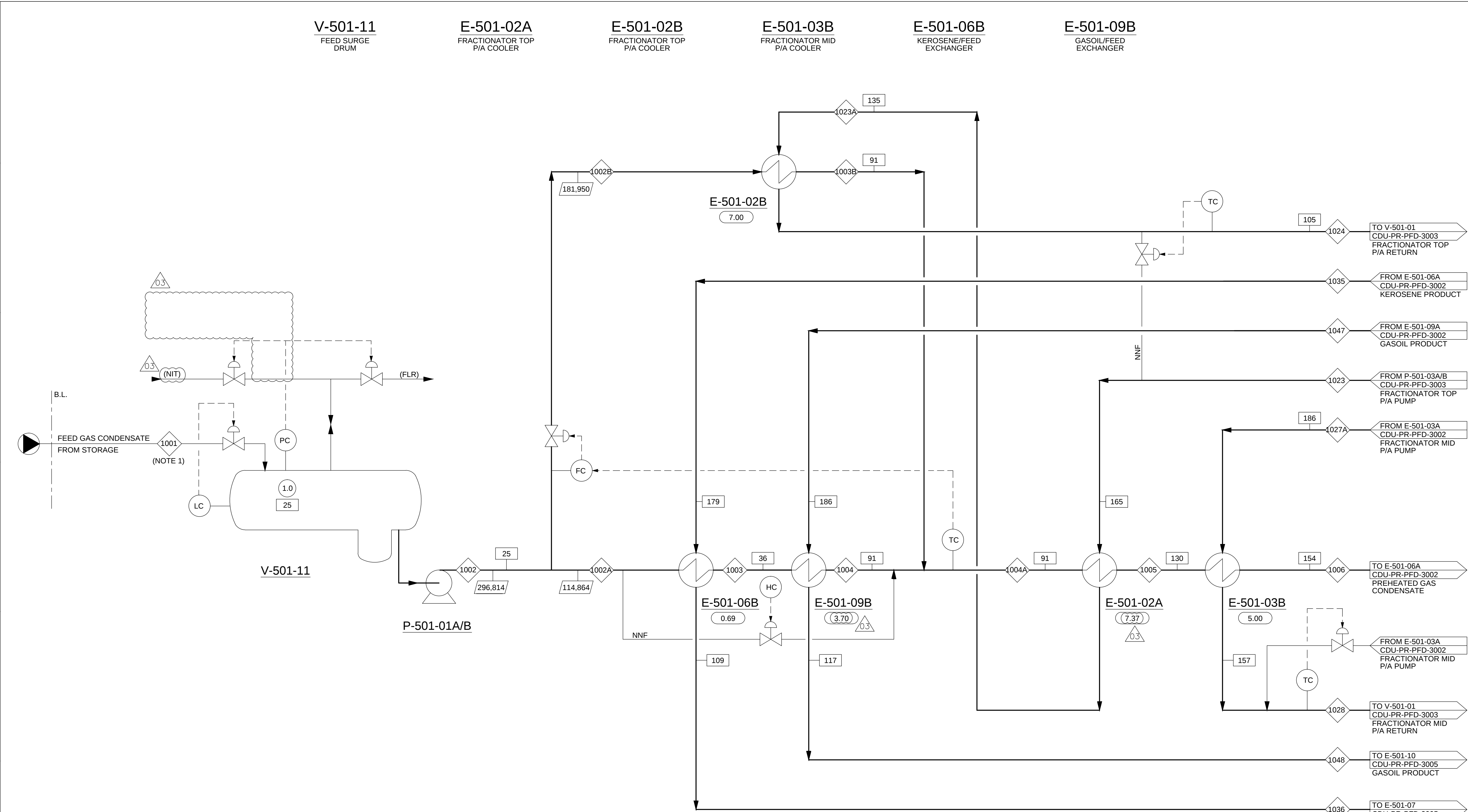




P-501-01A/B																				
FEED PUMPS																				
CAPACITY = 401.3 x 1.1 m³/hr																				
DIFF. PRESS. = 28.7 bar																				
Stream No.	Unit	1001	1002	1002A	1002B	1003	1003B	1004	1004A	1005	1006	1023	1023A	1024	1027A	1028	1035	1036	1047	1048
Stream Description		FEED GAS COND.	P-501-01 DISCHARGE	E-501-06B TUBE IN	E-501-02B TUBE IN	E-501-09B TUBE IN	E-501-02B TUBE OUT	E-501-09B TUBE OUT	E-501-02A TUBE IN	E-501-03B TUBE IN	E-501-03B TUBE OUT	TOP P/A TO E-501-02A	E-501-02B SHELL IN	TOP P/A RETURN	E-501-03B SHELL IN	MID. P/A RETURN	KERO. PROD. TO E-501-06B	KERO. PROD. TO E-501-07	GAS OIL PROD. TO E-501-09B	GAS OIL PROD. TO E-501-10
Phase		Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid
Total Mass Rate	kg/hr	296,814	296,814	114,864	181,950	114,864	181,950	114,864	296,814	296,814	296,814	367,607	367,607	367,607	250,000	250,000	15,000	15,000	81,463	81,463
Temperature	°C	25	25	25	25	36	91	91	91	130	154	165	135	105	186	157	109	186	117	
Pressure	barG	4.5	29.3	29.3	28.3	27.8	27.1	27.1	27.1	26.6	26.1	8.3	7.9	7.6	7.7	7.4	11.0	10.7	8.5	8.2
Total Enthalpy	MW	4.4	4.4	1.7	2.7	2.4	9.7	6.1	15.8	23.3	28.3	36.2	28.9	21.9	27.9	22.9	1.6	0.9	8.9	5.2
LIQUID																				
Molecular Weight	kg/kg.mol	116.0	116.0	116.0	116.0	116.0	116.0	116.0	116.0	116.0	116.0	132.2	132.2	132.2	153.9	153.9	164.2	164.2	210.7	210.7
Mass Rate	kg/hr	296,814	296,814	114,864	181,950	114,864	181,950	114,864	296,814	296,814	296,814	367,607	367,607	367,607	250,000	250,000	15,000	15,000	81,463	81,463
Volume Rate	BPSD	60,000	60,000	23,219	36,781	23,219	36,781	23,219	60,000	60,000	60,000	71,567	71,567	71,567	47,540	47,540	2,825	2,825	14,752	14,752
Density	kg/m³	739.5	742.8	742.8	742.6	734.2	688.3	688.3	688.3	651.3	625.0	651.7	682.2	708.2	663.8	690.1	684.2	739.2	723.6	771.2
Viscosity	cP	0.618	0.639	0.639	0.637	0.552	0.301	0.301	0.301	0.211	0.171	0.199	0.248	0.313	0.219	0.270	0.258	0.448	0.402	0.799
VAPOR																				
Molecular Weight	kg/kg.mol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mass Rate	kg/hr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volume Rate	m³/hr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Density	kg/m³	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Viscosity	cP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

NOTES

1- CDU INLET PRESSURE WILL BE FINALIZED AFTER FEED PUMP HYDRAULIC CALCULATION.

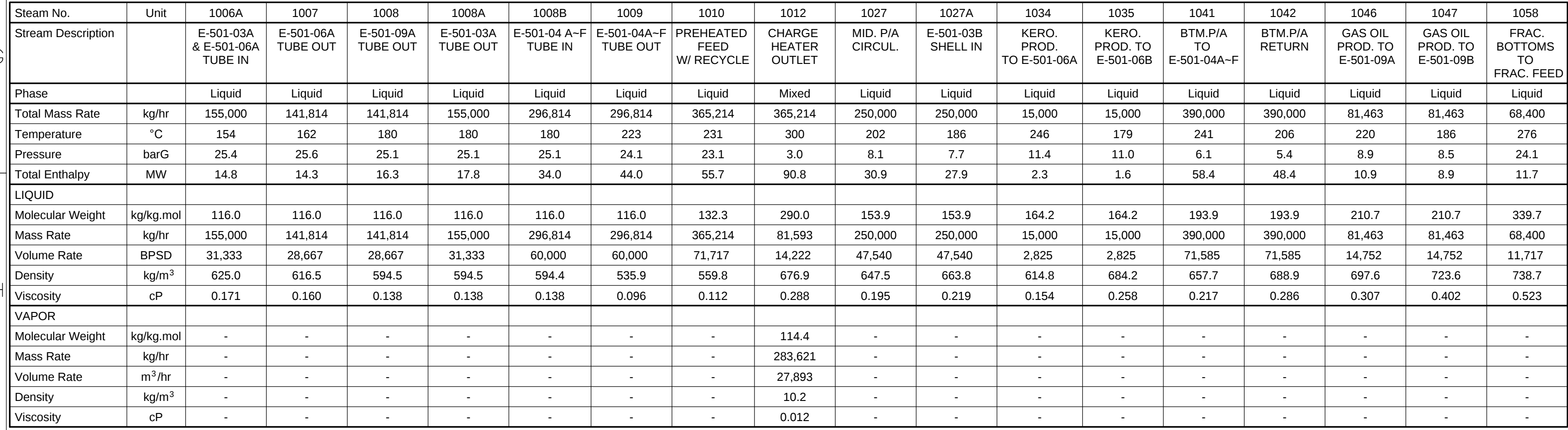
GENERAL NOTES

1- BPSD AT STANDARD CONDITION (1 ATM & 60°F).

SYMBOLS & LEGEND:

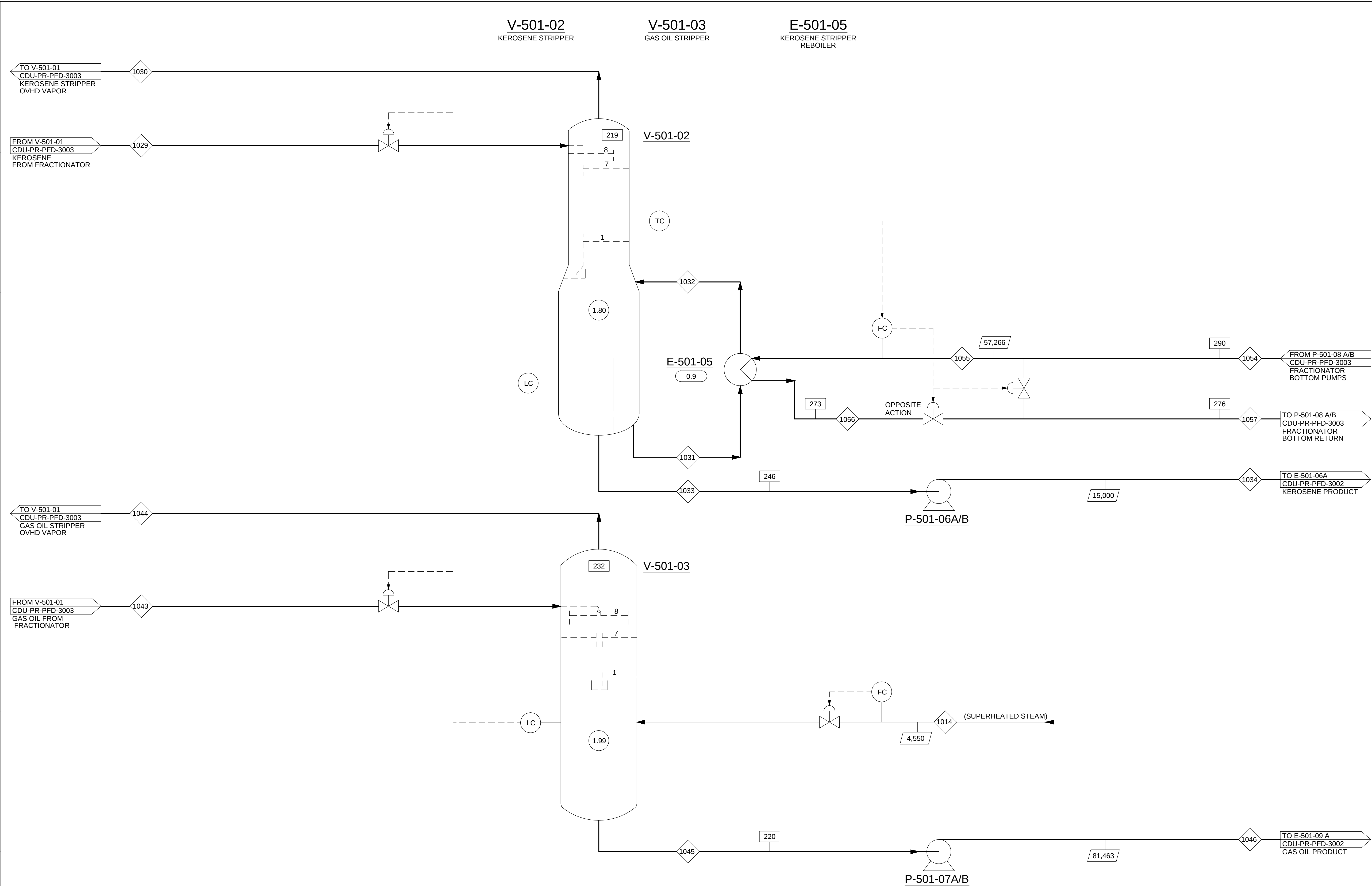
- ◇ = STREAM NUMBER
- = PRESSURE, barG
- = TEMPERATURE, °C
- = NORMAL HEAT DUTY, MW
- ▭ = FLOW RATE, kg/hr

03	23/Feb/18	ISSUED FOR FINAL	SM.P	I.J.K	JH.N	
02	09/Feb/18	ISSUED FOR FINAL	SM.P	I.J.K	JH.N	
01	15/Jan/18	ISSUED FOR APPROVAL	SM.P	I.J.K	JH.N	
00	27/Dec/17	ISSUED FOR APPROVAL	SM.P	T.J.K	JH.N	
REV.	DATE	DESCRIPTION	PREP. BY	CHKD. BY	APPD. BY	AUTH. BY
		SOUTHERN ADISH GAS CONDENSATE REFINERY PROJECT			 Southern Adish Gas Refinery Project	
CONTRACT NO.: ADSH-E-CO-GE-001			SCALE:			
DRAWING TITLE: PROCESS FLOW DIAGRAM CDU (FIRST PREHEAT SECTION) (MAX NAPHTHA/GASOIL CASE)						
DWG NO.:	PROJ	PHASE	UNIT	DISC	TYPE	SEQ.
	SACR	DE	CDU	PR	PFD	3001
						03
						1 OF 1
						1
						A1



 = STREAM NUMBER
 = PRESSURE, barG
 = TEMPERATURE, °C
 = NORMAL HEAT DUTY, MW
 = FLOW RATE, kg/hr

DWG NO.:	PROJ	PHASE	UNIT	DISC	TYPE	SEQ.	REV.	SHT NO.	CLASS	SI
	SACR	DE	CDU	PR	PFD	3002	03	1 OF 1	1	A



Stream No.	Unit	1014	1029	1030	1031	1032	1033	1034	1043	1044	1045	1046	1054	1055	1056	1057
Stream Description		GASOIL STRIPPER SUPERHEATED STEAM	KERO. STRIPPER FEED	KERO. STRIPPER VAPOR	KERO. REBOILER LIQUID IN	KERO. REBOILER VAPOR OUT	KERO. STRIPPER BOTTOM	KERO. PROD. TO E-501-06A	GASOIL STRIPPER FEED	GASOIL STRIPPER VAPOR	GASOIL STRIPPER BOTTOM	GASOIL PROD. TO E-501-09A	FRAC. BTM. PUMP DISCH.	FRAC. BTM TO STRIPPER REBOILER	FRAC. BTM FROM STRIPPER REBOILER	FRAC. BTM.
Phase		Vapor	Liquid	Vapor	Liquid	Mixed	Liquid	Liquid	Liquid	Vapor	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid
Total Mass Rate	kg/hr	4,550	19,968	4,968	38,000	38,000	15,000	15,000	108,752	31,839	81,463	81,463	69,550	57,266	57,266	69,550
Temperature	°C	330	202	219	237	244	246	246	241	232	220	293	293	293	273	276
Pressure	barG	3.0	1.9	1.8	1.8	1.7	1.9	11.4	1.9	1.9	2.0	8.9	24.4	24.4	24.1	24.1
Total Enthalpy	MW	4.0	2.5	1.0	5.7	6.6	2.3	2.3	16.3	9.4	10.8	10.9	12.7	10.5	9.6	11.8
LIQUID																
Molecular Weight	kg/kg.mol	-	153.9	-	160.4	163.4	164.2	164.2	193.9	-	210.7	210.7	339.7	339.7	339.7	339.7
Mass Rate	kg/hr	-	19,968	-	38,000	26,728	15,000	15,000	108,752	-	81,463	81,463	69,550	57,266	57,266	69,550
Volume Rate	BPSD	-	3,797	-	7,179	5,038	2,825	2,825	19,961	-	14,752	14,752	11,914	9,810	9,810	11,914
Density	kg/m³	-	645.6	-	619.2	616.3	614.8	614.8	656.1	-	695.6	697.6	728.4	728.4	740.9	738.7
Viscosity	cP	-	0.195	-	0.159	0.156	0.154	0.154	0.217	-	0.306	0.307	0.450	0.453	0.541	0.523
VAPOR																
Molecular Weight	kg/kg.mol	18.0	-	129.4	-	154.0	-	-	-	74.6	-	-	-	-	-	-
Mass Rate	kg/hr	4,550	-	4,968	-	11,272	-	-	-	31,839	-	-	-	-	-	-
Volume Rate	m³/hr	3,131	-	514	-	994.1	-	-	-	6,015	-	-	-	-	-	-
Density	kg/m³	1.5	-	9.7	-	11.3	-	-	-	5.3	-	-	-	-	-	-
Viscosity	cP	0.022	-	0.010	-	0.010	-	-	-	0.012	-	-	-	-	-	-

P-501-06A/B
KEROSENE PRODUCT PUMPS
CAPACITY = $(36 \times 1.1 \text{ m}^3/\text{hr})$
DIFF. PRESS. = (6.52 bar)

P-501-07A/B
GAS OIL PRODUCT PUMPS
CAPACITY = $(117 \times 1.1 \text{ m}^3/\text{hr})$
DIFF. PRESS. = (5.3 bar)

NOTES

1- LP STEAM COIL IS USED FOR WINTERIZING ONLY.

GENERAL NOTES

1- BPSD AT STANDARD CONDITION (1 ATM & 60°F).

SYMBOLS & LEGEND:

= STREAM NUMBER

= PRESSURE, barG

= TEMPERATURE, °C

= NORMAL HEAT DUTY, MW

= FLOW RATE, kg/hr

03	23/Feb/18	ISSUED FOR FINAL	SM.P	I.J.K	J.H.N	
02	09/Feb/18	ISSUED FOR FINAL	SM.P	I.J.K	J.H.N	
01	15/Jan/18	ISSUED FOR APPROVAL	SM.P	I.J.K	J.H.N	
00	27/Dec/17	ISSUED FOR APPROVAL	SM.P	T.J.K	J.H.N	
REV.	DATE	DESCRIPTION	PREP. BY	CHKD. BY	APPD. BY	AUTH. BY

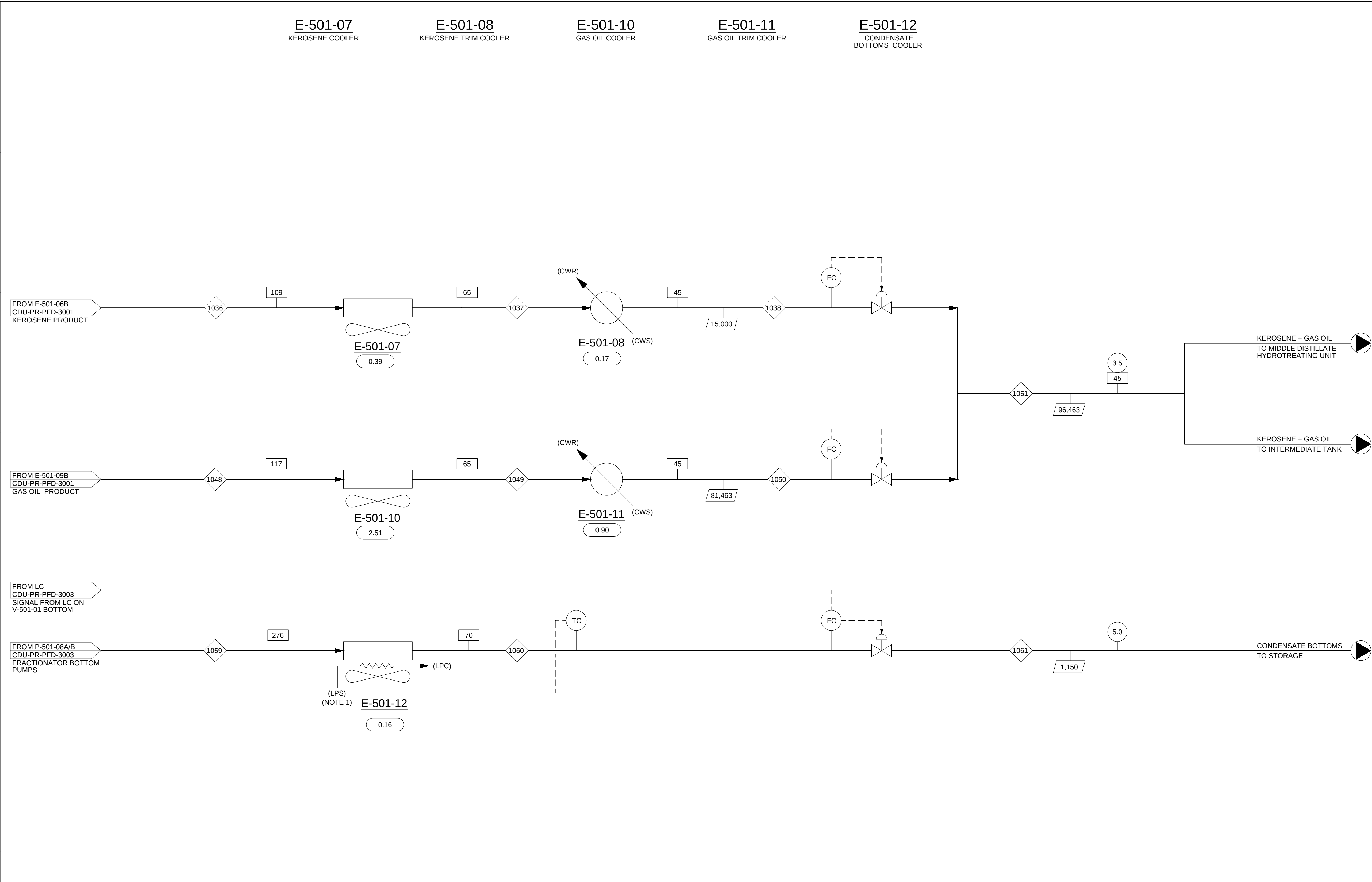
SOUTHERN ADISH GAS CONDENSATE REFINERY PROJECT

CONTRACT NO.: ADSH-E-CO-GE-001

SCALE:

DRAWING TITLE: PROCESS FLOW DIAGRAM
CDU
(FRACTIONATOR COLUMN SIDE STRIPPERS SECTION)
(MAX NAPHTHA/GASOIL CASE)

DWG NO.:	PROJ	PHASE	UNIT	DISC	TYPE	SEQ.	REV.	SHT No.	CLASS	SIZE
	SACR	DE	CDU	PR	PFD	3004	03	1 OF 1	1	A1



Stream No.	Unit	1036	1037	1038	1048	1049	1050	1051	1059	1060	1061
Stream Description		KERO. PROD. TO E-501-07	KERO. PROD. TO E-501-08	KERO. PROD.	GAS OIL PROD. TO E-501-10	GAS OIL PROD. TO E-501-11	GAS OIL PROD.	GAS OIL + KERO.	FRAC. BOTTOM	FRAC. BOTTOM	FRAC. BOTTOM TO STORAGE
Phase		Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid
Total Mass Rate	kg/hr	15,000	15,000	15,000	81,463	81,463	81,463	96,463	1,150	1,150	1,150
Temperature	°C	109	65	45	117	65	45	45	276	70	70
Pressure	barG	10.7	9.7	9.4	8.2	7.8	7.4	3.5	24.1	23.4	5.0
Total Enthalpy	MW	0.90	0.51	0.34	5.16	2.66	1.76	2.10	0.20	0.04	0.04
LIQUID											
Molecular Weight	kg/kg.mol	164.2	164.2	164.2	210.7	210.7	210.7	201.8	339.7	339.7	339.7
Mass Rate	kg/hr	15,000	15,000	15,000	81,463	81,463	81,463	96,463	1,150	1,150	1,150
Volume Rate	BPSD	2.825	2.825	2.825	14,752	14,752	14,752	17,577	197	197	197
Density	kg/m³	739.2	769.7	783.2	771.2	804.0	816.3	810.6	738.7	854.7	854.7
Viscosity	cP	0.448	0.707	0.908	0.799	1.622	2.272	1.953	0.523	10.402	10.402
VAPOR											
Molecular Weight	kg/kg.mol	-	-	-	-	-	-	-	-	-	-
Mass Rate	kg/hr	-	-	-	-	-	-	-	-	-	-
Volume Rate	m³/hr	-	-	-	-	-	-	-	-	-	-
Density	kg/m³	-	-	-	-	-	-	-	-	-	-
Viscosity	cP	-	-	-	-	-	-	-	-	-	-

NOTES

1. LP STREAM COIL IS USED FOR WINTERIZING ONLY.

GENERAL NOTES

1- BPSD AT STANDARD CONDITION (1 ATM & 60°F).

SYMBOLS & LEGEND:

◇ = STREAM NUMBER

○ = PRESSURE, barG

□ = TEMPERATURE, °C

○ = NORMAL HEAT DUTY, MW

▭ = FLOW RATE, kg/hr

03	23/Feb/18	ISSUED FOR FINAL	SM.P	I.J.K	J.H.N	
02	09/Feb/18	ISSUED FOR FINAL	SM.P	I.J.K	J.H.N	
01	15/Jan/18	ISSUED FOR APPROVAL	SM.P	I.J.K	J.H.N	
00	27/Dec/17	ISSUED FOR APPROVAL	SM.P	T.J.K	J.H.N	
REV.	DATE	DESCRIPTION	PREP. BY	CHKD. BY	APPD. BY	AUTH. BY

PIELOS

Engineering Co., Ltd

SOUTHERN ADISH GAS CONDENSATE REFINERY PROJECT

ADISH

ADISH GAS CONDENSATE REFINERY PROJECT

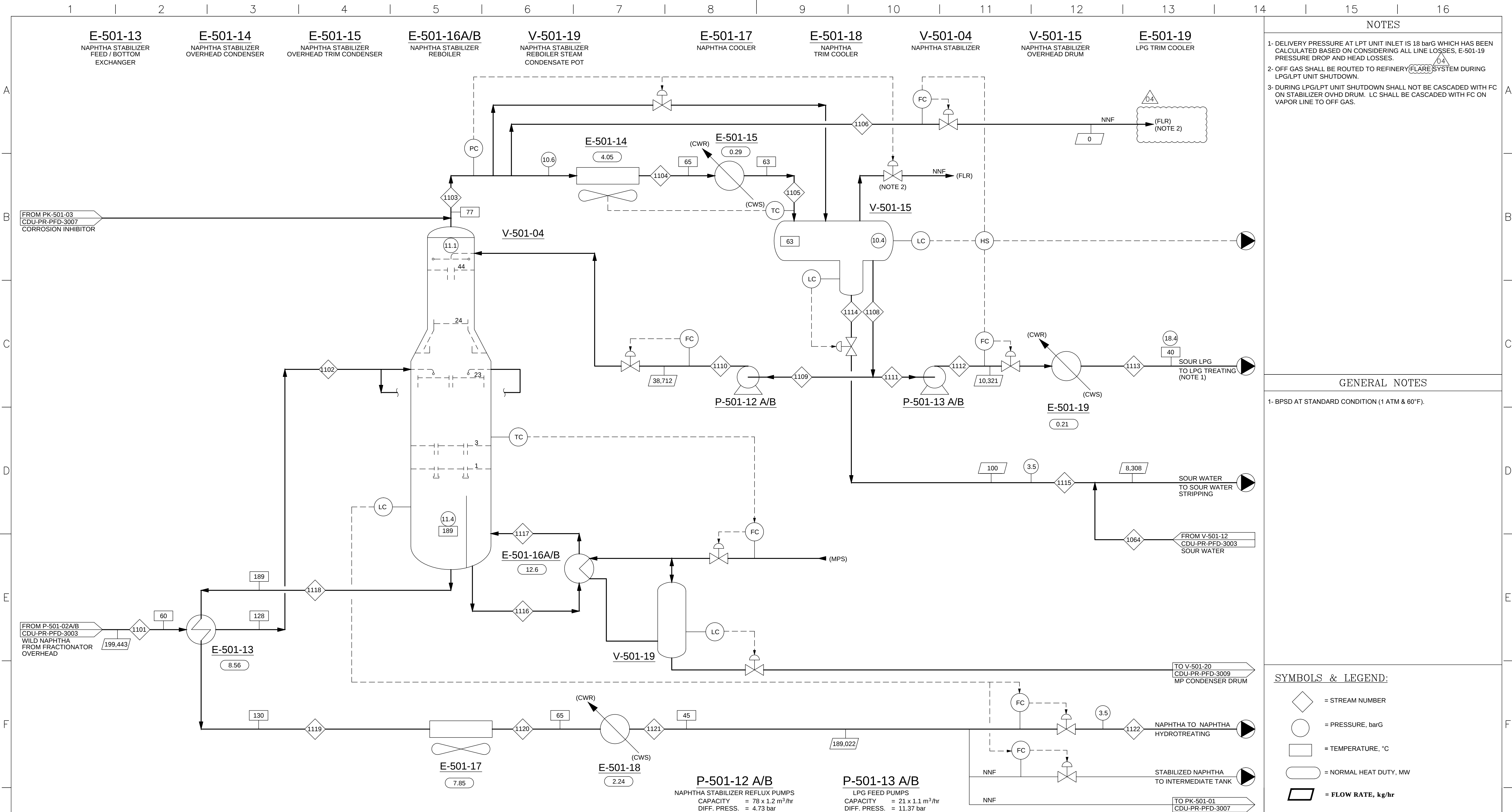
CONTRACT NO.: ADSH-E-CO-GE-001

SCALE:

DRAWING TITLE:

PROCESS FLOW DIAGRAM
CDU
(PRODUCT COOLING SECTION)
(MAX NAPHTHA/GASOIL CASE)

DWG NO.:	PROJ	PHASE	UNIT	DISC	TYPE	SEQ.	REV.	SHT No.	CLASS	SIZE
	SACR	DE	CDU	PR	PFD	3005	03	1 OF 1	1	A1



Stream No.	Unit	1064	1101	1102	1103	1104	1105	1106	1108	1109	1110	1111	1112	1113	1114	1115	1116	1117	1118	1119	1120	1121	1122
Stream Description		SOUR WATER TO SOUR WATER STRIPPING	WILD NAPH. FROM FRACTIONATOR OVERHEAD	NAPH. STABILIZER FEED	NAPH. STABILIZER OVERHEAD	NAPH. STABILIZER OVERHEAD	NAPH. STABILIZER OVERHEAD	NAPH. STABILIZER OFF GAS	NAPH. STABILIZER OVHD LIQUID	NAPH. STABILIZER OVHD REFLUX	NAPH. STABILIZER REFLUX	SOUR LPG	SOUR LPG TO E-501-19A/B	SOUR LPG TO LPT	NAPH. STABILIZER OVHD WATER	SOUR WATER TO SOUR WATER STRIPPING	NAPH. STABILIZER REBOILER IN	NAPH. STABILIZER REBOILER OUT	STABILIZED NAPH.	STABILIZED NAPH. TO E-501-17	STABILIZED NAPH. TO E-501-18	STABILIZED NAPH.	STABILIZED NAPH. TO NHT
Phase		Water	Liquid	Liquid	Vapor	Mixed	Liquid	-	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Water	Water	Liquid	Mixed	Liquid	Liquid	Liquid	Liquid	Liquid
Total Mass Rate	kg/hr	8,208	199,443	199,443	49,132	49,132	49,132	-	49,033	38,712	38,712	10,321	10,321	10,321	100	100	437,808	437,808	189,022	189,022	189,022	189,022	189,022
Temperature	°C	60	60	128	77	65	63	-	63	63	63	40	63	40	63	63	175	189	189	130	65	45	45
Pressure	barG	3.5	14.8	14.4	11.1	10.6	10.4	-	10.4	10.4	14.7	10.4	20.6	18.4	10.4	3.5	11.4	11.3	11.4	10.8	10.5	10.1	3.5
Total Enthalpy	MW	0.57	7.16	15.72	6.61	2.55	2.26	-	2.25	1.78	1.78	0.47	0.47	0.28	0.01	0.01	50.71	63.35	23.52	14.96	7.11	4.87	4.87
LIQUID																							
Molecular Weight	kg/kg.mol	18.0	95.4	95.4	-	54.6	54.4	-	54.6	54.6	54.6	54.6	54.6	54.6	18.0	18.0	94.2	99.7	99.6	99.6	99.6	99.6	99.6
Mass Rate	kg/hr	8,208	199,443	199,443	-	46,452	49,132	-	49,033	38,712	38,712	10,321	10,321	10,321	100	100	437,808	306,404	189,022	189,022	189,022	189,022	189,022
Volume Rate	BPSD	1.241	42,263	42,263	-	12,415	13,146	-	13,131	10,367	10,367	2,764	2,764	2,764	15	15	93,237	64,002	39,484	39,484	39,484	39,484	39,484
Density	kg/m³	983.1	674.2	604.5	-	494.7	496.6	-	496.1	496.1	496.1	496.1	496.1	534.2	981.5	981.5	536.7	539.6	539.5	616.4	682.0	699.5	698.7
Viscosity	cP	0.462	0.266	0.152	-	0.095	0.096	-	0.095	0.095	0.095	0.095	0.095	0.122	0.441	0.441	0.102	0.102	0.102	0.163	0.278	0.334	0.332
VAPOR																							
Molecular Weight	kg/kg.mol	-	-	-	54.4	50.8	-	-	-	-	-	-	-	-	-	-	83.6	-	-	-	-	-	-
Mass Rate	kg/hr	-	-	-	49,132	2,680	-	-	-	-	-	-	-	-	-	-	131,403	-	-	-	-	-	-
Volume Rate	m³/hr	-	-	-	1.732	105	-	-	-	-	-	-	-	-	-	-	3,859	-	-	-	-	-	-
Density	kg/m³	-	-	-	28.4	25.6	-	-	-	-	-	-	-	-	-	-	34.1	-	-	-	-	-	-
Viscosity	cP	-	-	-	0.009	0.009	-	-	-	-	-	-	-	-	-	-	0.019	-	-	-	-	-	-

NOTES

- DELIVERY PRESSURE AT LPT UNIT INLET IS 18 barG WHICH HAS BEEN CALCULATED BASED ON CONSIDERING ALL LINE LOSSES, E-501-19 PRESSURE DROP AND HEAD LOSSES.
- OFF GAS SHALL BE ROUTED TO REFINERY FLARE SYSTEM DURING LPG/LPT UNIT SHUTDOWN.
- DURING LPG/LPT UNIT SHUTDOWN SHALL NOT BE CASCADED WITH FC ON STABILIZER OVHD DRUM. LC SHALL BE CASCADED WITH FC ON VAPOR LINE TO OFF GAS.

GENERAL NOTES

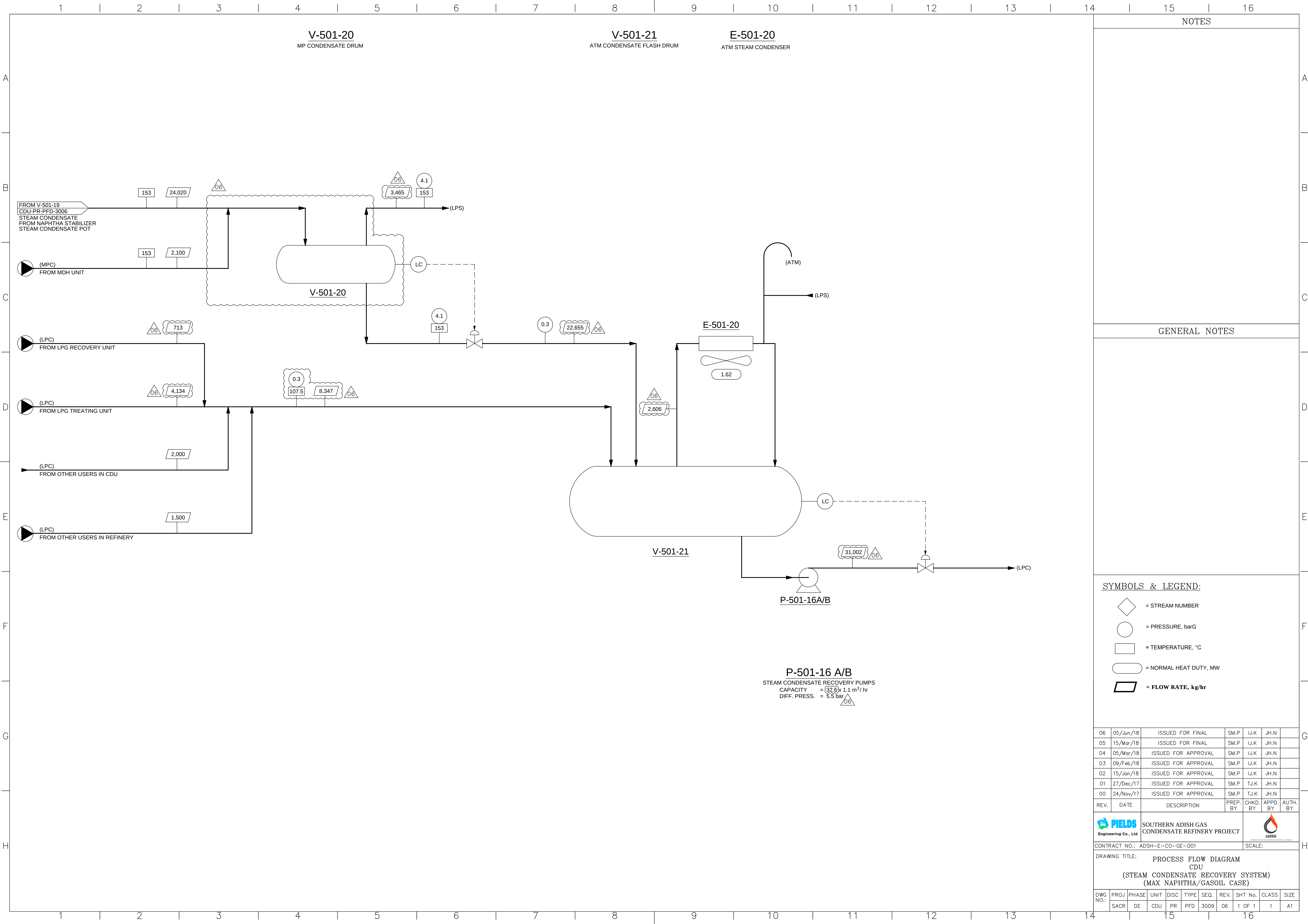
1- BPSD AT STANDARD CONDITION (1 ATM & 60°F).

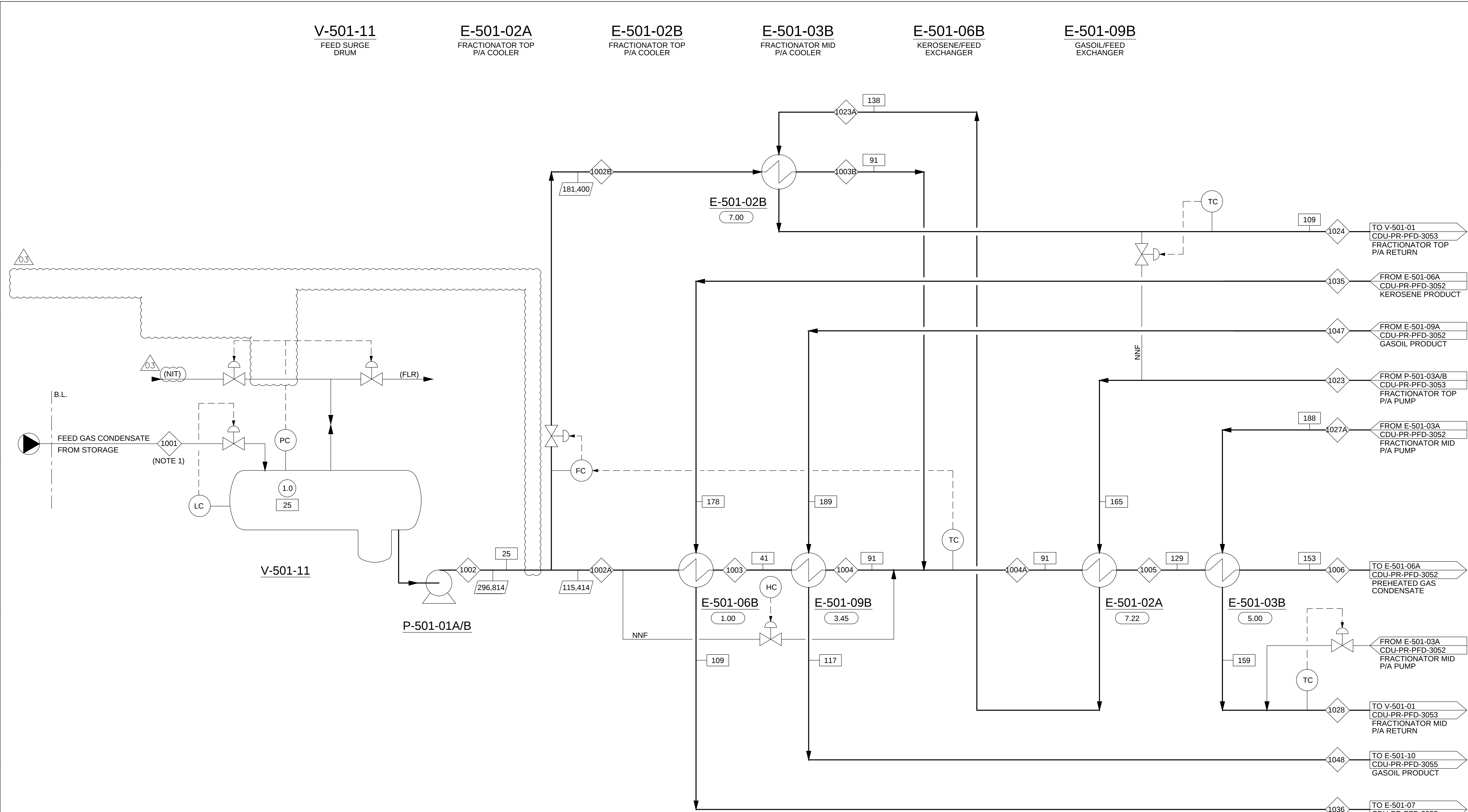
SYMBOLS & LEGEND:

- = STREAM NUMBER
- = PRESSURE, barG
- = TEMPERATURE, °C
- = NORMAL HEAT DUTY, MW
- = FLOW RATE, kg/hr

04	15/Mar/18	ISSUED FOR FINAL	SM.P	I.J.K	J.H.N	
03	23/Feb/18	ISSUED FOR APPROVAL	SM.P	I.J.K	J.H.N	
02	09/Feb/18	ISSUED FOR APPROVAL	SM.P	I.J.K	J.H.N	
01	15/Jan/18	ISSUED FOR APPROVAL	SM.P	I.J.K	J.H.N	
00	27/Dec/17	ISSUED FOR APPROVAL	SM.P	T.J.K	J.H.N	
REV.	DATE	DESCRIPTION	PREP. BY	CHKD. BY	APPD. BY	AUTH. BY

		SOUTHERN ADISH GAS CONDENSATE REFINERY PROJECT					 ADISH Refinery & Petrochemicals Company			
CONTRACT NO.: ADSH-E-CO-GE-001							SCALE:			
DRAWING TITLE: PROCESS FLOW DIAGRAM CDU (NAPHTHA STABILIZER SECTION) (MAX NAPHTHA/GASOIL CASE)										
DWG NO.:	PROJ	PHASE	UNIT	DISC	TYPE	SEQ.	REV.	SHT No.	CLASS	SIZE
	SACR	DE	CDU	PR	PFD	3006	04	1 OF 1	1	A1





P-501-01A/B

FEED PUMPS
CAPACITY = $(401.3 \times 1.1 \text{ m}^3/\text{hr})$
DIFF. PRESS. = (28.7 bar)

Stream No.	Unit	1001	1002	1002A	1002B	1003	1003B	1004	1004A	1005	1006	1023	1023A	1024	1027A	1028	1035	1036	1047	1048
Stream Description		FEED GAS COND.	P-501-01 DISCHARGE	E-501-06B TUBE IN	E-501-02B TUBE IN	E-501-09B TUBE IN	E-501-02B TUBE OUT	E-501-09B TUBE OUT	E-501-02A TUBE IN	E-501-03B TUBE IN	E-501-03B TUBE OUT	TOP P/A TO E-501-02A	E-501-02B SHELL IN	TOP P/A RETURN	E-501-03B SHELL IN	MID. P/A RETURN	KERO. PROD. TO E-501-06B	KERO. PROD. TO E-501-07	GAS OIL PROD. TO E-501-09B	GAS OIL PROD. TO E-501-10
Phase		Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid
Total Mass Rate	kg/hr	296,814	296,814	115,414	181,400	115,414	181,400	115,414	296,814	296,814	296,814	385,000	385,000	385,000	250,000	250,000	22,158	22,158	72,733	72,733
Temperature	°C	25	25	25	25	41	91	91	129	153	165	138	109	188	159	178	109	189	117	
Pressure	barG	4.5	29.3	29.3	28.3	27.8	27.1	27.1	27.1	26.6	26.1	8.3	7.9	7.6	7.7	7.4	11.0	10.7	8.5	8.2
Total Enthalpy	MW	4.4	4.4	1.7	2.7	2.7	9.7	6.2	15.9	23.1	28.1	38.0	30.9	23.9	28.2	23.2	2.3	1.3	8.0	4.6
LIQUID																				
Molecular Weight	kg/kg.mol	116.0	116.0	116.0	116.0	116.0	116.0	116.0	116.0	116.0	116.0	132.6	132.6	132.6	156.0	156.0	165.5	165.5	214.0	214.0
Mass Rate	kg/hr	296,814	296,814	115,414	181,400	115,414	181,400	115,414	296,814	296,814	296,814	385,000	385,000	385,000	250,000	250,000	22,158	22,158	72,733	72,733
Volume Rate	BPSD	60,000	60,000	23,331	36,669	23,331	36,669	23,331	60,000	60,000	60,000	74,921	74,921	74,921	47,442	47,442	4,168	4,168	13,144	13,144
Density	kg/m ³	739.5	742.8	742.8	742.6	730.4	668.1	688.1	688.1	652.2	626.0	652.0	680.4	705.2	664.6	690.7	686.5	740.4	724.5	773.4
Viscosity	cP	0.618	0.639	0.639	0.637	0.520	0.301	0.301	0.301	0.213	0.172	0.199	0.245	0.305	0.221	0.272	0.264	0.457	0.405	0.829
VAPOR																				
Molecular Weight	kg/kg.mol	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Mass Rate	kg/hr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Volume Rate	m ³ /hr	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Density	kg/m ³	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Viscosity	cP	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

NOTES

1- CDU INLET PRESSURE WILL BE FINALIZED AFTER FEED PUMP HYDRAULIC CALCULATION.

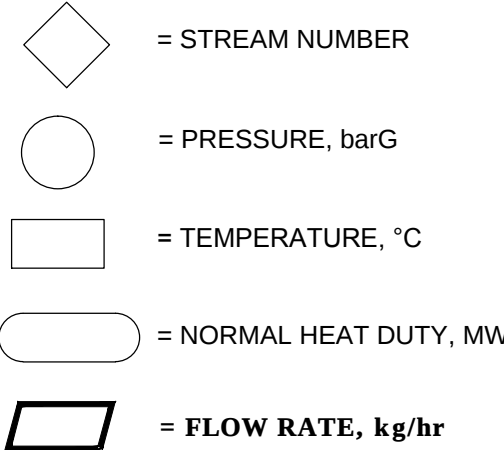
GENERAL NOTES

1- BPSD AT STANDARD CONDITION (1 ATM & 60°F).

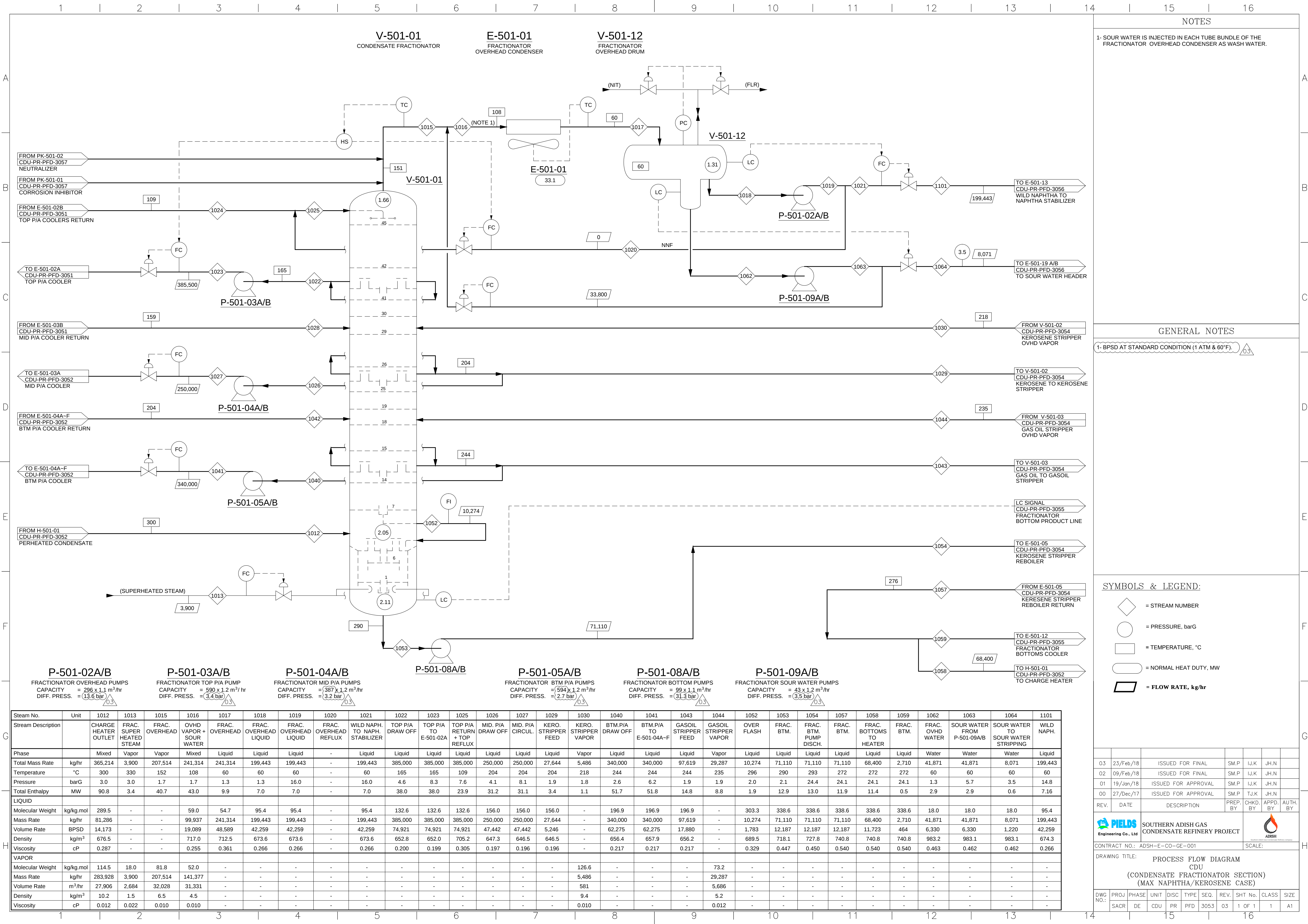
SYMBOLS & LEGEND:

- = STREAM NUMBER
- = PRESSURE, barG
- = TEMPERATURE, °C
- = NORMAL HEAT DUTY, MW
- = FLOW RATE, kg/hr

03	23/Feb/18	ISSUED FOR FINAL	SM.P	I.J.K	J.H.N	
02	09/Feb/18	ISSUED FOR FINAL	SM.P	I.J.K	J.H.N	
01	19/Jan/18	ISSUED FOR APPROVAL	SM.P	I.J.K	J.H.N	
00	27/Dec/17	ISSUED FOR APPROVAL	SM.P	T.J.K	J.H.N	
REV.	DATE	DESCRIPTION	PREP. BY	CHKD. BY	APPD. BY	AUTH. BY
		SOUTHERN ADISH GAS CONDENSATE REFINERY PROJECT			 Southern Adish Refinery	
CONTRACT NO.: ADSh-E-CO-GE-001						SCALE:
DRAWING TITLE: PROCESS FLOW DIAGRAM CDU (FIRST PREHEAT SECTION) (MAX NAPHTHA/KEROSENE CASE)						
DWG NO.:	PROJ	PHASE	UNIT	DISC	TYPE	SEQ.
	SACR	DE	CDU	PR	PFD	3051
						03
						1 OF 1
						1
						A1



		SOUTHERN ADISH GAS CONDENSATE REFINERY PROJECT								
CONTRACT NO.: ADSh-E-CO-GE-001							SCALE:			
DRAWING TITLE:										
PROCESS FLOW DIAGRAM CDU (SECOND PREHEAT SECTION) (MAX NAPHTHA/KEROSENE CASE)										
DWG NO.:	PROJ	PHASE	UNIT	DISC	TYPE	SEQ.	REV.	SHT No.	CLASS	SI
	SACR	DE	CDU	PR	PFD	3052	03	1 OF 1	1	



NOTES

1- SOUR WATER IS INJECTED IN EACH TUBE BUNDLE OF THE FRACTIONATOR OVERHEAD CONDENSER AS WASH WATER.

GENERAL NOTES

1- BPSD AT STANDARD CONDITION (1 ATM & 60°F).

SYMBOLS & LEGEND:

= STREAM NUMBER

= PRESSURE, barG

= TEMPERATURE, °C

= NORMAL HEAT DUTY, MW

= FLOW RATE, kg/hr

CONTRACT NO.: ADSH-E-CO-GE-001

SCALE:

DRAWING TITLE: PROCESS FLOW DIAGRAM
CDU
(CONDENSATE FRACTIONATOR SECTION)
(MAX NAPHTHA/KEROSENE CASE)

DWG NO.:SACR

PROJ DE

PHASE CDU

UNIT PR

DISC PFD

TYPE 3053

SEQ 03

REV 1

SHT No. OF 1

CLASS 1

SIZE A1

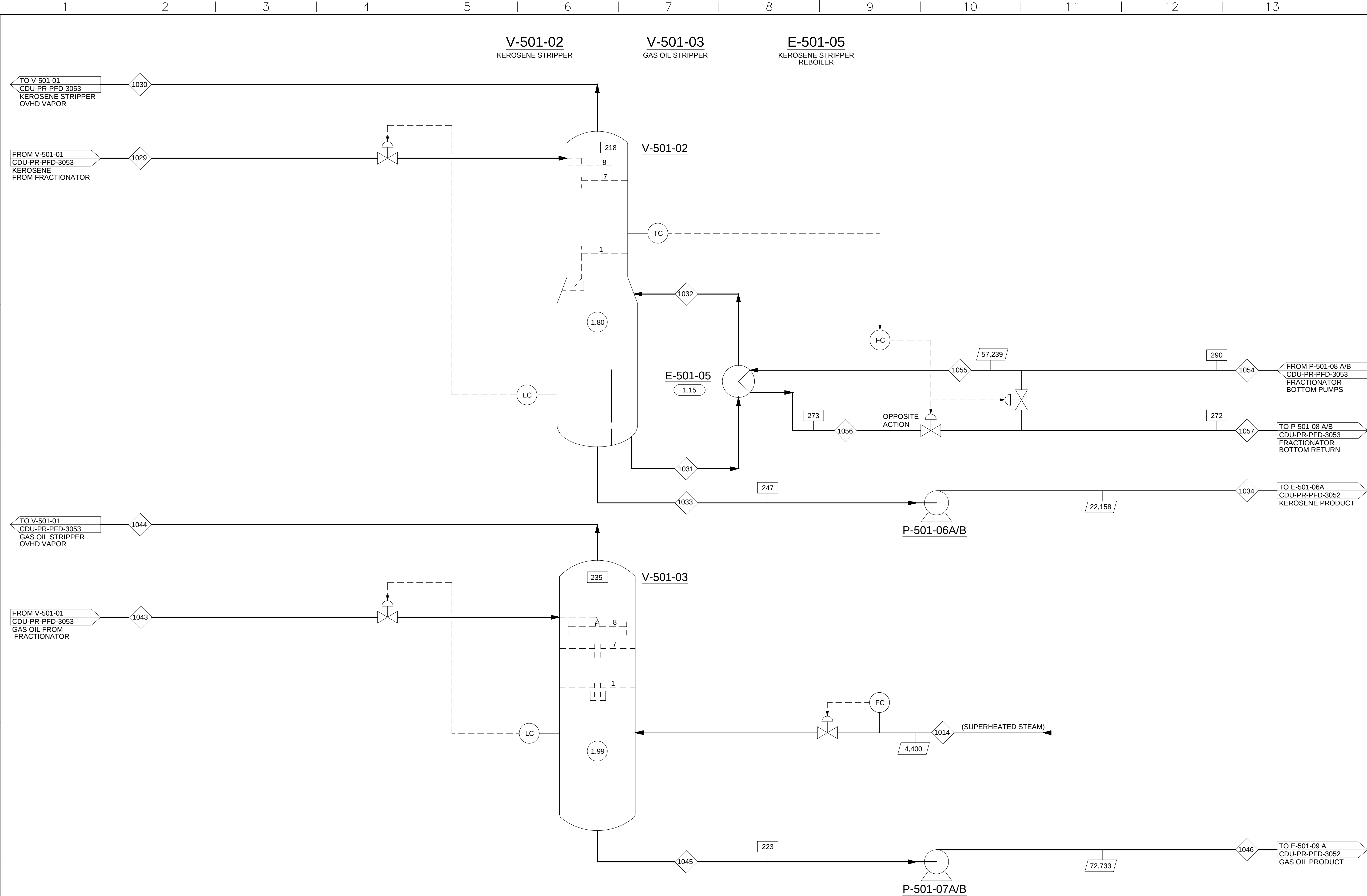
PIELOS

Engineering Co., Ltd

SOUTHERN ADISH GAS CONDENSATE REFINERY PROJECT

ADISH

ADISH ENGINEERING & PROJECT MANAGEMENT



Stream No.	Unit	1014	1029	1030	1031	1032	1033	1034	1043	1044	1045	1046	1054	1055	1056	1057
Stream Description		GASOIL STRIPPER SUPERHEATED STEAM	KERO. STRIPPER FEED	KERO. STRIPPER VAPOR	KERO. REBOILER LIQUID IN	KERO. REBOILER VAPOR OUT	KERO. STRIPPER BOTTOM	KERO. PROD. TO E-501-06A	GASOIL STRIPPER FEED	GASOIL STRIPPER VAPOR	GASOIL STRIPPER BOTTOM	GASOIL PROD. TO E-501-09A	FRAC. BTM. PUMP DISCH.	FRAC. BTM TO STRIPPER REBOILER	FRAC. BTM FROM STRIPPER REBOILER	FRAC. BTM.
Phase		Vapor	Liquid	Vapor	Liquid	Mixed	Liquid	Liquid	Liquid	Vapor	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid
Total Mass Rate	kg/hr	4,400	27,644	5,486	45,300	45,300	22,158	22,158	97,619	29,287	72,733	72,733	71,110	57,239	57,239	71,110
Temperature	°C	330	204	218	236	245	247	247	244	235	223	224	293	293	267	272
Pressure	barG	3.0	1.9	1.8	1.8	1.7	1.9	11.4	1.9	1.9	2.0	8.9	24.4	24.4	24.1	24.1
Total Enthalpy	MW	3.8	3.4	1.1	6.7	7.9	3.5	3.5	14.8	8.8	9.8	9.9	13.0	10.5	9.3	11.9
LIQUID																
Molecular Weight	kg/kg.mol	-	156.0	-	161.2	164.8	165.5	165.5	196.9	-	214.0	214.0	338.6	338.6	338.6	338.6
Mass Rate	kg/hr	-	27,644	-	45,300	31,737	22,158	22,158	97,619	-	72,733	72,733	71,110	57,239	57,239	71,110
Volume Rate	BPSD	-	5,246	-	8,551	5,973	4,168	4,168	17,880	-	13,144	12,187	9,810	9,810	12,187	12,187
Density	kg/m³	-	646.5	-	621.3	617.5	616.1	616.1	656.2	-	695.9	697.9	727.8	727.8	743.9	740.8
Viscosity	cP	-	0.196	-	0.162	0.157	0.156	0.156	0.217	-	0.307	0.307	0.450	0.450	0.566	0.540
VAPOR																
Molecular Weight	kg/kg.mol	18.0	-	126.6	-	153.3	-	-	-	73.2	-	-	-	-	-	-
Mass Rate	kg/hr	4,400	-	5,486	-	13,563	-	-	-	29,287	-	-	-	-	-	-
Volume Rate	m³/hr	3,028	-	581	-	1,206	-	-	-	5,686	-	-	-	-	-	-
Density	kg/m³	1.5	-	9.4	-	11.0	-	-	-	5.2	-	-	-	-	-	-
Viscosity	cP	0.022	-	0.010	-	0.010	-	-	-	0.012	-	-	-	-	-	-

NOTES

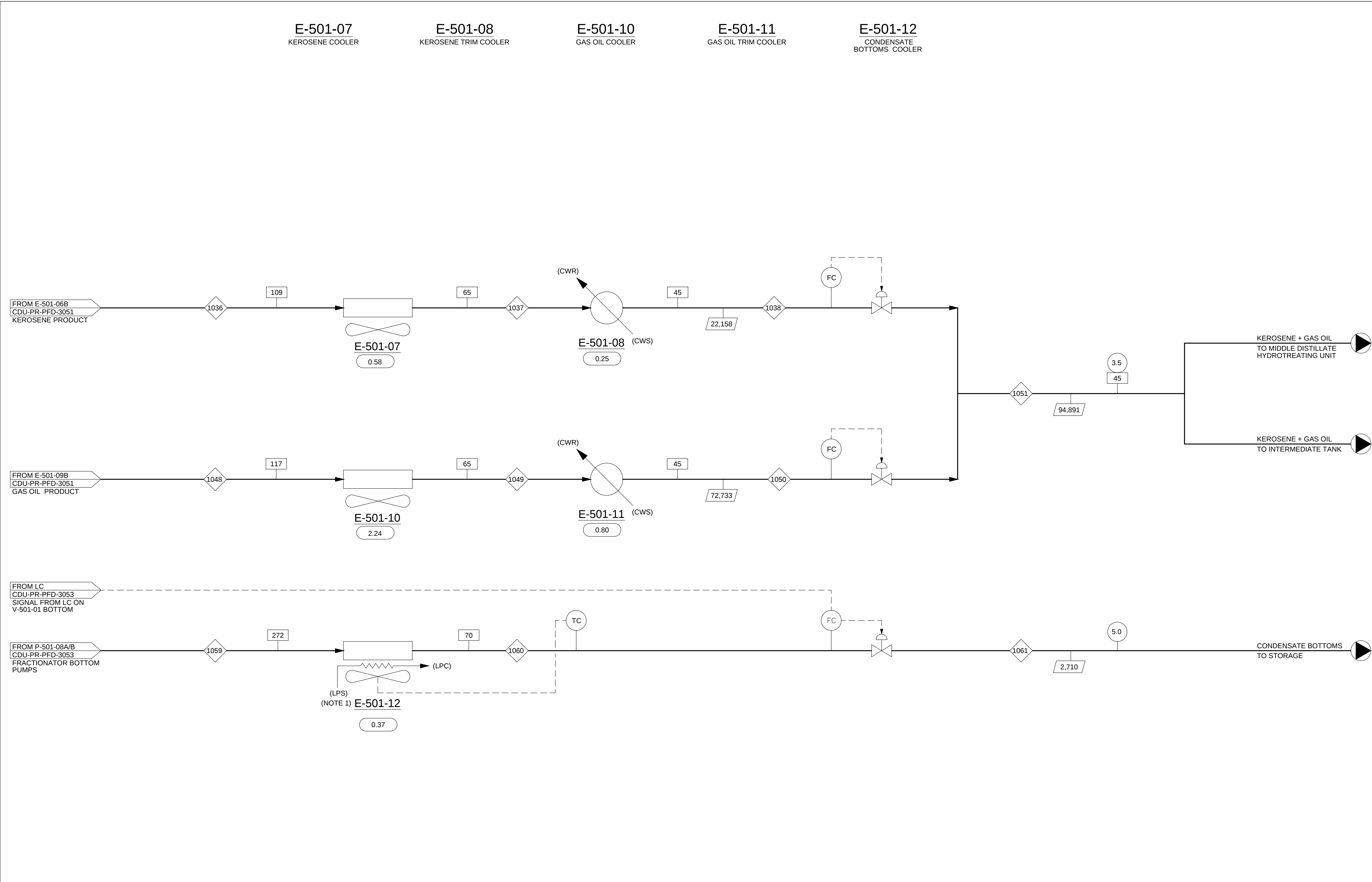
GENERAL NOTES

1- BPSD AT STANDARD CONDITION (1 ATM & 60°F).

SYMBOLS & LEGEND:

- = STREAM NUMBER
- = PRESSURE, barG
- = TEMPERATURE, °C
- = NORMAL HEAT DUTY, MW
- = FLOW RATE, kg/hr

03	05/Mar/18	ISSUED FOR FINAL			SM.P	I.J.K	J.H.N			
02	23/Feb/18	ISSUED FOR APPROVAL			SM.P	I.J.K	J.H.N			
01	19/Jan/18	ISSUED FOR APPROVAL			SM.P	I.J.K	J.H.N			
00	27/Dec/17	ISSUED FOR APPROVAL			SM.P	T.J.K	J.H.N			
REV.	DATE	DESCRIPTION				PREP. BY	CHKD. BY	APPD. BY	AUTH. BY	
		SOUTHERN ADISH GAS CONDENSATE REFINERY PROJECT					 Southern Adish Refinery			
CONTRACT NO.: ADSH-E-CO-GE-001							SCALE:			
DRAWING TITLE:		PROCESS FLOW DIAGRAM CDU (FRACTIONATOR COLUMN SIDE STRIPPERS SECTION) (MAX NAPHTHA/KEROSENE CASE)								
DWG NO.:	PROJ	PHASE	UNIT	DISC	TYPE	SEQ.	REV.	SHT No.	CLASS	SIZE
	SACR	DE	CDU	PR	PFD	3054	03	1 OF 1	1	A1



Stream No.	Unit	1036	1037	1038	1048	1049	1050	1051	1059	1060	1061
Stream Description		KERO. PROD. TO E-501-07	KERO. PROD. TO E-501-08	KERO. PROD.	GAS OIL PROD. TO E-501-10	GAS OIL PROD. TO E-501-11	GAS OIL PROD.	GAS OIL + KERO.	FRAC. BOTTOM	FRAC. BOTTOM	FRAC. BOTTOM TO STORAGE
Phase		Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid
Total Mass Rate	kg/hr	22,158	22,158	22,158	72,733	72,733	72,733	94,891	2,710	2,710	2,710
Temperature	°C	109	65	45	117	65	45	272	70	68	
Pressure	barG	10.7	9.7	9.3	8.2	7.8	7.4	3.5	24.1	23.4	5.0
Total Enthalpy	MW	1.33	0.75	0.50	4.60	2.36	1.56	2.06	0.45	0.08	0.08
LIQUID											
Molecular Weight	kg/kg.mol	165.5	165.5	165.5	214.0	214.0	214.0	200.3	338.6	338.6	338.6
Mass Rate	kg/hr	22,158	22,158	22,158	72,733	72,733	72,733	94,891	2,710	2,710	2,710
Volume Rate	BPSD	4,168	4,168	4,168	13,144	13,144	13,144	17,311	464	464	464
Density	kg/m³	740.4	770.9	784.2	773.4	805.9	818.1	809.7	740.8	854.2	851.7
Viscosity	cP	0.457	0.725	0.933	0.829	1.692	2.376	1.886	0.540	10.251	10.386
VAPOR											
Molecular Weight	kg/kg.mol	-	-	-	-	-	-	-	-	-	-
Mass Rate	kg/hr	-	-	-	-	-	-	-	-	-	-
Volume Rate	m³/hr	-	-	-	-	-	-	-	-	-	-
Density	kg/m³	-	-	-	-	-	-	-	-	-	-
Viscosity	cP	-	-	-	-	-	-	-	-	-	-

NOTES

1. LP STREAM COIL IS USED FOR WINTERIZING ONLY.

GENERAL NOTES

1- BPSD AT STANDARD CONDITION (1 ATM & 60°F).

SYMBOLS & LEGEND:

= STREAM NUMBER

= PRESSURE, barG

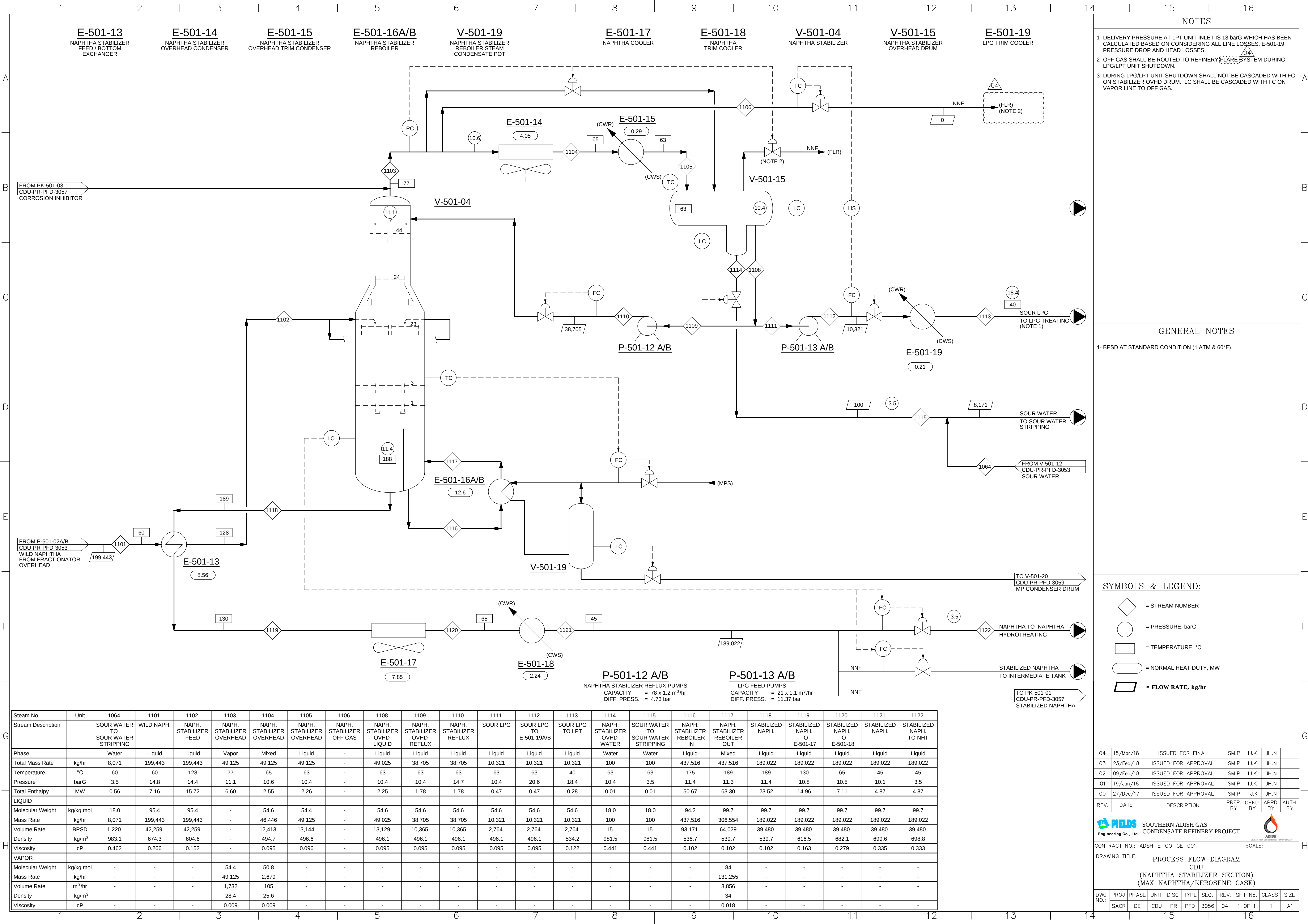
= TEMPERATURE, °C

= NORMAL HEAT DUTY, MW

= FLOW RATE, kg/hr

02	23/Feb/18	ISSUED FOR FINAL	SM.P	I.J.K	J.H.N		
01	19/Jan/18	ISSUED FOR APPROVAL	SM.P	I.J.K	J.H.N		
00	27/Dec/17	ISSUED FOR APPROVAL	SM.P	T.J.K	J.H.N		
REV.	DATE	DESCRIPTION	PREP. BY	CHKD. BY	APPD. BY	AUTH. BY	
PIELOS Engineering Co., Ltd		SOUTHERN ADISH GAS CONDENSATE REFINERY PROJECT					
CONTRACT NO.: ADSH-E-CO-GE-001		SCALE:					
DRAWING TITLE: PROCESS FLOW DIAGRAM CDU (PRODUCT COOLING SECTION) (MAX NAPHTHA/KEROSENE CASE)							
DWG NO.:	PROJ	PHASE	UNIT	DISC	TYPE	SEQ.	REV.
	SACR	DE	CDU	PR	PFD	3055	02

SHT No.	CLASS	SIZE
1 OF 1	1	A1



NOTES

1- DELIVERY PRESSURE AT LPT UNIT INLET IS 18 barG WHICH HAS BEEN CALCULATED BASED ON CONSIDERING ALL LINE LOSSES, E-501-19 PRESSURE DROP AND HEAD LOSSES.

2- OFF GAS SHALL BE ROUTED TO REFINERY FLARE SYSTEM DURING LPG/LPT UNIT SHUTDOWN.

3- DURING LPG/LPT UNIT SHUTDOWN SHALL NOT BE CASCADED WITH FC ON STABILIZER OVHD DRUM. LC SHALL BE CASCADED WITH FC ON VAPOR LINE TO OFF GAS.

GENERAL NOTES

1- BPSD AT STANDARD CONDITION (1 ATM & 60°F).

SYMBOLS & LEGEND:

◇ = STREAM NUMBER

○ = PRESSURE, barG

□ = TEMPERATURE, °C

▭ = NORMAL HEAT DUTY, MW

▭ = FLOW RATE, kg/hr

Stream No.	Unit	1064	1101	1102	1103	1104	1105	1106	1108	1109	1110	1111	1112	1113	1114	1115	1116	1117	1118	1119	1120	1121	1122
Stream Description		SOUR WATER TO SOUR WATER STRIPPING	WILD NAPH. FEED	NAPH. STABILIZER FEED	NAPH. STABILIZER OVERHEAD	NAPH. STABILIZER OVERHEAD	NAPH. STABILIZER OVERHEAD	NAPH. STABILIZER OFF GAS	NAPH. STABILIZER OVHD LIQUID	NAPH. STABILIZER OVHD LIQUID	NAPH. STABILIZER REFLUX	SOUR LPG	SOUR LPG TO E-501-19A/B	SOUR LPG TO LPT	NAPH. STABILIZER OVHD WATER	SOUR WATER TO SOUR WATER STRIPPING	NAPH. STABILIZER REBOILER IN	NAPH. STABILIZER REBOILER OUT	STABILIZED NAPH.	STABILIZED NAPH. TO E-501-17	STABILIZED NAPH. TO E-501-18	STABILIZED NAPH.	STABILIZED NAPH. TO NHT
Phase		Water	Liquid	Liquid	Vapor	Mixed	Liquid	-	Liquid	Liquid	Liquid	Liquid	Liquid	Liquid	Water	Water	Liquid	Mixed	Liquid	Liquid	Liquid	Liquid	Liquid
Total Mass Rate	kg/hr	8,071	199,443	199,443	49,125	49,125	49,125	-	49,025	38,705	38,705	10,321	10,321	10,321	100	100	437,516	437,516	189,022	189,022	189,022	189,022	189,022
Temperature	°C	60	60	128	77	65	63	-	63	63	63	40	63	40	63	63	175	189	189	130	65	45	45
Pressure	barG	3.5	14.8	14.4	11.1	10.6	10.4	-	10.4	10.4	14.7	10.4	20.6	18.4	10.4	3.5	11.4	11.3	11.4	10.8	10.5	10.1	3.5
Total Enthalpy	MW	0.56	7.16	15.72	6.60	2.55	2.26	-	2.25	1.78	1.78	0.47	0.47	0.28	0.01	0.01	50.67	63.30	23.52	14.96	7.11	4.87	4.87
LIQUID																							
Molecular Weight	kg/kg.mol	18.0	95.4	95.4	-	54.6	54.4	-	54.6	54.6	54.6	54.6	54.6	54.6	18.0	18.0	94.2	99.7	99.7	99.7	99.7	99.7	99.7
Mass Rate	kg/hr	8,071	199,443	199,443	-	46,446	49,125	-	49,025	38,705	38,705	10,321	10,321	10,321	100	100	437,516	306,554	189,022	189,022	189,022	189,022	189,022
Volume Rate	BPSD	1.220	42,259	42,259	-	12,413	13,144	-	13,129	10,365	10,365	2,764	2,764	2,764	15	15	93,171	64,029	39,480	39,480	39,480	39,480	39,480
Density	kg/m³	983.1	674.3	604.6	-	494.7	496.6	-	496.1	496.1	496.1	496.1	496.1	534.2	981.5	981.5	536.7	539.7	539.7	616.5	682.1	699.6	698.8
Viscosity	cP	0.462	0.266	0.152	-	0.095	0.096	-	0.095	0.095	0.095	0.095	0.095	0.122	0.441	0.441	0.102	0.102	0.102	0.163	0.279	0.335	0.333
VAPOR																							
Molecular Weight	kg/kg.mol	-	-	-	54.4	50.8	-	-	-	-	-	-	-	-	-	-	84	-	-	-	-	-	-
Mass Rate	kg/hr	-	-	-	49,125	2,679	-	-	-	-	-	-	-	-	-	-	131,255	-	-	-	-	-	-
Volume Rate	m³/hr	-	-	-	1.732	105	-	-	-	-	-	-	-	-	-	-	3,856	-	-	-	-	-	-
Density	kg/m³	-	-	-	28.4	25.6	-	-	-	-	-	-	-	-	-	-	34	-	-	-	-	-	-
Viscosity	cP	-	-	-	0.009	0.009	-	-	-	-	-	-	-	-	-	-	0.018	-	-	-	-	-	-

0415/Mar/18ISSUED FOR FINALSM.PI.J.KJ.H.N

0323/Feb/18ISSUED FOR APPROVALSM.PI.J.KJ.H.N

0209/Feb/18ISSUED FOR APPROVALSM.PI.J.KJ.H.N

0119/Jun/18ISSUED FOR APPROVALSM.PI.J.KJ.H.N

0027/Dec/17ISSUED FOR APPROVALSM.PT.J.KJ.H.N

REV. DATEDESCRIPTIONPREP. BYCHKD. BYAPPD. BYAUTH. BY

PIEDS
Engineering Co., Ltd.

SOUTHERN ADISH GAS CONDENSATE REFINERY PROJECT

ADISH

CONTRACT NO.: ADSH-E-CO-GE-001

SCALE:

DRAWING TITLE: PROCESS FLOW DIAGRAM
CDU
(NAPHTHA STABILIZER SECTION)
(MAX NAPHTHA/KEROSENE CASE)

DWG NO.:SACRDECDUPRPFDD3056041 OF 11A1

