SCOPE TRACKING - ADDITIONAL WORK (TAW) - 15889

SDD108A; 4Q2011 4 CRUDE MAJOR-EASTSIDE

Scope Creep Type

- ○ Late (Deliverables supplied late)
- ○ Cancel (cancel existing job after WL Frz)
- ○ TAW Pre-ER Discovery
- ○ Scope Reduction Pre-ER
- ○ Scope Addition Pre-ER
- ◉ TAW Post-ER Discovery
- ○ Scope Reduction Post-ER
- ○ Scope Addition Post-ER
- ○ Work Deferral
- ○ Other (work done outside of TA)

Approval Status

- ○ NEW
- ○ ESTIMATING
- ○ UNDECIDED
- ◉ APPROVED
- ○ DENY

Date: 10/16/2011

WO Nbr: 313079 - 02

Remarks: Approved - MRG - 10/17/11

Engineering Required: ◉ Yes ○ No

Environmental Review: ○ Yes ◉ No

Risk Assessment?: ○ Yes ◉ No

Originator: Sohnrey, Kenneth (kcso) RI

T/A Interval (Mos):

ER Submission Date:

System No:

Equip / Loc: (D) VALVES

Description of work: (Include Options)

(--) BE102-ES/ 4CU / EXTRA ORBIT VALVES
116. C-118u safety Bypass 2" 150 Valve Frozen bolted System 4
117. 11PC005 U/S Block Valve 4" 150 valve frozen System 12
118. K-1171 2nd stage discharge safety bypass 2" 150 valve frozen bolted System 4
119. K-1171A 1st stage discharge safety bypass 2' 150 valve frozen bolted System 4
120. P-1190 utility tie-in to suction 4" 150 frozen orbit bolted System 9

DED INSTRUCTIONS:
SEE ATTACHED WORK INSTRUCTIONS

Justification for this TAW

Reason work was identified after work list freeze or late:

Work List Freeze Date:

Schedule Status (for use by schedulers):

Current Estimates:		*Summary Info:*	
Labor	$0	ER Contingency:	$0
Material	$0	TAW Estimates at ER Creation:	$861,360
Equip.	$0	Current TAW Estimate:	$0
Total:	$0	TAW $ Approved to Date:	$1,103,664
		Remaining Contingency:	($1,103,664)

Effect on Schedule

- [x] None
- [ ] Risk, Miss Planning Milestone
- [ ] Risk, number of non-critical path jobs
- [ ] Potential critical path
- [ ] New critical path
- [ ] Extends Schedule by 0

Planning Notes:

Impacts Budget?

○ Yes ◉ No ◎ Capital ◎ Expense

10/21/2011 3:19:39 PM

SCOPE TRACKING - ADDITIONAL WORK (TAW) - 15889

SDD108A; 4Q2011 4 CRUDE MAJOR-EASTSIDE

Approvals: Select Added Work Classification and Type To Show Required Approvals...

	Req?	Core Team Members:	Status:	Date:	NOT SUBMITTED
Operations:	Y	Sohnrey, Kenneth (kcso) RI			
Technical:	Y	MURPHY, PAT (pmgr) RI			
Inspection:	Y	BEAUREGARD, JOHN (tbea) RI			
Maint. Core Team Lead:	Y	MASSARO, VINCENT (vrma) RI		10/21/11	
		Management Approvals:			
Impact Team Leader:	Y	GREENFIELD, MATTHEW (mgcv) RI	10/21/11		
TA Superintendent:	N				
Section Head:	N				
Area Business Mgr:	N				
Mgr Of Operations:	N				

Approval Process Comments

CommentDate	Comment	UserEntered
10/20/2011 4:13:03 PM	EWO ATTACHED AND GIVEN TO IMPACT	MURPHY, PAT (pmgr) RI

Entered By: KCSO 10/16/2011 10:15:00 AM Last Updated By: PMGR 10/20/2011 4:16:12 PM

R. RAMIREZ
OCT 21 2011

10/20/2011 4:16:24 PM

1.0 SCOPE

Five valves have been identified as needing repair or replacements. This EWO provides specific work direction for these valves.

2.0 GENERAL REQUIREMENTS

All work in this EWO shall be in strict compliance with the following ASME Codes and Richmond Refinery standards:

- ASME Section VIII (latest):_____Pressure Vessel Code
- NBIC (latest):_____National Board Inspection Code
- ASME Section IX (latest):_____Welding and Brazing Qualifications
- ASME Section V (latest):_____Nondestructive Examination
- All piping work in this EWO shall be in compliance with the "Richmond Refinery Metals Craft Manual". The piping Contractor is responsible for complying with these quality assurance procedures.
- Any repair alternatives to the instructions in this EWO shall be reviewed and approved by a Chevron Designs Engineer.

3.0 MATERIALS

- Obtain 4" Orbit Valve from **Maximo W.O.# 313079-002**
- All other materials to be supplied by Maintenance and/or the Contractor

4.0 WORK INSTRUCTIONS

4.1 Perform work on valves as directed on attached "2011 4CRU Extra Orbit Valve List". This will provide the following information:

- Valve info (tag #, size, class, style).
- Location within plant (work with attached sketches).
- Work direction (repack, remove/repair, replace, etc.).
- Appropriate Welding Procedure Specifications.
- Hydrostatic Test Pressure Information
- Pipe Class Specifications

4.2 Replace Insulation In Kind

- Where required, insulation shall be removed sufficiently to complete valve work including testing. The insulation shall be replaced to match existing after all valve work and testing is complete.
- Test and Abate Asbestos Insulation as Necessary.

5.0 ATTACHMENTS

	Dwg No	Sheets
• **Valve Work Detail List:**	2011 4CRU Extra Orbit Valve List	1
• **Individual Valve Sketches**	SK-15889-1(XVLV-116) SK-15889-2 (XVLV-117) SK-15888-3 (XVLV-118,119) SK-15888-4 (XVLV-120)	1 ea
• **Piping Classification:**	3CS11, AB0, AB1	3 ea

Think Before You Act!

D&R Distillation

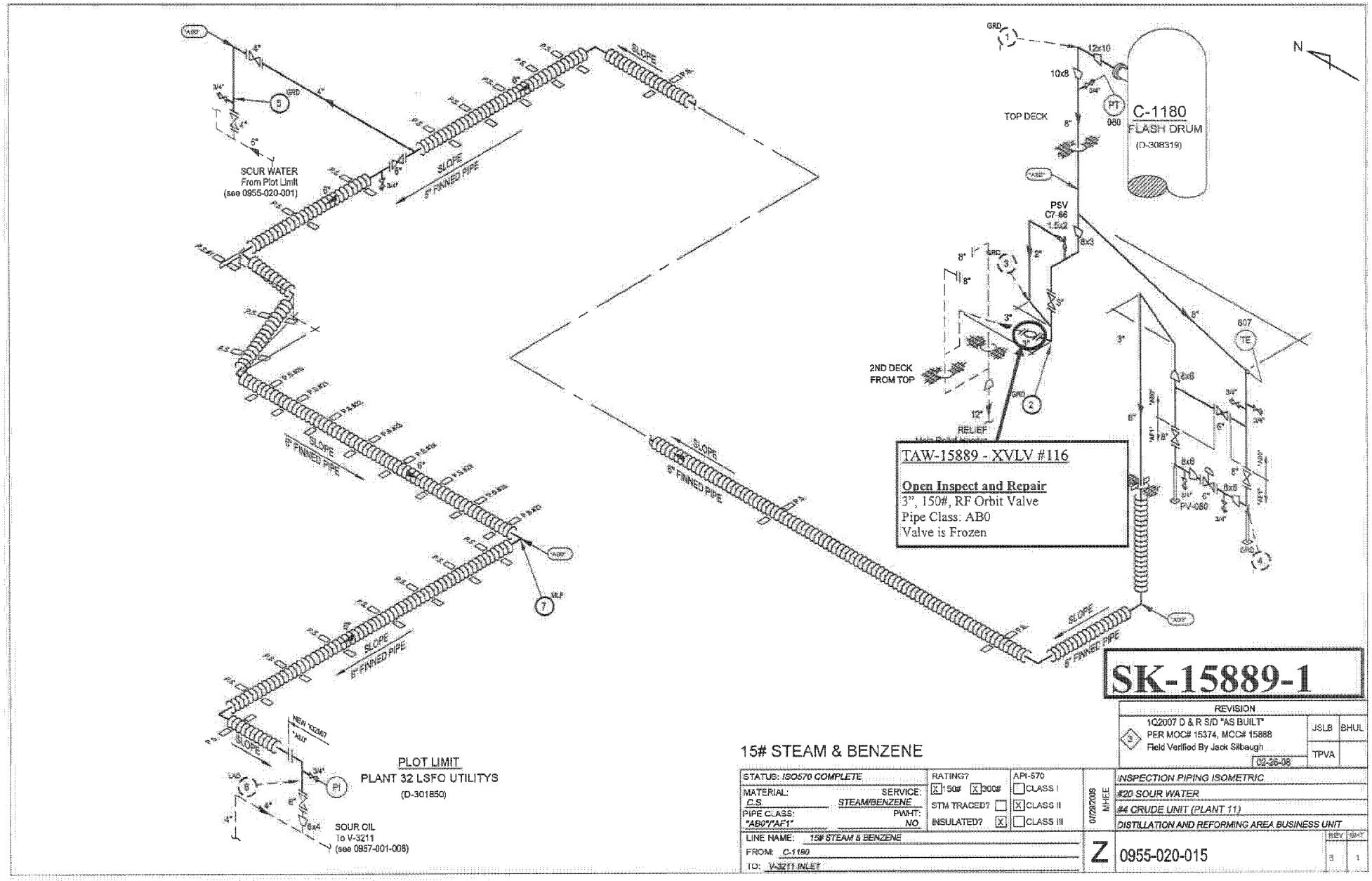
Engineering Valve List

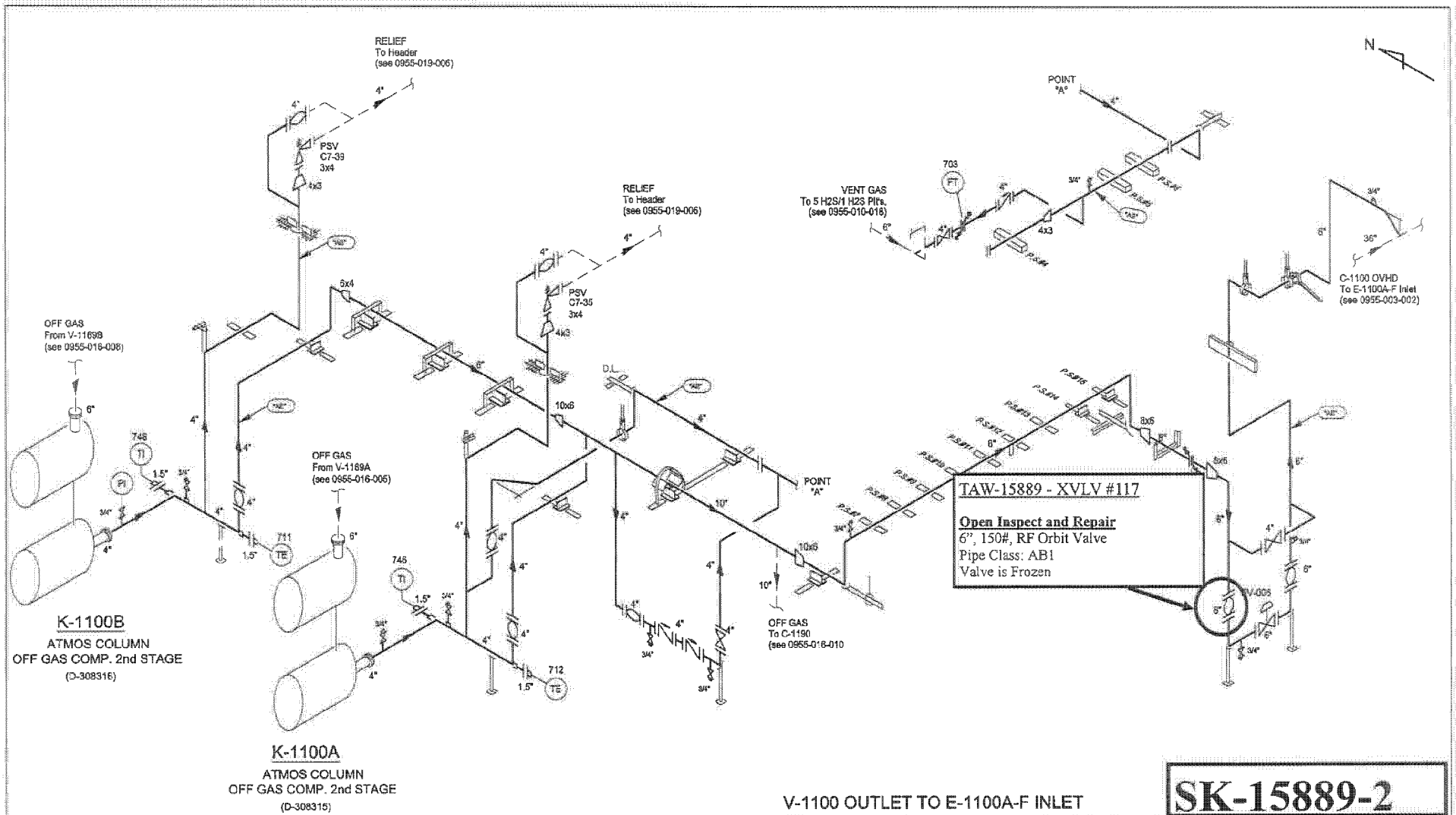
26 #	Process Area: Distillation	Plant: 4Crude	Impact Team Leader: Greenfield, Matthew R.
EWO # BE102-E5	Type of List: Process Valve List		Impact Supervisor: Smith, Bruce D.
MOC #	Shutdown Title: 2011	List Rev Date: 10/18/2011 8:43:59 AM	Maint. Supervisor: Massaro, Vincent R.
			Ops. Coordinator: Sohnrey, Kenneth C.

Tag Number	Sys No	Size (in.)	Valve Type	Valve Rating	Flange Type	VOC No / MOC No	Location: Line Number	Location: Insp Drwg No.	Location: P&ID No.	Service	Work #	Engineering Work Notes: PipeClass	Engineering Work Notes: Weld Procedure	Engineering Work Notes: PWHT	Hydro Press.
116	4_4 CU	3"	Orbit	150	RF		C-1180 PRD BYPASS			Relief	2	Open Inspect and Repair (See SK-15889-1)			N/A
							V11116	0955-020-015	D-308319			AB0	N/A	N/A	
117	12_ 4C U	6"	Orbit	150	RF		11PC005 UPSTREAM BLOCK VALVE			Relief	2	Open Inspect and Repair (see SK-15889-2)			N/A
							P11179	0955-016-009	D-308313			AB1	N/A	N/A	
118	4_4 CU	3"	Orbit	150	RF		K-1171 2ND STAGE DISCHARGE PRD BYPASS			Relief	2	Open Inspect and Repair (see SK-15889-3)			N/A
							V11136	0955-019-004	D-308333			AB0	N/A	N/A	
119	4_4 CU	3"	Orbit	150	RF		K-1171A 1ST STAGE DISCHARGE PRD BYPASS			Relief	2	Open Inspect and Repair (See SK-15889-3)			N/A
							V11176	0955-019-004	D-308333			AB0	N/A	N/A	
120	9_4 CU	4"	Orbit	150	RF		P-1190 UTILITY SPOOL TIE-IN BLOCK VALVE			Naphtha	2	Replace Valve (see SK-15889-4)			N/A
								0955-017-003	308318			3CS11	N/A	N/A	

Work Note: **1-Repack; 2- Free Up; 3-Repair Bonnet Leak; 4-Repair Flange Leak; 5-Replace Valve ; 6-Open and Inspect; 7-Leaks By; 8-Other**
Pints to Tag MFG-7289

CUSA-CSB-0019128
EPA


SCUR WATER
From Plot Limit
(see 0955-020-001)
SLOPE
6" FINNED PIPE
C-1180
FLASH DRUM
(D-308319)
TOP DECK
PSV
C7-66
1.5x2
2ND DECK
FROM TOP
RELIEF
TAW-15889 - XVLV #116
Open Inspect and Repair
3", 150#, RF Orbit Valve
Pipe Class: AB0
Valve is Frozen
PV-080
PLOT LIMIT
PLANT 32 LSFO UTILITYS
(D-301850)
SOUR OIL
To V-3211
(see 0957-001-008)
SK-15889-1
REVISION
1Q2007 D & R S/D "AS BUILT"
PER MOC# 15374, MCC# 15888
Field Verified By Jack Silbaugh
02-26-08
JSLB
BHUL
TPVA
15# STEAM & BENZENE
STATUS: ISO570 COMPLETE
MATERIAL: C.S
SERVICE: STEAM/BENZENE
PIPE CLASS: "AB0"/"AF1"
PWHT: NO
RATING? X 150# X 300#
STM TRACED? X
INSULATED? X
API-570 CLASS I CLASS II CLASS III
07/09/2008 M-HEE
INSPECTION PIPING ISOMETRIC
#20 SOUR WATER
#4 CRUDE UNIT (PLANT 11)
DISTILLATION AND REFORMING AREA BUSINESS UNIT
LINE NAME: 15# STEAM & BENZENE
FROM: C-1180
TO: V-3211 INLET
Z
0955-020-015
REV 3
SHT 1



V-1100 OUTLET TO E-1100A-F INLET

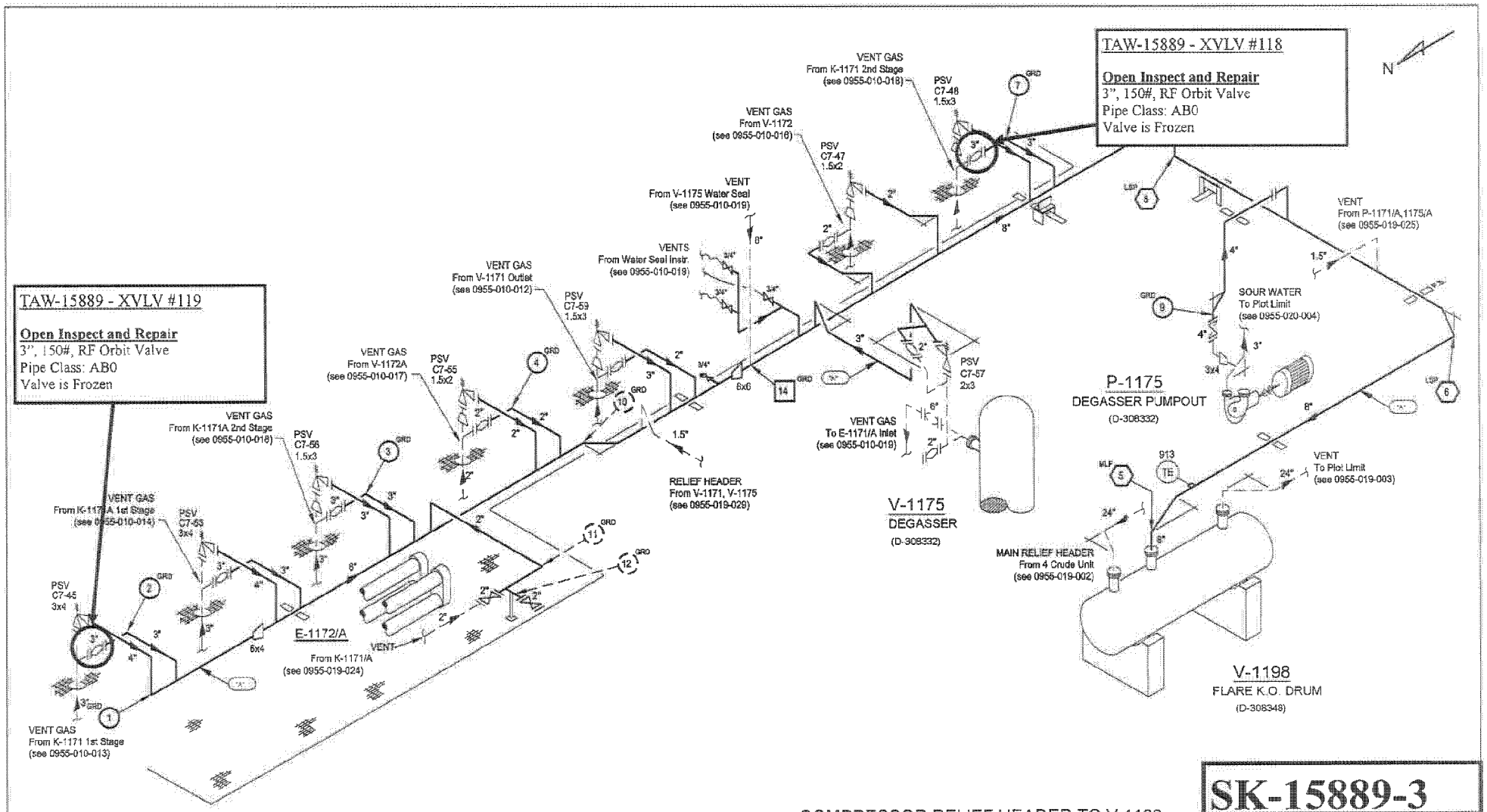
SK-15889-2

STATUS: ISO570 COMPLETE	RATING? [X] 150# [ ] 300#	API-570 [ ] CLASS I [X] CLASS II [ ] CLASS III	04/05/2011 TTM/W
MATERIAL: C.S. / SERVICE: OFF-GAS	STM TRACED? [X]		
PIPE CLASS: *AB1*(IAE) / PWHT: NO	INSULATED? [X]		
LINE NAME: V-1100 OUTLET TO E-1100A-F INLET			
FROM: K-1100A/B (2ND STAGE)			
TO: E-1100A-F INLET			

INSPECTION PIPING ISOMETRIC
#16 OFF-GAS
#4 CRUDE UNIT (PLANT 11)
DISTILLATION AND REFORMING AREA BUSINESS UNIT

Z 0955-016-009 REV 5 SHT 1

REVISION			
5	RECONCILED LABELING AND STANDARDIZED FORMAT FOR PRD/PSV IDENTIFICATION. 02/15/08	DOGR TPVA	PHSC



SK-15889-3

COMPRESSOR RELIEF HEADER TO V-1198

REVISION			
7	RECONCILED LABELING AND STANDARDIZED FORMAT FOR PRD/PSV IDENTIFICATION. 02/15/06	DOGR / TPVA	PHSC

STATUS: ISO570 COMPLETE	RATING? [X] 150# [ ] 300#	API-570 [ ] CLASS I	8/19/05 MHEE
MATERIAL: C.S.	SERVICE: RELIEF	STM TRACED? [ ]	[X] CLASS II
PIPE CLASS: *AB0*(A)	PWHT: NO	INSULATED? [ ]	[ ] CLASS III
LINE NAME: COMPRESSOR RELIEF HEADER TO V-1198			
FROM: COMPRESSOR AREA			
TO: V-1198			

INSPECTION PIPING ISOMETRIC
#19 RELIEF
#4 CRUDE UNIT (PLANT 11)
DISTILLATION AND REFORMING AREA BUSINESS UNIT

Z 0955-019-004 — REV 8 — SHT 1

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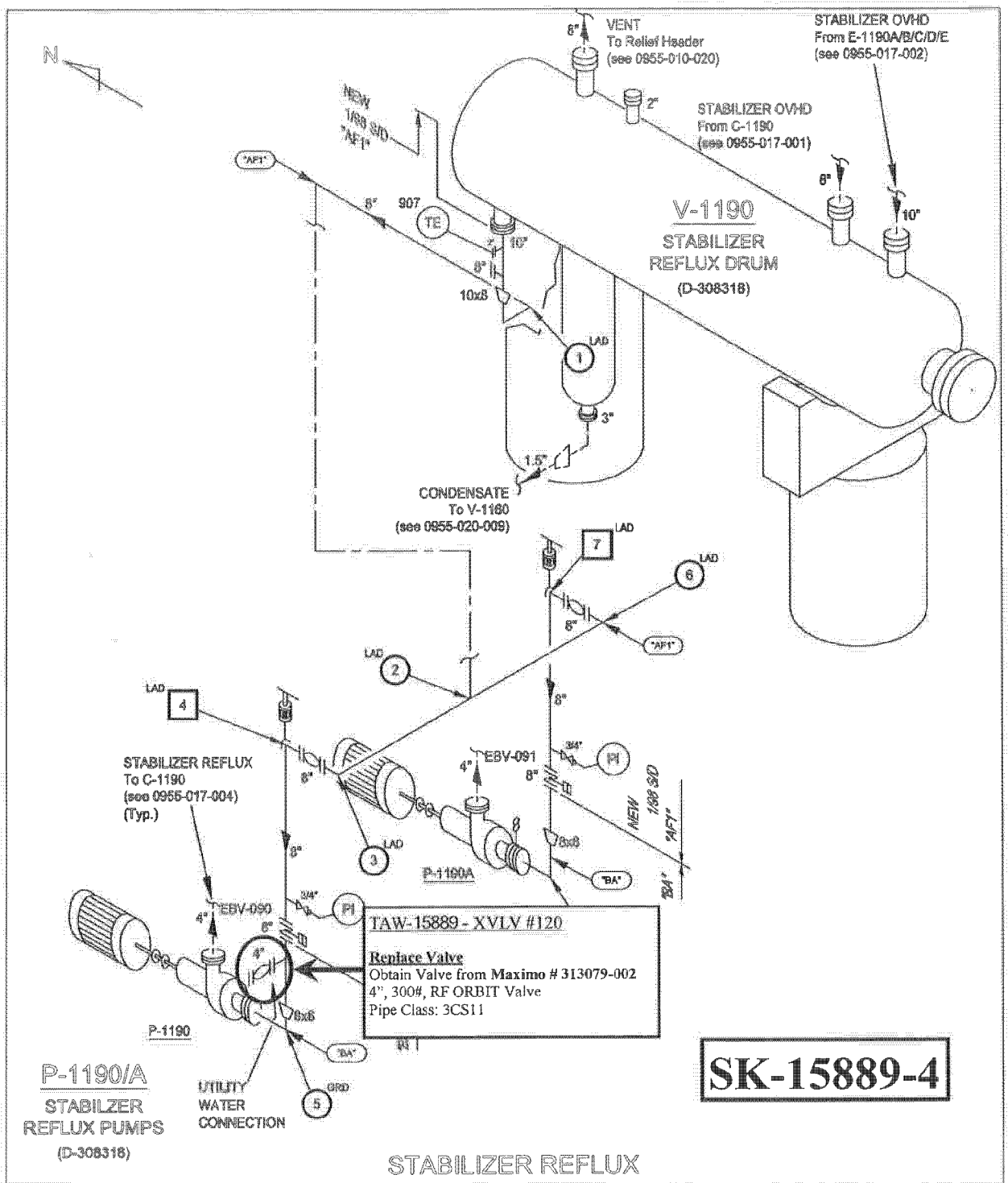
EPA



STATUS: *ISO570 COMPLETE*	RATING? ☐ 150# ☒ 300#	API-570 ☒ CLASS I	07/07/01 rstn/DPM	*INSPECTION PIPING ISOMETRIC*
MATERIAL: *C.S.* SERVICE: *HC*	STM TRACED? ☐	☐ CLASS II		*#17 STABILIZER OVERHEAD*
PIPE CLASS: *"AF1"(BA)* PWHT: *NO*	INSULATED? ☐	☐ CLASS III		*#4 CRUDE UNIT (PLANT 11)*
				DISTILLATION AND REFORMING AREA BUSINESS UNIT
LINE NAME: *STABILIZER REFLUX*			Z	0955-017-003 (REV 3, SHT 1)
FROM: *V-1190*				
TO: *P-1190/A*				

		LIMITED BY:	Flanges
SERVICE:	Process	MATERIAL:	Carbon Steel
RATING CLASS:	300 RF, ASME B16.5-2009	DESIGN CODE:	ASME B31.3-2008
TEMPERATURE LIMIT:	Min. to 750F	STRESS RELIEF:	None
NOMINAL CORROSION ALLOWANCE:	0.063 in. (0.035 in. MIN for ¼")	EXAMINATION:	5% RT, PT & Visual
VALVE TRIM:	API Trim #8 (13CR & HF)		

PRESSURE - TEMPERATURE RATINGS			NOTE: HYDROTEST @ AMBIENT = 1125 psig					
TEMP F	Min. to 100	200	300	400	500	600	700	750
psig	740	680	655	635	605	570	530	505
TEMP C	Min. to 38	93	149	204	260	316	371	399
kPag	5100	4690	4515	4380	4170	3930	3655	3480

For NPS 3/4 through NPS 24 (Full flange ratings per ASME B16.5, Table 2-1.1.)

MINIMUM TEMPERATURE (see Note 300)		
SIZE:	¾" - 20"	24"
°F:	-20	+9
°C:	-29	-12

ITEM	NOTES	NPS	SCH/RAT	ENDS	DESCRIPTION	ITEM CODE
PIPE						
		3/4 – 1-1/2	XS/80	PE	CS, SMLS, ASTM A106-B	L11NA1B
		2 – 2	XS/80	BE	CS, SMLS, ASTM A106-B	L11NA2A
		3 – 12	STD	BE	CS, SMLS, ASTM A106-B	L11MA2A
		14 – 20	XS	BE	CS, S MLS, ASTM A106-B	L11NA2A
		24 – 24	40	BE	CS, SMLS, ASTM A106-B	L11EA2A
NIPPLES Branch						
Branch		3/4 – 1-1/2	160	PE	CS, SMLS , ASTM A106-B	L34LAEJ
Branch		3/4 – 1-1/2	160	TOE-POE	CS, SMLS , ASTM A106-B	L34LAHJ
Swage (CONC)		3/4 – 1-1/2	160	BBE	CS, ASTM A234-WPB-S, MSS SP-95	L55NA1VA
Swage (CONC)		3/4 – 1-1/2	160	BLE-TSE	CS, ASTM A234-WPB-S, MSS SP-95	L35LBMQ
FITTINGS						
Sockolet		3/4 – 1-1/2	Class 3000	SW	CS, ASTM A105, MSS SP-97	L36SBDT
Thredolet	03	3/4 – 1-1/2	Class 3000	THRD	CS, ASTM A105, MSS SP-97	L36SBAT
SW Elbolet		3/4 – 1-1/2	Class 3000	SW	CS, ASTM A105	L36SBDU
Latrolet	92	3/4 – 1-1/2	XS/80	Weld	CS, ASTM A105	L56NA1K
Weldolet	05	3/4 – 1-1/2	XS/80	Weld	CS, ASTM A105, MSS SP-97	L56NA1H
90 ELL		3/4 – 1-1/2	Class 3000	SW	CS, ASTM A105, ASME B16.11	L30SBDB
45 ELL		3/4 – 1-1/2	Class 3000	SW	CS, ASTM A105, ASME B16.11	L30SBDA
Tee		3/4 – 1-1/2	Class 3000	SW	CS, ASTM A105, ASME B16.11	L31SBD
Tee	03	3/4 – 1-1/2	Class 3000	THRD	CS, ASTM A105, ASME B16.11	L31SBA
Tee (RED)		3/4 – 1-1/2	Class 3000	SW	CS, ASTM A105, ASME B16.11	L31SBDD
Plug	03	3/4 – 1-1/2		THRD	CS, ASTM A105, round head, ASME B16.11	L370ABW
Plug		3/4 – 1-1/2		PE	CS, ASTM A105, round head, ASME B16.11	L370AEW
Coupling		3/4 – 1-1/2	Class 3000	SW	CS, ASTM A105, ASME B16.11	L34SBDH
Cap		3/4 – 1-1/2	Class 3000	SW	CS, ASTM A105, ASME B16.11	L37SBDX
Reducer (CONC)		2 – 2	XS/80	Weld	CS, ASTM A234-WPB-S, ASME B16.9	L55NA1DA
Reducer (ECC)		2 – 2	XS/80	Weld	CS, ASTM A234-WPB-S, ASME B16.9	L55NA1DB
Weldolet	05	2 – 2	XS/80	Weld	CS, ASTM A105, MSS SP-97	L56NA1H
90 LR ELL		2 – 2	XS/80	Weld	CS, ASTM A234-WPB-S, ASME B16.9	L50NA1BC
45 LR ELL		2 – 2	XS/80	Weld	CS, ASTM A234-WPB-S, ASME B16.9	L50NA1AC
Tee		2 – 2	XS/80	Weld	CS, ASTM A234-WPB-S, ASME B16.9	L51NA1
Tee (RED)	99	2 – 2	XS/80	Weld	CS, ASTM A234-WPB-S, ASME B16.9	L51NA1D
Cap		2 – 2	XS/80	Weld	CS, ASTM A234-WPB-S, ASME B16.9	L57NA1R
Reducer (CONC)		3 – 12	STD	Weld	CS, ASTM A234-WPB-S, ASME B16.9	L55MA1DA
Reducer (ECC)		3 – 12	STD	Weld	CS, ASTM A234-WPB-S, ASME B16.9	L55MA1DB
Weldolet	05	3 – 8	STD	Weld	CS, ASTM A105, MSS SP-97	L56MA1H
90 LR ELL		3 – 12	STD	Weld	CS, ASTM A234-WPB-S, ASME B16.9	L50MA1BC
45 LR ELL		3 – 12	STD	Weld	CS, ASTM A234-WPB-S, ASME B16.9	L50MA1AC
Tee		3 – 12	STD	Weld	CS, ASTM A234-WPB-S, ASME B16.9	L51MA1
Tee (RED)	99	3 – 12	STD	Weld	CS, ASTM A234-WPB-S, ASME B16.9	L51MA1D
Cap		3 – 12	STD	Weld	CS, ASTM A234-WPB-S, ASME B16.9	L57MA1R

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EPA

ITEM	NOTES	NPS	SCH/RAT	ENDS	DESCRIPTION	ITEM CODE
Reducer(CONC)		14 – 20	XS	Weld	CS, ASTM A234-WPB-S, ASME B16.9	L55NA1DA
Reducer (ECC)		14 – 20	XS	Weld	CS, ASTM A234-WPB-S, ASME B16.9	L55NA1DB
90 LR ELL		14 – 20	XS	Weld	CS, ASTM A234-WPB-S, ASME B16.9	L50NA1BC
45 LR ELL		14 – 20	XS	Weld	CS, ASTM A234-WPB-S, ASME B16.9	L50NA1AC
Tee		14 – 20	XS	Weld	CS, ASTM A234-WPB-S, ASME B16.9	L51NA1
Tee (RED)		14 – 20	XS	Weld	CS, ASTM A234-WPB-S, ASME B16.9	L51NA1D
Cap		14 – 20	XS	Weld	CS, ASTM A234-WPB-S, ASME B16.9	L57NA1R
Reducer (CONC)		24 – 24	40	Weld	CS, ASTM A234-WPB-S, ASME B16.9	L55EA1DA
Reducer (ECC)		24 – 24	40	Weld	CS, ASTM A234-WPB-S, ASME B16.9	L55EA1DB
90 LR ELL		24 – 24	40	Weld	CS, ASTM A234-WPB-S, ASME B16.9	L50EA1BC
45 LR ELL		24 – 24	40	Weld	CS, ASTM A234-WPB-S, ASME B16.9	L50EA1AC
Tee		24 – 24	40	Weld	CS, ASTM A234-WPB-S, ASME B16.9	L51EA1
Tee (RED)		24 – 24	40	Weld	CS, ASTM A234-WPB-S, ASME B16.9	L51EA1D
Cap		24 – 24	40	Weld	CS, ASTM A234-WPB-S, ASME B16.9	L57EA1R
VALVES						
Gate	67	1/2 – 1/2	Class 800	MSW/FSW	CS body, API #8 trim, BB, RP, EXTD body	L20KAXHDM
Gate	15	3/4 – 1-1/2	Class 300	RF	CS body, API #8 trim, BB, RP	L20FA3HD
Gate		3/4 – 1-1/2	Class 800	SW	CS body, API #8 trim, RP, BB	L20KA1HD
Gate	325	3/4 – 1-1/2	Class 800	SW	CS body, API #8 trim, FP, BB	L20KA1DD
Gate		3/4 – 1-1/2	Class 800	T/SW	CS body, API #8 trim, RP, BB	L20KA7HD
Gate	94	3/4 – 1-1/2	Class 800	MSW/FNPT	CS body, API #8 trim, BB, RP, EXTD body	L20KAYHDM
Gate	06, 161	3/4 – 1-1/2	Class 800	SW	CS body, API #8 trim, RP, BELLOW SEAL, WB	L20KD1MDL
Gate	06, 161,325	3/4 – 1-1/2	Class 800	SW	CS body, API #8 trim, FP, BELLOW SEAL, WB	L20KD1FDL
Gate	06, 161	3/4 – 1-1/2	Class 800	T/SW	CS body, API #8 trim, RP, BELLOW SEAL, WB	L20KD7MDL
Gate		2 – 6	Class 300	RF	CS body, API #8 trim, BB, FP	L20FA3DD
Gate		8 – 24	Class 300	RF	CS body, API #8 trim, BB, FP, GO	L20FA3DDF
Globe	161, 307	3/4 – 1-1/2	Class 800	T/SW	CS body, API #8 trim, BELLOW SEAL, WB	L21KD7JEL
Globe	161, 307	3/4 – 1-1/2	Class 800	SW	CS body, API #8 trim, BELLOW SEAL, WB	L21KD1JEL
Globe	307	3/4 – 1-1/2	Class 800	SW	CS body, API #8 trim, BB	L21KA1DE
Globe	307	2 – 2	Class 300	RF	CS body, API #8 trim, BB	L21FA3DE
Globe	307	3 – 8	Class 300	RF	CS body, API #8 trim, BB, GO	L21FA3DEB
Check	61, 328	3/4 – 1-1/2	Class 800	SW	CS body, API #8 trim, BC, Piston, HORIZ	L22KA1TEF
Check	62, 328	2 – 24	Class 300	RF	CS body, API #8 trim, BC, Swing	L22FA3PE
Check	62,328	2 – 24	Class 300	RF	CS body, API #8 trim, Dual Plate	L22FA3LEH
Ball	26, 101	2 – 12	Class 300	RF	CS, (A216-WCB) T3 MOD, RP, ORBIT	L25FB3FB
Ball	101, 327	2 – 4	Class 300	RF	CS body, 316 SS trim, RP, TFE seat, FS	L25FA3CE
Ball	101, 327	6 – 24	Class 300	RF	CS body, 316 SS trim, RP, TFE seat, FS, GO	L25FA3CEM
Butterfly	101	2 – 24	Class 300	RF	CS body, 316 SS trim, Flg, Triple Offset GO	L26FA3TJM
FLANGES	02, 13					
Socket Weld		3/4 – 1-1/2	Class 300	RF	CS, ASTM A105, ASME B16.5, XS Bore	L40FA3BN
Blind		3/4 – 24	Class 300	RF	CS, ASTM A105, ASME B16.5	L43FA3
Blind Spectacle		3/4 – 14	Class 300	RF	CS, ASTM A516-70, ASME B16.48	L45FA3E
Spacer Ring		16 – 24	Class 300	RF	CS, ASTM A516-70, ASME B16.48	L45FA3F
Blind Plate		16 – 24	Class 300	RF	CS, ASTM A516-70, ASME B16.48	L45FA3G
Weld Neck		2 – 2	Class 300	RF	CS, ASTM A105, ASME B16.5, XS/80 Bore	L40FA3DN
Weld Neck		3 – 12	Class 300	RF	CS, ASTM A105, ASME B16.5, STD Bore	L40FA3DM
Weld Neck		14 – 20	Class 300	RF	CS, ASTM A105, ASME B16.5, XS Bore	L40FA3DN
Weld Neck		24 – 24	Class 300	RF	CS, ASTM A105, ASME B16.5, 40 Bore	L40FA3DE
Pair WN Orifice		1 – 2	Class 300	RF	CS, ASTM A105, ASME B16.36, ½ SW taps, XS/80 Bore	L42FA3DNL
Pair WN Orifice		3 – 12	Class 300	RF	CS, ASTM A105, ASME B16.36, 1/2 SW taps, STD bore	L42FA3DML
Pair WN Orifice	17	14 – 18	Class 300	RF	CS, ASTM A105, ASME B16.36, ½ SW taps, XS Bore	L42FA3DNL
GASKETS		3/4 – 24	Class 300	RF	Spiral wound type 316L SS w/ flexible Inhibited Graphite filler, ASME B16.20, w/inner ring	L61FF1CAC
	301	3/4 – 24	Class 300		KAM style, 316LSS w/APX-2 Graphite, EXH-SU-5151	L61FF1ZA
BOLTING						
Stud Bolts	310	3/4 – 24			ASTM A193, Gr B7 stud w/ 2 heavy hex nuts ASTM A194,Gr 2H	L620BM
Stud Bolts	311	3/4 – 24			ASTM A193, Gr B16 stud w/ 2 heavy hex nuts ASTM A194,Gr 7	L620CM

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90° BRANCH CONNECTION, Legend and Chart

BRANCH \ HEADER SIZE	24	20	18	16	14	12	10	8	6	4	3	2	1-1/2	1	3/4	1/2
24	T															
20	E	T														
18	E	E	T													
16	E	E	E	T												
14	E	E	E	E	T											
12	E	E	E	E	E	T										
10	E	E	E	E	E	E	T									
8	W	E	E	E	E	E	E	T								
6	W	W	W	E	E	E	E	E	T							
4	W	W	W	W	W	W	E	E	E	T						
3	W	W	W	W	W	W	W	E	E	E	T					
2	W	W	W	W	W	W	W	W	W	E	E	T				
1-1/2	S	S	S	S	S	S	S	S	S	S	S	S	T			
1	S	S	S	S	S	S	S	S	S	S	S	S	E	T		
3/4	S	S	S	S	S	S	S	S	S	S	S	S	E	E	T	
1/2	S	S	S	S	S	S	S	S	S	S	S	S	E	E	E	T

E Reducing Tee
P Branch Weld w/ Reinforcing Pad (Pad thickness equals run pipe thickness. Pad width equals 1/2 branch OD.)
T Equal Tee
S Sockolet
W Weldolet (Note 05)

NOTES:

03 THREADED JOINTS ARE PERMITTED ONLY AT OUTLET OF VENT AND DRAIN VALVES, AT HYDROSTATIC CONNECTIONS, AT OUTLET OF INSTRUMENT TAKE-OFF VALVES, AND TO MATCH EQUIPMENT.
05 INTEGRALLY REINFORCED BRANCH CONNECTIONS ARE PERMITTED OUTSIDE THE SIZES SHOWN IN THE BRANCH CONNECTION TABLE. DESIGNER SHALL CHECK WELD THICKNESS OF INTEGRALLY REINFORCED CONNECTIONS TO DETERMINE IF PWHT IS REQUIRED.
06 THESE VALVES SHALL BE USED FOR VENT, DRAIN AND INSTRUMENT CONNECTIONS ONLY.
15 TO BE USED WHEN MATING TO FLANGED NOZZLES.
26 TO BE USED ONLY WHEN INDICATED ON THE P&ID.
61 INSTALL IN HORIZONTAL POSITION WITH COVER UP.
62 INSTALL IN HORIZONTAL POSITION WITH COVER UP OR IN VERTICAL POSITION WITH UPWARD FLOW.
300 FOR PIPING SYSTEM MAWP LOWER THAN PIPE CLASS MAX. PRESSURE, SEE FIG. 323.2.2B IN ASME B31.3 FOR REDUCTION IN MINIMUM DESIGN METAL TEMPERATURE.
301 FOR USE IN VOC REGULATED SERVICES; IN FLANGES WITH SLIGHTLY DAMAGED GASKET SEATING FACES; OR IN FLANGES WITH A HISTORY OF LEAKING.
307 LIMITED TO THROTTLING SERVICES UP TO 150 PSI DIFFERENTIAL PRESSURE. FOR SERVICE APPLICATIONS WITH DIFFERENTIAL PRESSURES GREATER THAN 150 PSI, CONSULT WITH THE VALVE MANUFACTURER AND CHEVRON PIPING & VALVE SME FOR SUITABILITY.
310 ASME A193/SA193 GR. B7 STUD BOLTING IS LIMITED TO PROCESS SERVICE TEMPERATURES NOT GREATER THAN 700°F TO AVOID THERMAL FATIGUE CRACKING.
311 ASME A193/SA193 GR. B16 STUD BOLTING SHOULD BE USED IN ALL PROCESS SERVICES WITH TEMPERATURES GREATER THAN 700°F. FLANGES SHOULD NOT BE INSULATED AT PROCESS SERVICE TEMPERATURES ABOVE 850°F TO AVOID THERMAL FATIGUE CRACKING. AT TEMPERATURES GREATER THAN 850°F, WEATHER SHIELDS OVER FLANGES ARE ACCEPTABLE.
325 USE FULL PORT VALVES IN LOCATIONS REQUIRING FULL OPENINGS SUCH AS UPSTREAM AND DOWNSTREAM OF RELIEF VALVES OR IN HORIZONTAL LINES CONTAINING HAZARDOUS LIQUIDS.
327 LIMITED TO PROCESS TEMPERATURES UP TO 250°F (121°C)
328 SIZING AND LOCATION OF CHECK VALVES IS CRITICAL FOR RELIABLE OPERATION. SEE SECTION 6.0 (25) IN THE GENERAL SPECIFICATION FOR MORE INFORMATION.
17 USE WELD NECK FLANGES AND THROAT TAPS NPS 20" AND LARGER.
67 USE RESTRICTED TO ORIFICE FLANGE TAP CONNECTIONS. THREADED NIPPLES TO BE SEAL WELDED. NIPPLE LENGTHS SHALL BE IN ACCORDANCE WITH STANDARD DRAWING D-601407.
92 USE RESTRICTEDTO THERMOWELL ASSEMBLY.
94 USE RESTRICTED TO DRAINS, OPERATIONAL VENTS, AND INSTRUMENT CONNECTIONS.
101 TO BE USED WHERE TIGHT SHUT-OFF IS REQUIRED.
104 ORBIT VALVES WITH TYPE "H" SEATS ARE LIMITED TO 500 F.
161 USE BELLOW SEAL GATE VALVES FOR ALL IN-KIND PEPLACEMENT ONLY. INSTALL NEW BELLOW SEAL VALVES WHEN REQUIRED BY PROJECT FOR PERMIT PURPOSES.

SERVICES:

- Hydrocarbon Liquid, Gas and Vapor
- Hydrocarbon Liquid, Gas and Vapor w/ Trace H2S
- LPG and LPG/HC
- LPG and LPG/HC w/ Trace H2S
- Fuel Gas, Fuel Oil, Natural Gas
- Hydrogen (to 450°F Maximum)
- Aqueous Ammonia
- Nitrogen, Process Air, and Process Water

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PIPING CLASSIFICATION - AB0

Size Inch	Item No.	Description	Note Nos.
		PIPE	
3/4 - 1-1/2	L11NA1B	PIPE SMLS XS CS(A106-B) PE	
2 - 2	L11NA2A	PIPE SMLS XS CS(A53-B) BFW	
3 - 24	L11MA2A	PIPE SMLS STD WT CS(A53-B) BFW	
		FITTINGS	
1/2 - 1/2	L370ABW	PLUG CS(A105) SCRD	67
3/4 - 1-1/2	L30SBDA	ELBOW CL3000 CS(A105) SW 45-DEG	
	L30SBDB	ELBOW CL3000 CS(A105) SW 90-DEG	
	L34SBDH	CPLG CL3000 CS(A105) SW	
	L35PBMQ	SWGE NIPPLE XXS CS(A234-WPB) BLE-TSE CONC	96
	L370ABW	PLUG CS(A105) SCRD	90,94
	L370AEW	PLUG CS(A105) PE	
	L378BDX	CAP CL3000 CS(A105) SW	
	L55NA1VA	SWGE NIPPLE XS CS(A234-WPB) BE CONC	
2 - 2	L50NA1AC	ELBOW XS CS(A234-WPB) BW 45-DEG	
	L50NA1BC	ELBOW XS CS(A234-WPB) BW 90-DEG LR	
	L55NA1DA	REDUCER XS CS(A234-WPB) BW CONC	
	L55NA1DB	REDUCER XS CS(A234-WPB) BW ECC	
	L57NA1R	CAP XS CS(A234-WPB) BW	
3 - 24	L50MA1AC	ELBOW STD WT CS(A234-WPB) BW 45-DEG	
	L50MA1BC	ELBOW STD WT CS(A234-WPB) BW 90-DEG LR	
	L55MA1DA	REDUCER STD WT CS(A234-WPB) BW CONC	
	L55MA1DB	REDUCER STD WT CS(A234-WPB) BW ECC	
	L57MA1R	CAP STD WT CS(A234-WPB) BW	
		BRANCHES	
1/2 - 1/2	L31VBA	TEE CL6000 CS(A105) SCRD	67
3/4 - 1-1/2	L31SBA	TEE CL3000 CS(A105) SCRD	153
	L31SBD	TEE CL3000 CS(A105) SW	
	L31SBDD	TEE CL3000 CS(A105) SW REDUCING	
	L36SBAT	THREDOLET CL3000 CS(A105) SCRD	90
	L36SBDT	SOCKOLET CL3000 CS(A105) SW	
	L36SBDU	ELBOLET 3000 LB CS(A105) SW	
1-1/2 - 1-1/2	L56NA1B	WELDOLET XS CS(A105) BW	92
	L56NA1J	ELBOLET XS CS(A105) BW	92
	L56NA1K	LATROLET XS CS(A105) BW	92
2 - 2	L51NA1	TEE XS CS(A234-WPB) BW STRT	
	L51NA1D	TEE XS CS(A234-WPB) BW REDUCING	3
	L56NA1H	WELDOLET XS CS(A105) BW	
3 - 8	L56MA1H	WELDOLET STD WT CS(A105) BW	
3 - 20	L51MA1D	TEE STD WT CS(A234-WPB) BW REDUCING	3
3 - 24	L51MA1	TEE STD WT CS(A234-WPB) BW STRT	
		FLANGES	
3/4 - 1-1/2	L40BA3BN	FLANGE CL150 RF CS(A105) SW XS	
3/4 - 24	L43BA3	BLIND FLG CL150 RF CS(A105)	
1 - 2	L42FA3DNL	ORIF FLGS CL300 RF CS(A105) WN XS	
1-1/2 - 1-1/2	L40BA3DN	FLANGE CL150 RF CS(A105) WN XS	92
	L47BA1	LAP JOINT FLANGE CL150 CS(A105)	92
2 - 2	L40BA3DN	FLANGE CL150 RF CS(A105) WN XS	
3 - 18	L42FA3DML	ORIF FLGS CL300 RF CS(A105) WN STD WT	17
3 - 24	L40BA3DM	FLANGE CL150 RF CS(A105) WN STD WT	104
		MISCELLANEOUS	
3/4 - 12	L45BA3E	BLIND CL150 RF CS(A516-70) SPECTACLE	
14 - 24	L45BA3FZ	BLIND CL150 RF CS(A516-70) SPACER RING	
	L45BA3GZ	BLIND CL150 RF CS(A516-70) PLATE	

Size Inch	Item No.	Description	Note Nos.
		NIPPLES	
1/2 - 1/2	L34LAHJ	NIPPLE SMLS 160 CS(A106-B) TOE-POE	67
3/4 - 1-1/2	L34NAEJ	NIPPLE SMLS XS CS(A106-B) PE	
		BLOCK VALVES	
3/4 - 1-1/2	L20KA1HD	GATE CL800 SW CS(A105)API TR#8 13CR/HF BB RP	
	L25JA0CM	BALL CL600 SCRD CS (A105) 13CR/TFE RP FS WO	102
2 - 6	L20BA3CD	GATE CL150 RF CS(A216-WCB)API TR#8 13CR/HF BB FP	
	L24BA3GB	PLUG CL150 RF CS(A216-WCB)TFE SHRT DYN WO	102,127
8 - 10	L20BA3CD	GATE CL150 RF CS(A216-WCB)API TR#8 13CR/HF BB FP	
8 - 12	L24BA3GBM	PLUG CL150 RF CS(A216-WCB)TFE SHRT DYN GO	102,127
12 - 24	L20BA3CDF	GATE CL150 RF CS(A216-WCB)API TR#8 13CR/HF BB FP GO	
		THROTTLE VALVES	
3/4 - 1-1/2	L21KA1DE	GLOBE CL800 SW CS(A105)API TR#8 13CR/HF BB	21
2 - 8	L21BA3DE	GLOBE CL150 RF CS(A216-WCB)API TR#8 13CR/HF BB	21
		CHECK VALVES	
3/4 - 1-1/2	L22KA1TEF	CHECK CL800 SW CS(A105)API TR#8 13CR/HF BC PISTON HORZ	
2 - 24	L22BA3PE	CHECK CL150 RF CS(A216-WCB)API TR#8 13CR/HF BC SWING	
		OTHER VALVES	
1/2 - 1/2	L20KAXHDM	GATE CL800 MSW/FSW CS(A105) API TR#8 RP BB EXTD BODY	67
3/4 - 1-1/2	L20KA1MD	GATE CL800 SW CS(A105)API TR#8 13CR/HF WB RP	121
	L20KAYHDM	GATE CL800 MSW/FNPT CS(A105)API TR#8 RP BB EXTD BODY	94
	L20KAYMDM	GATE CL800 MSW/FNPT CS(A105)API TR#8 RP WB EXTD BODY	94,121
	L20KD0MDL	GATE CL800 SCRD CS(A105)APITR#8 13CR/HF WB BELLOW SEAL	161
	L20KD1MDL	GATE CL800 SW CS(A105N)API TR#8 13CR/HF WB BELLOW SEAL	161
	L21KA1JE	GLOBE CL800 SW CS(A105)API TR#8 13CR/HF WB	21,121
	L21KD0JEL	GLOBE CL800 SCRD CS(A105)API TR#8 WB BELLOW SEAL	21,161
	L21KD1JEL	GLOBE CL800 SW CS(A105N)API TR#8 WB BELLOW SEAL	21,161
	L23JA1DE	ANGLE CL600 SW CS(A105) API TR#8 13CR/HF BB	
2 - 12	L25BB3FF	BALL CL150 RF CS(A216-WCB)T7 MOD H SEAT RF ORBIT	101
		BOLTS AND GASKETS	
3/4 - 24	L61BF1ZA	GASKET CL150 RF 304L/APX-2 GRAPHITE KAM STYLE	
	L61FF1ZA	GASKET CL300 RF 304L/APX-2 GRAPHITE KAM STYLE	104
	L620BM	STUD BOLT ASTM A193 B7 W/2 ASTM A194 2H NUTS	
	L620BQ	CAP SCREW A193 B-7	127

Piping Item Notes:

3 BRANCH SIZE WALL THICKNESS ARE SHOWN FOR REDUCING TEES AND WELDOLETS. RUN SIZE WALL THICKNESS SHALL BE IN ACCORDANCE WITH THIS PIPE CLASS.

17 USE WELD NECK FLANGES AND THROAT TAPS NPS 20 AND LARGER.

21 LIMITED TO THROTTLING SERVICES UP TO 150 PSI DIFFERENTIAL. FOR SERVICES WITH DIFFERENTIAL PRESSURES GREATER THAN 150 PSI, USE THE SIZING EQUATIONS IN ANSI/ISA-75.01.01 FOR DETERMINING SIZE AND STYLE AND REVIEW WITH CHEVRON CONTROL VALVE SME.

67 USE RESTRICTED TO ORIFICE FLANGE TAP CONNECTIONS. THREADED NIPPLES TO BE SEAL WELDED. NIPPLE LENGTHS SHALL BE IN ACCORDANCE WITH STANDARD DRAWING D-601407.

90 USE RESTRICTED TO HYDROSTATIC VENTS AND DRAINS. PLUG MUST BE SEAL WELDED.

92 USE RESTRICTED TO THERMOWELL ASSEMBLY ONLY.

94 USE RESTRICTED TO DRAINS, OPERATIONAL VENTS, AND INSTRUMENT CONNECTIONS.

96 THREADED CONNECTIONS ARE PERMITTED ONLY AT OUTLET OF VENT AND DRAIN VALVES, AT HYDRO CONNECTIONS, AT OUTLET OF INSTRUMENT TAKE-OFF VALVES, AND TO MATCH EQUIPMENT.

101 TO BE USED WHERE TIGHT SHUT-OFF IS REQUIRED.

102 FOR USE IN FUEL GAS SERVICE.

104 USE CLASS 300 FLANGES WHEN MATING TO CONTROL VALVES AND EQUIPMENT.

121 USE RESTRICTED TO WHERE BONNET GASKET LEAKAGE IS KNOWN TO BE A PROBLEM.

127 CAP SCREWS MAY BE REQUIRED IN CERTAIN VALVE DESIGNS AND SIZES.

153 USE RESTRICTED TO NON-VALVED HYDROSTATIC VENTS. COMPLETE SEAL WELDING IS REQUIRED AND SHALL COVER ALL EXPOSED THREADS (SEE STD DWG. GD-L1057).

161 USE BELLOW SEAL GATE VALVES FOR ALL IN-KIND REPLACEMENT ONLY. INSTALL NEW BELLOW SEAL VALVES WHEN REQUIRED BY PROJECT FOR PERMIT PURPOSES.

Temp-PressLimits

Temp Deg F	PSIG Max	H2PART Maximum	Vacuum
-20/100	285		FULL
200	260		FULL
300	230		FULL
400	200		FULL
450	185		FULL

EXCEPTIONS NONE
LIMITED BY FLANGES

Services

GENERAL SERVICES
CONDENSATE AND BOILER FEED WATER
COOLING WATER
FUEL GAS, FUEL OIL
HYDROCARBON LIQUID, GAS AND VAPOR (NOT LPG)
CAUSTIC (5% TO 30% AND LESS THAN 140F)
NITROGEN
PROCESS AIR AND WATER, STEAM (TO 185 PSIG)

Notes:

CHEVRON PRODUCTS COMPANY - REFINERY DEPARTMENT
RICHMOND REFINERY
PIPING CLASSIFICATION - AB0

FLANGE TYPE	150 RF	**VALVE TRIM**	API TR#8 (13CR/HF)
BRANCH TABLE	TABLE 1	**CORR ALLOW**	1/16"
CHG DIRECT	TABLE 1	**DESIGN CODE**	ASME B31.3
TEMP CONN	FLANGED	**RADIOGRAPHY**	5% RANDOM BUTT WELDS
SEAL WELDING	LIMITED (SEE GEN NOTES)	**STRESS RELIEF**	NONE
PIPE MATERIAL		**MAX HYDROTEST**	

Revision Date 5/2/07 Created on 10/14/2010 31:27AM

PIPING CLASSIFICATION - AB1

Size Inch	Item No.	Description	Note Nos.
		PIPE	
3/4 - 1-1/2	L11NA1B	PIPE SMLS XS CS(A106-B) PE	
2 - 2	L11NA2A	PIPE SMLS XS CS(A53-B) BFW	
3 - 24	L11MA2A	PIPE SMLS STD WT CS(A53-B) BFW	
28 - 30	L14MA2A	PIPE SMLS/DSAW STD WT CS(API-5L)BFW	202
		FITTINGS	
1/2 - 1/2	L370ABW	PLUG CS(A105) SCRD	67
3/4 - 1-1/2	L30SBDA	ELBOW CL3000 CS(A105) SW 45-DEG	
	L30SBDB	ELBOW CL3000 CS(A105) SW 90-DEG	
	L34SBDH	CPLG CL3000 CS(A105) SW	
	L35PBMQ	SWGE NIPPLE XXS CS(A234-WPB) BLE-TSE CONC	96
	L370ABW	PLUG CS(A105) SCRD	90,94
	L370AEW	PLUG CS(A105) PE	
	L37SBDX	CAP CL3000 CS(A105) SW	
	L55NA1VA	SWGE NIPPLE XS CS(A234-WPB) BE CONC	
2 - 2	L50NA1AC	ELBOW XS CS(A234-WPB) BW 45-DEG	
	L50NA1BC	ELBOW XS CS(A234-WPB) BW 90-DEG LR	
	L55NA1DA	REDUCER XS CS(A234-WPB) BW CONC	
	L55NA1DB	REDUCER XS CS(A234-WPB) BW ECC	
	L57NA1R	CAP XS CS(A234-WPB) BW	
3 - 30	L50MA1AC	ELBOW STD WT CS(A234-WPB) BW 45-DEG	
	L50MA1BC	ELBOW STD WT CS(A234-WPB) BW 90-DEG LR	
	L55MA1DA	REDUCER STD WT CS(A234-WPB) BW CONC	
	L55MA1DB	REDUCER STD WT CS(A234-WPB) BW ECC	
	L57MA1R	CAP STD WT CS(A234-WPB) BW	
		BRANCHES	
1/2 - 1/2	L31VBA	TEE CL6000 CS(A105) SCRD	67
3/4 - 3/4	L36SBAT	THREDOLET CL3000 CS(A105) SCRD	90
3/4 - 1-1/2	L31SBA	TEE CL3000 CS(A105) SCRD	153
	L31SBD	TEE CL3000 CS(A105) SW	
	L31SBDD	TEE CL3000 CS(A105) SW REDUCING	
	L36SBDT	SOCKOLET CL3000 CS(A105) SW	
	L36SBDU	ELBOLET 3000 LB CS(A105) SW	
1-1/2 - 1-1/2	L56GA1H	WELDOLET SCH 80 CS(A105) BW	92
	L56GA1J	ELBOLET SCH 80 CS(A105) BW	92
	L56GA1K	LATROLET SCH 80 CS(A105) BW	92
2 - 2	L51NA1	TEE XS CS(A234-WPB) BW STRT	
	L51NA1D	TEE XS CS(A234-WPB) BW REDUCING	3
	L56NA1H	WELDOLET XS CS(A105) BW	
3 - 8	L56MA1H	WELDOLET STD WT CS(A105) BW	
3 - 28	L51MA1D	TEE STD WT CS(A234-WPB) BW REDUCING	3
3 - 30	L51MA1	TEE STD WT CS(A234-WPB) BW STRT	
		FLANGES	
3/4 - 1-1/2	L40BA3BN	FLANGE CL150 RF CS(A105) SW XS	
3/4 - 24	L43BA3	BLIND FLG CL150 RF CS(A105)	
1 - 2	L42FA3DNL	ORIF FLGS CL300 RF CS(A105) WN XS	
1-1/2 - 1-1/2	L40BA3DN	FLANGE CL150 RF CS(A105) WN XS	92
	L47BA1	LAP JOINT FLANGE CL150 CS(A105)	92
2 - 2	L40BA3DN	FLANGE CL150 RF CS(A105) WN XS	
	L40FA3DN	FLANGE CL300 RF CS(A105) WN XS	32,104
3 - 18	L42FA3DML	ORIF FLGS CL300 RF CS(A105) WN STD WT	17
3 - 24	L40BA3DM	FLANGE CL150 RF CS(A105) WN STD WT	
	L40FA3DM	FLANGE CL300 RF CS(A105) WN STD WT	32,104
28 - 30	L48BA3DM2	FLANGE CL150 RF CS(A105)WN STD B16.47 "B"	203
		MISCELLANEOUS	
3/4 - 12	L45BA3E	BLIND CL150 RF CS(A516-70) SPECTACLE	
14 - 12	L45BA3FZ	BLIND CL150 RF CS(A516-70) SPACER RING	
	L45BA3GZ	BLIND CL150 RF CS(A516-70) PLATE	

Size Inch	Item No.	Description	Note Nos.
		NIPPLES	
1/2 - 1/2	L34LAHJ	NIPPLE SMLS 160 CS(A106-B) TOE-POE	67
3/4 - 1-1/2	L34NAEJ	NIPPLE SMLS XS CS(A106-B) PE	
		BLOCK VALVES	
3/4 - 1-1/2	L20KA1HD	GATE CL800 SW CS(A105)API TR#8 13CR/HF BB RP	
2 - 10	L20BA3CD	GATE CL150 RF CS(A216-WCB)API TR#8 13CR/HF BB FP	
12 - 24	L20BA3CDF	GATE CL150 RF CS(A216-WCB)API TR#8 13CR/HF BB FP GO	
		THROTTLE VALVES	
3/4 - 1-1/2	L21KA1DE	GLOBE CL800 SW CS(A105)API TR#8 13CR/HF BB	21
2 - 8	L21BA3DE	GLOBE CL150 RF CS(A216-WCB)API TR#8 13CR/HF BB	21
		CHECK VALVES	
3/4 - 1-1/2	L22KA1REF	CHECK CL800 SW CS(A105)API TR#8 13CR/HF BC LIFT HORIZ	
2 - 24	L22BA3PE	CHECK CL150 RF CS(A216-WCB)API TR#8 13CR/HF BC SWING	
		OTHER VALVES	
1/2 - 1/2	L20KAXHDM	GATE CL800 MSW/FSW CS(A105) API TR#8 RP BB EXTD BODY	67
3/4 - 1-1/2	L20BA3HD	GATE CL150 RF CS(A216-WCB)API TR#8 13CR/HF BB RP	15
	L20KA1LD	GATE CL800 SW CS(A105)API TR#8 13CR/HF BB FP GRSE SL	120
	L20KAYHDM	GATE CL800 MSW/FNPT CS(A105)API TR#8 RP BB EXTD BODY	94
	L20KD1MDL	GATE CL800 SW CS(A105N)API TR#8 13CR/HF WB BELLOW SEAL	161
	L20KD7MDL	GATE CL800 SW/SCRD CS(A105N)API TR#8 WB BELLOW SEAL	161
	L21KD1JEL	GLOBE CL800 SW CS(A105N)API TR#8 WB BELLOW SEAL	21,161
2 - 12	L25BB3FF	BALL CL150 RF CS(A216-WCB)T7 MOD H SEAT RP ORBIT	101
		BOLTS AND GASKETS	
3/4 - 24	L61BF1ZA	GASKET CL150 RF 304L/APX-2 GRAPHITE KAM STYLE	
	L61FF1ZA	GASKET CL300 RF 304L/APX-2 GRAPHITE KAM STYLE	104
	L620BM	STUD BOLT ASTM A193 B7 W/2 ASTM A194 2H NUTS	
28 - 30	L61BF1ZAZ	GASKET CL150 RF 304L/APX-2 GRAPHITE KAM STYLE B16.47-B	

Piping Item Notes:

3 BRANCH SIZE WALL THICKNESS ARE SHOWN FOR REDUCING TEES AND WELDOLETS. RUN SIZE WALL THICKNESS SHALL BE IN ACCORDANCE WITH THIS PIPE CLASS.
15 TO BE USED WHEN MATING TO FLANGED NOZZLES.
17 USE WELD NECK FLANGES AND THROAT TAPS NPS 20 AND LARGER.
21 LIMITED TO THROTTLING SERVICES UP TO 150 PSI DIFFERENTIAL. FOR SERVICES WITH DIFFERENTIAL PRESSURES GREATER THAN 150 PSI, USE THE SIZING EQUATIONS IN ANSI/ISA-75.01.01 FOR DETERMINING SIZE AND STYLE AND REVIEW WITH CHEVRON CONTROL VALVE SME.
32 USE CLASS 300 RF FLANGES UP TO & INCLUDING FIRST BLOCK VALVE ON LIQUID LINES OFF LPG COLUMNS & VESSELS.
67 USE RESTRICTED TO ORIFICE FLANGE TAP CONNECTIONS, THREADED NIPPLES TO BE SEAL WELDED. NIPPLE LENGTHS SHALL BE IN ACCORDANCE WITH STANDARD DRAWING D-601407.
90 USE RESTRICTED TO HYDROSTATIC VENTS AND DRAINS. PLUG MUST BE SEAL WELDED.
92 USE RESTRICTED TO THERMOWELL ASSEMBLY ONLY;
94 USE RESTRICTED TO DRAINS, OPERATIONAL VENTS, AND INSTRUMENT CONNECTIONS.
96 THREADED CONNECTIONS ARE PERMITTED ONLY AT OUTLET OF VENT AND DRAIN VALVES, AT HYDRO CONNECTIONS, AT OUTLET OF INSTRUMENT TAKE-OFF VALVES, AND TO MATCH EQUIPMENT.
101 TO BE USED WHERE TIGHT SHUT-OFF IS REQUIRED.
104 USE CLASS 300 FLANGES WHEN MATING TO CONTROL VALVES AND EQUIPMENT.
120 USE ONLY IN DESIGNATED AREAS WHERE ODORS FROM STEM LEAKAGE WOULD BE INTOLERABLE AND IN RI-601 CAT 1, 2, 3 & 4 SERVICES IF VOC CERTIFIED STANDARD VALVES ARE NOT AVAILABLE.
153 USE RESTRICTED TO NON-VALVED HYDROSTATIC VENTS. COMPLETE SEAL WELDING IS REQUIRED AND SHALL COVER ALL EXPOSED THREADS (SEE STD DWG. GD-L1057).
161 USE BELLOW SEAL GATE VALVES FOR ALL IN-KIND REPLACEMENT ONLY. INSTALL NEW BELLOW SEAL VALVES WHEN REQUIRED BY PROJECT FOR PERMIT PURPOSES.
~~203 ERW PIPE IS NOT ACCEPTABLE.~~
203 FLANGES AND GASKETS SHALL CONFORM TO ASME B16.47 SERIES B.

Temp-PressLimits	Temp Deg F	PSIG Max	H2PART Maximum	Vacuum
	-20/100	285		FULL
	200	260		FULL
	300	230		FULL
	400	200		FULL
	450	185		FULL

EXCEPTIONS NONE
LIMITED BY FLANGES

Service:

NON-CRS SVC W/H2S (RI 601, CAT 2,3 &4)
HYDROCARBON MIXTURES WITH MODERATE H2S
INERT GAS
LPG AND LPG/HC WITH MODERATE H2S
NON-CORROSIVE SERVICES (RI 601 CATEGORIES 2, 3, & 4)
HYDROGEN
PRIMARY WASH & RE-PULP FILTRATE
PRIMARY WAX MIX
SOLVENT, WAXY OIL

Notes:

~~CHEVRON PRODUCTS COMPANY - REFINERY DEPARTMENT~~
RICHMOND REFINERY
PIPING CLASSIFICATION - AB1

FLANGE TYPE	150 RF	VALVE TRIM	~~AISI TR#8 (13CR/HF)~~
BRANCH TABLE	TABLE 1	CORR ALLOW	1/16"
CHG DIRECT	TABLE 1	DESIGN CODE	ASME B31.3
TEMP CONN	FLANGED	RADIOGRAPHY	5% RANDOM BUTT WELDS
SEAL WELDING	COMPLETE (SEE GEN NOTES)	STRESS RELIEF	NONE
PIPE MATERIAL		MAX HYDROTEST	

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