



Foster Wheeler USA Corporation

Contract N.: 1310087902

Client: Valero Refining Company - Texas

Location: Texas City, Texas

Project: Valero Refinery Reconfiguration (TCRR)

Piping Material Specification			
Spec. No. : 10087902-SP-50-03			
Class : BA9C			
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VALERO	3	03 Jun 02	1
Compared with:	2	28 Feb 02	

Appr. by: L.SMITH

Issued for : E
Issued by: T.WILLIAMSON

Checked by: T.WILLIAMSON

Service: SOUR PROCESS FLUIDS, (PWHT REQUIRED FOR > 3/4" WALL) (FOR BRANCH CONNECTIONS SEE ATTACHMENT "A")			
Gaskets : SPIRAL WOUND GRAPHITE / S.S.304	Rating/Facing : CL300 RF	Corrosion : 0.250" (6.3MM) See Note 7	Facing Finish : ASME B16.5
		Block Valve Trim : API TRIM No. 10	Weld Quality Insp : PER JOB SPEC -52A1
			Stress Relief : NO (See Note 8 & 9)
Materials : CARBON STEEL PIPING & VALVES (SEE GENERAL NOTES 1 THRU 28)		Temp/Press Limits : 420 PSIG AT 100F ; 420 PSIG AT 400F (420 PSIG MAX.) (See Note 10 & 11)	

Item Name	Range		Det	Rev
Unique/Client* Code	from	to		
GATE VALVE 512GF0016	1/2"	2"	GAT	
Body Mat'l : ASTM A105 Codes : API 602 Body constr. : BOLTED BONNET Rating : 1500# Ends : S.W. Trim constr. : PLAIN SOLID WEDGE, O.S.& Y. Trim Mat'l : API TRIM N.10 (SS.316 TRIM) Bolt Mat'l : PER API STANDARD 602. Packing : GRAPHITE PACKING . Note : GENERAL NOTES FOR VALVES: SEE JOB SPEC 59B9 Operator : HANDWHEEL				
GATE VALVE 511GB0003	3"	24"	GAT	
Body Mat'l : ASTM A216 GR.WCB Codes : API 600 Body constr. : BOLTED BONNET Rating : 300# Ends : RF Face finish : ASME B16.5 Trim constr. : PLAIN OR FLEXIBLE SOLID WEDGE, O.S.& Y. Trim Mat'l : API TRIM N.10 (SS.316 TRIM) Bolt Mat'l : PER API STANDARD 600. Gasket Mat'l : PER API STANDARD 600. Packing : GRAPHITE PACKING . Note : GENERAL NOTES FOR VALVES: SEE JOB SPEC 59B9 Operator : HANDWHEEL				

* Client codes only, not including sizes

Continue....



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GATE VALVE N **14" 24"** **GATN**
 511GB0004

Body Mat'l : ASTM A216 GR.WCB
 Codes : API 600
 Body constr. : BOLTED BONNET
Rating : 300#
Ends : RF
 Face finish : ASME B16.5
 Trim constr. : PLAIN OR FLEXIBLE SOLID WEDGE, O.S. & Y.
 Trim Mat'l : API TRIM N.10 (SS.316 TRIM)
 Bolt Mat'l : PER API STANDARD 600.
 Gasket Mat'l : PER API STANDARD 600.
 Packing : GRAPHITE PACKING .
 Note : GENERAL NOTES FOR VALVES: SEE JOB SPEC 59B9
 Operator : GEAR OP (N) PINION SHAFT AT RIGHT ANGLE TO RUN OF VALVE.

GATE V.FP **1/2" 2"** **GAFP**
 512GB0004

Body Mat'l : ASTM A105
 Codes : API 602
 Body constr. : BOLTED BONNET, FULL PORT.
Rating : 300#
Ends : RF
 Face finish : ASME B16.5
 Trim constr. : PLAIN SOLID WEDGE, FULL PORT, O.S. & Y.
 Trim Mat'l : API TRIM N.10 (SS.316 TRIM)
 Bolt Mat'l : PER API STANDARD 602.
 Gasket Mat'l : PER API STANDARD 602.
 Packing : GRAPHITE PACKING .
 Note : GENERAL NOTES FOR VALVES: SEE JOB SPEC 59B9
 Operator : HANDWHEEL

GATE V.FP **1/2" 2"** **GAFPS**
 512GF0017

Body Mat'l : ASTM A105
 Codes : API 602
 Body constr. : BOLTED BONNET, FULL PORT.
Rating : 1500#
Ends : S.W.
 Trim constr. : PLAIN SOLID WEDGE, FULL PORT, O.S. & Y.
 Trim Mat'l : API TRIM N.10 (SS.316 TRIM)
 Bolt Mat'l : PER API STANDARD 602.
 Packing : GRAPHITE PACKING .
 Note : GENERAL NOTES FOR VALVES: SEE JOB SPEC 59B9
 Operator : HANDWHEEL

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DR/VE VALVE 1/2" 2" **GAD**
 512EF007

Body Mat'l : ASTM A105
 Codes : API 602
 Body constr. : EXTENDED BODY, BOLTED BONNET.
Rating : 1500#
Ends : MALE PE x FEMALE NPT
 Trim constr. : PLAIN SOLID WEDGE, O.S.& Y.
 Trim Mat'l : API TRIM N.10 (SS.316 TRIM)
 Bolt Mat'l : PER API STANDARD 602.
 Packing : GRAPHITE PACKING .
 Note : GENERAL NOTES FOR VALVES: SEE JOB SPEC 59B9
 Operator : HANDWHEEL

INSTR. VALVE 1/2" 3/4" **GAI**
 512EF006

Body Mat'l : ASTM A105
 Codes : API 602
 Body constr. : EXTENDED BODY, BOLTED BONNET.
Rating : 1500#
Ends : MALE NPT x FEMALE NPT
 Trim constr. : PLAIN SOLID WEDGE, O.S.& Y.
 Trim Mat'l : API TRIM N.10 (SS.316 TRIM)
 Bolt Mat'l : PER API STANDARD 602.
 Packing : GRAPHITE PACKING .
 Note : GENERAL NOTES FOR VALVES: SEE JOB SPEC 59B9
 Operator : HANDWHEEL

GATE V.SWxTH 1/2" 2" **GATST**
 512GF0018

Body Mat'l : ASTM A105
 Codes : API 602
 Body constr. : BOLTED BONNET
Rating : 1500#
Ends : S.W. x THDD
 Trim constr. : PLAIN SOLID WEDGE, O.S.& Y.
 Trim Mat'l : API TRIM N.10 (SS.316 TRIM)
 Bolt Mat'l : PER API STANDARD 602.
 Packing : GRAPHITE PACKING .
 Note : GENERAL NOTES FOR VALVES: SEE JOB SPEC 59B9
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GATE V. FLG. 1/2" 2" **GAF**
512GB0006

Body Mat'l : ASTM A105
Codes : API 602
Body constr. : BOLTED BONNET
Rating : 300#
Ends : RF
Face finish : ASME B16.5
Trim constr. : PLAIN SOLID WEDGE, O.S. & Y.
Trim Mat'l : API TRIM N.10 (SS.316 TRIM)
Bolt Mat'l : PER API STANDARD 602.
Gasket Mat'l : PER API STANDARD 602.
Packing : GRAPHITE PACKING .
Note : GENERAL NOTES FOR VALVES: SEE JOB SPEC 59B9
Operator : HANDWHEEL

GLOBE VALVE 1/2" 2" **GLO**
512DF0005

Body Mat'l : ASTM A105
Codes : API 602 / ASME B16.34
Body constr. : BOLTED BONNET
Rating : 1500#
Ends : S.W.
Trim constr. : LOOSE DISC, O.S. & Y.
Trim Mat'l : API TRIM N.10 (SS.316 TRIM)
Bolt Mat'l : PER API STANDARD 602.
Packing : GRAPHITE PACKING .
Note : GENERAL NOTES FOR VALVES: SEE JOB SPEC 59B9
Operator : HANDWHEEL

GLOBE VALVE 3" 8" **GLO**
511DB0002

Body Mat'l : ASTM A216 GR.WCB
Codes : API 600 / ASME B16.34
Body constr. : BOLTED BONNET
Rating : 300#
Ends : RF
Face finish : ASME B16.5
Trim constr. : PLUG DISC TYPE, O.S. & Y.
Trim Mat'l : API TRIM N.10 (SS.316 TRIM)
Bolt Mat'l : PER API STANDARD 600.
Gasket Mat'l : PER API STANDARD 600.
Packing : GRAPHITE PACKING .
Note : GENERAL NOTES FOR VALVES: SEE JOB SPEC 59B9
Operator : HANDWHEEL

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CHECK VALVE 1/2" 2"
 512CF0003

CHE

Body Mat'l : ASTM A105
 Codes : API 602 / ASME B16.34
 Body constr. : BOLTED CAP
Rating : 1500#
Ends : S.W.
 Trim constr. : PISTON TYPE,T-BODY,HORIZONTAL INSTALLATION
 Trim Mat'l : API TRIM N.10 (SS.316 TRIM)
 Bolt Mat'l : PER API STANDARD 602.
 Gasket Mat'l : PER API STANDARD 602.
 Note : GENERAL NOTES FOR VALVES: SEE JOB SPEC 59B9

CHECK VALVE 3" 24"
 511CB0002

CHE

Body Mat'l : ASTM A216 GR.WCB
 Codes : API 600 / ASME B16.34
 Body constr. : BOLTED CAP
Rating : 300#
Ends : RF
 Face finish : ASME B16.5
 Trim constr. : SWING TYPE, HORIZONTAL & VERTICAL INSTALLATION
 Trim Mat'l : API TRIM N.10 (SS.316 TRIM)
 Bolt Mat'l : PER API STANDARD 600.
 Gasket Mat'l : PER API STANDARD 600.
 Note : GENERAL NOTES FOR VALVES: SEE JOB SPEC 59B9

BALL VALVE 1/2" 2"
 512BF0003

BAL

Body Mat'l : ASTM A105 OR ASTM A216 GR.WCB.
 Codes : ASME B16.34 / API 607
 Body constr. : REDUCED BORE
Rating : 1500#
Ends : S.W.
 Trim constr. : FLOATING BALL, FIRESAFE DESIGN, ANTISTATIC DEVICE, ANTI-BLOW
 OUT STEM
 Trim Mat'l : SS.316 BALL AND STEM, REINFORCED TFE SEATS
 Bolt Mat'l : PER API STANDARD 608.
 Gasket Mat'l : PER API STANDARD 608.
 Packing : GRAPHITE PACKING .
 Note : GENERAL NOTES FOR VALVES: SEE JOB SPEC 59B9
 Operator : LEVER

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PIPE A/G	1/2"	2"	SCH. XXS	PIP
541SG0004				

Material : KILLED C.S. ASTM A106 GR.B
 Manufact. : SMLS
 Codes : ASME B36.10
 Note : PIPE SHALL COMPLY WITH JOB SPEC 52A2
 Ends : **P.E.**

PIPE A/G	3"	3"	SCH. 160	PIP
541SG0008				

Material : KILLED C.S. ASTM A106 GR.B
 Manufact. : SMLS
 Codes : ASME B36.10
 Note : PIPE SHALL COMPLY WITH JOB SPEC 52A2
 Ends : **B.E.**

PIPE A/G	4"	4"	SCH. 120	PIP
541SG0009				

Material : KILLED C.S. ASTM A106 GR.B
 Manufact. : SMLS
 Codes : ASME B36.10
 Note : PIPE SHALL COMPLY WITH JOB SPEC 52A2
 Ends : **B.E.**

PIPE A/G	6"	18"	SCH. XS	PIP
541SG0010				

Material : KILLED C.S. ASTM A106 GR.B
 Manufact. : SMLS
 Codes : ASME B36.10
 Note : PIPE SHALL COMPLY WITH JOB SPEC 52A2
 Ends : **B.E.**

PIPE A/G	20"	24"	SCH. 40	PIP
541SG0011				

Material : KILLED C.S. ASTM A106 GR.B
 Manufact. : SMLS
 Codes : ASME B36.10
 Note : PIPE SHALL COMPLY WITH JOB SPEC 52A2
 Ends : **B.E.**

PIPE A/G	30"	36"	CALC	PIP
-----------------	------------	------------	-------------	------------

Material : C.S. ASTM A672 GR.C70 CL.12
 Manufact. : E.F.W.
 Codes : ASME B36.10
 Note : PIPE SHALL COMPLY WITH JOB SPEC 52A2
 Ends : **B.E.**

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PIPE A/G 541SGAAA	3"	3"	SCH. 160	PIP8
Material : KILLED C.S. ASTM A106 GR.B Manufact. : SMLS Coating : PAINTING SYSTEM NO. 8, PER VALERO JOB SPEC NO. SP-80-02. Codes : ASME B36.10 Note : PIPE SHALL COMPLY WITH JOB SPEC 52A2 Ends : B.E.				
PIPE A/G 541SGAAA	6"	18"	SCH. XS	PIP8
Material : KILLED C.S. ASTM A106 GR.B Manufact. : SMLS Coating : PAINTING SYSTEM NO. 8, PER VALERO JOB SPEC NO. SP-80-02. Codes : ASME B36.10 Note : PIPE SHALL COMPLY WITH JOB SPEC 52A2 Ends : B.E.				
NIPPLES 551NC0002	1/2"	2"	SCH. XXS	NIP
Material : C.S. ASTM A106 GR.B Codes : ASME B36.10 Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2 Ends : T.O.E.				
FLANGE 561NB0016	1/2"	2"	SCH. XXS	FLG
Type : S.W. Material : ASTM A105 Codes : ASME B16.5 Rating : 300# Ends : RF Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2				
FLANGE 561WB0015	3"	3"	SCH. 160	FLG
Type : W.N. Material : ASTM A105 Codes : ASME B16.5 Rating : 300# Ends : RF Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2				

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FLANGE 4" 4" SCH. 120 **FLG**
561WB0016

Type : W.N.
Material : ASTM A105
Codes : ASME B16.5
Rating : **300#**
Ends : **RF**
Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

FLANGE 6" 18" SCH. XS **FLG**
561WB0017

Type : W.N.
Material : ASTM A105
Codes : ASME B16.5
Rating : **300#**
Ends : **RF**
Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

FLANGE 20" 24" SCH. 40 **FLG**
561WB0018

Type : W.N.
Material : ASTM A105
Codes : ASME B16.5
Rating : **300#**
Ends : **RF**
Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

FLANGE W.N. 30" 36" CALC **FWN7A**

Type : W.N.
Material : ASTM A105
Codes : ASME B16.47 "A" (EX MSS-SP44)
Rating : **300#**
Ends : **RF**
Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

FLANGE W.N. 30" 36" CALC **FWN7B**

Type : W.N.
Material : ASTM A105
Codes : ASME B16.47 "B" (EX API-605)
Rating : **300#**
Ends : **RF**
Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

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FLANGE 561NB0021	1/2"	2"	SCH. XXS	FL1
Type : S.W. Material : ASTM A105 Codes : ASME B16.5 Rating : 600# Ends : RF Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2				
FLANGE 561WB0043	3"	3"	SCH. 160	FL1
Type : W.N. Material : ASTM A105 Codes : ASME B16.5 Rating : 600# Ends : RF Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2				
FLANGE 561WB0045	4"	4"	SCH. 120	FL1
Type : W.N. Material : ASTM A105 Codes : ASME B16.5 Rating : 600# Ends : RF Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2				
FLANGE 561WB0037	6"	18"	SCH. XS	FL1
Type : W.N. Material : ASTM A105 Codes : ASME B16.5 Rating : 600# Ends : RF Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2				
FLANGE 561WB0047	20"	24"	SCH. 40	FL1
Type : W.N. Material : ASTM A105 Codes : ASME B16.5 Rating : 600# Ends : RF Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2				

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FLANGE F.F. 1/2" 2" SCH. XXS FLGFF
561NB0022

Type : S.W.
Material : ASTM A105
Codes : ASME B16.5
Rating : **300#**
Ends : **FF**
Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

FLANGE F.F. 3" 3" SCH. 160 FLGFF
561WB0027

Type : W.N.
Material : ASTM A105
Codes : ASME B16.5
Rating : **300#**
Ends : **FF**
Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

FLANGE F.F. 4" 4" SCH. 120 FLGFF
561WB0028

Type : W.N.
Material : ASTM A105
Codes : ASME B16.5
Rating : **300#**
Ends : **FF**
Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

FLANGE F.F. 6" 18" SCH. XS FLGFF
561WB0029

Type : W.N.
Material : ASTM A105
Codes : ASME B16.5
Rating : **300#**
Ends : **FF**
Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

FLANGE F.F. 20" 24" SCH. 40 FLGFF
561WB0030

Type : W.N.
Material : ASTM A105
Codes : ASME B16.5
Rating : **300#**
Ends : **FF**
Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

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BLIND FLANGE 1/2" 24" **FBL**
561BB0004

Material : ASTM A105
Codes : ASME B16.5
Rating : **300#**
Ends : **RF**
Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

BLIND F.47/A 30" 36" **FBL7A**
561BB0006

Material : ASTM A105
Codes : ASME B16.47 "A" (EX MSS-SP44)
Rating : **300#**
Ends : **RF**
Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

BLIND F.47/B 30" 36" **FBL7B**
561BB0005

Material : ASTM A105
Codes : ASME B16.47 "B" (EX API-605)
Rating : **300#**
Ends : **RF**
Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

ORIFICE FLG 2" 2" **SCH. XXS** **FTR**
561CB0018

Material : ASTM A105
Component : ORIFICE FLANGE SET, WELD NECK TYPE
Codes : ASME B16.36
Rating : **300#**
Ends : **RF**
Hole Tape : N.2 HOLES 180 DEGREES 1/2" S.W.
Note : WITHOUT BOLTS AND GASKETS. FLANGES SHALL COMPLY WITH JOB SPECS 50A2, 52A2, AND 57B12 (JACK SCREWS).

ORIFICE FLG 3" 3" **SCH. 160** **FTR**
561CB0022

Material : ASTM A105
Component : ORIFICE FLANGE SET, WELD NECK TYPE
Codes : ASME B16.36
Rating : **300#**
Ends : **RF**
Hole Tape : N.2 HOLES 180 DEGREES 1/2" S.W.
Note : WITHOUT BOLTS AND GASKETS. FLANGES SHALL COMPLY WITH JOB SPECS 50A2, 52A2, AND 57B12 (JACK SCREWS).

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ORIFICE FLG 4" 4" SCH. 120 FTR
561CB0026

Material : ASTM A105
Component : ORIFICE FLANGE SET, WELD NECK TYPE
Codes : ASME B16.36
Rating : 300#
Ends : RF
Hole Tape : N.2 HOLES 180 DEGREES 1/2" S.W.
Note : WITHOUT BOLTS AND GASKETS. FLANGES SHALL COMPLY WITH JOB SPECS 50A2, 52A2, AND 57B12 (JACK SCREWS).

ORIFICE FLG 6" 16" SCH. XS FTR
561CB0007

Material : ASTM A105
Component : ORIFICE FLANGE SET, WELD NECK TYPE
Codes : ASME B16.36
Rating : 300#
Ends : RF
Hole Tape : N.2 HOLES 180 DEGREES 1/2" S.W.
Note : WITHOUT BOLTS AND GASKETS. FLANGES SHALL COMPLY WITH JOB SPECS 50A2, 52A2, AND 57B12 (JACK SCREWS).

ORIFICE FLG 2" 2" SCH. XXS FTR
561CB0019

Material : ASTM A105
Component : ORIFICE FLANGE SET, WELD NECK TYPE
Codes : ASME B16.36
Rating : 300#
Ends : RF
Hole Tape : N.4 HOLES 90 DEGREES 1/2" S.W.
Note : USE ONLY FOR SPECIAL INSTR. CONNECTIONS. WITHOUT BOLTS AND GASKETS. FLANGES SHALL COMPLY WITH JOB SPECS 50A2, 52A2, AND 57B12 (JACK SCREWS).

ORIFICE FLG 3" 3" SCH. 160 FTR
561CB0023

Material : ASTM A105
Component : ORIFICE FLANGE SET, WELD NECK TYPE
Codes : ASME B16.36
Rating : 300#
Ends : RF
Hole Tape : N.4 HOLES 90 DEGREES 1/2" S.W.
Note : USE ONLY FOR SPECIAL INSTR. CONNECTIONS. WITHOUT BOLTS AND GASKETS. FLANGES SHALL COMPLY WITH JOB SPECS 50A2, 52A2, AND 57B12 (JACK SCREWS).

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ORIFICE FLG 4" 4" **SCH. 120** **FTRI**
561CB0028

Material : ASTM A105
 Component : ORIFICE FLANGE SET, WELD NECK TYPE
 Codes : ASME B16.36
Rating : 300#
Ends : RF
 Hole Tape : N.4 HOLES 90 DEGREES 1/2" S.W.
 Note : USE ONLY FOR SPECIAL INSTR. CONNECTIONS. WITHOUT BOLTS AND GASKETS. FLANGES SHALL COMPLY WITH JOB SPECS 50A2, 52A2, AND 57B12 (JACK SCREWS).

ORIFICE FLG 6" 16" **SCH. 40** **FTRI**
561CB0029

Material : ASTM A105
 Component : ORIFICE FLANGE SET, WELD NECK TYPE
 Codes : ASME B16.36
Rating : 300#
Ends : RF
 Hole Tape : N.4 HOLES 90 DEGREES 1/2" S.W.
 Note : USE ONLY FOR SPECIAL INSTR. CONNECTIONS. WITHOUT BOLTS AND GASKETS. FLANGES SHALL COMPLY WITH JOB SPECS 50A2, 52A2, AND 57B12 (JACK SCREWS).

90 ELBOW 1/2" 2" **90E**
551HB0016

Material : C.S. ASTM A105
 Component : 90 DEGREES ELBOWS
 Codes : ASME B16.11
Rating : 9000#
Ends : S.W.
 Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

90 ELBOW 3" 3" **SCH. 160** **90E**
551EF0021

Material : C.S. ASTM A234 WPB
 Component : 90 DEGREES LONG RADIUS
 Codes : ASME B16.9
 Manufact. : SMLS
Ends : B.W.
 Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

* Client codes only, not including sizes



Contract N.: 1310087902

Client: Valero Refining Company - Texas

Location: Texas City, Texas

Project: Valero Refinery Reconfiguration (TCRR)

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45 ELBOW 551EF0017	3"	3"	SCH. 160	45E
Material : C.S. ASTM A234 WPB Component : 45 DEGREES LONG RADIUS Codes : ASME B16.9 Manufact. : SMLS Ends : B.W. Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2				
45 ELBOW 551EF0018	4"	4"	SCH. 120	45E
Material : C.S. ASTM A234 WPB Component : 45 DEGREES LONG RADIUS Codes : ASME B16.9 Manufact. : SMLS Ends : B.W. Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2				
45 ELBOW 551EF0019	6"	18"	SCH. XS	45E
Material : C.S. ASTM A234 WPB Component : 45 DEGREES LONG RADIUS Codes : ASME B16.9 Manufact. : SMLS Ends : B.W. Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2				
45 ELBOW 551EF0020	20"	24"	SCH. 40	45E
Material : C.S. ASTM A234 WPB Component : 45 DEGREES LONG RADIUS Codes : ASME B16.9 Manufact. : SMLS Ends : B.W. Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2				
45 ELBOW	30"	36"	CALC	45E
Material : C.S. ASTM A234 WPB Component : 45 DEGREES LONG RADIUS Codes : ASME B16.9 Manufact. : WELDED Ends : B.W. Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2				

* Client codes only, not including sizes



Foster Wheeler USA Corporation

Contract N.: 1310087902

Client: Valero Refining Company - Texas

Location: Texas City, Texas

Project: Valero Refinery Reconfiguration (TCRR)

Piping Material Specification			
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CAP 551HB0018	1/2"	2"			CAP
<p>Material : C.S. ASTM A105 Component : CAP Codes : ASME B16.11 Rating : 9000# Ends : S.W. Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2</p>					
CAP 551EF0025	3"	3"	SCH. 160		CAP
<p>Material : C.S. ASTM A234 WPB Component : CAP Codes : ASME B16.9 Manufact. : SMLS Ends : B.W. Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2</p>					
CAP 551EF0026	4"	4"	SCH. 120		CAP
<p>Material : C.S. ASTM A234 WPB Component : CAP Codes : ASME B16.9 Manufact. : SMLS Ends : B.W. Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2</p>					
CAP 551EF0027	6"	18"	SCH. XS		CAP
<p>Material : C.S. ASTM A234 WPB Component : CAP Codes : ASME B16.9 Manufact. : SMLS Ends : B.W. Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2</p>					
CAP 551EF0028	20"	24"	SCH. 40		CAP
<p>Material : C.S. ASTM A234 WPB Component : CAP Codes : ASME B16.9 Manufact. : SMLS Ends : B.W. Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2</p>					

* Client codes only, not including sizes



Contract N.: 1310087902
 Client: Valero Refining Company - Texas
 Location: Texas City, Texas
 Project: Valero Refinery Reconfiguration (TCRR)

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CAP	30"	36"	CALC		CAP
			Material : C.S. ASTM A234 WPB Component : CAP Codes : ASME B16.9 Manufact. : WELDED Ends : B.W. Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2		
PLUG 551HB0004	1/2"	2"			ROU
			Material : C.S. ASTM A105 Component : PLUG ROUND BAR STOCK L=75 MM (3") Codes : ASME B16.11 Ends : SCRD Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2		
PLUG ORI 551HB0005	1/2"	1/2"			ROUO
			Material : C.S. ASTM A105 Component : PLUG ROUND BAR STOCK L=75 MM (3") Codes : ASME B16.11 Ends : P.E. Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2		
CONC. RED. 551RF0011	3"	3"	SCH. 160		CRE
			Material : C.S. ASTM A234 WPB Component : CONCENTRIC REDUCER Codes : ASME B16.9 Manufact. : SMLS Ends : B.W. Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2		
CONC. RED. 551RF0012	4"	4"	SCH. 120		CRE
			Material : C.S. ASTM A234 WPB Component : CONCENTRIC REDUCER Codes : ASME B16.9 Manufact. : SMLS Ends : B.W. Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2		

* Client codes only, not including sizes



Contract N.: 1310087902
Client: Valero Refining Company - Texas
Location: Texas City, Texas
Project: Valero Refinery Reconfiguration (TCRR)

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CONC. RED. 6" 18" **SCH. XS** **CRE**
551RF0013

Material : C.S. ASTM A234 WPB
Component : CONCENTRIC REDUCER
Codes : ASME B16.9
Manufact. : SMLS
Ends : **B.W.**
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

CONC. RED. 20" 24" **SCH. 40** **CRE**
551RF0014

Material : C.S. ASTM A234 WPB
Component : CONCENTRIC REDUCER
Codes : ASME B16.9
Manufact. : SMLS
Ends : **B.W.**
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

CONC. RED. 30" 36" **CALC** **CRE**

Material : C.S. ASTM A234 WPB
Component : CONCENTRIC REDUCER
Codes : ASME B16.9
Manufact. : WELDED
Ends : **B.W.**
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

ECC.RED. 3" 3" **SCH. 160** **ERE**
551RF0015

Material : C.S. ASTM A234 WPB
Component : ECCENTRIC REDUCER
Codes : ASME B16.9
Manufact. : SMLS
Ends : **B.W.**
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

ECC.RED. 4" 4" **SCH. 120** **ERE**
551RF0016

Material : C.S. ASTM A234 WPB
Component : ECCENTRIC REDUCER
Codes : ASME B16.9
Manufact. : SMLS
Ends : **B.W.**
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

* Client codes only, not including sizes



Piping Material Specification Spec. No. : 10087902-SP-50-03 Class : BA9C			
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Contract N.: 1310087902
 Client: Valero Refining Company - Texas
 Location: Texas City, Texas
 Project: Valero Refinery Reconfiguration (TCRR)

ECC.RED. 551RF0017	6"	18"	SCH. XS	ERE
Material : C.S. ASTM A234 WPB Component : ECCENTRIC REDUCER Codes : ASME B16.9 Manufact. : SMLS Ends : B.W. Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2				
ECC.RED. 551RF0018	20"	24"	SCH. 40	ERE
Material : C.S. ASTM A234 WPB Component : ECCENTRIC REDUCER Codes : ASME B16.9 Manufact. : SMLS Ends : B.W. Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2				
ECC.RED.	30"	36"	CALC	ERE
Material : C.S. ASTM A234 WPB Component : ECCENTRIC REDUCER Codes : ASME B16.9 Manufact. : WELDED Ends : B.W. Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2				
TEE 551HB0019	1/2"	2"		TEE
Material : C.S. ASTM A105 Component : TEE Codes : ASME B16.11 Rating : 9000# Ends : S.W. Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2				
TEE 551EF0029	3"	3"	SCH. 160	TEE
Material : C.S. ASTM A234 WPB Component : TEE Codes : ASME B16.9 Manufact. : SMLS Ends : B.W. Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2				

* Client codes only, not including sizes



Foster Wheeler USA Corporation

Contract N.: 1310087902

Client: Valero Refining Company - Texas

Location: Texas City, Texas

Project: Valero Refinery Reconfiguration (TCRR)

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TEE	4"	4"	SCH. 120	TEE
551EF0030				

Material : C.S. ASTM A234 WPB
Component : TEE
Codes : ASME B16.9
Manufact. : SMLS
Ends : **B.W.**
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

TEE	6"	18"	SCH. XS	TEE
551EF0031				

Material : C.S. ASTM A234 WPB
Component : TEE
Codes : ASME B16.9
Manufact. : SMLS
Ends : **B.W.**
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

TEE	20"	24"	SCH. 40	TEE
551EF0032				

Material : C.S. ASTM A234 WPB
Component : TEE
Codes : ASME B16.9
Manufact. : SMLS
Ends : **B.W.**
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

TEE	30"	36"	CALC	TEE
------------	------------	------------	-------------	------------

Material : C.S. ASTM A234 WPB
Component : TEE
Codes : ASME B16.9
Manufact. : WELDED
Ends : **B.W.**
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

RED.TEE	1/2"	2"		TER
551FB0005				

Material : C.S. ASTM A105
Component : REDUCER TEE
Codes : ASME B16.11
Ends : **S.W.**
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2
Rating : **9000#**

* Client codes only, not including sizes



Foster Wheeler USA Corporation

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CONC.SWAGE 1/2" 2" **SCH. XXS** **CSA**
551SC0012

Material : C.S. ASTM A106 GR.B
Component : CONCENTRIC SWAGE
Codes : MANUFACTURED TO ASTM A234
Manufact. : SMLS
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2
Ends : **P.E.**

CONC.SWAGE 1/2" 4" **SCH. XXS** **CSC**
551SC0013

Material : C.S. ASTM A106 GR.B
Component : CONCENTRIC SWAGE
Codes : MANUFACTURED TO ASTM A234
Manufact. : SMLS
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2
Ends : **LEB-SEP**

ECC.SWAGE 1/2" 2" **SCH. XXS** **ESA**
551SC0032

Material : C.S. ASTM A106 GR.B
Component : ECCENTRIC SWAGE
Codes : MANUFACTURED TO ASTM A234
Manufact. : SMLS
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2
Ends : **P.E.**

ECC.SWAGE 1/2" 4" **SCH. XXS** **ESC**
551SC0015

Material : C.S. ASTM A106 GR.B
Component : ECCENTRIC SWAGE
Codes : MANUFACTURED TO ASTM A234
Manufact. : SMLS
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2
Ends : **LEB-SEP**

ELBOLET BW 3" 3" **SCH. 160** **ELBBW**
551WB0005

Material : C.S. ASTM A105
Component : ELBOLET
Codes : MSS SP97
Ends : **B.W.**
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

* Client codes only, not including sizes



Foster Wheeler USA Corporation

Contract N.: 1310087902

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Project: Valero Refinery Reconfiguration (TCRR)

Piping Material Specification			
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ELBOLET BW 4" 4" **SCH. 120** **ELBBW**
551WB0006

Material : C.S. ASTM A105
Component : ELBOLET
Codes : MSS SP97
Ends : **B.W.**
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

ELBOLET BW 6" 8" **SCH. XS** **ELBBW**
551WB0007

Material : C.S. ASTM A105
Component : ELBOLET
Codes : MSS SP97
Ends : **B.W.**
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

ELBOLET SW 1/2" 36" **ELBS**
551LB0013

Material : C.S. ASTM A105
Component : ELBOLET
Codes : MSS SP97
Ends : **S.W.**
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2
Rating : **9000#**

SOCKOLET 1/2" 36" **SOL**
551LB0014

Material : C.S. ASTM A105
Component : SOCKOLET
Codes : MSS SP97
Ends : **S.W.**
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2
Rating : **9000#**

WELDOLET 3" 3" **SCH. 160** **WOL**
551WB0011

Material : C.S. ASTM A105
Component : WELDOLET
Codes : MSS SP97
Ends : **B.W.**
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

* Client codes only, not including sizes



Contract N.: 1310087902
Client: Valero Refining Company - Texas
Location: Texas City, Texas
Project: Valero Refinery Reconfiguration (TCRR)

Piping Material Specification			
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WELDOLET 4" 4" **SCH. 120** **WOL**
551WB0012

Material : C.S. ASTM A105
Component : WELDOLET
Codes : MSS SP97
Ends : **B.W.**
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

WELDOLET 6" 18" **SCH. XS** **WOL**
551WB0013

Material : C.S. ASTM A105
Component : WELDOLET
Codes : MSS SP97
Ends : **B.W.**
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

WELDOLET 20" 24" **SCH. 40** **WOL**
551WB0014

Material : C.S. ASTM A105
Component : WELDOLET
Codes : MSS SP97
Ends : **B.W.**
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

LATROLET BW 3" 3" **SCH. 160** **LATBW**
551WB0008

Material : C.S. ASTM A105
Component : LATROLET
Codes : MSS SP97
Ends : **B.W.**
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

LATROLET BW 4" 4" **SCH. 120** **LATBW**
551WB0009

Material : C.S. ASTM A105
Component : LATROLET
Codes : MSS SP97
Ends : **B.W.**
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

* Client codes only, not including sizes



Foster Wheeler USA Corporation

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LATROLET BW 6" 8" **SCH. XS** **LATBW**
551WB0010

Material : C.S. ASTM A105
Component : LATROLET
Codes : MSS SP97
Ends : **B.W.**
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

LATROLET SW 1/2" 36" **LATS**
551LB0015

Material : C.S. ASTM A105
Component : LATROLET
Codes : MSS SP97
Ends : **S.W.**
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2
Rating : **9000#**

FULL CPLG. 1/2" 2" **CPL**
551HB0020

Material : C.S. ASTM A105
Component : FULL COUPLING
Codes : ASME B16.11
Rating : **9000#**
Ends : **S.W.**
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

UNION 1/2" 2" **GRO**
551HB0015

Material : C.S. ASTM A105
Component : UNION, GROUND JOINT, INTEGRAL CS SEATS
Codes : MSS SP83
Rating : **9000#**
Ends : **S.W.**
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

* Client codes only, not including sizes



Foster Wheeler USA Corporation

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Y STRAINER 1/2" 2" **YST**
 592YA0012

Body Mat'l : ASTM A216 GR.WCB
 Codes : ACCORDING TO MANUFACTURER'S STD
 Body constr. : BOLTED CAP
Rating : 600#
Ends : S.W.
 Screen Mat'l : S.S.304, .033" PERFORATION
 Bolt Mat'l : BODY BOLTING AND GLAND BOLTING PER MANUFACTURER'S STANDARD
 Gasket Mat'l : SPIRAL WOUND SS.304/GRAPHITE
 Note : TO BE SUPPLIED WITH S.W. BLOW-OFF CONNECTION.

TEMP. CONIC. 2" 24" **TCS**
 592TE0003

Rating : 300#
 Codes : ASME B16.5
Ends : RF
 Material : C.S. CONICAL SCREEN.
 Mesh size : 14 GA PERFORATED PLATE WITH 1/8" DIA. HOLES ON 3/16" CENTERS,
 200% OPEN AREA.

TEMP. CONIC. 30" 36" **TCS**
 592TE0004

Rating : 300#
 Codes : ASME B16.47 "B" (EX API-605)
Ends : RF
 Material : C.S. CONICAL SCREEN.
 Mesh size : 14 GA PERFORATED PLATE WITH 1/8" DIA. HOLES ON 3/16" CENTERS,
 200% OPEN AREA.

FIGURE 8 6" 12" **F8F**
 561FP0003

Material : ASTM A516 GR.70
 Codes : ASME B16.48
Rating : 300#
Ends : RF
 Face finish : ASME B16.5
 Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

* Client codes only, not including sizes



Contract N.: 1310087902

Client: Valero Refining Company - Texas

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PADDLE BLIND 1" 4" **PBL**
561PP0005

Material : ASTM A516 GR.70
Codes : ASME B16.48
Rating : 300#
Ends : RF
Face finish : ASME B16.5
Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

PADDLE BLIND 14" 24" **PBL**
561PP0005

Material : ASTM A516 GR.70
Codes : ASME B16.48
Rating : 300#
Ends : RF
Face finish : ASME B16.5
Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

PAD.B16.47/B 30" 36" **PAD7B**
561PP0012

Material : ASTM A516 GR.70
Codes : ASME B16.47 "B" (EX API-605)
Rating : 300#
Ends : RF
Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

DRIP RING 1" 12" **DRI**
561DP0009

Material : ASTM A516 GR.70
Codes : ASME B16.48
Rating : 300#
Ends : RF
Face finish : ASME B16.5
Hole on body : HOLE 3/4" SOCKET WELD
Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

SPACER RING 1" 4" **SPA**
561RP0005

Material : ASTM A516 GR.70
Codes : ASME B16.48
Rating : 300#
Ends : RF
Face finish : ASME B16.5
Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

* Client codes only, not including sizes



Foster Wheeler USA Corporation

Contract N.: 1310087902

Client: Valero Refining Company - Texas

Location: Texas City, Texas

Project: Valero Refinery Reconfiguration (TCRR)

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SPACER RING 14" 24" SPA

561RP0005

Material : ASTM A516 GR.70
 Codes : ASME B16.48
Rating : 300#
Ends : RF
 Face finish : ASME B16.5
 Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

SPA.R.47/B 30" 36" SPA7B

561RP0012

Material : ASTM A516 GR.70
 Codes : ASME B16.47 "B" (EX API-605)
Rating : 300#
Ends : RF
 Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

STUD BOLTS 1/2" 4" STU

572SC0002

Material : ASTM A193 GR.B7 / WITH (2) HEAVY HEX NUTS ASTM A194 GR.2H
 Thr'd Code : ANSI B18.2.1 & B18.2.2
 Note : BOLTING SHALL COMPLY WITH JOB SPEC 52A3

GASK.16.47/B 30" 36" GA1

574SC0010

Material : SPIRAL WOUND SS.304/GRAPHITE
 Codes : GASKET DIMENSIONS PER ASME B16.20 ; FLANGES DIMENSIONS PER ASME B16.47 "B" (API-605)
 Thickness : 3.2 MM (1/8")
Rating : 300#
 Ring Out/In : 3.2 MM (1/8") THK. OUTER C.S. RING / INNER SS.304 RING
 Note : GASKETS SHALL COMPLY WITH JOB SPEC 52A3. GASKETS TO BE SUPPLIED W/O TAPE, STRING OR OTHER WRAPPING AROUND SPIRAL WINDING.
Ends : RF

* Client codes only, not including sizes



Contract N.: 1310087902
Client: Valero Refining Company - Texas
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GASK.16.47/A **30"** **36"** **GA2**
574SC0009

Material : SPIRAL WOUND SS.304/GRAPHITE
Codes : GASKET DIMENSIONS PER ASME B16.20 ; FLANGES DIMENSIONS PER ASME B16.47 "A" (MSS-SP44)
Thickness : 3.2 MM (1/8")
Rating : 300#
Ring Out/In : 3.2 MM (1/8") THK. OUTER C.S. RING / INNER SS.304 RING
Note : GASKETS SHALL COMPLY WITH JOB SPEC 52A3. GASKETS TO BE SUPPLIED W/O TAPE, STRING OR OTHER WRAPPING AROUND SPIRAL WINDING.
Ends : RF

GASKET **1/2"** **24"** **GAS**
574SA0002

Material : SPIRAL WOUND SS.304/GRAPHITE
Codes : DIMENSIONS PER ASME B16.20
Thickness : 3.2 MM (1/8")
Rating : 300#
Ring Out/In : 3.2 MM (1/8") THK. OUTER C.S. RING
Note : GASKETS SHALL COMPLY WITH JOB SPEC 52A3. GASKETS TO BE SUPPLIED W/O TAPE, STRING OR OTHER WRAPPING AROUND SPIRAL WINDING.
Ends : RF

GASKET **1/2"** **24"** **GAS1**
574SA0003

Material : SPIRAL WOUND SS.304/GRAPHITE
Codes : DIMENSIONS PER ASME B16.20
Thickness : 3.2 MM (1/8")
Rating : 600#
Ring Out/In : 3.2 MM (1/8") THK. OUTER C.S. RING
Note : GASKETS SHALL COMPLY WITH JOB SPEC 52A3. GASKETS TO BE SUPPLIED W/O TAPE, STRING OR OTHER WRAPPING AROUND SPIRAL WINDING.
Ends : RF

* Client codes only, not including sizes



Foster Wheeler USA Corporation

Contract N.: 1310087902
 Client: Valero Refining Company - Texas
 Location: Texas City, Texas
 Project: Valero Refinery Reconfiguration (TCRR)

Piping Material Specification			
Spec. No. : 10087902-SP-50-03			
Class : BA9C			
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Compared with:	2	28 Feb 02	

GASK.16.47/A 30" 36" **GAS1A**
 574SC0011

Material : SPIRAL WOUND SS.304/GRAPHITE
 Codes : GASKET DIMENSIONS PER ASME B16.20 ; FLANGES DIMENSIONS PER ASME B16.47 "A" (MSS-SP44)
 Thickness : 3.2 MM (1/8")
Rating : 600#
 Ring Out/In : 3.2 MM (1/8") THK. OUTER C.S. RING / INNER SS.304 RING
 Note : GASKETS SHALL COMPLY WITH JOB SPEC 52A3. GASKETS TO BE SUPPLIED W/O TAPE, STRING OR OTHER WRAPPING AROUND SPIRAL WINDING.
Ends : RF

GASK.16.47/B 30" 36" **GAS1B**
 574SC0012

Material : SPIRAL WOUND SS.304/GRAPHITE
 Codes : GASKET DIMENSIONS PER ASME B16.20 ; FLANGES DIMENSIONS PER ASME B16.47 "B" (API-605)
 Thickness : 3.2 MM (1/8")
Rating : 600#
 Ring Out/In : 3.2 MM (1/8") THK. OUTER C.S. RING / INNER SS.304 RING
 Note : GASKETS SHALL COMPLY WITH JOB SPEC 52A3. GASKETS TO BE SUPPLIED W/O TAPE, STRING OR OTHER WRAPPING AROUND SPIRAL WINDING.
Ends : RF

GASKET FF 1/2" 24" **GASFF**
 574Cy0004

Material : FLEXIBLE GRAPHITE ENCAPSULATED GASKET. CORR-A-SEAL / GRAPHONICS
 Codes : DIMENSIONS PER ASME B16.21
 Thickness : 1.6 MM (1/16")
Rating : 300#
 Note : GASKETS SHALL COMPLY WITH JOB SPEC 52A3
Ends : FF

General Notes:

- 1.) Use Extended Body Gate Valves, Threaded Outlet, For Branches Not In Process Flow (Such As Vent, Drain, PI, Orifice Taps Etc. Connections). Piping Downstream, If Any, Shall Usually Be In Accord With The Applicable Instrument Piping Material Specification. If No Piping, Insert A Plug In The Threaded Outlet. Other Valves, Such As SW x T Should Only Be Used When Spaced Restrictions Are Encountered.
- 2.) Det 'GATST' To Be Use Only Where Extended Body Valves Do Not Fit The Design Situation.
- 3.) Dets 'GAF' And 'GAF1' Are To Be Used At Flanged Equipment Or When Required At Instrument.
- 4.) Globe Valves Shall Be Sized Such That Its Minimum % Open Is Not Less Than 20%. These Valves Shall Not Be Subject To Pressure Differential Greater Than 30% Of Its Cold Working Pressure.

* Client codes only, not including sizes

Continue....



Contract N.: 1310087902

Client: Valero Refining Company - Texas

Location: Texas City, Texas

Project: Valero Refinery Reconfiguration (TCRR)

Piping Material Specification			
Spec. No. : 10087902-SP-50-03			
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- 5.) Check Valves When Installed In The Horizontal Position Shall Be Bonnet Cover Up & Those Install In The Vertical Position Shall Be Flow Up Only.
- 6.) Gear Operated Valves Shall Be Used When Indicated On The EFD'S.
- 7.) A Minimum Of 0.20" Corrosion Allowance May Be Used To Substantiate Wall Schedule Selection For Boderline Cases. Such Cases Must Be Approved By The Project Engineering Manager And A Remark Added To The Line Llst.
- 8.) Heat Treatment Noted Is For General Fabrication. Weld Size For Fillet And/Or Branch Connections Shall Govern Per ASME B31.3 Para. 331.1.3. Heat Treatment For Bends Shall Be Per ASME B31.3 Para. 332.4.1 & 332.4.2 And Specs 52A5 And 52A6 Accordingly.
- 9.) Maximum Allowable Hardness Of 200 BHN. PWHT Required For Welds Above 200 BHN.
- 10.) Where Pipe Schedule Is Shown, It Is Adequate For The Full Flange Rating. Where "CALC" Is Shown, The Pressure Limit May Be Lower Than Flange Rating. See The Project Line List And Applicable Piping Drawing For Details.
- 11.) Typical Hydrotest Limiting Factor Is 1.5 x ASME Class Rating Cold Working Pressure Exception To This Include:
 * 1.1 x CWP For Closed Valves (Test Against Seat. This Method Is Not Preferred.)
 * Check Manufactures Data For Ball Valves.
- 12.) Pipe And Components > 1/2" Thickness May Require Impact Tested Materials When The Minimum Design Metal Temperature Is Below 100F Per ASME B31.3 Para. 323.2.2.
- 13.) All Fabrication Shall Comply With 52A1.
- 14.) Pipe Supports And Spring Hangers Shall Comply With 59A2 And 59A3 Respectively.
- 15.) 'BEP' Nipples Shall Be Cut From Pipe.
- 16.) Pipe Size 1/2" - 3/4" To Be Use In No Flow Condition.
- 17.) The Crotch Thickness Of The Branch Outlet Of Buttweld Tees Shall Be No Less Than 150% Of The Nominal Wall Thickness Of The Tee. The Crotch Radius Of The Branch Outlet Of Buttweld Tees Shall Be No Less Than 12.5% Of The Branch Outlet OD.
- 18.) Use Union Or Coupling To Join Pipe. Flanged Joint To Be Used Only Where Indicated On EFD'S.
- 19.) Couplings Shall Not Be Used For Branch Connections Use Inline Only.
- 20.) Use Flat Face Valve, Flange & Full Face Gasket To Mate With Flat Face Nozzles Only.
- 21.) Flanges Shall Not Be Insulated.
- 22.) Temperature Instrument Connection Shall Be NPS 1-1/2" Flanged.
- 23.) Pressure Instrument Connection Shall Be NPS 3/4" Socket-weld.
- 24.) In Sizes Above NPS 24", Flanges In Accord With ASME B16.47 Series B (API-605) Preferred. Where Required To Match Equipment Or Wafer Style Valves, Flanges Per ASME B16.47 Series A (MSS-SP44) May Be Used.
- 25.) Branch Connections Should Follow The Guidelines Of Job Spec 52B2 And The Attachment Unless Specifically Overriden By The Pipe Stress Engineer.
- 26.) CORR-A-SEAL / GRAPHONICS Gaskets Shall Be Used For Flat Face Flanges.
- 27.) Concentric & Eccentric Reducers Are Limited To 2 Nominal Diameter Size Reductions Without Piping Engineer Approval.
- 28.) Remove Temporary Strainers After Flushing.

* Client codes only, not including sizes



Foster Wheeler USA Corporation

Contract N.: 1310087902

Client: Valero Refining Company - Texas

Location: Texas City, Texas

Project: Valero Refinery Reconfiguration (TCRR)

Piping Material Specification			
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Foster Wheeler USA Corporation

Piping Material Specification			
Spec. No.: 10087902-50A10			
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Contract #: 1310087902
 Client: Valero Refining Company - Texas
 Location: Texas City, Texas
 Project: Valero Refinery Reconfiguration (TCRR)

ATTACHMENT "A"

REINFORCEMENT CHART																			
APPLICABLE TO PIPE SPECIFICATION (S) : BA9C																			
MATERIAL (S) : CS SMLS ASTM A106 GR. B										P/SE :					C.A. : 0.250"				
DESIGN LIMIT (S) : 740 PSIG AT -20F TO 100F 410 PSIG AT 800F MAX. TEMP.																			
NOM. SIZE	NOM. THICK.	NOMINAL SIZE OF BRANCH CONNECTION (INCHES)																	
		1/2	3/4	1	1 1/2	2	3	4	6	8	10	12	14	16	18	20	24		
1/2	XXS	T																	
3/4	XXS	RT	T																
1	XXS	RT	RT	T															
1 1/2	XXS	RT	RT	RT	T														
2	XXS	RT	RT	RT	RT	T													
3	160	SK	SK	SK	SK	SK	T												
4	120	SK	SK	SK	SK	SK	W	T											
6	XS	SK	SK	SK	SK	SK	W	W	T										
8	XS	SK	SK	SK	SK	SK	W	W	W	T									
10	XS	SK	SK	SK	SK	SK	W	W	W	W	T								
12	XS	SK	SK	SK	SK	SK	W	W	W	W	W	T							
14	XS	SK	SK	SK	SK	SK	W	W	W	W	W	W	T						
16	XS	SK	SK	SK	SK	SK	W	W	W	W	W	W	CA	T					
18	XS	SK	SK	SK	SK	SK	W	W	W	W	W	W	CA	CA	T				
20	40	SK	SK	SK	SK	SK	W	W	W	W	W	W	CA	CA	CA	T			
24	40	SK	SK	SK	SK	SK	W	W	W	W	W	W	CA	CA	CA	CA	T		
30	CALC	SK	SK	SK	SK	SK	W	W	W	W	W	W	CA	CA	CA	CA	CA	T	
36	CALC	SK	SK	SK	SK	SK	W	W	W	W	W	W	CA	CA	CA	CA	CA	CA	T

LEGEND :

- | | |
|--|---|
| <p>T = TEE</p> <p>RT = REDUCING TEE</p> <p>RE = TEE AND REDUCER OR REDUCING INSERT</p> <p>SK = SOCKOLET, SW ELBOLET OR LATROLET</p> <p>TH = THREDOLET, THD ELBOLET OR LATROLET</p> <p>W = WELDOLET, BW ELBOLET OR LATROLET</p> <p>LW = LONG WELD NECK FLANGE</p> <p>TB = TEE AND BUSHING</p> | <p>CA = CALCULATE</p> <p>F1 = STUB IN WITH 3/8" FILLET WELD</p> <p>P2 = STUB IN WITH 2" WIDE PAD (PAD TO BE SAME THICKNESS AS RUN SIZE)</p> <p>P3 = STUB IN WITH 3" WIDE PAD (PAD TO BE SAME THICKNESS AS RUN SIZE)</p> <p>P4 = STUB IN WITH 4" WIDE PAD (PAD TO BE SAME THICKNESS AS RUN SIZE)</p> <p>P5 = STUB IN WITH 5" WIDE PAD (PAD TO BE SAME THICKNESS AS RUN SIZE)</p> <p>P6 = STUB IN WITH 6" WIDE PAD (PAD TO BE SAME THICKNESS AS RUN SIZE)</p> <p>P7 = STUB IN WITH 7" WIDE PAD (PAD TO BE SAME THICKNESS AS RUN SIZE)</p> |
|--|---|

NOTE : ANY SITUATION NOT COVERED BY THE ABOVE CHART SHOULD BE BROUGHT TO THE ATTENTION OF THE ASSIGNED PIPING ENGINEER.