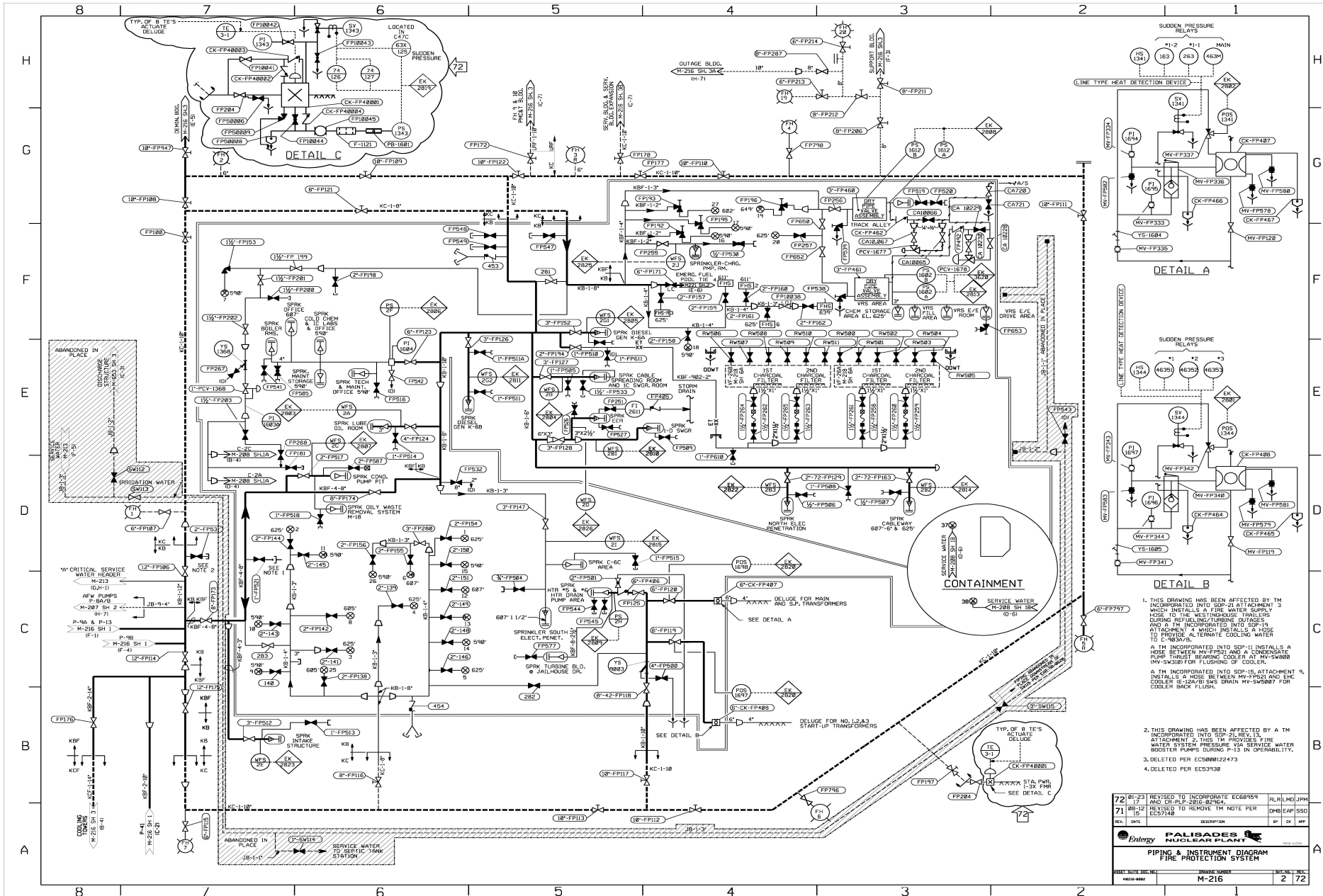
**PIPING & INSTRUMENT DIAGRAM
HIGH PRESSURE AIR OPERATED VALVES**



PIPING & INSTRUMENT DIAGRAM
FIRE PROTECTION SYSTEM



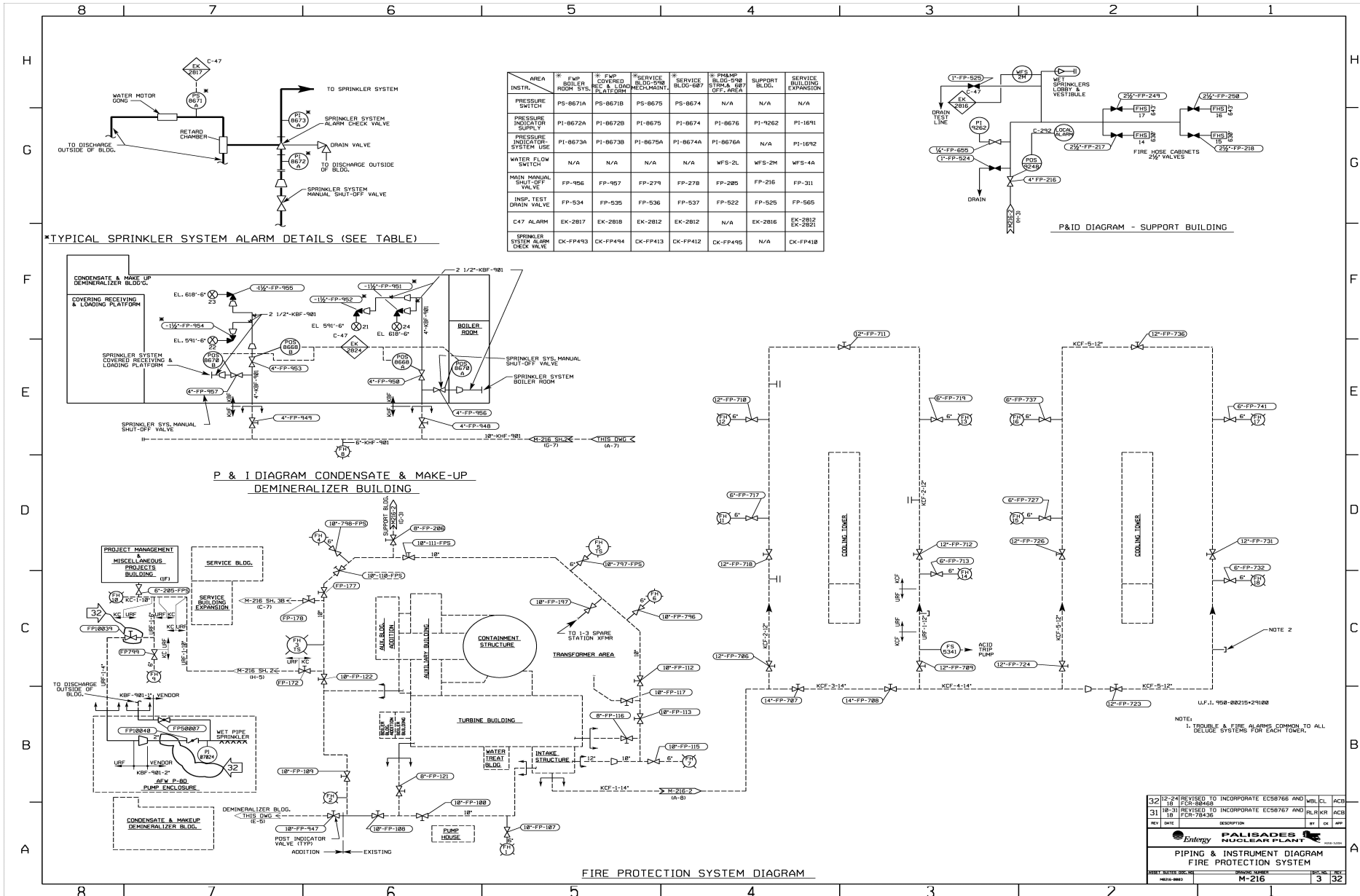
PIPING & INSTRUMENT DIAGRAM
FIRE PROTECTION SYSTEM



1. THIS DRAWING HAS BEEN AFFECTED BY TM INCORPORATED INTO SSP-21 REV. 13.
2. THIS DRAWING HAS BEEN AFFECTED BY A TM INCORPORATED INTO SSP-21 REV. 13.
3. DELETED PER EC59800122473
4. DELETED PER EC53938

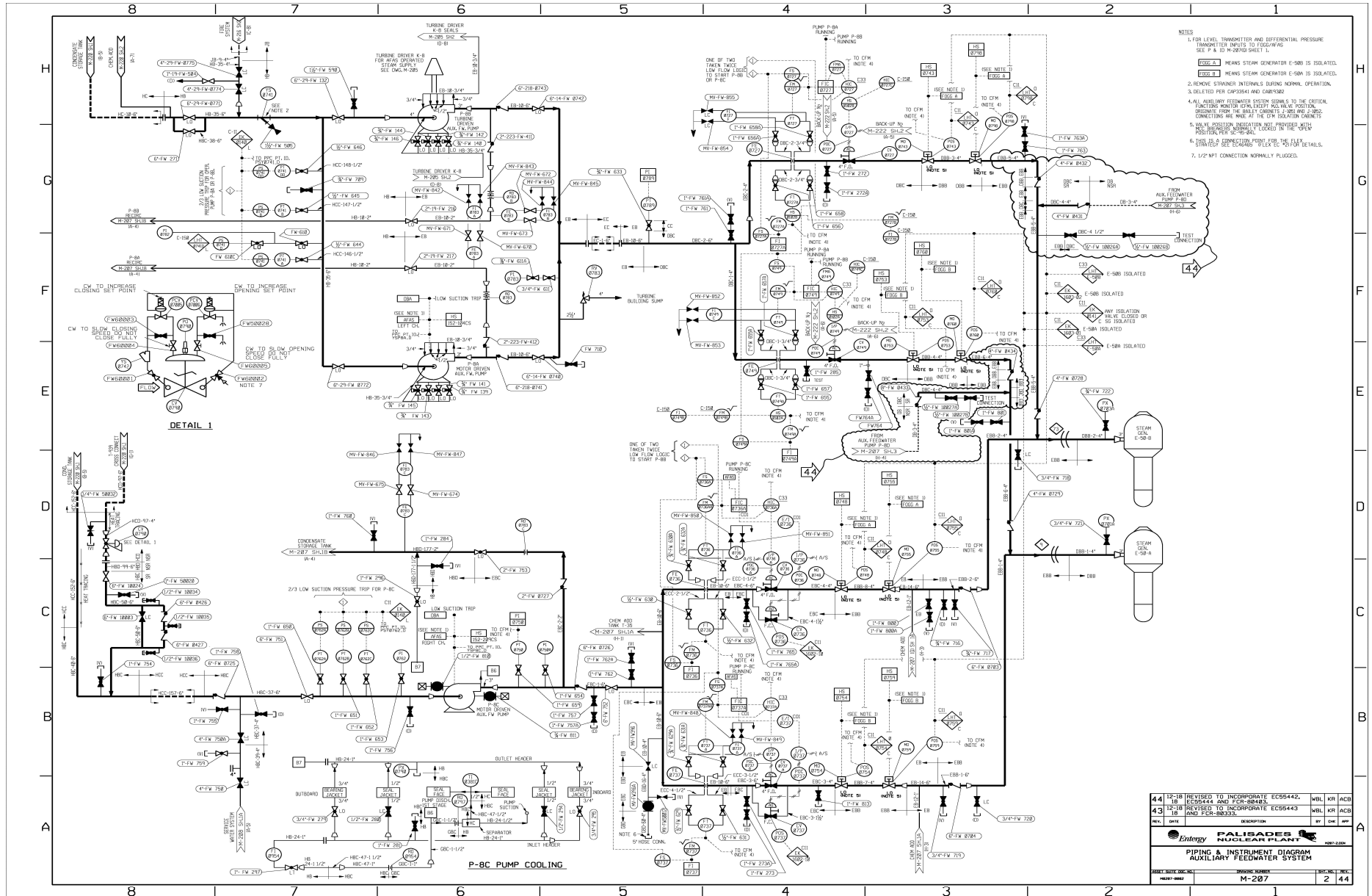
72	REV. 17	REVISED TO INCORPORATE EC68699 AND CR-PLP-2816-82964.	RLM	LD	JPM
71	REV. 15	REVISED TO REMOVE TM NOTE PER EC57148	DMB	EAP	SSD
REV.	DATE	DESCRIPTION	BY	CHK	APP
PIPING & INSTRUMENT DIAGRAM					
FIRE PROTECTION SYSTEM					
DATE	SCALE	DOC. NO.	PROG. NUMBER	SHEET NO.	TOTAL SHEETS
MAY-88	AS SHOWN	M-216		2	72

PIPING & INSTRUMENT DIAGRAM
FIRE PROTECTION SYSTEM

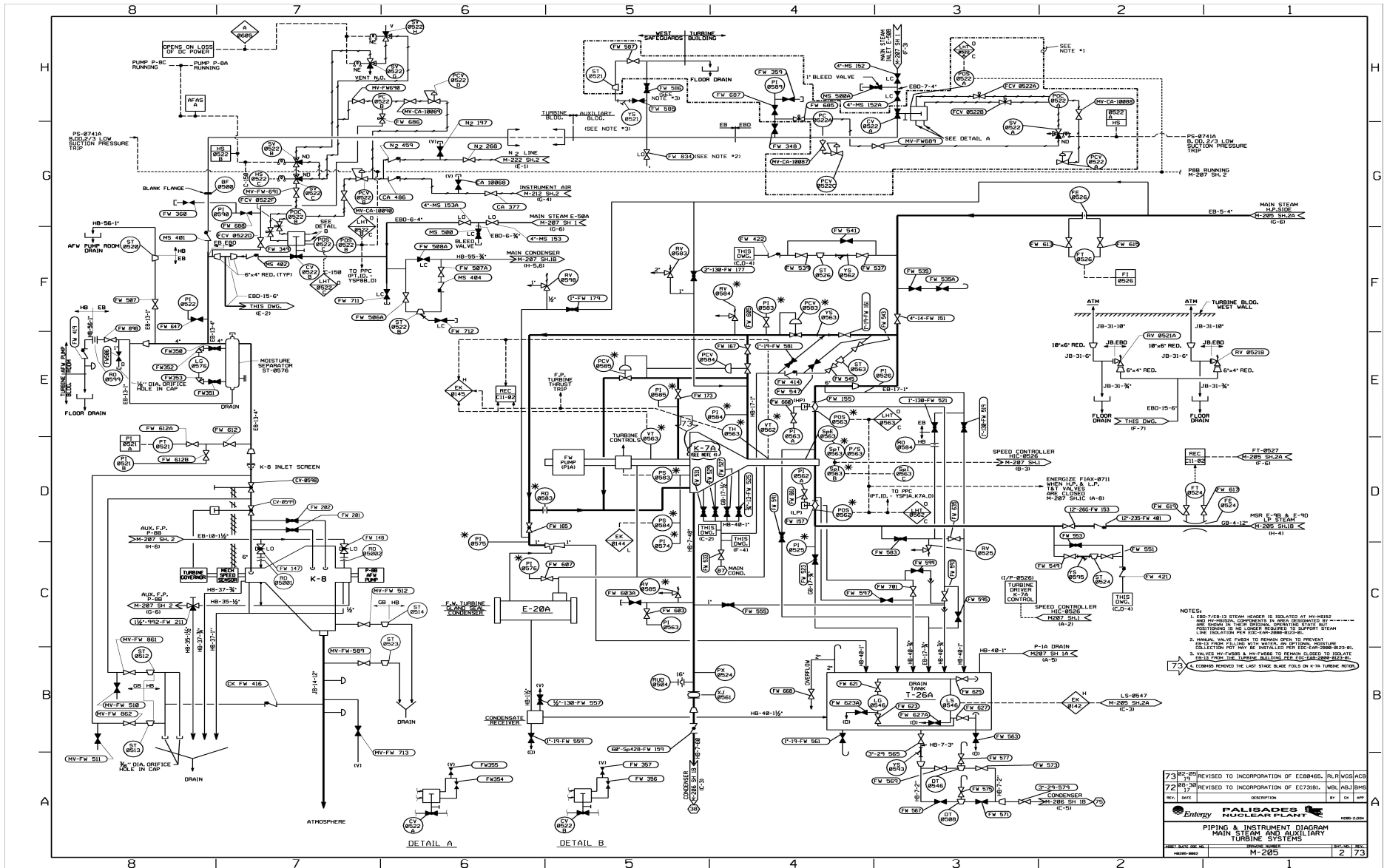


32	REVISED TO INCORPORATE EC58766 AND EC58767	WBL	CL	ACB
31	REVISED TO INCORPORATE EC58767 AND EC58768	RLR	KR	ACB
18	REVISED TO INCORPORATE EC58767 AND EC58768	RLR	KR	ACB
REV	DATE	DESCRIPTION	BY	CHK
PIPING & INSTRUMENT DIAGRAM FIRE PROTECTION SYSTEM				
PROJECT NUMBER	DATE	DRAWING NUMBER	REV. NO.	TOTAL
9810-0000		M-216	3	32

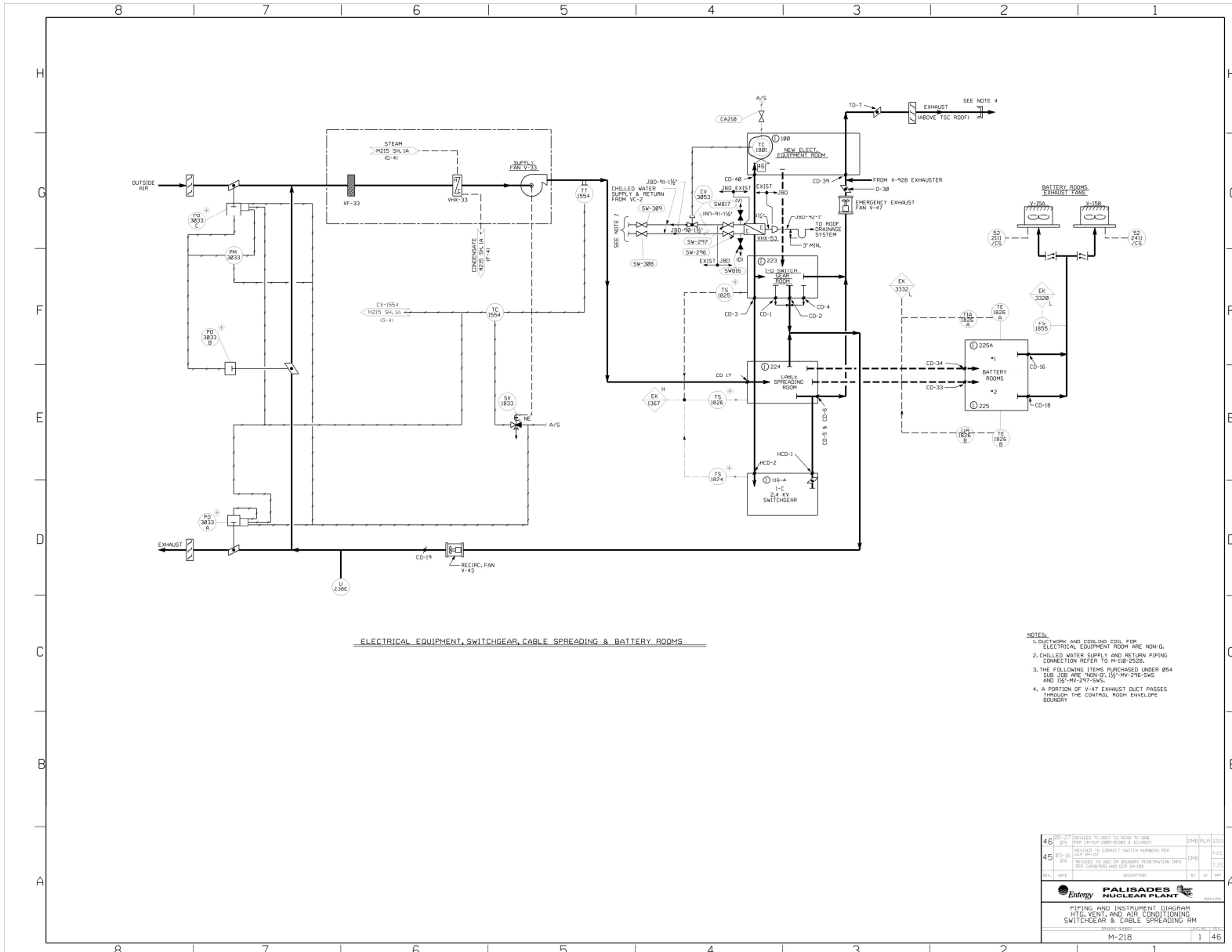
**PIPING & INSTRUMENT DIAGRAM
AUXILIARY FEEDWATER SYSTEM**



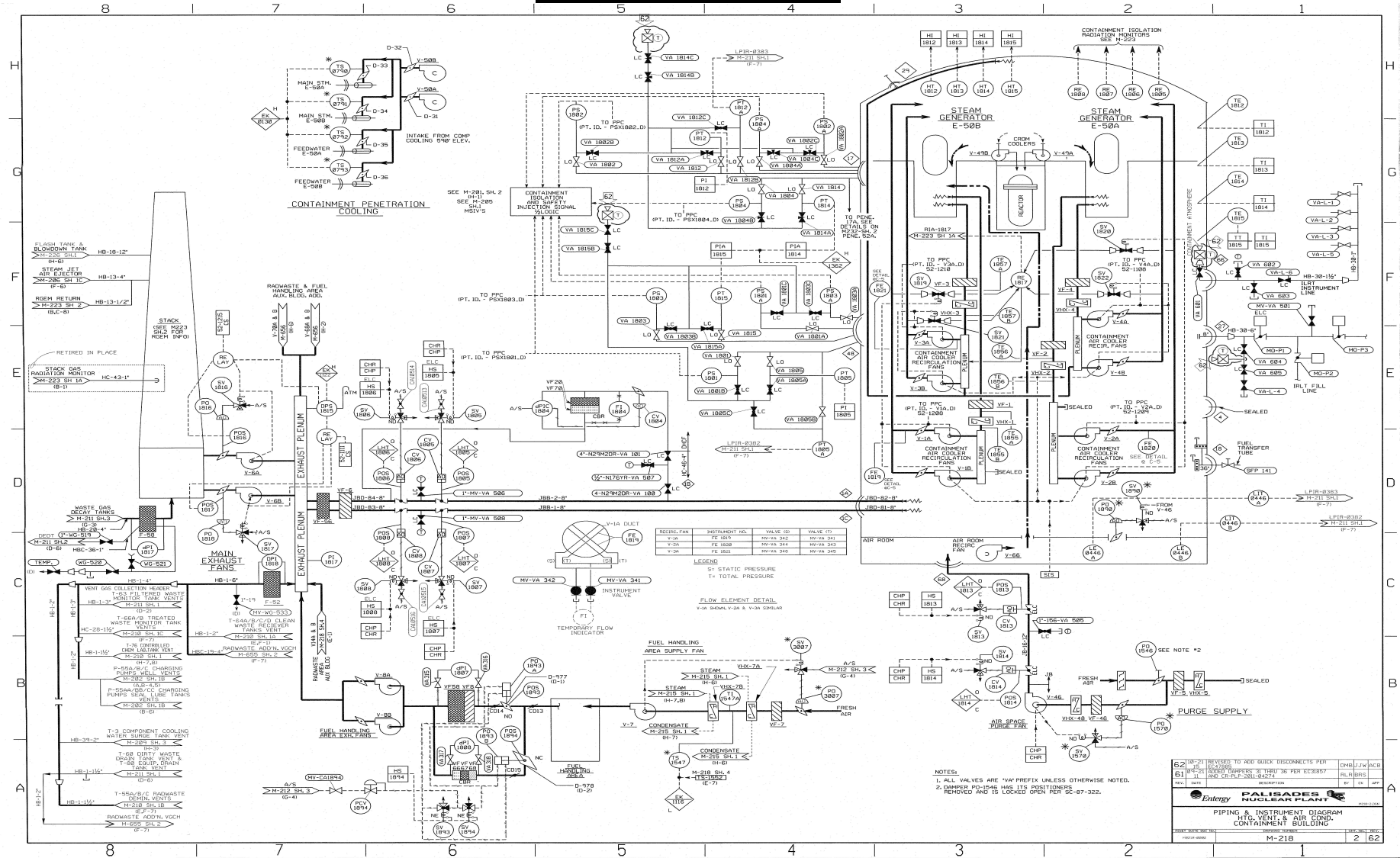
**PIPING & INSTRUMENT DIAGRAM
AUXILIARY FEEDWATER STEAM SUPPLY**



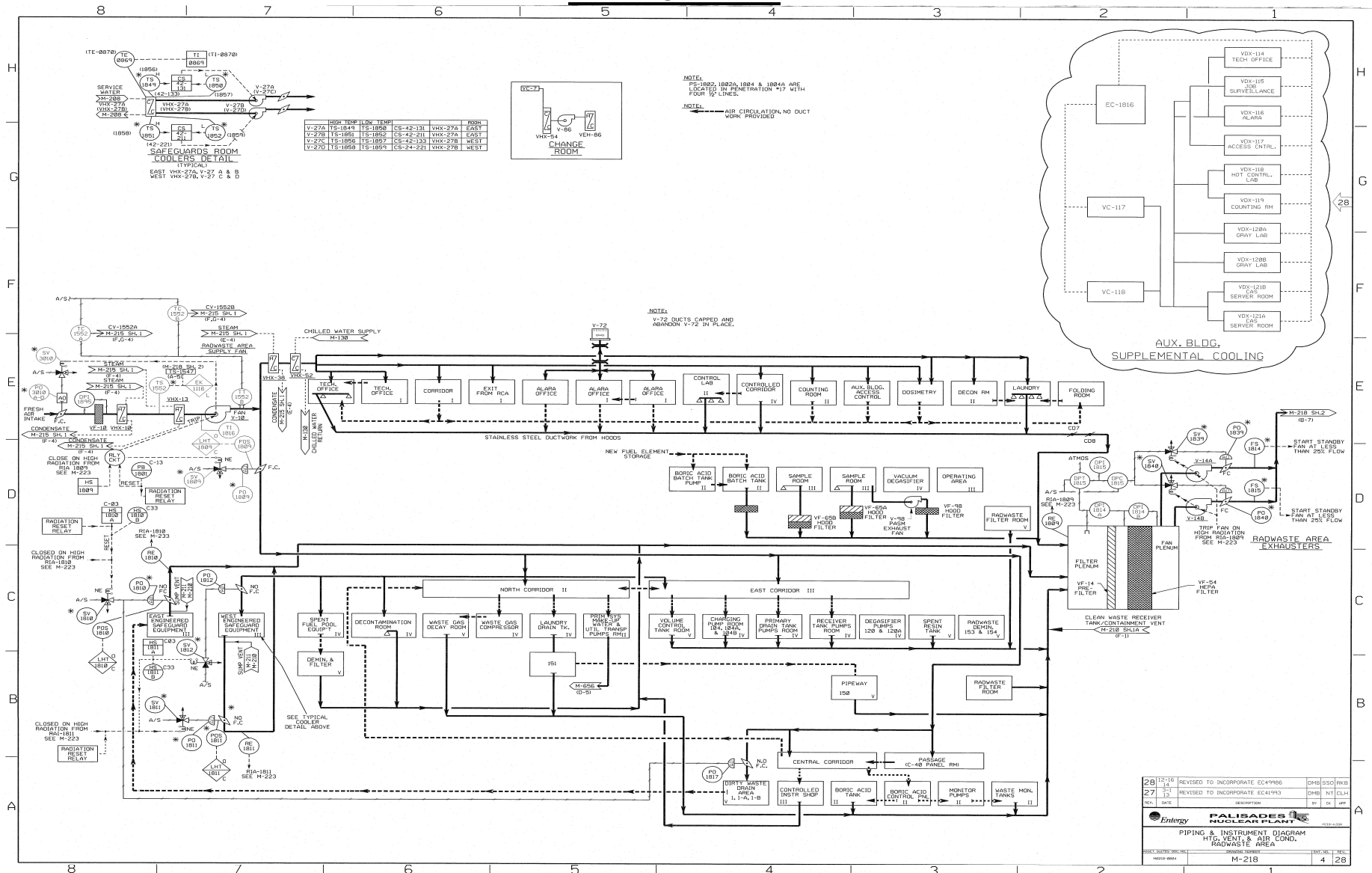
**PIPING & INSTRUMENT DIAGRAM
HEATING, VENTILATION AND AIR CONDITIONING,
SWITCHGEAR AND CABLE SPREADING ROOMS**



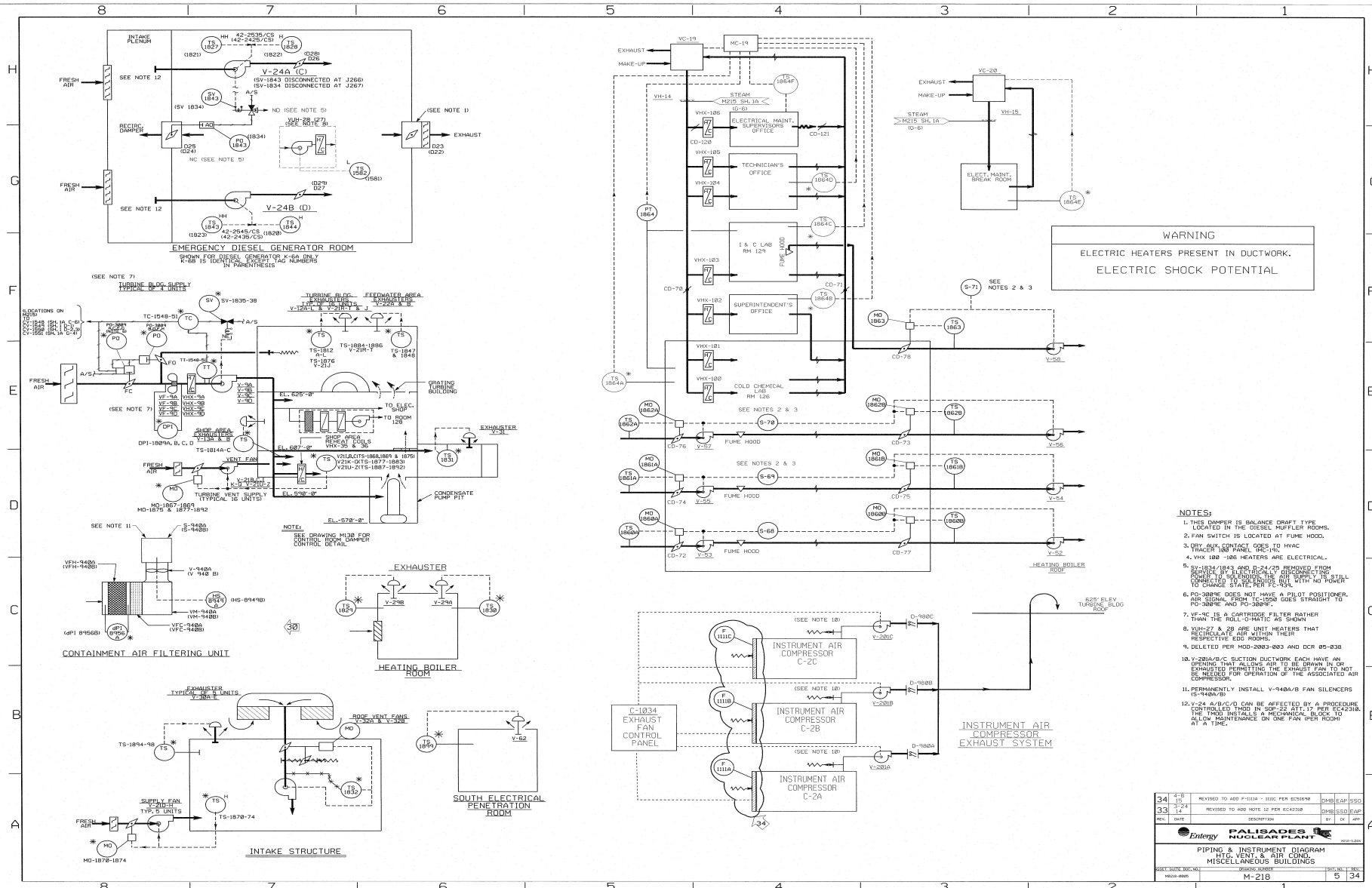
**PIPING & INSTRUMENT DIAGRAM
HEATING, VENTILATION AND AIR CONDITIONING,
CONTAINMENT BUILDING**



**PIPING & INSTRUMENT DIAGRAM
HEATING, VENTILATION AND AIR CONDITIONING,
RADWASTE AREA**

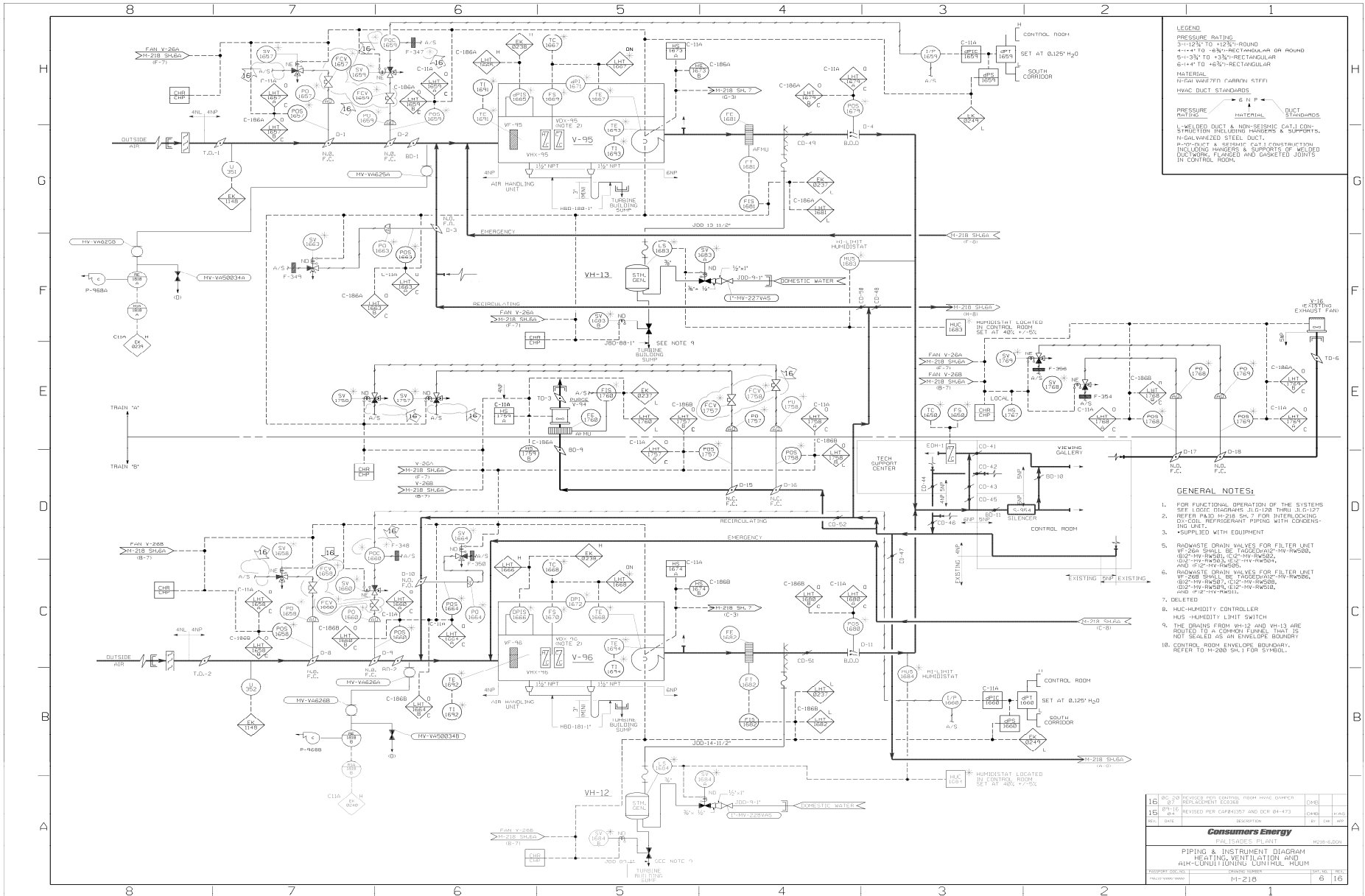


PIPING & INSTRUMENT DIAGRAM
HEATING, VENTILATION AND AIR CONDITIONING,
MISCELLANEOUS BUILDINGS



34	4-B	REVISED TO ADD P-1101A - 100IC PER SCHEDULE	DATE	BY	APP
33	3-24	REVISED TO ADD NOTE 12 PER ECA2508	DATE	BY	APP
14	14	050207030	DATE	BY	APP
REV	DATE	DESCRIPTION	DATE	BY	APP
Palisades Nuclear Plant PIPING & INSTRUMENT DIAGRAM HEATING, VENTILATION AND AIR CONDITIONING MISCELLANEOUS BUILDINGS					
SHEET NO. 4000 M-218				OF 34	

PIPING & INSTRUMENT DIAGRAM
HEATING, VENTILATION AND AIR CONDITIONING,
CONTROL ROOM



LEGEND

PRESSURE RATING:
 3"-12 1/2" TO +12 1/2" ROUND
 1 1/2"-3 1/2" RECTANGULAR OR ROUND
 5 1/4"-3 1/2" TO +3 1/2" RECTANGULAR
 6 1/4" TO +6 1/2" RECTANGULAR

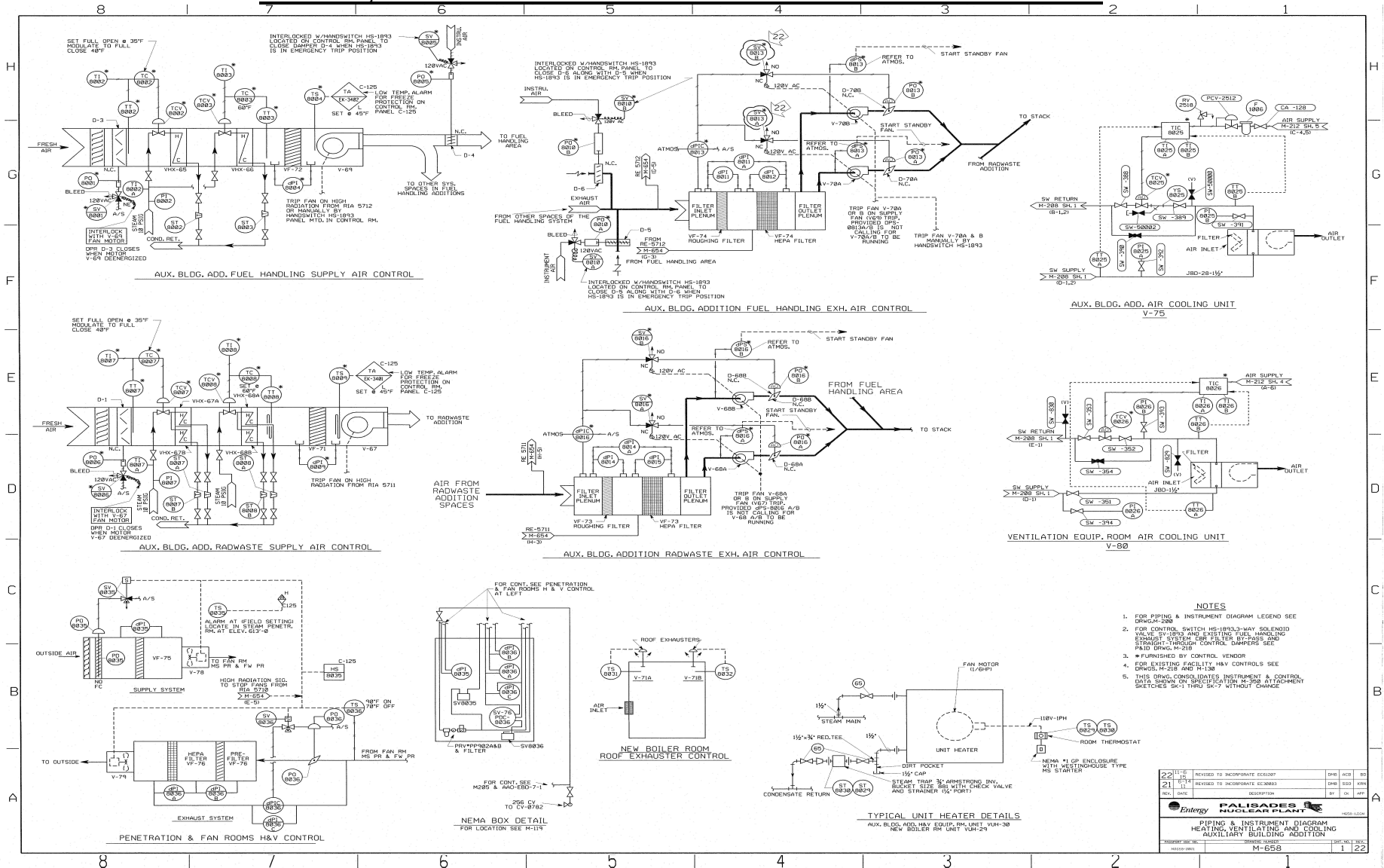
MATERIAL:
 H-20 GALV. STEEL CARBON STEEL
 HVAC DUCT STANDARDS

DUCT STANDARDS:
 L-WELDED DUCT & NON-SEISMIC CAT 1 CONSTRUCTION INCLUDING HANGERS & SUPPORTS, H-GALVANIZED STEEL DUCT.
 H-20 SET & REMOVAL FACT 1 ENHANCEMENT INCLUDING HANGERS & SUPPORTS OF WELDED DUCTWORK, FLANGED AND GASKETED JOINTS IN CONTROL ROOM.

- GENERAL NOTES:**
- FOR FUNCTIONAL OPERATION OF THE SYSTEMS SEE LEGEND TIMERS IN (E-218) (M-217).
 - REFER PAID M-218 SH. 7 FOR INTERLOCKING LOGIC, REFRIGERANT PIPING WITH COOLERS UNIT.
 - SUPPLIED WITH EQUIPMENT
 - FOR FAN V-26A AND V-26B, FILTER UNIT V-26A SHALL BE TAGGED AND V-26B, (B-2) HV-RW50, (C-2) HV-RW50, (D-2) HV-RW50, (E-2) HV-RW50, AND (F-2) HV-RW50.
 - FOR FAN V-26B, FILTER UNIT V-26B SHALL BE TAGGED AND V-26B, (B-2) HV-RW50, (C-2) HV-RW50, (D-2) HV-RW50, (E-2) HV-RW50, AND (F-2) HV-RW50.
 - DELETED
 - HUMIDITY LIMIT SWITCH
 - THE DRAWING FROM VH-12 AND VH-13 ARE CONTROLLED TO A COMMON FURNACE THAT IS NOT SCALED AS AN ENVELOPE BOUNDARY.
 - CONTROL ROOM ENVELOPE BOUNDARY, REFER TO M-200 SH.1 FOR SYMBOL.

REV	NO.	DESCRIPTION	DATE
16	20	REVISED PER CONTROL ROOM CHANGES	
15	17	REVISED PER E-218	
14	16	REVISED PER CAP41307 AND BCR-04-473	
REV	DATE	DESCRIPTION	BY
Consumers Energy			
Piping & Instrument Diagram			
Heating, Ventilation and Air Conditioning			
Control Room			
M-218		6 16	

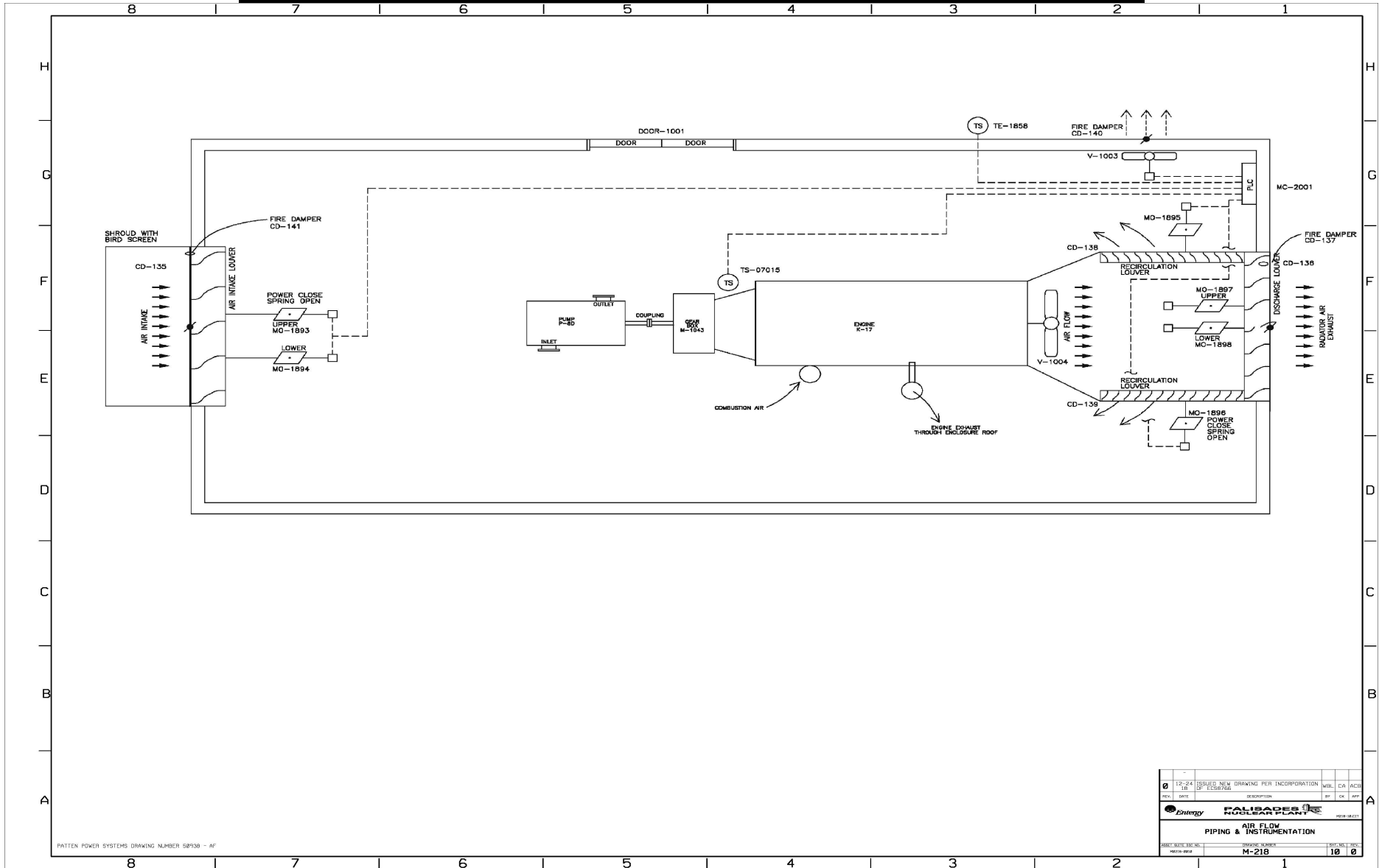
**PIPING & INSTRUMENT DIAGRAM
HEATING, VENTILATION AND COOLING AUXILIARY BUILDING ADDITION**



- NOTES**
1. FOR PIPING & INSTRUMENT DIAGRAM LEGEND SEE DWG-M-208
 2. FOR CONTROL SWITCH HS-1893, 3-WAY SOLENOID VALVE (SOLV) AND STARTING FAN HANDLING EXHAUST SYSTEM (SOLV) FILTER, BY-PASS AND STARTING FAN CONTROL DAMPERS SEE P&ID DWG-M-218
 3. *FURNISHED BY CONTROL VENDOR
 4. FOR EXISTING FACILITY, HAV CONTROLS SEE DWG-M-218 AND M-138
 5. THIS DWG. CONSOLIDATES INSTRUMENT & CONTROL DATA SHOWN ON SPECIFICATION M-208 ATTACHMENT SKETCHES S-1 THRU S-7 WITHOUT CHANGE

20	11/16	REVISED TO INCORPORATE DESIGN	DWH	ADD	SD
21	11/17	REVISED TO INCORPORATE DE-20893	DWH	SSD	KHN
REV.	DATE	DESCRIPTION	BY	CHK.	APP.
			10000-10000		
PIPING & INSTRUMENT DIAGRAM HEATING, VENTILATING AND COOLING AUXILIARY BUILDING ADDITION					
DESIGN NUMBER M-658			SHEET NUMBER 1 / 22		

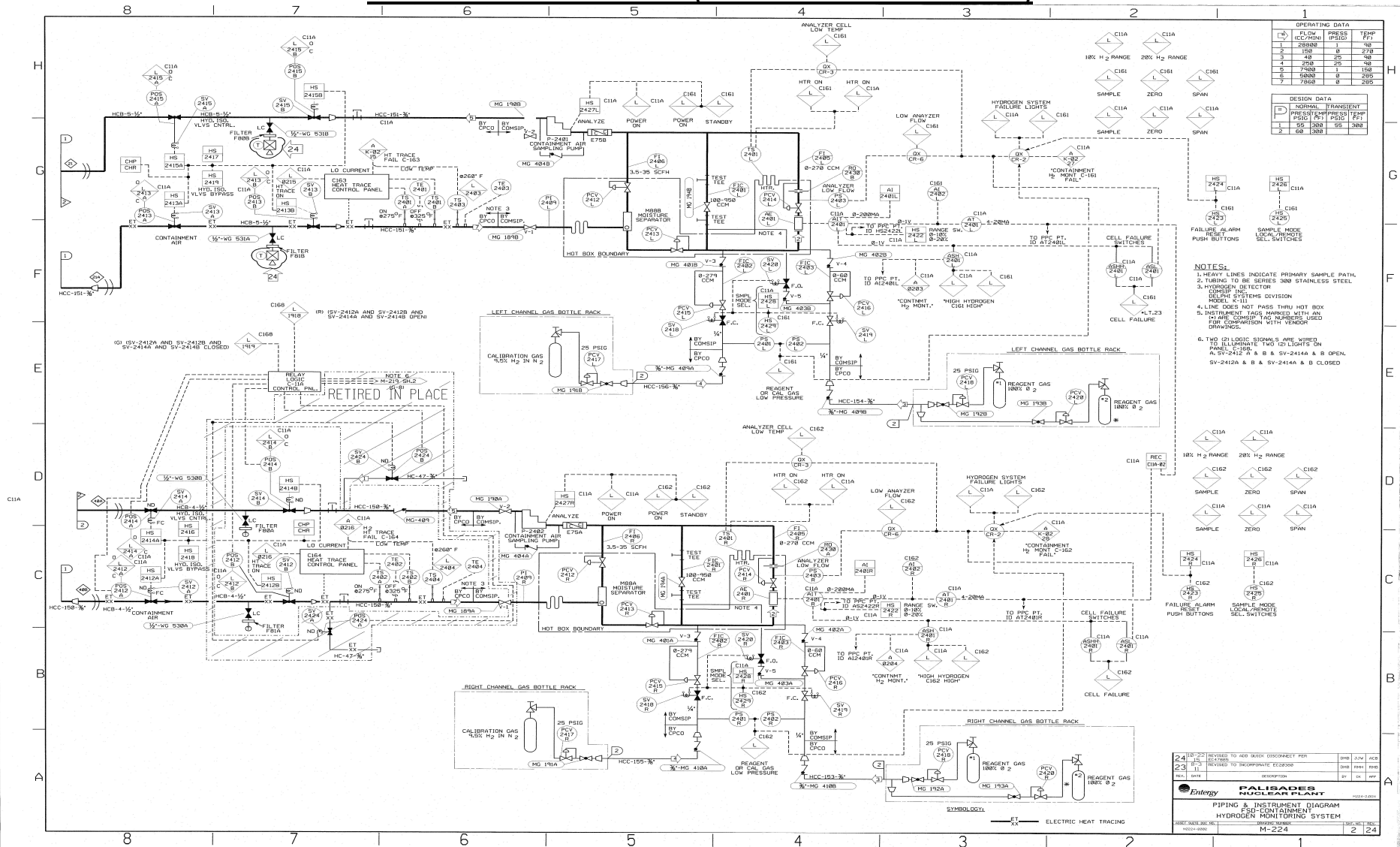
**PIPING & INSTRUMENT DIAGRAM
HEATING AND VENTILATION AUXILIARY FEEDWATER PUMP P-8D ENCLOSURE**



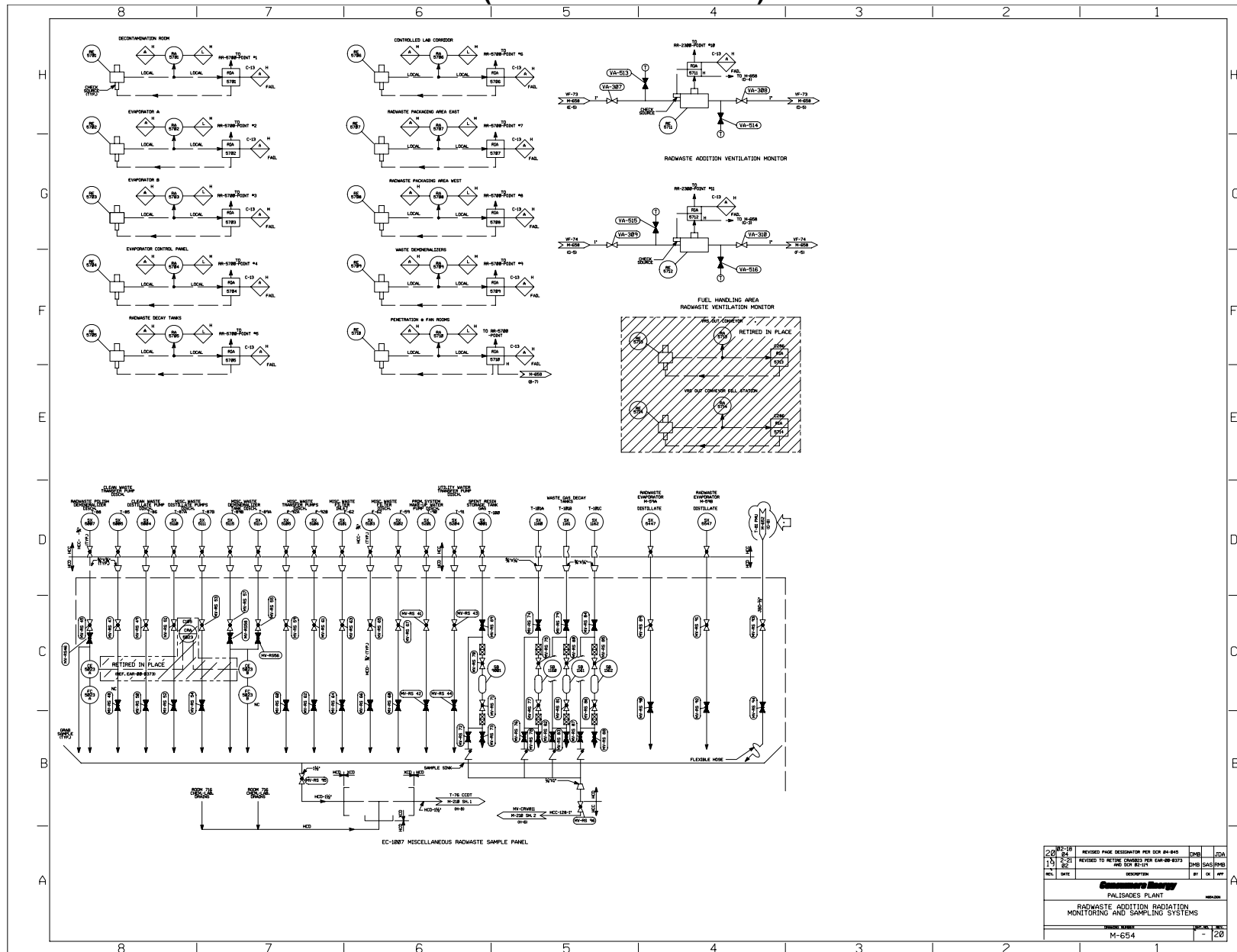
PATTEN POWER SYSTEMS DRAWING NUMBER 58938 - AF

0	12-24-10	ISSUED NEW DRAWING PER INCORPORATION	WBL	CA	ACB
REV	DATE	DESCRIPTION	BY	CHK	APP
			10/18/11		
AIR FLOW PIPING & INSTRUMENTATION					
SHEET NO. 10		DRAWING NUMBER M-218		SHEET TOTAL 10	

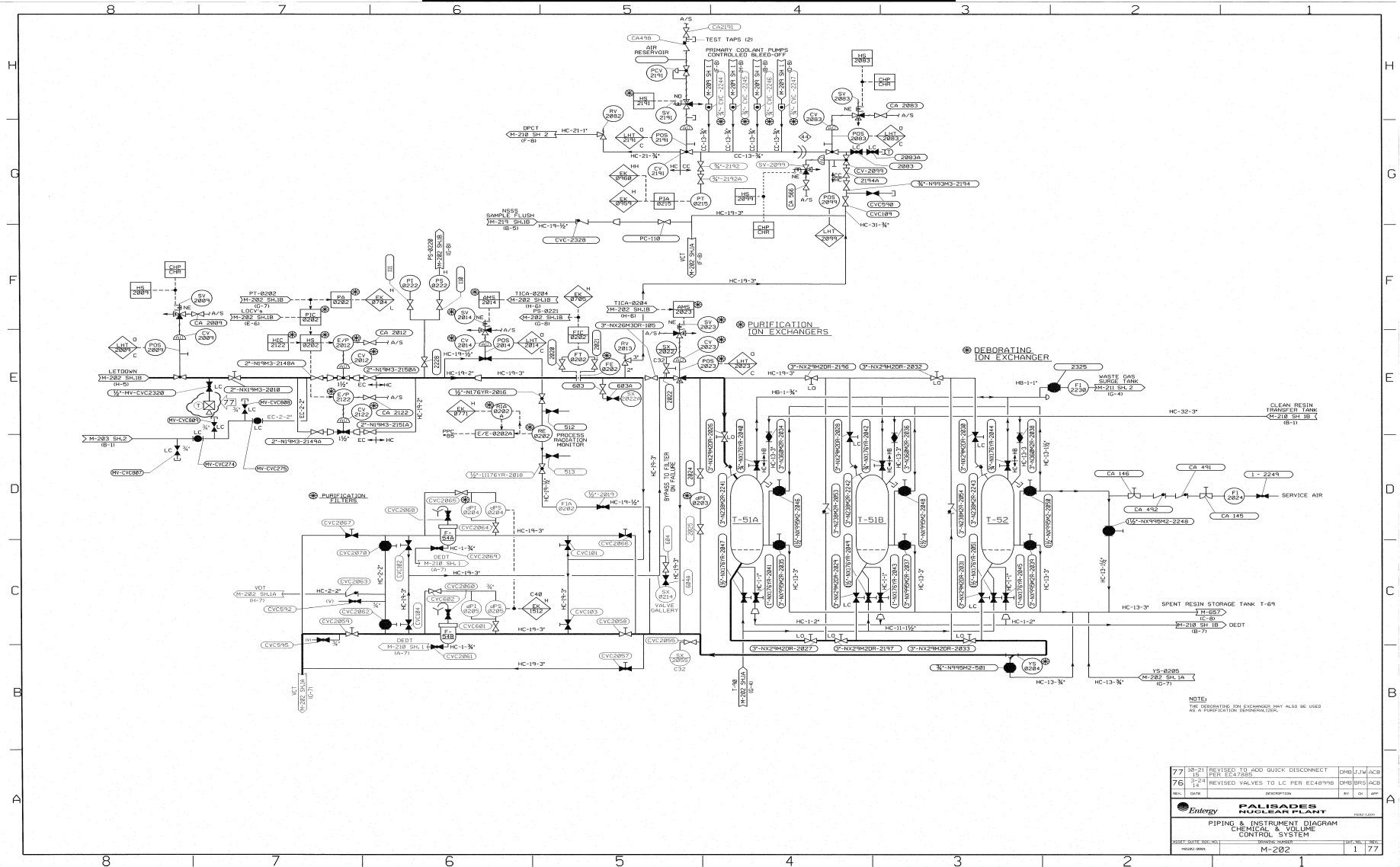
**PIPING & INSTRUMENT DIAGRAM
GAS ANALYZING SYSTEMS (CONTAINMENT HYDROGEN)**



**MONITORING AND SAMPLING SYSTEMS
(RADWASTE ADDITION)**



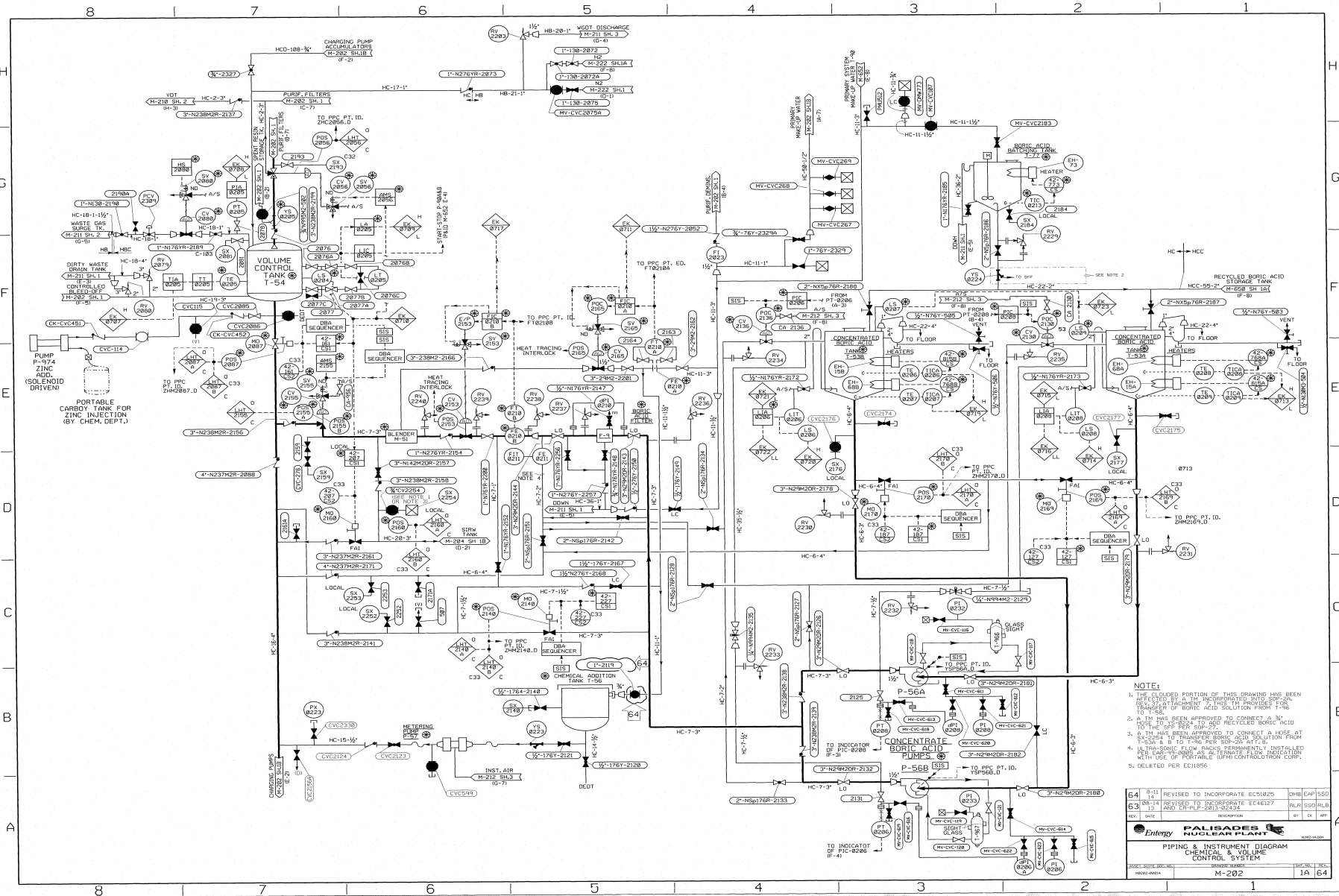
**PIPING & INSTRUMENT DIAGRAM
CHEMICAL AND VOLUME CONTROL SYSTEM**



NOTE:
THE DEAERATING ION EXCHANGER MAY ALSO BE USED
AS A PURIFICATION ION EXCHANGER.

77	10-21	REVISED TO ADD QUICK DISCONNECT	DNB/JJM/ACB
76	1-24	REVISED VALVES TO LC PER EC48998	DNB/BRS/ACB
		REVISIONS	BY
		DATE	DATE
		FALISADES NUCLEAR PLANT PIPING & INSTRUMENT DIAGRAM CHEMICAL & VOLUME CONTROL SYSTEM SHEET NO. M-202 OF 177	

**PIPING & INSTRUMENT DIAGRAM
CHEMICAL AND VOLUME CONTROL SYSTEM**

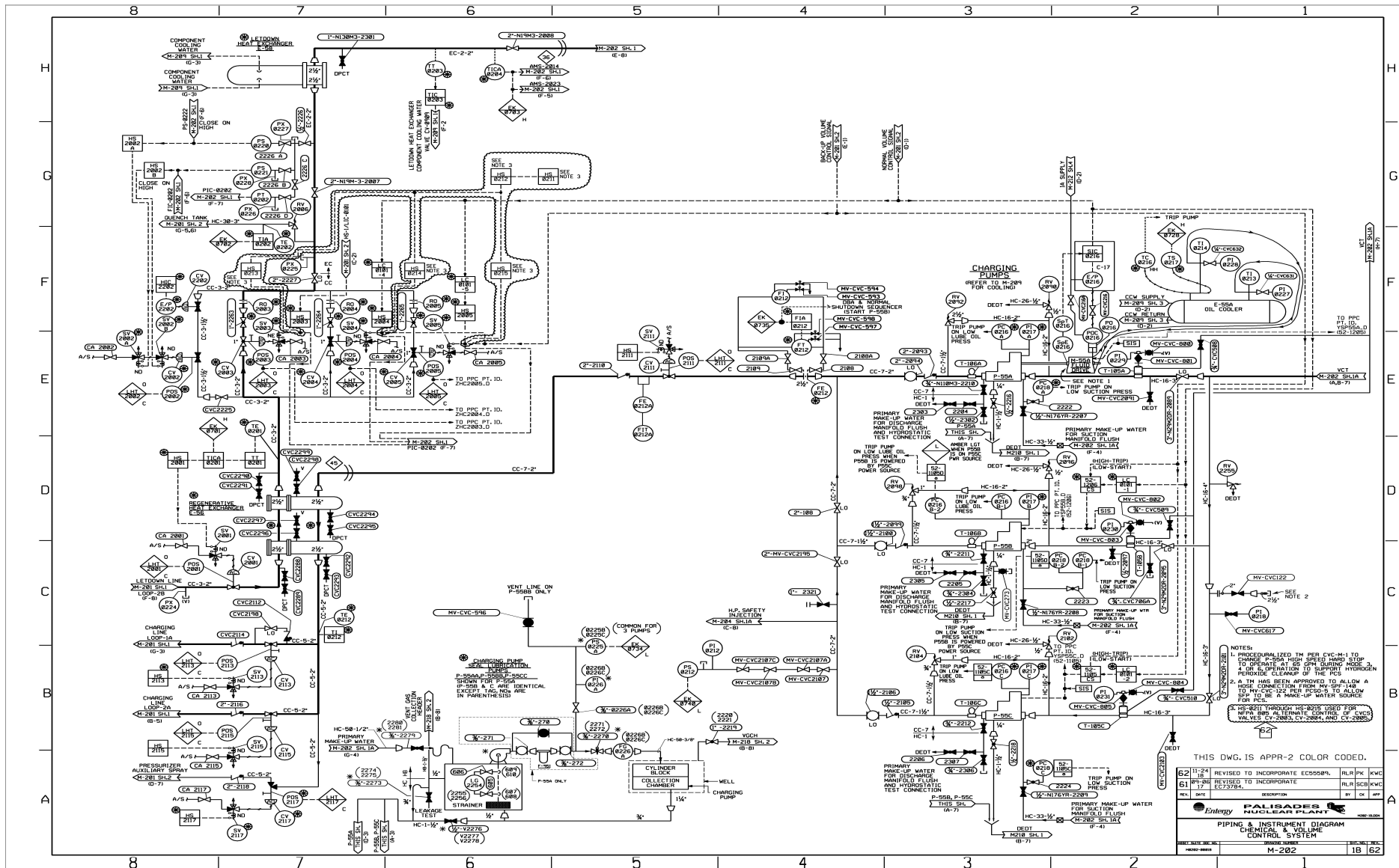


NOTE:

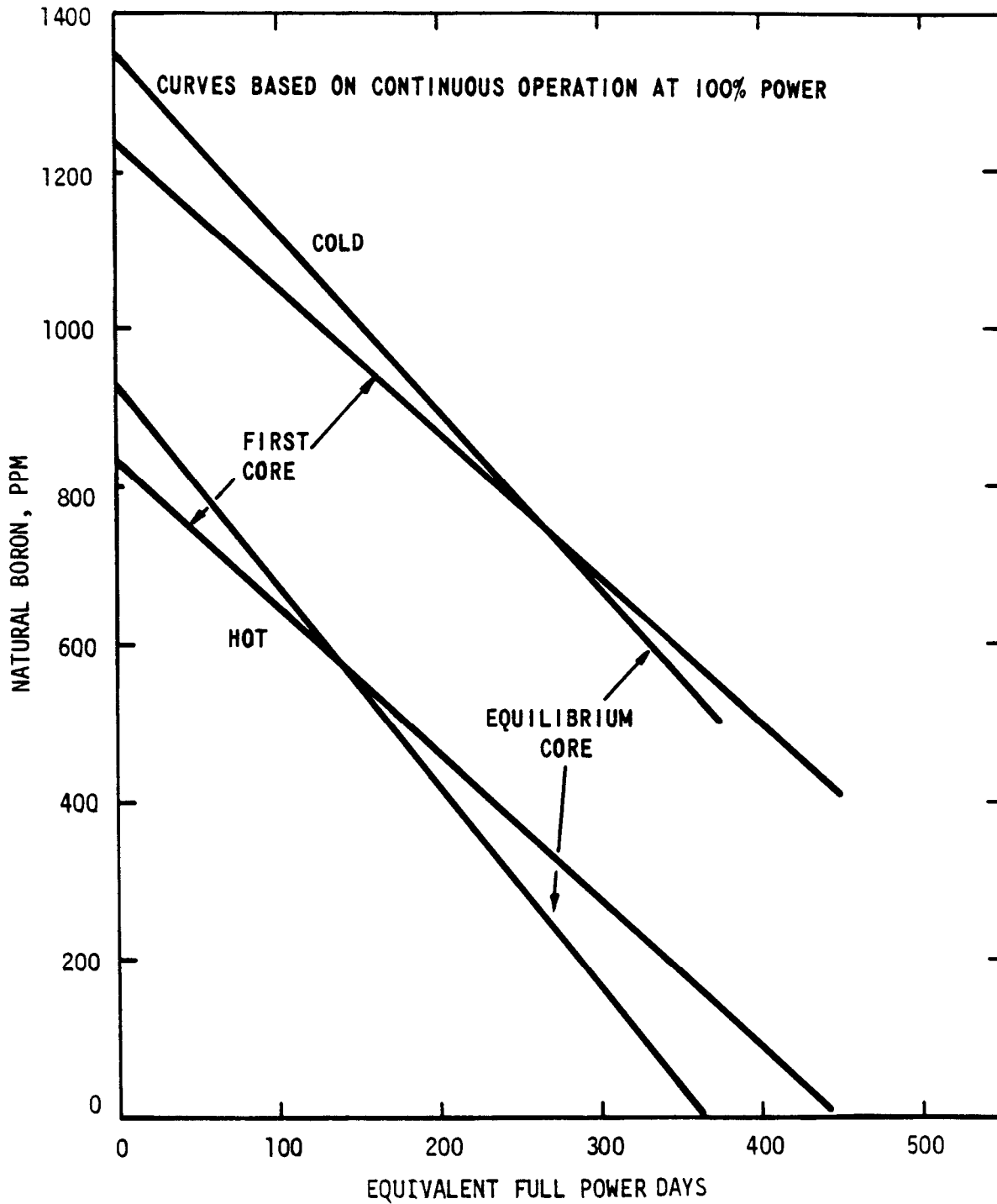
1. THE CLOTTED PORTION OF THIS DRAWING HAS BEEN REVISED TO SHOW THE CORRECT FLOW DIRECTION FOR THE TRANSFER OF BORIC ACID SOLUTION FROM T-56 TO T-54.
2. THIS HAS BEEN APPROVED TO CONNECT A 3" PIPING TO T-56 FOR THE 1.50% RECYCLED BORIC ACID.
3. THIS HAS BEEN APPROVED TO CONNECT A 1/2" PIPE AT T-56 TO T-54 FOR THE 1.50% RECYCLED BORIC ACID.
4. THE FLOW DIRECTION FOR THE 1.50% RECYCLED BORIC ACID SOLUTION FROM T-56 TO T-54 IS SHOWN IN THE CLOTTED PORTION OF THIS DRAWING.
5. DELTAED PER EC11056

64	8-11	REVISED TO INCORPORATE EC51025	DMB	EAP	SSO
63	05-14	REVISED TO INCORPORATE EC46127	PLR	SSO	RLB
REV.	DATE	DESCRIPTION	BY	CHK	APP
PIPING & INSTRUMENT DIAGRAM CHEMICAL & VOLUME CONTROL SYSTEM					
SHEET NO. 000-000-000-000 M-201			SHEET NO. 000-000-000-000 1A 64		

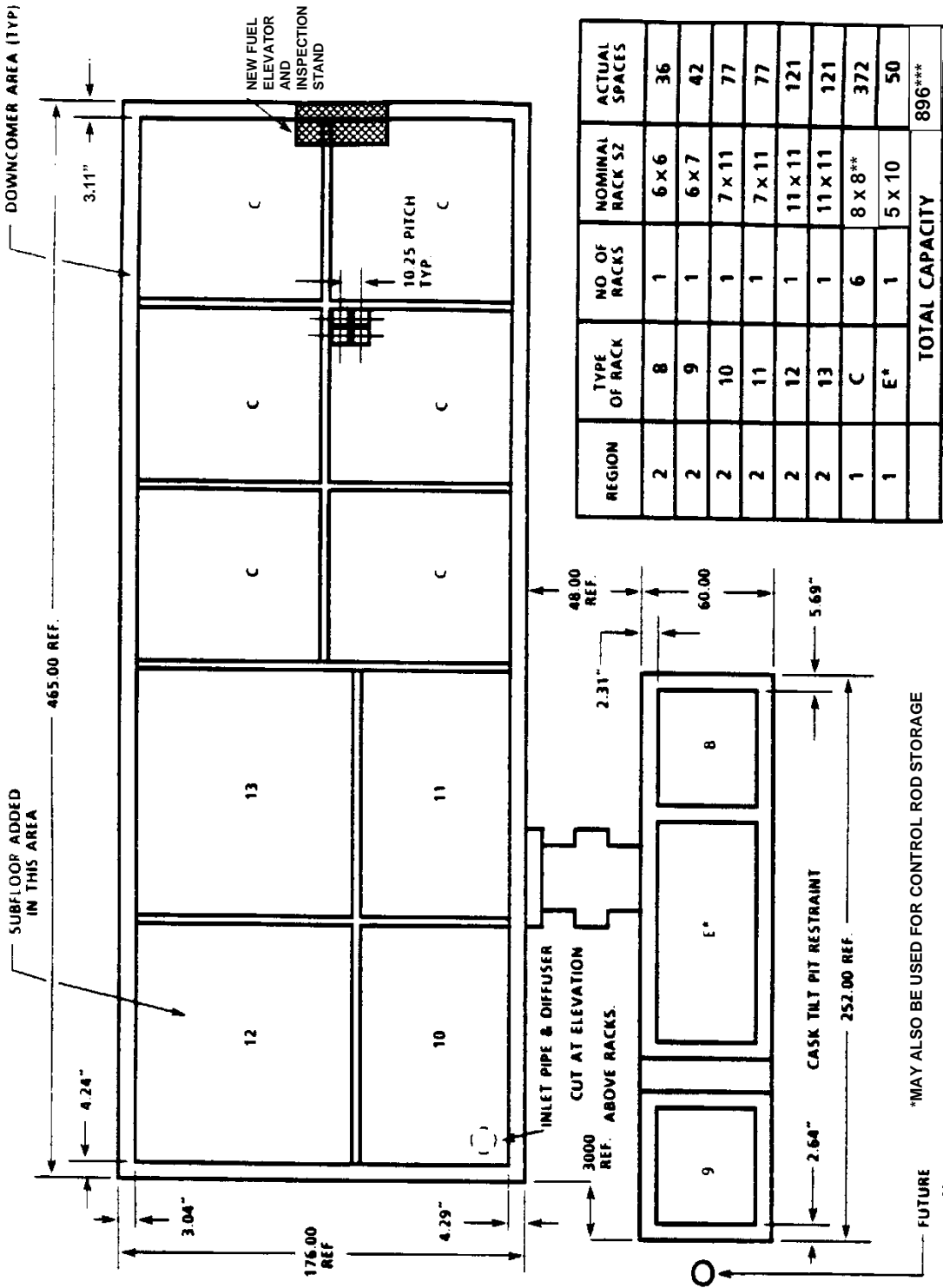
PIPING & INSTRUMENT DIAGRAM
CHEMICAL AND VOLUME CONTROL SYSTEM



BORON CONCENTRATION VS CORE LIFETIME



PALISADES PLANT SPENT FUEL STORAGE RACK ARRANGEMENT



*MAY ALSO BE USED FOR CONTROL ROD STORAGE
 **NOMINAL, SOME SPACES NOT INSTALLED FOR NFE AND INSPECTION STAND
 ***PHYSICAL SPOTS. ONLY 892 LICENSED LOCATIONS DUE TO LACK OF ABILITY TO ACCESS

FUTURE
 JIB CRANE
 FOR FUEL
 HANDLING