



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 : GA5B			
Client Ref.	Rev. No.	Issue Date	Page
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

<b>Service:</b> PROCESS FLUIDS AND COKE CUTTING WATER, (PWHT REQUIRED FOR WALL > 3/4" WALL) (FOR BRANCH CONNECTIONS SEE ATTACHMENT "A")						
<b>Gaskets :</b> OCTAGONAL RING GASKET SOFT IRON	<b>Rating/Facing :</b> CL2500 RTJ	<b>Corrosion :</b> 0.125" (3.0MM) See Note 5	<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> YES >3/4" WALL (Note 6)
<b>Materials :</b> CARBON STEEL PIPING & VALVES (SEE GENERAL NOTES 1 THRU 24)			<b>Temp/Press Limits :</b> 5040 PSIG AT 100F; 5040 PSIG AT 150F; MAX. TEMP. (See Note 7 & 8)			

Item Name	Range		Det	Rev
Unique/Client* Code	from	to		
<b>GATE VALVE</b> 512GG0001	1/2"	2"	<b>GAT</b>	
Body Mat'l : ASTM A105 Codes : API 602 Body constr. : WELDED BONNET <b>Rating : 2500#</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> 511GG0002	3"	12"	<b>GAT</b>	
Body Mat'l : ASTM A216 GR.WCB Codes : API 600 Body constr. : BOLTED BONNET <b>Rating : 2500#</b> <b>Ends : RTJ</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				

\* Client codes only, not including sizes



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**GATE VALVE N**      8"      12"      **GATN**  
511GG0001

Body Mat'l : ASTM A216 GR.WCB  
Codes : API 600  
Body constr. : BOLTED BONNET  
**Rating : 2500#**  
**Ends : RTJ**  
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.

**DR/VE VALVE**      1/2"      2"      **GAD**  
512GG0002

Body Mat'l : ASTM A105  
Codes : API 602  
Body constr. : WELDED BONNET  
**Rating : 2500#**  
**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

**GLOBE VALVE**      1/2"      2"      **GLO**  
512DG0001

Body Mat'l : ASTM A105  
Codes : API 602 / ASME B16.34  
Body constr. : WELDED BONNET  
**Rating : 2500#**  
**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

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Table with Piping Material Specification header and a grid containing Client Ref., Rev. No., Issue Date, and Page information.

GLOBE VALVE 3" 8" GLO
511DG0001

Body Mat'l : ASTM A216 GR.WCB
Codes : API 600 / ASME B16.34
Body constr. : BOLTED BONNET
Rating : 2500#
Ends : RTJ
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
512CG0001

Body Mat'l : ASTM A105
Codes : API 602 / ASME B16.34
Body constr. : BOLTED CAP
Rating : 2500#
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

CHECK VALVE 3" 12" CHE
511CG0001

Body Mat'l : ASTM A216 GR.WCB
Codes : API 600 / ASME B16.34
Body constr. : BOLTED CAP
Rating : 2500#
Ends : RTJ
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

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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. XXS	PIP
541SG0013				
			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"	.750"	PIP
541SG0014				
			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"	6"	1.125"	PIP
541SG0015				
			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	8"	8"	1.375"	PIP
541SG0016				
			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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PIPE A/G	8"	8"	1.375"	PIP8	[*]
541SGAAAK					
			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	1/2"	2"	SCH. XXS	NIP	
551NC0002					
			Material : C.S. ASTM A106 GR.B		
			Codes : ASME B36.10		
			Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2		
			Ends : T.O.E.		
FLANGE	1/2"	2"	SCH. XXS	FLG	
561WB0008					
			Type : W.N.		
			Material : ASTM A105		
			Codes : ASME B16.5		
			Rating : 2500#		
			Ends : RTJ		
			Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2		
FLANGE	3"	3"	SCH. XXS	FLG	
561WB0008					
			Type : W.N.		
			Material : ASTM A105		
			Codes : ASME B16.5		
			Rating : 2500#		
			Ends : RTJ		
			Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2		
FLANGE	4"	4"	.750"	FLG	
561WB0031					
			Type : W.N.		
			Material : ASTM A105		
			Codes : ASME B16.5		
			Rating : 2500#		
			Ends : RTJ		
			Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2		

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ORIFICE FLG 3" 3" SCH. XXS 561CB0020 FTR

Material : ASTM A105
Component : ORIFICE FLANGE SET, WELD NECK TYPE
Codes : ASME B16.36
Rating : 2500#
Ends : RTJ
Hole Tape : N.2 HOLES 180 DEGREES 3/4" S.W.
Note : WITHOUT BOLTS AND GASKETS. FLANGES SHALL COMPLY WITH JOB SPECS 50A2, 52A2, AND 57B12 (JACK SCREWS).

ORIFICE FLG 4" 4" .750" 561CB0030 FTR

Material : ASTM A105
Component : ORIFICE FLANGE SET, WELD NECK TYPE
Codes : ASME B16.36
Rating : 2500#
Ends : RTJ
Hole Tape : N.2 HOLES 180 DEGREES 3/4" S.W.
Note : WITHOUT BOLTS AND GASKETS. FLANGES SHALL COMPLY WITH JOB SPECS 50A2, 52A2, AND 57B12 (JACK SCREWS).

ORIFICE FLG 6" 6" 1.125" 561CB0031 FTR

Material : ASTM A105
Component : ORIFICE FLANGE SET, WELD NECK TYPE
Codes : ASME B16.36
Rating : 2500#
Ends : RTJ
Hole Tape : N.2 HOLES 180 DEGREES 3/4" S.W.
Note : WITHOUT BOLTS AND GASKETS. FLANGES SHALL COMPLY WITH JOB SPECS 50A2, 52A2, AND 57B12 (JACK SCREWS).

ORIFICE FLG 8" 8" 1.375" 561CB0032 FTR

Material : ASTM A105
Component : ORIFICE FLANGE SET, WELD NECK TYPE
Codes : ASME B16.36
Rating : 2500#
Ends : RTJ
Hole Tape : N.2 HOLES 180 DEGREES 3/4" 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**      **FTRI**  
 561CB0021

Material : ASTM A105  
 Component : ORIFICE FLANGE SET, WELD NECK TYPE  
 Codes : ASME B16.36  
 Rating : **2500#**  
 Ends : **RTJ**  
 Hole Tape : N.4 HOLES 90 DEGREES 3/4" 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. XXS**      **FTRI**  
 561CB0021

Material : ASTM A105  
 Component : ORIFICE FLANGE SET, WELD NECK TYPE  
 Codes : ASME B16.36  
 Rating : **2500#**  
 Ends : **RTJ**  
 Hole Tape : N.4 HOLES 90 DEGREES 3/4" 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"      **.750"**      **FTRI**  
 561CB0033

Material : ASTM A105  
 Component : ORIFICE FLANGE SET, WELD NECK TYPE  
 Codes : ASME B16.36  
 Rating : **2500#**  
 Ends : **RTJ**  
 Hole Tape : N.4 HOLES 90 DEGREES 3/4" 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"      6"      **1.125"**      **FTRI**  
 561CB0034

Material : ASTM A105  
 Component : ORIFICE FLANGE SET, WELD NECK TYPE  
 Codes : ASME B16.36  
 Rating : **2500#**  
 Ends : **RTJ**  
 Hole Tape : N.4 HOLES 90 DEGREES 3/4" 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**      8"      8"      1.375"      FTRI  
561CB0035

Material : ASTM A105  
 Component : ORIFICE FLANGE SET, WELD NECK TYPE  
 Codes : ASME B16.36  
**Rating : 2500#**  
**Ends : RTJ**  
 Hole Tape : N.4 HOLES 90 DEGREES 3/4" 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. XXS      90E  
551EF0037

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**      4"      4"      .750"      90E  
551EF0038

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"      6"      1.125"      90E  
551EF0039

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

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**45 ELBOW**      8"      8"      1.375"      **45E**  
 551EF0036

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

**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. XXS**      **CAP**  
 551EF0041

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"      .750"      **CAP**  
 551EF0042

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**      6"      6"      1.125"      **CAP**  
 551EF0043

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

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<b>CAP</b>	8"	8"	1.375"		<b>CAP</b>
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551EF0044

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

<b>PLUG ORI</b>	1/2"	1/2"			<b>ROUO</b>
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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

<b>CONC. RED.</b>	3"	3"	SCH. XXS		<b>CRE</b>
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551RF0020

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

<b>CONC. RED.</b>	4"	4"	.750"		<b>CRE</b>
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551RF0021

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

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**CONC. RED.**                  6"                  6"                  1.125"                  CRE

551RF0022

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.**                  8"                  8"                  1.375"                  CRE

551RF0023

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"                  8"                  1.375"                  CREIJ [\*]

551RF0034

1.125"

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

[\*]  
[\*]  
[\*]  
[\*]  
[\*]  
[\*]  
[\*]

**ECC.RED.**                  3"                  3"                  SCH. XXS                  ERE

551RF0024

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"                  .750"                  ERE

551RF0025

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

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<b>ECC.RED.</b> 551RF0026	6"	6"	1.125"	ERE
Material : C.S. ASTM A234 WPB Component : ECCENTRIC REDUCER Codes : ASME B16.9 Manufact. : SMLS Ends : <b>B.W.</b> Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2				
<b>ECC.RED.</b> 551RF0027	8"	8"	1.375"	ERE
Material : C.S. ASTM A234 WPB Component : ECCENTRIC REDUCER Codes : ASME B16.9 Manufact. : SMLS Ends : <b>B.W.</b> Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2				
<b>TEE</b> 551HB0019	1/2"	2"		TEE
Material : C.S. ASTM A105 Component : TEE Codes : ASME B16.11 Rating : <b>9000#</b> Ends : <b>S.W.</b> Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2				
<b>TEE</b> 551EF0045	3"	3"	SCH. XXS	TEE
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> 551EF0046	4"	4"	.750"	TEE
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				

\* 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>TEE</b>	<b>6"</b>	<b>6"</b>	<b>1.125"</b>	<b>TEE</b>
551EF0047				

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

<b>TEE</b>	<b>8"</b>	<b>8"</b>	<b>1.375"</b>	<b>TEE</b>
551EF0048				

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

<b>RED.TEE</b>	<b>1/2"</b>	<b>2"</b>		<b>TER</b>
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#**

<b>CONC.SWAGE</b>	<b>1/2"</b>	<b>2"</b>	<b>SCH. XXS</b>	<b>CSA</b>
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.**

<b>CONC.SWAGE</b>	<b>1/2"</b>	<b>4"</b>	<b>SCH. XXS</b>	<b>CSC</b>
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**

\* 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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**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. XXS**      **ELBBW**  
551WB0023

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

**ELBOLET BW**      4"      4"      **.750"**      **ELBBW**  
551WB0024

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

**ELBOLET BW**      6"      6"      **1.125"**      **ELBBW**  
551WB0025

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

Client: Valero Refining Company - Texas

Location: Texas City, Texas

Project: Valero Refinery Reconfiguration (TCRR)

Piping Material Specification			
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**ELBOLET BW**      8"      8"      1.375"      **ELBBW**  
551WB0026

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"      8"      **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"      8"      **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. XXS**      **WOL**  
551WB0020

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

**WELDOLET**      4"      4"      .750"      **WOL**  
551WB0021

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			
Spec. No. : 10087902-SP-50-03			
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**WELDOLET**          6"          6"          1.125"          WOL  
551WB0022

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

**WELDOLET**          8"          8"          1.125"          WOL  
551WB0022

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. XXS          LATBW  
551WB0016

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"          .750"          LATBW  
551WB0017

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

**LATROLET BW**          6"          6"          1.125"          LATBW  
551WB0018

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 BW**      8"      8"      1.375"      **LATBW**  
 551WB0019

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"      8"      **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

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

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<b>Y STRAINER</b> 592YA0013	1/2"	2"	YST
Body Mat'l : ASTM A216 GR.WCB Codes : ACCORDING TO MANUFACTURER'S STD Body constr. : BOLTED CAP <b>Rating : 2500#</b> <b>Ends : S.W.</b> 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.			
<b>TEMP. CONIC.</b> 592TE0008	2"	8"	TCS
<b>Rating : 2500#</b> Codes : ASME B16.5 <b>Ends : RTJ</b> Material : C.S. CONICAL SCREEN. Mesh size : 14 GA PERFORATED PLATE WITH 1/8" DIA. HOLES ON 3/16" CENTERS, 200% OPEN AREA.			
<b>FIGURE 8</b> 561FP0006	1"	8"	F8F [*]
Material : ASTM A516 GR.70 Codes : ASME B16.48 <b>Rating : 2500#</b> <b>Ends : RTJ</b> Face finish : ASME B16.5 Note : FLANGES SHALL COMPLY WITH JOB SPECS 50A2 AND 52A2			
<b>PADDLE BLIND</b> 561PP0010	1"	4"	PBL
Material : ASTM A516 GR.70 Codes : ASME B16.48 <b>Rating : 2500#</b> <b>Ends : RTJ</b> 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)

<b>Piping Material Specification</b>			
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Cases Must Be Approved By The Project Engineering Manager And A Remark Added To The Line List.

6.) 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.

7.) Where Pipe Schedule Is Shown, It Is Adequate For The Conditions Listed In The Temp/Press Limits. Where "CALC" Is Shown, The Pressure Limit May Be Lower Than Flange Rating. See The Project Line List And Applicable Piping Drawing For Details.

8.) 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.

9.) 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.

10.) All Fabrication Shall Comply With 52A1.

11.) Pipe Supports And Spring Hangers Shall Comply With 59A2 And 59A3 Respectively.

12.) "BEP" Nipples Shall Be Cut From Pipe.

13.) 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.

14.) Use Union Or Coupling To Join Pipe. Flanged Joint To Be Used Only Where Indicated On EFD'S.

15.) Couplings Shall Not Be Used For Branch Connections Use Inline Only.

16.) Use Flat Face Valve, Flange & Full Face Gasket To Mate With Flat Face Nozzles Only.

17.) Flanges Shall Not Be Insulated.

18.) Temperature Instrument Connection Shall Be NPS 1-1/2" Flanged.

19.) Pressure Instrument Connection Shall Be NPS 3/4" Socket-Weld.

20.) 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.

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

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

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

24.) Remove Temporary Strainers After Flushing.

END OF DOCUMENT

\* Client codes only, not including sizes



Foster Wheeler USA Corporation

<b>Piping Material Specification</b>			
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 Client: Valero Refining Company - Texas  
 Location: Texas City, Texas  
 Project: Valero Refinery Reconfiguration (TCRR)

**ATTACHMENT "A"**

REINFORCEMENT CHART															
APPLICABLE TO PIPE SPECIFICATION (S) : GA5B															
MATERIAL (S) : CARBON STEEL, SMLS ASTM A106 GR. B										P/SE :		C.A. : 0.125"			
DESIGN LIMIT (S) : 5040 PSIG AT 100F 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			
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	XXS	SK	SK	SK	SK	SK	T								
4	0.75	SK	SK	SK	SK	SK	W	T							
6	1.125	SK	SK	SK	SK	SK	W	W	T						
8	1.375	SK	SK	SK	SK	SK	W	W	W	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.**