



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 : AD			
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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:**  
 PROCESS FLUIDS,  
 (FOR BRANCH CONNECTIONS SEE ATTACHMENT "A" )

<b>Gaskets :</b> SPIRAL WOUND GRAPHITE / S.S.304	<b>Rating/Facing :</b> CL150 RF	<b>Corrosion :</b> 0.250" (6.3MM) See Note 7	<b>Facing Finish :</b> ASME B16.5	<b>Block Valve Trim :</b> API TRIM No. 8	<b>Weld Quality Insp :</b> PER JOB SPEC -52A1	<b>Stress Relief :</b> NO (See Note 8)
<b>Materials :</b> CARBON STEEL PIPING & VALVES (SEE GENERAL NOTES 1 THRU 27)			<b>Temp/Press Limits :</b> 285 PSIG AT 100F ; 200 PSIG AT 400F ; (See Note 9 & 10)			

Item Name	Range		Det	Rev
Unique/Client* Code	from	to		
<b>GATE VALVE</b> 512GF0001	<b>1/2"</b>	<b>2"</b>	<b>GAT</b>	
Body Mat'l : ASTM A105 Codes : API 602 Body constr. : WELDED BONNET <b>Rating : 1500#</b> <b>Ends : S.W.</b> Trim constr. : PLAIN SOLID WEDGE, O.S.& Y. Trim Mat'l : API TRIM N.8 (STELLITE BODY SEATS) Bolt Mat'l : PER API STANDARD 602. Packing : GRAPHITE PACKING . Note : GENERAL NOTES FOR VALVES: SEE JOB SPEC 59B9 Operator : HANDWHEEL				
<b>GATE VALVE</b> 511GA0001	<b>3"</b>	<b>24"</b>	<b>GAT</b>	
Body Mat'l : ASTM A216 GR.WCB Codes : API 600 Body constr. : BOLTED BONNET <b>Rating : 150#</b> <b>Ends : RF</b> Face finish : ASME B16.5 Trim constr. : PLAIN OR FLEXIBLE SOLID WEDGE, O.S.& Y. Trim Mat'l : API TRIM N.8 (STELLITE BODY SEATS) 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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GATE VALVE N 14" 24" 511GA0002 GATN

Body Mat'l :ASTM A216 GR.WCB
Codes : API 600
Body constr. :BOLTED BONNET
Rating : 150#
Ends : RF
Face finish :ASME B16.5
Trim constr. :PLAIN OR FLEXIBLE SOLID WEDGE, O.S.& Y.
Trim Mat'l :API TRIM N.8 (STELLITE BODY SEATS)
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" 512GA0001 GAFF

Body Mat'l :ASTM A105
Codes : API 602
Body constr. :BOLTED BONNET, FULL PORT.
Rating : 150#
Ends : RF
Face finish :ASME B16.5
Trim constr. :PLAIN SOLID WEDGE, FULL PORT, O.S. & Y.
Trim Mat'l :API TRIM N.8 (STELLITE BODY SEATS)
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" 512GB0002 GAFF1

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.8 (STELLITE BODY SEATS)
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

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**GATE V.SWxTH**      1/2"      2"      **GATST**  
 512GF0003

Body Mat'l : ASTM A105  
 Codes : API 602  
 Body constr. : WELDED BONNET  
**Rating : 1500#**  
**Ends : S.W. x THDD**  
 Trim constr. : PLAIN SOLID WEDGE, O.S.& Y.  
 Trim Mat'l : API TRIM N.8 (STELLITE BODY SEATS)  
 Bolt Mat'l : PER API STANDARD 602.  
 Packing : GRAPHITE PACKING .  
 Note : GENERAL NOTES FOR VALVES: SEE JOB SPEC 59B9  
 Operator : HANDWHEEL

**GATE V. FLG.**      1/2"      2"      **GAF**  
 512GA0005

Body Mat'l : ASTM A105  
 Codes : API 602  
 Body constr. : BOLTED BONNET  
**Rating : 150#**  
**Ends : RF**  
 Face finish : ASME B16.5  
 Trim constr. : PLAIN SOLID WEDGE, O.S.& Y.  
 Trim Mat'l : API TRIM N.8 (STELLITE BODY SEATS)  
 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. FLG.**      1/2"      2"      **GAF1**  
 512GB0005

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.8 (STELLITE BODY SEATS)  
 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  
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**GLOBE VALVE**      1/2"      2"      **GLO**  
512DF0001

Body Mat'l : ASTM A105  
Codes : API 602 / ASME B16.34  
Body constr. : WELDED BONNET  
**Rating : 1500#**  
**Ends : S.W.**  
Trim constr. : LOOSE DISC, O.S. & Y.  
Trim Mat'l : API TRIM N.8 (STELLITE BODY SEATS)  
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**  
511DA0002

Body Mat'l : ASTM A216 GR.WCB  
Codes : API 600 / ASME B16.34  
Body constr. : BOLTED BONNET  
**Rating : 150#**  
**Ends : RF**  
Face finish : ASME B16.5  
Trim constr. : PLUG DISC TYPE, O.S. & Y.  
Trim Mat'l : API TRIM N.8 (STELLITE BODY SEATS)  
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

**CHECK VALVE**      1/2"      2"      **CHE**  
512CF0001

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.8 (STELLITE BODY SEATS)  
Bolt Mat'l : PER API STANDARD 602.  
Gasket Mat'l : PER API STANDARD 602.  
Note : GENERAL NOTES FOR VALVES: SEE JOB SPEC 59B9

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**CHECK VALVE**      3"      24"      **CHE**  
511CA0002

Body Mat'l : ASTM A216 GR.WCB  
Codes : API 600 / ASME B16.34  
Body constr. : BOLTED CAP  
**Rating : 150#**  
**Ends : RF**  
Face finish : ASME B16.5  
Trim constr. : SWING TYPE, HORIZONTAL & VERTICAL INSTALLATION  
Trim Mat'l : API TRIM N.8 (STELLITE BODY SEATS)  
Bolt Mat'l : PER API STANDARD 600.  
Gasket Mat'l : PER API STANDARD 600.  
Note : GENERAL NOTES FOR VALVES: SEE JOB SPEC 59B9

**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"      12"      **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.**

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<b>FLANGE</b> 561WB0019	3"	3"	<b>SCH. 160</b>	<b>FLG</b>
<p>Type : W.N.  Material : ASTM A105  Codes : ASME B16.5  Rating : <b>150#</b>  Ends : <b>RF</b>  Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2</p>				
<b>FLANGE</b> 561WB0020	4"	4"	<b>SCH. 120</b>	<b>FLG</b>
<p>Type : W.N.  Material : ASTM A105  Codes : ASME B16.5  Rating : <b>150#</b>  Ends : <b>RF</b>  Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2</p>				
<b>FLANGE</b> 561WB0021	6"	12"	<b>SCH. XS</b>	<b>FLG</b>
<p>Type : W.N.  Material : ASTM A105  Codes : ASME B16.5  Rating : <b>150#</b>  Ends : <b>RF</b>  Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2</p>				
<b>FLANGE</b> 561WB0022	14"	14"	<b>SCH. 40</b>	<b>FLG</b>
<p>Type : W.N.  Material : ASTM A105  Codes : ASME B16.5  Rating : <b>150#</b>  Ends : <b>RF</b>  Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2</p>				
<b>FLANGE</b> 561WB0021	16"	24"	<b>SCH. XS</b>	<b>FLG</b>
<p>Type : W.N.  Material : ASTM A105  Codes : ASME B16.5  Rating : <b>150#</b>  Ends : <b>RF</b>  Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2</p>				

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

Type : W.N.  
 Material : ASTM A105  
 Codes : ASME B16.47 "A" ( EX MSS-SP44 )  
**Rating : 150#**  
**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 : 150#**  
**Ends : RF**  
 Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

**FLANGE            1/2"    2"    SCH. XXS      FL1**  
 561NB0016

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            3"      3"    SCH. 160      FL1**  
 561WB0015

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            4"      4"    SCH. 120      FL1**  
 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

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**FLANGE F.F.**      4"      4"      **SCH. 120**      **FLGFF**  
561WB0024

Type : W.N.  
Material : ASTM A105  
Codes : ASME B16.5  
**Rating : 150#**  
**Ends : FF**  
Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

**FLANGE F.F.**      6"      12"      **SCH. XS**      **FLGFF**  
561WB0025

Type : W.N.  
Material : ASTM A105  
Codes : ASME B16.5  
**Rating : 150#**  
**Ends : FF**  
Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

**FLANGE F.F.**      14"      14"      **SCH. 40**      **FLGFF**  
561WB0026

Type : W.N.  
Material : ASTM A105  
Codes : ASME B16.5  
**Rating : 150#**  
**Ends : FF**  
Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

**FLANGE F.F.**      16"      24"      **SCH. XS**      **FLGFF**  
561WB0025

Type : W.N.  
Material : ASTM A105  
Codes : ASME B16.5  
**Rating : 150#**  
**Ends : FF**  
Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

**BLIND FLANGE**      1/2"      24"      **FBL**  
561BB0001

Material : ASTM A105  
Codes : ASME B16.5  
**Rating : 150#**  
**Ends : RF**  
Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

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**BLIND F.47/A**      **30"**    **36"**      **FBL7A**  
 561BB0003

Material : ASTM A105  
 Codes : ASME B16.47 "A" ( EX MSS-SP44 )  
**Rating : 150#**  
**Ends : RF**  
 Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

**BLIND F.47/B**      **30"**    **36"**      **FBL7B**  
 561BB0002

Material : ASTM A105  
 Codes : ASME B16.47 "B" ( EX API-605 )  
**Rating : 150#**  
**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 561CB0026 FTR

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" 12" SCH. XS 561CB0007 FTR

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 14" 14" SCH. 40 561CB0027 FTR

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 16" 16" SCH. XS 561CB0007 FTR

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 2" 2" SCH. XXS 561CB0019 FTRI

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 561CB0023 FTRI

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 4" 4" SCH. 120 561CB0028 FTRI

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" 12" SCH. XS 561CB0009 FTRI

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**      **14"**    **14"**    **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).

**ORIFICE FLG**      **16"**    **16"**    **SCH. XS**      **FTRI**  
561CB0009

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)

Piping Material Specification			
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**90 ELBOW**      **4"**      **4"**      **SCH. 120**      **90E**  
551EF0022

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

**90 ELBOW**      **6"**      **12"**      **SCH. XS**      **90E**  
551EF0023

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

**90 ELBOW**      **14"**      **14"**      **SCH. 40**      **90E**  
551EF0024

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

**90 ELBOW**      **16"**      **24"**      **SCH. XS**      **90E**  
551EF0023

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

**90 ELBOW**      **30"**      **36"**      **CALC**      **90E**

Material : C.S. ASTM A234 WPB  
Component : 90 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)

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**45 ELBOW**      1/2"      2"      **45E**  
551HB0017

Material : C.S. ASTM A105  
Component : 45 DEGREES ELBOWS  
Codes : ASME B16.11  
Rating : **9000#**  
Ends : **S.W.**  
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

**45 ELBOW**      3"      3"      **SCH. 160**      **45E**  
551EF0017

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**      4"      4"      **SCH. 120**      **45E**  
551EF0018

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**      6"      12"      **SCH. XS**      **45E**  
551EF0019

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**      14"      14"      **SCH. 40**      **45E**  
551EF0020

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

\* 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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**45 ELBOW**      **16"    24"    SCH. XS**      **45E**  
 551EF0019

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

**CAP**      **1/2"    2"**      **CAP**  
 551HB0018

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

**CAP**      **3"    3"    SCH. 160**      **CAP**  
 551EF0025

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

**CAP**      **4"    4"    SCH. 120**      **CAP**  
 551EF0026

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

\* 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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<b>CAP</b>	<b>6"</b>	<b>12"</b>	<b>SCH. XS</b>	<b>CAP</b>
551EF0027				

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

<b>CAP</b>	<b>14"</b>	<b>14"</b>	<b>SCH. 40</b>	<b>CAP</b>
551EF0028				

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

<b>CAP</b>	<b>16"</b>	<b>24"</b>	<b>SCH. XS</b>	<b>CAP</b>
551EF0027				

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

<b>CAP</b>	<b>30"</b>	<b>36"</b>	<b>CALC</b>	<b>CAP</b>
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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

<b>PLUG</b>	<b>1/2"</b>	<b>2"</b>		<b>ROU</b>
551HB0004				

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

\* 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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PLUG ORI 1/2" 1/2" ROUO
551HB0005

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. 3" 3" SCH. 160 CRE
551RF0011

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. 4" 4" SCH. 120 CRE
551RF0012

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. 6" 12" 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. 14" 14" 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

\* 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.**      16"      24"      **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.**      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

**ECC.RED.**      6"      12"      **SCH. XS**      **ERE**  
551RF0017

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



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

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ECC.RED. 14" 14" SCH. 40 551RF0018 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. 16" 24" SCH. XS 551RF0017 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 551RF0019 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 1/2" 2" 551HB0019 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 3" 3" SCH. 160 551EF0029 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



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

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<b>TEE</b> 551EF0030	4"	4"	<b>SCH. 120</b>	<b>TEE</b>
Material : C.S. ASTM A234 WPB Component : TEE Codes : ASME B16.9 Manufact. : SMLS Ends : <b>B.W.</b> Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2				
<b>TEE</b> 551EF0031	6"	12"	<b>SCH. XS</b>	<b>TEE</b>
Material : C.S. ASTM A234 WPB Component : TEE Codes : ASME B16.9 Manufact. : SMLS Ends : <b>B.W.</b> Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2				
<b>TEE</b> 551EF0032	14"	14"	<b>SCH. 40</b>	<b>TEE</b>
Material : C.S. ASTM A234 WPB Component : TEE Codes : ASME B16.9 Manufact. : SMLS Ends : <b>B.W.</b> Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2				
<b>TEE</b> 551EF0031	16"	24"	<b>SCH. XS</b>	<b>TEE</b>
Material : C.S. ASTM A234 WPB Component : TEE Codes : ASME B16.9 Manufact. : SMLS Ends : <b>B.W.</b> Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2				
<b>TEE</b>	30"	36"	<b>CALC</b>	<b>TEE</b>
Material : C.S. ASTM A234 WPB Component : TEE Codes : ASME B16.9 Manufact. : WELDED Ends : <b>B.W.</b> 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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**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#**

**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**

\* 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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**ELBOLET BW      3"      36"      CALC      ELBBW**

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"      36"      CALC      WOL**

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

**LATROLET BW      3"      36"      CALC      LATBW**

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

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

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**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

**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.

\* 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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TEMP. CONIC. 2" 24" TCS
592TE0001

Rating: 150#
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
592TE0002

Rating: 150#
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
561FP0002

Material: ASTM A516 GR.70
Codes: ASME B16.48
Rating: 150#
Ends: RF
Face finish: ASME B16.5
Note: FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

PADDLE BLIND 1" 4" PBL
561PP0003

Material: ASTM A516 GR.70
Codes: ASME B16.48
Rating: 150#
Ends: RF
Face finish: ASME B16.5
Note: FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

PADDLE BLIND 14" 24" PBL
561PP0003

Material: ASTM A516 GR.70
Codes: ASME B16.48
Rating: 150#
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

Location: Texas City, Texas

Project: Valero Refinery Reconfiguration (TCRR)

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**PAD.B16.47/B**      **30"**    **36"**      **PAD7B**  
561PP0011

Material : ASTM A516 GR.70  
Codes : ASME B16.47 "B" ( EX API-605 )  
**Rating : 150#**  
**Ends : RF**  
Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

**DRIP RING**      **1"**    **12"**      **DRI**  
561DP0008

Material : ASTM A516 GR.70  
Codes : ASME B16.48  
**Rating : 150#**  
**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**  
561RP0003

Material : ASTM A516 GR.70  
Codes : ASME B16.48  
**Rating : 150#**  
**Ends : RF**  
Face finish : ASME B16.5  
Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

**SPACER RING**      **14"**    **24"**      **SPA**  
561RP0003

Material : ASTM A516 GR.70  
Codes : ASME B16.48  
**Rating : 150#**  
**Ends : RF**  
Face finish : ASME B16.5  
Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2

**SPA.R.47/B**      **30"**    **36"**      **SPA7B**  
561RP0011

Material : ASTM A516 GR.70  
Codes : ASME B16.47 "B" ( EX API-605 )  
**Rating : 150#**  
**Ends : RF**  
Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 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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**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**  
 574SC0001

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 : **150#**  
 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/A**      30"      36"      **GA2**  
 574SC0002

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 : **150#**  
 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**  
 574SA0001

Material : SPIRAL WOUND SS.304/GRAPHITE  
 Codes : DIMENSIONS PER ASME B16.20  
 Thickness : 3.2 MM (1/8")  
 Rating : **150#**  
 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





Contract N.: 1310087902

Client: Valero Refining Company - Texas

Location: Texas City, Texas

Project: Valero Refinery Reconfiguration (TCRR)

<b>Piping Material Specification</b>			
<b>Spec. No. : 10087902-SP-50-03</b>			
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**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.
- 5.) Check Valves When Install 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 Be 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.) 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.
- 10.) 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.
- 11.) 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.
- 12.) All Fabrication Shall Comply With 52A1.
- 13.) Pipe Supports And Spring Hangers Shall Comply With 59A2 And 59A3 Respectively.
- 14.) 'BEP' Nipples Shall Be Cut From Pipe.
- 15.) Pipe Size 1/2" - 3/4" To Be Use In No Flow Condition.
- 16.) 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.
- 17.) Use Union Or Coupling To Join Pipe. Flanged Joint To Be Used Only Where Indicated On EFD'S.
- 18.) Couplings Shall Not Be Used For Branch Connections Use Inline Only.
- 19.) Use Flat Face Valve, Flange & Full Face Gasket To Mate With Flat Face Nozzles Only.
- 20.) Flanges Shall Not Be Insulated.
- 21.) Temperature Instrument Connection Shall Be NPS 1-1/2" Flanged.
- 22.) Pressure Instrument Connection Shall Be NPS 3/4" Socket-weld.

\* Client codes only, not including sizes

Continue....



Foster Wheeler USA Corporation

Contract N.: 1310087902

Client: Valero Refining Company - Texas

Location: Texas City, Texas

Project: Valero Refinery Reconfiguration (TCRR)

<b>Piping Material Specification</b>			
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23.) 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.

24.) Branch Connections Should Follow The Guidelines Of Job Spec 52B2 And The Attachment Unless Specifically Overriden By The Pipe Stress Engineer.

25.) CORR-A-SEAL / GRAPHONICS Gaskets Shall Be Used For Flat Face Flanges.

26.) Concentric & Eccentric Reducers Are Limited To 2 Nominal Diameter Size Reductions Without Piping Engineer Approval.

27.) Remove Temporary Strainers After Flushing.

END OF DOCUMENT

\* Client codes only, not including sizes





Foster Wheeler USA Corporation

**Piping Material Specification**

**Spec. No.: 10087902-SP-50-03**

**Class: AD**

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

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**ATTACHMENT "A"**

REINFORCEMENT CHART																				
APPLICABLE TO PIPE SPECIFICATION (S) : AD																				
MATERIAL (S) : CARBON STEEL, SMLS ASTM A106 GR. B											P/SE :		C.A. : 0.250"							
CARBON STEEL, EFW, ASTM, A672 GR. C70 CL. 12																				
DESIGN LIMIT (S) : 285 PSIG AT -20F TO 100F; 95 PSIG AT 750F 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	30	36	
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	40	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	XS	SK	SK	SK	SK	SK	W	W	W	W	W	W	CA	CA	CA	T				
24	XS	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 :**

T = TEE  
 RT = REDUCING TEE  
 RE = TEE AND REDUCER OR REDUCING INSERT  
 SK = SOCKOLET, SW ELBOLET OR LATROLET  
 TH = THREDOLET, THD ELBOLET OR LATROLET  
 W = WELDOLET, BW ELBOLET OR LATROLET  
 LW = LONG WELD NECK FLANGE  
 TB = TEE AND BUSHING

CA = CALCULATE  
 F1 = STUB IN WITH 3/8" FILLET WELD  
 P2 = STUB IN WITH 2" WIDE PAD (PAD TO BE SAME THICKNESS AS RUN SIZE)  
 P3 = STUB IN WITH 3" WIDE PAD (PAD TO BE SAME THICKNESS AS RUN SIZE)  
 P4 = STUB IN WITH 4" WIDE PAD (PAD TO BE SAME THICKNESS AS RUN SIZE)  
 P5 = STUB IN WITH 5" WIDE PAD (PAD TO BE SAME THICKNESS AS RUN SIZE)  
 P6 = STUB IN WITH 6" WIDE PAD (PAD TO BE SAME THICKNESS AS RUN SIZE)  
 P7 = STUB IN WITH 7" WIDE PAD (PAD TO BE SAME THICKNESS AS RUN SIZE)

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