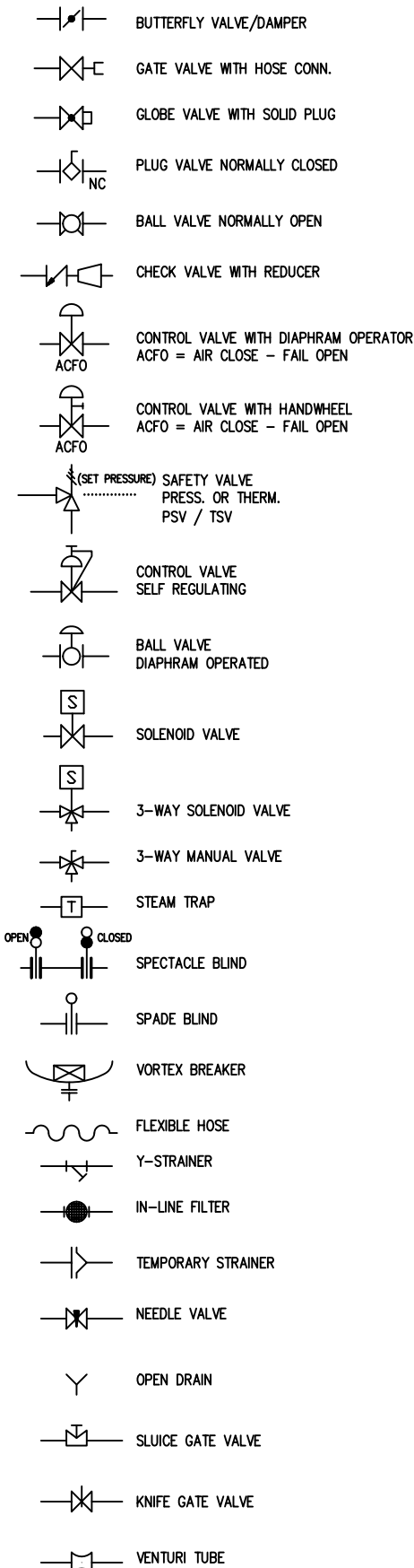
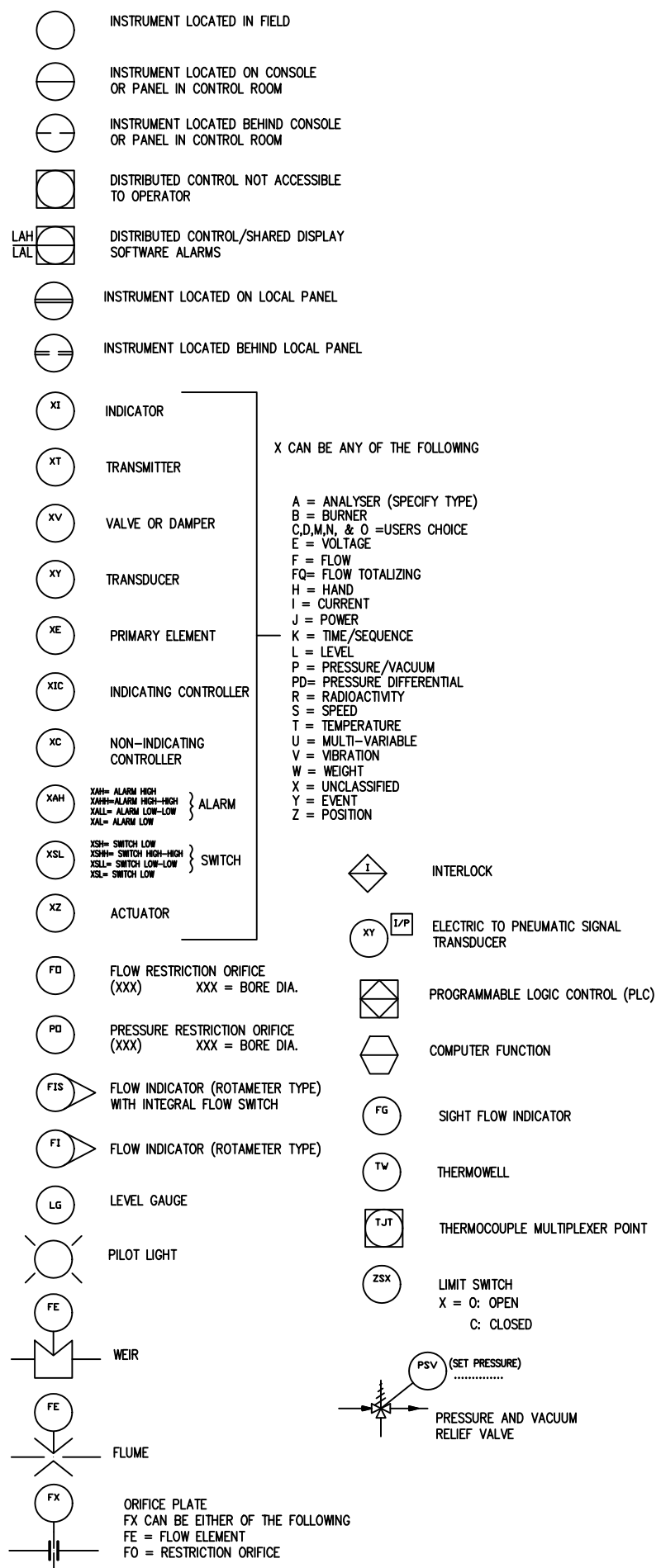


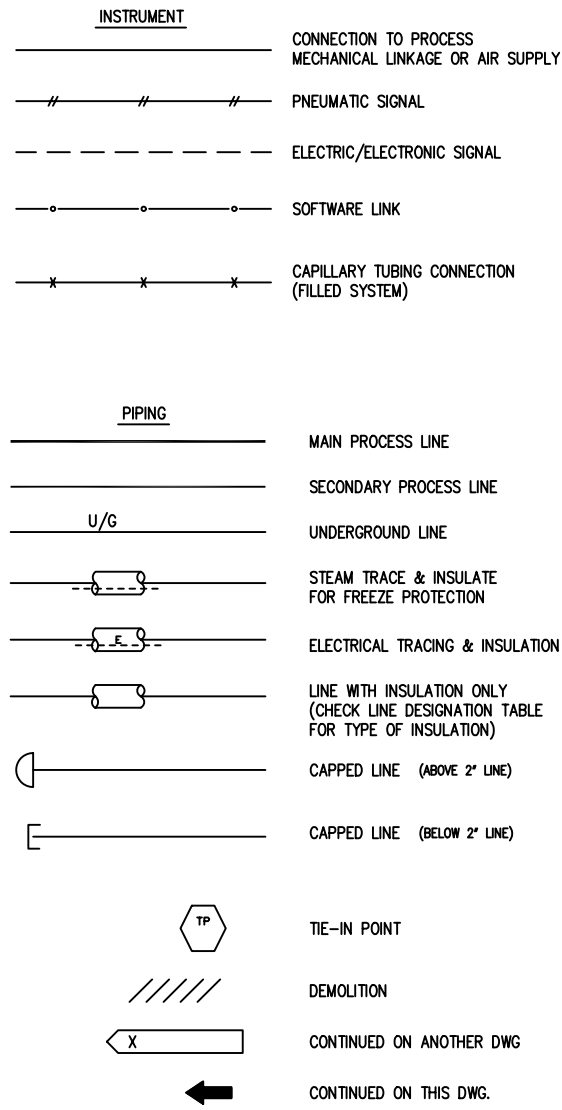
PIPING SYMBOLS



INSTRUMENT SYMBOLS



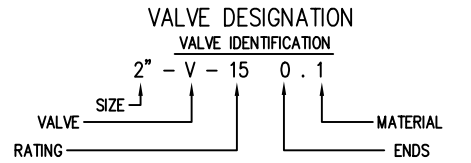
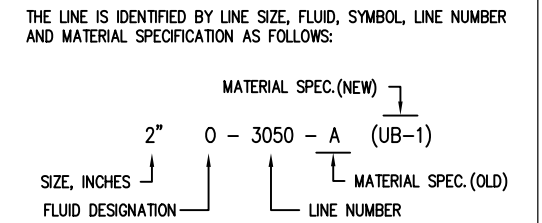
LEGEND



SYMBOL	FLUID
AA	AERATION-AIR
AI	INSTRUMENT AIR
AO	OZONE-AIR
AR	REGENERATION-AIR
AU	UTILITY-AIR
BD	BLOWDOWN & RELIEF
BO	BOILER BLOW-OFF
BS	SLOPS & PUMPOUT
C	CATALYST
CA	CATALYST-AIR
DO	STORM WATER
DP	PROCESS DRAIN
DT	TANK DRAIN
EA	EXHAUST AIR
GF	FUEL GAS
GL	FLUE GAS
GH	HYDROGEN
GN	NITROGEN
GP	PURGE GAS
GS	HYDROGEN SULFIDE GAS
HS	SULPHURIC-ACID
I	INHIBITOR
KA	AMMONIA
KC	CAUSTIC
KL	TETRA-ETHYL LEAD
KP	PROCESS CHEMICALS
O	OIL OR OIL VAPOUR
OF	FUEL OIL
OG	GLAND OR SEAL OIL
OH	HYDRAULIC OIL
OL	LUBE OIL
PO	PUMPOUT
S	SATURATED STEAM
SC	STEAM CONDENSATE
SE	EXHAUST-STEAM
SL	LP STEAM
SS	SUPERHEATED STEAM
SU	UTILITY-STEAM
WB	BOILER FEEDWATER
WC	COOLING WATER
WD	POTABLE WATER
WE	EFFLUENT WATER
WF	FIRE WATER
WL	LAKE WATER
WP	PROCESS WATER
WS	SOUR WATER
WT	TEMPERED WATER
WU	UTILITY WATER

GENERAL NOTES

LINE DESIGNATION
LINE IDENTIFICATION SYMBOLS



VALVE TYPE	RATING	ENDS	MATERIAL
A - ANGLE	15 - ANSI 150	0 - FLANGED	1 - CARBON STEEL
B - BALL	30 - ANSI 300	1 - BUTT WELD	2 - 1 1/4 CHR 1/2 MO
C - CHECK	60 - ANSI 600	2 - SOCKET WELD	3 - 2 1/4 CHR 1/2 MO
G - GLOBE	80 - ANSI 800	3 - SCREWED	4 - 5 CHR 1/2 MO
P - PLUG	90 - ANSI 900	4 - COMBINATION	5 - 9 CHR 1 MO
V - GATE	150 - ANSI 1500	eg. (M.SCRD/SW)	6 - 316 SS
W - BUTTERFLY			7 - 321 SS
N - NEEDLE			8 - 347 SS
K - KNIFE			9 - ALLOY 20
			10 - MONEL

SERVICE	MATERIAL	SPECIFICATION			PREVIOUS SPEC.		
		ANSI RATING	ANSI RATING	ANSI RATING	ANSI RATING	ANSI RATING	ANSI RATING
PROCESS NON-CORROSIVE	CS	150	300	600	150	300	600
FUEL OIL	CS	UB-1	UD-1	UJ-1	15-1	30-1	60-1
FUEL GAS	CS	UB-1	-	-	15-1	-	-
RELIEF & FLARE	CS	UB-1	-	-	15-1	-	-
GENERAL PROCESS/UTILITY	CS	UB-1	UD-1	-	15-1, A/B1/B2	30-1, B	-
LPG	CS	UB-1	UD-1	-	15-7, A	30-7, BL,C1	-
INSTRUMENT AIR	CS	WA-3	-	-	15-1	-	-
INSTRUMENT AIR HEADERS	CS	AA-1	-	-	15-1	-	-
PROCESS HEAVY CORROSIVE	CS	UB-2	UD-2	-	15-2, AN/AY	30-2, BY	-
HYDROGEN BEARING LINES	CS	UB-3	UD-3	-	15-3	30-3, BB	-
CAUSTIC 30%	CS	XB-1	XD-1	-	15-6, AK	30-6, BK	-
CAUSTIC ALL CONC.	CS	XB-2	XD-2	-	15-6, AK	30-6, BK	-
PLATFORM REACTOR CIRCUITS	1 1/4 Cr-1/2 Mo	UE-2	-	-	-	30-12, 30-10, BG	-
REACTOR VAPOUR LINE (CATALYTIC)	1 1/4 Cr-1/2 Mo	UE-2	-	-	-	30-12, 30-10, BG	-
GENERAL PROCESS HIGH TEMP/CORR.	5Cr- 1/2 Mo	UE-3	-	-	15-13	30-13, BO	-
PROCESS LINES (CAT. UNIT)	5Cr- 1/2 Mo	UE-3	-	-	-	30-13, BO	-
HYDROBON REACTOR CIRCUIT	321 SS	UE-6	-	-	-	30-15	-
FLUE GAS (& MISC. CONN.-REGEN.)	304H SS	UD-5	-	-	-	30-16	-
STEAM	CS	SB-1	SD-1	-	15-1	30-1	-
STEAM/B.F.W.	CS	SB-1	SD-1	-	15-5, AX	30-5	-
BOILER FEED WATER	CS	SB-1	SD-1	-	15-1	30-1	-
CONDENSATE	CS	SB-1	-	-	15-1	-	-
STEAM TRACING	304 SS/CS/CU	T1,T2	-	-	15-1	-	-
UTILITY WATER	CS	WA-1	-	-	15-1	-	-
TEMPERED WATER	CS	WA-1	-	-	15-1	-	-
COOLING WATER	CS	WA-1	-	-	15-1	-	-
POTABLE WATER (ABOVE GROUND)	CS (GALV.)	WA-3	-	-	15-4	-	-
FIREWATER (UNDERGROUND)	CS	H-1	-	-	-	-	-
UTILITY AIR	CS	AA-1	-	-	15-1	-	-
PILOT GAS	304 SS	UB-4	-	-	15-15	-	-
AMINE	CS	UB-2	-	-	15-1	-	-

0	APR.94	REDRAWN FOR STB	JP		
REVISION	DATE	DESCRIPTION	DRAWN BY	CHK'D BY	APP'D BY



TITLE	DEPARTMENT
PROCESS FLOW DIAGRAM	AREA NO.
FLUID CATAL. CRACKING UNIT	CLASS NO.
	PROJ. NO. 10436.0002
	DATE
	SCALE NONE

DRAWN BY	CHECKED CH. DRAFT	SECTION NO.	DWG. NO.	REV.
J.P.	CHECKED ENGINEER	APPROVED BY	122-KE-1	0
			SHT 1 OF 5	

22-E-5
LCO / BFW EXCHANGER
1.88 MM BTU/HR
(1.77 MM BTU/HR)

22-E-31
LCO PRODUCT
AIR COOLER
1.66 MM BTU/HR
(3.29 MM BTU/HR)

22-C-2
LCO STRIPPER
3'-0" I.D. x 26'-0" T/T

22-E-4
LCO STRIPPER REBOILER
0.5 MM BTU/HR
(0.5 MM BTU/HR)

22-E-44A/B
LCO TRIM COOLER
0.15 MM BTU/HR
(0.27 MM BTU/HR)

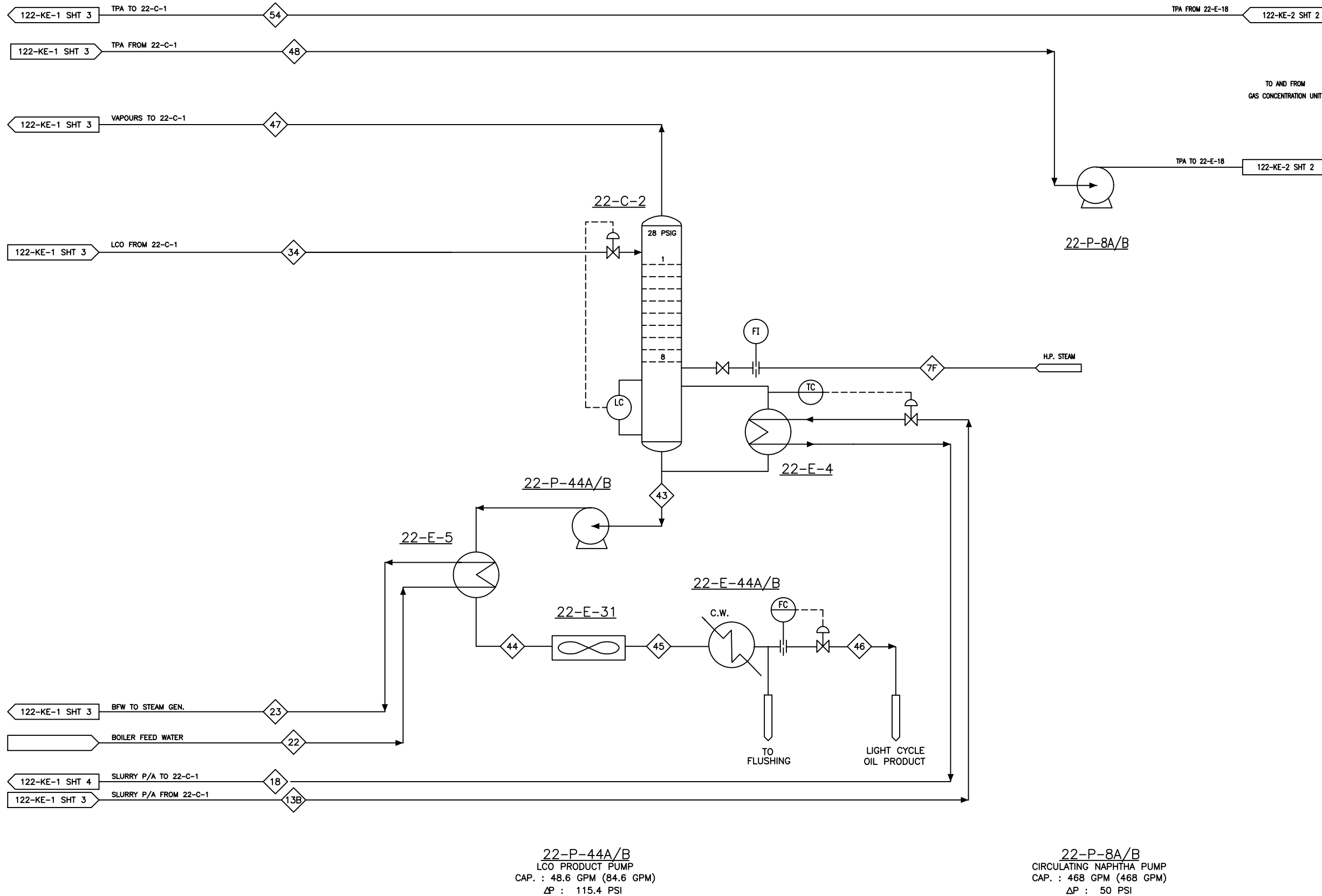
GENERAL NOTES

- CAPACITIES / DUTIES SHOWN ARE FOR SUMMER CASE
• 12000 BPSD RAW OIL FEED AND 3000 BPSD LCO RECYCLE.
NUMBERS SHOWN IN BRACKETS ARE FOR WINTER CASE
• 13000 BPSD RAW OIL FEED AND 3000 BPSD LCO RECYCLE.

- COOLING MEDIUM TEMPERATURES ARE AS FOLLOWS:

	SUMMER	WINTER
AIR	85° F	45° F
C.W.	77° F	65° F

- FOR GENERAL NOTES & SYMBOL LEGEND SEE 122-KE-1 SHT.1.



22-P-44A/B
LCO PRODUCT PUMP
CAP. : 48.6 GPM (84.6 GPM)
ΔP : 115.4 PSI

22-P-8A/B
CIRCULATING NAPHTHA PUMP
CAP. : 468 GPM (468 GPM)
ΔP : 50 PSI

REVISION	DATE	DESCRIPTION	DRAWN BY	CHK'D BY	APP'D BY
4	FEB. '94	REVISED TO INCORPORATE SIZE-THE-BUSINESS PROJECT MODIFICATIONS		R.D.	
B		FOR DESIGN		D.M.	H.B.
A	Jan. '93	FOR CLIENT APPROVAL		R.S.	
	NOV. 92	PRELIMINARY			



TITLE PROCESS FLOW DIAGRAM FLUID CATAL. CRACKING UNIT		DEPARTMENT	
AREA NO.		CLASS NO.	
PRJ. NO. 10436.0002		DATE	
SCALE NONE		REV.	
DRAWN BY J.P.	CHECKED CH. DRAFT CHECKED ENGINEER	SECTION NO. APPROVED BY	SVG. NO. 122-KE-1 SHT 2 OF 5

22-E-1
 STEAM GENERATOR
 6.08 MM BTU/HR
 (6.1 MM BTU/HR)

22-E-42
 STEAM GENERATOR
 20.52 MM BTU/HR
 (21.31 MM BTU/HR)

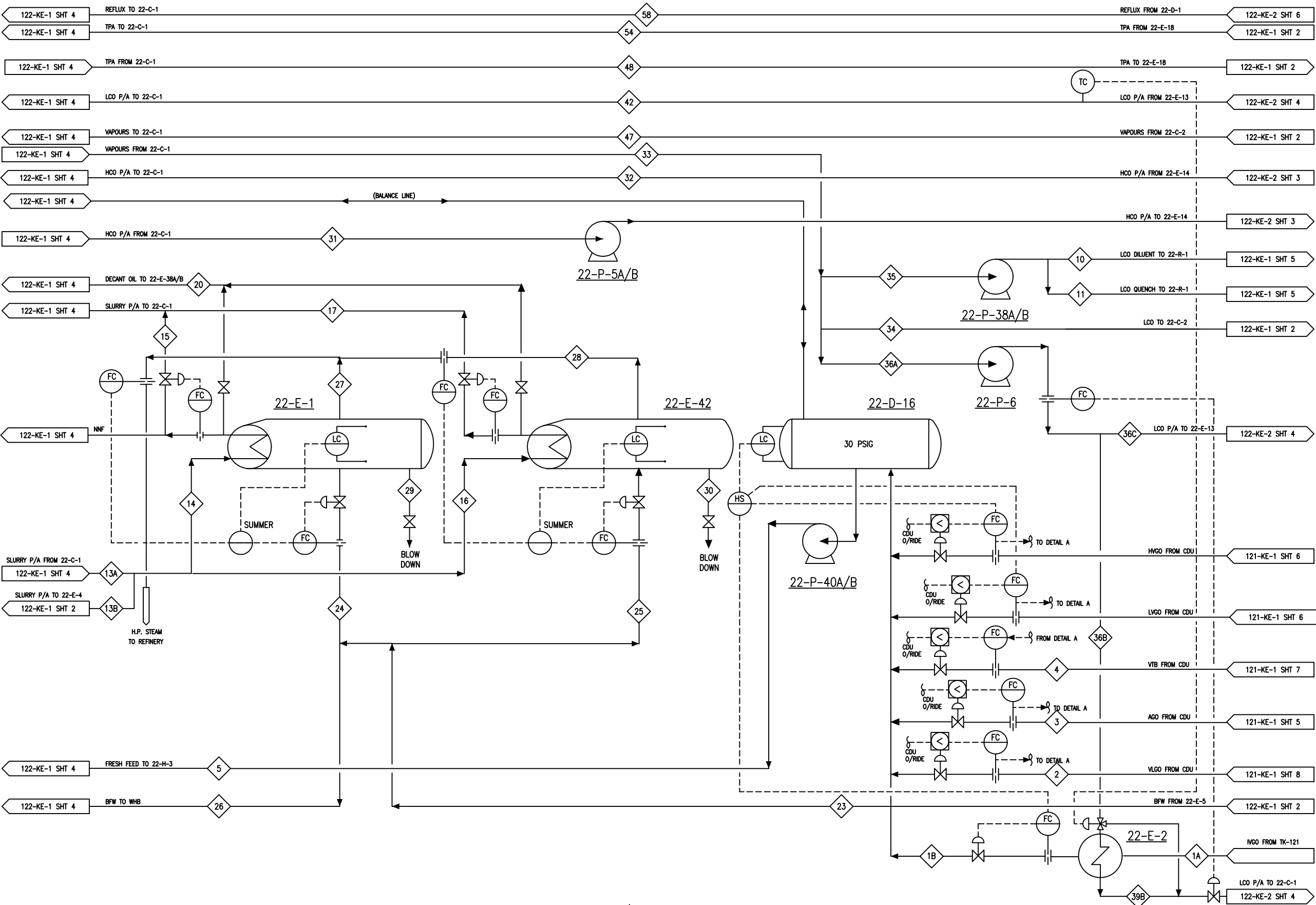
22-D-16
 RAW OIL CHARGE
 SURGE DRUM
 10'-0" I.D. x 27'- 0" T/T

22-E-2
 HVGO FEED PREHEATER
 7.22 MM BTU/HR
 (6.27 MM BTU/HR)

GENERAL NOTES

- CAPACITIES / DUTIES SHOWN ARE FOR SUMMER CASE
 • 12000 BPSD RAW OIL FEED AND 3000 BPSD LCO RECYCLE.
 NUMBERS SHOWN IN BRACKETS ARE FOR WINTER CASE
 • 13000 BPSD RAW OIL FEED AND 3000 BPSD LCO RECYCLE.
- COOLING MEDIUM TEMPERATURES ARE AS FOLLOWS:

	SUMMER	WINTER
AIR	85° F	45° F
C.W.	77° F	65° F
- FOR GENERAL NOTES & SYMBOL LEGEND SEE 122-KE-1 SHT.1.



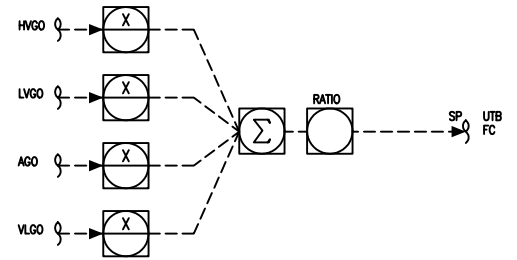
22-P-5A/B
 CIRCULATING HCO PUMP
 CAP. : 609 GPM (609 GPM)
 Δ P : 55 PSI

22-P-40A/B
 FEED PUMP
 CAP. : 400 GPM (428 GPM)
 Δ P : 207 PSI

22-P-38A/B
 LCO RECYCLE PUMP
 CAP. : 106 GPM (104 GPM)
 Δ P : 114.2 PSI

22-P-6
 CIRCULATING LCO PUMP
 CAP. : 500 GPM (492 GPM)
 Δ P : 60 PSI

DETAIL A



REVISION	DATE	DESCRIPTION	DRAWN BY	CHK'D BY	APP'D BY
4	FEB.94	REVISED TO INCORPORATE SIZE-THE-BUSINESS PROJECT MODIFICATIONS		R.D.	
B		FOR DESIGN		D.M.	
A	Jan. '93	FOR CLIENT APPROVAL		R.S.	
	NOV. 92	PRELIMINARY			



TITLE	DEPARTMENT
PROCESS FLOW DIAGRAM	AREA NO.
FLUID CATAL. CRACKING UNIT	CLASS NO.
	PROJ. NO. 10436.0002
	DATE
	SCALE NONE

DRAWN BY	CHECKED CH. DRAFT	SECTION NO.	DWG. NO.	REV.
J.P.	CHECKED ENGINEER	APPROVED BY	122-KE-1	4
			SHT 3 OF 5	

22-H-3
 FEED PREHEATER
 24.46 MM BTU/HR
 (28.79 MM BTU/HR)

22-E-38A/B
 CLARIFIED OIL COOLER
 2.38 MM BTU/HR
 (2.60 MM BTU/HR)

22-C-1
 FRACTIONATING COLUMN
 10'-6" I.D. x 100'-0" T/T

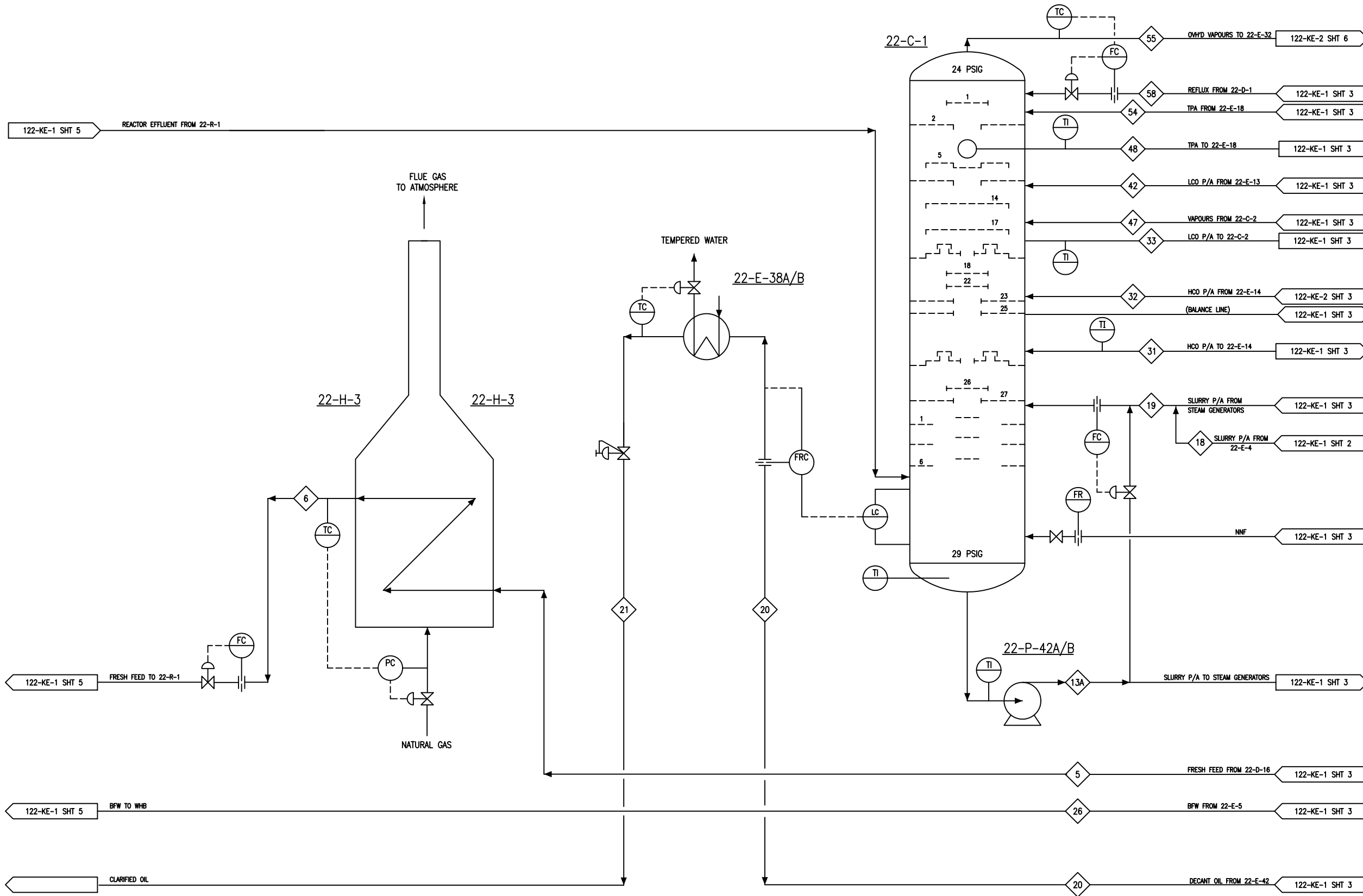
GENERAL NOTES

- CAPACITIES / DUTIES SHOWN ARE FOR SUMMER CASE
 = 12000 BPSD RAW OIL FEED AND 3000 BPSD LCO RECYCLE.
 NUMBERS SHOWN IN BRACKETS ARE FOR WINTER CASE
 = 13000 BPSD RAW OIL FEED AND 3000 BPSD LCO RECYCLE.

- COOLING MEDIUM TEMPERATURES ARE AS FOLLOWS:

	SUMMER	WINTER
AIR	85° F	45° F
C.W.	77° F	65° F

- FOR GENERAL NOTES & SYMBOL LEGEND SEE 122-KE-1 SHT.1.



22-P-42A/B
 MAIN COLUMN BOTTOMS CIRCULATING PUMP
 CAP. : 634 GPM (638 GPM)
 ΔP : 63 PSI

REVISION	DATE	DESCRIPTION	DRAWN BY	CHK'D BY	APP'D BY
4	FEB. 94	REVISED TO INCORPORATE SIZE-THE-BUSINESS PROJECT MODIFICATIONS.		R.D.	
B		FOR DESIGN		D.M.	H.B.
A	Jan. '93	FOR CLIENT APPROVAL		R.S.	
	NOV. 92	PRELIMINARY			



TITLE PROCESS FLOW DIAGRAM				DEPARTMENT	
FLUID CATAL. CRACKING UNIT				CLASS NO.	
PRJL. NO. 10436.0002				DATE	
SCALE NONE				REV.	
DRAWN BY J.P.	CHECKED CH. DRAFT CHECKED ENGINEER	SECTION NO. APPROVED BY	SWG. NO. 122-KE-1 SHT 4 OF 5	REV. 4	

22-D-17
FRESH CATALYST
STORAGE HOPPER
15'-0" DIA. x 50'-0"

22-D-32
EQUILIBRIUM CATALYST
LOADER

22-D-35
EQUILIBRIUM CATALYST
STORAGE HOPPER
11'-0" DIA. x 53'-3"

22-D-18
SPENT CATALYST
STORAGE HOPPER
5'-0" DIA. x 50'-0"

22-D-5
STEAM DISENGAGING
DRUM
15'-0" ID. x 15'-0" T/T

22-K-2
MAIN AIR BLOWER

22-H-2
DIRECT FIRED HEATER

22-R-2
REGENERATOR

22-R-1
REACTOR STRIPPER

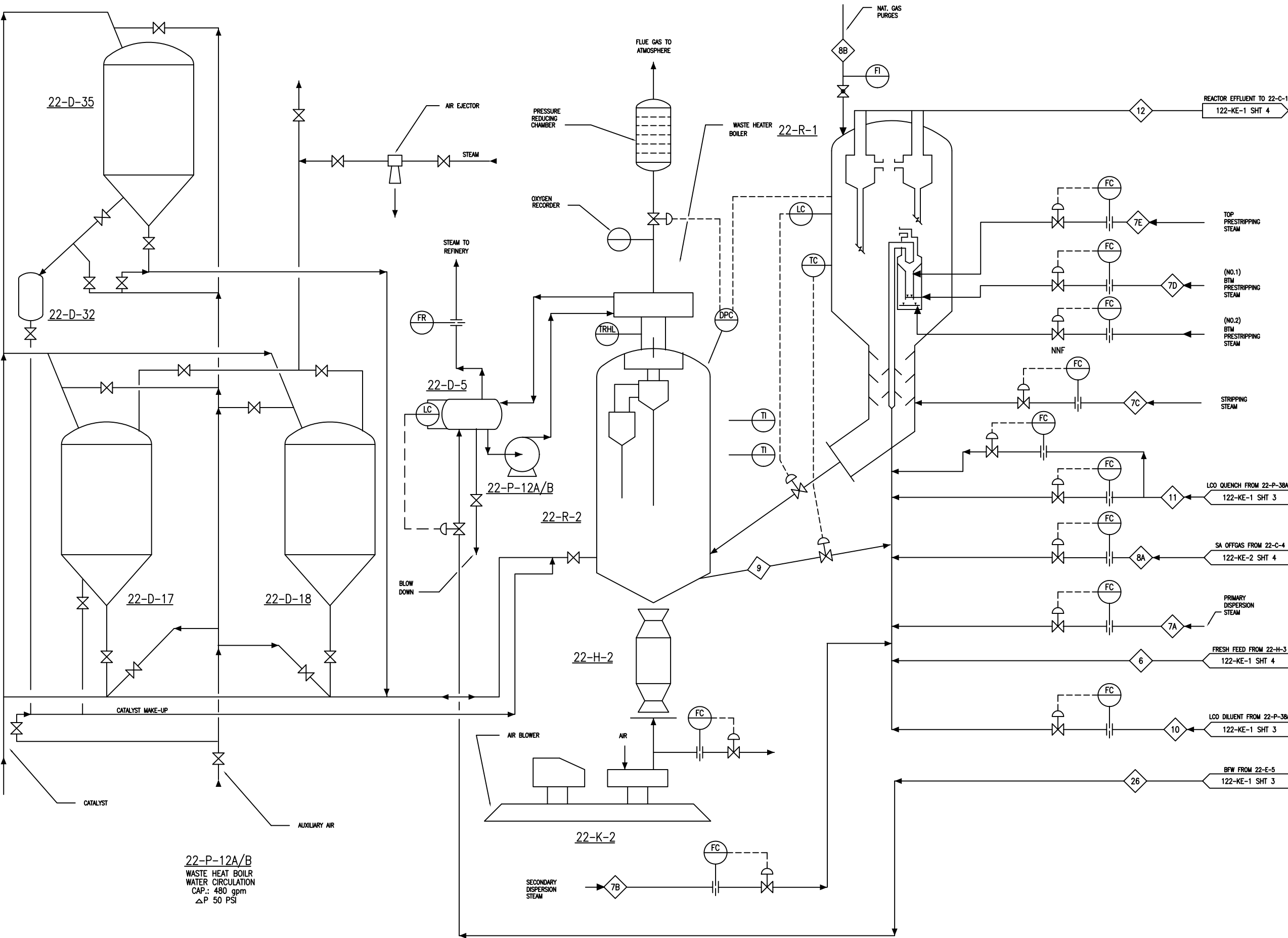
GENERAL NOTES

1. CAPACITIES / DUTIES SHOWN ARE FOR SUMMER CASE
= 12000 BPSD RAW OIL FEED AND 3000 BPSD LCO
RECYCLE.
NUMBERS SHOWN IN BRACKETS ARE FOR WINTER CASE
= 13000 BPSD RAW OIL FEED AND 3000 BPSD LCO
RECYCLE.

2. COOLING MEDIUM TEMPERATURES ARE AS FOLLOWS:

	SUMMER	WINTER
AIR	85° F	45° F
C.W.	77° F	65° F

3. FOR GENERAL NOTES & SYMBOL LEGEND SEE 122-KE-1 SHT.1.



22-P-12A/B
WASTE HEAT BOILER
WATER CIRCULATION
CAP.: 480 gpm
ΔP 50 PSI

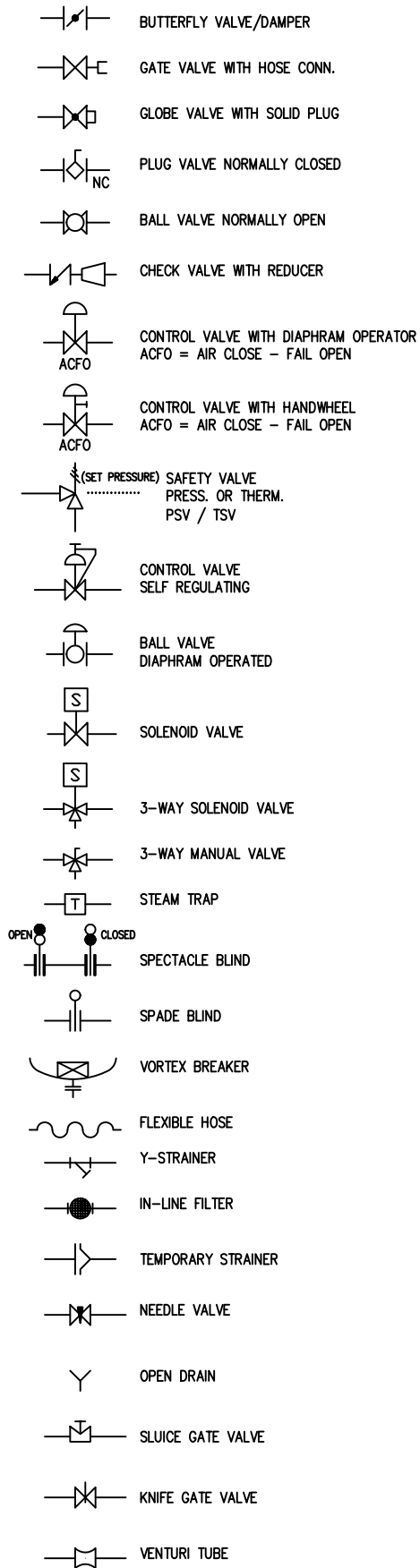
REVISION	DATE	DESCRIPTION	DRAWN BY	CHK'D BY	APP'D BY
5	JAN. 94	ADDED 22-D-35 & 22-D-32 ENG.#006301		DCB	AW MV
4	FEB. 94	REVISED TO INCORPORATE SIZE-THE-BUSINESS PROJECT MODIFICATIONS.		R.D.	
B		FOR DESIGN		D.M.	H.B.
A	Jan. '93	FOR CLIENT APPROVAL		R.S.	
	NOV. 92	PRELIMINARY			



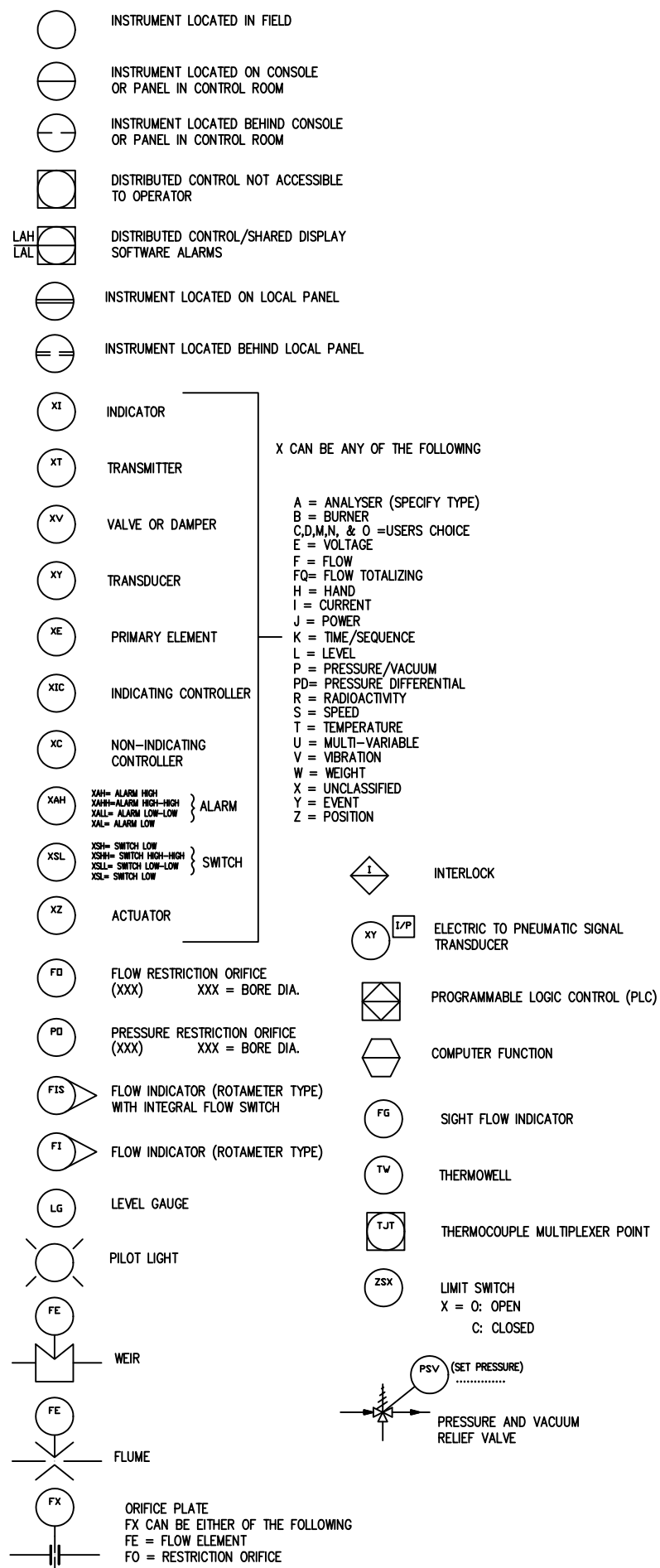
TITLE	DEPARTMENT
PROCESS FLOW DIAGRAM	
FLUID CATAL. CRACKING UNIT	
AREA NO.	
CLASS NO.	
PROJ. NO.	10436.0002
DATE	
SCALE	NONE

DRAWN BY	CHECKED CH. DRAFT	SECTION NO.	DWG. NO.	REV.
J.P.	CHECKED ENGINEER	APPROVED BY	122-KE-1 SHT 5 OF 5	5

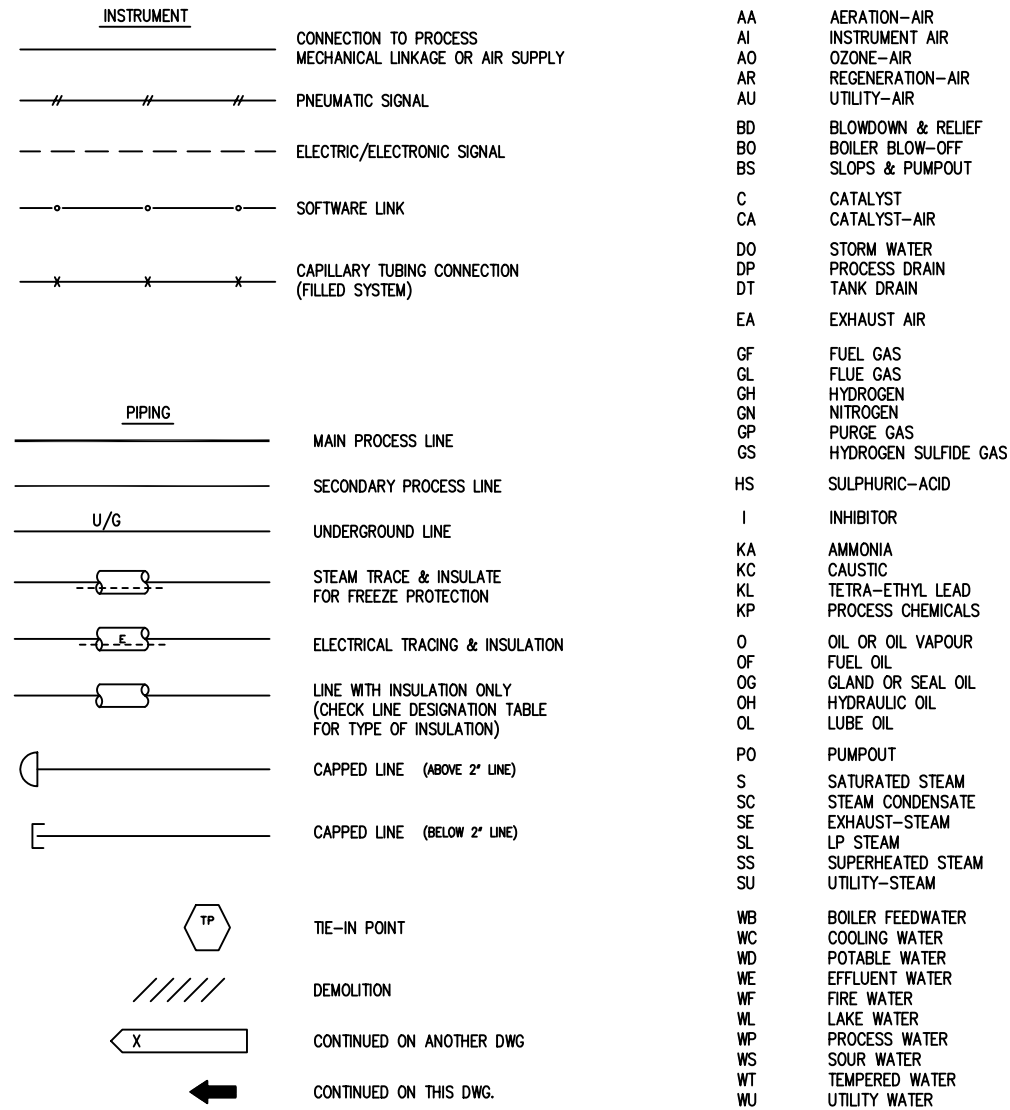
PIPING SYMBOLS



INSTRUMENT SYMBOLS



LEGEND

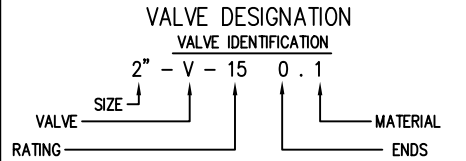
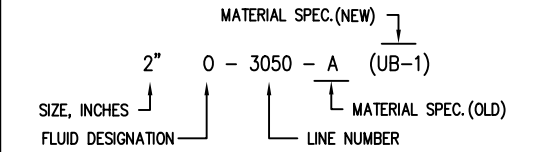


SYMBOL	FLUID
AA	AERATION-AIR
AI	INSTRUMENT AIR
AO	OZONE-AIR
AR	REGENERATION-AIR
AU	UTILITY-AIR
BD	BLOWDOWN & RELIEF
BO	BOILER BLOW-OFF
BS	SLOPS & PUMPOUT
C	CATALYST
CA	CATALYST-AIR
DO	STORM WATER
DP	PROCESS DRAIN
DT	TANK DRAIN
EA	EXHAUST AIR
GF	FUEL GAS
GL	FLUE GAS
GH	HYDROGEN
GN	NITROGEN
GP	PURGE GAS
GS	HYDROGEN SULFIDE GAS
HS	SULPHURIC-ACID
I	INHIBITOR
KA	AMMONIA
KC	CAUSTIC
KL	TETRA-ETHYL LEAD
KP	PROCESS CHEMICALS
O	OIL OR OIL VAPOUR
OF	FUEL OIL
OG	GLAND OR SEAL OIL
OH	HYDRAULIC OIL
OL	LUBE OIL
PO	PUMPOUT
S	SATURATED STEAM
SC	STEAM CONDENSATE
SE	EXHAUST-STEAM
SL	LP STEAM
SS	SUPERHEATED STEAM
SU	UTILITY-STEAM
WB	BOILER FEEDWATER
WC	COOLING WATER
WD	POTABLE WATER
WE	EFFLUENT WATER
WF	FIRE WATER
WL	LAKE WATER
WP	PROCESS WATER
WS	SOUR WATER
WT	TEMPERED WATER
WU	UTILITY WATER

GENERAL NOTES

LINE DESIGNATION
LINE IDENTIFICATION SYMBOLS

THE LINE IS IDENTIFIED BY LINE SIZE, FLUID, SYMBOL, LINE NUMBER AND MATERIAL SPECIFICATION AS FOLLOWS:



VALVE TYPE	RATING	ENDS	MATERIAL
A - ANGLE	15 - ANSI 150	0 - FLANGED	1 - CARBON STEEL
B - BALL	30 - ANSI 300	1 - BUTT WELD	2 - 1 1/4 CHR 1/2 MO
C - CHECK	60 - ANSI 600	2 - SOCKET WELD	3 - 2 1/4 CHR 1/2 MO
G - GLOBE	80 - ANSI 800	3 - SCREWED	4 - 5 CHR 1/2 MO
P - PLUG	90 - ANSI 900	4 - COMBINATION	5 - 9 CHR 1 MO
V - GATE	150 - ANSI 1500	eg. (M.SCRD/SW)	6 - 316 SS
W - BUTTERFLY			7 - 321 SS
N - NEEDLE			8 - 347 SS
K - KNIFE			9 - ALLOY 20
			10 - MONEL

SERVICE	MATERIAL	SPECIFICATION			PREVIOUS SPEC.		
		ANSI RATING	ANSI RATING	ANSI RATING	ANSI RATING	ANSI RATING	ANSI RATING
PROCESS NON-CORROSIVE	CS	150	300	600	150	300	600
FUEL OIL	CS	UD-1	UD-1	UD-1	15-1	30-1	60-1
FUEL GAS	CS	UD-1	UD-1	UD-1	15-1	-	-
RELIEF & FLARE	CS	UD-1	UD-1	UD-1	15-1	-	-
GENERAL PROCESS/UTILITY	CS	UD-1	UD-1	UD-1	15-1, A/B1/B2	30-1, B	-
LPG	CS	UD-1	UD-1	UD-1	15-7, A	30-7, BL,C1	-
INSTRUMENT AIR	CS	WA-3	-	-	15-1	-	-
INSTRUMENT AIR HEADERS	CS	AA-1	-	-	15-1	-	-
PROCESS HEAVY CORROSIVE	CS	UB-2	UD-2	UD-2	15-2, AN/AY	30-2, BY	-
HYDROGEN BEARING LINES	CS	UB-3	UD-3	UD-3	15-3	30-3, BB	-
CAUSTIC 30%	CS	XB-1	XD-1	XD-1	15-6, AK	30-6, BK	-
CAUSTIC ALL CONC.	CS	XB-2	XD-2	XD-2	15-6, AK	30-6, BK	-
PLATFORM REACTOR CIRCUITS	1 1/4 Cr-1/2 Mo	UE-2	-	-	-	30-12, 30-10, BG	-
REACTOR VAPOUR LINE (CATALYTIC)	1 1/4 Cr-1/2 Mo	UE-2	-	-	-	30-12, 30-10, BG	-
GENERAL PROCESS HIGH TEMP/CORR.	5Cr- 1/2 Mo	UE-3	-	-	15-13	30-13, BO	-
PROCESS LINES (CAT. UNIT)	5Cr- 1/2 Mo	UE-3	-	-	-	30-13, BO	-
HYDROBON REACTOR CIRCUIT	321 SS	UE-6	-	-	-	30-15	-
FLUE GAS (& MISC. CONN.-REGEN.)	304H SS	UD-5	-	-	-	30-16	-
STEAM	CS	SB-1	-	-	15-1	30-1	-
STEAM/B.F.W.	CS	SB-1	SD-1	SD-1	15-5, AX	30-5	-
BOILER FEED WATER	CS	SB-1	SD-1	SD-1	15-1	30-1	-
CONDENSATE	CS	SB-1	-	-	15-1	-	-
STEAM TRACING	304 SS/CS/CU	T1,T2	-	-	15-1	-	-
UTILITY WATER	CS	WA-1	-	-	15-1	-	-
TEMPERED WATER	CS	WA-1	-	-	15-1	-	-
COOLING WATER	CS	WA-1	-	-	15-1	-	-
POTABLE WATER (ABOVE GROUND)	CS (GALV.)	WA-3	-	-	15-4	-	-
FIREWATER (UNDERGROUND)	CS	H-1	-	-	-	-	-
UTILITY AIR	CS	AA-1	-	-	15-1	-	-
PILOT GAS	304 SS	UB-4	-	-	15-15	-	-
AMINE	CS	UB-2	-	-	15-1	-	-

REVISION	DATE	DESCRIPTION	DRAWN BY	CHK'D BY	APP'D BY
0	APR.94	REDRAWN FOR STB			
			JP		



TITLE	DEPARTMENT
PROCESS FLOW DIAGRAM	AREA NO.
FCC GAS CONCENTRATION UNIT	CLASS NO.
	PROJ. NO. 10436.0002
	DATE
	SCALE NONE

DRAWN BY	CHECKED CH. DRAFT	SECTION NO.	DWG. NO.	REV.
J.P.	CHECKED ENGINEER	APPROVED BY	122-KE-2	0
			SHT 1 of 6	

22-E-16
DEPROPANIZER FEED EXCHANGER
0.53 MM BTU/HR
(0.56 MM BTU/HR)

22-E-17
DEPROPANIZER BOTTOMS COOLER
0.72 MM BTU/HR
(0.77 MM BTU/HR)

22-C-7
DEPROPANIZER
5'-0" I.D. x 82'-6" T/T

22-E-19
DEPROPANIZER STEAM REBOILER
1.26 MM BTU/HR
(2.2 MM BTU/HR)

22-E-18
DEPROPANIZER NAPHTHA REBOILER
3.47 MM BTU/HR
(2.76 MM BTU/HR)

23-E-39
C3/C4 SPLITTER REBOILER
4.76 MM BTU/HR
(4.00 MM BTU/HR)

22-E-41
TPA/TEMPERED WATER EXCHANGER
8.06 MM BTU/HR
(6.24 MM BTU/HR)

22-D-12
DEPROPANIZER RECEIVER
5'-0" I.D. x 15'-0" T/T

22-E-37
DEPROPANIZED CONDENSER
3.9 MM BTU/HR
(4.08 MM BTU/HR)

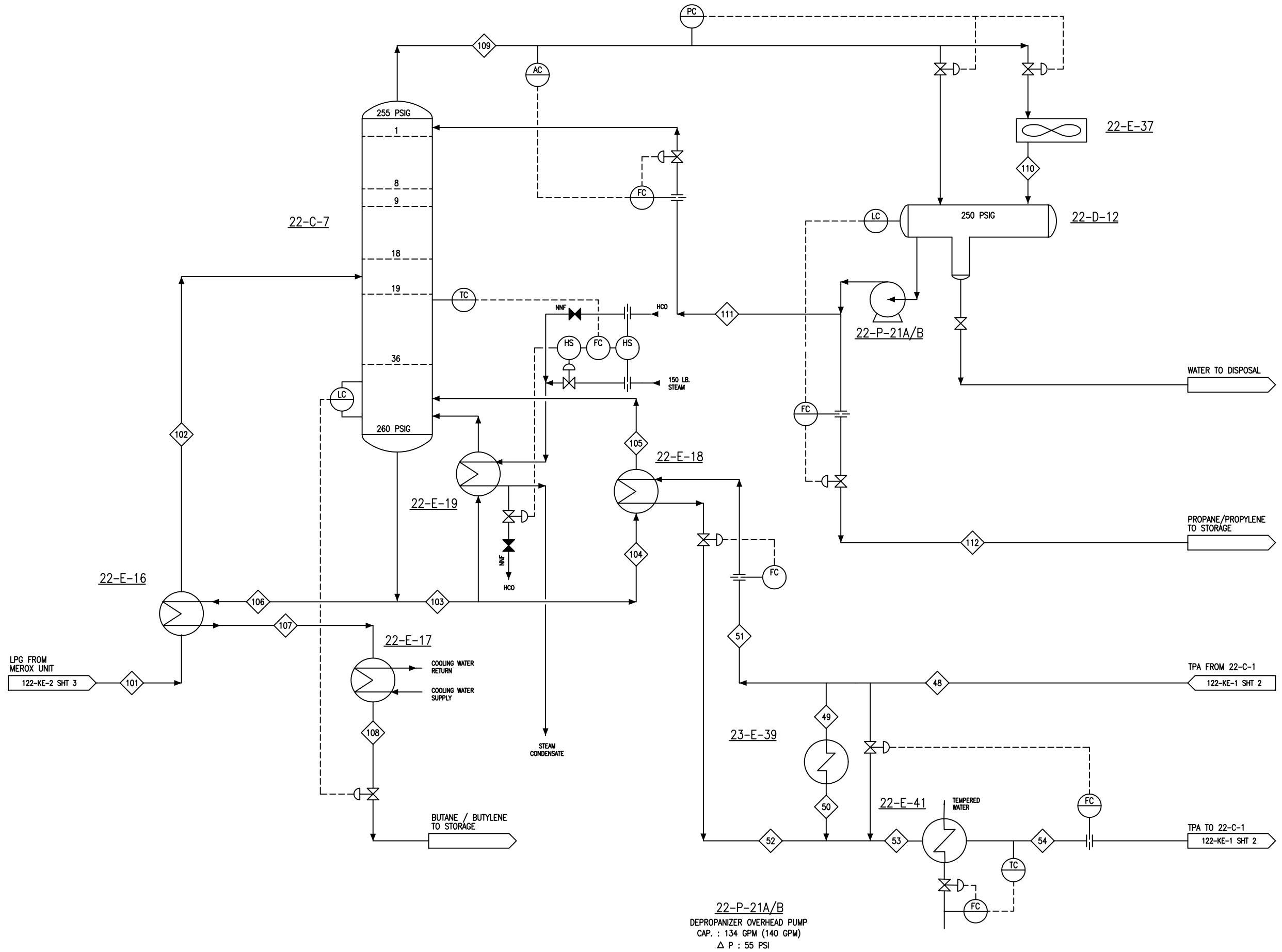
GENERAL NOTES

1. CAPACITIES / DUTIES SHOWN ARE FOR SUMMER CASE
= 12000 BPSD RAW OIL FEED AND 3000 BPSD LCO RECYCLE.
NUMBERS SHOWN IN BRACKETS ARE FOR WINTER CASE
= 13000 BPSD RAW OIL FEED AND 3000 BPSD LCO RECYCLE.

2. COOLING MEDIUM TEMPERATURES ARE AS FOLLOWS:

	SUMMER	WINTER
AIR	85° F	45° F
C.W.	77° F	65° F

3. FOR GENERAL NOTES & SYMBOL LEGEND SEE 122-KE-2 SHT.1.



22-P-21A/B
DEPROPANIZER OVERHEAD PUMP
CAP. : 134 GPM (140 GPM)
Δ P : 55 PSI

REVISION	DATE	DESCRIPTION	DRAWN BY	CHK'D BY	APP'D BY
5	FEB. '94	REVISED TO INCORPORATE SIZE-THE-BUSINESS PROJECT MODIFICATIONS.			R.D.
B		FOR DESIGN			D.M. H.B.
A	Jan. '93	FOR CLIENT APPROVAL			



TITLE	DEPARTMENT
PROCESS FLOW DIAGRAM	
FCC GAS CONCENTRATION UNIT	
AREA NO.	
CLASS NO.	
PROJ. NO.	10436.0002
DATE	
SCALE	NONE

DRAWN BY	CHECKED CH. DRAFT	SECTION NO.	DWG. NO.	REV.
J.P.	CHECKED ENGINEER	APPROVED BY	122-KE-2 SHT 2 of 6	5

22-C-6
 DEBUTANIZER
 5'-0" & 7'-6" I.D. x 86'-6" T/T

22-E-14
 DEBUTANIZER REBOILER
 14.1 MM BTU/HR
 (14.1 MM BTU/HR)

22-E-15
 DEBUTANIZER OVERHEAD COOLER
 0.43 MM BTU/HR
 (0.52 MM BTU/HR)

22-D-11
 DEBUTANIZER RECEIVER
 5'-6" I.D. x 18'-0" T/T

22-E-36
 DEBUTANIZER OVERHEAD CONDENSER
 9.4 MM BTU/HR
 (9.13 MM BTU/HR)

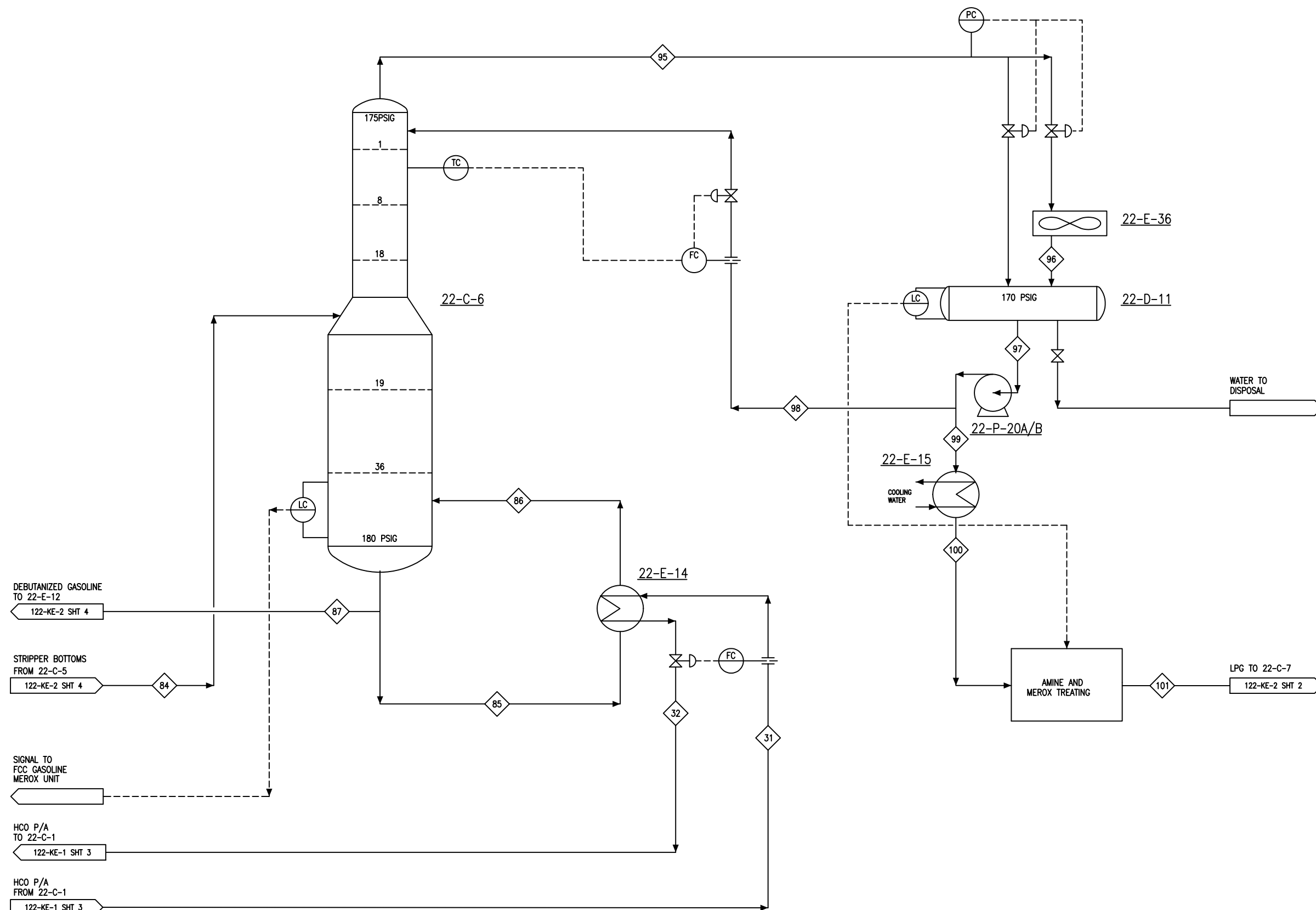
GENERAL NOTES

1. CAPACITIES / DUTIES SHOWN ARE FOR SUMMER CASE
 • 12000 BPSD RAW OIL FEED AND 3000 BPSD LCO RECYCLE.
 NUMBERS SHOWN IN BRACKETS ARE FOR WINTER CASE
 • 13000 BPSD RAW OIL FEED AND 3000 BPSD LCO RECYCLE.

2. COOLING MEDIUM TEMPERATURES ARE AS FOLLOWS:

	SUMMER	WINTER
AIR	85° F	45° F
C.W.	77° F	65° F

3. FOR GENERAL NOTES & SYMBOL LEGEND SEE 122-KE-2 SHT.1.



22-P-20 A/B
 DEBUTANIZER OVERHEAD PUMP
 CAP. : 256 GPM (248 GPM)
 Δ P : 70 PSI

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5	FEB. '94	REVISED TO INCORPORATE SIZE-THE-BUSINESS PROJECT MODIFICATIONS.		R.D.	
B		FOR DESIGN		D.M.	H.B.
A	Jan. '93	FOR CLIENT APPROVAL			



TITLE PROCESS FLOW DIAGRAM FCC GAS CONCENTRATION UNIT		DEPARTMENT AREA NO. CLASS NO. PROJ. NO. 10436.0002 DATE SCALE NONE	
DRAWN BY J.P.	CHECKED CH. DRAFT CHECKED ENGINEER	SECTION NO. APPROVED BY	DWG. NO. 122-KE-2 SHT 3 of 6
			REV. 5

GENERAL NOTES

1. CAPACITIES / DUTIES SHOWN ARE FOR SUMMER CASE
 = 12000 BPSD RAW OIL FEED AND 3000 BPSD LCO
 RECYCLE.
 NUMBERS SHOWN IN BRACKETS ARE FOR WINTER CASE
 = 13000 BPSD RAW OIL FEED AND 3000 BPSD LCO
 RECYCLE.

2. COOLING MEDIUM TEMPERATURES ARE AS FOLLOWS:

	SUMMER	WINTER
AIR	85° F	45° F
C.W.	77° F	65° F

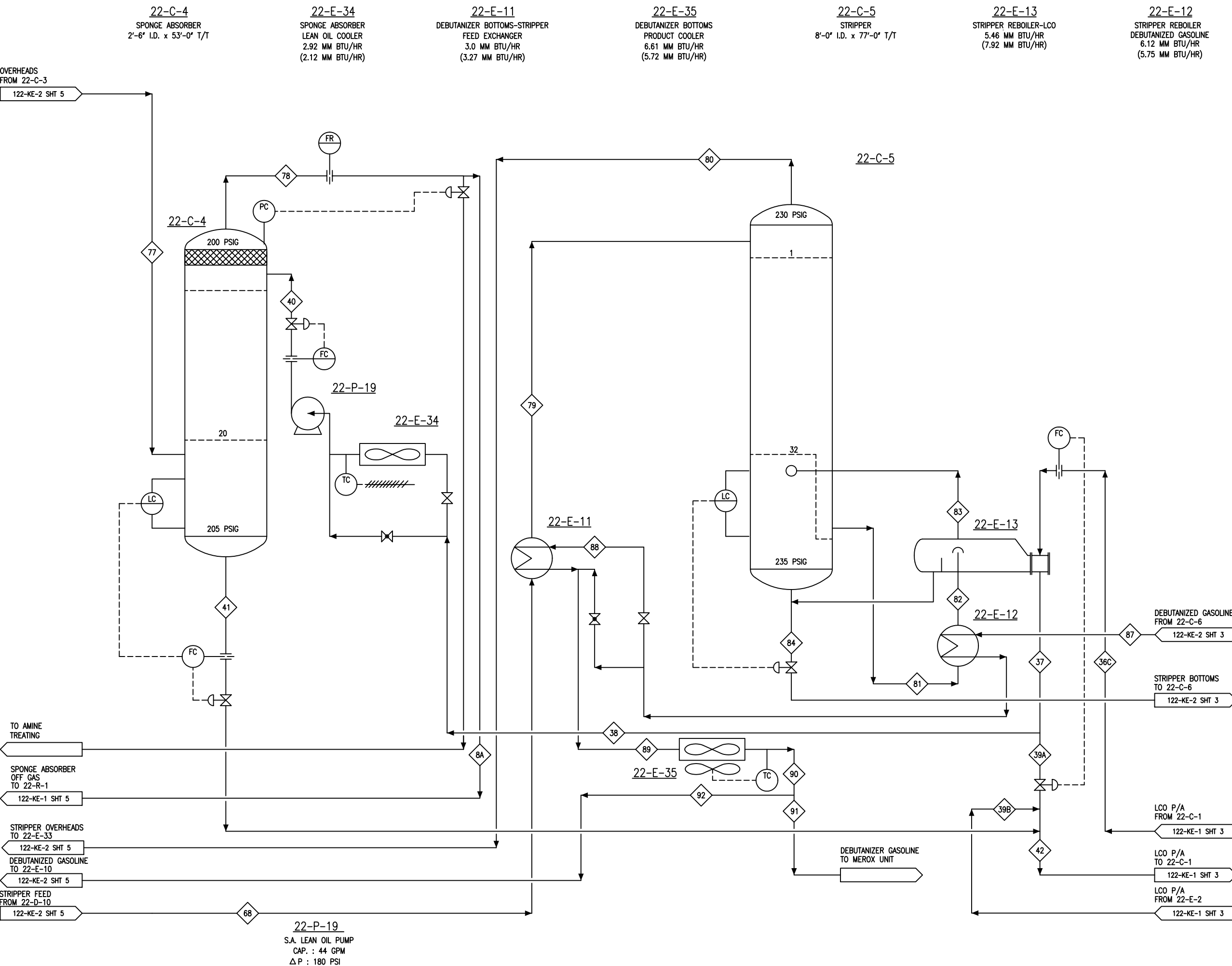
3. FOR GENERAL NOTES & SYMBOL LEGEND SEE 122-KE-2 SHT.1.

REVISION	DATE	DESCRIPTION	DRAWN BY	CHK'D BY	APP'D BY
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TITLE	DEPARTMENT
PROCESS FLOW DIAGRAM	AREA NO.
FCC GAS CONCENTRATION UNIT	CLASS NO.
	PROJ. NO. 10436.0002
	DATE
	SCALE NONE

DRAWN BY	CHECKED CH. DRAFT	SECTION NO.	DWG. NO.	REV.
J.P.	CHECKED ENGINEER	APPROVED BY	122-KE-2 SHT 4 of 6	5



22-C-4
 SPONGE ABSORBER
 2'-6" I.D. x 53'-0" T/T

22-E-34
 SPONGE ABSORBER
 LEAN OIL COOLER
 2.92 MM BTU/HR
 (2.12 MM BTU/HR)

22-E-11
 DEBUTANIZER BOTTOMS-STRIPPER
 FEED EXCHANGER
 3.0 MM BTU/HR
 (3.27 MM BTU/HR)

22-E-35
 DEBUTANIZER BOTTOMS
 PRODUCT COOLER
 6.61 MM BTU/HR
 (5.72 MM BTU/HR)

22-C-5
 STRIPPER
 8'-0" I.D. x 77'-0" T/T

22-E-13
 STRIPPER REBOILER-LCO
 5.46 MM BTU/HR
 (7.92 MM BTU/HR)

22-E-12
 STRIPPER REBOILER
 DEBUTANIZED GASOLINE
 6.12 MM BTU/HR
 (5.75 MM BTU/HR)

22-P-19
 S.A. LEAN OIL PUMP
 CAP. : 44 GPM
 ΔP : 180 PSI

22-E-33
HIGH PRESSURE RECEIVER
CONDENSER
7.15 MM BTU/HR
(10.44 MM BTU/HR)

22-D-10
HIGH PRESSURE
RECEIVER
10'-0" I.D. x 30'-0" T/T

22-C-3
PRIMARY ABSORBER
2'-6" & 5'-0" I.D. x 87'-0" T/T

22-E-9
P.A. INTER COOLER
0.89 MM BTU/HR
(1.1 MM BTU/HR)

22-E-10
PRIMARY ABSORBER LEAN
OIL COOLER
0.072 MM BTU/HR
(0.077 MM BTU/HR)

PRIMARY ABSORBER
OVERHEADS
TO 22-C-4

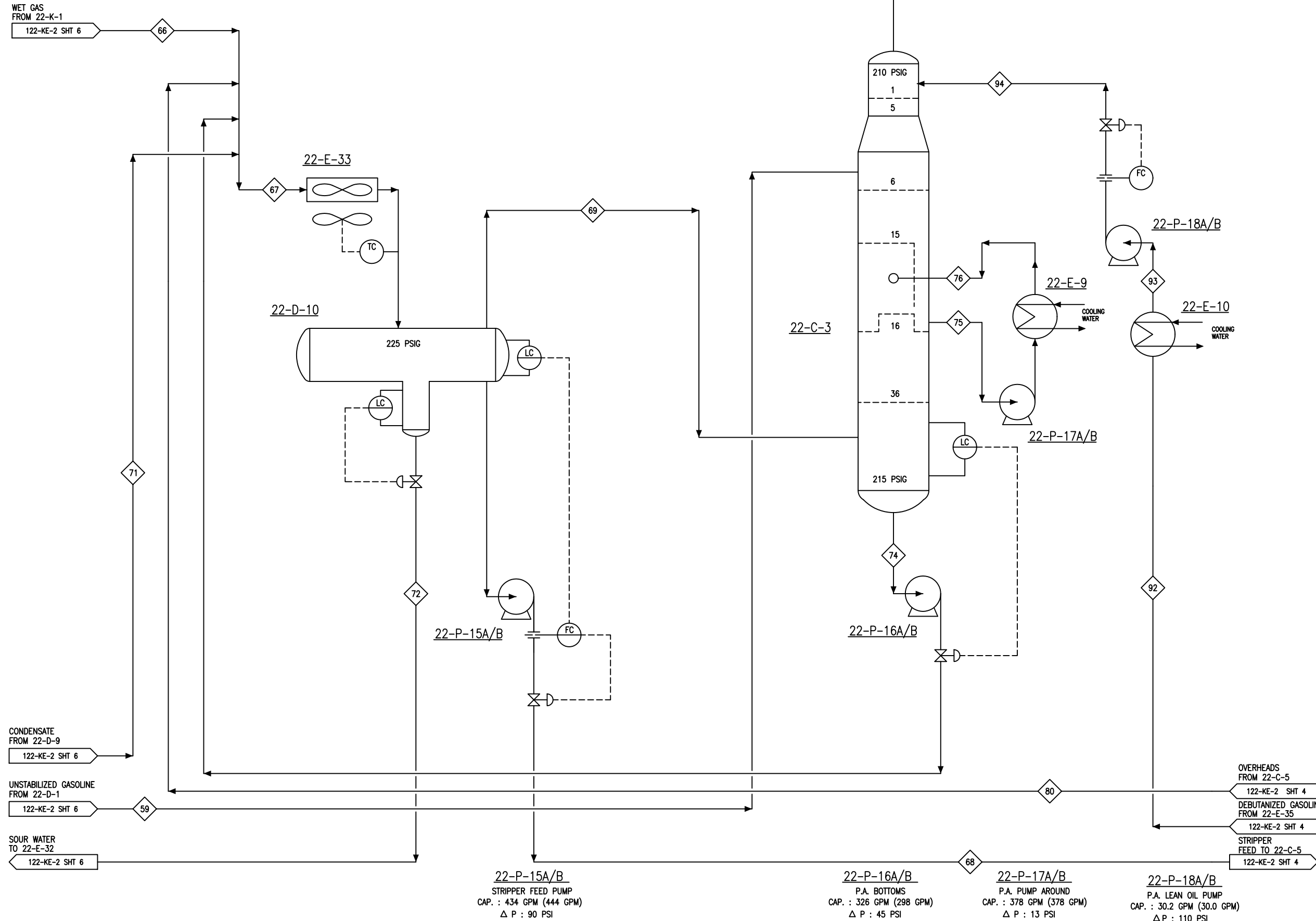
GENERAL NOTES

1. CAPACITIES / DUTIES SHOWN ARE FOR SUMMER CASE
= 12000 BPSD RAW OIL FEED AND 3000 BPSD LCO
RECYCLE.
NUMBERS SHOWN IN BRACKETS ARE FOR WINTER CASE
= 13000 BPSD RAW OIL FEED AND 3000 BPSD LCO
RECYCLE.

2. COOLING MEDIUM TEMPERATURES ARE AS FOLLOWS:

	SUMMER	WINTER
AIR	85° F	45° F
C.W.	77° F	65° F

3. FOR GENERAL NOTES & SYMBOL LEGEND SEE 122-KE-2 SHT.1.



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5	FEB. '94	REVISED TO INCORPORATE SIZE-THE-BUSINESS PROJECT MODIFICATIONS.		R.D.	
B		FOR DESIGN		D.M.	H.B.
A	Jan. '93	FOR CLIENT APPROVAL			



TITLE	DEPARTMENT
PROCESS FLOW DIAGRAM	
FCC GAS CONCENTRATION UNIT	
AREA NO.	
CLASS NO.	
PROJ. NO.	10436.0002
DATE	
SCALE	NONE

DRAWN BY	CHECKED CH. DRAFT	SECTION NO.	DWG. NO.	REV.
J.P.	CHECKED ENGINEER	APPROVED BY	122-KE-2 SHT 5 of 6	5

22-E-32
MAIN FRACTIONATOR
CONDENSER
33.5 MM BTU/HR
(49.5 MM BTU/HR)

22-E-43A/B
MAIN FRACTIONATOR
TRIM CONDENSER
9.73 MM BTU/HR
(3.83 MM BTU/HR)

22-D-1
MAIN COLUMN
RECEIVER
8'-0" I.D. x 25'-0" T/T

22-D-6
COMPRESSOR
SUCTION DRUM
5'-6" I.D. x 10'-0" T/T

22-K-1
WET GAS COMPRESSOR

22-D-9
INTERSTAGE RECEIVER
4'-0" I.D. x 10'-0" T/T

22-E-45
COMPRESSOR INTERSTAGE
COOLER
2.57 MM BTU/HR
(3.12 MM BTU/HR)

22-D-8
INJECTION WATER DRUM
5'-0" ID x 6'-0" T/T

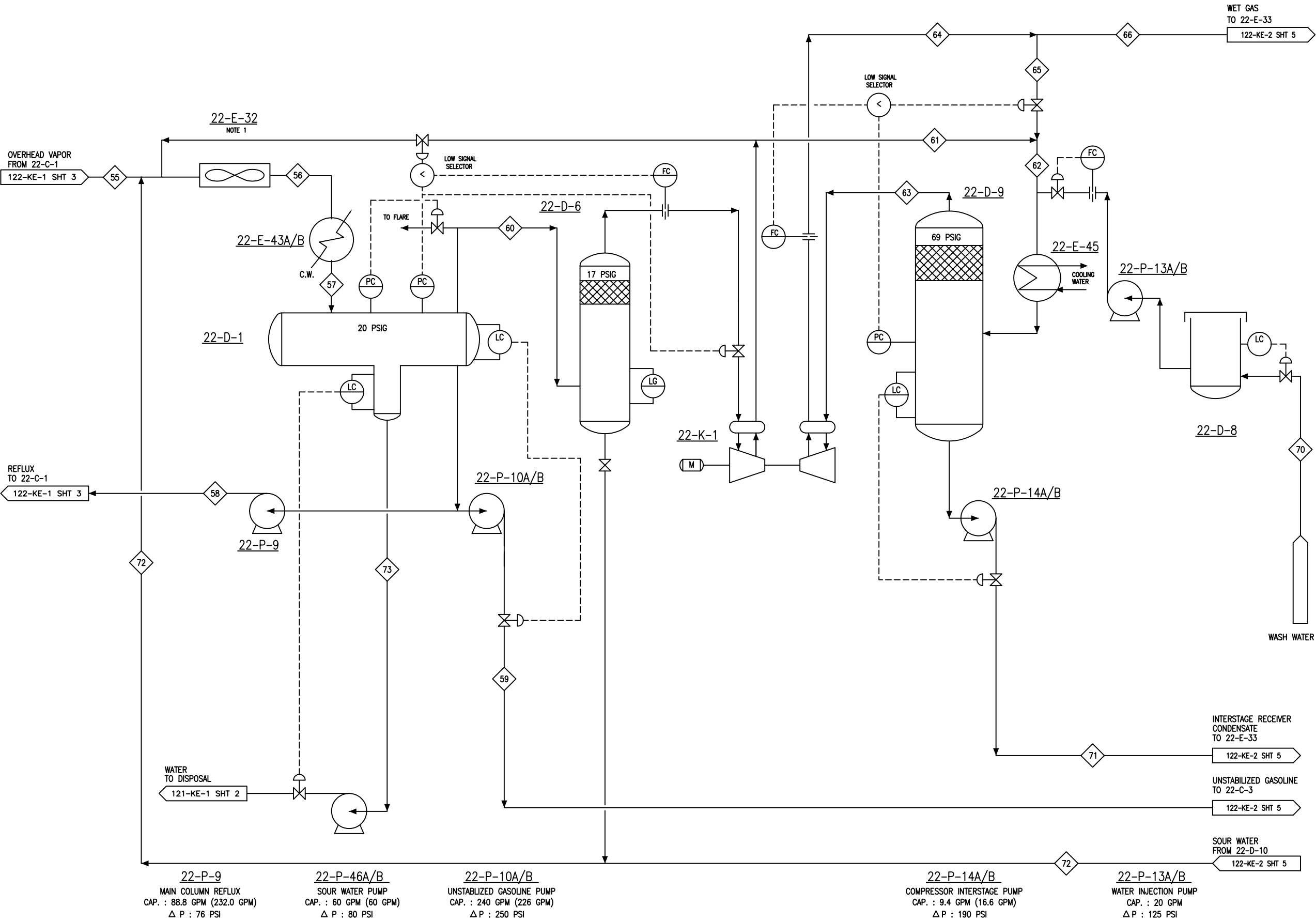
GENERAL NOTES

- CAPACITIES / DUTIES SHOWN ARE FOR SUMMER CASE
= 12000 BPSD RAW OIL FEED AND 3000 BPSD LCO
RECYCLE.
NUMBERS SHOWN IN BRACKETS ARE FOR WINTER CASE
= 13000 BPSD RAW OIL FEED AND 3000 BPSD LCO
RECYCLE.

- COOLING MEDIUM TEMPERATURES ARE AS FOLLOWS:

	SUMMER	WINTER
AIR	85° F	45° F
C.W.	77° F	65° F

- FOR GENERAL NOTES & SYMBOL LEGEND SEE 122-KE-2 SHT.1.



REVISION	DATE	DESCRIPTION	DRAWN BY	CHK'D BY	APP'D BY
6	AUG. 94	22-P-46A/B WAS 22-P-30A/B, 95 T/A			DL AW
5	FEB. '94	REVISED TO INCORPORATE SIZE-THE-BUSINESS PROJECT MODIFICATIONS.			R.D.
B		FOR DESIGN			D.M. H.B.
A	Jan. '93	FOR CLIENT APPROVAL			



TITLE	DEPARTMENT
PROCESS FLOW DIAGRAM	
FCC GAS CONCENTRATION UNIT	
AREA NO.	
CLASS NO.	
PROJ. NO. 10436.0002	
DATE	
SCALE NONE	

DRAWN BY	CHECKED CH. DRAFT	SECTION NO.	DWG. NO.	REV.
J.P.	CHECKED ENGINEER	APPROVED BY	122-KE-2	6
			SHT 6 of 6	