



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 : S1 | | | |
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Appr. by: L.SMITH

Issued for : E
 Issued by: T.WILLIAMSON

Checked by: T.WILLIAMSON

Service:
 HIGH PRESSURE STEAM,
 (PWHT REQUIRED FOR > 3/4" WALL)
 (FOR BRANCH CONNECTIONS SEE ATTACHMENT "A")

| | | | | | | |
|---|------------------------------------|---|--|---|--|---|
| Gaskets : SPIRAL WOUND GRAPHITE / S.S.304 | Rating/Facing : CL600 RF | Corrosion : 0.063" (1.5MM) See Note 7 | Facing Finish : ASME B16.5 | Block Valve Trim : API TRIM No. 5 | Weld Quality Insp : PER JOB SPEC -52A1 | Stress Relief : YES >3/4" WALL (Note 8) |
| Materials : CARBON STEEL PIPING & VALVES (SEE GENERAL NOTES 1 THRU 27) | | | Temp/Press Limits : 680 PSIG AT 100F TO 225F; 500 PSIG AT 750F MAX. TEMP. (See Note 9 & 10) | | | |

| Item Name | Range | | Det | Rev |
|--|-------------|------------|-----------------|-------------|
| Unique/Client* Code | from | to | | |
| GATE VALVE 512GQ0021 | 1/2" | 2" | GAT | |
| Body Mat'l : ASTM A105 Codes : API 602 Body constr. : WELDED BONNET Rating : 800# Ends : S.W. Trim constr. : PLAIN SOLID WEDGE, O.S.& Y. Trim Mat'l : API TRIM N.5 (FULL STELLITED) Bolt Mat'l : PER API STANDARD 602. Packing : GRAPHITE PACKING . Note : GENERAL NOTES FOR VALVES: SEE JOB SPEC 59B9 Operator : HANDWHEEL | | | | |
| GATE V. BW 511GD0005 | 3" | 14" | SCH. STD | GATF |
| Body Mat'l : ASTM A216 GR.WCB Codes : API 600 Body constr. : BOLTED BONNET Rating : 600# Ends : B.W. Face finish : ASME B16.5 Trim constr. : PLAIN OR FLEXIBLE SOLID WEDGE, O.S.& Y. Trim Mat'l : API TRIM N.5 (FULL STELLITED) 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 V. BW **16"** **18"** **SCH. XS** **GATJ**
 511GD0006

Body Mat'l : ASTM A216 GR.WCB
 Codes : API 600
 Body constr. : BOLTED BONNET
Rating : 600#
Ends : B.W.
 Face finish : ASME B16.5
 Trim constr. : PLAIN OR FLEXIBLE SOLID WEDGE, O.S.& Y.
 Trim Mat'l : API TRIM N.5 (FULL STELLITED)
 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

GATE V. BW **20"** **24"** **SCH. 40** **GATK**
 511GD0016

Body Mat'l : ASTM A216 GR.WCB
 Codes : API 600
 Body constr. : BOLTED BONNET
Rating : 600#
Ends : B.W.
 Face finish : ASME B16.5
 Trim constr. : PLAIN OR FLEXIBLE SOLID WEDGE, O.S.& Y.
 Trim Mat'l : API TRIM N.5 (FULL STELLITED)
 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

GATE V.FP **1/2"** **2"** **GAFF**
 512GD0005

Body Mat'l : ASTM A105
 Codes : API 602
 Body constr. : BOLTED BONNET, FULL PORT.
Rating : 600#
Ends : RF
 Face finish : ASME B16.5
 Trim constr. : PLAIN SOLID WEDGE, FULL PORT, O.S. & Y.
 Trim Mat'l : API TRIM N.5 (FULL STELLITED)
 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.FP 1/2" 2" **GAFPS**
512GQ0020

Body Mat'l : ASTM A105
Codes : API 602
Body constr. : WELDED BONNET, FULL PORT.
Rating : 800#
Ends : S.W.
Trim constr. : PLAIN SOLID WEDGE, FULL PORT, O.S. & Y.
Trim Mat'l : API TRIM N.5 (FULL STELLITED)
Bolt Mat'l : PER API STANDARD 602.
Packing : GRAPHITE PACKING .
Note : GENERAL NOTES FOR VALVES: SEE JOB SPEC 59B9
Operator : HANDWHEEL

GATE VALVE N 8" 14" **SCH. STD** **GATNF**
511GD0008

Body Mat'l : ASTM A216 GR.WCB
Codes : API 600
Body constr. : BOLTED BONNET
Rating : 600#
Ends : B.W.
Face finish : ASME B16.5
Trim constr. : PLAIN OR FLEXIBLE SOLID WEDGE, O.S.& Y.
Trim Mat'l : API TRIM N.5 (FULL STELLITED)
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 VALVE N 16" 18" **SCH. XS** **GATNJ**
511GD0009

Body Mat'l : ASTM A216 GR.WCB
Codes : API 600
Body constr. : BOLTED BONNET
Rating : 600#
Ends : B.W.
Face finish : ASME B16.5
Trim constr. : PLAIN OR FLEXIBLE SOLID WEDGE, O.S.& Y.
Trim Mat'l : API TRIM N.5 (FULL STELLITED)
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.

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GATE VALVE N **20"** **24"** **SCH. 40** **GATNK**
511GD0017

Body Mat'l : ASTM A216 GR.WCB
Codes : API 600
Body constr. : BOLTED BONNET
Rating : 600#
Ends : B.W.
Face finish : ASME B16.5
Trim constr. : PLAIN OR FLEXIBLE SOLID WEDGE, O.S.& Y.
Trim Mat'l : API TRIM N.5 (FULL STELLITED)
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**
512EQ0011

Body Mat'l : ASTM A105
Codes : API 602
Body constr. : EXTENDED BODY, WELDED BONNET.
Rating : 800#
Ends : MALE PE x FEMALE NPT
Trim constr. : PLAIN SOLID WEDGE, O.S.& Y.
Trim Mat'l : API TRIM N.5 (FULL STELLITED)
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**
512EQ0010

Body Mat'l : ASTM A105
Codes : API 602
Body constr. : EXTENDED BODY, WELDED BONNET.
Rating : 800#
Ends : MALE NPT x FEMALE NPT
Trim constr. : PLAIN SOLID WEDGE, O.S.& Y.
Trim Mat'l : API TRIM N.5 (FULL STELLITED)
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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GATE V.SWxTH 1/2" 2" **GATST**
512GQ0019

Body Mat'l : ASTM A105
Codes : API 602
Body constr. : WELDED BONNET
Rating : 800#
Ends : S.W. x THDD
Trim constr. : PLAIN SOLID WEDGE, O.S.& Y.
Trim Mat'l : API TRIM N.5 (FULL STELLITED)
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**
512GD0007

Body Mat'l : ASTM A105
Codes : API 602
Body constr. : BOLTED BONNET
Rating : 600#
Ends : RF
Face finish : ASME B16.5
Trim constr. : PLAIN SOLID WEDGE, O.S.& Y.
Trim Mat'l : API TRIM N.5 (FULL STELLITED)
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**
512DQ0006

Body Mat'l : ASTM A105
Codes : API 602 / ASME B16.34
Body constr. : WELDED BONNET
Rating : 800#
Ends : S.W.
Trim constr. : LOOSE DISC, O.S. & Y.
Trim Mat'l : API TRIM N.5 (FULL STELLITED)
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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GLOBE V.BW 3" 8" **SCH. STD** **GLOF**
 511DD0003

Body Mat'l : ASTM A216 GR.WCB
 Codes : API 600 / ASME B16.34
 Body constr. : BOLTED BONNET
Rating : 600#
Ends : B.W.
 Face finish : ASME B16.5
 Trim constr. : PLUG DISC TYPE, O.S. & Y.
 Trim Mat'l : API TRIM N.5 (FULL STELLITED)
 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**
 512CQ0006

Body Mat'l : ASTM A105
 Codes : API 602 / ASME B16.34
 Body constr. : BOLTED CAP
Rating : 800#
Ends : S.W.
 Trim constr. : PISTON TYPE,T-BODY,HORIZONTAL INSTALLATION
 Trim Mat'l : API TRIM N.5 (FULL STELLITED)
 Bolt Mat'l : PER API STANDARD 602.
 Gasket Mat'l : PER API STANDARD 602.
 Note : GENERAL NOTES FOR VALVES: SEE JOB SPEC 59B9

CHECK V. B.W 3" 14" **SCH. STD** **CHEF**
 511CD0003

Body Mat'l : ASTM A216 GR.WCB
 Codes : API 600 / ASME B16.34
 Body constr. : BOLTED CAP
Rating : 600#
Ends : B.W.
 Face finish : ASME B16.5
 Trim constr. : SWING TYPE, HORIZONTAL & VERTICAL INSTALLATION
 Trim Mat'l : API TRIM N.5 (FULL STELLITED)
 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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CHECK V. B.W 16" 18" SCH. XS CHEJ
511CD0004

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

CHECK V. B.W 20" 24" SCH. 40 CHEK
511CD0009

Body Mat'l : ASTM A216 GR.WCB
Codes : API 600 / ASME B16.34
Body constr. : BOLTED CAP
Rating : 600#
Ends : B.W.
Face finish : ASME B16.5
Trim constr. : SWING TYPE, HORIZONTAL & VERTICAL INSTALLATION
Trim Mat'l : API TRIM N.5 (FULL STELLITED)
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. XS PIP
541SG0001

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" 14" SCH. STD PIP
541SG0002

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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ORIFICE FLG 2" 2" **SCH. XS** **FTR**
561CB0011

Material : ASTM A105
Component : ORIFICE FLANGE SET, WELD NECK TYPE
Codes : ASME B16.36
Rating : **600#**
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" 14" **SCH. STD** **FTR**
561CB0013

Material : ASTM A105
Component : ORIFICE FLANGE SET, WELD NECK TYPE
Codes : ASME B16.36
Rating : **600#**
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. XS** **FTRI**
561CB0012

Material : ASTM A105
Component : ORIFICE FLANGE SET, WELD NECK TYPE
Codes : ASME B16.36
Rating : **600#**
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" 14" **SCH. STD** **FTRI**
561CB0036

Material : ASTM A105
Component : ORIFICE FLANGE SET, WELD NECK TYPE
Codes : ASME B16.36
Rating : **600#**
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 16" 16" SCH. XS FTRI
561CB0012

Material : ASTM A105
Component : ORIFICE FLANGE SET, WELD NECK TYPE
Codes : ASME B16.36
Rating : 600#
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
551HB0001

Material : C.S. ASTM A105
Component : 90 DEGREES ELBOWS
Codes : ASME B16.11
Rating : 3000#
Ends : S.W.
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

90 ELBOW 3" 14" SCH. STD 90E
551EF0001

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" 18" 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 20" 24" 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

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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

45 ELBOW 1/2" 2" 45E
551HB0002

Material : C.S. ASTM A105
Component : 45 DEGREES ELBOWS
Codes : ASME B16.11
Rating : **3000#**
Ends : **S.W.**
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

45 ELBOW 3" 14" SCH. STD 45E
551EF0003

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 16" 18" 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 20" 24" 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

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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

551HB0003

Material : C.S. ASTM A105
 Component : CAP
 Codes : ASME B16.11
 Rating : **3000#**
 Ends : **S.W.**
 Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

CAP 3" 14" SCH. STD CAP

551EF0006

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 16" 18" SCH. XS CAP

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

CAP 20" 24" SCH. 40 CAP

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

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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" 14" **SCH. STD** **ERE**
551RF0003

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" 18" **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

ECC.RED. 20" 24" **SCH. 40** **ERE**
551RF0018

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)

| Piping Material Specification | | | |
|-------------------------------|----------|------------|------|
| Spec. No. : 10087902-SP-50-03 | | | |
| Class : S1 | | | |
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ECC.SWAGE 1/2" 4" **SCH. XS** **ESC**
551SC0007

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" 14" **SCH. STD** **ELBBW**
551WB0001

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**
551LB0010

Material : C.S. ASTM A105
Component : ELBOLET
Codes : MSS SP97
Ends : **S.W.**
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2
Rating : **3000#**

SOCKOLET 1/2" 36" **SOL**
551LB0011

Material : C.S. ASTM A105
Component : SOCKOLET
Codes : MSS SP97
Ends : **S.W.**
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2
Rating : **3000#**

FLAT SOL 1/2" 36" **SOF**
551LB0025

Material : C.S. ASTM A105
Component : FLAT SOCKOLET
Codes : MSS SP97
Ends : **S.W.**
Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2
Rating : **3000#**

* 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 | | | |
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| | | | | |
|---|-----|-----|-----------------------------------|--------------|
| WELDOLET 551WB0002 | 3" | 14" | SCH. STD | WOL |
| Material : C.S. ASTM A105 Component : WELDOLET Codes : MSS SP97 Ends : B.W. Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2 | | | | |
| WELDOLET 551WB0013 | 16" | 18" | SCH. XS | WOL |
| Material : C.S. ASTM A105 Component : WELDOLET Codes : MSS SP97 Ends : B.W. Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2 | | | | |
| WELDOLET 551WB0014 | 20" | 24" | SCH. 40 | WOL |
| Material : C.S. ASTM A105 Component : WELDOLET Codes : MSS SP97 Ends : B.W. Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2 | | | | |
| FLAT WOL 551WB0040 | 3" | 18" | SCH. XS SCH. STD | WOFJF |
| Material : C.S. ASTM A105 Component : FLAT WELDOLET Codes : MSS SP97 Ends : B.W. Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2 | | | | |
| LATROLET BW 551WB0003 | 3" | 14" | SCH. STD | 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



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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LATROLET SW **1/2" 36"** **LATS**
 551LB0012

Material : C.S. ASTM A105
 Component : LATROLET
 Codes : MSS SP97
 Ends : **S.W.**
 Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2
 Rating : **3000#**

FULL CPLG. **1/2" 2"** **CPL**
 551HB0007

Material : C.S. ASTM A105
 Component : FULL COUPLING
 Codes : ASME B16.11
 Rating : **3000#**
 Ends : **S.W.**
 Note : FITTINGS SHALL COMPLY WITH JOB SPEC 52A2

STEAM TRAP **3/4" 3/4"** **STR**
 579DA0003

Body Mat'l : ASTM A105
 Intern.Mat'l : S.S. TYPE 304
 Type : DISC-TYPE THERMODYNAMIC TRAP, INTEGRAL STRAINER WITH SS SCREEN AND INTEGRAL BLOW-OFF VALVE.SPIRAX/SARCO UTD-52L-HP.
 Gasket Mat'l : AS PER MANUFACTURER'S STANDARD (ASBESTOS NOT PERMITTED)
 Rating : **600#**
 Ends : **S.W.**

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



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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| Spec. No. : 10087902-SP-50-03 | | | |
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GASK.16.47/B 30" 36" **GA1**
 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

GASK.16.47/A 30" 36" **GA2**
 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

GASKET 1/2" 24" **GAS**
 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 | | | |
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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.) Det 'PIPP' To Be Used With SW x T Valves Only.

16.) The Crotch Thickness Of The Branch Outlet Of Butt weld Tees Shall Be No Less Than 150% Of The Nominal Wall Thickness Of The Tee. The Crotch Radius Of The Branch Outlet Of Butt weld Tees Shall Be No Less Than 12.5% Of The Branch Outlet OD.

17.) Use Coupling To Join Pipe. Flanged Joint To Be Used Only Where Required For Breakout.

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.

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: S1

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) : S1 | | | | | | | | | | | | | | | | | | | | |
| MATERIAL (S) : CARBON STEEL, SMLS ASTM A106 GR. B | | | | | | | | | | | P/SE : | | C.A. : 0.063" | | | | | | | |
| CARBON STEEL, EFW, ASTM A672 GR. C70 CL.12 | | | | | | | | | | | | | | | | | | | | |
| DESIGN LIMIT (S) : 1480 PSIG AT -20F TO 100F; 825 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 | 30 | 36 | |
| 1/2 | XS | T | | | | | | | | | | | | | | | | | | |
| 3/4 | XS | RT | T | | | | | | | | | | | | | | | | | |
| 1 | XS | RT | RT | T | | | | | | | | | | | | | | | | |
| 1 1/2 | XS | RT | RT | RT | T | | | | | | | | | | | | | | | |
| 2 | XS | RT | RT | RT | RT | T | | | | | | | | | | | | | | |
| 3 | SPEC | SK | SK | SK | SK | SK | T | | | | | | | | | | | | | |
| 4 | SPEC | SK | SK | SK | SK | SK | W | T | | | | | | | | | | | | |
| 6 | SPEC | SK | SK | SK | SK | SK | W | W | T | | | | | | | | | | | |
| 8 | SPEC | SK | SK | SK | SK | SK | W | W | W | T | | | | | | | | | | |
| 10 | SPEC | SK | SK | SK | SK | SK | W | W | W | W | T | | | | | | | | | |
| 12 | SPEC | SK | SK | SK | SK | SK | W | W | W | W | W | T | | | | | | | | |
| 14 | SPEC | SK | SK | SK | SK | SK | W | W | W | W | W | W | T | | | | | | | |
| 16 | SPEC | SK | SK | SK | SK | SK | W | W | W | W | W | W | CA | T | | | | | | |
| 18 | SPEC | SK | SK | SK | SK | SK | W | W | W | W | W | W | CA | CA | T | | | | | |
| 20 | SPEC | SK | SK | SK | SK | SK | W | W | W | W | W | W | CA | CA | CA | T | | | | |
| 24 | SPEC | 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.