

Figure 10.1-2 – Reference Heat Balance for Guaranteed Reactor Rating

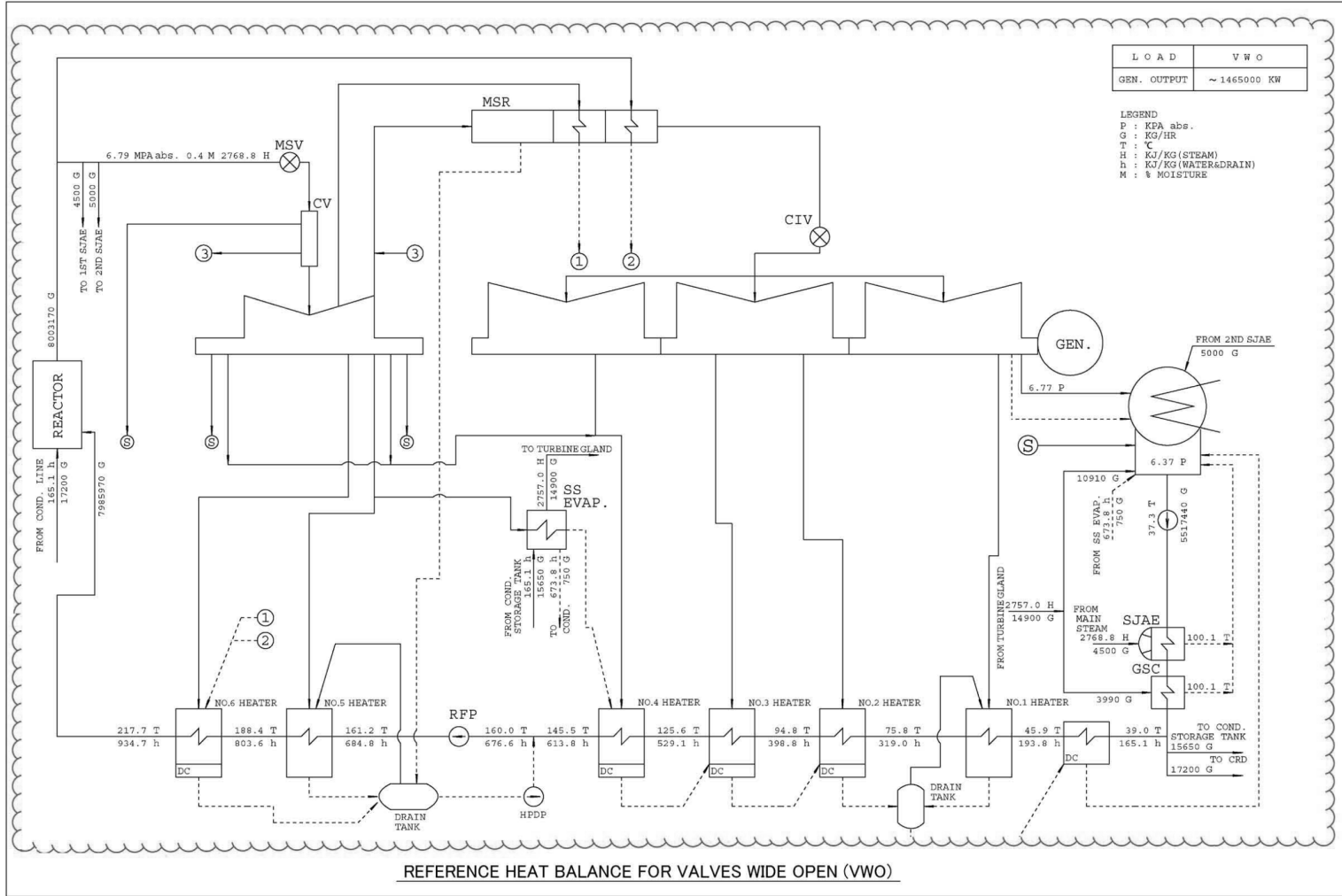


Figure 10.1-3 – Reference Heat Balance for Valves Wide Open (VWO)

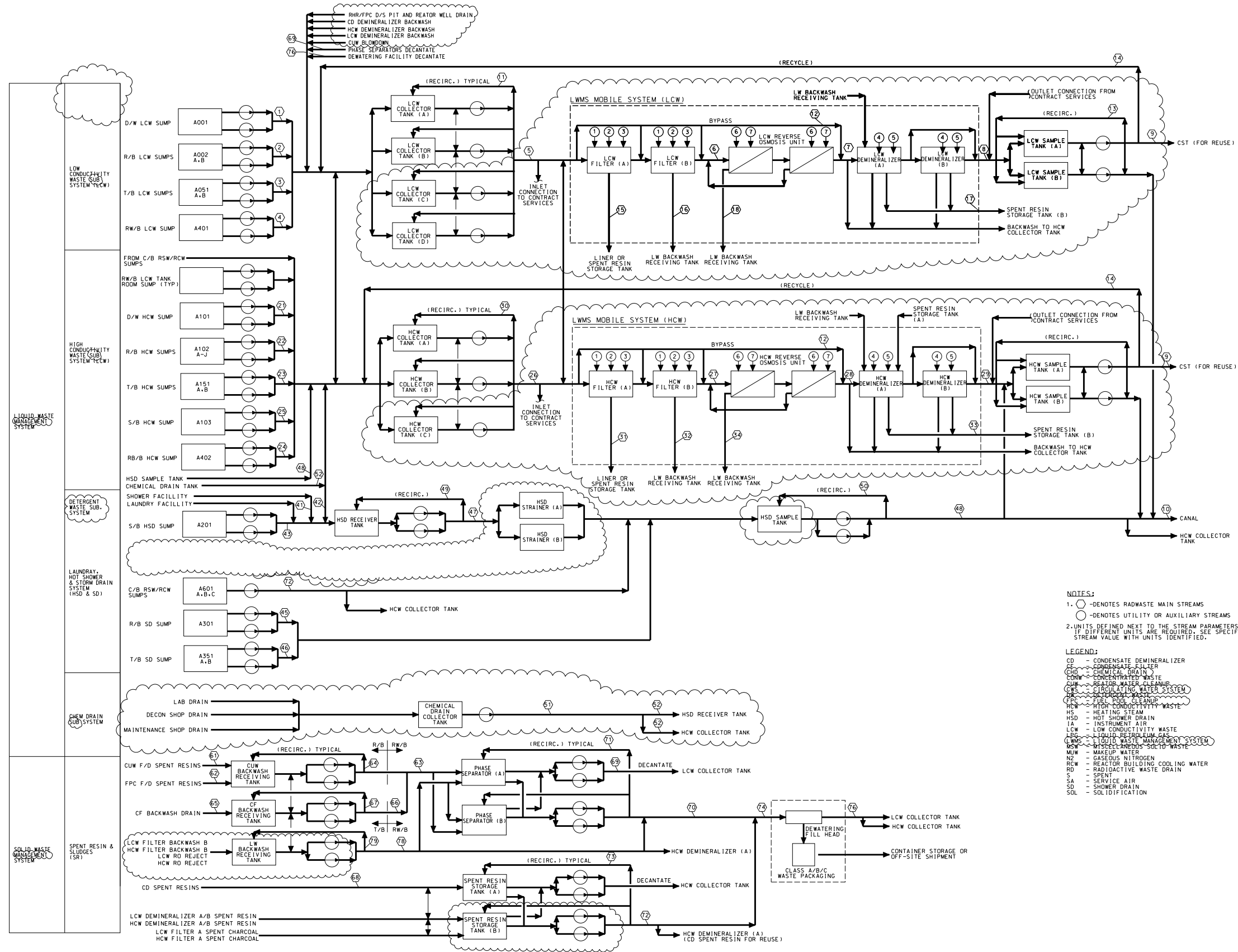


Figure 11.2-1 – Radwaste System (Sheet 1 OF 2)

Stream No. ●	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	69	76	
Sub System	LCW-RD	LCW-RD	LCW-RD	LCW-RD	LCW	LCW	LCW	LCW	LCW	LCW	LCW	LCW	LCW	LCW	LCW	LCW	LCW-Resin	LCW	LCW-SR	LCW-SR	
Liquid/Slurry	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Slurry	Slurry	Slurry	Slurry	Liquid	Liquid
Normal Batch/day	4	6	6	2	--	--	--	--	--	--	--	--	--	--	--	1/30	1/365	--	--	--	
Maximum Batch/day	44	6	6	2	--	--	--	--	--	--	--	--	--	--	--	1	1	--	--	--	
Batch Volume m <sup>3</sup> /day	2.5	2.5	2.5	2.5	140	140	140	140	140	--	--	--	--	--	--	min 0.25	14.4	min	60	--	
Normal Volume m <sup>3</sup> /day	10	15	15	5	55	55	55	55	55	47.6	--	--	--	--	--	min 0.25	14.4	min	--	--	
Normal Average Volume m <sup>3</sup> /day	10	15	15	5	60	60	60	60	60	--	--	--	--	--	--	--	--	--	--	--	
Maximum Volume m <sup>3</sup> /day	110	15	15	5	615	615	615	615	615	145.3	--	--	--	--	--	min 0.25	14.4	min	--	--	
Flow m <sup>3</sup> /hr	10	10	10	10	34	34	34	34	150	40	68	34	150	150	--	--	--	--	10	10	
Temperature °C	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	
Pressure kg/cm <sup>2</sup>	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	
Conductivity uS/cm	<5	<5	<5	<5	<5	<5	<5	<1	<1	<1	<5	>1	<1	>1	--	--	--	--	--	--	
Undissolved Solid ppm	<2	<2	<2	<2	<2	<0.1	<0.1	<0.1	<0.1	<0.1	<2	<0.1	<0.1	<0.1	18 wt%	<1700	18 wt%	<500	--	--	

Stream No. ●	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
Sub System	HCW-RD	HCW-RD	HCW-RD	HCW-RD	HCW-RD	HCW	HCW	HCW	HCW	HCW	HCW	HCW	HCW-RESIN	HCW	HCW	HCW	HCW	HCW
Liquid/Slurry	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Slurry	Slurry	Slurry	Slurry	Liquid	Liquid	Liquid	Liquid
Normal Batch/day	--	2	2	1.2	0.8	--	--	--	--	--	1/365	12/365	1/365	12/365	--	--	--	--
Maximum Batch/day	--	22	2	1.2	0.8	--	--	--	--	--	--	--	--	--	--	--	--	--
Batch Volume m <sup>3</sup> /day	2.5	2.5	2.5	2.5	2.5	140	140	140	140	140	1.4	1	14.4	12	--	--	--	140
Normal Volume m <sup>3</sup> /day	--	5	5	3	2	15	15	15	15	--	1.4	1	1.4	12	--	--	--	15
Normal Average Volume m <sup>3</sup> /day	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Maximum Volume m <sup>3</sup> /day	--	55	5	3	2	63	63	63	63	--	1.4	1	14.4	12	--	--	--	63
Flow m <sup>3</sup> /hr	10	10	10	10	10	34	34	34	34	68	--	--	--	--	34	150	150	150
Temperature °C	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66
Pressure kg/cm <sup>2</sup>	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
Conductivity uS/cm	<5	<1000	<1000	<10000	<10000	1000 ~ 10000	<10	<10	<1	1000 ~ 10000	--	--	--	--	1000 ~ 10000	1000 ~ 10000	<1	<1
Undissolved Solid ppm	<2	0.05 wt%	0.05 wt%	0.05 wt%	1.25 wt%	0.05 ~ 2.00 wt%	<0.5	<0.5	<0.1	0.05 ~ 2.00 wt%	18 wt%	<1700	18 wt%	<500	0.05 ~ 2.00 wt%	0.05 ~ 2.00 wt%	<0.1	<0.1

Stream No. ●	41	42	43	44	45	46	47	48	49	50
Sub System	DW	HCW-RD	HCW-RD	NOT USED	DW	DW	DW	DW	DW	DW
Liquid/Slurry	Liquid	Liquid	Liquid	--	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid
Normal Batch/day	--	--	--	--	8	8	--	--	--	--
Maximum Batch/day	--	--	--	--	12	12	--	--	--	--
Batch Volume m <sup>3</sup> /day	--	--	2.5	--	2.5	2.5	30	30	30	--
Normal Volume m <sup>3</sup> /day	7.5	3.8	--	--	20	20	4	4	--	--
Normal Average Volume m <sup>3</sup> /day	--	--	--	--	--	--	--	--	--	--
Maximum Volume m <sup>3</sup> /day	32.5	16.5	--	--	30	30	12	12	--	--
Flow m <sup>3</sup> /hr	--	10	10	--	10	20	34	80	80	80
Temperature °C	66	66	66	--	66	66	66	66	66	66
Pressure kg/cm <sup>2</sup>	10	10	10	--	10	10	10	10	10	10
Conductivity uS/cm	--	--	--	--	--	--	--	--	--	--
Undissolved Solid ppm	--	--	--	--	--	--	--	--	--	--

Stream No. ●	51	52	53	54	55
Sub System	CHD	CHD	CHD	CHD	CHD
Liquid/Slurry	Liquid	Liquid	Liquid	Liquid	Liquid
Normal Batch/day	--	--	--	--	--
Maximum Batch/day	--	--	--	--	--
Batch Volume m <sup>3</sup> /day	4	4	4	4	4
Normal Volume m <sup>3</sup> /day	2	2	2	2	2
Normal Average Volume m <sup>3</sup> /day	--	--	--	--	--
Maximum Volume m <sup>3</sup> /day	2	2	2	2	2
Flow m <sup>3</sup> /hr	4	4	10	4	4
Temperature °C	66	66	66	66	66
Pressure kg/cm <sup>2</sup>	10	10	10	10	10
Conductivity uS/cm	--	--	--	--	--
Undissolved Solid ppm	--	--	--	--	--

Stream No. ●	61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81
Sub System	SR	SR	SR	SR	SR	SR	SR	SR	SR	LCW-SR	SR	SR	SR	SR	Not Used	LCW-SR	Not Used	SR	SR	SR	SR
Liquid/Slurry	Slurry	Slurry	Slurry	Slurry	Slurry	Slurry	Slurry	Slurry	Slurry	Liquid	Liquid	Slurry	Slurry	Slurry	--	Liquid	--	Slurry	Slurry	Slurry	Liquid
Normal Batch/day	0.08	0.02	0.08	--	0.088	0.088	--	6/3yr	--	--	--	--	--	--	--	--	--	--	--	--	--
Maximum Batch/day	2	1	1	--	3	3	--	2	--	--	--	--	--	--	--	--	--	--	--	--	--
Batch Volume m <sup>3</sup> /day	15	20	30/35	--	35	35	--	30	60	--	--	--	--	--	--	--	--	--	--	--	--
Normal Volume m <sup>3</sup> /day	15	20	30/35	--	35	35	--	30	--	--	--	--	--	--	--	--	--	--	--	--	--
Normal Average Volume m <sup>3</sup> /day	1.2	0.4	1.6	--	3.1	3.1	--	0.16	--	--	--	--	--	--	--	--	--	--	--	--	--
Maximum Volume m <sup>3</sup> /day	30	20	35	--	105	105	--	60	--	--	--	--	--	--	--	--	--	--	--	--	--
Flow m <sup>3</sup> /hr	--	--	30	90	30	90	90	10	10	190	10	90	10	10	--	10	--	30	90	30	10
Temperature °C	66	66	66	66	66	66	66	66	66	66	66	66	66	66	--	66	--	66	66	66	66
Pressure kg/cm <sup>2</sup>	10	10	10	10	10	10	10	10	10	10	10	10	10	10	--	10	--	10	10	10	10
Conductivity uS/cm	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Undissolved Solid ppm	2200	2600	2200-2600	2200-2600	850	850	850	10 wt%	--	10-15 wt%	10 wt%	15 wt%	15 wt%	10-15 wt%	--	--	--	>2000	>2000	>2000	--

Stream No. ○	1	2	3	4	5	6	7
Utility	MW	IA	SA	MW	SA	MW	SA
Pressure kg/cm <sup>2</sup>	4.0	4.0	4.0	4.0	4.0	4.0	4.0
Flow m <sup>3</sup> /hour	10	38Nm <sup>3</sup> /hr	22Nm <sup>3</sup> /hr	10	112Nm <sup>3</sup> /hr	10	112Nm <sup>3</sup> /hr
Heat kcal/hr	--	--	--	--	--	--	--
Temperature °C	≤40	≤40	≤40	≤40	≤40	≤40	≤40

Notes:  
 (a) Based on one collector tank batch

Figure 11.2-1 – Radwaste System (Sheet 2 OF 2)

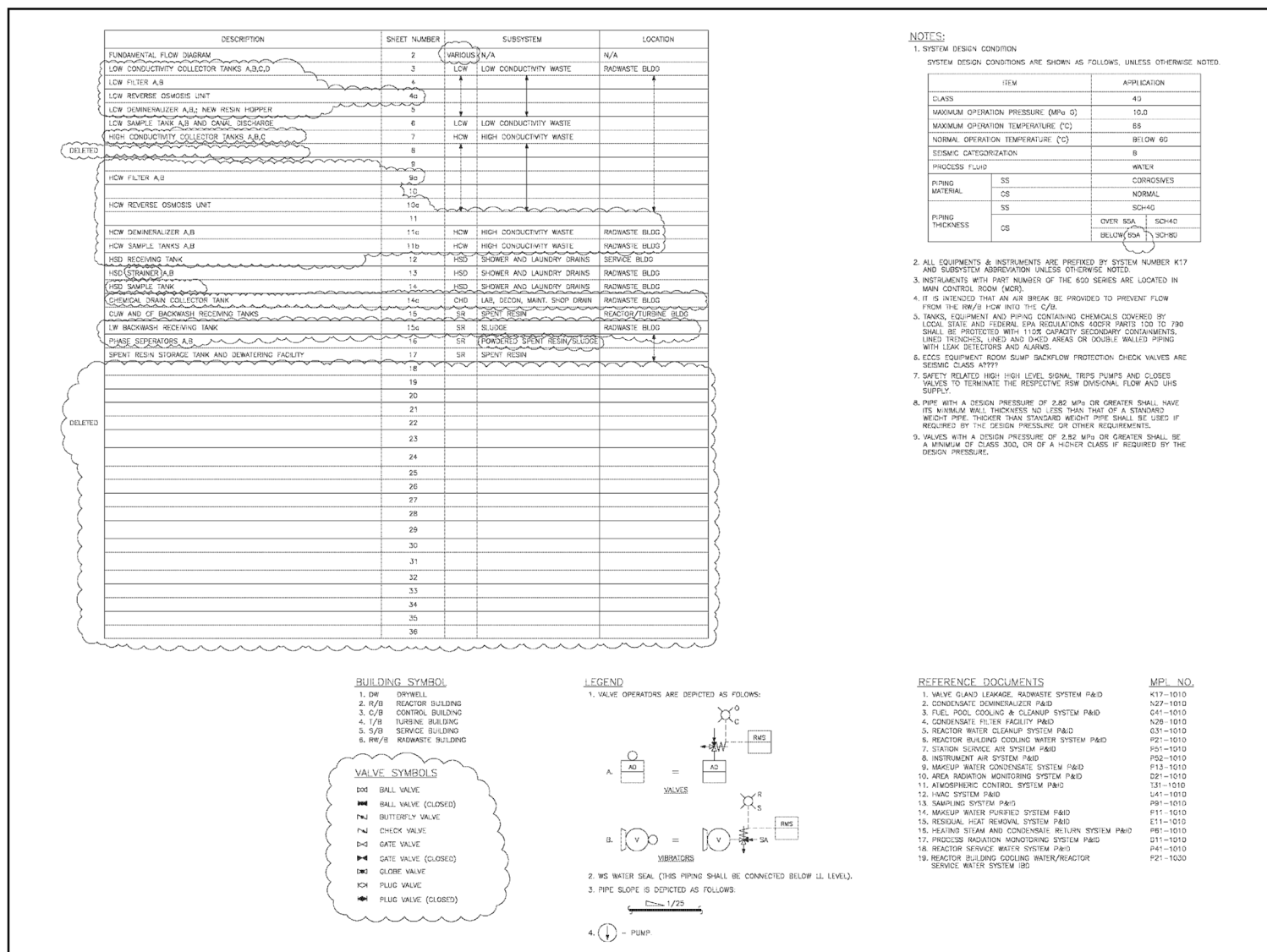


Figure 11.2-2 – Radwaste System (Sheet 1 OF 36)

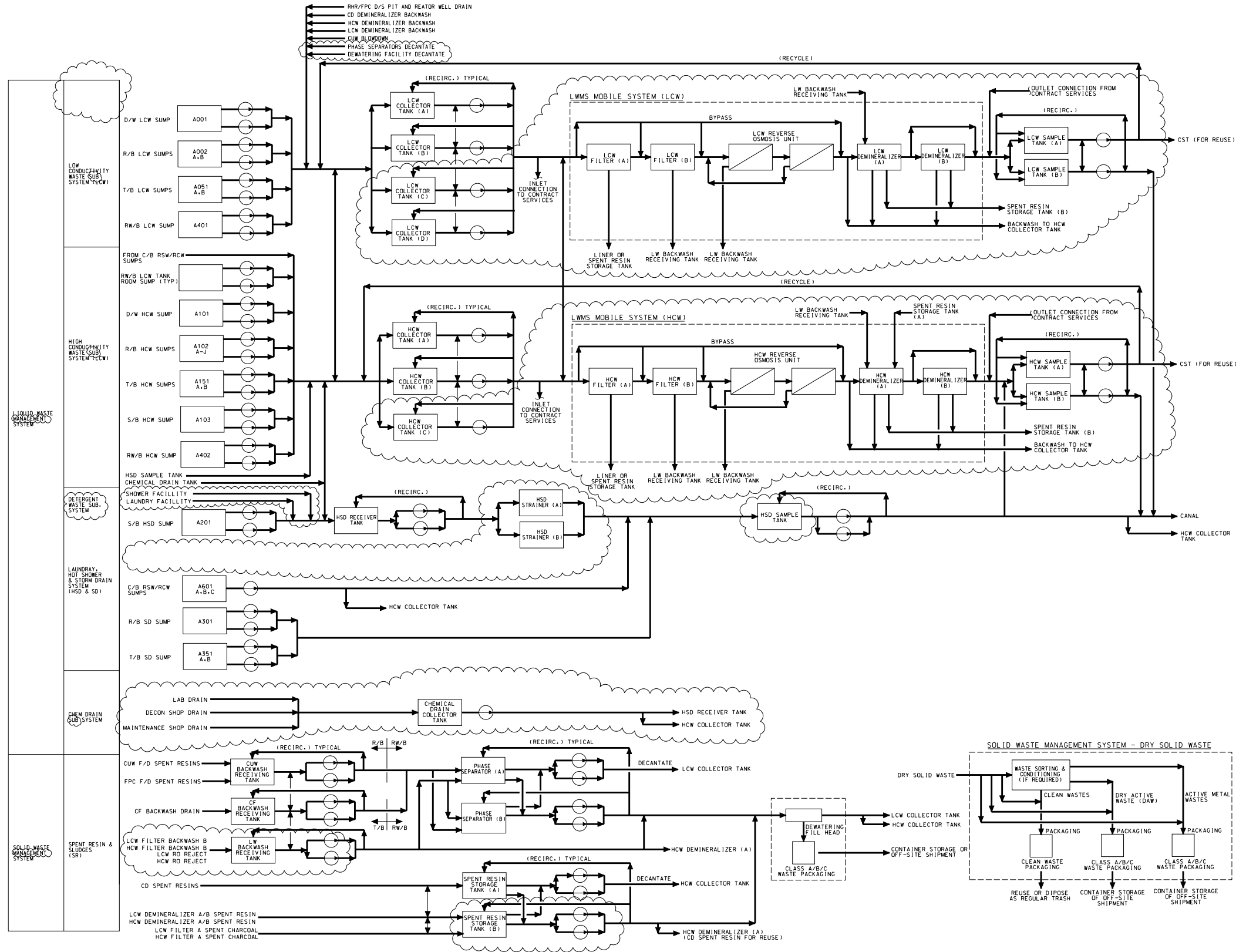


Figure 11.2-2 – Radwaste System (Sheet 2 OF 36)

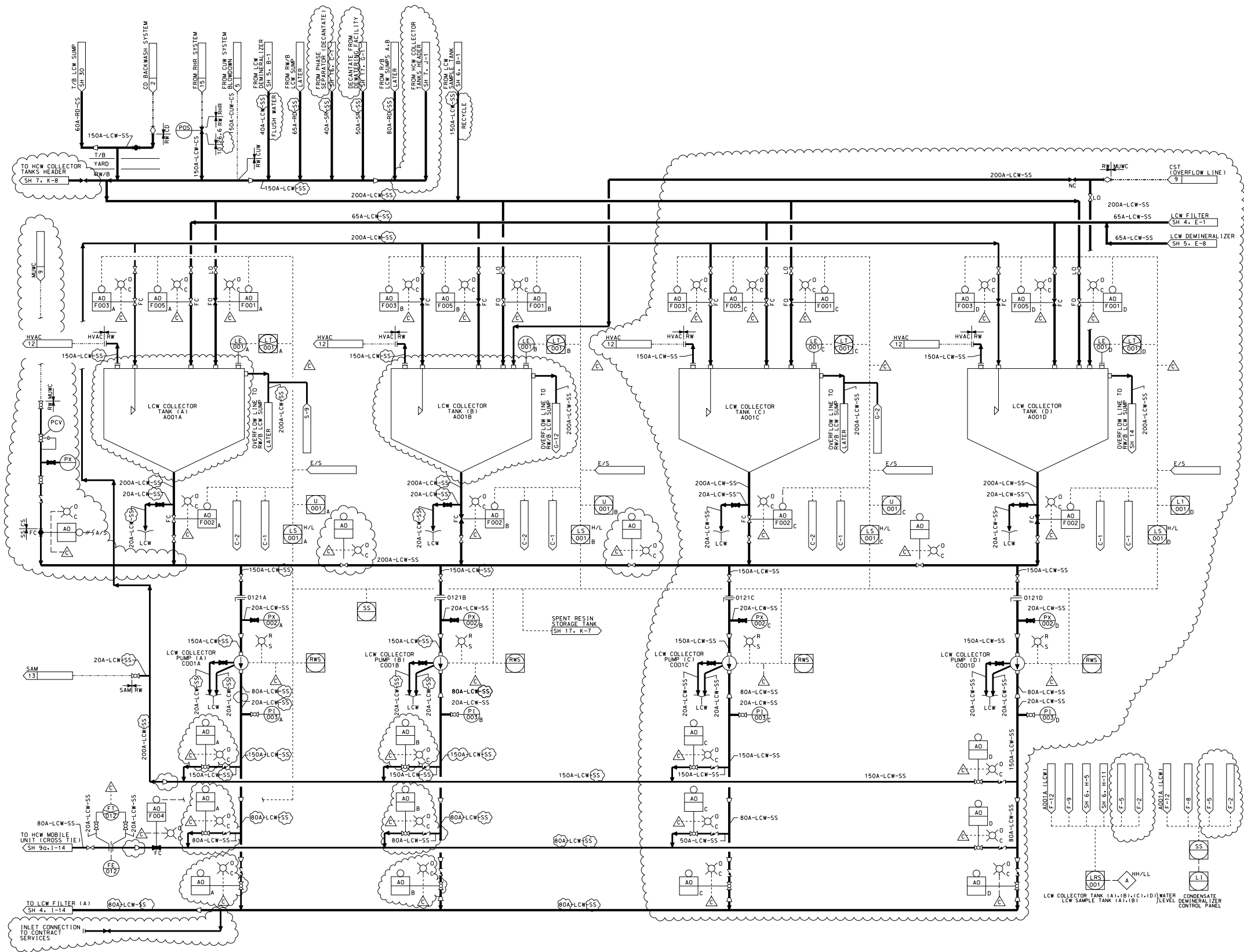


Figure 11.2-2 – Radwaste System (Sheet 3 OF 36)

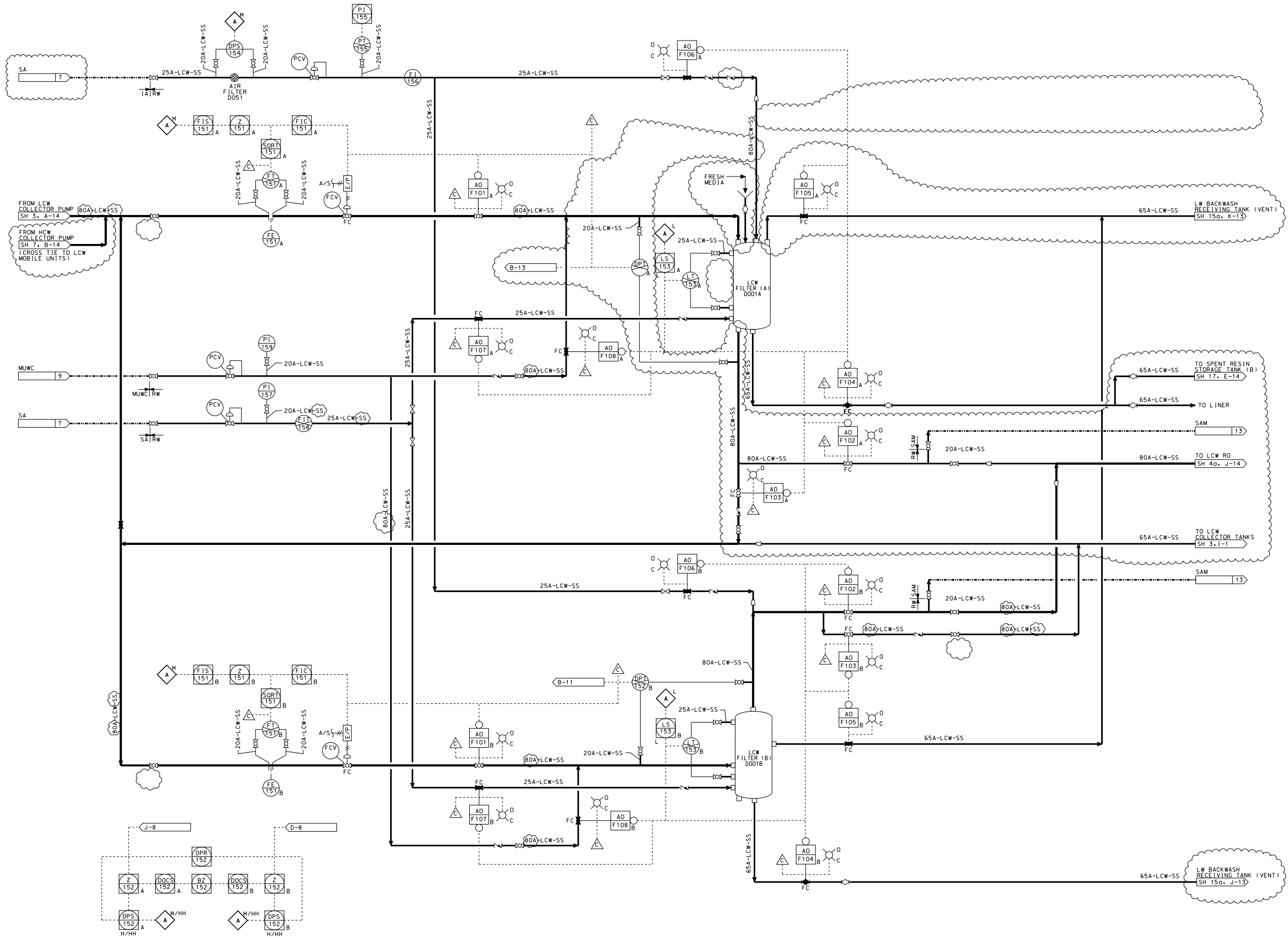


Figure 11.2-2 – Radwaste System (Sheet 4 OF 36)



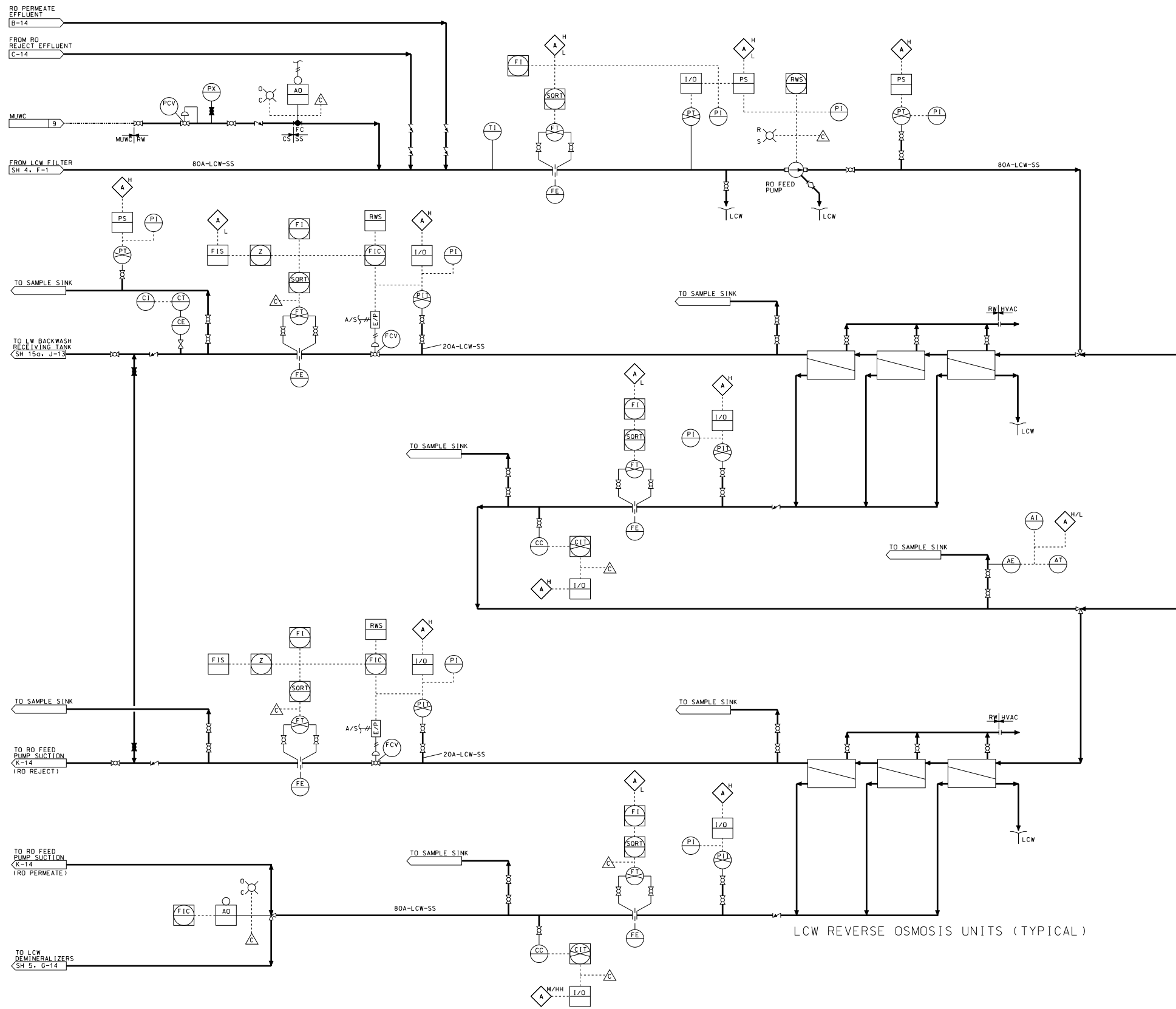


Figure 11.2-2 – Radwaste System (Sheet 4a OF 36)

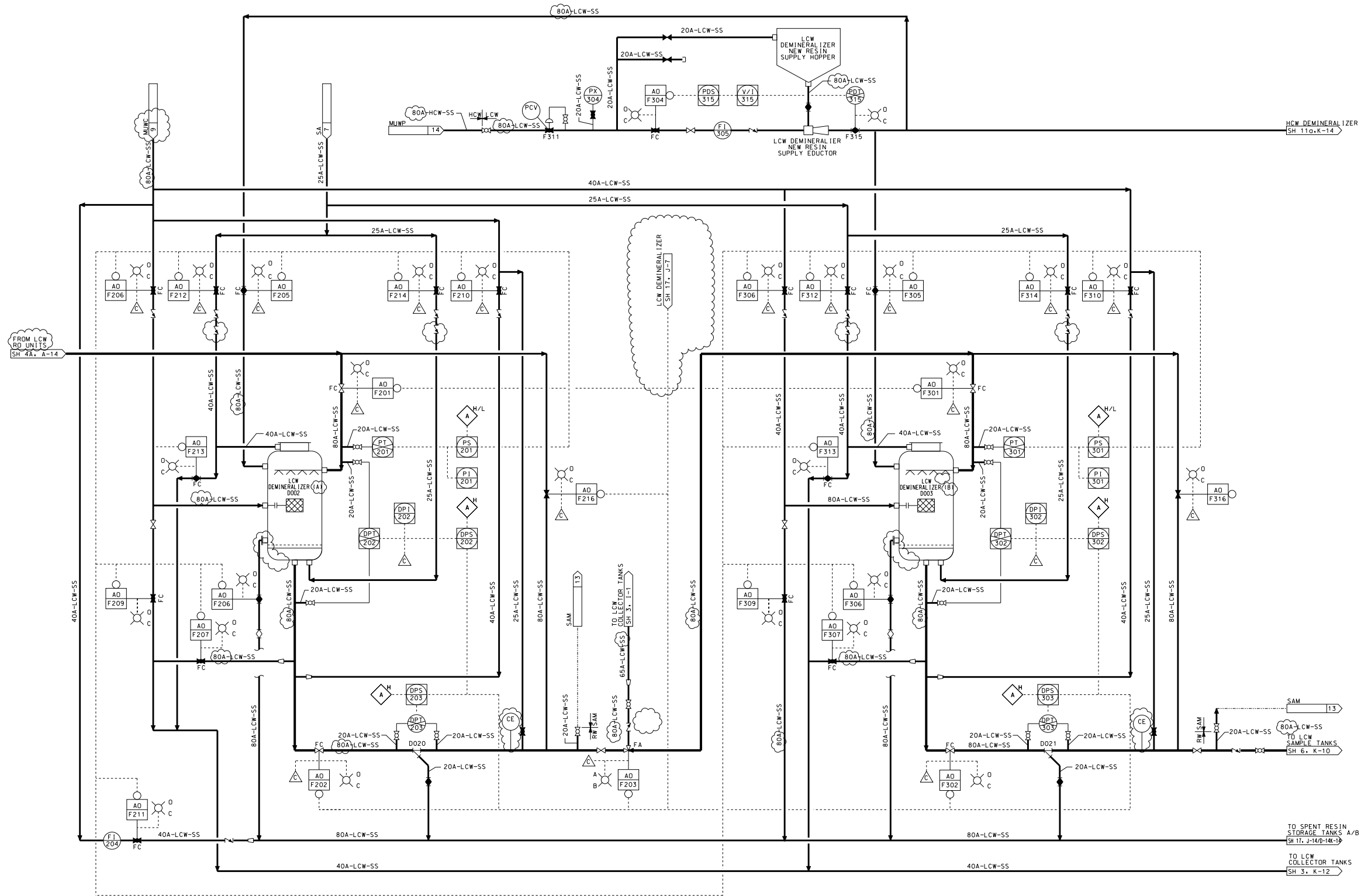


Figure 11.2-2 – Radwaste System (Sheet 5 OF 36)

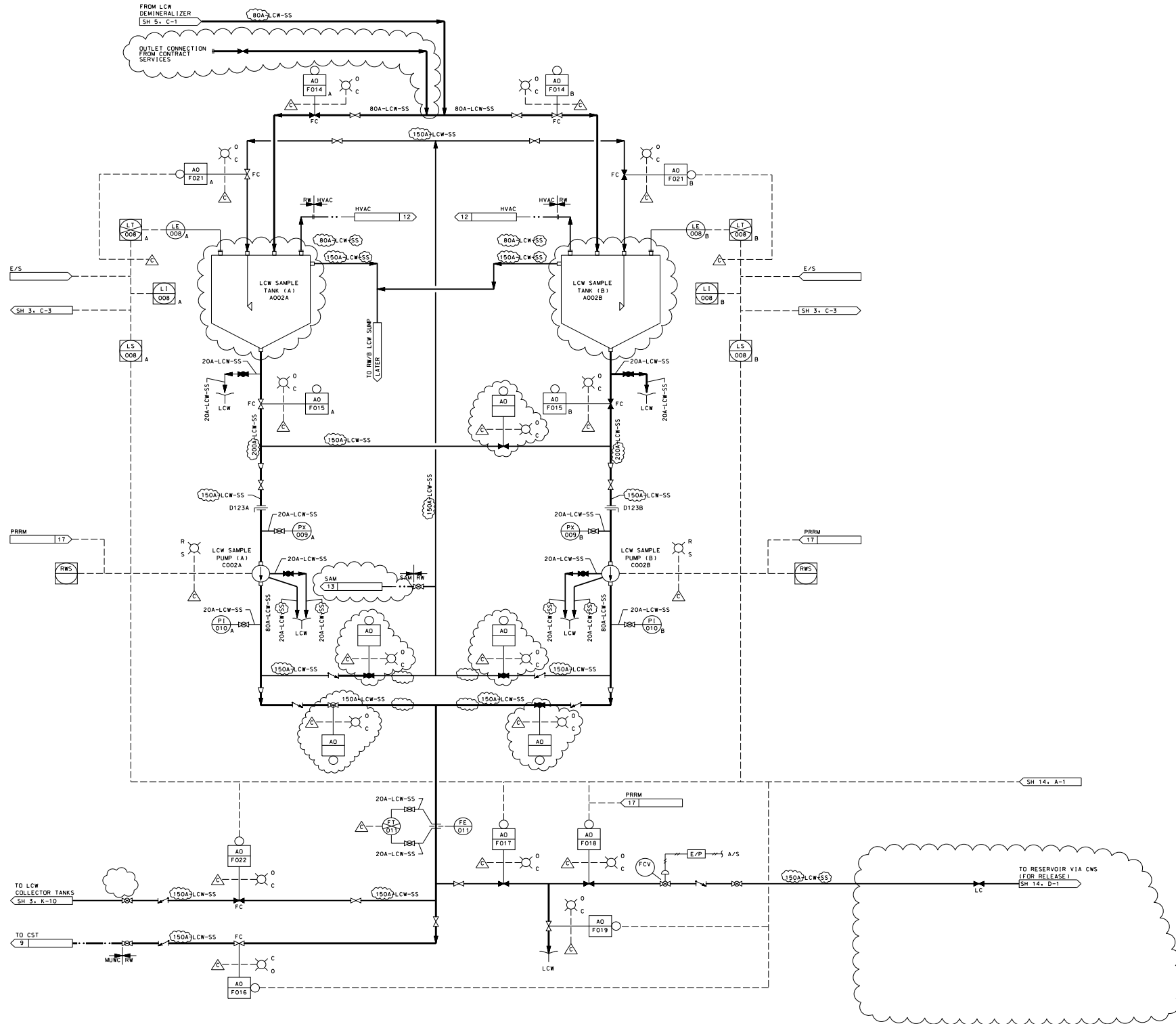


Figure 11.2-2 – Radwaste System (Sheet 6 OF 36)

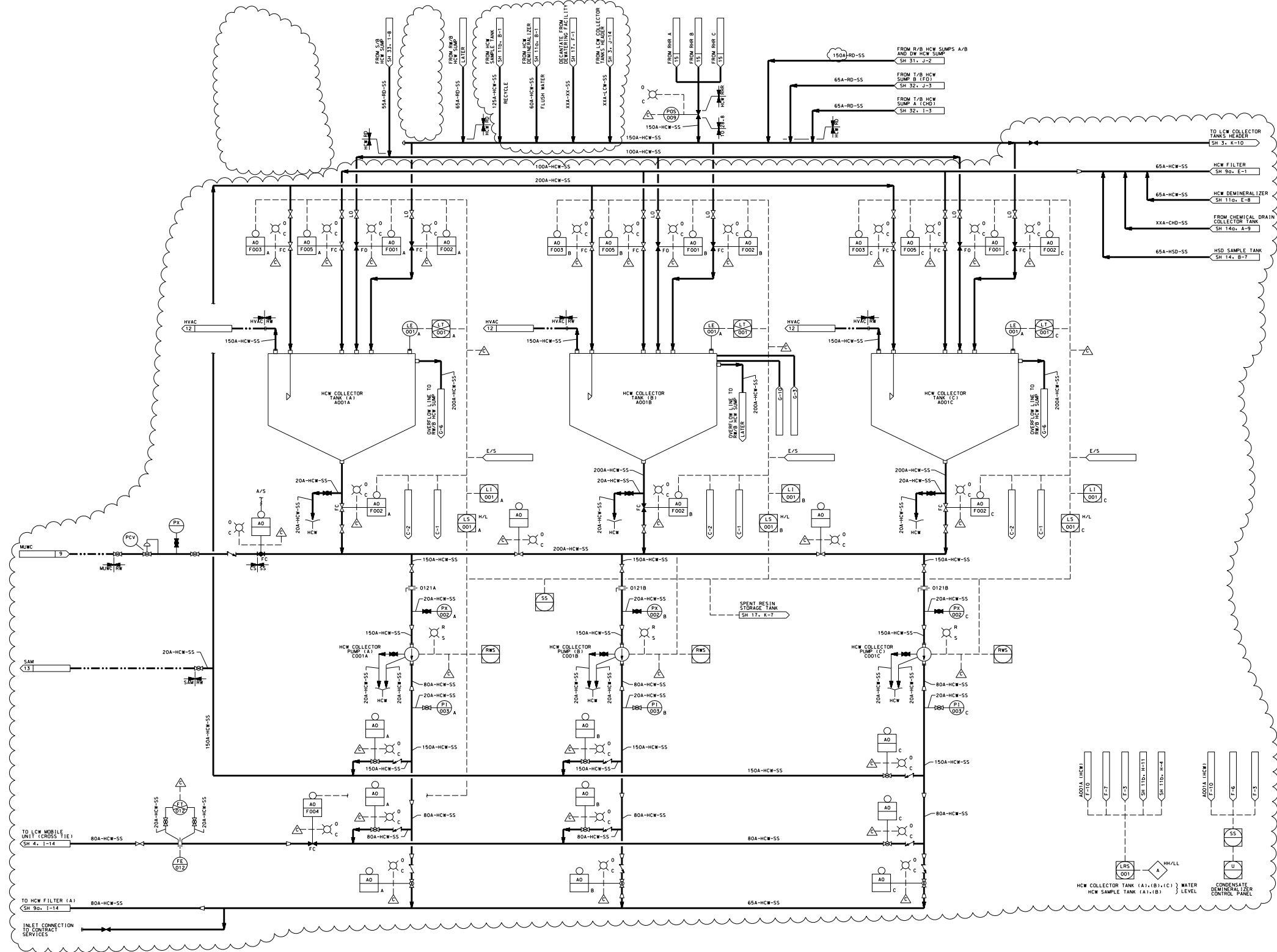


Figure 11.2-2 – Radwaste System (Sheet 7 OF 36)

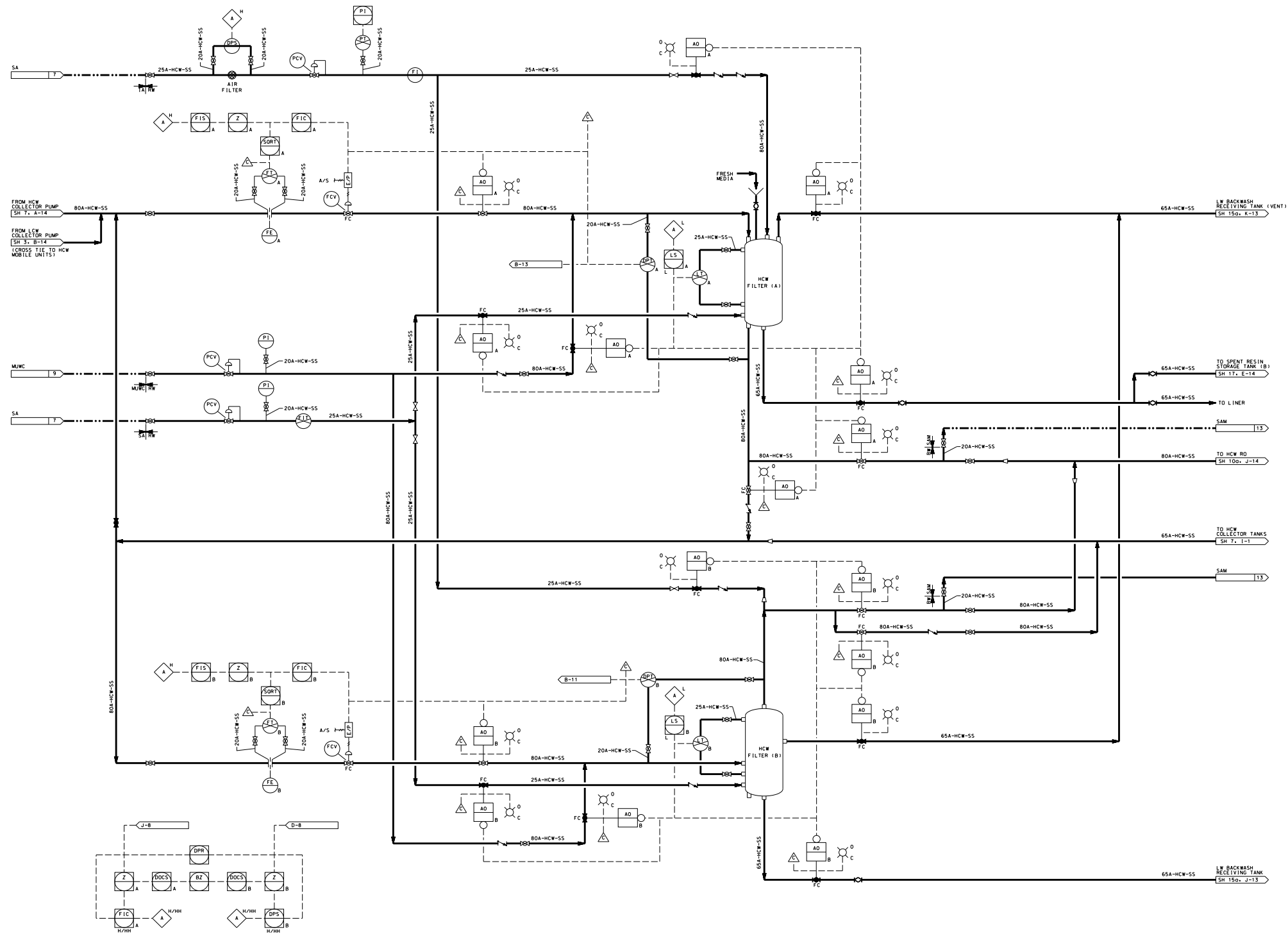


Figure 11.2-2 – Radwaste System (Sheet 9a OF 36)

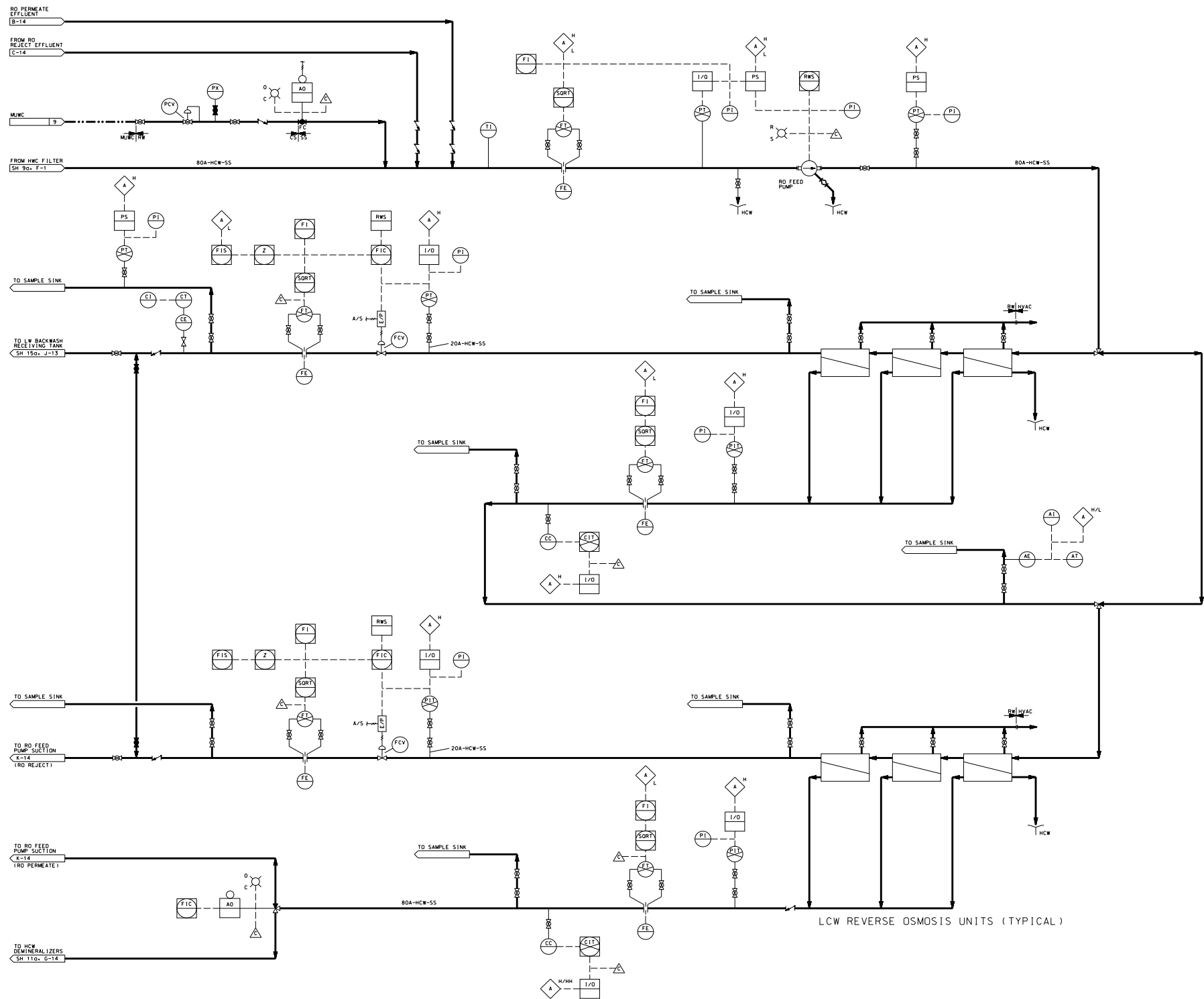


Figure 11.2-2 – Radwaste System (Sheet 10a OF 36)

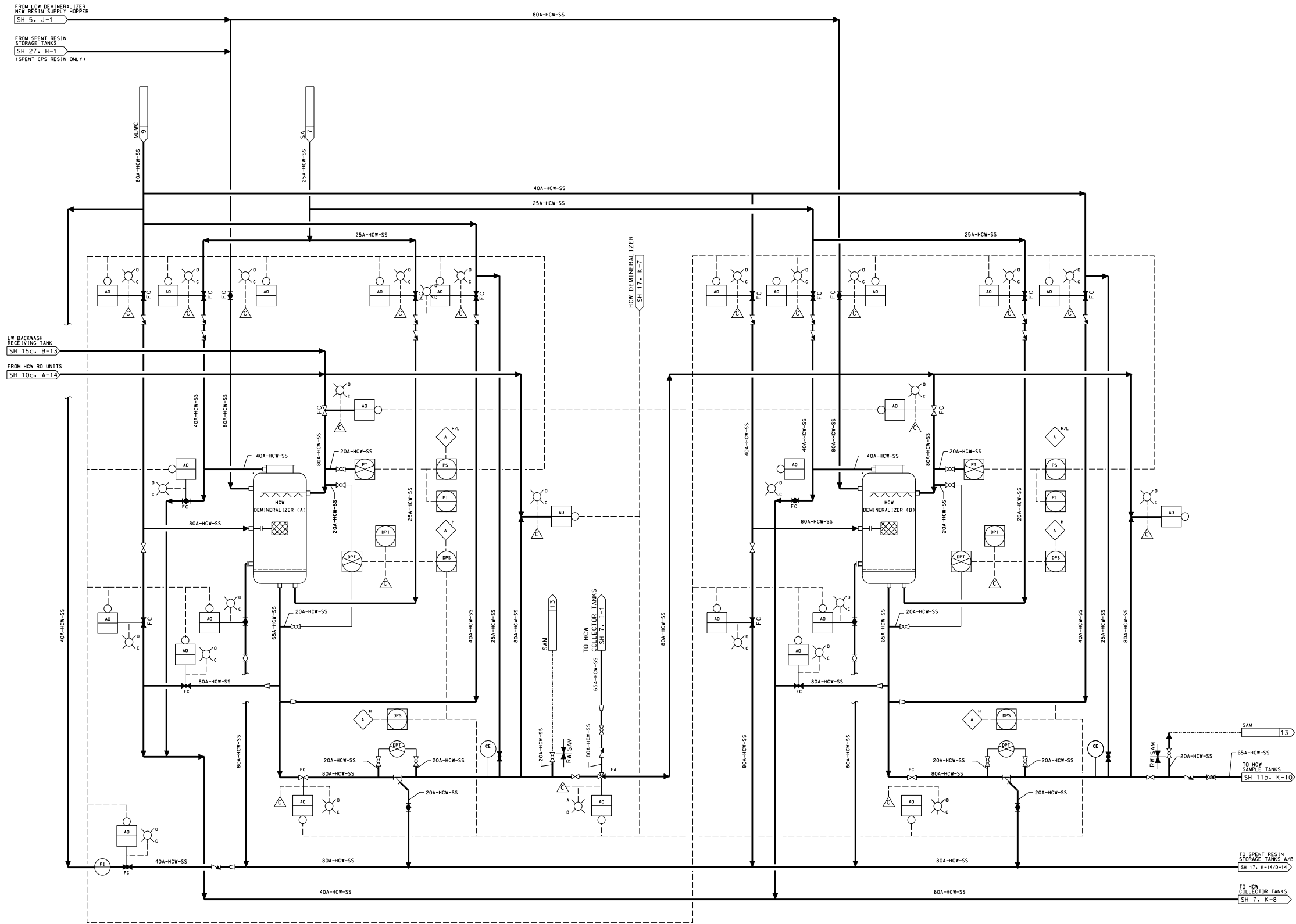


Figure 11.2-2 – Radwaste System (Sheet 11a OF 36)

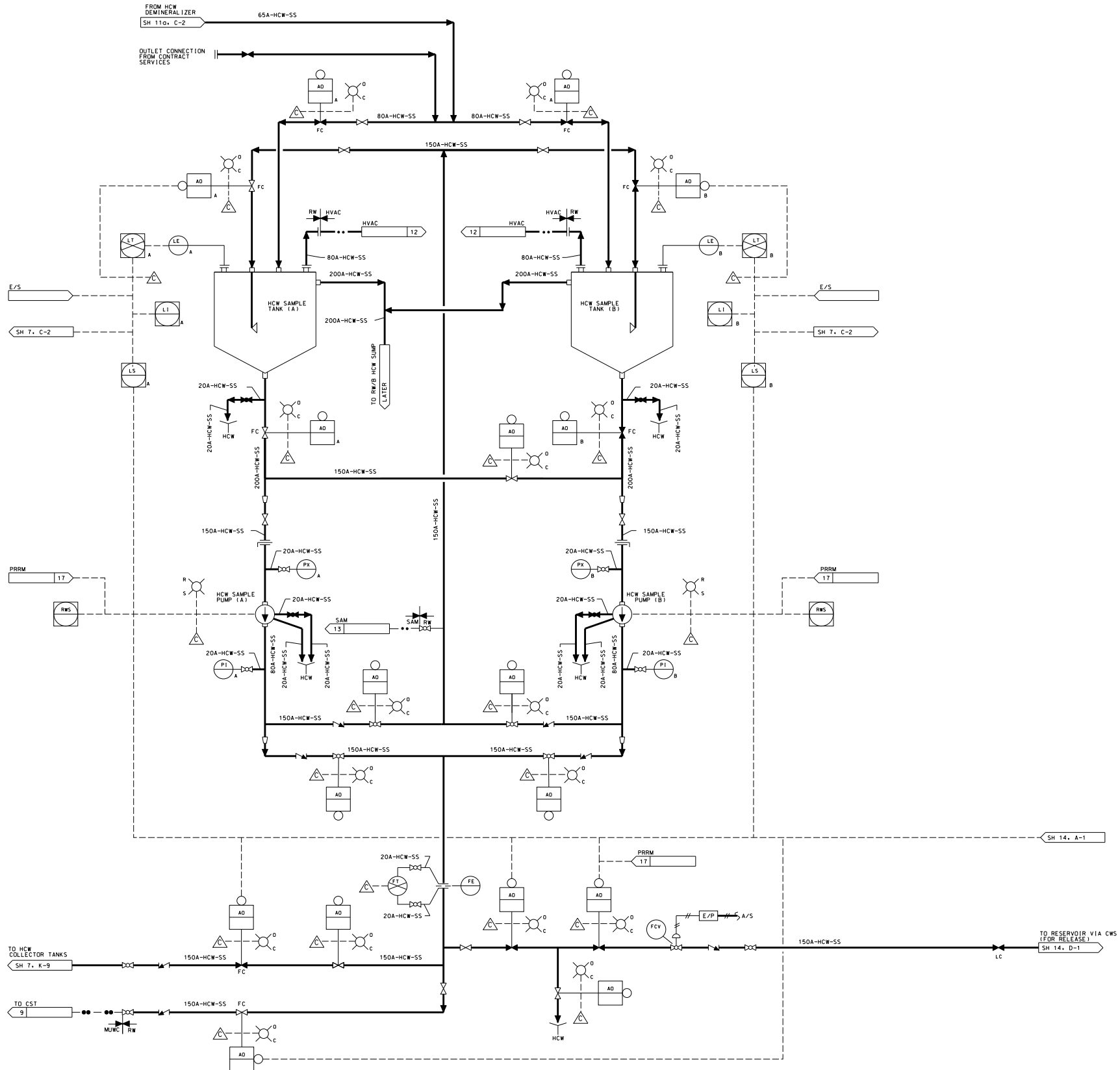


Figure 11.2-2 – Radwaste System (Sheet 11b OF 36)



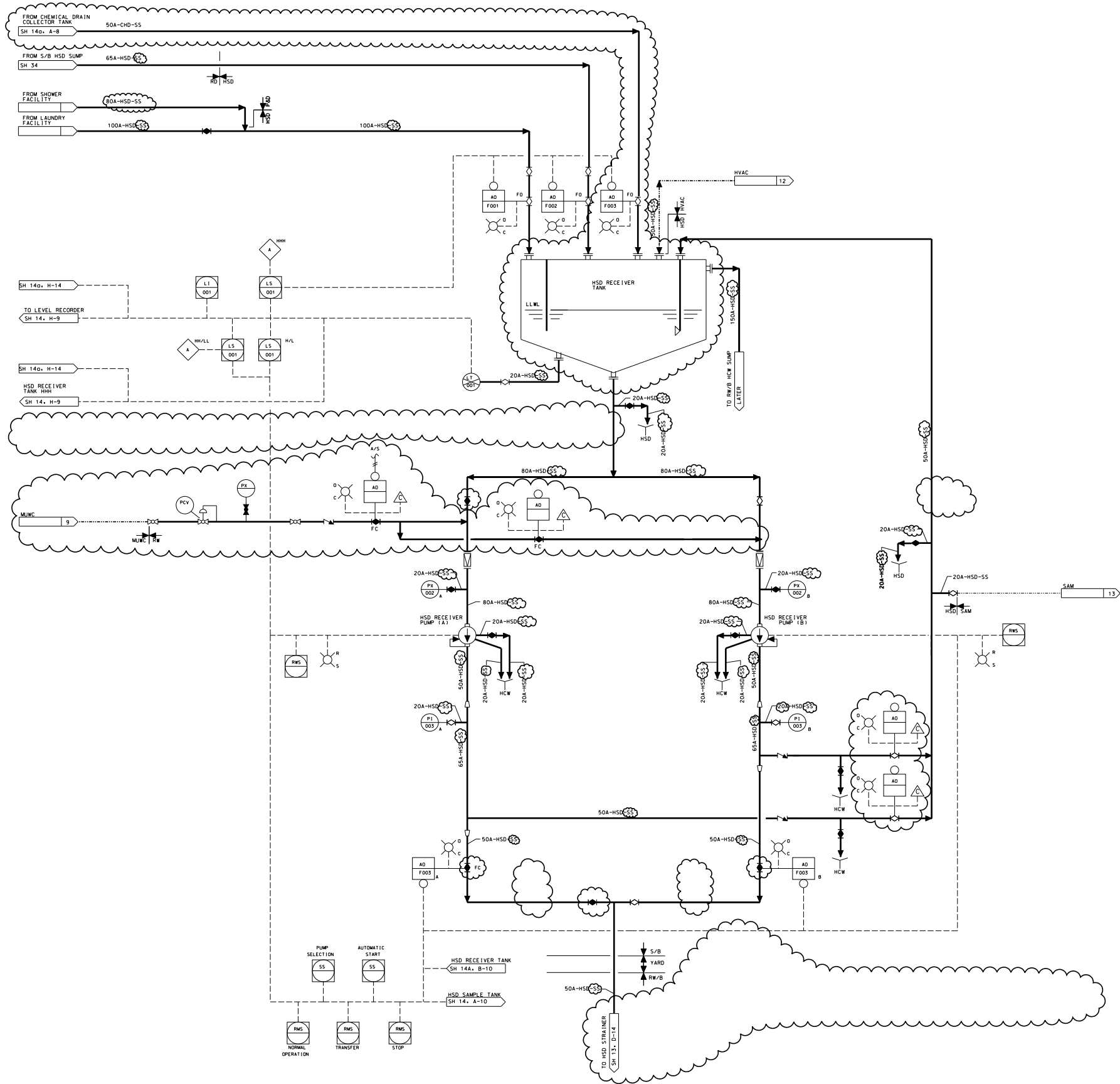


Figure 11.2-2 – Radwaste System (Sheet 12 OF 36)



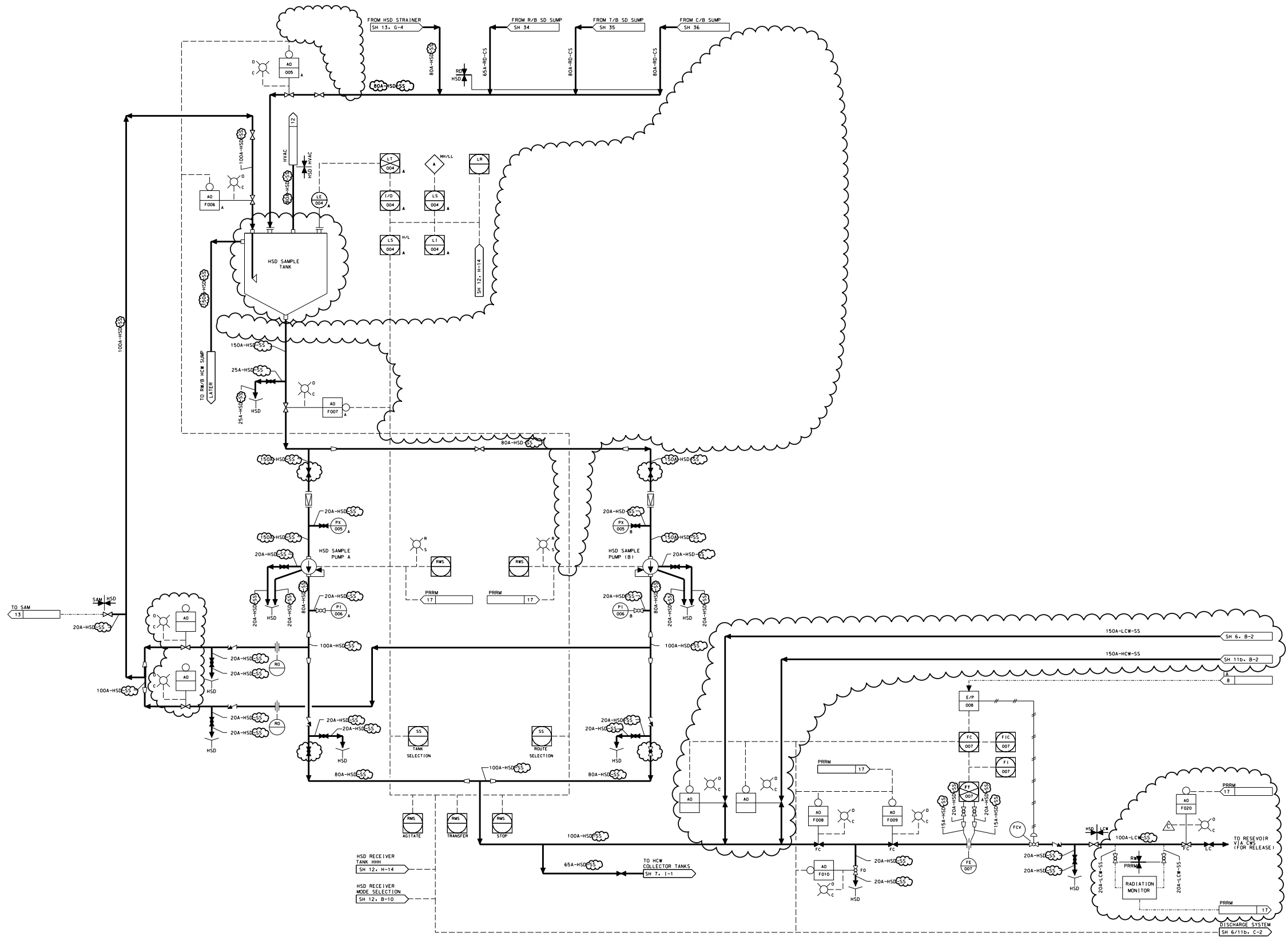


Figure 11.2-2 – Radwaste System (Sheet 14 OF 36)

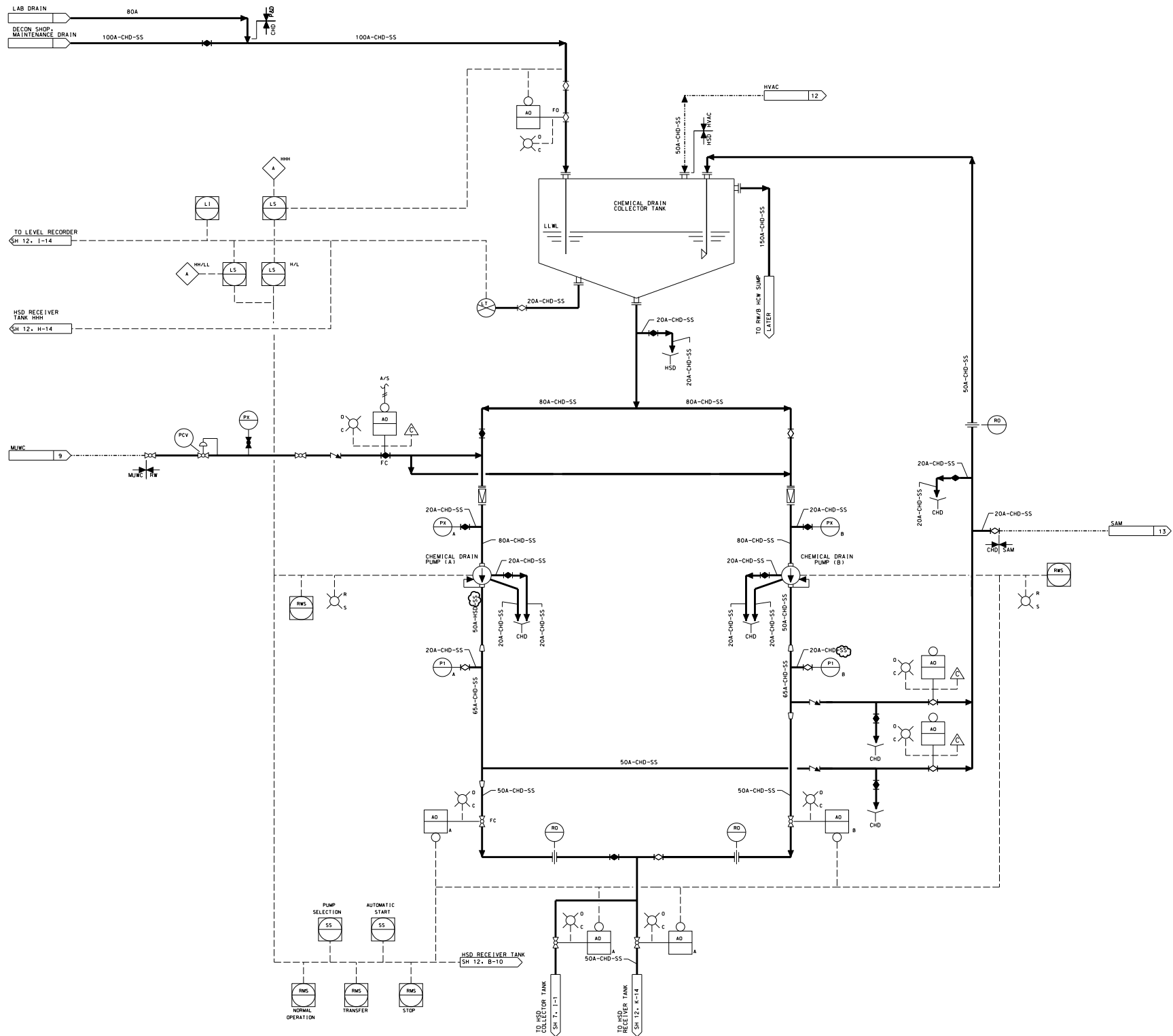


Figure 11.2-2 – Radwaste System (Sheet 14a OF 36)

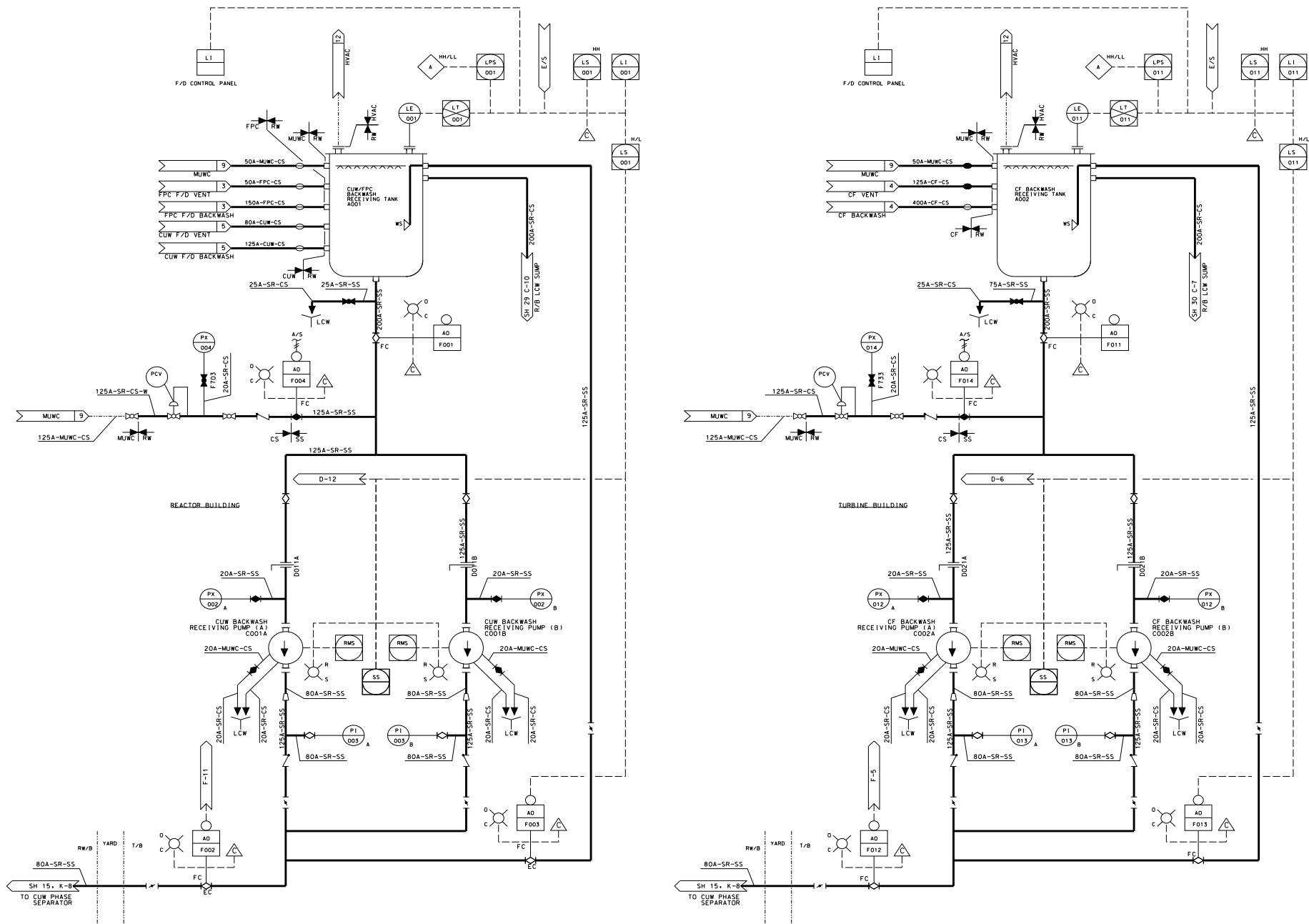


Figure 11.2-2 – Radwaste System (Sheet 15 OF 36)

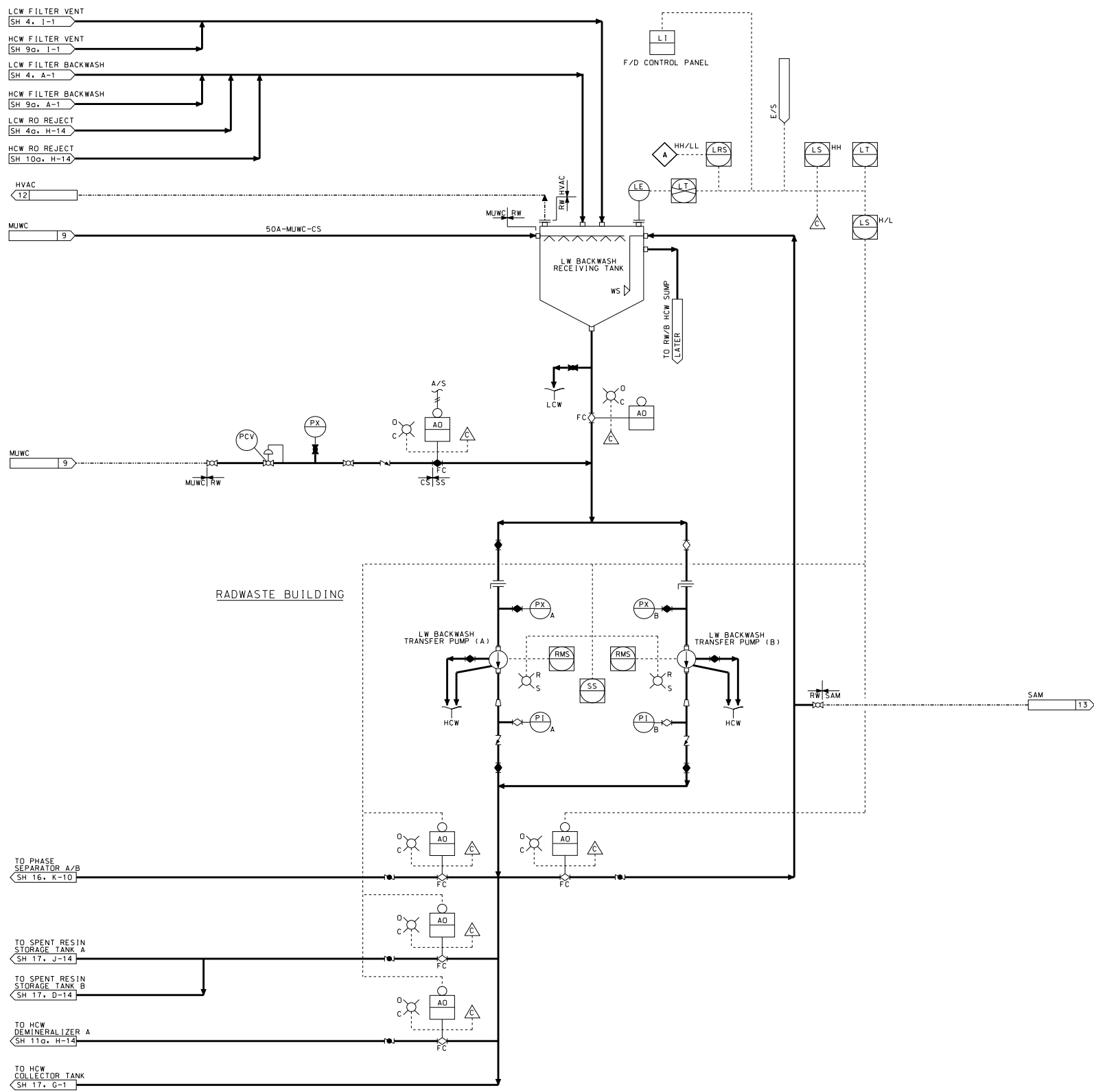


Figure 11.2-2 – Radwaste System (Sheet 15a OF 36)

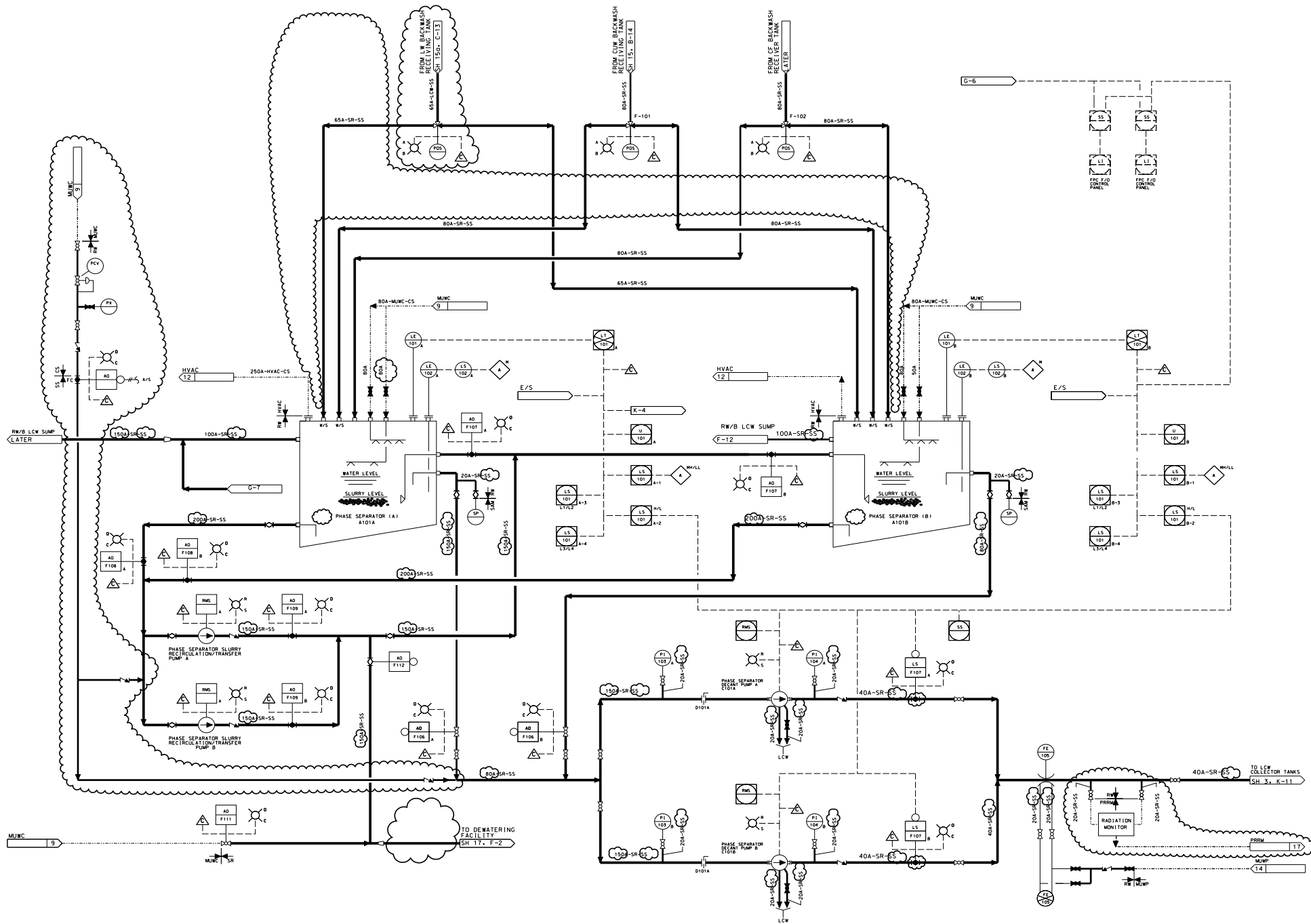


Figure 11.2-2 – Radwaste System (Sheet 16 OF 36)

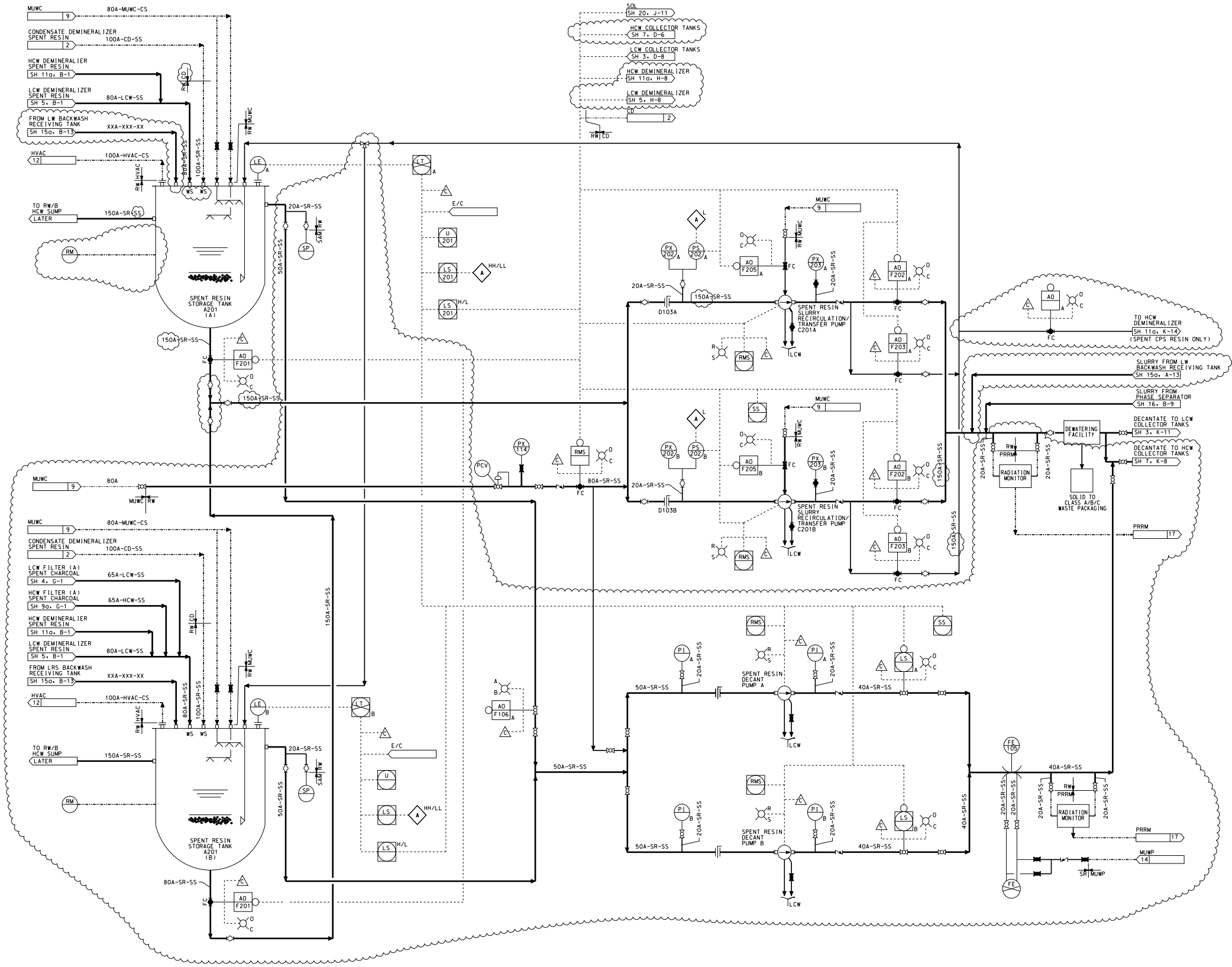
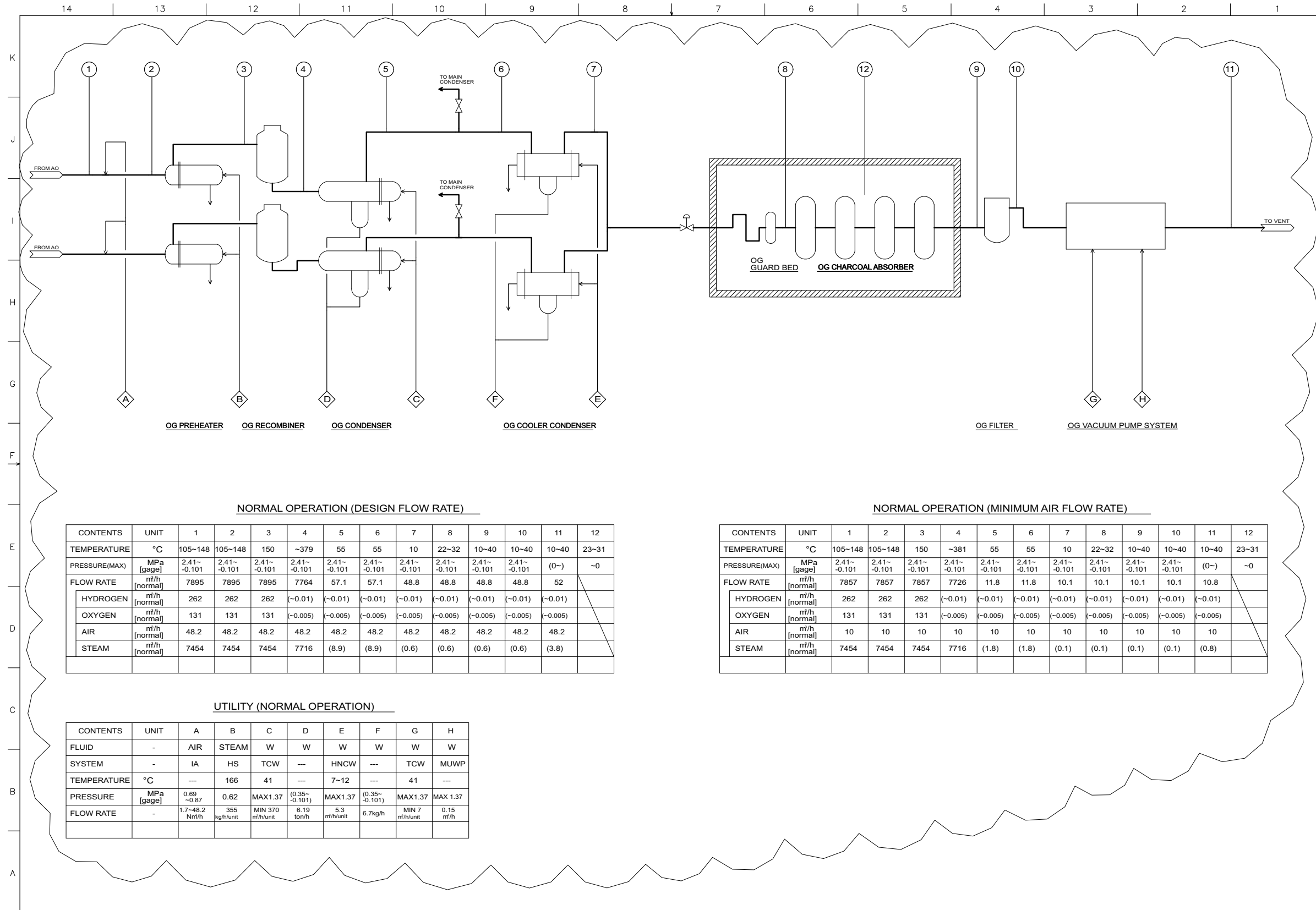


Figure 11.2-2 – Radwaste System (Sheet 17 OF 36)





NORMAL OPERATION (DESIGN FLOW RATE)

CONTENTS	UNIT	1	2	3	4	5	6	7	8	9	10	11	12
TEMPERATURE	°C	105-148	105-148	150	-379	55	55	10	22-32	10-40	10-40	10-40	23-31
PRESSURE(MAX)	MPa [gage]	2.41~ -0.101	2.41~ -0.101	2.41~ -0.101	2.41~ -0.101	2.41~ -0.101	2.41~ -0.101	2.41~ -0.101	2.41~ -0.101	2.41~ -0.101	2.41~ -0.101	(0~)	~0
FLOW RATE	m <sup>3</sup> /h [normal]	7895	7895	7895	7764	57.1	57.1	48.8	48.8	48.8	48.8	52	
HYDROGEN	m <sup>3</sup> /h [normal]	262	262	262	(-0.01)	(-0.01)	(-0.01)	(-0.01)	(-0.01)	(-0.01)	(-0.01)	(-0.01)	
OXYGEN	m <sup>3</sup> /h [normal]	131	131	131	(-0.005)	(-0.005)	(-0.005)	(-0.005)	(-0.005)	(-0.005)	(-0.005)	(-0.005)	
AIR	m <sup>3</sup> /h [normal]	48.2	48.2	48.2	48.2	48.2	48.2	48.2	48.2	48.2	48.2	48.2	
STEAM	m <sup>3</sup> /h [normal]	7454	7454	7454	7716	(8.9)	(8.9)	(0.6)	(0.6)	(0.6)	(0.6)	(3.8)	

NORMAL OPERATION (MINIMUM AIR FLOW RATE)

CONTENTS	UNIT	1	2	3	4	5	6	7	8	9	10	11	12
TEMPERATURE	°C	105-148	105-148	150	-381	55	55	10	22-32	10-40	10-40	10-40	23-31
PRESSURE(MAX)	MPa [gage]	2.41~ -0.101	2.41~ -0.101	2.41~ -0.101	2.41~ -0.101	2.41~ -0.101	2.41~ -0.101	2.41~ -0.101	2.41~ -0.101	2.41~ -0.101	2.41~ -0.101	(0~)	~0
FLOW RATE	m <sup>3</sup> /h [normal]	7857	7857	7857	7726	11.8	11.8	10.1	10.1	10.1	10.1	10.8	
HYDROGEN	m <sup>3</sup> /h [normal]	262	262	262	(-0.01)	(-0.01)	(-0.01)	(-0.01)	(-0.01)	(-0.01)	(-0.01)	(-0.01)	
OXYGEN	m <sup>3</sup> /h [normal]	131	131	131	(-0.005)	(-0.005)	(-0.005)	(-0.005)	(-0.005)	(-0.005)	(-0.005)	(-0.005)	
AIR	m <sup>3</sup> /h [normal]	10	10	10	10	10	10	10	10	10	10	10	
STEAM	m <sup>3</sup> /h [normal]	7454	7454	7454	7716	(1.8)	(1.8)	(0.1)	(0.1)	(0.1)	(0.1)	(0.8)	

UTILITY (NORMAL OPERATION)

CONTENTS	UNIT	A	B	C	D	E	F	G	H
FLUID	-	AIR	STEAM	W	W	W	W	W	W
SYSTEM	-	IA	HS	TCW	---	HNCW	---	TCW	MUWP
TEMPERATURE	°C	---	166	41	---	7-12	---	41	---
PRESSURE	MPa [gage]	0.69 -0.87	0.62	MAX1.37	(0.35- -0.101)	MAX1.37	(0.35- -0.101)	MAX1.37	MAX 1.37
FLOW RATE	-	1.7-48.2 Nm <sup>3</sup> /h	355 kg/h/unit	MIN 370 m <sup>3</sup> /h/unit	6.19 ton/h	5.3 m <sup>3</sup> /h/unit	6.7kg/h	MIN 7 m <sup>3</sup> /h/unit	0.15 m <sup>3</sup> /h

Figure 11.3-1 – Offgas System PFD (Sheet 1)

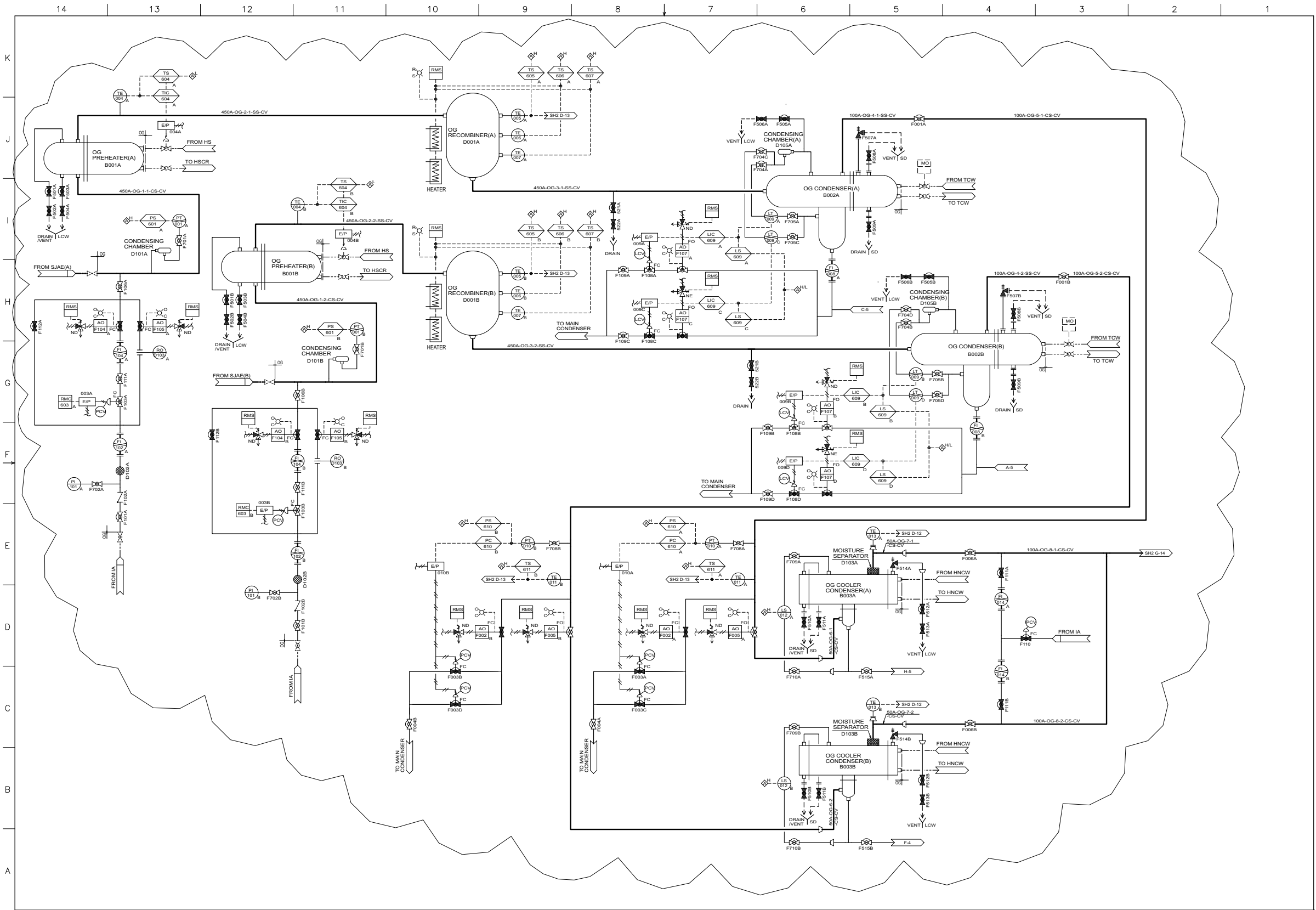


Figure 11.3-2 – Offgas System P&ID (Sheet 1 of 3)

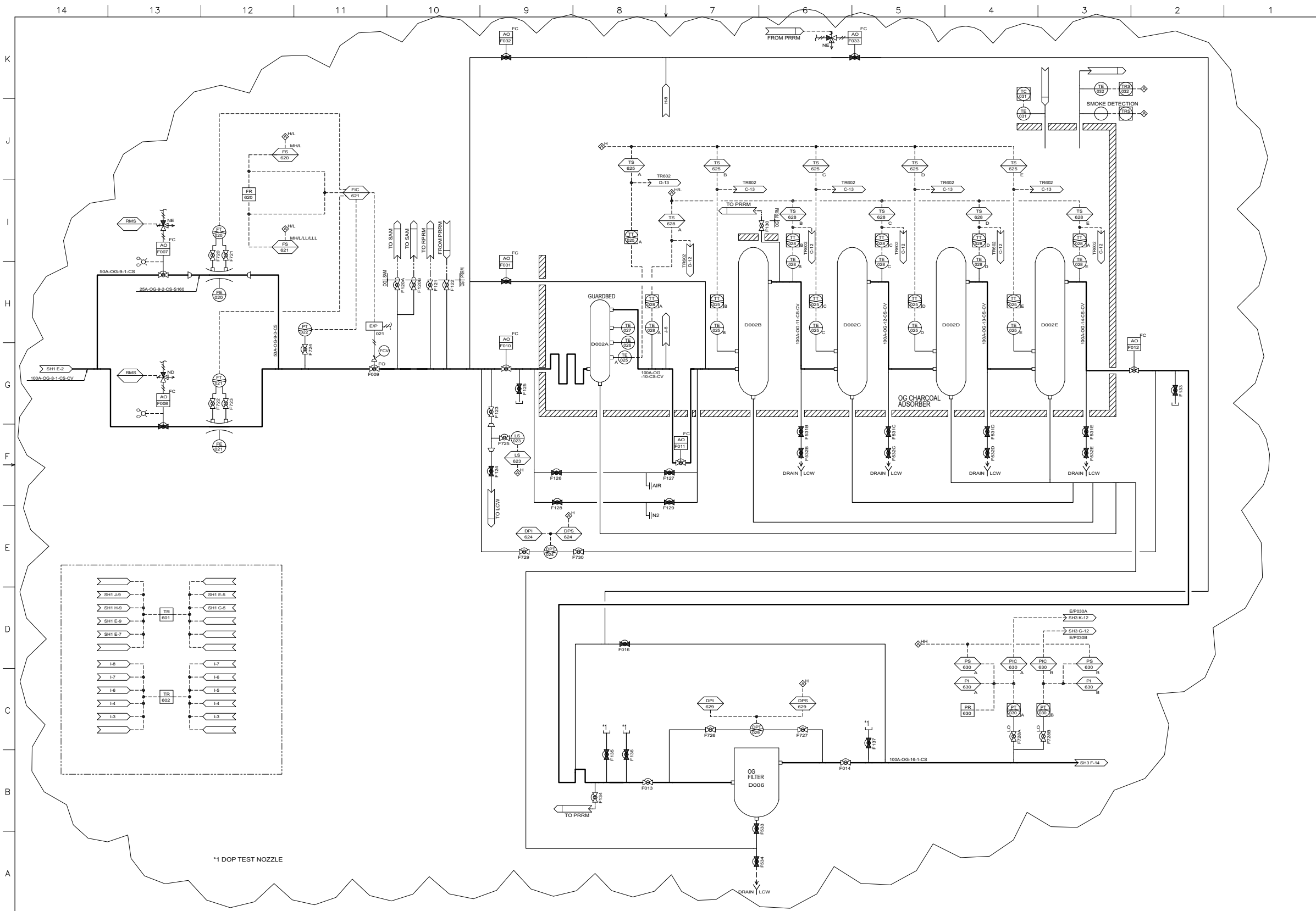


Figure 11.3-2 – Offgas System P&ID (Sheet 2 of 3)

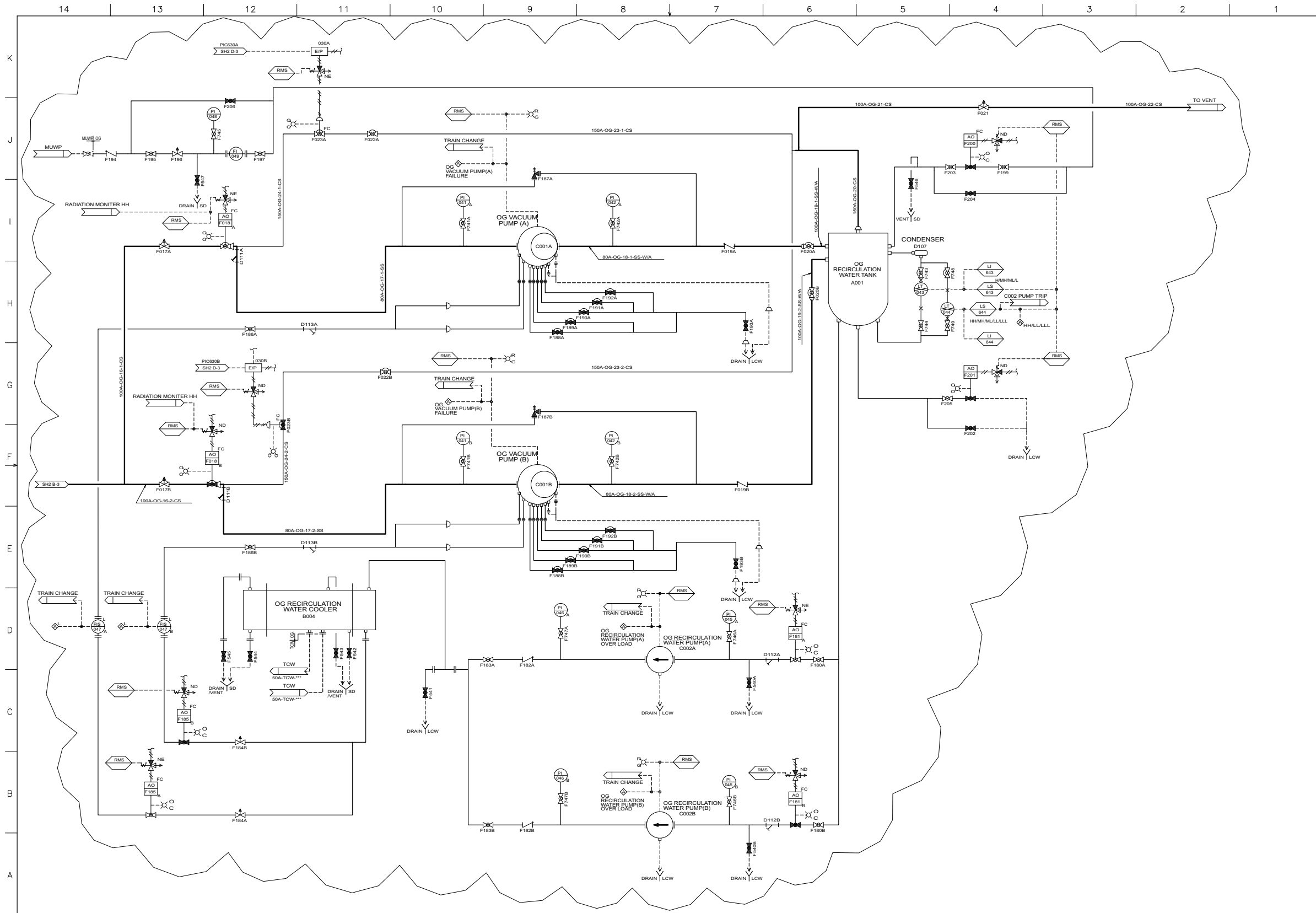


Figure 11.3-2 – Offgas System P&ID (Sheet 3 of 3)