Salishan Uprate 2012
Job Number: 887024719
Design Pressure Calculations

Salishan Supply

Facility ID	Worksheets
020.A-1	Design Pressure Worksheet
	Branch Calculation Worksheet
020.A-4	Design Pressure Worksheet
020.A-5	Design Pressure Worksheet
020.A-1.B	Design Pressure Worksheet
020.A-1.C	Design Pressure Worksheet
	Branch Calculation Worksheet
020.A-1.D	Design Pressure Worksheet
020.A-1.E	Design Pressure Worksheet
020.A-1.F	Design Pressure Worksheet
	Branch Calculation Worksheet
020.B-1	Design Pressure Worksheet
020.C-1	Design Pressure Worksheet
	Branch Calculation Worksheet
020.U-1	Design Pressure Worksheet
	Branch Calculation Worksheet
020.U-2	Design Pressure Worksheet
	Branch Calculation Worksheet
020.U-3	Design Pressure Worksheet
020.U-4	Design Pressure Worksheet
	Branch Calculation Worksheet
020.AR-1	Design Pressure Worksheet
	Branch Calculation Worksheet
RS-0266 (RETIRED)	Design Pressure Worksheet
RS-0983 (RETIRED)	Design Pressure Worksheet
RS-1031 (RETIRED)	Design Pressure Worksheet
RS-1220 (RETIRED)	Design Pressure Worksheet
RS-1306 (RETIRED)	Design Pressure Worksheet
RS-1327 (RETIRED)	Design Pressure Worksheet
RS-1371 (RETIRED)	Design Pressure Worksheet
RS-1404 (RETIRED)	Design Pressure Worksheet
RS-1418 (RETIRED)	Design Pressure Worksheet
RS-1472 (RETIRED)	Design Pressure Worksheet
RS-1480 (RETIRED)	Design Pressure Worksheet
RS-1538 (RETIRED)	Design Pressure Worksheet

RS-1868 (RETIRED)	Design Pressure Worksheet
RS-1877 (RETIRED)	Design Pressure Worksheet
RS-1973 (RETIRED)	Design Pressure Worksheet
RS-2123 (RETIRED)	Design Pressure Worksheet
RS-2311	Design Pressure Worksheet
	Branch Calculation Worksheet
RS-2695	Design Pressure Worksheet
	Branch Calculation Worksheet
RS-2696	Design Pressure Worksheet
	Branch Calculation Worksheet
RS-2697	Design Pressure Worksheet
	Branch Calculation Worksheet
RS-2968	Design Pressure Worksheet
	Branch Calculation Worksheet
RS-2723	Design Pressure Worksheet
	Branch Calculation Worksheet

Pierce Transit Supply

Facility ID	Worksheets
020.X-1	Design Pressure Worksheet
	Branch Calculation Worksheet
020.X-2	Design Pressure Worksheet
	Branch Calculation Worksheet
020.Y-1	Design Pressure Worksheet
	Branch Calculation Worksheet
020.Y-1.A	Design Pressure Worksheet
020.Y-1.B	Design Pressure Worksheet
020.Z-1	Design Pressure Worksheet
	Branch Calculation Worksheet
020.Z-1.A	Design Pressure Worksheet
020.Z-1.B	Design Pressure Worksheet
020.Z-1.C	Design Pressure Worksheet
020.Z-1.D	Design Pressure Worksheet
020.Z-1.E	Design Pressure Worksheet
020.Z-1.F	Design Pressure Worksheet
020.Z-1.G	Design Pressure Worksheet
020.AA-1	Design Pressure Worksheet
	Branch Calculation Worksheet
020.AA-1.A	Design Pressure Worksheet
	Branch Calculation Worksheet
020.AB-1	Design Pressure Worksheet

	Branch Calculation Worksheet
020.AC-1	Design Pressure Worksheet
	Branch Calculation Worksheet
020.AC-1.A	Design Pressure Worksheet
020.AC-1.B	Design Pressure Worksheet
020.AS-1	Design Pressure Worksheet
020.AT-1	Design Pressure Worksheet
020.AU-1	Design Pressure Worksheet
020.AV-1	Design Pressure Worksheet
	Branch Calculation Worksheet
020.AW-1	Design Pressure Worksheet
RS-2558	Design Pressure Worksheet
	Branch Calculation Worksheet
HPS-0001 – HPS-0021	Design Pressure Worksheet
HPS-0022	Design Pressure Worksheet
	Branch Calculation Worksheet
HPS-0023 – HPS-0052	Design Pressure Worksheet

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	020_A-1
Facility Type	HP PIPE SEGMENT

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Reviewed By	Review Completion Date	Reviewed By	Review Completion Date
1	60S-323	Sailshan HP Supply	3D05-321	10/25/1950	R Nakano	6/10/2011	C Koo	6/10/2011
2	109017759	Relocation 020-A-1F - Added Fittings	3D05-321	4/25/2005	C Koo	6/10/2011	C Koo	6/10/2011
3	718-274	RS-1418 Tie-In	71D-305	6/22/1971	C Koo	6/20/2011	C Koo	6/21/2011
4	109023568	RS-2698 Tie-In	3D11-560	1/5/2006	C Koo	6/20/2011	C Koo	6/21/2011
5	72S-500	RS-1538 Tie-In	72S-500	9/18/1972	C Koo	6/21/2011	C Koo	6/21/2011
6	D-4	RS-1868 Tie-In	N/A	6/26/1960	C Koo	6/21/2011	C Koo	6/21/2011
7	67S-355	RS-1031 Tie-In	67S-355	9/1/1967	C Koo	6/21/2011	C Koo	6/21/2011
8	66S-1019	RS-0983 Tie-In	66s-1019	1/1/1967	C Koo	6/21/2011	C Koo	6/21/2011
9	109023562	RS-2695 Tie-In	3D11-538	12/22/2005	C Koo	6/21/2011	C Koo	6/21/2011
10	109008726	Relocation 020-A-1C - Added Fittings	3D7-400	5/11/2001	C Koo	6/21/2011	C Koo	6/21/2011
11	887028747	Install Gauge Point	3D05-321	TBD	D Frieze	6/21/2012	D Frieze	6/21/2012

Facility Evaluation Summary

Facility Design Pressure	531	
Design Factor	0.4	(Class 4 Location)
Pipe Design Pressure	610.3	
Non-Rated Fitting Design Pressure	610.0	
Rated Fitting Rated Pressure	610.0	
Branch Connection Design Pressure	531.5	
Current System MAOP	150.0	
The Highest % SMYS of the Facility at the Current System MAOP	9.8%	
Proposed system MAOP	250.0	
The Highest % SMYS of the Facility at the Proposed System MAOP	16.4%	

Table 1 - Pipe Design Pressure

Enter MID#, PO#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	1	Not Noted	8" PIPE X 0.188 WALL Gr.B	ACTIVE	8"	0.188	Gr.B	610	9.83%	16.38%	Thickness - Historical Spec
11	2	9997607	3/4" PIPE X 0.154 WALL Gr.B	ACTIVE	3/4"	0.154	Gr.B	4107	1.46%	2.44%	

THE LOWEST DESIGN PRESSURE: 610 9.8% 16.4%

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, PO#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	8	Not Noted	8" Weld Ell X 0.188 WALL Gr.B	ACTIVE	8"	0.188			Gr.B	Weld Ell	610	9.83%	16.38%	Thickness & grade - Historical Spec.
1	9	Not Noted	8" Weld Cap X 0.188 WALL Gr.B	ACTIVE	8"	0.188			Gr.B	Weld Cap	610	9.83%	16.38%	Thickness & grade - Historical Spec.
1	12	Not Noted	8" Weld Tee X 0.188 WALL Gr.B	ACTIVE	8"	0.188			Gr.B	Weld Tee	610	9.83%	16.38%	Thickness & grade - Historical Spec.
2	23	5200739	8" Weld Cap X 0.322 WALL X-42	ACTIVE	8"	0.322			X-42	Weld Cap	1254	4.78%	7.97%	Add-on Fitting from 020-A-1-F
10	5	5200740	8" Weld Cap X 0.188 WALL X-42	ACTIVE	8"	0.188			X-42	Weld Cap	732	8.19%	13.65%	Add-on Fitting from 020-A-1-C
3	N/A	N/A	2" Fishmouth X 0.154 WALL Gr.A25	ACTIVE	2"	0.154			Gr.A25	Fishmouth	776	4.63%	7.71%	Tie-In Fitting for RS-1418 (retired)
11	3	9996424	3/4" X TH 3/4" Nipple 0.154 X 0.11653 WALL Gr.B	ACTIVE	3/4"	0.154	TH 3/4"	0.11653	Gr.B	Nipple	3346	1.79%	2.99%	
11	7	9997605	3/4" Elbow X 0.154 WALL Gr.B	ACTIVE	3/4"	0.154			Gr.B	Elbow	4107	1.46%	2.44%	

THE LOWEST DESIGN PRESSURE: 610 9.8% 16.4%

Table 3 - Rated Fittings Rated Pressure

Enter MID#, PO#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
1	3	Not Noted	8" Valve Nordstrom, Fig 4249-1/4 CLASS 300 WOP 720PSIG	ACTIVE	8"	CLASS 300	Valve	Nordstrom, Fig 4249-1/4	720	
2	25	6800841	2" Save-A-Valve Mueller H17491 WOP 1440PSIG	ACTIVE	2"		Save-A-Valve	Mueller H17491	1440	w/ Weld-o-let
2	26	4500220521	2" x 8" Weld-o-let WOP 627PSIG	ACTIVE	2"		x 8" Weld-o-let		627	Branch fitting
2	24	9995337	1" Save-A-Valve Mueller H17491 WOP 1440PSIG	ACTIVE	1"		Save-A-Valve	Mueller H17491	1440	Add-on fitting 020-A-1F
2	21	7800796	8" B/O Linestopper Mueller H17281 CLASS 300 WOP 720PSIG	ACTIVE	8"	CLASS 300	B/O Linestopper	Mueller H17281	720	Branch to 020-A-1F
4	1	7800775	2" Service Tee Mueller H-17650 (Upgraded) WOP 1440PSIG	ACTIVE	2"		Service Tee	Mueller H-17650 (Upgraded	1440	Branch to RS-2698
5	N/A	N/A	3/4" Punch-It Tee Mueller H-18101 WOP 1200PSIG	ACTIVE	3/4"		Punch-It Tee	Mueller H-18101	1200	Branch to RS-1538
6	N/A	N/A	1" Valve Tee H-17656 WOP 1200PSIG	ACTIVE	1"		Valve Tee	H-17656	1200	Branch to RS-1868
7	N/A	N/A	3/4" Punch-It Tee Mueller H-18102 WOP 1200PSIG	ACTIVE	3/4"		Punch-It Tee	Mueller H-18102	1200	Branch to RS-1031
8	N/A	N/A	3/4" Punch-It Tee Mueller H-18102 WOP 1200PSIG	ACTIVE	3/4"		Punch-It Tee	Mueller H-18102	1200	Branch to RS-0983
9	1	7600786	8" B/O Stopper Mueller H-17281 CLASS 300 WOP 720PSIG	ACTIVE	8"	CLASS 300	B/O Stopper	Meuller H-17281	720	Branch to RS-2695
10	1	7600786	8" B/O Stopper Meuller H-17281 CLASS 300 WOP 720PSIG	ACTIVE	8"	CLASS 300	B/O Stopper	Meuller H-17281	720	Branch to 020-A-1C
10	7	9995337	1" Save-A-Valve Mueller H-17491 WOP 1440PSIG	ACTIVE	1"		Save-A-Valve	Mueller H-17491	1440	Add-on fitting 020-A-1C
10	6	6800841	2" Save-A-Valve Mueller H-17491 WOP 1440PSIG	ACTIVE	2"		Save-A-Valve	Mueller H-17491	1440	Add-on fitting 020-A-1C
3	N/A	N/A	8" x 4" Weld-O-Let WOP 810PSIG	ACTIVE	8"		x 4" Weld-O-Let		810	Branch to RS-1418 Bypass Valve
11	5	7200024	3/4" Plug 6000 WOP 6000PSIG	ACTIVE	3/4"	6000	Plug		6000	
11	4	9998141	3/4" Ball Valve 2000 WOP 2000PSIG	ACTIVE	3/4"	2000	Ball Valve		2000	
11	1	7600812	3/4" Service Tee H-17501 WOP 1440PSIG	ACTIVE	3/4"		Service Tee	H-17501	1440	

THE LOWEST PRESSURE RATING: 610

Design Pressure Calculation on a Branch

Design Factor (F)	0.4
Current MAOP	150
Proposed MAOP	250

Dimensions											
	Job Key of the Header Pipe	1	1	1	1	1	1	1	1	1	1
	Header OD (inch)	8.625	8.625	8.625	8.625	8.625	8.625	8.625	8.625	8.625	8.625
	Header Wall Thickness (inch)	0.188	0.188	0.188	0.188	0.188	0.188	0.188	0.188	0.188	0.188
	Header Yield Strength	35000	35000	35000	35000	35000	35000	35000	35000	35000	35000
	Header Longitudinal Joint Factor	1	1	1	1	1	1	1	1	1	1
	Job Key of the Branch	2	3	4	5	6	7	8	10	10	11
	Branch Fitting Description	1" Save-A-Valve	2" Pipe	2" Tee H-17650	3/4" Tee H-18101	1" Tee H-17656	3/4" Tee H-18102	3/4" Tee H-18102	1" Save-a-Valve	2" Save-a-Valve	1" H-17501
	Branch OD (inch)	1.125	2.375	2.410	1.180	1.430	1.180	1.180	1.125	2.218	1.430
	Branch Wall Thickness (inch)	0.178	0.154	0.27	0.181	0.18	0.181	0.181	0.178	0.234	0.18
	Branch Yield Strength (psi)	36000	25000	36000	36000	36000	36000	36000	36000	36000	36000
	Branch Longitudinal Joint Factor	1	0.6	1	1	1	1	1	1	1	1
	Temperature Derating Factor (from Header)	1	1	1	1	1	1	1	1	1	1
	Tap Size (Maximum) (inch)	0.769	2.067	1.87	0.818	1.07	0.818	0.818	0.769	1.75	1.07
	Tap Size (inch)	0.769	2.067	1.87	0.818	1.07	0.818	0.818	0.769	1.75	1.07
	Recommended Fitting Weld Leg (in)	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
	Fitting Weld Length (in)	0.25	0	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
Effective A3 Provided by Additional Reinforcement											
	Max 'Usable' Length (OD) of additional Reinforcement	1.538	4.134	3.74	1.636	2.14	1.636	1.636	1.538	3.5	2.14
	OD of Additional Reinforcement (inch)	0	3.375	0	0	0	0	0	0	0	0
	Thickness of Additional Reinforcement M (inch)	0	0.188	0	0	0	0	0	0	0	0
	Yield Strength of Additional Reinforcement (psi)	0	35000	0	0	0	0	0	0	0	0
Effective A3 Provided by Weldments											
	Max Header Weld Leg Length for A3 (inch)	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
	Header Weld Leg Length for A3 (inch)	0	0.25	0	0	0	0	0	0	0	0
	Max Branch Weld Leg Length for A3 (inch)	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
	Branch Weld Leg Length for A3 (inch)	0	0.25	0	0	0	0	0	0	0	0
Conclusion and Calculation Summary											
	Design Pressure (psig)	715.009231	572.4185821	542.6609133	701.6387322	604.7303862	701.6387322	701.6387322	715.009231	531.4649319	604.7304
	L (inch)	0.445	0.47	0.47	0.4525	0.45	0.4525	0.4525	0.445	0.47	0.45
	d – OD/2 (Max Reinforcement Width)	0.2065	0.8795	0.665	0.228	0.355	0.228	0.228	0.2065	0.641	0.355
	t (inch)	0.220248379	0.176325367	0.167158942	0.216129788	0.186278556	0.216129788	0.216129788	0.220248379	0.16371018	0.186279
	tb (inch)	0.027930048	0.113291178	0.045410167	0.028747698	0.030026543	0.028747698	0.028747698	0.027930048	0.040930181	0.030027
	Ar (sq in)	0.169371004	0.364464533	0.312587222	0.176794167	0.199318055	0.176794167	0.176794167	0.169371004	0.286492815	0.199318
	A1 (sq in)	0	0.024131467	0.038972778	0	0.001841945	0	0	0	0.042507185	0.001842
	A2 (sq in)	0.133562257	0.038266293	0.211114443	0.137788333	0.134976111	0.137788333	0.137788333	0.133562257	0.18148563	0.134976
	A2' (sq in)	0.133562257	0.027333066	0.211114443	0.137788333	0.134976111	0.137788333	0.137788333	0.133562257	0.18148563	0.134976
	A3 (Fitting Weld Material)	0.06060775	0	0.0625	0.062016	0.0625	0.062016	0.062016	0.06060775	0.0625	0.0625
	A3 Reinforcement (sq in)	0	0.188	0	0	0	0	0	0	0	0
	A3 Weldment (sq in)	0	0.125	0	0	0	0	0	0	0	0
	A3 (sq in)	0.06060775	0.313	0.0625	0.062016	0.0625	0.062016	0.062016	0.06060775	0.0625	0.0625
	Status (Branch Status from Calculation Worksheet)	Active	Active	Active	Active	Active	Active	Active	Active	Active	Active
	Design Pressure Evaluation	715.009231	572.4185821	542.6609133	701.6387322	604.7303862	701.6387322	701.6387322	715.009231	531.4649319	604.7304

Branch Connection with Weld-o-let

Table 4A - Basic Input

Job Key of the Header Pipe (Table 1)	1	1
Header OD (inch)	8.625	8.625
Header Wall Thickness (inch)	0.188	0.188
Header Yield Strength	35000	35000
Job Key of the Branch (Table 1/2/3)	2	3
Branch Fitting Description	2" Salve-A-Valve	4" Fig 2245-1/2 Valve

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	020. A-4
Facility Type	HP PIPE SEGMENT

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Reviewed By	Review Completion Date	Reviewed By	Review Completion Date
1	605-323	Salishan HP Supply	3005-321	10/25/1960	R Nakano	7/18/2011	C Kob	7/18/2011

Facility Evaluation Summary

Facility Design Pressure	812
Design Factor	0.4 (Class 4 Location)
Pipe Design Pressure	811.6
Non-Rated Fitting Design Pressure	N/A
Rated Fitting Rated Pressure	N/A
Branch Connection Design Pressure	N/A
Current System MAOP	150.0
The Highest % SMYS of the Facility at the Current System MAOP	7.4%
Proposed system MAOP	250.0
The Highest % SMYS of the Facility at the Proposed System MAOP	12.3%

Table 1 - Pipe Design Pressure

Enter MID#, PO#, or "PO" in this field

Select Date from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	9	Not Noted	8" PIPE X 0.25 WALL Gr.B	ACTIVE	8"	0.25	Gr.B	812	7.39%	12.32%	Hist Spec

THE LOWEST DESIGN PRESSURE: 812 7.4% 12.3%

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, PO#, or "PO" in this field

Select Date from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP

THE LOWEST DESIGN PRESSURE:

Table 3 - Rated Fittings Rated Pressure

Enter MID#, PO#, or "PO" in this field

Select Date from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments

THE LOWEST PRESSURE RATING:

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	020, A-5
Facility Type	HP PIPE SEGMENT

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	803-323	Salishan HP Supply	3D05-321	10/25/1980	R Nakano	3/30/2011	C Koo	3/30/2011
2	887028747	Install Gauge Points	3D05-321	TBD	D Frieze	6/21/2012	D Frieze	8/21/2012

Facility Evaluation Summary

Facility Design Pressure	549	
Design Factor	0.4	(Class 4 Location)
Pipe Design Pressure	549.0	
Non-Rated Fitting Design Pressure	549.0	
Rated Fitting Rated Pressure	720.0	
Branch Connection Design Pressure	604.7	
Current System MAOP	150.0	
The Highest % SMYS of the Facility at the Current System MAOP	10.9%	
Proposed system MAOP	250.0	
The Highest % SMYS of the Facility at the Proposed System MAOP	18.2%	

Table 1 - Pipe Design Pressure

Enter MID#, PO#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	2	Not Noted	12" PIPE X 0.25 WALL Gr.B	ACTIVE	12"	0.25	Gr.B	549	10.93%	18.21%	Historic pipe spec
2	2	9997607	3/4" PIPE X 0.154 WALL Gr.B	ACTIVE	3/4"	0.154	Gr.B	1122	1.46%	2.44%	

THE LOWEST DESIGN PRESSURE: 549 10.9% 18.2%

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, PO#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	11	Not Noted	12" X 12" Weld Tee 0.25 X 0.25 WALL Gr.B	ACTIVE	12"	0.25	12"	0.25	Gr.B	Weld Tee	549	10.93%	18.21%	Historic pipe spec
1	13	Not Noted	12" X 8" Weld Reducer 0.25 X 0.219 WALL Gr.B	ACTIVE	12"	0.25	8"	0.219	Gr.B	Weld Reducer	549	10.93%	18.21%	Historic pipe spec
2	3	9996424	3/4" X TH 3/4" Nipole 0.154 X 0.11653 WALL Gr.B	ACTIVE	3/4"	0.154	TH 3/4"	0.11653	Gr.B	Nipole	914	1.79%	2.99%	
2	7	9997805	3/4" Elbow X 0.154 WALL Gr.B	ACTIVE	3/4"	0.154			Gr.B	Elbow	1122	1.46%	2.44%	

THE LOWEST DESIGN PRESSURE: 549 10.9% 18.2%

Table 3 - Rated Fittings Rated Pressure

Enter MID#, PO#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
1	14	Not Noted	12" Flange, WN, RF Unknown CLASS 300 WOP 720PSIG	ACTIVE	12"	CLASS 300	Flange, WN, RF	Unknown	720	
2	6	7200024	3/4" Plug 6000 WOP 6000PSIG	ACTIVE	3/4"	6000	Plug		6000	
2	4	9995141	3/4" Ball Valve, 2000 WOP 2000PSIG	ACTIVE	3/4"	2000	Ball Valve		2000	
2	1	7800612	3/4" Service Tee H-17501 WOP 1440PSIG	ACTIVE	3/4"		Service Tee	H-17501	1440	

THE LOWEST PRESSURE RATING: 720

Design Pressure Calculation on a Branch

Design Factor (F)	0.4
Current MAOP	
Proposed MAOP	

Dimensions	
Job Key of the Header Pipe	1
Header OD (inch)	8.625
Header Wall Thickness (inch)	0.188
Header Yield Strength	35000
Header Longitudinal Joint Factor	1
Job Key of the Branch	11
Branch Fitting Description	1" H-17501
Branch OD (inch)	1.430
Branch Wall Thickness (inch)	0.18
Branch Yield Strength (psi)	36000
Branch Longitudinal Joint Factor	1
Temperature Derating Factor (from Header)	1
Tap Size (Maximum) (inch)	1.07
Tap Size (inch)	1.07
Recommended Fitting Weld Leg (in)	0.25
Fitting Weld Length (in)	0.25
Effective A3 Provided by Additional Reinforcement	
Max 'Usable' Length (OD) of additional Reinforcement	2.14
OD of Additional Reinforcement (inch)	0
Thickness of Additional Reinforcement M (inch)	0
Yield Strength of Additional Reinforcement (psi)	0
Effective A3 Provided by Weldments	
Max Header Weld Leg Length for A3 (inch)	0.25
Header Weld Leg Length for A3 (inch)	0
Max Branch Weld Leg Length for A3 (inch)	0.25
Branch Weld Leg Length for A3 (inch)	0
Conclusion and Calculation Summary	
Design Pressure (psig)	604.7303862
L (inch)	0.45
d – OD/2 (Max Reinforcement Width)	0.355
t (inch)	0.186278556
tb (inch)	0.030026543
Ar (sq in)	0.199318055
A1 (sq in)	0.001841945
A2 (sq in)	0.134976111
A2' (sq in)	0.134976111
A3 (Fitting Weld Material)	0.0625
A3 Reinforcement (sq in)	0
A3 Weldment (sq in)	0
A3 (sq in)	0.0625
Status (Branch Status from Calculation Worksheet)	Active
Design Pressure Evaluation	604.7303862

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	020_A-18
Facility Type	HP PIPE SEGMENT

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	618-139	Install 8" STW HP	618-139	2/20/1983	R Nelkens	3/30/2011	C Fee	3/30/2011

Facility Evaluation Summary

Facility Design Pressure	610
Design Factor	0.4 (Class 4 Location)
Pipe Design Pressure	610.3
Non-Rated Fitting Design Pressure	N/A
Rated Fitting Rated Pressure	N/A
Branch Connection Design Pressure	N/A
Current System MAOP	150.0
The Highest % SMYS of the Facility at the Current System MAOP	9.8%
Proposed system MAOP	250.0
The Highest % SMYS of the Facility at the Proposed System MAOP	16.4%

Table 1 - Pipe Design Pressure

Enter MIDM, POM, or "PO" in this field | Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1		None	8" PIPE X 0.188 WALL Gr.B	ACTIVE	8"	0.188	Gr.B	610	9.83%	16.39%	Historic pipe spec

THE LOWEST DESIGN PRESSURE: 610 10% 16%

Table 2 - Non-Rated Fitting Design Pressure

Enter MIDM, POM, or "PO" in this field | Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments

THE LOWEST DESIGN PRESSURE:

Table 3 - Rated Fittings Rated Pressure

Enter MIDM, POM, or "PO" in this field | Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments

THE LOWEST PRESSURE RATING:

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID: 020, A-1.C
Facility Type: HP PIPE SEGMENT

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	109006726	Salishan HP Supply Reloc, 38XX E M St, Tacoma	3D7400	8/11/2001	R Nakano	6/21/2011	C Koo	6/21/2011

Facility Evaluation Summary

Facility Design Pressure	720
Design Factor	0.4 (Class 4 Location)
Pipe Design Pressure	1264.4
Non-Rated Fitting Design Pressure	1264.0
Rated Fitting Rated Pressure	720.0
Branch Connection Design Pressure	882.1
Current System MAOP	150.0
The Highest % SMYS of the Facility at the Current System MAOP	4.8%
Proposed system MAOP	250.0
The Highest % SMYS of the Facility at the Proposed System MAOP	8.0%

Table 1 - Pipe Design Pressure

Enter MID#, PO#, or "PO" in this field. | Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	2	7000621	8" PIPE X 0.322 WALL X-42	ACTIVE	8"	0.322	X-42	1264	4.78%	7.97%	

THE LOWEST DESIGN PRESSURE: 1254 4.8% 8.0%

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, PO#, or "PO" in this field. | Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP
1	3	6000801	8" 45 degree Ell X 0.322 WALL X-42	ACTIVE	8"	0.322			X-42	45 degree Ell	1264	4.78%	7.97%
1	4	6000814	8" 90 degree Ell X 0.322 WALL X-42	ACTIVE	8"	0.322			X-42	90 degree Ell	1264	4.78%	7.97%

THE LOWEST DESIGN PRESSURE: 1254 4.8% 8.0%

Table 3 - Rated Fittings Rated Pressure

Enter MID#, PO#, or "PO" in this field. | Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
1	1	7600796	8" BO Stopper Mueller, H-17281 WOP 720PSIG	ACTIVE	8"		BO Stopper	Mueller, H-17281	720	
1	6	6800841	2" Save-A-Valve Mueller H17491 WOP 1440PSIG	ACTIVE	2"		Save-A-Valve	Mueller H17491	1440	Branch Fitting

THE LOWEST PRESSURE RATING: 720

Design Pressure Calculation on a Branch

Design Factor (F)	0.4
Current MAOP	150
Proposed MAOP	250

Dimensions			
	Job Key of the Header Pipe	1	
	Header OD (inch)	8.625	
	Header Wall Thickness (inch)	0.322	
	Header Yield Strength	42000	
	Header Longitudinal Joint Factor	1	
	Job Key of the Branch	1	
	Branch Fitting Description	2" Save-a-Valve	
	Branch OD (inch)	2.218	
	Branch Wall Thickness (inch)	0.234	
	Branch Yield Strength (psi)	36000	
	Branch Longitudinal Joint Factor	1	1
	Temperature Derating Factor (from Header)	1	1
	Tap Size (Maximum) (inch)	1.75	0
	Tap Size (inch)	1.75	0
	Recommended Fitting Weld Leg (in)	0.25	0.25
	Fitting Weld Length (in)	0.25	0
Effective A3 Provided by Additional Reinforcement			
	Max 'Usable' Length (OD) of additional Reinforcement	3.5	0
	OD of Additional Reinforcement (inch)	0	0
	Thickness of Additional Reinforcement M (inch)	0	0
	Yield Strength of Additional Reinforcement (psi)	0	0
Effective A3 Provided by Weldments			
	Max Header Weld Leg Length for A3 (inch)	0.25	0.25
	Header Weld Leg Length for A3 (inch)	0	0
	Max Branch Weld Leg Length for A3 (inch)	0.25	0.25
	Branch Weld Leg Length for A3 (inch)	0	0
Conclusion and Calculation Summary			
	Design Pressure (psig)	882.1295225	
	L (inch)	0.585	0
	d – OD/2 (Max Reinforcement Width)	0.641	0
	t (inch)	0.226439498	#DIV/0!
	tb (inch)	0.067936225	#DIV/0!
	Ar (sq in)	0.396269121	#DIV/0!
	A1 (sq in)	0.167230879	#DIV/0!
	A2 (sq in)	0.194294617	#DIV/0!
	A2' (sq in)	0.166538243	#DIV/0!
	A3 (Fitting Weld Material)	0.0625	0
	A3 Reinforcement (sq in)	0	#DIV/0!
	A3 Weldment (sq in)	0	0
	A3 (sq in)	0.0625	#DIV/0!
	Status (Branch Status from Calculation Worksheet)	Active	Active
	Design Pressure Evaluation	882.1295225	

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	020_A-1.D
Facility Type	HP PIPE SEGMENT

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	639-160	Install 8" STW HP	639-180	6/11/1993	R Nakano	3/30/2011	C Koo	3/30/2011

Facility Evaluation Summary

Facility Design Pressure	610	
Design Factor	0.4	(Class 4 Location)
Pipe Design Pressure	610.3	
Non-Rated Fitting Design Pressure	610.0	
Rated Fitting Rated Pressure	N/A	
Branch Connection Design Pressure	N/A	
Current System MAOP	150.0	
The Highest % SMYS of the Facility at the Current System MAOP	9.8%	
Proposed system MAOP	250.0	
The Highest % SMYS of the Facility at the Proposed System MAOP	16.4%	

Table 1 - Pipe Design Pressure

Enter MID#, PO#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1		None	8" PIPE X 0.188 WALL Gr.B	ACTIVE	8"	0.188	Gr.B	610	9.83%	16.38%	Historic pipe spec.

THE LOWEST DESIGN PRESSURE: 610 10% 16%

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, PO#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1		None	8" Weld Ell X 0.188 WALL WPB	ACTIVE	8"	0.188			WPB	Weld Ell	610	9.83%	16.38%	Historic pipe spec.

THE LOWEST DESIGN PRESSURE: 610 10% 16%

Table 3 - Rated Fittings Rated Pressure

Enter MID#, PO#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments

THE LOWEST PRESSURE RATING:

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	020, A-1.E
Facility Type	HP PIPE SEGMENT

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	839-180	Install 8" 61W HP	839-180	6/11/1953	R Nakano	3/30/2011	C Koo	3/30/2011

Facility Evaluation Summary

Facility Design Pressure	610
Design Factor	0.4 (Class 4 Location)
Pipe Design Pressure	610.3
Non-Rated Fitting Design Pressure	610.0
Rated Fitting Rated Pressure	N/A
Branch Connection Design Pressure	N/A
Current System MAOP	150.0
The Highest % SMYS of the Facility at the Current System MAOP	9.8%
Proposed system MAOP	250.0
The Highest % SMYS of the Facility at the Proposed System MAOP	16.4%

Table 1 - Pipe Design Pressure

Job Key	ITEM #	MID (Enter MID#, PO#, or "PO" in this field)	Description	Status (Select Data from the drop down manual)	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1		None	8" PIPE X 0.188 WALL Gr.B	ACTIVE	8"	0.188	Gr.B	610	9.83%	16.38%	Historic pipe spec

THE LOWEST DESIGN PRESSURE: 610 10% 16%

Table 2 - Non-Rated Fitting Design Pressure

Job Key	ITEM #	MID (Enter MID#, PO#, or "PO" in this field)	Description	Status (Select Data from the drop down manual)	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1		None	8" Weld Ell X 0.188 WALL WPB	ACTIVE	8"	0.188			WPB	Weld Ell	610	9.83%	16.38%	Historic pipe spec

THE LOWEST DESIGN PRESSURE: 610 10% 16%

Table 3 - Rated Fittings Rated Pressure

Job Key	ITEM #	MID (Enter MID#, PO#, or "PO" in this field)	Description	Status (Select Data from the drop down manual)	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments

THE LOWEST PRESSURE RATING:

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	Main ID 020, A-1.F
Facility Type	HP PIPE SEGMENT

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Complied By	Compilation Completion Date	Reviewed By	Review Completion Date
	109017759	8" STW HP Main Relocation - Sellahan HP Supply	3005-321	4/25/2005	R Nekano	3/29/2011	C Koo	3/30/2011

Facility Evaluation Summary

Facility Design Pressure	627	
Design Factor	0.4	(Class 4 Location)
Pipe Design Pressure	1254.4	
Non-Rated Fitting Design Pressure	1045.0	
Rated Fitting Rated Pressure	627.0	
Branch Connection Design Pressure	792.0	
Current System MAOP	150.0	
The Highest % SMYS of the Facility at the Current System MAOP	5.7%	
Proposed system MAOP	250.0	
The Highest % SMYS of the Facility at the Proposed System MAOP	9.9%	

Table 1 - Pipe Design Pressure

Enter MID#, PO#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
	20	7000821	8" PIPE X 0.322 WALL X-42	ACTIVE	8"	0.322	X-42	1254	4.78%	7.97%	

THE LOWEST DESIGN PRESSURE: 1254 5% 8%

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, PO#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
	22	5200814	8" 90 degree Ell X 0.322 WALL Y-42	ACTIVE	8"	0.322			Y-42	90 degree Ell	1254	4.78%	7.97%	
	23	5200739	8" Cap X 0.322 WALL Y-42	ACTIVE	8"	0.322			Y-42	Cap	1254	4.78%	7.97%	
	27	6000818	8" 45 degree Ell X 0.322 WALL WPB	ACTIVE	8"	0.322			WPB	45 degree Ell	1045	5.74%	9.67%	

THE LOWEST DESIGN PRESSURE: 1045 8% 10%

Table 3 - Rated Fittings Rated Pressure

Enter MID#, PO#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
	21	7600786	8" B/O Stopper Mueller, H-17281 CLASS 300 WOP 720PSIG	ACTIVE	8"	CLASS 300	B/O Stopper	Mueller, H-17281	720	
	24	9995937	1" Sav-a-Valve Nipple Mueller, H-17491 CLASS 300 WOP 144	ACTIVE	1"	CLASS 300	Sav-a-Valve Nipple	Mueller, H-17491	1440	
	26	6900841	2" Sav-a-Valve Nipple Mueller, H-17491 CLASS 300 WOP 144	ACTIVE	2"	CLASS 300	Sav-a-Valve Nipple	Mueller, H-17491	1440	Branch Fitting w/ weld-o-let
	28	PO	2" x 8" Weld-o-let WOP 627PSIG	ACTIVE	2"		x 8" Weld-o-let		627	Branch Fitting

THE LOWEST PRESSURE RATING: 627

Design Pressure Calculation on a Branch

Design Factor (F)	0.4
Current MAOP	150
Proposed MAOP	250

Dimensions			
	Job Key of the Header Pipe	1	
	Header OD (inch)	8.625	
	Header Wall Thickness (inch)	0.188	
	Header Yield Strength	35000	
	Header Longitudinal Joint Factor	1	
	Job Key of the Branch	1	
	Branch Fitting Description	1" Save-A-Valve	
	Branch OD (inch)	1.125	
	Branch Wall Thickness (inch)	0.203125	
	Branch Yield Strength (psi)	36000	
	Branch Longitudinal Joint Factor	1	
	Temperature Derating Factor (from Header)	1	
	Tap Size (Maximum) (inch)	0.71875	0
	Tap Size (inch)	0.71875	0
	Recommended Fitting Weld Leg (in)	0.25	0.25
	Fitting Weld Length (in)	0.25	0
Effective A3 Provided by Additional Reinforcement			
	Max 'Usable' Length (OD) of additional Reinforcement	1.4375	0
	OD of Additional Reinforcement (inch)	0	0
	Thickness of Additional Reinforcement M (inch)	0	0
	Yield Strength of Additional Reinforcement (psi)	0	0
Effective A3 Provided by Weldments			
	Max Header Weld Leg Length for A3 (inch)	0.25	0.25
	Header Weld Leg Length for A3 (inch)	0	0
	Max Branch Weld Leg Length for A3 (inch)	0.25	0.25
	Branch Weld Leg Length for A3 (inch)	0	0
Conclusion and Calculation Summary			
	Design Pressure (psig)	791.9865006	
	L (inch)	0.47	0
	d – OD/2 (Max Reinforcement Width)	0.15625	0
	t (inch)	0.243960127	#DIV/0!
	tb (inch)	0.030936973	#DIV/0!
	Ar (sq in)	0.175346342	#DIV/0!
	A1 (sq in)	0	#DIV/0!
	A2 (sq in)	0.161856746	#DIV/0!
	A2' (sq in)	0.161856746	#DIV/0!
	A3 (Fitting Weld Material)	0.053710938	0
	A3 Reinforcement (sq in)	0	#DIV/0!
	A3 Weldment (sq in)	0	0
	A3 (sq in)	0.053710938	#DIV/0!
	Status (Branch Status from Calculation Worksheet)	Active	Active
	Design Pressure Evaluation	791.9865006	

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	020. B-1
Facility Type	HP PIPE SEGMENT

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	#120	Install 8' STW HP Main	62-500	1/7/1963	R Nakano	3/30/2011	C Koo	3/30/2011

Facility Evaluation Summary

Facility Design Pressure	610
Design Factor	0.4 (Class 4 Location)
Pipe Design Pressure	610.3
Non-Rated Fitting Design Pressure	610.0
Rated Fitting Rated Pressure	720.0
Branch Connection Design Pressure	N/A
Current System MAOP	150.0
The Highest % SMYS of the Facility at the Current System MAOP	9.83%
Proposed system MAOP	250.0
The Highest % SMYS of the Facility at the Proposed System MAOP	16.4%

Table 1 - Pipe Design Pressure

Enter MID#, PO#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	1	Not Noted	8" PIPE X 0.188 WALL Gr.B	ACTIVE	8"	0.188	Gr.B	610	9.83%	16.38%	Histrolo Pipe Spec

THE LOWEST DESIGN PRESSURE: 610 10% 16%

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, PO#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	4	Not Noted	8" X 90 Degree Weld Ell X 0.188 WALL WPB	ACTIVE	8"	0.188			WPB	X 90 Degree Weld Ell	610	9.83%	16.38%	Grade & Thickness Assumed
1	NA	Not Noted	8" X 4" Reducer Tee 0.188 X 0.237 WALL WPB	ACTIVE	8"	0.188	4"	0.237	WPB	Reducer Tee	610	9.83%	16.38%	Reducer Tee to a Branch Main 020.AR-01

THE LOWEST DESIGN PRESSURE: 610 10% 16%

Table 3 - Rated Fittings Rated Pressure

Enter MID#, PO#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
1	2	Not Noted	8" Valve, Plug Nordstrom Fig 4249-1/2 CLASS 300 WOP 720PSIG	ACTIVE	8"	CLASS 300	Valve, Plug	Nordstrom Fig 4249 1/2	720	

THE LOWEST PRESSURE RATING: 720

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	020..C1
Facility Type	HP PIPE SEGMENT

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	698-828	Install 8" STW HP main	70D-102	8/28/1970	R Nakano	8/21/2011	C Koo	8/21/2011
2	708-411	RS-1306 Tie-In	708-411	8/30/1970	C Koo	8/21/2011	C Koo	8/21/2011
3	719-792	RS-1460 Tie-In	719-792	11/2/1971	C Koo	8/21/2011	C Koo	8/21/2011
4	789-876	RS-1973 Tie-In	789-876	11/2/1978	C Koo	8/21/2011	C Koo	8/21/2011
5	708-820	RS-1327 Tie-In	708-820	9/25/1970	C Koo	8/21/2011	C Koo	8/21/2011
6	846-282	RS-2123 Tie-In	846-282	7/19/1984	C Koo	8/21/2011	C Koo	8/21/2011
7	708-803	RS-1371 Tie-In	708-803	11/23/1970	C Koo	8/21/2011	C Koo	8/21/2011
8	778-256	RS-1977 Tie-In	778-256	3/3/1978	C Koo	8/21/2011	C Koo	8/21/2011
9	100020043	RS-2897 Tie-In	3D11-640	8/15/2007	C Koo	8/21/2011	C Koo	8/21/2011
10	698-828	RS-1220 Tie-In	69S-828	8/27/1970	C Koo	8/21/2011	C Koo	8/21/2011

Facility Evaluation Summary

Facility Design Pressure	502	
Design Factor	0.4	(Class 4 Location)
Pipe Design Pressure	610.3	
Non-Rated Fitting Design Pressure	1254.0	
Rated Fitting Rated Pressure	610.0	
Branch Connection Design Pressure	501.5	
Current System MAOP	150.0	
The Highest % SMYS of the Facility at the Current System MAOP	9.8%	
Proposed system MAOP	250.0	
The Highest % SMYS of the Facility at the Proposed System MAOP	16.4%	

Table 1 - Pipe Design Pressure

Enter MID#, POI#, or "PO" in this field | Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	4	70810	8" PIPE X 0.188 WALL Gr.B	ACTIVE	8"	0.188	Gr.B	610	9.83%	16.38%	Historic pipe spec for grade

THE LOWEST DESIGN PRESSURE: 610 10% 16%

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, POI#, or "PO" in this field | Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	60	60815	8" X 90 Degree, Elbow, Weld X 0.322 WALL Y-42	ACTIVE	8"	0.322			Y-42	X 90 Degree, Elbow, Weld	1254	4.78%	7.97%	

THE LOWEST DESIGN PRESSURE: 1254 5% 8%

Table 3 - Rated Fittings Rated Pressure

Enter MID#, POI#, or "PO" in this field | Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
1	5	59932	8" Valve, Plug Nordstrom, Fig 4249-1/2 CLASS 300 WOP 720	ACTIVE	8"	CLASS 300	Valve, Plug	Nordstrom, Fig 4249	720	
1	9	69841	2" Nipple, Sw-A-Valve Mueller, H-17481 WOP 1440PSIG	ACTIVE	2"		Nipple, Sw-A-Valve	Mueller, H-17481	1440	Branch fitting
2	N/A	N/A	3/4" Service Tee Mueller H-18101 WOP 1200PSIG	ACTIVE	3/4"		Service Tee	Mueller H-18101	1200	RS-1306 Tie-In
3	N/A	N/A	3/4" Service Tee Mueller H-18101 WOP 1200PSIG	ACTIVE	3/4"		Service Tee	Mueller H-18101	1200	RS-1460 Tie-In
4	N/A	N/A	3/4" Service Tee Mueller H-18102 WOP 1200PSIG	ACTIVE	3/4"		Service Tee	Mueller H-18102	1200	RS-1973 Tie-In
5	N/A	N/A	3/4" Service Tee Mueller H-18101 WOP 1200PSIG	ACTIVE	3/4"		Service Tee	Mueller H-18101	1200	RS-1327 Tie-In
6	N/A	N/A	3/4" Service Tee Mueller H-18101 WOP 1200PSIG	ACTIVE	3/4"		Service Tee	Mueller H-18101	1200	RS-2123 Tie-In
7	N/A	N/A	3/4" Service Tee Mueller H-18101 WOP 1200PSIG	ACTIVE	3/4"		Service Tee	Mueller H-18101	1200	RS-1371 Tie-In
8	N/A	N/A	3/4" Service Tee Mueller H-18101 WOP 1200PSIG	ACTIVE	3/4"		Service Tee	Mueller H-18101	1200	RS-1977 Tie-In
9	34	N/A	4" Flange Tee Mueller H-17506 CLASS 300 WOP 720PSIG	ACTIVE	4"	CLASS 300	Flange Tee	Mueller H-17506	720	RS-2897 Tie-In w/ Pad
9	1	7900812	3/4" Service Tee Mueller H17501 WOP 1440PSIG	ACTIVE	3/4"		Service Tee	Mueller H17501	1440	Tap to RTU
10	18	N/A	8" x 4" Weld-o-let WOP 610PSIG	ACTIVE	8"		x 4" Weld-o-let		610	RS-1220 Tie-In

THE LOWEST PRESSURE RATING: 610

Design Pressure Calculation on a Branch

Design Factor (F)	0.4
Current MAOP	150
Proposed MAOP	250

Dimensions										
	Job Key of the Header Pipe	1	1	1	1	1	1	1	1	1
	Header OD (inch)	8.625	8.625	8.625	8.625	8.625	8.625	8.625	8.625	8.625
	Header Wall Thickness (inch)	0.188	0.188	0.188	0.188	0.188	0.188	0.188	0.188	0.188
	Header Yield Strength	35000	35000	35000	35000	35000	35000	35000	35000	35000
	Header Longitudinal Joint Factor	1	1	1	1	1	1	1	1	1
	Job Key of the Branch	1	2	3	4	5	6	7	8	9
	Branch Fitting Description	2" Save-A-Valve	3/4" H118101 Tee	3/4" H118101 Tee	3/4" H118102 Tee	3/4" H118101 Tee	3/4" H118101 Tee	3/4" H118101 Tee	3/4" H118101 Tee	4" Flange Tee H-17506
	Branch OD (inch)	2.218	1.180	1.180	1.180	1.180	1.180	1.180	1.180	4.625
	Branch Wall Thickness (inch)	0.234	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.299
	Branch Yield Strength (psi)	36000	36000	36000	36000	36000	36000	36000	36000	36000
	Branch Longitudinal Joint Factor	1	1	1	1	1	1	1	1	1
	Temperature Derating Factor (from Header)	1	1	1	1	1	1	1	1	1
	Tap Size (Maximum) (inch)	1.75	0.82	0.82	0.82	0.82	0.82	0.82	0.82	4.027
	Tap Size (inch)	1.75	0.82	0.82	0.82	0.82	0.82	0.82	0.82	4.027
	Recommended Fitting Weld Leg (in)	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
	Fitting Weld Length (in)	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0
Effective A3 Provided by Additional Reinforcement										
	Max 'Usable' Length (OD) of additional Reinforcement	3.5	1.64	1.64	1.64	1.64	1.64	1.64	1.64	8.054
	OD of Additional Reinforcement (inch)	0	0	0	0	0	0	0	0	5.50
	Thickness of Additional Reinforcement M (inch)	0	0	0	0	0	0	0	0	0.322
	Yield Strength of Additional Reinforcement (psi)	0	0	0	0	0	0	0	0	42000
Effective A3 Provided by Weldments										
	Max Header Weld Leg Length for A3 (inch)	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
	Header Weld Leg Length for A3 (inch)	0	0	0	0	0	0	0	0	0
	Max Branch Weld Leg Length for A3 (inch)	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25
	Branch Weld Leg Length for A3 (inch)	0	0	0	0	0	0	0	0	0
Conclusion and Calculation Summary										
	Design Pressure (psig)	531.4649319	697.8277055	697.8277055	697.8277055	697.8277055	697.8277055	697.8277055	697.8277055	501.5003557
	L (inch)	0.47	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.47
	d – OD/2 (Max Reinforcement Width)	0.641	0.23	0.23	0.23	0.23	0.23	0.23	0.23	1.7145
	t (inch)	0.16371018	0.214955856	0.214955856	0.214955856	0.214955856	0.214955856	0.214955856	0.214955856	0.15448002
	tb (inch)	0.040930181	0.028591552	0.028591552	0.028591552	0.028591552	0.028591552	0.028591552	0.028591552	0.080536081
	Ar (sq in)	0.286492815	0.176263802	0.176263802	0.176263802	0.176263802	0.176263802	0.176263802	0.176263802	0.622091042
	A1 (sq in)	0.042507185	0	0	0	0	0	0	0	0.134984958
	A2 (sq in)	0.18148563	0.136267603	0.136267603	0.136267603	0.136267603	0.136267603	0.136267603	0.136267603	0.205356083
	A2' (sq in)	0.18148563	0.136267603	0.136267603	0.136267603	0.136267603	0.136267603	0.136267603	0.136267603	0.205356083
	A3 (Fitting Weld Material)	0.0625	0.0621	0.0621	0.0621	0.0621	0.0621	0.0621	0.0621	0
	A3 Reinforcement (sq in)	0	0	0	0	0	0	0	0	0.28175
	A3 Weldment (sq in)	0	0	0	0	0	0	0	0	0
	A3 (sq in)	0.0625	0.0621	0.0621	0.0621	0.0621	0.0621	0.0621	0.0621	0.28175
	Status (Branch Status from Calculation Worksheet)	Active	Active	Active	Active	Active	Active	Active	Active	Active
	Design Pressure Evaluation	531.4649319	697.8277055	697.8277055	697.8277055	697.8277055	697.8277055	697.8277055	697.8277055	501.5003557

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	020, U-1
Facility Type	HP PIPE SEGMENT

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	905-604	8" STW HP	605-604B	7/16/1991	R Nakano	4/18/2011	C Koo	4/21/2011
2	109031160	BO to RS-2723	3D11-559	7/30/2007	C Koo	4/21/2011	C Koo	4/21/2011
3								

Facility Evaluation Summary

Facility Design Pressure	604	
Design Factor	0.4	(Class 4 Location)
Pipe Design Pressure	732.4	
Non-Rated Fitting Design Pressure	1045.0	
Rated Fitting Rated Pressure	720.0	
Branch Connection Design Pressure	604.2	
Current System MAOP	150.0	
The Highest % SMYS of the Facility at the Current System MAOP	8.2%	
Proposed system MAOP	250.0	
The Highest % SMYS of the Facility at the Proposed System MAOP	13.7%	

Table 1 - Pipe Design Pressure

Enter MID#, POR, or "PO" in this field — Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	1 & 50	7000610	8" PIPE X 0.188 WALL X-42	ACTIVE	8"	0.188	X-42	732	8.19%	13.65%	

THE LOWEST DESIGN PRESSURE: 732 8% 14%

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, POR, or "PO" in this field — Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	6	PO	8" X 90 Degree Elbow, Weld X 0.322 WALL WPB	ACTIVE	8"	0.322			WPB	X 90 Degree Elbow, Weld	1045	6.74%	9.67%	Wall thickness assumed

THE LOWEST DESIGN PRESSURE: 1045 6% 10%

Table 3 - Rated Fittings Rated Pressure

Enter MID#, POR, or "PO" in this field — Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
1	2	6600933	8" Valve, Plug Nordstrom, Fig. 4249-1/2 CLASS 300 WOP 74	ACTIVE	8"	CLASS 300	Valve, Plug	Nordstrom, Fig. 4249-1/2	740	
1	11 & 55	6600841	2" Nipple, Sav-A-Valve Mueller, H-17491 WOP 1440PSIG	ACTIVE	2"		Nipple, Sav-A-Valve	Mueller, H-17491	1440	Branch fitting
1	16	PO	8" Coupling, Insulated Kerotest WOP 720PSIG	ACTIVE	8"		Coupling, Insulated	Kerotest	720	
1	1	7600790	8" Bottom Out Mueller, H-17281 CLASS 300 WOP 720PSIG	ACTIVE	8"	CLASS 300	Bottom Out	Mueller, H-17281	720	Branch Fitting for RS-2723

THE LOWEST PRESSURE RATING: 720

Design Pressure Calculation on a Branch

Design Factor (F)	0.4
Current MAOP	150
Proposed MAOP	250

Dimensions			
	Job Key of the Header Pipe	1	
	Header OD (inch)	8.625	
	Header Wall Thickness (inch)	0.188	
	Header Yield Strength	42000	
	Header Longitudinal Joint Factor	1	
	Job Key of the Branch	1	
	Branch Fitting Description	2" Save-A-Valve	
	Branch OD (inch)	2.219	
	Branch Wall Thickness (inch)	0.234375	
	Branch Yield Strength (psi)	36000	
	Branch Longitudinal Joint Factor	1	1
	Temperature Derating Factor (from Header)	1	1
	Tap Size (Maximum) (inch)	1.75	0
	Tap Size (inch)	1.75	0
	Recommended Fitting Weld Leg (in)	0.25	0.25
	Fitting Weld Length (in)	0.25	0
Effective A3 Provided by Additional Reinforcement			
	Max 'Usable' Length (OD) of additional Reinforcement	3.5	0
	OD of Additional Reinforcement (inch)	0	0
	Thickness of Additional Reinforcement M (inch)	0	0
	Yield Strength of Additional Reinforcement (psi)	0	0
Effective A3 Provided by Weldments			
	Max Header Weld Leg Length for A3 (inch)	0.25	0.25
	Header Weld Leg Length for A3 (inch)	0	0
	Max Branch Weld Leg Length for A3 (inch)	0.25	0.25
	Branch Weld Leg Length for A3 (inch)	0	0
Conclusion and Calculation Summary			
	Design Pressure (psig)	604.1993144	
	L (inch)	0.47	0
	d – OD/2 (Max Reinforcement Width)	0.640625	0
	t (inch)	0.155095806	#DIV/0!
	tb (inch)	0.046547473	#DIV/0!
	Ar (sq in)	0.271417661	#DIV/0!
	A1 (sq in)	0.057582339	#DIV/0!
	A2 (sq in)	0.176557875	#DIV/0!
	A2' (sq in)	0.151335322	#DIV/0!
	A3 (Fitting Weld Material)	0.0625	0
	A3 Reinforcement (sq in)	0	#DIV/0!
	A3 Weldment (sq in)	0	0
	A3 (sq in)	0.0625	#DIV/0!
	Status (Branch Status from Calculation Worksheet)	Active	Active
	Design Pressure Evaluation	604.1993144	

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	020_U-2
Facility Type	HP PIPE SEGMENT

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	905-504	6" STW HP	3D07-312	7/18/1991	R Nakano	4/7/2011	C Koo	4/8/2011

Facility Evaluation Summary

Facility Design Pressure	740	
Design Factor	0.4	(Class 4 Location)
Pipe Design Pressure	1045.3	
Non-Rated Fitting Design Pressure	1045.0	
Rated Fitting Rated Pressure	740.0	
Branch Connection Design Pressure	770.8	
Current System MAOP	150.0	
The Highest % SMYS of the Facility at the Current System MAOP	5.7%	
Proposed system MAOP	250.0	
The Highest % SMYS of the Facility at the Proposed System MAOP	9.6%	

Table 1 - Pipe Design Pressure

Enter MID#, PO#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	4	PO	6" PIPE X 0.322 WALL Gr.B	ACTIVE	6"	0.322	Gr.B	1045	5.74%	9.57%	

THE LOWEST DESIGN PRESSURE: 1045 6% 10%

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, PO#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	6	PO	6" X 90 Degree, Elbow, Weld X 0.322 WALL WPB	ACTIVE	6"	0.322			WPB	X 90 Degree, Elbow, Weld	1045	5.74%	9.57%	Taper bored both ends. Wall thickness assumed.

THE LOWEST DESIGN PRESSURE: 1045 6% 10%

Table 3 - Rated Fittings Rated Pressure

Enter MID#, PO#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
1	9	6400510	6" Flange, WN, FF CLASS 300 WOP 740PSIG	ACTIVE	6"	CLASS 300	Flange, WN, FF		740	
1	11	6800841	2 Nipple, Sav-A-Valve Mueller, H-17491 WOP 1440PSIG	ACTIVE	2		Nipple, Sav-A-Valve	Mueller, H-17491	1440	Branch Fitting

THE LOWEST PRESSURE RATING: 740

Design Pressure Calculation on a Branch

Design Factor (F)	0.4
Current MAOP	150
Proposed MAOP	250

Dimensions			
	Job Key of the Header Pipe	1	
	Header OD (inch)	8.625	
	Header Wall Thickness (inch)	0.322	
	Header Yield Strength	35000	
	Header Longitudinal Joint Factor	1	
	Job Key of the Branch	1	
	Branch Fitting Description	2" Save-A-Valve	
	Branch OD (inch)	2.219	
	Branch Wall Thickness (inch)	0.234375	
	Branch Yield Strength (psi)	36000	
	Branch Longitudinal Joint Factor	1	1
	Temperature Derating Factor (from Header)	1	1
	Tap Size (Maximum) (inch)	1.75	0
	Tap Size (inch)	1.75	0
	Recommended Fitting Weld Leg (in)	0.25	0.25
	Fitting Weld Length (in)	0.25	0
Effective A3 Provided by Additional Reinforcement			
	Max 'Usable' Length (OD) of additional Reinforcement	3.5	0
	OD of Additional Reinforcement (inch)	0	0
	Thickness of Additional Reinforcement M (inch)	0	0
	Yield Strength of Additional Reinforcement (psi)	0	0
Effective A3 Provided by Weldments			
	Max Header Weld Leg Length for A3 (inch)	0.25	0.25
	Header Weld Leg Length for A3 (inch)	0	0
	Max Branch Weld Leg Length for A3 (inch)	0.25	0.25
	Branch Weld Leg Length for A3 (inch)	0	0
Conclusion and Calculation Summary			
	Design Pressure (psig)	770.8434167	
	L (inch)	0.5859375	0
	d – OD/2 (Max Reinforcement Width)	0.640625	0
	t (inch)	0.237447302	#DIV/0!
	tb (inch)	0.059385723	#DIV/0!
	Ar (sq in)	0.415532779	#DIV/0!
	A1 (sq in)	0.147967221	#DIV/0!
	A2 (sq in)	0.205065559	#DIV/0!
	A2' (sq in)	0.205065559	#DIV/0!
	A3 (Fitting Weld Material)	0.0625	0
	A3 Reinforcement (sq in)	0	#DIV/0!
	A3 Weldment (sq in)	0	0
	A3 (sq in)	0.0625	#DIV/0!
	Status (Branch Status from Calculation Worksheet)	Active	Active
	Design Pressure Evaluation	770.8434167	

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	020, U-3
Facility Type	HP PIPE SEGMENT

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Reviewed By	Review Completion Date	Reviewed By	Review Completion Date
1	905-504	8" STW HP (Tie-In Pup)	3007-312	7/18/1991	R Nakano	4/18/2011	C Koo	4/21/2011

Facility Evaluation Summary

Facility Design Pressure	1045	
Design Factor	0.4	(Class 4 Location)
Pipe Design Pressure	1045.3	
Non-Rated Fitting Design Pressure	N/A	
Rated Fitting Rated Pressure	N/A	
Branch Connection Design Pressure	N/A	
Current System MAOP	150.0	
The Highest % SMYS of the Facility at the Current System MAOP	5.7%	
Proposed system MAOP	250.0	
The Highest % SMYS of the Facility at the Proposed System MAOP	9.6%	

Table 1 - Pipe Design Pressure

Enter MID#, PO#, or "PO" in this field

Select Date from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	52	PO	8" PIPE X 0.322 WALL Gr.B	ACTIVE	8"	0.322	Gr.B	1045	5.74%	9.57%	

THE LOWEST DESIGN PRESSURE: 1045 6% 10%

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, PO#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments

THE LOWEST DESIGN PRESSURE:

Table 3 - Rated Fittings Rated Pressure

Enter MID#, PO#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments

THE LOWEST PRESSURE RATING:

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	020, U-4
Facility Type	HP PIPE SEGMENT

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Reviewed By	Review Completion Date	Reviewed By	Review Completion Date
1	905-504	8" STW HP	3D07-312	7/18/1991	R Nakano	4/18/2011	C Koo	4/21/2011

Facility Evaluation Summary

Facility Design Pressure	771	
Design Factor	0.4	(Class 4 Location)
Pipe Design Pressure	1045.3	
Non-Rated Fitting Design Pressure	1045.0	
Rated Fitting Rated Pressure	1440.0	
Branch Connection Design Pressure	770.8	
Current System MAOP	150.0	
The Highest % SMYS of the Facility at the Current System MAOP	5.7%	
Proposed system MAOP	250.0	
The Highest % SMYS of the Facility at the Proposed System MAOP	9.6%	

Table 1 - Pipe Design Pressure

Enter MID#, PO#, or "PO" in this field | Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	59	PO	8" PIPE X 0.322 WALL Gr.B	ACTIVE	8"	0.322	Gr.B	1045	5.74%	9.57%	

THE LOWEST DESIGN PRESSURE: 1045 6% 10%

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, PO#, or "PO" in this field | Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	54	7800446	8" X 4" Tee, Reducing, Weld 0.322 X 0.237 WALL WPB	ACTIVE	8"	0.322	4"	0.237	WPB	Tee, Reducing, Weld	1046	5.74%	9.57%	Branch to RS-2311

THE LOWEST DESIGN PRESSURE: 1046 6% 10%

Table 3 - Rated Fittings Rated Pressure

Enter MID#, PO#, or "PO" in this field | Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
1	11	6800841	2 Nipple, Sav-A-Valve Mueller, H-17491 WOP 1440PSIG	ACTIVE	2		Nipple, Sav-A-Valve	Mueller, H-17491	1440	Branch Fitting

THE LOWEST PRESSURE RATING: 1440

Design Pressure Calculation on a Branch

Design Factor (F)	0.4
Current MAOP	150
Proposed MAOP	250

Dimensions			
	Job Key of the Header Pipe	1	
	Header OD (inch)	8.625	
	Header Wall Thickness (inch)	0.322	
	Header Yield Strength	35000	
	Header Longitudinal Joint Factor	1	
	Job Key of the Branch	1	
	Branch Fitting Description	2" Save-A-Valve	
	Branch OD (inch)	2.219	
	Branch Wall Thickness (inch)	0.234375	
	Branch Yield Strength (psi)	36000	
	Branch Longitudinal Joint Factor	1	1
	Temperature Derating Factor (from Header)	1	1
	Tap Size (Maximum) (inch)	1.75	0
	Tap Size (inch)	1.75	0
	Recommended Fitting Weld Leg (in)	0.25	0.25
	Fitting Weld Length (in)	0.25	0
Effective A3 Provided by Additional Reinforcement			
	Max 'Usable' Length (OD) of additional Reinforcement	3.5	0
	OD of Additional Reinforcement (inch)	0	0
	Thickness of Additional Reinforcement M (inch)	0	0
	Yield Strength of Additional Reinforcement (psi)	0	0
Effective A3 Provided by Weldments			
	Max Header Weld Leg Length for A3 (inch)	0.25	0.25
	Header Weld Leg Length for A3 (inch)	0	0
	Max Branch Weld Leg Length for A3 (inch)	0.25	0.25
	Branch Weld Leg Length for A3 (inch)	0	0
Conclusion and Calculation Summary			
	Design Pressure (psig)	770.8434167	
	L (inch)	0.5859375	0
	d – OD/2 (Max Reinforcement Width)	0.640625	0
	t (inch)	0.237447302	#DIV/0!
	tb (inch)	0.059385723	#DIV/0!
	Ar (sq in)	0.415532779	#DIV/0!
	A1 (sq in)	0.147967221	#DIV/0!
	A2 (sq in)	0.205065559	#DIV/0!
	A2' (sq in)	0.205065559	#DIV/0!
	A3 (Fitting Weld Material)	0.0625	0
	A3 Reinforcement (sq in)	0	#DIV/0!
	A3 Weldment (sq in)	0	0
	A3 (sq in)	0.0625	#DIV/0!
	Status (Branch Status from Calculation Worksheet)	Active	Active
	Design Pressure Evaluation	770.8434167	

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	020.AR-1
Facility Type	HP PIPE SEGMENT

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	EX982-300	Previously inlet to RS-0490 reclassified as HP main	62D-109 or MC62-32	1/7/1963	R Nakano	3/30/2011	C Koo	3/30/2011
2	108528829	Retire RS-0490	3D11-539	1/7/1963	R Nakano	3/30/2011	C Koo	3/30/2011
3	109025042	Fittings installed on main for RS-2695	3D11-539	12/15/2005	C Koo	3/30/2011	C Koo	3/30/2011

Facility Evaluation Summary

Facility Design Pressure	610	
Design Factor	0.4	(Class 4 Location)
Pipe Design Pressure	1474.7	
Non-Rated Fitting Design Pressure	610.0	
Rated Fitting Rated Pressure	740.0	
Branch Connection Design Pressure	1151.9	
Current System MAOP	160.0	
The Highest % SMYS of the Facility at the Current System MAOP	9.8%	
Proposed system MAOP	250.0	
The Highest % SMYS of the Facility at the Proposed System MAOP	16.4%	

Table 1 - Pipe Design Pressure

Enter MID#, ROW, or "PO" in this field. Select Data from the drop down manual.

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	None	None	4" PIPE X 0.237 WALL Gr.B	ACTIVE	4"	0.237	Gr.B	1475	4.07%	6.78%	Historic Pipe Spec

THE LOWEST DESIGN PRESSURE: 1475 4% 7%

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, ROW, or "PO" in this field. Select Data from the drop down manual.

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	None	None	6" X 4" Tee, Weld 0.188 X 0.237 WALL WPB	ACTIVE	6"	0.188	4"	0.237	WPB	Tee, Weld	610	9.83%	16.38%	Thickness & Grade based on Pipe Historical Spec
2		6200713	4" Cap, Weld X 0.237 WALL Y-42	ACTIVE	4"	0.237			Y-42	Cap, Weld	1770	3.39%	5.65%	Could be Y-42 (42000 psig) or WPB (46500 psig).
3	None	None	4" 45 Deg Ell X 0.237 WALL WPB	ACTIVE	4"	0.237			WPB	45 Deg Ell	1475	4.07%	6.78%	Thickness & Grade based on Pipe Historical Spec

THE LOWEST DESIGN PRESSURE: 610 10% 16%

Table 3 - Rated Fittings Rated Pressure

Enter MID#, ROW, or "PO" in this field. Select Data from the drop down manual.

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
1	None	None	4" Valve, Plug Nordstrom, Fig 2245-1/2 CLASS 600 WOP 144	ACTIVE	4"	CLASS 600	Valve, Plug	Nordstrom, Fig 2245-1/2	1440	
2	3	7600769	4" Bottome Out H17251 STD CLASS 300 WOP 740PSIG	ACTIVE	4"	CLASS 300	Bottome Out	H17251 STD	740	Branch Fitting to RS 2695
3	5	6800841	2" Save-A-Valve H17491 WOP 1440PSIG	ACTIVE	2"		Save-A-Valve	H17491	1440	Branch Fitting (Installed w/ RS 2695)

THE LOWEST PRESSURE RATING: 740

Design Pressure Calculation on a Branch

Design Factor (F)	0.4
Current MAOP	150
Proposed MAOP	250

Dimensions			
	Job Key of the Header Pipe	1	
	Header OD (inch)	4.500	
	Header Wall Thickness (inch)	0.237	
	Header Yield Strength	35000	
	Header Longitudinal Joint Factor	1	
	Job Key of the Branch	3	
	Branch Fitting Description	2" Save-A-Valve	
	Branch OD (inch)	2.219	
	Branch Wall Thickness (inch)	0.234375	
	Branch Yield Strength (psi)	36000	
	Branch Longitudinal Joint Factor	1	1
	Temperature Derating Factor (from Header)	1	1
	Tap Size (Maximum) (inch)	1.75	0
	Tap Size (inch)	1.75	0
	Recommended Fitting Weld Leg (in)	0.25	0.25
	Fitting Weld Length (in)	0.25	0
Effective A3 Provided by Additional Reinforcement			
	Max 'Usable' Length (OD) of additional Reinforcement	3.5	0
	OD of Additional Reinforcement (inch)	0	0
	Thickness of Additional Reinforcement M (inch)	0	0
	Yield Strength of Additional Reinforcement (psi)	0	0
Effective A3 Provided by Weldments			
	Max Header Weld Leg Length for A3 (inch)	0.25	0.25
	Header Weld Leg Length for A3 (inch)	0	0
	Max Branch Weld Leg Length for A3 (inch)	0.25	0.25
	Branch Weld Leg Length for A3 (inch)	0	0
Conclusion and Calculation Summary			
	Design Pressure (psig)	1151.853392	
	L (inch)	0.5859375	0
	d – OD/2 (Max Reinforcement Width)	0.640625	0
	t (inch)	0.185119295	#DIV/0!
	tb (inch)	0.088738705	#DIV/0!
	Ar (sq in)	0.323958766	#DIV/0!
	A1 (sq in)	0.090791234	#DIV/0!
	A2 (sq in)	0.170667533	#DIV/0!
	A2' (sq in)	0.170667533	#DIV/0!
	A3 (Fitting Weld Material)	0.0625	0
	A3 Reinforcement (sq in)	0	#DIV/0!
	A3 Weldment (sq in)	0	0
	A3 (sq in)	0.0625	#DIV/0!
	Status (Branch Status from Calculation Worksheet)	Active	Active
	Design Pressure Evaluation	1151.853392	

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	RS-0266 Inlet (Retired)
Facility Type	REGULATOR STATION

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	608-323	Salishan HP Supply	3D05-321	10/28/1980	RNAKAN	7/14/2011	C Kao	7/14/2011
2	IR# 9272-08	Install RS-0266 (Completely Removed)	3D02-584	10/31/1980	RNAKAN	7/14/2011	C Kao	7/14/2011
3	108527261	Retire RS-0266	3D02-584	1/12/2006	RNAKAN	7/14/2011	C Kao	7/14/2011

Facility Evaluation Summary

Facility Design Pressure	610	
Design Factor	0.4	(Class 4 Location)
Pipe Design Pressure	1169.8	
Non-Rated Fitting Design Pressure	1170.0	
Rated Fitting Rated Pressure	610.0	
Branch Connection Design Pressure	N/A	
Current System MAOP	150.0	
The Highest % SMYS of the Facility at the Current System MAOP	5.1%	
Proposed system MAOP	250.0	
The Highest % SMYS of the Facility at the Proposed System MAOP	8.6%	

Table 1 - Pipe Design Pressure

Enter MID#, PO#, or "PO" in this field

Select Date from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	None	Unknown	4" PIPE X 0.188 WALL Gr.B	ACTIVE	4"	0.188	Gr.B	1170	5.13%	8.55%	Hist Spec

THE LOWEST DESIGN PRESSURE: 1170 5% 9%

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, PO#, or "PO" in this field

Select Date from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP
1	15	Not noted	4" 90 Degree Weld Ell X 0.188 WALL WPB	ACTIVE	4"	0.188			WPB	90 Degree Weld Ell	1170	5.13%	8.55%
3	2	5200713	4" Weld Cap X 0.237 WALL WPR	ACTIVE	4"	0.237			WPR	Weld Cap	1938	3.10%	5.16%

THE LOWEST DESIGN PRESSURE: 1170 5% 9%

Table 3 - Rated Fittings Rated Pressure

Enter MID#, PO#, or "PO" in this field

Select Date from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
1	6	Not Noted	4" Valve Nordstrom, Fig 2024-1/2 CLASS 300 WOP 720PSIG	ACTIVE	4"	CLASS 300	Valve	Nordstrom, Fig 2024	720	
1	4	Not Noted	6" x 4" WELD-O-LET WOP 610PSIG	ACTIVE			6" x 4" WELD-O-LET		610	Tie-In Fitting

THE LOWEST PRESSURE RATING: 610

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	RS-0983 Inlet - Retired
Facility Type	REGULATOR STATION

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	685-10191	Install RS-0983	66-1019	1/1/1967	R Nakano	3/28/2011	C Koo	3/28/2011
2	108526094	Retire RS-0983	66-1019	1/11/2006	R Nakano	3/28/2011	C Koo	3/28/2011

Facility Evaluation Summary

Facility Design Pressure	1200
Design Factor	0.4 (Class 4 Location)
Pipe Design Pressure	1291.4
Non-Rated Fitting Design Pressure	3013.0
Rated Fitting Rated Pressure	1200.0
Branch Connection Design Pressure	N/A
Current System MAOP	150.0
The Highest % SMYS of the Facility at the Current System MAOP	2.8%
Proposed system MAOP	250.0
The Highest % SMYS of the Facility at the Proposed System MAOP	4.6%

Table 1 - Pipe Design Pressure

Enter MID#, PO#, or "PO" in this field — Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1		Unknown	3/4" PIPE X 0.113 WALL Gr.A25	ACTIVE	3/4"	0.113	Gr.A25	1291	2.79%	4.65%	Historical Spec

THE LOWEST DESIGN PRESSURE: 1291 3% 5%

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, PO#, or "PO" in this field — Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
2	1	5200558	3/4" Weld Cap X 0.113 WALL WPB	ACTIVE	3/4"	0.113			WPB	Weld Cap	3013	1.99%	3.32%	

THE LOWEST DESIGN PRESSURE: 3013 2% 3%

Table 3 - Rated Fittings Rated Pressure

Enter MID#, PO#, or "PO" in this field — Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
1	1	7800600	3/4" Auto-Perf Tee Mueller, H-18102 WOP 1200PSIG	ACTIVE	3/4"		Auto-Perf Tee	Mueller, H-18102	1200	Confirmed 687026101

THE LOWEST PRESSURE RATING: 1200

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	RS-1031 Inlet - Retired
Facility Type	REGULATOR STATION

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	675-355	Install RS-1031	675-355	9/1/1967	R Nakano	3/28/2011	C Koo	3/28/2011
2	108522397	Retire RS-1031	RS-1031	1/20/2005	R Nakano	3/28/2011	C Koo	3/28/2011

Facility Evaluation Summary

Facility Design Pressure	1200	
Design Factor	0.4	(Class 4 Location)
Pipe Design Pressure	1291.4	
Non-Rated Fitting Design Pressure	3013.0	
Rated Fitting Rated Pressure	1200.0	
Branch Connection Design Pressure	N/A	
Current System MAOP	150.0	
The Highest % SMYS of the Facility at the Current System MAOP	2.8%	
Proposed system MAOP	250.0	
The Highest % SMYS of the Facility at the Proposed System MAOP	4.6%	

Table 1 - Pipe Design Pressure

Enter MID#, PO#, or "PO" in this field — Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1		Unknown	3/4" PIPE X 0.113 WALL Gr.A25	ACTIVE	3/4"	0.113	Gr.A25	1291	2.79%	4.65%	Historical Spec

THE LOWEST DESIGN PRESSURE: 1291 3% 5%

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, PO#, or "PO" in this field — Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
2	35	5200555	3/4" Weld Cap X 0.113 WALL WPB	ACTIVE	3/4"	0.113			WPB	Weld Cap	3013	1.99%	3.32%	

THE LOWEST DESIGN PRESSURE: 3013 2% 3%

Table 3 - Rated Fittings Rated Pressure

Enter MID#, PO#, or "PO" in this field — Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
1		None	3/4" Auto-Perf Tee Mueller, H-18102 WOP 1200PSIG	ACTIVE	3/4"		Auto-Perf Tee	Mueller, H-18102	1200	Confirmed 887026762

THE LOWEST PRESSURE RATING: 1200

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	RB-1220 - Inlet (Retired)
Facility Type	REGULATOR STATION

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Completion Date	Reviewed By	Review Completion Date
1	698-525	Install RB-1220	70D-308	6/27/1970	R Nakano	4/5/2011	C Koo	4/5/2011
2	108828930	Retire RB-1220	70D-308	3/14/2007	R Nakano	4/5/2011	C Koo	4/6/2011

Facility Evaluation Summary

Facility Design Pressure	400	
Design Factor	0.4	(Class 4 Location)
Pipe Design Pressure	N/A	
Non-Rated Fitting Design Pressure	N/A	
Rated Fitting Rated Pressure	400.0	
Branch Connection Design Pressure	N/A	
Current System MAOP	150.0	
The Highest % SMYS of the Facility at the Current System MAOP	0.0%	
Proposed system MAOP	250.0	
The Highest % SMYS of the Facility at the Proposed System MAOP	0.0%	

Table 1 - Pipe Design Pressure

Job Key	ITEM #	Enter MID#, PO#, or "PO" in this field: MID	Description	Select Data from the drop down manual: Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
(Station Piping)											

THE LOWEST DESIGN PRESSURE:

Table 2 - Non-Rated Fitting Design Pressure

Job Key	ITEM #	Enter MID#, PO#, or "PO" in this field: MID	Description	Select Data from the drop down manual: Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
(Station Piping)														

THE LOWEST DESIGN PRESSURE:

Table 3 - Rated Fittings Rated Pressure

Job Key	ITEM #	Enter MID#, PO#, or "PO" in this field: MID	Description	Select Data from the drop down manual: Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
(Station Piping)										
1	15	56770	4" Valve, Plug Nordstrom, Fig. 305 WOP 400PSIG	ACTIVE	4"		Valve, Plug	Nordstrom, Fig. 305	400	
1	17	64390	4" Flange, WN, FF CLASS 300 WOP 720PSIG	ACTIVE	4"	CLASS 300	Flange, WN, FF		720	
1	16	60820	6" X 4" Weld-O-Let WOP 610PSIG	ACTIVE	6"		X 4" Weld-O-Let		610	Tie-In Fitting
2	51	6400320	4" Flange, Blind CLASS 300 WOP 740PSIG	ACTIVE	4"	CLASS 300	Flange, Blind		740	

THE LOWEST PRESSURE RATING: 400

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	RS-1306 Inlet - Retired
Facility Type	REGULATOR STATION

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	709-411	Install RS-1306	709-411	6/30/1970	R Nakano	4/8/2011	C Koo	4/8/2011
2	108826096	Retire RS-1306	709-411	10/26/2007	R Nakano	4/5/2011	C Koo	4/5/2011

Facility Evaluation Summary

Facility Design Pressure	1200	
Design Factor	0.4	(Class 4 Location)
Pipe Design Pressure	1291.4	
Non-Rated Fitting Design Pressure	3013.0	
Rated Fitting Rated Pressure	1200.0	
Branch Connection Design Pressure	N/A	
Current System MAOP	150.0	
The Highest % SMYS of the Facility at the Current System MAOP	2.8%	
Proposed system MAOP	250.0	
The Highest % SMYS of the Facility at the Proposed System MAOP	4.6%	

Table 1 - Pipe Design Pressure

Enter MID#, PO#, or "PO" in this field. Select Data from the drop down manual.

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
(Station Piping)											
1	12	Not Noted	3/4" PIPE X 0.113 WALL Gr.A25	ACTIVE	3/4"	0.113	Gr.A25	1291	2.76%	4.65%	Historical Spec

THE LOWEST DESIGN PRESSURE: 1291 3% 5%

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, PO#, or "PO" in this field. Select Data from the drop down manual.

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
(Station Piping)														
2	34	5200558	3/4" Cap, Weld X 0.113 WALL WPB	ACTIVE	3/4"	0.113			WPB	Cap, Weld	3013	1.99%	3.32%	

THE LOWEST DESIGN PRESSURE: 3013 2% 3%

Table 3 - Rated Fittings Rated Pressure

Enter MID#, PO#, or "PO" in this field. Select Data from the drop down manual.

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
(Station Piping)										
1	Not Noted	7800600	3/4" Tee, Autoperf Mueller, H-16101 WOP 1200PSIG	ACTIVE	3/4"		Tee, Autoperf	Mueller, H-16101	1200	

THE LOWEST PRESSURE RATING: 1200

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	RS-1327 - Inlet
Facility Type	REGULATOR STATION

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	705-620	Instal RS-1327	79S-676	9/25/1970	R Nakano	3/31/2011	C Koo	3/31/2011
2	108528099	Retire RS-1327	79S-676	9/29/2005	R Nakano	3/31/2011	C Koo	3/31/2011

Facility Evaluation Summary

Facility Design Pressure	1200	
Design Factor	0.4	(Class 4 Location)
Pipe Design Pressure	1291.4	
Non-Rated Fitting Design Pressure	3013.0	
Rated Fitting Rated Pressure	1200.0	
Branch Connection Design Pressure	N/A	
Current System MAOP	150.0	
The Highest % SMYS of the Facility at the Current System MAOP	2.8%	
Proposed system MAOP	250.0	
The Highest % SMYS of the Facility at the Proposed System MAOP	4.6%	

Table 1 - Pipe Design Pressure

Job Key	ITEM #	MID (Enter MID#, PO#, or "PO" in this field)	Description	Status (Select Data from the drop down manual)	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
(Station Piping)											
1	Not Noted	Not Noted	3/4" PIPE X 0.113 WALL Gr.A25	ACTIVE	3/4"	0.113	Gr.A25	1291	2.79%	4.65%	Historical Spec

THE LOWEST DESIGN PRESSURE: 1291 3% 5%

Table 2 - Non-Rated Fitting Design Pressure

Job Key	ITEM #	MID (Enter MID#, PO#, or "PO" in this field)	Description	Status (Select Data from the drop down manual)	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
(Station Piping)														
2	Not Noted	5200556	3/4" Cap, Weld X 0.113 WALL WPB	ACTIVE	3/4"	0.113			WPB	Cap, Weld	3013	1.99%	3.32%	

THE LOWEST DESIGN PRESSURE: 3013 2% 3%

Table 3 - Rated Fittings Rated Pressure

Job Key	ITEM #	MID (Enter MID#, PO#, or "PO" in this field)	Description	Status (Select Data from the drop down manual)	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
(Station Piping)										
1	Not Noted	Not noted	3/4" Tee, Service Mueller Autoperf WOP 1200PSIG	ACTIVE	3/4"		Tee, Service	Mueller Autoperf	1200	Confirmed 887025760

THE LOWEST PRESSURE RATING: 1200

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	RS-1371 - Inlet
Facility Type	REGULATOR STATION

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	708-803	Install RS-1371	708-803	11/23/1970	R Nakano	3/31/2011	C Koo	3/31/2011
2	108528115	Retire RS-1371	708-803	9/13/2005	R Nakano	3/31/2011	C Koo	3/31/2011

Facility Evaluation Summary

Facility Design Pressure	1200	
Design Factor	0.4	(Class 4 Location)
Pipe Design Pressure	1291.4	
Non-Rated Fitting Design Pressure	3013.0	
Rated Fitting Rated Pressure	1200.0	
Branch Connection Design Pressure	N/A	
Current System MAOP	150.0	
The Highest % SMYS of the Facility at the Current System MAOP	2.8%	
Proposed system MAOP	250.0	
The Highest % SMYS of the Facility at the Proposed System MAOP	4.6%	

Table 1 - Pipe Design Pressure

		Enter MID#, PO#, or "PO" in this field		Select Data from the drop down manual							
Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
(Station Piping)											
1	Not Noted	Not Noted	3/4" PIPE X 0.113 WALL Gr.A25	ACTIVE	3/4"	0.113	Gr.A25	1291	2.79%	4.65%	Historical Spec

THE LOWEST DESIGN PRESSURE: 1291 3% 5%

Table 2 - Non-Rated Fitting Design Pressure

		Enter MID#, PO#, or "PO" in this field		Select Data from the drop down manual										
Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
(Station Piping)														
2	38	5200552	3/4" Cap, Weld, Pretested X 0.113 WALL WPB	ACTIVE	3/4"	0.113			WPB	Cap, Weld, Pretested	3013	1.99%	3.32%	

THE LOWEST DESIGN PRESSURE: 3013 2% 3%

Table 3 - Rated Fittings Rated Pressure

		Enter MID#, PO#, or "PO" in this field		Select Data from the drop down manual						
Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
(Station Piping)										
1	Not Noted	Not Noted	3/4" Tee Mueller, Auto-Perf WOP 1200PSIG	ACTIVE	3/4"		Tee	Mueller, Auto-Perf	1200	Confirmed 887026105

THE LOWEST PRESSURE RATING: 1200

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	RS-1404 - Retired
Facility Type	REGULATOR STATION

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	718-071	Install RS-1404	718-071	2/16/1971	C Koo	6/10/2011	C Koo	6/10/2011
2	108522516	Retire RS-1404	108522516	2/1/2005	C Koo	6/10/2011	C Koo	6/10/2011

Facility Evaluation Summary

Facility Design Pressure	1200	
Design Factor	0.4	(Class 4 Location)
Pipe Design Pressure	1291.4	
Non-Rated Fitting Design Pressure	2832.0	
Rated Fitting Rated Pressure	1200.0	
Branch Connection Design Pressure	N/A	
Current System MAOP	150.0	
The Highest % SMYS of the Facility at the Current System MAOP	2.8%	
Proposed system MAOP	250.0	
The Highest % SMYS of the Facility at the Proposed System MAOP	4.6%	

Table 1 - Pipe Design Pressure

Enter MID#, PO#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	N/A	N/A	3/4" PIPE X 0.113 WALL Gr.A25	ACTIVE	3/4"	0.113	Gr.A25	1291	2.79%	4.65%	Historical Spec

THE LOWEST DESIGN PRESSURE: 1291 3% 5%

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, PO#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	N/A	N/A	1" CAP X 0.133 WALL WPB	ACTIVE	1"	0.133			WPB	CAP	2832	2.12%	3.53%	

THE LOWEST DESIGN PRESSURE: 2832 2% 4%

Table 3 - Rated Fittings Rated Pressure

Enter MID#, PO#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
1	N/A	N/A	3/4" SERVICE TEE MEULLER 18101 WOP 1200PSIG	ACTIVE	3/4"		SERVICE TEE	MEULLER 18101	1200	Confirmed 887026099

THE LOWEST PRESSURE RATING: 1200

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	RS-1416 (Retired)
Facility Type	REGULATOR STATION

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	718-274	Install RS-1416	710-305	6/22/1971	R Nekano	7/14/2011	C Koo	7/14/2011
2	108527202	Retire RS-1416	710-305	1/8/2008	R Nekano	7/14/2011	C Koo	7/14/2011

Facility Evaluation Summary

Facility Design Pressure	400
Design Factor	0.4 (Class 4 Location)
Pipe Design Pressure	778.1
Non-Rated Fitting Design Pressure	778.0
Rated Fitting Rated Pressure	400.0
Branch Connection Design Pressure	N/A
Current System MAOP	150.0
The Highest % SMYS of the Facility at the Current System MAOP	4.8%
Proposed system MAOP	260.0
The Highest % SMYS of the Facility at the Proposed System MAOP	7.7%

Table 1 - Pipe Design Pressure

Job Key	ITEM #	MID (Enter MID#, PO#, or "PO" in this field)	Description (Select Data from the drop down manual)	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	6	72270	2" PIPE X 0.154 WALL Gr.A25	ACTIVE	2"	0.154	Gr.A25	778	4.83%	7.71%	Hist Spec

THE LOWEST DESIGN PRESSURE: 778 5% 8%

Table 2 - Non-Rated Fitting Design Pressure

Job Key	ITEM #	MID (Enter MID#, PO#, or "PO" in this field)	Description (Select Data from the drop down manual)	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	5	72270	2" Fishmouth Tee X 0.154 WALL Gr.A25	ACTIVE	2"	0.154			Gr.A25	Fishmouth Tee	778	4.83%	7.71%	Made fishmouth tee using a short section of run pipe.

THE LOWEST DESIGN PRESSURE: 778 5% 8%

Table 3 - Rated Fittings Rated Pressure

Job Key	ITEM #	MID (Enter MID#, PO#, or "PO" in this field)	Description (Select Data from the drop down manual)	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
1	10	68640	2" Valve, Plug Nordstrom, Fig 305 WOP 400PSIG	ACTIVE	2"		Valve, Plug	Nordstrom, Fig 305	400	
1	12	64185	2" Flange, WN, RF CLASS 300 WOP 720PSIG	ACTIVE	2"	CLASS 300	Flange, WN, RF		720	
2	63	6400155	2" Flange, Blind, RF CLASS 300 WOP 740PSIG	ACTIVE	2"	CLASS 300	Flange, Blind, RF		740	
1	N/A	N/A	4" Weld x Weld Valve Nod Fig 2245-1/2 WOP 1480PSIG	ACTIVE	4"		Weld x Weld Valve	Nod Fig 2245-1/2	1480	Bypass Valve
1	N/A	N/A	8" x 4" Weld-O-Let WOP 810PSIG	ACTIVE	8"		x 4" Weld-O-Let		810	Bypass Valve Tie In

THE LOWEST PRESSURE RATING: 400

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	RS-1472 Inlet - Retired
Facility Type	REGULATOR STATION

Job Key	Job Number	Job Description	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	718-697	Install RS-1472	718-697	10/11/1971	R Nekano	4/5/2011	C Koo	4/5/2011
2	105526045	Retire RS-1472	718-697	10/22/2007	R Nekano	4/5/2011	C Koo	4/5/2011

Facility Evaluation Summary

Facility Design Pressure	1200	
Design Factor	0.4	(Class 4 Location)
Pipe Design Pressure	1213.7	
Non-Rated Fitting Design Pressure	2832.0	
Rated Fitting Rated Pressure	1200.0	
Branch Connection Design Pressure	N/A	
Current System MAOP	150.0	
The Highest % SMYS of the Facility at the Current System MAOP	3.9%	
Proposed system MAOP	250.0	
The Highest % SMYS of the Facility at the Proposed System MAOP	4.9%	

Table 1 - Pipe Design Pressure

Job Key	ITEM #	Enter MID#, PO#, or "PO" in this field: MID	Description	Select Data from the drop down manual: Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
(Station Piping)											
1	12	7000140	1" PIPE X 0.133 WALL Gr.A25	ACTIVE	1"	0.133	Gr.A25	1214	2.97%	4.84%	Historical Spec

THE LOWEST DESIGN PRESSURE: 1214 3% 5%

Table 2 - Non-Rated Fitting Design Pressure

Job Key	ITEM #	Enter MID#, PO#, or "PO" in this field: MID	Description	Select Data from the drop down manual: Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
(Station Piping)														
2	34	5200808	1" Cap, Weld X 0.133 WALL WPB	ACTIVE	1"	0.133			WPB	Cap, Weld	2832	2.12%	3.63%	

THE LOWEST DESIGN PRESSURE: 2832 2% 4%

Table 3 - Rated Fittings Rated Pressure

Job Key	ITEM #	Enter MID#, PO#, or "PO" in this field: MID	Description	Select Data from the drop down manual: Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
(Station Piping)										
1	1	6600820	1" Tee Mueller, Auto-Perf, H-16101 WOP 1200PSIG	ACTIVE	1"		Tee	Mueller, Auto-Perf, H-16101	1200	

THE LOWEST PRESSURE RATING: 1200

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	RS-1480 - Inlet
Facility Type	REGULATOR STATION

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	718-792	Install RS-1480	718-792	11/2/1971	R Nakano	4/5/2011	C Koo	6/9/2011
2	108828097	Retire RS-1480	718-792	10/26/2007	R Nakano	4/5/2011	C Koo	6/9/2011

Facility Evaluation Summary

Facility Design Pressure	1200	
Design Factor	0.4	(Class 4 Location)
Pipe Design Pressure	1291.4	
Non-Rated Fitting Design Pressure	3013.0	
Rated Fitting Rated Pressure	1200.0	
Branch Connection Design Pressure	N/A	
Current System MAOP	150.0	
The Highest % SMYS of the Facility at the Current System MAOP	2.8%	
Proposed system MAOP	250.0	
The Highest % SMYS of the Facility at the Proposed System MAOP	4.6%	

Table 1 - Pipe Design Pressure

Enter MID#, PO#, or "PO" in this field | Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
(Station Piping)											
1	Not Noted	Not Noted	3/4" PIPE X 0.113 WALL Gr.A25	ACTIVE	3/4"	0.113	Gr.A25	1291	2.79%	4.65%	Historical Spec

THE LOWEST DESIGN PRESSURE: 1291 3% 5%

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, PO#, or "PO" in this field | Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
(Station Piping)														
2	34	5200556	3/4" Cap, Weld X 0.113 WALL WPB	ACTIVE	3/4"	0.113			WPB	Cap, Weld	3013	1.99%	3.32%	

THE LOWEST DESIGN PRESSURE: 3013 2% 3%

Table 3 - Rated Fittings Rated Pressure

Enter MID#, PO#, or "PO" in this field | Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
(Station Piping)										
1	Not Noted	Not Noted	3/4" Tee, Autoperf Mueller, H-18102 WOP 1200PSIG	ACTIVE	3/4"		Tee, Autoperf	Mueller, H-18102	1200	Confirmed 887025761
1	Not noted	Not Noted	3/4" Coupling Dresser WOP PSIG	RETIRED	3/4"		Coupling	Dresser		Rated for 150 - To be retired

THE LOWEST PRESSURE RATING: 1200

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	RS-1538 Inlet - Retired
Facility Type	REGULATOR STATION

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	728-500	Install RS-1538	728-500	9/18/1972	R Nakano	3/28/2011	C Koo	3/28/2011
2	108526080	Retire RS-1538	728-500	1/27/2006	R Nakano	3/28/2011	C Koo	3/28/2011

Facility Evaluation Summary

Facility Design Pressure	1200	
Design Factor	0.4	(Class 4 Location)
Pipe Design Pressure	1291.4	
Non-Rated Fitting Design Pressure	3013.0	
Rated Fitting Rated Pressure	1200.0	
Branch Connection Design Pressure	N/A	
Current System MAOP	150.0	
The Highest % SMYS of the Facility at the Current System MAOP	2.8%	
Proposed system MAOP	250.0	
The Highest % SMYS of the Facility at the Proposed System MAOP	4.6%	

Table 1 - Pipe Design Pressure

Enter MID#, PO#, or "PO" in this field — Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	NA	None	3/4" PIPE X 0.113 WALL Gr.A25	ACTIVE	3/4"	0.113	Gr.A25	1291	2.79%	4.65%	Historical Spec

THE LOWEST DESIGN PRESSURE: 1291 3% 5%

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, PO#, or "PO" in this field — Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
2	35	5200556	3/4" Weld Cap, Std X 0.113 WALL WPB	ACTIVE	3/4"	0.113			WPB	Weld Cap, Std	3013	1.99%	3.32%	

THE LOWEST DESIGN PRESSURE: 3013 2% 3%

Table 3 - Rated Fittings Rated Pressure

Enter MID#, PO#, or "PO" in this field — Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
1		None	3/4" Autoperf Tee Mueller, H18101 WOP 1200PSIG	ACTIVE	3/4"		Autoperf Tee	Mueller, H18101	1200	Confirmed 887026100

THE LOWEST PRESSURE RATING: 1200

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	RS-1868 Inlet - Retired
Facility Type	REGULATOR STATION

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	D-4 Card	Install RS-1868	None	6/26/1962	R Nakano	3/28/2011	C Koo	3/28/2011
2	108626091	Retire RS-1868	RS-1868	1/20/2005	R Nakano	3/28/2011	C Koo	3/28/2011

Facility Evaluation Summary

Facility Design Pressure	1291
Design Factor	0.4 (Class 4 Location)
Pipe Design Pressure	1291.4
Non-Rated Fitting Design Pressure	3013.0
Rated Fitting Rated Pressure	1440.0
Branch Connection Design Pressure	N/A
Current System MAOP	150.0
The Highest % SMYS of the Facility at the Current System MAOP	2.8%
Proposed system MAOP	250.0
The Highest % SMYS of the Facility at the Proposed System MAOP	4.6%

Table 1 - Pipe Design Pressure

Enter MID#, PO#, or "PO" in this field | Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	12	7000140	3/4" PIPE X 0.113 WALL Gr.A26	ACTIVE	3/4"	0.113	Gr.A26	1291	2.79%	4.65%	Historical Spec

THE LOWEST DESIGN PRESSURE: 1291 3% 5%

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, PO#, or "PO" in this field | Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
2	35	5200605	3/4" Weld Cap X 0.113 WALL WPB	ACTIVE	3/4"	0.113			WPB	Weld Cap	3013	1.99%	3.32%	

THE LOWEST DESIGN PRESSURE: 3013 2% 3%

Table 3 - Rated Fittings Rated Pressure

Enter MID#, PO#, or "PO" in this field | Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
1	1	Not Noted	1" Valve Tee H-17656 WOP 1440PSIG	ACTIVE	1"		Valve Tee	H-17656	1440	Confirmed per 887025763

THE LOWEST PRESSURE RATING: 1440

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	RS-1877 Inlet - Retired
Facility Type	REGULATOR STATION

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	778-256	Install RS-1877	778-256	3/3/1978	R Nakano	4/4/2011	C Koo	4/4/2011
2	108526116	Retire RS-1877	778-256	3/14/2007	R Nakano	4/4/2011	C Koo	4/4/2011

Facility Evaluation Summary

Facility Design Pressure	1200	
Design Factor	0.4	(Class 4 Location)
Pipe Design Pressure	1213.7	
Non-Rated Fitting Design Pressure	2832.0	
Rated Fitting Rated Pressure	1200.0	
Branch Connection Design Pressure	N/A	
Current System MAOP	150.0	
The Highest % SMYS of the Facility at the Current System MAOP	3.0%	
Proposed system MAOP	250.0	
The Highest % SMYS of the Facility at the Proposed System MAOP	4.9%	

Table 1 - Pipe Design Pressure

Job Key	ITEM #	MID (Enter MID#, PO#, or "PO" in this field)	Description	Status (Select Data from the drop down manual)	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
(Station Piping)											
1	12	7000140	1" PIPE X 0.133 WALL Gr.A25	ACTIVE	1"	0.133	Gr.A25	1214	2.97%	4.94%	Historical Spec

THE LOWEST DESIGN PRESSURE: 1214 3% 5%

Table 2 - Non-Rated Fitting Design Pressure

Job Key	ITEM #	MID (Enter MID#, PO#, or "PO" in this field)	Description	Status (Select Data from the drop down manual)	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
(Station Piping)														
2	35	5200606	1" Cap, Weld X 0.133 WALL WPB	ACTIVE	1"	0.133			WPB	Cap, Weld	2832	2.12%	3.53%	

THE LOWEST DESIGN PRESSURE: 2832 2% 4%

Table 3 - Rated Fittings Rated Pressure

Job Key	ITEM #	MID (Enter MID#, PO#, or "PO" in this field)	Description	Status (Select Data from the drop down manual)	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
(Station Piping)										
1	1	6600620	3/4" X 1", Tee Mueller, Auto-Perf, H-18101 WOP 1200PSIG	ACTIVE	3/4"		X 1", Tee	Mueller, Auto-Perf, H-18101	1200	Confirmed 887026106

THE LOWEST PRESSURE RATING: 1200

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	RB-1973 - Inlet - Retired
Facility Type	REGULATOR STATION

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	799-876	Instal RB-1973	799-876	11/2/1979	R Nakano	3/30/2011	C Koo	3/30/2011
2	108826098	Retire RB-1973	799-876	10/14/2005	R Nakano	3/30/2011	C Koo	3/30/2011

Facility Evaluation Summary

Facility Design Pressure	1200	
Design Factor	0.4	(Class 4 Location)
Pipe Design Pressure	1291.4	
Non-Rated Fitting Design Pressure	3013.0	
Rated Fitting Rated Pressure	1200.0	
Branch Connection Design Pressure	N/A	
Current System MAOP	150.0	
The Highest % SMYS of the Facility at the Current System MAOP	2.8%	
Proposed system MAOP	250.0	
The Highest % SMYS of the Facility at the Proposed System MAOP	4.8%	

Table 1 - Pipe Design Pressure

Enter MID#, PO#, or "PO" in this field | Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
(Station Piping)											
1	NA	None	3/4" PIPE X 0.113 WALL Gr.A25	ACTIVE	3/4"	0.113	Gr.A25	1291	2.79%	4.65%	Historical Spec

THE LOWEST DESIGN PRESSURE: 1291 3% 5%

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, PO#, or "PO" in this field | Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
(Station Piping)														
2	35	6200556	3/4" Cap, Weld X 0.113 WALL WPB	ACTIVE	3/4"	0.113			WPB	Cap, Weld	3013	1.99%	3.32%	

THE LOWEST DESIGN PRESSURE: 3013 2% 3%

Table 3 - Rated Fittings Rated Pressure

Enter MID#, PO#, or "PO" in this field | Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
(Station Piping)										
1	NA	None	3/4" Tee, Service Mueller H-16102 WOP 1200PSIG	ACTIVE	3/4"		Tee, Service	Mueller H-16102	1200	

THE LOWEST PRESSURE RATING: 1200

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	RS-2123 - Inlet
Facility Type	REGULATOR STATION

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	846-282	Install RS-2123	846-282	7/19/1984	R Nakano	3/31/2011	C Koo	3/31/2011
2	100526114	Retire RS-2123	846-282	9/15/2006	R Nakano	3/31/2011	C Koo	3/31/2011

Facility Evaluation Summary

Facility Design Pressure	500	
Design Factor	0.4	(Class 4 Location)
Pipe Design Pressure	1213.7	
Non-Rated Fitting Design Pressure	2832.0	
Rated Fitting Rated Pressure	500.0	
Branch Connection Design Pressure	N/A	
Current System MAOP	150.0	
The Highest % SMYS of the Facility at the Current System MAOP	3.0%	
Proposed system MAOP	250.0	
The Highest % SMYS of the Facility at the Proposed System MAOP	4.9%	

Table 1 - Pipe Design Pressure

		Enter MID#, PO#, or "PO" in this field		Select Data from the drop down manual							
Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
(Station Piping)											
1	12	7000140	1" PIPE X 0.133 WALL Gr.A25	ACTIVE	1"	0.133	Gr.A25	1214	2.97%	4.94%	Historical Spec

THE LOWEST DESIGN PRESSURE: 1214 3% 5%

Table 2 - Non-Rated Fitting Design Pressure

		Enter MID#, PO#, or "PO" in this field		Select Data from the drop down manual										
Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
(Station Piping)														
2	1	5200808	1" Cap, Weld X 0.133 WALL WPB	ACTIVE	1"	0.133			WPB	Cap, Weld	2832	2.12%	3.63%	

THE LOWEST DESIGN PRESSURE: 2832 2% 4%

Table 3 - Rated Fittings Rated Pressure

		Enter MID#, PO#, or "PO" in this field		Select Data from the drop down manual						
Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
(Station Piping)										
1	1	6600620	1" Tee, Autoperf Mueller, H-18101 WOP 1200PSIG	ACTIVE	1"		Tee, Autoperf	Mueller, H-18101	1200	
1	Not noted	6400095	1" Flange, WN, FF CLASS 300 WOP 740PSIG	ACTIVE	1"	CLASS 300	Flange, WN, FF		740	
1	Not noted	Not Noted	1" Valve, Plug Fig 525 CLASS 300 WOP 500PSIG	ACTIVE	1"	CLASS 300	Valve, Plug	Fig 525	500	
2	34	6400095	1" Flange, WN, RF CLASS 300 WOP 740PSIG	ACTIVE	1"	CLASS 300	Flange, WN, RF		740	

THE LOWEST PRESSURE RATING: 500

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	RS-2311 - Inlet
Facility Type	REGULATOR STATION

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	905-504	Install RS-2311	3D08-571	9/16/1991	R Nakano	7/14/2011	C Koo	7/14/2011

Facility Evaluation Summary

Facility Design Pressure	400
Design Factor	0.4 (Class 4 Location)
Pipe Design Pressure	1213.7
Non-Rated Fitting Design Pressure	1770.0
Rated Fitting Rated Pressure	400.0
Branch Connection Design Pressure	1273.5
Current System MAOP	150.0
The Highest % SMYS of the Facility at the Current System MAOP	4.3%
Proposed system MAOP	250.0
The Highest % SMYS of the Facility at the Proposed System MAOP	7.1%

Table 1 - Pipe Design Pressure

Enter MID#, POI#, or "PO" in this field. Select Date from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
(Station Piping)											
1	38	7000440	4" PIPE X 0.188 WALL X-42	ACTIVE	4"	0.188	X-42	1404	4.27%	7.12%	
(First Stage Piping)											
1	38	7000440	4" PIPE X 0.188 WALL X-42	ACTIVE	4"	0.188	X-42	1404	4.27%	7.12%	
1	30	7000292	2" PIPE X 0.154 WALL Gr.B	ACTIVE	2"	0.154	Gr.B	1818	3.30%	5.51%	
(Second Stage or Relief Piping)											
1	30	7000292	2" PIPE X 0.154 WALL Gr.B	ACTIVE	2"	0.154	Gr.B	1818	3.30%	5.51%	
1	38	7000440	4" PIPE X 0.188 WALL X-42	ACTIVE	4"	0.188	X-42	1404	4.27%	7.12%	
1	21	7000080	3/4" PIPE X 0.113 WALL Gr.A25	ACTIVE	3/4"	0.113	Gr.A25	1291	2.79%	4.65%	
1	48	7000140	1" PIPE X 0.133 WALL Gr.A25	ACTIVE	1"	0.133	Gr.A25	1214	2.67%	4.84%	
(RTU Piping)											
1	65	7000080	3/4" PIPE X 0.113 WALL Gr.A25	ACTIVE	3/4"	0.113	Gr.A25	1291	2.79%	4.65%	

THE LOWEST DESIGN PRESSURE: 1214 4% 7%

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, POI#, or "PO" in this field. Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
(Station Piping)														
1	7	7800499	4" X 2" Tee, Weld 0.237 X 0.154 WALL WPR	ACTIVE	4"	0.237	2"	0.154	WPR	Tee, Weld	1938	3.10%	5.16%	
1	35	6200713	4" Cap, Weld X 0.237 WALL WPR	ACTIVE	4"	0.237			WPR	Cap, Weld	1938	3.10%	5.16%	
1	39	6000697	4" X 90 Degree, Elbow, Weld X 0.237 WALL WPR	ACTIVE	4"	0.237			WPR	X 90 Degree, Elbow, Weld	1938	3.10%	5.16%	
(First Stage Piping)														
1	5	6000500	2" X 90 Degree, Elbow, Weld X 0.154 WALL WPB	ACTIVE	2"	0.154			WPB	X 90 Degree, Elbow, Weld	1818	3.30%	5.51%	
1	25	6800235	TH 1/2" Threaded Nipple X 0.07153 WALL WPB	ACTIVE	TH 1/2"	0.07153			WPB	Threaded Nipple	2618	2.29%	3.82%	Branch Fitting
(Second Stage or Relief Piping)														
1	25	6800235	TH 1/2" Threaded Nipple X 0.07153 WALL WPB	ACTIVE	TH 1/2"	0.07153			WPB	Threaded Nipple	2618	2.29%	3.82%	Branch Fitting
1	5	6000500	2" X 90 Elbow X 0.154 WALL WPB	ACTIVE	2"	0.154			WPB	x 90 Elbow	1818	3.30%	5.51%	
1	7	7800400	2" X 4" Red Tee 0.154 X 0.237 WALL Y-42	ACTIVE	2"	0.154	4"	0.237	Y-42	Red Tee	1770	3.39%	5.65%	
1	35	6200713	4" Weld Cap X 0.237 WALL Y-42	ACTIVE	4"	0.237			Y-42	Weld Cap	1770	3.39%	5.65%	
1	39	6000697	4" x 90 Elbow X 0.237 WALL Y-42	ACTIVE	4"	0.237			Y-42	x 90 Elbow	1770	3.39%	5.65%	
(RTU Piping)														

THE LOWEST DESIGN PRESSURE: 1770 3% 6%

Table 3 - Rated Fittings Rated Pressure

Enter MID#, POI#, or "PO" in this field. Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
(Station Piping)										
1	40	6600784	4" Valve, Plug Nordstrom, Fig. 2045-1/2 CLASS 300 WOP 740PSIG	ACTIVE	4"	CLASS 300	Valve, Plug	Nordstrom, Fig. 2045-1/2	740	
(First Stage Piping)										
1	2	6400185	2" Flange, WN, FF CLASS 300 WOP 740PSIG	ACTIVE	2"	CLASS 300	Flange, WN, FF		740	
1	24	6800840	2" Valve, Plug Nordstrom, Fig 305, Class 250 WOP 400PSIG	ACTIVE	2"		Valve, Plug	Nordstrom, Fig 305, Class 250	400	
1	8	PO	2" Strainer Mueller, Fig 188 CLASS 300 WOP 740PSIG	ACTIVE	2"	CLASS 300	Strainer	Mueller, Fig 188	740	
1	28	5600342	1/2" Ball Valve Apollo WOP 1000PSIG	ACTIVE	1/2"		Ball Valve	Apollo	1000	
1	19	7400116	1/4" Pilot Fisher 161-M WOP 1500PSIG	ACTIVE	1/4"		P594	Fisher 161-M	1500	
1	17	6200376	1/4" Filter P594 WOP 1400PSIG	ACTIVE	1/4"		Filter	P594	1400	
(Second Stage or Relief Piping)										
1	2	6400185	2" Weld Neck Flange CLASS 300 WOP 740PSIG	ACTIVE	2"	CLASS 300	Weld Neck Flange		740	
1	28	5600342	1/2" Ball Valve Apollo WOP 1000PSIG	ACTIVE	1/2"		Ball Valve	Apollo	1000	
1	24	6800640	2" Plug Valve Fig 305 WOP 400PSIG	ACTIVE	2"		Plug Valve	Fig 305	400	
1	25	7800612	3/4" Servic eTee H17501 WOP 1440PSIG	ACTIVE	3/4"		Servic eTee	H17501	1440	Branch Fitting
1	19	7400116	1/4" Pilot Fisher 161-M WOP 1500PSIG	ACTIVE	1/4"		Pilot	Fisher 161-M	1500	
1	16	5600315	1/4" Check valve P503 WOP PSIG	ACTIVE	1/4"		Check valve	P503		
1	17	6200376	1/4" Filter P594 WOP 1400PSIG	ACTIVE	1/4"		Filter	P594	1400	
(RTU Piping)										
1	66	7800612	3/4" Tee, Service Mueller, H-17501 WOP 1440PSIG	ACTIVE	3/4"		Tee, Service	Mueller, H-17501	1440	

THE LOWEST PRESSURE RATING: 400

Design Pressure Calculation on a Branch

Design Factor (F)	0.4
Current MAOP	150
Proposed MAOP	250

Dimensions			
	Job Key of the Header Pipe	1	1
	Header OD (inch)	4.500	2.375
	Header Wall Thickness (inch)	0.188	0.154
	Header Yield Strength	42000	35000
	Header Longitudinal Joint Factor	1	1
	Job Key of the Branch	1	1
	Branch Fitting Description	3/4" Service Tee	1/2" Nipple
	Branch OD (inch)	1.180	0.840
	Branch Wall Thickness (inch)	0.18	0.109
	Branch Yield Strength (psi)	36000	35000
	Branch Longitudinal Joint Factor	1	1
	Temperature Derating Factor (from Header)	1	1
	Tap Size (Maximum) (inch)	0.82	0.622
	Tap Size (inch)	0.82	0.622
	Recommended Fitting Weld Leg (in)	0.25	0.25
	Fitting Weld Length (in)	0.25	0
Effective A3 Provided by Additional Reinforcement			
	Max 'Usable' Length (OD) of additional Reinforcement	1.64	1.244
	OD of Additional Reinforcement (inch)	0	0
	Thickness of Additional Reinforcement M (inch)	0	0
	Yield Strength of Additional Reinforcement (psi)	0	0
Effective A3 Provided by Weldments			
	Max Header Weld Leg Length for A3 (inch)	0.25	0.25
	Header Weld Leg Length for A3 (inch)	0	0
	Max Branch Weld Leg Length for A3 (inch)	0.25	0.25
	Branch Weld Leg Length for A3 (inch)	0	0
Conclusion and Calculation Summary			
	Design Pressure (psig)	1413.401564	1273.453096
	L (inch)	0.45	0.2725
	d – OD/2 (Max Reinforcement Width)	0.23	0.202
	t (inch)	0.189294852	0.108016111
	tb (inch)	0.057910203	0.038203593
	Ar (sq in)	0.155221779	0.067186021
	A1 (sq in)	0	0.028601979
	A2 (sq in)	0.109880817	0.038584042
	A2' (sq in)	0.094183558	0.038584042
	A3 (Fitting Weld Material)	0.0621	0
	A3 Reinforcement (sq in)	0	0
	A3 Weldment (sq in)	0	0
	A3 (sq in)	0.0621	0
	Status (Branch Status from Calculation Worksheet)	Active	Active
	Design Pressure Evaluation	1413.401564	1273.453096

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	RS-2695 Inlet
Facility Type	REGULATOR STATION

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
	109023552	Install RS-2695	3D11-538	12/22/2005	R Nakano	3/28/2011	C Kog	3/28/2011

Facility Evaluation Summary

Facility Design Pressure	720
Design Factor	0.4 (Class 4 Location)
Pipe Design Pressure	1769.6
Non-Rated Fitting Design Pressure	1045.0
Rated Fitting Rated Pressure	720.0
Branch Connection Design Pressure	1184.8
Current System MAOP	150.0
The Highest % SMYS of the Facility at the Current System MAOP	5.7%
Proposed system MAOP	250.0
The Highest % SMYS of the Facility at the Proposed System MAOP	9.6%

Table 1 - Pipe Design Pressure

Job Key	ITEM #	Enter MID#, PO#, or "PO" in this field: MID	Description	Select Data from the drop down manual: Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
(Station Piping)											
	5	9998588	4" PIPE X 0.237 WALL X-42	ACTIVE	4"	0.237	X-42	1770	3.39%	5.65%	
(First Stage Piping)											
	1	7000270	2" PIPE X 0.154 WALL Gr.B	ACTIVE	2"	0.154	Gr.B	1816	3.30%	5.51%	
	17	9998124	4" PIPE X 0.237 WALL X-42	ACTIVE	4"	0.237	X-42	1770	3.39%	5.65%	
								THE LOWEST DESIGN PRESSURE:	1770	3%	6%

Table 2 - Non-Rated Fitting Design Pressure

Job Key	ITEM #	Enter MID#, PO#, or "PO" in this field: MID	Description	Select Data from the drop down manual: Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
(Station Piping)														
	2	6000814	8" X60 Weld Ell X 0.322 WALL WPB	ACTIVE	8"	0.322			WPB	X60 Weld Ell	1045	5.74%	9.57%	
	3	7000575	8" X 4" Weld Reducer 0.322 X 0.237 WALL WPB	ACTIVE	8"	0.322	4"	0.237	WPB	Weld Reducer	1045	5.74%	9.57%	
	4	6000872	4" X 45 Weld Ell X 0.237 WALL WPB	ACTIVE	4"	0.237			WPB	X 45 Weld Ell	1938	3.10%	5.16%	
	9	6000887	4" X 90 Weld Ell X 0.237 WALL WPB	ACTIVE	4"	0.237			WPB	X 90 Weld Ell	1476	4.07%	6.78%	
(First Stage Piping)														
	21	6000897	4" X 90 Weld Ell X 0.237 WALL WPB	ACTIVE	4"	0.237			WPB	X 90 Weld Ell	1476	4.07%	6.78%	
	4	7000502	4" X 2" Weld Reducer 0.237 X 0.154 WALL WPB	ACTIVE	4"	0.237	2"	0.154	WPB	Weld Reducer	1938	3.10%	5.16%	
	5	6000500	2" X 90 Weld Ell X 0.154 WALL WPB	ACTIVE	2"	0.154			WPB	X 90 Weld Ell	1816	3.30%	5.51%	
	9	7000412	4" Weld Tee X 0.237 WALL Y-42	ACTIVE	4"	0.237			Y-42	Weld Tee	1770	3.39%	5.65%	
	15	6000370	TH_3/4" Nipple, Threaded X 0.07563 WALL Gr.B	ACTIVE	TH_3/4"	0.07563			Gr.B	Nipple, Threaded	2169	2.77%	4.61%	Sch 40 - Branch Fitting
										THE LOWEST DESIGN PRESSURE:	1045	6%	10%	

Table 3 - Rated Fittings Rated Pressure

Job Key	ITEM #	Enter MID#, PO#, or "PO" in this field: MID	Description	Select Data from the drop down manual: Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
(Station Piping)										
	1	7600795	8" B/O Stopper Mueller H-17281 CLASS 300 WOP 720PSIG	ACTIVE	8"	CLASS 300	B/O Stopper	Mueller H-17281	720	Tie-in fitting
	6	6600764	4" Valve Nordstrom Fig 2045-1/2 CLASS 300 WOP 740PSIG	ACTIVE	4"	CLASS 300	Valve	Nordstrom Fig 2045 1/2	740	Inlet Valve
	8	6600841	2" Nipple, Sav-a-Valve Mueller H17491 WOP 1440PSIG	ACTIVE	2"		Nipple, Sav-a-Valve	Mueller H17491	1440	Branch fitting
(First Stage Piping)										
	2	6400185	2" Flange, WN, RF CLASS 300 WOP 740PSIG	ACTIVE	2"	CLASS 300	Flange, WN, RF		740	
	6	9995810	2" Valve Ball-o-max CLASS 300 WOP 740PSIG	ACTIVE	2"	CLASS 300	Valve	Ball-o-max	740	
	7	9995840	2" Strainer Mueller, 126-FCS CLASS 300 WOP 740PSIG	ACTIVE	2"	CLASS 300	Strainer	Mueller, 126-FCS	740	
	10	7400370	2" Regulator Mooney FG-30 CLASS 300 WOP 740PSIG	ACTIVE	2"	CLASS 300	Regulator	Mooney FG-30	740	
	11	7400145	1/4" Pilot American Meter, Z8C-100 WOP 1440PSIG	ACTIVE	1/4"		Pilot	American Meter, Z8C-100	1440	
	12	9995940	1/4" Pilot Restrictor Fisher WOP 1500PSIG	ACTIVE	1/4"		Pilot Restrictor	Fisher	1500	
	13	9995939	1/4" Pilot Filter Fisher, 252 WOP 2150PSIG	ACTIVE	1/4"		Pilot Filter	Fisher, 252	2150	
	16	9998141	3/4" Valve Ball WOP 2000PSIG	ACTIVE	3/4"		Valve	Ball	2000	
								THE LOWEST PRESSURE RATING:	720	

Design Pressure Calculation on a Branch

Design Factor (F)	0.4
Current MAOP	150
Proposed MAOP	250

Dimensions			
	Job Key of the Header Pipe	1	1
	Header OD (inch)	4.500	2.375
	Header Wall Thickness (inch)	0.237	0.154
	Header Yield Strength	42000	35000
	Header Longitudinal Joint Factor	1	1
	Job Key of the Branch	1	1
	Branch Fitting Description	2" Save-A-Valve	3/4" Nipple
	Branch OD (inch)	2.219	1.050
	Branch Wall Thickness (inch)	0.234375	0.113
	Branch Yield Strength (psi)	36000	35000
	Branch Longitudinal Joint Factor	1	1
	Temperature Derating Factor (from Header)	1	1
	Tap Size (Maximum) (inch)	1.75	0.824
	Tap Size (inch)	1.75	0.824
	Recommended Fitting Weld Leg (in)	0.25	0.25
	Fitting Weld Length (in)	0	0
Effective A3 Provided by Additional Reinforcement			
	Max 'Usable' Length (OD) of additional Reinforcement	3.5	1.648
	OD of Additional Reinforcement (inch)	0	0
	Thickness of Additional Reinforcement M (inch)	0	0
	Yield Strength of Additional Reinforcement (psi)	0	0
Effective A3 Provided by Weldments			
	Max Header Weld Leg Length for A3 (inch)	0.25	0.25
	Header Weld Leg Length for A3 (inch)	0	0
	Max Branch Weld Leg Length for A3 (inch)	0.25	0.25
	Branch Weld Leg Length for A3 (inch)	0	0
Conclusion and Calculation Summary			
	Design Pressure (psig)	1190.498092	1184.923845
	L (inch)	0.5859375	0.2825
	d – OD/2 (Max Reinforcement Width)	0.640625	0.299
	t (inch)	0.159441709	0.100506933
	tb (inch)	0.09171589	0.044434644
	Ar (sq in)	0.27902299	0.082817713
	A1 (sq in)	0.13572701	0.044078287
	A2 (sq in)	0.167178644	0.038739426
	A2' (sq in)	0.143295981	0.038739426
	A3 (Fitting Weld Material)	0	0
	A3 Reinforcement (sq in)	0	0
	A3 Weldment (sq in)	0	0
	A3 (sq in)	0	0
	Status (Branch Status from Calculation Worksheet)	Active	Active
	Design Pressure Evaluation	1190.498092	1184.923845

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	RS-2695 Inlet
Facility Type	REGULATOR STATION

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
	189025042	Install RS-2695	9D11-699	12/15/2005	R Nakano	4/6/2011	C Koo	4/6/2011

Facility Evaluation Summary

Facility Design Pressure	720
Design Factor	0.4 (Class 4 Location)
Pipe Design Pressure	1769.8
Non-Rated Fitting Design Pressure	1770.0
Rated Fitting Rated Pressure	720.0
Branch Connection Design Pressure	984.3
Current System MAOP	150.0
The Highest % SMYS of the Facility at the Current System MAOP	3.4%
Proposed system MAOP	260.0
The Highest % SMYS of the Facility at the Proposed System MAOP	5.7%

Table 1 - Pipe Design Pressure

Job Key	ITEM #	Enter MID#, PO#, or "PO" in this field: MID	Select Data from the drop down manual: Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
(Station Piping)											
1	6	9986688	4" PIPE X 0.237 WALL X-42	ACTIVE	4"	0.237	X-42	1770	3.39%	5.65%	Wrapped
1	7	9986124	4" PIPE X 0.237 WALL X-42	ACTIVE	4"	0.237	X-42	1770	3.39%	5.65%	Bare
(First Stage Piping)											
1	2	9986124	4" PIPE X 0.237 WALL X-42	ACTIVE	4"	0.237	X-42	1770	3.39%	5.65%	Bare
1	5	7009270	2" PIPE X 0.154 WALL Gr.B	ACTIVE	2"	0.154	Gr.B	1616	3.30%	5.51%	Bare

THE LOWEST DESIGN PRESSURE: 1770 3% 6%

Table 2 - Non-Rated Fitting Design Pressure

Job Key	ITEM #	Enter MID#, PO#, or "PO" in this field: MID	Select Data from the drop down manual: Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
(Station Piping)														
1	4	9986779	4" X 90 Degree, Elbow, Weld X 0.237 WALL Y-52	ACTIVE	4"	0.237			Y-52	X 90 Degree, Elbow, Weld	2191	2.74%	4.56%	
(First Stage Piping)														
1	1	9986779	4" X 90 Degree, Elbow, Weld X 0.237 WALL Y-52	ACTIVE	4"	0.237			Y-52	X 90 Degree, Elbow, Weld	2191	2.74%	4.56%	
1	3	7809412	4" X 4" Tee, Weld 0.237 X 0.237 WALL Y-42	ACTIVE	4"	0.237	4"	0.237	Y-42	Tee, Weld	1770	3.39%	5.65%	
1	4	6000710	4" X 2" X 90 Degree, Elbow, Reducing, Weld 0.237 X 0.154 WALL Y-42	ACTIVE	4"	0.237	2"	0.154	Y-42	X 90 Degree, Elbow, Reducing, Weld	1770	3.39%	5.65%	
1	9	6000500	2" X 90 Degree, Elbow, Weld X 0.154 WALL WPB	ACTIVE	2"	0.154			WPB	X 90 Degree, Elbow, Weld	1616	3.30%	5.51%	
1	10	9986454	TH_3/4" X 3" Nipple, Weld x Thread, Sch 40 X 0.07553 WALL Gr.B	ACTIVE	TH_3/4"	0.07553			Gr.B	X 3" Nipple, Weld X Thread, Sch 40	2186	2.77%	4.61%	Branch Fitting

THE LOWEST DESIGN PRESSURE: 1770 3% 6%

Table 3 - Rated Fittings Rated Pressure

Job Key	ITEM #	Enter MID#, PO#, or "PO" in this field: MID	Select Data from the drop down manual: Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
(Station Piping)										
1	3	7800788	4" Stopper, B/O Mueller, H-17261 CLASS 300 WOP 720PSIG	ACTIVE	4"	CLASS 300	Stopper, B/O	Mueller, H-17261	720	Branch Fitting, Tie-In Fitting
1	5	6800841	2" Nipple, Sav-A-Valve Mueller, H-17491 WOP 1440PSIG	ACTIVE	2"		Nipple, Sav-A-Valve	Mueller, H-17491	1440	Branch Fitting on the 4" station inlet and 4" main
1	9	6800784	4" Valve, Plug Nordstrom, Fig 2045-1/2 CLASS 300 WOP 740PSIG	ACTIVE	4"	CLASS 300	Valve, Plug	Nordstrom, Fig 2045-1/2	740	
(First Stage Piping)										
1	6	6400186	2" Flange, WN, FF CLASS 300 WOP 740PSIG	ACTIVE	2"	CLASS 300	Flange, WN, FF		740	
1	8	9986910	2" Valve, Plug Ball-a-Max CLASS 300 WOP 740PSIG	ACTIVE	2"	CLASS 300	Valve, Plug	Ball-a-Max	740	
1	10	9985840	2" Strainer Mueller, 126-FGS CLASS 300 WOP 740PSIG	ACTIVE	2"	CLASS 300	Strainer	Mueller, 126-FGS	740	
1	11	7400370	2" Regulator Mooney, FG-30 CLASS 300 WOP 740PSIG	ACTIVE	2"	CLASS 300	Regulator	Mooney, FG-30	740	
1	12	7400146	1/4" Pilot American Meter, Z6C-100 WOP 1440PSIG	ACTIVE	1/4"		Pilot	American Meter, Z6C-100	1440	
1	13	9985938	1/4" Pilot Restrictor Fisher WOP 1500PSIG	ACTIVE	1/4"		Pilot Restrictor	Fisher	1500	
1	14	9985939	1/4" Pilot Filter Fisher, 252 WOP 2150PSIG	ACTIVE	1/4"		Pilot Filter	Fisher, 252	2150	
1	17	9986141	3/4" Valve, Ball WOP 2000PSIG	ACTIVE	3/4"		Valve, Ball		2000	

THE LOWEST PRESSURE RATING: 720

Design Pressure Calculation on a Branch

Design Factor (F)	0.4
Current MAOP	150
Proposed MAOP	250

Dimensions			
Job Key of the Header Pipe	1	1	1
Header OD (inch)	4.500	4.500	2.375
Header Wall Thickness (inch)	0.237	0.188	0.154
Header Yield Strength	42000	35000	35000
Header Longitudinal Joint Factor	1	1	1
Job Key of the Branch	1	1	1
Branch Fitting Description	2" Save-A-Valve	2" Save-A-Valve	3/4" Nipple
Branch OD (inch)	2.219	2.219	1.050
Branch Wall Thickness (inch)	0.23475	0.23475	0.113
Branch Yield Strength (psi)	36000	36000	35000
Branch Longitudinal Joint Factor	1	1	1
Temperature Derating Factor (from Header)	1	1	1
Tap Size (Maximum) (inch)	1.74925	1.74925	0.824
Tap Size (inch)	1.74925	1.74925	0.824
Recommended Fitting Weld Leg (in)	0.25	0.25	0.25
Fitting Weld Length (in)	0.25	0.25	0.25
Effective A3 Provided by Additional Reinforcement			
Max 'Usable' Length (OD) of additional Reinforcement	3.4985	3.4985	1.648
OD of Additional Reinforcement (inch)	0	0	0
Thickness of Additional Reinforcement M (inch)	0	0	0
Yield Strength of Additional Reinforcement (psi)	0	0	0
Effective A3 Provided by Weldments			
Max Header Weld Leg Length for A3 (inch)	0.25	0.25	0.25
Header Weld Leg Length for A3 (inch)	0	0	0
Max Branch Weld Leg Length for A3 (inch)	0.25	0.25	0.25
Branch Weld Leg Length for A3 (inch)	0	0	0
Conclusion and Calculation Summary			
Design Pressure (psig)	1306.178302	964.3086445	1573.187198
L (inch)	0.586875	0.47	0.2825
d – OD/2 (Max Reinforcement Width)	0.639875	0.639875	0.299
t (inch)	0.174934594	0.154978175	0.133439986
tb (inch)	0.100627886	0.074290271	0.05899452
Ar (sq in)	0.306004339	0.271095573	0.109954548
A1 (sq in)	0.108567911	0.057763427	0.016941452
A2 (sq in)	0.157425832	0.150832145	0.030513096
A2' (sq in)	0.134936427	0.150832145	0.030513096
A3 (Fitting Weld Material)	0.0625	0.0625	0.0625
A3 Reinforcement (sq in)	0	0	0
A3 Weldment (sq in)	0	0	0
A3 (sq in)	0.0625	0.0625	0.0625
Status (Branch Status from Calculation Worksheet)	Active	Active	Active
Design Pressure Evaluation	1306.178302	964.3086445	1573.187198

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	RS-2697 - Inlet
Facility Type	REGULATOR STATION

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	109026043	Install RS-2697	9011-549	3/15/2007	R Nakano	4/5/2011	C Koo	4/6/2011

Facility Evaluation Summary

Facility Design Pressure	720
Design Factor	0.4 (Class 4 Location)
Pipe Design Pressure	1769.6
Non-Rated Fitting Design Pressure	1770.0
Rated Fitting Rated Pressure	720.0
Branch Connection Design Pressure	1304.9
Current System MAOP	150.0
The Highest % SMYS of the Facility at the Current System MAOP	3.4%
Proposed system MAOP	260.0
The Highest % SMYS of the Facility at the Proposed System MAOP	5.7%

Table 1 - Pipe Design Pressure

Job Key	ITEM #	MID (Enter MID#, PO#, or "PO" in this field)	Description	Status (Select Data from the drop down manual)	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
(Station Piping)											
1	4	8899585	4" PIPE X 0.237 WALL X-42	ACTIVE	4"	0.237	X-42	1770	3.39%	5.65%	Bare
(First Stage Piping)											
1	1	7000270	2" PIPE X 0.154 WALL Gr.B	ACTIVE	2"	0.154	Gr.B	1818	3.30%	5.51%	Bare
1	17	8998124	4" PIPE X 0.237 WALL X-42	ACTIVE	4"	0.237	X-42	1770	3.39%	5.65%	Bare

THE LOWEST DESIGN PRESSURE: 1770 3% 6%

Table 2 - Non-Rated Fitting Design Pressure

Job Key	ITEM #	MID (Enter MID#, PO#, or "PO" in this field)	Description	Status (Select Data from the drop down manual)	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
(Station Piping)														
1	23	6000807	4" X 90 Degree Elbow, Weld X 0.237 WALL Y-42	ACTIVE	4"	0.237			Y-42	X 90 Degree Elbow, Weld	1770	3.39%	5.65%	
(First Stage Piping)														
1	5	6000600	2" X 90 Degree, Elbow, Weld X 0.154 WALL WPB	ACTIVE	2"	0.154			WPB	X 90 Degree, Elbow, Weld	1818	3.30%	5.51%	
1	9	7800412	4" X 4" Tee, Weld 0.237 X 0.237 WALL Y-42	ACTIVE	4"	0.237	4"	0.237	Y-42	Tee, Weld	1770	3.39%	5.65%	
1	16	6800370	TH, 3/4" Nipple, Weld X Thread, Sch 40 X 0.07553 WALL Gr.B	ACTIVE	TH_3/4"	0.07553			Gr.B	Nipple, Weld X Thread, Sch 40	2169	2.77%	4.61%	Branch Fitting
1	22	6000710	4" X 2" X 90 Degree, Elbow, Reducing, Weld 0.237 X 0.154 WALL Y-42	ACTIVE	4"	0.237	2"	0.154	Y-42	X 90 Degree, Elbow, Reducing, Weld	1770	3.39%	5.65%	

THE LOWEST DESIGN PRESSURE: 1770 3% 6%

Table 3 - Rated Fittings Rated Pressure

Job Key	ITEM #	MID (Enter MID#, PO#, or "PO" in this field)	Description	Status (Select Data from the drop down manual)	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
(Station Piping)										
1	8	6600784	4" Valve, Plug Nordstrom, Fig 2045-1/2 CLASS 300 WOP 740PSIG	ACTIVE	4"	CLASS 300	Valve, Plug	Nordstrom, Fig 2045-1/2	740	
1	34	7800755	4" Tee, Flanged Mueller, H-17606 CLASS 300 WOP 720PSIG	ACTIVE	4"	CLASS 300	Tee, Flanged	Mueller, H-17606	720	Branch Fitting/ Tie-In Fitting
1	15	6800841	2" Save-A-Valve Mueller, H-17491 WOP 1440PSIG	ACTIVE	2"		Save-A-Valve	Mueller, H-17491	1440	Branch Fitting
(First Stage Piping)										
1	2	6400185	2" Flange, WN, FF CLASS 300 WOP 740PSIG	ACTIVE	2"	CLASS 300	Flange, WN, FF		740	
1	6	9999910	2" Valve, Ball Ball-o-Max CLASS 300 WOP 740PSIG	ACTIVE	2"	CLASS 300	Valve, Ball	Ball-o-Max	740	
1	7	9998540	2" Strainer Mueller, 12B-FCB CLASS 300 WOP 740PSIG	ACTIVE	2"	CLASS 300	Strainer	Mueller, 12B-FCB	740	
1	10	7400370	2" Regulator Mooney, FG-30 CLASS 300 WOP 740PSIG	ACTIVE	2"	CLASS 300	Regulator	Mooney, FG-30	740	
1	11	7400146	1/4" Pilot American Meter, ZBC-100 WOP 1440PSIG	ACTIVE	1/4"		Pilot	American Meter, ZBC-100	1440	
1	12	9998538	1/4" Pilot Restrictor Fisher, 112 WOP 1500PSIG	ACTIVE	1/4"		Pilot Restrictor	Fisher, 112	1500	
1	13	6200378	1/4" Pilot Filter Fisher, PS64 WOP 1400PSIG	ACTIVE	1/4"		Pilot Filter	Fisher, PS64	1400	
1	18	9998141	3/4" Valve, Ball WOP 2000PSIG	ACTIVE	3/4"		Valve, Ball		2000	

THE LOWEST PRESSURE RATING: 720

Design Pressure Calculation on a Branch

Design Factor (F)	0.4
Current MAOP	150
Proposed MAOP	250

Dimensions		
Job Key of the Header Pipe	1	1
Header OD (inch)	4.500	2.375
Header Wall Thickness (inch)	0.237	0.154
Header Yield Strength	42000	35000
Header Longitudinal Joint Factor	1	1
Job Key of the Branch	1	1
Branch Fitting Description	2" Save-A-Valve	3/4" Nipple
Branch OD (inch)	2.219	1.050
Branch Wall Thickness (inch)	0.234375	0.113
Branch Yield Strength (psi)	36000	35000
Branch Longitudinal Joint Factor	1	1
Temperature Derating Factor (from Header)	1	1
Tap Size (Maximum) (inch)	1.75	0.824
Tap Size (inch)	1.75	0.824
Recommended Fitting Weld Leg (in)	0.25	0.25
Fitting Weld Length (in)	0.25	0.25
Effective A3 Provided by Additional Reinforcement		
Max 'Usable' Length (OD) of additional Reinforcement	3.5	1.648
OD of Additional Reinforcement (inch)	0	0
Thickness of Additional Reinforcement M (inch)	0	0
Yield Strength of Additional Reinforcement (psi)	0	0
Effective A3 Provided by Weldments		
Max Header Weld Leg Length for A3 (inch)	0.25	0.25
Header Weld Leg Length for A3 (inch)	0	0
Max Branch Weld Leg Length for A3 (inch)	0.25	0.25
Branch Weld Leg Length for A3 (inch)	0	0
Conclusion and Calculation Summary		
Design Pressure (psig)	1304.9389	1573.187198
L (inch)	0.5859375	0.2825
d – OD/2 (Max Reinforcement Width)	0.640625	0.299
t (inch)	0.174768603	0.133439986
tb (inch)	0.100532402	0.05899452
Ar (sq in)	0.305845055	0.109954548
A1 (sq in)	0.108904945	0.016941452
A2 (sq in)	0.156846794	0.030513096
A2' (sq in)	0.134440109	0.030513096
A3 (Fitting Weld Material)	0.0625	0.0625
A3 Reinforcement (sq in)	0	0
A3 Weldment (sq in)	0	0
A3 (sq in)	0.0625	0.0625
Status (Branch Status from Calculation Worksheet)	Active	Active
Design Pressure Evaluation	1304.9389	1573.187198

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	RS-2698 Inlet
Facility Type	REGULATOR STATION

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	108023568	Install RS-2698	3D11-560	1/5/2006	R Nakano	3/28/2011	C Koo	3/28/2011
2	887029022	Upgrade the Inlet Tie-In Fitting	3D11-560	TBD	D. Frieze	6/21/2012	D. Frieze	6/21/2012

Facility Evaluation Summary

Facility Design Pressure	492	
Design Factor	0.4	(Class 4 Location)
Pipe Design Pressure	1815.6	
Non-Rated Fitting Design Pressure	1816.0	
Rated Fitting Rated Pressure	740.0	
Branch Connection Design Pressure	491.9	
Current System MAOP	150.0	
The Highest % SMYS of the Facility at the Current System MAOP	3.3%	
Proposed system MAOP	250.0	
The Highest % SMYS of the Facility at the Proposed System MAOP	5.5%	

Table 1 - Pipe Design Pressure

Job Key	ITEM #	MID (Enter MID#, PO#, or "PO" in this field)	Description	Status (Select Data from the drop down manual)	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
(Station Piping)											
1	2	7000320	2" PIPE X 0.154 WALL Gr.B	ACTIVE	2"	0.154	Gr.B	1816	3.30%	5.51%	STW
1	7	7000292	2" PIPE X 0.154 WALL Gr.B	ACTIVE	2"	0.154	Gr.B	1816	3.30%	5.51%	
(First Stage Piping)											
1	1	7000270	2" PIPE X 0.154 WALL Gr.B	ACTIVE	2"	0.154	Gr.B	1816	3.30%	5.51%	Bare
							THE LOWEST DESIGN PRESSURE:	1816	3%	6%	

Table 2 - Non-Rated Fitting Design Pressure

Job Key	ITEM #	MID (Enter MID#, PO#, or "PO" in this field)	Description	Status (Select Data from the drop down manual)	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
(Station Piping)														
1	26	6000500	2" 90 Degress Weld Ell X 0.154 WALL WPB	ACTIVE	2"	0.154			WPB	90 Degress Weld Ell	1816	3.30%	5.51%	
(First Stage Piping)														
1	4	7800360	2" X 2" Weld Tee 0.154 X 0.154 WALL WPB	ACTIVE	2"	0.154	2"	0.154	WPB	Weld Tee	1816	3.30%	5.51%	
1	5	6000500	2" 90 Degree Weld Ell X 0.154 WALL WPB	ACTIVE	2"	0.154			WPB	90 Degree Weld Ell	1816	3.30%	5.51%	
1	15	6800370	TH_3/4" X 6" Threaded Nipple, SCH 40 X 0.07553 WALL Gr.B	ACTIVE	TH_3/4"	0.07553			Gr.B	X 6" Threaded Nipple, SCH 40	2169	2.77%	4.61%	Branch Fitting
								THE LOWEST DESIGN PRESSURE:	1816	3%	6%	

Table 3 - Rated Fittings Rated Pressure

Job Key	ITEM #	MID (Enter MID#, PO#, or "PO" in this field)	Description	Status (Select Data from the drop down manual)	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
(Station Piping)										
1	1	7800775	2" Valve Tee Mueller, H-17650 WOP 250PSIG	RETIRED	2"		Valve Tee	Mueller, H-17650	250	Tie-In Branch Fitting
1	3	6800642	2" Valve Nordstrom Fig 2045-1/4 CLASS 300 WOP 740PSIG	ACTIVE	2"	CLASS 300	Valve	Nordstrom Fig 2045 1/4	740	
1	6	6400185	2" Flange, WN, FF CLASS 300 WOP 740PSIG	ACTIVE	2"	CLASS 300	Flange, WN, FF		740	
1	8	6800841	2" Save-A-Valve Mueller, H17491 WOP 1440PSIG	ACTIVE	2"		Save-A-Valve	Mueller, H17491	1440	Branch Fitting
2	TBD	N/A	2" Valve Tee Mueller H-17650 (Upgraded) WOP 1440PSIG	ACTIVE	2"		Valve Tee	Mueller H-17650 (Upgraded)	1440	To Be Upgraded to 1440 psig
(First Stage Piping)										
1	2	6400185	2" Flange, WN, FF CLASS 300 WOP 740PSIG	ACTIVE	2"	CLASS 300	Flange, WN, FF		740	
1	6	9995910	2" Valve, Ball Ball-o-Max CLASS 300 WOP 740PSIG	ACTIVE	2"	CLASS 300	Valve, Ball	Ball-o-Max	740	
1	7	9995940	2" Strainer Mueller, 126FCS CLASS 300 WOP 740PSIG	ACTIVE	2"	CLASS 300	Strainer	Mueller, 126FCS	740	
1	10	7400370	2" Regulator Mooney FG-30 CLASS 300 WOP 740PSIG	ACTIVE	2"	CLASS 300	Regulator	Mooney FG-30	740	
1	11	7400371	1/4" Pilot Mooney, Series 20 WOP 1500PSIG	ACTIVE	1/4"		Pilot	Mooney, Series 20	1500	
1	12	9995938	1/4" Pilot Restrictor Fisher, 112 WOP 1500PSIG	ACTIVE	1/4"		Pilot Restrictor	Fisher, 112	1500	
1	13	6200376	1/4" Pilot Filter Fisher, P594-1 WOP 1400PSIG	ACTIVE	1/4"		Pilot Filter	Fisher, P594-1	1400	
1	16	9996141	3/4" Valve Ball WOP 2000PSIG	ACTIVE	3/4"		Valve	Ball	2000	
							THE LOWEST PRESSURE RATING:		740	

Design Pressure Calculation on a Branch

Design Factor (F)	0.4
Current MAOP	150
Proposed MAOP	250

Dimensions				
	Job Key of the Header Pipe	1	1	1
	Header OD (inch)	8.625	2.375	2.375
	Header Wall Thickness (inch)	0.188	0.154	0.154
	Header Yield Strength	35000	35000	35000
	Header Longitudinal Joint Factor	1	1	1
	Job Key of the Branch	1	1	1
	Branch Fitting Description	2"x2" H-17650 Tee	2" Save-A-Valve	3/4" Nipple
	Branch OD (inch)	2.410	2.219	1.050
	Branch Wall Thickness (inch)	0.27	0.234375	0.113
	Branch Yield Strength (psi)	36000	36000	35000
	Branch Longitudinal Joint Factor	1	1	1
	Temperature Derating Factor (from Header)	1	1	1
	Tap Size (Maximum) (inch)	1.87	1.75	0.824
	Tap Size (inch)	1.87	1.75	0.824
	Recommended Fitting Weld Leg (in)	0.25	0.25	0.25
	Fitting Weld Length (in)	0	0	0
Effective A3 Provided by Additional Reinforcement				
	Max 'Usable' Length (OD) of additional Reinforcement	3.74	3.5	1.648
	OD of Additional Reinforcement (inch)	0	0	0
	Thickness of Additional Reinforcement M (inch)	0	0	0
	Yield Strength of Additional Reinforcement (psi)	0	0	0
Effective A3 Provided by Weldments				
	Max Header Weld Leg Length for A3 (inch)	0.25	0.25	0.25
	Header Weld Leg Length for A3 (inch)	0	0	0
	Max Branch Weld Leg Length for A3 (inch)	0.25	0.25	0.25
	Branch Weld Leg Length for A3 (inch)	0	0	0
Conclusion and Calculation Summary				
	Design Pressure (psig)	491.8773553	1263.262558	1184.923845
	L (inch)	0.47	0.385	0.2825
	d – OD/2 (Max Reinforcement Width)	0.665	0.640625	0.299
	t (inch)	0.151515792	0.107151735	0.100506933
	tb (inch)	0.04116057	0.09732166	0.044434644
	Ar (sq in)	0.283334532	0.187515536	0.082817713
	A1 (sq in)	0.068225468	0.081984464	0.044078287
	A2 (sq in)	0.215109064	0.105531072	0.038739426
	A2' (sq in)	0.215109064	0.105531072	0.038739426
	A3 (Fitting Weld Material)	0	0	0
	A3 Reinforcement (sq in)	0	0	0
	A3 Weldment (sq in)	0	0	0
	A3 (sq in)	0	0	0
	Status (Branch Status from Calculation Worksheet)	Active	Active	Active
	Design Pressure Evaluation	491.8773553	1263.262558	1184.923845

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	RS-2723 Inlet
Facility Type	REGULATOR STATION

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Completion Completion Date	Reviewed By	Review Completion Date
1	109031159	Install RS-2723	3011-599	7/30/2007	Roy N	4/8/2011	C Koo	4/11/2011

Facility Evaluation Summary

Facility Design Pressure	720
Design Factor	0.4 (Class 4 Location)
Pipe Design Pressure	1789.6
Non-Rated Fitting Design Pressure	907.0
Rated Fitting Rated Pressure	720.0
Branch Connection Design Pressure	1304.9
Current System MAOP	150.0
The Highest % SMYS of the Facility at the Current System MAOP	6.8%
Proposed system MAOP	250.0
The Highest % SMYS of the Facility at the Proposed System MAOP	11.0%

Table 1 - Pipe Design Pressure

Enter MID#, PO#, or "PO" in this field. Select Data from the drop down manual.

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
(Station Piping)											
1	4	9998588	4" PIPE X 0.237 WALL X-42	ACTIVE	4"	0.237	X-42	1770	3.39%	6.65%	
(First Stage Piping)											
1	1	9998124	4" PIPE X 0.237 WALL X-42	ACTIVE	4"	0.237	X-42	1770	3.39%	6.65%	
(RTU Piping)											
1	2	7800812	3/4" PIPE X 0.113 WALL Gr.B	ACTIVE	3/4"	0.113	Gr.B	3013	1.99%	3.32%	

THE LOWEST DESIGN PRESSURE: 1770 3% 6%

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, PO#, or "PO" in this field. Select Data from the drop down manual.

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
(Station Piping)														
1	2	9998782	6" X 90 Degree, Elbow, Weld X 0.188 WALL Y-52	ACTIVE	6"	0.188			Y-52	X 90 Degree, Elbow, Weld	907	6.62%	11.03%	
1	3	9998783	6" X 4" Reducer, Weld 0.188 X 0.237 WALL Y-52	ACTIVE	6"	0.188	4"	0.237	Y-52	Reducer, Weld	907	6.62%	11.03%	
1	6	9998779	4" X 90 Degree, Elbow, Weld X 0.237 WALL Y-52	ACTIVE	4"	0.237			Y-52	X 90 Degree, Elbow, Weld	2191	2.74%	4.56%	
(First Stage Piping)														
1	2	6000597	4" X 90 Degree, Elbow, Weld X 0.237 WALL WPB	ACTIVE	4"	0.237			WPB	X 90 Degree, Elbow, Weld	1475	4.07%	6.76%	
1	3	7800412	4" X 4" Tee, Weld 0.237 X 0.237 WALL WPB	ACTIVE	4"	0.237	4"	0.237	WPB	Tee, Weld	1475	4.07%	6.76%	
1	10	9998424	TH_3/4" Nipple, Weld x Thread, Sch 80 X 0.11653 WALL Gr.B	ACTIVE	TH_3/4"	0.11653			Gr.B	Nipple, Weld x Thread, Sch 80	3348	1.79%	2.99%	
1	13	7200502	4" X 2" Reducer, Weld 0.237 X 0.154 WALL WPB	ACTIVE	4"	0.237	2"	0.154	WPB	Reducer, Weld	1936	3.10%	5.16%	
(RTU Piping)														
1	3	6000165	3/4" X 90 Degree, Elbow, Weld X 0.113 WALL Gr.B	ACTIVE	3/4"	0.113			Gr.B	X 90 Degree, Elbow, Weld	3013	1.99%	3.32%	

THE LOWEST DESIGN PRESSURE: 907 7% 11%

Table 3 - Rated Fittings Rated Pressure

Enter MID#, PO#, or "PO" in this field. Select Data from the drop down manual.

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
(Station Piping)										
1	1	7600796	6" Stopper, B/O, TW Mueller, H-17281 CLASS 300 WOP 720PSIG	ACTIVE	6"	CLASS 300	Stopper, B/O, TW	Mueller, H-17281	720	
1	5	6600841	2" Nipple, Sav-A-Valve Mueller, H-17491 WOP 1440PSIG	ACTIVE	2"		Nipple, Sav-A-Valve	Mueller, H-17491	1440	Branch Fitting
1	7	6600785	4" Valve, Plug Nordstrom, Fig. 2045-1/4 CLASS 300 WOP 740PSIG	ACTIVE	4"	CLASS 300	Valve, Plug	Nordstrom, Fig. 2045-1/4	740	
1	9	9998844	4" Flange, WN, RF CLASS 300 WOP 740PSIG	ACTIVE	4"	CLASS 300	Flange, WN, RF		740	
1	11	9998141	3/4" Valve, Ball WOP 2000PSIG	ACTIVE	3/4"		Valve, Ball		2000	
(First Stage Piping)										
1	4	9998844	4" Flange, WN, RF CLASS 300 WOP 740PSIG	ACTIVE	4"	CLASS 300	Flange, WN, RF		740	
1	6	9995911	4" Valve, Ball Ball-O-Max CLASS 300 WOP 740PSIG	ACTIVE	4"	CLASS 300	Valve, Ball	Ball-O-Max	740	
1	7	6400360	4" Flange, WN, FF CLASS 300 WOP 740PSIG	ACTIVE	4"	CLASS 300	Flange, WN, FF		740	
1	9	9995836	4" Strainer Mueller, Fig 196 CLASS 300 WOP 740PSIG	ACTIVE	4"	CLASS 300	Strainer	Mueller, Fig 196	740	
1	14	9995842	2" Flange, WN, RF CLASS 300 WOP 740PSIG	ACTIVE	2"	CLASS 300	Flange, WN, RF		740	
1	16	7400370	2" Regulator Mooney, FG-30 CLASS 300 WOP 740PSIG	ACTIVE	2"	CLASS 300	Regulator	Mooney, FG-30	740	
1	17	7400149	1/4" Pilot American Meter, ZSC-100 WOP 1440PSIG	ACTIVE	1/4"		Pilot	American Meter, ZSC-100	1440	
1	18	7400372	1/4" Restrictor Mooney, Type 24R WOP 1500PSIG	ACTIVE	1/4"		Restrictor	Mooney, Type 24R	1500	
1	19	6200378	1/4" Pilot Filter Fisher P594-1 WOP 1440PSIG	ACTIVE	1/4"		Pilot Filter	Fisher P594-1	1440	
(RTU Piping)										
1	1	7800812	3/4" Tee, Service Mueller, H-17501 WOP 1440PSIG	ACTIVE	3/4"		Tee, Service	Mueller, H-17501	1440	Branch Fitting
1	4	9998141	3/4" Valve, Ball WOP 2000PSIG	ACTIVE	3/4"		Valve, Ball		2000	

THE LOWEST PRESSURE RATING: 720

Design Pressure Calculation on a Branch

Design Factor (F)	0.4
Current MAOP	150
Proposed MAOP	250

Dimensions		
Job Key of the Header Pipe	1	1
Header OD (inch)	4.500	4.500
Header Wall Thickness (inch)	0.237	0.237
Header Yield Strength	42000	42000
Header Longitudinal Joint Factor	1	1
Job Key of the Branch	1	1
Branch Fitting Description	2" Save-A-Valve	3/4' H17501 Tee
Branch OD (inch)	2.219	1.430
Branch Wall Thickness (inch)	0.234375	0.18
Branch Yield Strength (psi)	36000	35000
Branch Longitudinal Joint Factor	1	1
Temperature Derating Factor (from Header)	1	1
Tap Size (Maximum) (inch)	1.75	1.07
Tap Size (inch)	1.75	1.07
Recommended Fitting Weld Leg (in)	0.25	0.25
Fitting Weld Length (in)	0.25	0.25
Effective A3 Provided by Additional Reinforcement		
Max 'Usable' Length (OD) of additional Reinforcement	3.5	2.14
OD of Additional Reinforcement (inch)	0	0
Thickness of Additional Reinforcement M (inch)	0	0
Yield Strength of Additional Reinforcement (psi)	0	0
Effective A3 Provided by Weldments		
Max Header Weld Leg Length for A3 (inch)	0.25	0.25
Header Weld Leg Length for A3 (inch)	0	0
Max Branch Weld Leg Length for A3 (inch)	0.25	0.25
Branch Weld Leg Length for A3 (inch)	0	0
Conclusion and Calculation Summary		
Design Pressure (psig)	1304.9389	1388.350646
L (inch)	0.5859375	0.45
d – OD/2 (Max Reinforcement Width)	0.640625	0.355
t (inch)	0.174768603	0.185939819
tb (inch)	0.100532402	0.070905051
Ar (sq in)	0.305845055	0.198955606
A1 (sq in)	0.108904945	0.054634394
A2 (sq in)	0.156846794	0.098185454
A2' (sq in)	0.134440109	0.081821212
A3 (Fitting Weld Material)	0.0625	0.0625
A3 Reinforcement (sq in)	0	0
A3 Weldment (sq in)	0	0
A3 (sq in)	0.0625	0.0625
Status (Branch Status from Calculation Worksheet)	Active	Active
Design Pressure Evaluation	1304.9389	1388.350646

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	020, X-1
Facility Type	HP PIPE SEGMENT

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	9705121	6" Pierce Transit HP Supply - 6" Tie-In between 6"x6" reducer and the BO U/S of DR 2311	9705121	5/18/1998	R Nakano	4/26/2011	C Koo	6/29/2011

Facility Evaluation Summary

Facility Design Pressure	720	
Design Factor	0.4	(Class 4 Location)
Pipe Design Pressure	953.5	
Non-Rated Fitting Design Pressure	1420.0	
Rated Fitting Rated Pressure	720.0	
Branch Connection Design Pressure	874.6	
Current System MAOP	150.0	
The Highest % SMYS of the Facility at the Current System MAOP	6.3%	
Proposed system MAOP	250.0	
The Highest % SMYS of the Facility at the Proposed System MAOP	10.5%	

Table 1 - Pipe Design Pressure

Enter MID#, PO#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	52	5200730	6" PIPE X 0.188 WALL X-42	ACTIVE	6"	0.188	X-42	953	6.29%	10.49%	

THE LOWEST DESIGN PRESSURE: 953 6% 10%

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, PO#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	49	6000752	6" X 90 Degree, Elbow, Weld X 0.28 WALL Y-42	ACTIVE	6"	0.28			Y-42	X 90 Degree, Elbow, Weld	1420	4.23%	7.04%	
1	51	520730	6" Cap, Weld X 0.28 WALL WPR	ACTIVE	6"	0.28			WPR	Cap, Weld	1555	3.86%	6.43%	
1	57	7800432	6" X 6" Tee, Weld 0.28 X 0.28 WALL Y-42	ACTIVE	6"	0.28	6"	0.28	Y-42	Tee, Weld	1420	4.23%	7.04%	
1														

THE LOWEST DESIGN PRESSURE: 1420 4% 7%

Table 3 - Rated Fittings Rated Pressure

Enter MID#, PO#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
1	48	7800779	6" Stopper, B/O Mueller, H-17261 CLASS 300 WOP 720PSIG	ACTIVE	6"	CLASS 300	Stopper, B/O	Mueller, H-17261	720	Tie-In Fitting
1	Not Noted	7800841	1" Service Tee Mueller Class 600 WOP 1440PSIG	ACTIVE	1"	Class 600	Service Tee	Mueller	1440	Confirmed 887025759

THE LOWEST PRESSURE RATING: 720

Design Pressure Calculation on a Branch

Design Factor (F)	0.4
Current MAOP	150
Proposed MAOP	250

Dimensions			
	Job Key of the Header Pipe	1	
	Header OD (inch)	6.625	
	Header Wall Thickness (inch)	0.188	
	Header Yield Strength	42000	
	Header Longitudinal Joint Factor	1	
	Job Key of the Branch	1	
	Branch Fitting Description	1" Service Tee	
	Branch OD (inch)	1.430	
	Branch Wall Thickness (inch)	0.18	
	Branch Yield Strength (psi)	36000	
	Branch Longitudinal Joint Factor	1	
	Temperature Derating Factor (from Header)	1	
	Tap Size (Maximum) (inch)	1.07	0
	Tap Size (inch)	1.07	0
	Recommended Fitting Weld Leg (in)	0.25	0.25
	Fitting Weld Length (in)	0.25	
Effective A3 Provided by Additional Reinforcement			
	Max 'Usable' Length (OD) of additional Reinforcement	2.14	0
	OD of Additional Reinforcement (inch)	0	0
	Thickness of Additional Reinforcement M (inch)	0	0
	Yield Strength of Additional Reinforcement (psi)	0	0
Effective A3 Provided by Weldments			
	Max Header Weld Leg Length for A3 (inch)	0.25	0.25
	Header Weld Leg Length for A3 (inch)	0	0
	Max Branch Weld Leg Length for A3 (inch)	0.25	0.25
	Branch Weld Leg Length for A3 (inch)	0	0
Conclusion and Calculation Summary			
	Design Pressure (psig)	874.5563064	
	L (inch)	0.45	0
	d – OD/2 (Max Reinforcement Width)	0.355	0
	t (inch)	0.172438557	#DIV/0!
	tb (inch)	0.04342415	#DIV/0!
	Ar (sq in)	0.184509256	#DIV/0!
	A1 (sq in)	0.016650744	#DIV/0!
	A2 (sq in)	0.122918265	#DIV/0!
	A2' (sq in)	0.105358513	#DIV/0!
	A3 (Fitting Weld Material)	0.0625	0
	A3 Reinforcement (sq in)	0	#DIV/0!
	A3 Weldment (sq in)	0	0
	A3 (sq in)	0.0625	#DIV/0!
	Status (Branch Status from Calculation Worksheet)	Active	Active
	Design Pressure Evaluation	874.5563064	

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	020_X-2
Facility Type	HP PIPE SEGMENT

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	9705121	6" Pierce Transit HP Supply - Between VA-1943 and 6" supply (including the reducer)	9705121	5/18/1998	R Nakano	4/26/2011	C Koo	4/26/2011
2	887028747	Install Gauge Points	3D05-321	TBD	D Frieze	6/21/2012	D Frieze	6/21/2012

Facility Evaluation Summary

Facility Design Pressure	604	
Design Factor	0.4	(Class 4 Location)
Pipe Design Pressure	732.4	
Non-Rated Fitting Design Pressure	1254.0	
Rated Fitting Rated Pressure	1440.0	
Branch Connection Design Pressure	604.2	
Current System MAOP	150.0	
The Highest % SMYS of the Facility at the Current System MAOP	8.2%	
Proposed system MAOP	250.0	
The Highest % SMYS of the Facility at the Proposed System MAOP	13.7%	

Table 1 - Pipe Design Pressure

Enter MID#, PO#, or "PO" in this field — Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	Not noted	Not noted	8" PIPE X 0.188 WALL X-42	ACTIVE	8"	0.188	X-42	732	8.19%	13.65%	Historical Purchase Spec
2	2	9997607	3/4" PIPE X 0.154 WALL Gr.B	ACTIVE	3/4"	0.154	Gr.B	841	1.46%	2.44%	

THE LOWEST DESIGN PRESSURE: 732 8% 14%

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, PO#, or "PO" in this field — Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	55	7200579	8" X 6" Reducer, Reducing, Weld 0.322 X 0.28 WALL Y-42	ACTIVE	8"	0.322	6"	0.28	Y-42	Reducer, Reducing, Weld	1254	4.78%	7.97%	
2	3	9996424	3/4" X TH .3/4" Nipple 0.154 X 0.11653 WALL Gr.B	ACTIVE	3/4"	0.154	TH .3/4"	0.11653	Gr.B	Nipple	3346	1.79%	2.99%	
2	7	9997605	3/4" Elbow X 0.154 WALL Gr.B	ACTIVE	3/4"	0.154			Gr.B	Elbow	4107	1.46%	2.44%	

THE LOWEST DESIGN PRESSURE: 1254 5% 8%

Table 3 - Rated Fittings Rated Pressure

Enter MID#, PO#, or "PO" in this field — Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
1	Not noted	Not Noted	2" X 3" Nipple, Sav-A-Valve Mueller, H-17491 WOP 1440PSI	ACTIVE	2"		X 3" Nipple, Sav-A-Valve	Mueller, H-17491	1440	Branch Fitting
2	5	7200024	3/4" Plug 6000 WOP 6000PSIG	ACTIVE	3/4"	6000	Plug		6000	
2	4	9996141	3/4" Ball Valve 2000 WOP 2000PSIG	ACTIVE	3/4"	2000	Ball Valve		2000	
2	1	7600812	3/4" Service Tee H-17501 WOP 1440PSIG	ACTIVE	3/4"		Service Tee	H-17501	1440	

THE LOWEST PRESSURE RATING: 1440

Design Pressure Calculation on a Branch

Design Factor (F)	0.4
Current MAOP	150
Proposed MAOP	250

Dimensions			
	Job Key of the Header Pipe	1	1
	Header OD (inch)	8.625	8.625
	Header Wall Thickness (inch)	0.188	0.188
	Header Yield Strength	42000	35000
	Header Longitudinal Joint Factor	1	1
	Job Key of the Branch	1	11
	Branch Fitting Description	2" Save-A-Valve	1" H-17501
	Branch OD (inch)	2.219	1.430
	Branch Wall Thickness (inch)	0.234375	0.18
	Branch Yield Strength (psi)	36000	36000
	Branch Longitudinal Joint Factor	1	1
	Temperature Derating Factor (from Header)	1	1
	Tap Size (Maximum) (inch)	1.75	1.07
	Tap Size (inch)	1.75	1.07
	Recommended Fitting Weld Leg (in)	0.25	0.25
	Fitting Weld Length (in)	0.25	0.25
Effective A3 Provided by Additional Reinforcement			
	Max 'Usable' Length (OD) of additional Reinforcement	3.5	2.14
	OD of Additional Reinforcement (inch)	0	0
	Thickness of Additional Reinforcement M (inch)	0	0
	Yield Strength of Additional Reinforcement (psi)	0	0
Effective A3 Provided by Weldments			
	Max Header Weld Leg Length for A3 (inch)	0.25	0.25
	Header Weld Leg Length for A3 (inch)	0	0
	Max Branch Weld Leg Length for A3 (inch)	0.25	0.25
	Branch Weld Leg Length for A3 (inch)	0	0
Conclusion and Calculation Summary			
	Design Pressure (psig)	604.1993144	604.7303862
	L (inch)	0.47	0.45
	d – OD/2 (Max Reinforcement Width)	0.640625	0.355
	t (inch)	0.155095806	0.186278556
	tb (inch)	0.046547473	0.030026543
	Ar (sq in)	0.271417661	0.199318055
	A1 (sq in)	0.057582339	0.001841945
	A2 (sq in)	0.176557875	0.134976111
	A2' (sq in)	0.151335322	0.134976111
	A3 (Fitting Weld Material)	0.0625	0.0625
	A3 Reinforcement (sq in)	0	0
	A3 Weldment (sq in)	0	0
	A3 (sq in)	0.0625	0.0625
	Status (Branch Status from Calculation Worksheet)	Active	Active
	Design Pressure Evaluation	604.1993144	604.7303862

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	020_Y-1
Facility Type	HP PIPE SEGMENT

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	905-504B	6" Pierce Transit HP Supply - Original 6" operated at IP then uprated to HP	905-504B	7/12/1991	R Nekano	4/27/2011	C Koo	4/27/2011
2	9705121	6" Uprate - New fittings installed	9705121	11/21/1999	C Koo	4/27/2011	C Koo	4/27/2011
3	915-876	2" Branch Main	915-876	1/2/1992	C Koo	6/29/2011	C Koo	6/29/2011
4	D-4	1-1/4" Service	D-4	1/2/1992	C Koo	6/29/2011	C Koo	6/29/2011

Facility Evaluation Summary

Facility Design Pressure	720	
Design Factor	0.4	(Class 4 Location)
Pipe Design Pressure	953.5	
Non-Rated Fitting Design Pressure	1420.0	
Rated Fitting Rated Pressure	720.0	
Branch Connection Design Pressure	771.5	
Current System MAOP	150.0	
The Highest % SMYS of the Facility at the Current System MAOP	6.3%	
Proposed system MAOP	250.0	
The Highest % SMYS of the Facility at the Proposed System MAOP	10.5%	

Table 1 - Pipe Design Pressure

Enter MID#, PO#, or "PO" in this field — Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	1	7000521	6" PIPE X 0.188 WALL X-42	ACTIVE	6"	0.188	X-42	953	6.29%	10.49%	

THE LOWEST DESIGN PRESSURE: 953 6% 10%

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, PO#, or "PO" in this field — Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	5	6000742	6" x 45 Degree, Elbow, Weld X 0.28 WALL Y-42	ACTIVE	6"	0.28			Y-42	x 45 Degree, Elbow, Weld	1420	4.23%	7.04%	

THE LOWEST DESIGN PRESSURE: 1420 4% 7%

Table 3 - Rated Fittings Rated Pressure

Enter MID#, PO#, or "PO" in this field — Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
1	2	6400440	6" Valve, Plug Nordstrom, Fig 143 CLASS 150 WOP N/APSIG	RETIRED	6"	CLASS 150	Valve, Plug	Nordstrom, Fig 143	N/A	Retired 9705121 Rated for 200 psig
1	3	6600840	6" Flange, FN, RF CLASS 150 WOP N/APSIG	RETIRED	6"	CLASS 150	Flange, FN, RF		N/A	Retired 9705121 - Rated for 275 psig
1	6	7600778	6" Stopper, B/O Mueller, H-17260 CLASS 150 WOP N/APSIG	RETIRED	6"	CLASS 150	Stopper, B/O	Mueller, H-17260	N/A	Retired 9705121 - Rated for 275 psig
2	48	7600779	6" Stopper, B/O Mueller, H-17261 WOP 720PSIG	ACTIVE	6"		Stopper, B/O	Mueller, H-17261	720	
1	Not Noted	7800841	1" Service Tee Mueller Class 600 WOP 1440PSIG	ACTIVE	1"	Class 600	Service Tee	Mueller	1440	Confirmed 887025759
2	Not Note	Not Note	2" Save-a-Valve WOP 1440PSIG	ACTIVE	2"		Save-a-Valve		1440	Branch fitting (For serv tee retirement)
3	Not Note	Not Note	2" Service Tee Mueller H17501 WOP 1440PSIG	ACTIVE	2"		Service Tee	Mueller H17501	1440	Branch to 020.AS-1
4	Not Note	Not Note	1-1/4" Service Tee Mueller H17501 WOP 1440PSIG	ACTIVE	1-1/4"		Service Tee	Mueller H17501	1440	Branch to HPS-0007

THE LOWEST PRESSURE RATING: 720

Design Pressure Calculation on a Branch

Design Factor (F)	0.4
Current MAOP	150
Proposed MAOP	250

Dimensions					
	Job Key of the Header Pipe	1	1	1	1
	Header OD (inch)	6.625	6.625	6.625	6.625
	Header Wall Thickness (inch)	0.188	0.188	0.188	0.188
	Header Yield Strength	42000	42000	42000	42000
	Header Longitudinal Joint Factor	1	1	1	1
	Job Key of the Branch	2	2	3	4
	Branch Fitting Description	2" Save-A-Valve	1" Service Tee	2" Service Tee H-17501	1-1/4" Service Tee H17501
	Branch OD (inch)	2.219	1.430	2.410	1.810
	Branch Wall Thickness (inch)	0.234375	0.18	0.27	0.22
	Branch Yield Strength (psi)	36000	36000	36000	36000
	Branch Longitudinal Joint Factor	1	1	1	1
	Temperature Derating Factor (from Header)	1	1	1	1
	Tap Size (Maximum) (inch)	1.75	1.07	1.87	1.37
	Tap Size (inch)	1.75	1.07	1.87	1.37
	Recommended Fitting Weld Leg (in)	0.25	0.25	0.25	0.25
	Fitting Weld Length (in)	0.25	0.25	0.25	0.25
Effective A3 Provided by Additional Reinforcement					
	Max 'Usable' Length (OD) of additional Reinforcement	3.5	2.14	3.74	2.74
	OD of Additional Reinforcement (inch)	0	0	0	0
	Thickness of Additional Reinforcement M (inch)	0	0	0	0
	Yield Strength of Additional Reinforcement (psi)	0	0	0	0
Effective A3 Provided by Weldments					
	Max Header Weld Leg Length for A3 (inch)	0.25	0.25	0.25	0.25
	Header Weld Leg Length for A3 (inch)	0	0	0	0
	Max Branch Weld Leg Length for A3 (inch)	0.25	0.25	0.25	0.25
	Branch Weld Leg Length for A3 (inch)	0	0	0	0
Conclusion and Calculation Summary					
	Design Pressure (psig)	771.5468507	874.5563064	784.7477896	841.6409874
	L (inch)	0.47	0.45	0.47	0.47
	d – OD/2 (Max Reinforcement Width)	0.640625	0.355	0.665	0.465
	t (inch)	0.152127913	0.172438557	0.154730777	0.165948558
	tb (inch)	0.059439916	0.04342415	0.065668131	0.052894798
	Ar (sq in)	0.266223848	0.184509256	0.289346553	0.227349524
	A1 (sq in)	0.062776152	0.016650744	0.062213447	0.030210476
	A2 (sq in)	0.164438979	0.122918265	0.192071957	0.15707889
	A2' (sq in)	0.140947696	0.105358513	0.164633106	0.134639048
	A3 (Fitting Weld Material)	0.0625	0.0625	0.0625	0.0625
	A3 Reinforcement (sq in)	0	0	0	0
	A3 Weldment (sq in)	0	0	0	0
	A3 (sq in)	0.0625	0.0625	0.0625	0.0625
	Status (Branch Status from Calculation Worksheet)	Active	Active	Active	Active
	Design Pressure Evaluation	771.5468507	874.5563064	784.7477896	841.6409874

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID: 020, Y-1 A
Facility Type: HP PIPE SEGMENT

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	9705121	6" Pierce Transit Uprate (6" HP Offset at East E St and 980th St	9705121	6/17/1998	R Nikand	4/27/2011	G Koo	4/27/2011
2								

Facility Evaluation Summary

Facility Design Pressure	720
Design Factor	0.4 (Class 4 Location)
Pipe Design Pressure	953.5
Non-Rated Fitting Design Pressure	1420.0
Rated Fitting Rated Pressure	720.0
Branch Connection Design Pressure	N/A
Current System MAOP	180.0
The Highest % SMYS of the Facility at the Current System MAOP	8.3%
Proposed system MAOP	250.0
The Highest % SMYS of the Facility at the Proposed System MAOP	10.5%

Table 1 - Pipe Design Pressure

Enter MID#, POI#, or "PO" in this field. Select Data from the drop down menus)

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	52	7000521	6" PIPE X 0.188 WALL X-42	ACTIVE	6"	0.188	X-42	953	6.29%	10.49%	

THE LOWEST DESIGN PRESSURE: 953 6% 10%

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, POI#, or "PO" in this field. Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	49	6000762	6" X 90 Degree, Elbow, Weld X 0.28 WALL Y-42	ACTIVE	6"	0.28			Y-42	X 60 Degree, Elbow, Weld	1420	4.23%	7.04%	
1	51	6200730	6" Cap, Weld X 0.28 WALL Y-42	ACTIVE	6"	0.28			Y-42	Cap, Weld	1420	4.23%	7.04%	BOM notes pretested

THE LOWEST DESIGN PRESSURE: 1420 4% 7%

Table 3 - Rated Fittings Rated Pressure

Enter MID#, POI#, or "PO" in this field. Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
1	48	7600778	6" Stopper, B/O, Std Mueller, H17261 CLASS 300 WOP 720P	ACTIVE	6"	CLASS 300	Stopper, B/O, Std	Mueller, H17261	720	
1	Not Noted	Not noted	6" Coupling, Insulated Kerotest WOP 720P5IG	ACTIVE	6"		Coupling, Insulated	Kerotest	720	Per Manufacturer Literature

THE LOWEST PRESSURE RATING: 720

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	020_Y-1_B
Facility Type	HP PIPE SEGMENT

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Completion Completion Date	Reviewed By	Review Completion Date
1	9705121	Install 6" HP Main ; Tie-in piping at Park & 66th	97015121	8/12/1998	R.Nakano	4/26/2011	G Koo	4/26/2011

Facility Evaluation Summary

Facility Design Pressure		
Design Factor	0.4	(Class 4 Location)
Pipe Design Pressure	953.5	
Non-Rated Fitting Design Pressure	1420.0	
Rated Fitting Rated Pressure	720.0	
Branch Connection Design Pressure	N/A	
Current System MAOP	150.0	
The Highest % SMYS of the Facility at the Current System MAOP	6.3%	
Proposed system MAOP	250.0	
The Highest % SMYS of the Facility at the Proposed System MAOP	10.5%	

Table 1 - Pipe Design Pressure

Enter MID#, POA#, or "PO" in this field

Select Data from the drop down menus!

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	62	7000521	6" PIPE X 0.188 WALL X-42	ACTIVE	6"	0.188	X-42	953	6.29%	10.49%	

THE LOWEST DESIGN PRESSURE: 953 6% 10%

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, POA#, or "PO" in this field

Select Data from the drop down menus!

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	48	6000752	6" X 90 Degree, Elbow, Weld X 0.28 WALL Y-42	ACTIVE	6"	0.28			Y-42	X 90 Degree, Elbow, Weld	1420	4.23%	7.04%	

THE LOWEST DESIGN PRESSURE: 1420 4% 7%

Table 3 - Rated Fittings Rated Pressure

Enter MID#, POA#, or "PO" in this field

Select Data from the drop down menus!

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
1	48	7600779	6" Stopper, B/O Mueller, H-17261 CLASS 300 WOP 720PSIG	ACTIVE	6"	CLASS 300	Stopper, B/O	Mueller, H-17261	720	

THE LOWEST PRESSURE RATING: 720

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	020_Z-1
Facility Type	HP PIPE SEGMENT

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	EX884-008	Install 6" IP Gas Main	EXS64-006	2/20/1964	R Nakano	6/30/2011	C Koo	6/30/2011
2	9705121	Uprate to HP	9705121	11/21/1899	R Nakano	6/30/2011	C Koo	6/30/2011
3	9309077	Install 2" Main	S309077	4/21/1993	C Koo	6/30/2011	C Koo	6/30/2011
4	N/A	Install HPS-0034	D-4	2/12/1987	C Koo	7/15/2011	C Koo	7/15/2011
5	N/A	Install HPS-0035	D-4	7/16/1987	C Koo	7/15/2011	C Koo	7/15/2011
6	N/A	Install HPS-0036	D-4	10/16/1969	C Koo	7/15/2011	C Koo	7/15/2011
7	N/A	Install HPS-0037	D-4	11/11/1954	C Koo	7/15/2011	C Koo	7/15/2011
8	N/A	Install HPS-0038	D-4	2/21/1987	C Koo	7/15/2011	C Koo	7/15/2011
9	N/A	Install HPS-0039	D-4	6/29/1973	C Koo	7/15/2011	C Koo	7/15/2011
10	N/A	Install HPS-0040	D-4	9/11/1969	C Koo	7/15/2011	C Koo	7/15/2011
11	N/A	Install HPS-0041	D-4	10/27/1995	C Koo	7/15/2011	C Koo	7/15/2011
12	N/A	InStall HPS-0002	D-4	8/17/1966	C Koo	7/15/2011	C Koo	7/15/2011
13	N/A	Install HPS-0003	D-4	6/11/1971	C Koo	7/15/2011	C Koo	7/15/2011
14	N/A	Install HPS-0004	D-4	10/29/1969	C Koo	7/15/2011	C Koo	7/15/2011
15	N/A	Install HPS-0006	D-4	8/9/1966	C Koo	7/15/2011	C Koo	7/15/2011
16	N/A	Install HPS-0008	D-4	11/21/1980	C Koo	7/15/2011	C Koo	7/15/2011
17	N/A	Install HPS-0009	D-4	8/9/1966	C Koo	7/15/2011	C Koo	7/15/2011
18	N/A	Install HPS-0010	D-4	3/19/1964	C Koo	7/15/2011	C Koo	7/15/2011
19	N/A	Install HPS-0011	D-4	12/2/1969	C Koo	7/15/2011	C Koo	7/15/2011
20	N/A	Install HPS-0013	D-4	11/29/1974	C Koo	7/15/2011	C Koo	7/15/2011
21	N/A	Install HPS-0044	D-4	10/29/1969	C Koo	7/15/2011	C Koo	7/15/2011
22	N/A	Install HPS-0051	D-4	7/7/1966	C Koo	7/24/2011	C Koo	7/28/2011
23	887026762	Pumpkin existing Fittings		4/16/2012	D Frieze	6/8/2012	D Frieze	6/8/2012

Facility Evaluation Summary

Facility Design Pressure	250	
Design Factor	0.4	(Class 4 Location)
Pipe Design Pressure	1183.4	
Non-Rated Fitting Design Pressure	1183.0	
Rated Fitting Rated Pressure	250.0	
Branch Connection Design Pressure	900.5	
Current System MAOP	150.0	
The Highest % SMYS of the Facility at the Current System MAOP	5.1%	
Proposed system MAOP	250.0	
The Highest % SMYS of the Facility at the Proposed System MAOP	8.5%	

Table 1 - Pipe Design Pressure

Enter MID#, POI#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	1	Not Noted	6" PIPE X 0.28 WALL Gr.B	ACTIVE	6"	0.28	Gr.B	1183	5.07%	8.45%	Hist Spec
23		N/A	4" PIPE X 0.237 WALL X-46	ACTIVE	4"	0.237	X-46	1838	3.10%	5.16%	
23		N/A	2" PIPE X 0.154 WALL Gr.B	ACTIVE	2"	0.154	Gr.B	1816	3.30%	5.51%	

THE LOWEST DESIGN PRESSURE: 1183 5% 8%

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, POI#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	9	Not Noted	6" x 45 Elbow X 0.28 WALL WPB	ACTIVE	6"	0.28			WPB	x 45 Elbow	1183	5.07%	8.45%	Hist Spec
2	51	5200730	6" Weld Cap X 0.28 WALL Y-42	ACTIVE	6"	0.28			Y-42	Weld Cap	1426	4.23%	7.04%	

THE LOWEST DESIGN PRESSURE: 1183 5% 8%

Table 3 - Rated Fittings Rated Pressure

Enter MID#, POI#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
2	48	7600779	6" Stopper BO Mueller H17261 WOP 720PSIG	ACTIVE	6"		Stopper BO	Mueller H17261	720	Branch to 020.Z-1B; 020.Z-1C; 020.Z-1D; 020.Z-1E; 020.Z-1F; and 020.Z-1G
2	Not Noted	6800481	2" Save-A-Valve Mueller H17491 WOP 1440PSIG	ACTIVE	2"		Save-A-Valve	Mueller H17491	1440	Branch Fitting - Retiring HPS-0001, HPS-0012, HPS-0014, HPS-0015, HPS-0031, HPS-0032, HPS-0033, HPS0042, HPS-0043
3	Not Noted	7800711	2" Service Tee Mueller H17501 WOP 1440PSIG	ACTIVE	2"		Service Tee	Mueller H17501	1440	Branch to 020.AT-1 Based on Material Store Ticket
4	N/A	N/A	3/4" Service Tee Mueller H18101 WOP 1200PSIG	ACTIVE	3/4"		Service Tee	Mueller H18101	1200	Branch to HPS-0034
5	N/A	N/A	3/4" Service Tee Mueller H18101 WOP 1200PSIG	ACTIVE	3/4"		Service Tee	Mueller H18101	1200	Branch to HPS-0035
6	N/A	N/A	3/4" Service Tee Mueller H18101 WOP 1200PSIG	ACTIVE	3/4"		Service Tee	Mueller H18101	1200	Branch to HPS-0036
7	N/A	N/A	3/4" Service Tee Mueller H18101 WOP 1200PSIG	ACTIVE	3/4"		Service Tee	Mueller H18101	1200	Branch to HPS-0037
8	N/A	N/A	3/4" Service Tee Mueller H18101 WOP 1200PSIG	ACTIVE	3/4"		Service Tee	Mueller H18101	1200	Branch to HPS-0038
9	N/A	N/A	3/4" Service Tee Mueller H18101 WOP 1200PSIG	ACTIVE	3/4"		Service Tee	Mueller H18101	1200	Branch to HPS-0039
10	N/A	N/A	3/4" Service Tee Mueller H18101 WOP 1200PSIG	ACTIVE	3/4"		Service Tee	Mueller H18101	1200	Branch to HPS-0040
11	N/A	N/A	1-1/4" Service Tee Mueller H17501 WOP 1440PSIG	ACTIVE	1-1/4"		Service Tee	Mueller H17501	1440	Branch to HPS-0041
12	N/A	N/A	3/4" Service Tee Mueller H18101 WOP 1200PSIG	ACTIVE	3/4"		Service Tee	Mueller H18101	1200	Branch to HPS-0002
13	N/A	N/A	3/4" Service Tee Mueller H18101 WOP 1200PSIG	ACTIVE	3/4"		Service Tee	Mueller H18101	1200	Branch to HPS-0003
14	N/A	N/A	3/4" Service Tee Mueller H18101 WOP 1200PSIG	ACTIVE	3/4"		Service Tee	Mueller H18101	1200	Branch to HPS-0004
15	N/A	N/A	3/4" Service Tee Mueller H18101 WOP 1200PSIG	ACTIVE	3/4"		Service Tee	Mueller H18101	1200	Branch to HPS-0006
16	N/A	N/A	3/4" Service Tee Mueller H18101 WOP 1200PSIG	ACTIVE	3/4"		Service Tee	Mueller H18101	1200	Branch to HPS-0008
17	N/A	N/A	3/4" Service Tee Mueller H18101 WOP 1200PSIG	ACTIVE	3/4"		Service Tee	Mueller H18101	1200	Branch to HPS-0009
18	N/A	N/A	1-1/4" Service Tee Mueller H17500 WOP 250PSIG	ACTIVE	1-1/4"		Service Tee	Mueller H17500	250	Branch to HPS-0010
19	N/A	N/A	3/4" Service Tee Mueller H18101 WOP 1200PSIG	ACTIVE	3/4"		Service Tee	Mueller H18101	1200	Branch to HPS-0011
20	N/A	N/A	3/4" Service Tee Mueller H17500 WOP 250PSIG	ACTIVE	3/4"		Service Tee	Mueller H17500	250	Branch to HPS-0013
21	N/A	N/A	3/4" Service Tee Mueller H18101 WOP 1200PSIG	ACTIVE	3/4"		Service Tee	Mueller H18101	1200	Branch to HPS-0044
22	N/A	N/A	1-1/4" Service Tee Mueller H17500 WOP 250PSIG	ACTIVE	1-1/4"		Service Tee	Mueller H17500	250	Branch to HPS-0051
23	N/A	N/A	4" Save-A-Valve Mueller H17491 CLASS 300 WOP 1440PSIG	ACTIVE	4"	CLASS 300	Save-A-Valve	Mueller H17491	1440	
23	N/A	N/A	3/4 Save-A-Valve Mueller H17496 CLASS 300 WOP 720PSIG	ACTIVE	3/4	CLASS 300	Save-A-Valve	Mueller H17496	720	

THE LOWEST PRESSURE RATING: 250

Design Pressure Calculation on a Branch

Design Factor (F)	0.4
Current MAOP	150
Proposed MAOP	250

Dimensions							
	Job Key of the Header Pipe	1	1	1	1	1	1
	Header OD (inch)	6.625	6.625	6.625	6.625	6.625	6.625
	Header Wall Thickness (inch)	0.28	0.28	0.28	0.28	0.28	0.28
	Header Yield Strength	35000	35000	35000	35000	35000	35000
	Header Longitudinal Joint Factor	1	1	1	1	1	1
	Job Key of the Branch	2	3	4, 5, 6, 7, 8, 9, 10, 12, 13, 14, 15, 16, 17, 19, 21	11	18, 22	20
	Branch Fitting Description	2" Save-A-Valve	2" Tee H-17501	3/4" Tee H-18101	1-1/4" Tee H-17501	1-1/4" Tee H-17500	3/4" Tee H-17500
	Branch OD (inch)	2.219	2.410	1.180	1.810	1.810	1.180
	Branch Wall Thickness (inch)	0.2343	0.27	0.18	0.22	0.22	0.18
	Branch Yield Strength (psi)	36000	36000	36000	36000	36000	36000
	Branch Longitudinal Joint Factor	1	1	1	1	1	1
	Temperature Derating Factor (from Header)	1	1	1	1	1	1
	Tap Size (Maximum) (inch)	1.7501	1.87	0.82	1.37	1.37	0.82
	Tap Size (inch)	1.7501	1.87	0.82	1.37	1.37	0.82
	Recommended Fitting Weld Leg (in)	0.25	0.25	0.25	0.25	0.25	0.25
	Fitting Weld Length (in)	0.25	0.25	0.25	0.25	0.25	0.25
Effective A3 Provided by Additional Reinforcement							
	Max 'Usable' Length (OD) of additional Reinforcement	3.5002	3.74	1.64	2.74	2.74	1.64
	OD of Additional Reinforcement (inch)	0	0	0	0	0	0
	Thickness of Additional Reinforcement M (inch)	0	0	0	0	0	0
	Yield Strength of Additional Reinforcement (psi)	0	0	0	0	0	0
Effective A3 Provided by Weldments							
	Max Header Weld Leg Length for A3 (inch)	0.25	0.25	0.25	0.25	0.25	0.25
	Header Weld Leg Length for A3 (inch)	0	0	0	0	0	0
	Max Branch Weld Leg Length for A3 (inch)	0.25	0.25	0.25	0.25	0.25	0.25
	Branch Weld Leg Length for A3 (inch)	0	0	0	0	0	0
Conclusion and Calculation Summary							
	Design Pressure (psig)	900.4683469	952.6200649	1067.75373	959.1105887	959.1105887	1067.75373
	L (inch)	0.58575	0.675	0.45	0.55	0.55	0.45
	d – OD/2 (Max Reinforcement Width)	0.64075	0.665	0.23	0.465	0.465	0.23
	t (inch)	0.213057243	0.225396712	0.252638159	0.226932416	0.226932416	0.252638159
	tb (inch)	0.069370456	0.079715776	0.043748243	0.060277436	0.060277436	0.043748243
	Ar (sq in)	0.372871481	0.421491851	0.207163291	0.31089741	0.31089741	0.207163291
	A1 (sq in)	0.117156519	0.102108149	0.022436709	0.07270259	0.07270259	0.022436709
	A2 (sq in)	0.193214961	0.256883702	0.122626581	0.17569482	0.17569482	0.122626581
	A2' (sq in)	0.193214961	0.256883702	0.122626581	0.17569482	0.17569482	0.122626581
	A3 (Fitting Weld Material)	0.0625	0.0625	0.0621	0.0625	0.0625	0.0621
	A3 Reinforcement (sq in)	0	0	0	0	0	0
	A3 Weldment (sq in)	0	0	0	0	0	0
	A3 (sq in)	0.0625	0.0625	0.0621	0.0625	0.0625	0.0621
	Status (Branch Status from Calculation Worksheet)	Active	Active	Active	Active	Active	Active
	Design Pressure Evaluation	900.4683469	952.6200649	1067.75373	959.1105887	959.1105887	1067.75373

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	020. Z-1.A
Facility Type	HP PIPE SEGMENT

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Complciation Completion Date	Reviewed By	Review Completion Date
1	675-884	Install HP gas main	Main Card	7/22/1987	R Nakano	7/25/2011	C Koo	7/25/2011
2	9705121	Relire portion of HP gas main	9705121	5/11/1998	R Nakano	7/25/2011	C Koo	7/25/2011
3	887026762	Install save-a-valves	9705121	4/16/2012	D Frieze	4/23/2012	D Frieze	4/25/2012

Facility Evaluation Summary

Facility Design Pressure	275
Design Factor	0.4 (Class 4 Location)
Pipe Design Pressure	794.6
Non-Rated Fitting Design Pressure	795.0
Rated Fitting Rated Pressure	275.0
Branch Connection Design Pressure	535.2
Current System MAOP	150.0
The Highest % SMYS of the Facility at the Current System MAOP	7.6%
Proposed system MAOP	250.0
The Highest % SMYS of the Facility at the Proposed System MAOP	12.6%

Table 1 - Pipe Design Pressure

Enter MID#, PO#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	Not Noted	Not Noted	6" PIPE X 0.188 WALL Gr.B	ACTIVE	6"	0.188	Gr.B	795	7.55%	12.59%	Historic pipe specs

THE LOWEST DESIGN PRESSURE: 795 8% 13%

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, PO#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	Not Noted	Not Noted	6" X90 Degree, Elbow, Weld X 0.188 WALL WPB	ACTIVE	6"	0.188			WPB	X90 Degree, Elbow, Weld	795	7.55%	12.59%	
2	51	5200730	6" Cap, Weld X 0.28 WALL Y-42	ACTIVE	6"	0.28			Y-42	Cap, Weld	1420	4.23%	7.04%	

THE LOWEST DESIGN PRESSURE: 795 8% 13%

Table 3 - Rated Fittings Rated Pressure

Enter MID#, PO#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
1	Not noted	Not Noted	6" Stopper, B/O Mueller, H-17260 WOP 275PSIG	ACTIVE	6"		Stopper, B/O	Mueller, H-17260	275	
3	Not noted	Not Noted	2" Save-a-valve Mueller, H-17491 WOP 1440PSIG	ACTIVE	2"		Save-a-valve	Mueller, H-17491	1440	
3	Not noted	Not Noted	4" Save-a-valve Mueller, H-17496 WOP 720PSIG	ACTIVE	4"		Save-a-valve	Mueller, H-17496	720	

THE LOWEST PRESSURE RATING: 275

Design Pressure Calculation on a Branch

Design Factor (F)	0.4
Current MAOP	150
Proposed MAOP	250

Dimensions			
	Job Key of the Header Pipe	1	1
	Header OD (inch)	6.625	6.625
	Header Wall Thickness (inch)	0.188	0.188
	Header Yield Strength	35,000	35,000
	Header Longitudinal Joint Factor	1	1
	Job Key of the Branch	3	3
	Branch Fitting Description	2" Save-a-valve	4" Save-a-valve
	Branch OD (inch)	2.218	4.625
	Branch Wall Thickness (inch)	0.234	0.299
	Branch Yield Strength (psi)	36000	36000
	Branch Longitudinal Joint Factor	1	1
	Temperature Derating Factor (from Header)	1	1
	Tap Size (Maximum) (inch)	1.75	4.027
	Tap Size (inch)	1.75	4.027
	Recommended Fitting Weld Leg (in)	0.25	0.25
	Fitting Weld Length (in)	0.25	0.25
Effective A3 Provided by Additional Reinforcement			
	Max 'Usable' Length (OD) of additional Reinforcement	3.5	8.054
	OD of Additional Reinforcement (inch)	0	0
	Thickness of Additional Reinforcement M (inch)	0	0
	Yield Strength of Additional Reinforcement (psi)	0	0
Effective A3 Provided by Weldments			
	Max Header Weld Leg Length for A3 (inch)	0.25	0.25
	Header Weld Leg Length for A3 (inch)	0	0
	Max Branch Weld Leg Length for A3 (inch)	0.25	0.25
	Branch Weld Leg Length for A3 (inch)	0	0
Conclusion and Calculation Summary			
	Design Pressure (psig)	679.0091506	535.1755322
	% SMYS at the Current System MAOP	0.088364052	0.112112749
	% SMYS at the Proposed System MAOP	0.14727342	0.186854581
	L (inch)	0.47	0.47
	d – OD/2 (Max Reinforcement Width)	0.641	1.7145
	t (inch)	0.160658415	0.126626354
	tb (inch)	0.052293135	0.085943987
	Ar (sq in)	0.281152226	0.509924326
	A1 (sq in)	0.047847774	0.247151674
	A2 (sq in)	0.170804453	0.200272652
	A2' (sq in)	0.170804453	0.200272652
	A3 (Fitting Weld Material)	0.0625	0.0625
	A3 Reinforcement (sq in)	0	0
	A3 Weldment (sq in)	0	0
	A3 (sq in)	0.0625	0.0625
	Status (Branch Status from Calculation Worksheet)	Active	Active
	Design Pressure Evaluation	679.0091506	535.1755322

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	020_Z-1_B
Facility Type	HP PIPE SEGMENT

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	9705121	Install HP gas main	9705121	11/21/1999	R Nakano	5/19/2011	C Koo	5/19/2011

Facility Evaluation Summary

Facility Design Pressure	720	
Design Factor	0.4	(Class 4 Location)
Pipe Design Pressure	953.5	
Non-Rated Fitting Design Pressure	1420.0	
Rated Fitting Rated Pressure	720.0	
Branch Connection Design Pressure	N/A	
Current System MAOP	150.0	
The Highest % SMYS of the Facility at the Current System MAOP	6.3%	
Proposed system MAOP	250.0	
The Highest % SMYS of the Facility at the Proposed System MAOP	10.5%	

Table 1 - Pipe Design Pressure

Enter MIDR, PO#, or "PO" in this field | Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	Not Noted	7000821	6" PIPE X 0.188 WALL X-42	ACTIVE	6"	0.188	X-42	953	6.28%	10.49%	X42 and 0.28" wall Eds were called for this job, but the item # was not noted on the As-build at this location

THE LOWEST DESIGN PRESSURE: 953 6% 10%

Table 2 - Non-Rated Fitting Design Pressure

Enter MIDR, PO#, or "PO" in this field | Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	Not Noted	6000782	6" X90 Degree, Elbow, Weld X 0.28 WALL Y-42	ACTIVE	6"	0.28			Y-42	X90 Degree, Elbow, Weld	1420	4.23%	7.04%	Y42 and 0.28" wall Eds were called for this job, but the item # was not noted on the As-build at this location

THE LOWEST DESIGN PRESSURE: 1420 4% 7%

Table 3 - Rated Fittings Rated Pressure

Enter MIDR, PO#, or "PO" in this field | Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
1	Not Noted	Not Noted	6" Stopper, B/O Mueller, H-17281 300 WOP 720PSIG	ACTIVE	6"	300	Stopper, B/O	Mueller, H-17281	720	Part # is not noted on this location on the As-built. H-17281 is based on the Material List which was attached to the Field Work Order Form

THE LOWEST PRESSURE RATING: 720

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	020_Z-1.C
Facility Type	HP PIPE SEGMENT

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	9705121	Retire portion of HP gas main	9705121	5/11/1998	R Nakano	5/19/2011	C Koo	5/19/2011

Facility Evaluation Summary

Facility Design Pressure	720
Design Factor	0.4 (Class 4 Location)
Pipe Design Pressure	953.5
Non-Rated Fitting Design Pressure	1420.0
Rated Fitting Rated Pressure	720.0
Branch Connection Design Pressure	N/A
Current System MAOP	160.0
The Highest % SMYS of the Facility at the Current System MAOP	6.3%
Proposed system MAOP	250.0
The Highest % SMYS of the Facility at the Proposed System MAOP	10.5%

Table 1 - Pipe Design Pressure

Enter MID#, PO#, or "PO" in this field | Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	Not Noted	7000821	6" PIPE X 0.188 WALL X-42	ACTIVE	6"	0.188	X-42	953	6.29%	10.49%	Pipe Grade is based on MID specification which matches with the historical specification

THE LOWEST DESIGN PRESSURE: 953 6% 10%

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, PO#, or "PO" in this field | Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	Not Noted	6000752	6" X90 Degree, Elbow, Weld X 0.28 WALL Y-42	ACTIVE	6"	0.28			Y-42	X90 Degree, Elbow, Weld	1420	4.23%	7.04%	Y42 and 0.28" wall Ells were called for this job, but the item # was not noted on the As-built at this location

THE LOWEST DESIGN PRESSURE: 1420 4% 7%

Table 3 - Rated Fittings Rated Pressure

Enter MID#, PO#, or "PO" in this field | Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
1	Not noted	7600770	6" Stopper, B/O Mueller, H-17281 300 WOP 720PSIG	ACTIVE	6"	300	Stopper, B/O	Mueller, H-17281	720	Part # is not noted on this location on the As-built. H-17281 is based on the Material List which was attached to the Field Work Order Form

THE LOWEST PRESSURE RATING: 720

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	020_Z-1.D
Facility Type	HP PIPE SEGMENT

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	9705121	Install HP gas main	9705121	5/11/1998	R Nekano	5/19/2011	C Koo	5/19/2011

Facility Evaluation Summary

Facility Design Pressure	720
Design Factor	0.4 (Class 4 Location)
Pipe Design Pressure	953.5
Non-Rated Fitting Design Pressure	1420.0
Rated Fitting Rated Pressure	720.0
Branch Connection Design Pressure	N/A
Current System MAOP	150.0
The Highest % SMYS of the Facility at the Current System MAOP	6.3%
Proposed system MAOP	200.0
The Highest % SMYS of the Facility at the Proposed System MAOP	10.5%

Table 1 - Pipe Design Pressure

Enter MID#, PO#, or "PO" in this field. Select Data from the drop down manual.

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	Not Noted	7000621	6" PIPE X 0.188 WALL X-42	ACTIVE	6"	0.188	X-42	953	6.29%	10.49%	Grade and thickness information was obtain from the Field Work Order Ticket

THE LOWEST DESIGN PRESSURE: 953 6% 10%

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, PO#, or "PO" in this field. Select Data from the drop down manual.

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	Not Noted	8000782	6" X90 Degree, Elbow, Weld X 0.28 WALL Y-42	ACTIVE	6"	0.28			Y-42	X90 Degree, Elbow, Weld	1420	4.23%	7.04%	Y42 and 0.28" wall Ells were called for this job, but the item number was not noted on the As-built at this location

THE LOWEST DESIGN PRESSURE: 1420 4% 7%

Table 3 - Rated Fittings Rated Pressure

Enter MID#, PO#, or "PO" in this field. Select Data from the drop down manual.

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
1	Not noted	7800787	6" Stopper, B/O Mueller, H-1717281 300 WOP 720P8IG	ACTIVE	6"	300	Stopper, B/O	Mueller, H-1717281	720	Part # not noted on the DWG. H-17281 is based on the Material List attached to the Field Work Order

THE LOWEST PRESSURE RATING: 720

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	020, 7-1 E
Facility Type	HP PIPE SEGMENT

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	9705121	Install HP gas main	9705121	8/4/1998	R Nakano	5/19/2011	C Kop	7/1/2011

Facility Evaluation Summary

Facility Design Pressure	720
Design Factor	0.4 (Class 4 Location)
Pipe Design Pressure	953.5
Non-Rated Fitting Design Pressure	1420.0
Rated Fitting Rated Pressure	720.0
Branch Connection Design Pressure	N/A
Current System MAOP	150.0
The Highest % SMYS of the Facility at the Current System MAOP	6.3%
Proposed system MAOP	280.0
The Highest % SMYS of the Facility at the Proposed System MAOP	10.5%

Table 1 - Pipe Design Pressure

Enter MID#, PO#, or "PO" in this field. Select Data from the drop down manual.

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	Not Noted	7000521	6" PIPE X 0.188 WALL X-42	ACTIVE	6"	0.188	X-42	953	6.29%	10.49%	Pipe Grade is based on MID which matches the historical spec.

THE LOWEST DESIGN PRESSURE: 953 6% 10%

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, PO#, or "PO" in this field. Select Data from the drop down manual.

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	Not Noted	6000755	6" X90 Degree, Elbow, Weld X 0.28 WALL Y-42	ACTIVE	6"	0.28			Y-42	X90 Degree, Elbow, Weld	1420	4.23%	7.04%	Y42 and 0.28" thickness ELLs were called for this job, but the item number was not noted on the As-built at this location
1	Not Noted	Not Noted	6" X45 Degree, Elbow, Weld X 0.28 WALL Y-42	ACTIVE	6"	0.28			Y-42	X45 Degree, Elbow, Weld	1420	4.23%	7.04%	Y42 and 0.28" thickness ELLs were called for this job, but the item number was not noted on the As-built at this location

THE LOWEST DESIGN PRESSURE: 1420 4% 7%

Table 3 - Rated Fittings Rated Pressure

Enter MID#, PO#, or "PO" in this field. Select Data from the drop down manual.

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
1	Not Noted	7000787	6" Stopper, B/O Mueller H-17281 300 WOP 720PSIG	ACTIVE	6"	300	Stopper, B/O	Mueller H-17281	720	Part # not noted on the DWG. H-17281 is based on the Material List attached with the Field Work Order

THE LOWEST PRESSURE RATING: 720

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	Main ID: 020, Z-1.F
Facility Type	HP PIPE SEGMENT

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	9706121	Install HP Main	9705121	7/22/1998	R Nakano	4/29/2011	O Koo	5/19/2011

Facility Evaluation Summary

Facility Design Pressure	720
Design Factor	0.4 (Class 4 Location)
Pipe Design Pressure	953.5
Non-Rated Fitting Design Pressure	1420.0
Rated Fitting Rated Pressure	720.0
Branch Connection Design Pressure	N/A
Current System MAOP	150.0
The Highest % SMYS of the Facility at the Current System MAOP	6.3%
Proposed system MAOP	250.0
The Highest % SMYS of the Facility at the Proposed System MAOP	10.5%

Table 1 - Pipe Design Pressure

Enter MIDs, POs, or "PO" in this field | Select Date from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	62	7000521	6" PIPE X 0.188 WALL X-42	ACTIVE	6"	0.188	X-42	953	6.29%	10.49%	Pipe Grade is based on MID specification which matches with the historical specification

THE LOWEST DESIGN PRESSURE: 953 6% 10%

Table 2 - Non-Rated Fitting Design Pressure

Enter MIDs, POs, or "PO" in this field | Select Date from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	49	8000762	6" X 90 Degree, Elbow, Weld X 0.28 WALL Y-42	ACTIVE	6"	0.28			Y-42	X 90 Degree, Elbow, Weld	1420	4.23%	7.04%	Y42 and 0.28" wall Ells were called for this job, but the item # was not noted on the As-build at this location

THE LOWEST DESIGN PRESSURE: 1420 4% 7%

Table 3 - Rated Fittings Rated Pressure

Enter MIDs, POs, or "PO" in this field | Select Date from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
1	48	8000307	6" Stopper, B/O Mueller, H-17281 CLASS 300 WOP 720PSIG	ACTIVE	6"	CLASS 300	Stopper, B/O	Mueller, H-17281	720	Part # is not noted on this location on the As-built; H-17281 is based on the Material List which was attached to the Field Work Order Form

THE LOWEST PRESSURE RATING: 720

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	020_Z-1.G
Facility Type	HP PIPE SEGMENT

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Complied By	Completion Date	Reviewed By	Review Completion Date
1	9705121	Install HP gas main	9705121	11/21/1999	R Nakano	6/19/2011	C Koo	6/19/2011

Facility Evaluation Summary

Facility Design Pressure	720
Design Factor	0.4 (Class 4 Location)
Pipe Design Pressure	953.5
Non-Rated Fitting Design Pressure	1420.0
Rated Fitting Rated Pressure	720.0
Branch Connection Design Pressure	N/A
Current System MAOP	150.0
The Highest % SMYS of the Facility at the Current System MAOP	6.3%
Proposed system MAOP	250.0
The Highest % SMYS of the Facility at the Proposed System MAOP	10.5%

Table 1 - Pipe Design Pressure

Enter MIDM, PO#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	Not Noted	7000821	6" PIPE X 0.188 WALL X-42	ACTIVE	6"	0.188	X-42	953	6.29%	10.49%	Pipe Grade is based on MID specification which matches with the historical specification

THE LOWEST DESIGN PRESSURE: 953 6% 10%

Table 2 - Non-Rated Fitting Design Pressure

Enter MIDM, PO#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	Not Noted	6000752	6" X90 Degree, Elbow, Weld X 0.28 WALL Y-42	ACTIVE	6"	0.28			Y-42	X90 Degree, Elbow, Weld	1420	4.23%	7.04%	Y42 and 0.28" wall Ells were called for this job, but this item # was not noted on the As-build at this location
1	Not Noted	Not Noted	6" X45 Degree, Elbow, Weld X 0.28 WALL Y-42	ACTIVE	6"	0.28			Y-42	X45 Degree, Elbow, Weld	1420	4.23%	7.04%	Y42 and 0.28" wall Ells were called for this job, but this item # was not noted on the As-build at this location

THE LOWEST DESIGN PRESSURE: 1420 4% 7%

Table 3 - Rated Fittings Rated Pressure

Enter MIDM, PO#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
1	Not noted	7600779	6" Stopper, B/O Mueller, H-17281 300 WOP 720PSIG	ACTIVE	6"	300	Stopper, B/O	Mueller, H-17281	720	Part # is not noted on this location on the As-built. H-17281 is based on the Material List which was attached to the Field Work Order Form

THE LOWEST PRESSURE RATING: 720

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	020.AA-1
Facility Type	HP PIPE SEGMENT

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	69S-515	Install IP Main	69S-515	7/15/1969	R Nakano	5/2/2011	C Koo	7/1/2011
2	795-373	Relocate portion of main & uprate to HP	795-373	6/8/1979	R Nakano	5/2/2001	C Koo	7/1/2011
3	9705121	Relocate portion of main & uprate to HP	9705121	7/1/2011	C Koo	7/1/2011	C Koo	7/1/2011
4	N/A	Seavice Installation HPS-0045	D-4	9/4/1992	C Koo	7/1/2011	C Koo	7/1/2011
5	109068555	Bottom-out Relocation	795-373	TBD	D Frieze	6/13/2012	D Frieze	6/13/2012

Facility Evaluation Summary

Facility Design Pressure	275	
Design Factor	0.4	(Class 4 Location)
Pipe Design Pressure	794.6	
Non-Rated Fitting Design Pressure	1420.0	
Rated Fitting Rated Pressure	275.0	
Branch Connection Design Pressure	584.2	
Current System MAOP	150.0	
The Highest % SMYS of the Facility at the Current System MAOP	7.6%	
Proposed system MAOP	250.0	
The Highest % SMYS of the Facility at the Proposed System MAOP	12.6%	

Table 1 - Pipe Design Pressure

Enter MID#, PO#, or "PO" in this field — Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	4	70520	6" PIPE X 0.188 WALL Gr.B	ACTIVE	6"	0.188	Gr.B	795	7.55%	12.59%	Historic pipe specs

THE LOWEST DESIGN PRESSURE: 795 8% 13%

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, PO#, or "PO" in this field — Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
3	N/A	5200730	6" Weld Cap X 0.28 WALL Y-42	ACTIVE	6"	0.28			Y-42	Weld Cap	1420	4.23%	7.04%	
5	25	5200730	6" Weld Cap X 0.28 WALL Y-42	ACTIVE	6"	0.28			Y-42	Weld Cap	1420	4.23%	7.04%	
5	13	PO	3/4" X TH .3/4" Nipple 0.154 X 0.11653 WALL Gr.B	ACTIVE	3/4"	0.154	TH .3/4"	0.11653	Gr.B	Nipple	3346	1.78%	2.99%	

THE LOWEST DESIGN PRESSURE: 1420 4% 7%

Table 3 - Rated Fittings Rated Pressure

Enter MID#, PO#, or "PO" in this field — Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type Short Stop or Line Stopper	Manufacturer and Model Number	Rated Pressure	Comments
1	5	76775	6" Short Stop or Line Stopper CLASS 150 WOP N/APSIG	RETIRED	6"	CLASS 150			N/A	Retired on 9705121
2	2	76786	6" Bttom Out Stopper <ueller, H-17280 T/W WOP 275PSIG	ACTIVE	6"		Bttom Out Stopper	<ueller, H-17280 T/W	275	Branch to 020.AA-1A
2	7	72096	6" Weld Plug WOP N/APSIG	RETIRED	6"		Weld Plug		N/A	Rated only for 125 psig. Field Confirmation is required. If the fitting is still active, fitting will be retired 887025764
3	N/A	7600779	6" Botoom-Out Mueller H-17261 WOP 720PSIG	ACTIVE	6"		Botoom-Out	Mueller H-17261	720	Branch to 020.Z-1G
4	N/A	N/A	1-1/4" Service Tee Mueller H17501 WOP 1440PSIG	ACTIVE	1-1/4"		Service Tee	Mueller H17501	1440	Branch to HPS-0045 Mode l number is based on Standards research
3	11	7800800	3/4" Auto-perf Tee Mueller H-18102 WOP 1200PSIG	ACTIVE	3/4"		Auto-perf Tee	Mueller H-18102	1200	
5	14	9997799	3/4" Socket Cap CLASS 3000 WOP 3000PSIG	ACTIVE	3/4"	CLASS 3000	Socket Cap		3000	
5	15	6800941	3" Save-a-valve Mueller H-17491 WOP 1440PSIG	ACTIVE	3"		Save-a-valve	Mueller H-17491	1440	

THE LOWEST PRESSURE RATING: 275

Design Pressure Calculation on a Branch

Design Factor (F)	0.4
Current MAOP	150
Proposed MAOP	250

Dimensions				
	Job Key of the Header Pipe	1	1	1
	Header OD (inch)	6.625	6.625	6.625
	Header Wall Thickness (inch)	0.188	0.188	0.188
	Header Yield Strength	35000	35000	35000
	Header Longitudinal Joint Factor	1	1	1
	Job Key of the Branch	4	5	5
	Branch Fitting Description	1-1/4" Service Tee H-17501	3" Save-a-valve	3/4" Nipple
	Branch OD (inch)	1.810	3.500	1.050
	Branch Wall Thickness (inch)	0.22	0.281	0.154
	Branch Yield Strength (psi)	36000	36000	35000
	Branch Longitudinal Joint Factor	1	1	1
	Temperature Derating Factor (from Header)	1	1	1
	Tap Size (Maximum) (inch)	1.37	2.938	0.742
	Tap Size (inch)	1.37	2.938	0.742
	Recommended Fitting Weld Leg (in)	0.25	0.25	0.25
	Fitting Weld Length (in)	0.25	0.25	0.25
Effective A3 Provided by Additional Reinforcement				
	Max 'Usable' Length (OD) of additional Reinforcement	2.74	5.876	1.484
	OD of Additional Reinforcement (inch)	0	0	0
	Thickness of Additional Reinforcement M (inch)	0	0	0
	Yield Strength of Additional Reinforcement (psi)	0	0	0
Effective A3 Provided by Weldments				
	Max Header Weld Leg Length for A3 (inch)	0.25	0.25	0.25
	Header Weld Leg Length for A3 (inch)	0	0	0
	Max Branch Weld Leg Length for A3 (inch)	0.25	0.25	0.25
	Branch Weld Leg Length for A3 (inch)	0	0	0
Conclusion and Calculation Summary				
	Design Pressure (psig)	744.8048143	584.2212	840.7553
	L (inch)	0.47	0.47	0.385
	d – OD/2 (Max Reinforcement Width)	0.465	1.188	0.217
	t (inch)	0.176226139	0.138231	0.198929
	tb (inch)	0.046808914	0.070999	0.031528
	Ar (sq in)	0.241429811	0.406122	0.147605
	A1 (sq in)	0.016130189	0.146222	0
	A2 (sq in)	0.162799621	0.197401	0.094303
	A2' (sq in)	0.162799621	0.197401	0.094303
	A3 (Fitting Weld Material)	0.0625	0.0625	0.061411
	A3 Reinforcement (sq in)	0	0	0
	A3 Weldment (sq in)	0	0	0
	A3 (sq in)	0.0625	0.0625	0.061411
	Status (Branch Status from Calculation Worksheet)	Active	Active	Active
	Design Pressure Evaluation	744.8048143	584.2212	840.7553

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	Main ID 020;AA-1.A
Facility Type	HP PIPE SEGMENT

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	795-373	Install IP main	795-373	8/8/1979	R Nakano	5/3/2011	C Koo	5/25/2011
2	9705121	Uprate to HP	9705121	11/21/1999	R Nakano	5/3/2011	C Koo	5/25/2011
3	D-4	Install Service HPS-0016	D-4	7/16/1985	C Koo	7/1/2011	C Koo	7/1/2011
4	D-4	Install Service HPS-0017	D-4	6/25/1969	C Koo	7/1/2011	C Koo	7/1/2011
5	109068555	Bottom-out Relocation	795-373	TBD	D Frieze	6/13/2012	D Frieze	6/13/2012

Facility Evaluation Summary

Facility Design Pressure	250
Design Factor	0.4 (Class 4 Location)
Pipe Design Pressure	794.6
Non-Rated Fitting Design Pressure	1420.0
Rated Fitting Rated Pressure	250.0
Branch Connection Design Pressure	584.2
Current System MAOP	150.0
The Highest % SMYS of the Facility at the Current System MAOP	7.6%
Proposed system MAOP	250.0
The Highest % SMYS of the Facility at the Proposed System MAOP	12.6%

Table 1 - Pipe Design Pressure

Enter MID#, PO#, or "PO" in this field — Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	1	7000520	6" PIPE X 0.188 WALL Gr.B	ACTIVE	6"	0.188	Gr.B	795	7.55%	12.59%	

THE LOWEST DESIGN PRESSURE: 795 8% 13%

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, PO#, or "PO" in this field — Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	3	6000752	6" X 90 Degree, Elbow, Weld X 0.28 WALL Y-42	ACTIVE	6"	0.28			Y-42	X 90 Degree, Elbow, Weld	1420	4.23%	7.04%	
5	25	5200730	6" Weld Cap X 0.28 WALL Y-42	ACTIVE	6"	0.28			Y-42	Weld Cap	1420	4.23%	7.04%	
5	13	PO	3/4" X TH 3/4" Nipple 0.154 X 0.11653 WALL Gr.B	ACTIVE	3/4"	0.154	TH 3/4"	0.11653	Gr.B	Nipple	3348	1.79%	2.99%	

THE LOWEST DESIGN PRESSURE: 1420 4% 7%

Table 3 - Rated Fittings Rated Pressure

Enter MID#, PO#, or "PO" in this field — Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
1	2	76786	6" Stopper, B/O, T/W Mueller, H-17280 CLASS 150 WOP 275PSIG	ACTIVE	6"	CLASS 150	Stopper, B/O, T/W	Mueller, H-17280	275	
3	N/A	N/A	3/4" Service Tee Mueller H-18101 WOP 1200PSIG	ACTIVE	3/4"		Service Tee	Mueller H-18101	1200	Confirmed 887025942
4	N/A	N/A	1-1/4" Service Tee Mueller H17500 WOP 250PSIG	ACTIVE	1-1/4"		Service Tee	Mueller H17500	250	Branch to HPS-0017
5	11	7600000	3/4" Auto-perf Tee Mueller H-18102 WOP 1200PSIG	ACTIVE	3/4"		Auto-perf Tee	Mueller H-18102	1200	
5	14	9997799	3/4" Socket Cap CLASS 3000 WOP 3000PSIG	ACTIVE	3/4"	CLASS 3000	Socket Cap		3000	
5	15	6800641	3" Save-a-valve Mueller H-17491 WOP 1440PSIG	ACTIVE	3"		Save-a-valve	Mueller H-17491	1440	

THE LOWEST PRESSURE RATING: 250

Design Pressure Calculation on a Branch

Design Factor (F)	0.4
Current MAOP	150
Proposed MAOP	250

Dimensions					
	Job Key of the Header Pipe	1	1	1	1
	Header OD (inch)	6.625	6.625	6.625	6.625
	Header Wall Thickness (inch)	0.188	0.188	0.188	0.188
	Header Yield Strength	35000	35000	35000	35000
	Header Longitudinal Joint Factor	1	1	1	1
	Job Key of the Branch	3	4	5	5
	Branch Fitting Description	3/4" Service Tee H18101	1-1/4" Service Tee H17500	3" Save-a-valve	3/4" Nipple
	Branch OD (inch)	1.180	1.810	3.500	1.050
	Branch Wall Thickness (inch)	0.18	0.22	0.281	0.154
	Branch Yield Strength (psi)	36000	36000	36000	35000
	Branch Longitudinal Joint Factor	1	1	1	1
	Temperature Derating Factor (from Header)	1	1	1	1
	Tap Size (Maximum) (inch)	0.82	1.37	2.938	0.742
	Tap Size (inch)	0.82	1.37	2.938	0.742
	Recommended Fitting Weld Leg (in)	0.25	0.25	0.25	0.25
	Fitting Weld Length (in)	0.25	0.25	0.25	0.25
Effective A3 Provided by Additional Reinforcement					
	Max 'Usable' Length (OD) of additional Reinforcement	1.64	2.74	5.876	1.484
	OD of Additional Reinforcement (inch)	0	0	0	0
	Thickness of Additional Reinforcement M (inch)	0	0	0	0
	Yield Strength of Additional Reinforcement (psi)	0	0	0	0
Effective A3 Provided by Weldments					
	Max Header Weld Leg Length for A3 (inch)	0.25	0.25	0.25	0.25
	Header Weld Leg Length for A3 (inch)	0	0	0	0
	Max Branch Weld Leg Length for A3 (inch)	0.25	0.25	0.25	0.25
	Branch Weld Leg Length for A3 (inch)	0	0	0	0
Conclusion and Calculation Summary					
	Design Pressure (psig)	890.2105484	744.8048143	584.2212	840.7553
	L (inch)	0.45	0.47	0.47	0.385
	d – OD/2 (Max Reinforcement Width)	0.23	0.465	1.188	0.217
	t (inch)	0.210630174	0.176226139	0.138231	0.198929
	tb (inch)	0.036473904	0.046808914	0.070999	0.031528
	Ar (sq in)	0.172716743	0.241429811	0.406122	0.147605
	A1 (sq in)	0	0.016130189	0.146222	0
	A2 (sq in)	0.129173486	0.162799621	0.197401	0.094303
	A2' (sq in)	0.129173486	0.162799621	0.197401	0.094303
	A3 (Fitting Weld Material)	0.0621	0.0625	0.0625	0.061411
	A3 Reinforcement (sq in)	0	0	0	0
	A3 Weldment (sq in)	0	0	0	0
	A3 (sq in)	0.0621	0.0625	0.0625	0.061411
	Status (Branch Status from Calculation Worksheet)	Active	Active	Active	Active
	Design Pressure Evaluation	890.2105484	744.8048143	584.2212	840.7553

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	Main ID: 020.AB-1
Facility Type	HP PIPE SEGMENT

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	74S-221	Install 6" IP Gas Main	74S-221	7/10/1974	Roy N	5/13/2011	C Koo	5/20/2011
2	9705121	Uprate to HP	9705121		Roy N	5/13/2011	C Koo	5/20/2011
3	N/A	HPS-0018 - Original Service Installation (Retired)	D-4	6/30/1979	C Koo	5/20/2011	C Koo	5/20/2011
4	N/A	HPS-0019 - Original Service Installation (Retired)	D-4	7/10/1974	C Koo	5/20/2011	C Koo	5/20/2011
5	N/A	HPS-0020 - Original Service Installation (Retired)	D-4	7/10/1974	C Koo	5/20/2011	C Koo	5/20/2011
6	N/A	2" Service Tee to 2" Main (Retired)	Main Card	6/27/1980	C Koo	5/20/2011	C Koo	5/20/2011
7	N/A	2" Service Tee to 2" Main (Retired)	815-178	12/31/1980	C Koo	5/20/2011	C Koo	5/20/2011
8	795-373	6" Relocation	795-373	6/8/1979	C Koo	7/1/2011	C Koo	7/1/2011
9	109068555	Bottom-out Relocation	795-373	TBD	D Frieze	6/13/2012	D Frieze	6/13/2012

Facility Evaluation Summary

Facility Design Pressure	250	
Design Factor	0.4	(Class 4 Location)
Pipe Design Pressure	794.6	
Non-Rated Fitting Design Pressure	1420.0	
Rated Fitting Rated Pressure	250.0	
Branch Connection Design Pressure	584.2	
Current System MAOP	150.0	
The Highest % SMYS of the Facility at the Current System MAOP	7.6%	
Proposed system MAOP	250.0	
The Highest % SMYS of the Facility at the Proposed System MAOP	12.6%	

Table 1 - Pipe Design Pressure

Enter MID#, PO#, or "PO" in this field — Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	4	70520	6" PIPE X 0.188 WALL Gr.B	ACTIVE	6"	0.188	Gr.B	795	7.55%	12.59%	Historic pipe specs

THE LOWEST DESIGN PRESSURE: 795 8% 13%

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, PO#, or "PO" in this field — Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
9	25	5200730	6" Cap X 0.28 WALL Y-42	ACTIVE	6"	0.28			Y-42	Cap	1420	4.23%	7.04%	
9	13	PO	3/4" X TH 3/4" Nipple 0.154 X 0.11653 WALL Gr.B	ACTIVE	3/4"	0.154	TH 3/4"	0.11653	Gr.B	Nipple	3346	1.79%	2.99%	

THE LOWEST DESIGN PRESSURE: 1420 4% 7%

Table 3 - Rated Fittings Rated Pressure

Enter MID#, PO#, or "PO" in this field — Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
3	N/A	N/A	1-1/4" Service Tee H17500 WOP 250PSIG	ACTIVE	1-1/4"		Service Tee	H17500	250	Branch of HPS-0020
4	N/A	N/A	1-1/4" Service Tee H17500 WOP 250PSIG	ACTIVE	1-1/4"		Service Tee	H17500	250	Branch of HPS-0019
5	N/A	N/A	1/4" Service Tee H17500 WOP 250PSIG	ACTIVE	1/4"		Service Tee	H17500	250	Branch of HPS-0018
6	N/A	N/A	2" Service Tee H17500 WOP 250PSIG	ACTIVE	2"		Service Tee	H17500	250	Branch of 020.AU-1
7	N/A	N/A	2" Service Tee H17500 WOP 250PSIG	ACTIVE	2"		Service Tee	H17500	250	Branch of 020.AU-1
8	2	76786	6" Bottom Out Mueller H17280 WOP 275PSIG	ACTIVE	6"		Bottom Out	Mueller H17280	275	Branch to 020.AA-01A
1		N/A	3/4" Service Tee Mueller H-18101 WOP 1200PSIG	ACTIVE	3/4"		Service Tee	Mueller H-18101	1200	B/O Purge Fitting Confirmed 887026761
9	11	7800800	3/4" Auto-perf Tee Mueller H-18102 WOP 1200PSIG	ACTIVE	3/4"		Auto-perf Tee	Mueller H-18102	1200	
9	14	8997799	3/4" Socket Cap CLASS 3000 WOP 3000PSIG	ACTIVE	3/4"	CLASS 3000	Socket Cap		3000	
9	15	6800641	3" Save-a-valve Mueller H-17491 WOP 1440PSIG	ACTIVE	3"		Save-a-valve	Mueller H-17491	1440	

THE LOWEST PRESSURE RATING: 250

Design Pressure Calculation on a Branch

Design Factor (F)	0.4
Current MAOP	150
Proposed MAOP	250

Dimensions						
	Job Key of the Header Pipe	1	1	1	1	1
	Header OD (inch)	6.625	6.625	6.625	6.625	6.625
	Header Wall Thickness (inch)	0.188	0.188	0.188	0.188	0.188
	Header Yield Strength	35000	35000	35000	35000	35000
	Header Longitudinal Joint Factor	1	1	1	1	1
	Job Key of the Branch	3,4,5	6, 7	1	9	9
	Branch Fitting Description	1-1/4" Service Tee H17500	2" Serivce Tee H17500	3/4" Service Tee H-18101	3" Save-a-valve	3/4" Nipple
	Branch OD (inch)	1.810	2.375	1.180	3.500	1.050
	Branch Wall Thickness (inch)	0.22	0.25	0.18	0.281	0.154
	Branch Yield Strength (psi)	36000	36000	36000	36000	35000
	Branch Longitudinal Joint Factor	1	1	1	1	1
	Temperature Derating Factor (from Header)	1	1	1	1	1
	Tap Size (Maximum) (inch)	1.37	1.875	0.82	2.938	0.742
	Tap Size (inch)	1.37	1.875	0.82	2.938	0.742
	Recommended Fitting Weld Leg (in)	0.25	0.25	0.25	0.25	0.25
	Fitting Weld Length (in)	0.25	0.25	0.25	0.25	0.25
Effective A3 Provided by Additional Reinforcement						
	Max 'Usable' Length (OD) of additional Reinforcement	2.74	3.75	1.64	5.876	1.484
	OD of Additional Reinforcement (inch)	0	0	0	0	0
	Thickness of Additional Reinforcement M (inch)	0	0	0	0	0
	Yield Strength of Additional Reinforcement (psi)	0	0	0	0	0
Effective A3 Provided by Weldments						
	Max Header Weld Leg Length for A3 (inch)	0.25	0.25	0.25	0.25	0.25
	Header Weld Leg Length for A3 (inch)	0	0	0	0	0
	Max Branch Weld Leg Length for A3 (inch)	0.25	0.25	0.25	0.25	0.25
	Branch Weld Leg Length for A3 (inch)	0	0	0	0	0
Conclusion and Calculation Summary						
	Design Pressure (psig)	744.8048143	673.7188468	890.2105484	584.2212	840.7553
	L (inch)	0.47	0.47	0.45	0.47	0.385
	d – OD/2 (Max Reinforcement Width)	0.465	0.6875	0.23	1.188	0.217
	t (inch)	0.176226139	0.159406691	0.210630174	0.138231	0.198929
	tb (inch)	0.046808914	0.055558412	0.036473904	0.070999	0.031528
	Ar (sq in)	0.241429811	0.298887546	0.172716743	0.406122	0.147605
	A1 (sq in)	0.016130189	0.053612454	0	0.146222	0
	A2 (sq in)	0.162799621	0.182775093	0.129173486	0.197401	0.094303
	A2' (sq in)	0.162799621	0.182775093	0.129173486	0.197401	0.094303
	A3 (Fitting Weld Material)	0.0625	0.0625	0.0621	0.0625	0.061411
	A3 Reinforcement (sq in)	0	0	0	0	0
	A3 Weldment (sq in)	0	0	0	0	0
	A3 (sq in)	0.0625	0.0625	0.0621	0.0625	0.061411
	Status (Branch Status from Calculation Worksheet)	Active	Active	Active	Active	Active
	Design Pressure Evaluation	744.8048143	673.7188468	890.2105484	584.2212	840.7553

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	020,AC-1
Facility Type	HP PIPE SEGMENT

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	905-504B	Install 6" IP gas main	905-504B	10/2/1990	R Nekeno	5/16/2011	G Koo	7/15/211
2	9705121	Retire portion of 6" pipe & uprisk to HP	9705121	11/21/1998	R Nekeno	5/16/2011	G Koo	7/15/211
3	N/A	Install HPS-0021 (Retired)	D-1	2/16/1984	C Koo	7/15/2011	C Koo	7/16/211

Facility Evaluation Summary

Facility Design Pressure	250	
Design Factor	0.4	(Class 4 Location)
Pipe Design Pressure	953.5	
Non-Rated Fitting Design Pressure	1420.0	
Rated Fitting Rated Pressure	250.0	
Branch Connection Design Pressure	771.5	
Current System MAOP	150.0	
The Highest % SMYS of the Facility at the Current System MAOP	6.3%	
Proposed system MAOP	250.0	
The Highest % SMYS of the Facility at the Proposed System MAOP	10.6%	

Table 1 - Pipe Design Pressure

Enter MIDs, POs, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	1	7000621	6" PIPE X 0.189 WALL X-42	ACTIVE	6"	0.188	X-42	953	6.29%	10.49%	

THE LOWEST DESIGN PRESSURE: 953 6% 10%

Table 2 - Non-Rated Fitting Design Pressure

Enter MIDs, POs, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	3	6000782	6" X 90 Degree, Elbow, Weld X 0.28 WALL Y-42	ACTIVE	6"	0.28			Y-42	X 90 Degree, Elbow, Weld	1420	4.23%	7.04%	
1	4	6200730	6" Cap, Weld X 0.28 WALL Y-42	ACTIVE	6"	0.28			Y-42	Cap, Weld	1420	4.23%	7.04%	
1	11	6000742	6" X 45 Degree, Elbow, Weld X 0.28 WALL Y-42	ACTIVE	6"	0.28			Y-42	X 45 Degree, Elbow, Weld	1420	4.23%	7.04%	
1	15	7800432	6" X 6" Tee, Weld 0.28 X 0.28 WALL Y-42	ACTIVE	6"	0.28	6"	0.28	Y-42	Tee, Weld	1420	4.23%	7.04%	
1	16	7800419	6" X 4" Tee, Weld, Reducing 0.28 X 0.237 WALL Y-42	ACTIVE	6"	0.28	4"	0.237	Y-42	Tee, Weld, Reducing	1420	4.23%	7.04%	
2	51	6200730	6" Cap, Weld X 0.28 WALL Y-42	ACTIVE	6"	0.28			Y-42	Cap, Weld	1420	4.23%	7.04%	See Main ID 020,AC-1,A
1	Not Noted	Not Noted	2" Transition Fitting, Steel Portion X 0.154 WALL WPB	ACTIVE	2"	0.154			WPB	Transition Fitting, Steel Portion	1616	3.30%	5.51%	
1	41	6200876	2" Cap, Weld X 0.154 WALL WPB	ACTIVE	2"	0.154			WPB	Cap, Weld	1616	3.30%	5.51%	

THE LOWEST DESIGN PRESSURE: 1420 4% 7%

Table 3 - Rated Fittings Rated Pressure

Enter MIDs, POs, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
1	Not Noted	Not Noted	2" Tee, Service Mueller, H-17600 WOP 250PSIG	ACTIVE	2"		Tee, Service	Mueller, H-17600	250	Retired tie in to 2" Main
1	Not Noted	Not Noted	2" Tee, Service Mueller, H17601 WOP 1440PSIG	ACTIVE	2"		Tee, Service	Mueller, H17601	1440	Retired tie in to 2" Main
2	Not Noted	6903841	2" Save-A-Valve Mueller H17491 WOP 1440PSIG	ACTIVE	2"		Save-A-Valve	Mueller H17491	1440	Retired tie-in to HPS-0048, HPS-0047, HPS-0046, HPS-0049, HPS-0050
2	48	7800778	6" Bottom Out Mueller 17261 WOP 720PSIG	ACTIVE	6"		Bottom Out	Mueller 17261	720	Branch To 020,AC-1A and 020,AC-1B
3	Not Noted	Not Noted	1-1/4" Tee, Service Mueller , H17501 WOP 1440PSIG	ACTIVE	1-1/4"		Tee, Service	Mueller , H17501	1440	Branch to HPS-0021

THE LOWEST PRESSURE RATING: 250

Design Pressure Calculation on a Branch

Design Factor (F)	0.4
Current MAOP	150
Proposed MAOP	250

Dimensions					
	Job Key of the Header Pipe	1	1	1	1
	Header OD (inch)	6.625	6.625	6.625	6.625
	Header Wall Thickness (inch)	0.188	0.188	0.188	0.188
	Header Yield Strength	42000	42000	42000	42000
	Header Longitudinal Joint Factor	1	1	1	1
	Job Key of the Branch	1	1	2	3
	Branch Fitting Description	2" Tee H-17500	2" Tee H-17501	2" Save-A-Valve	1-1/4" Tee H-17501
	Branch OD (inch)	2.410	2.410	2.219	1.810
	Branch Wall Thickness (inch)	0.27	0.27	0.2343	0.22
	Branch Yield Strength (psi)	36000	36000	36000	36000
	Branch Longitudinal Joint Factor	1	1	1	1
	Temperature Derating Factor (from Header)	1	1	1	1
	Tap Size (Maximum) (inch)	1.87	1.87	1.7501	1.37
	Tap Size (inch)	1.87	1.87	1.7501	1.37
	Recommended Fitting Weld Leg (in)	0.25	0.25	0.25	0.25
	Fitting Weld Length (in)	0.25	0.25	0.25	0.25
Effective A3 Provided by Additional Reinforcement					
	Max 'Usable' Length (OD) of additional Reinforcement	3.74	3.74	3.5002	2.74
	OD of Additional Reinforcement (inch)	0	0	0	0
	Thickness of Additional Reinforcement M (inch)	0	0	0	0
	Yield Strength of Additional Reinforcement (psi)	0	0	0	0
Effective A3 Provided by Weldments					
	Max Header Weld Leg Length for A3 (inch)	0.25	0.25	0.25	0.25
	Header Weld Leg Length for A3 (inch)	0	0	0	0
	Max Branch Weld Leg Length for A3 (inch)	0.25	0.25	0.25	0.25
	Branch Weld Leg Length for A3 (inch)	0	0	0	0
Conclusion and Calculation Summary					
	Design Pressure (psig)	784.7477896	784.7477896	771.452496	841.6409874
	L (inch)	0.47	0.47	0.47	0.47
	d – OD/2 (Max Reinforcement Width)	0.665	0.665	0.64075	0.465
	t (inch)	0.154730777	0.154730777	0.152109309	0.165948558
	tb (inch)	0.065668131	0.065668131	0.059431307	0.052894798
	Ar (sq in)	0.289346553	0.289346553	0.266206502	0.227349524
	A1 (sq in)	0.062213447	0.062213447	0.062812298	0.030210476
	A2 (sq in)	0.192071957	0.192071957	0.164376571	0.15707889
	A2' (sq in)	0.164633106	0.164633106	0.140894204	0.134639048
	A3 (Fitting Weld Material)	0.0625	0.0625	0.0625	0.0625
	A3 Reinforcement (sq in)	0	0	0	0
	A3 Weldment (sq in)	0	0	0	0
	A3 (sq in)	0.0625	0.0625	0.0625	0.0625
	Status (Branch Status from Calculation Worksheet)	Active	Active	Active	Active
	Design Pressure Evaluation	784.7477896	784.7477896	771.452496	841.6409874

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	020-AG-1-A
Facility Type	HP PIPE SEGMENT

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Reviewed By	Review Completion Date	Reviewed By	Review Completion Date
1	9705121	Install HP gas main	9705121	8/19/1998	R Nakano	5/16/2011	C Koo	5/16/2011

Facility Evaluation Summary

Facility Design Pressure	720
Design Factor	0.4 (Class 4 Location)
Pipe Design Pressure	953.5
Non-Rated Fitting Design Pressure	1420.0
Rated Fitting Rated Pressure	720.0
Branch Connection Design Pressure	N/A
Current System MAOP	150.0
The Highest % SMYS of the Facility at the Current System MAOP	6.3%
Proposed system MAOP	250.0
The Highest % SMYS of the Facility at the Proposed System MAOP	10.5%

Table 1 - Pipe Design Pressure

Enter MID#, PO#, or "PO" in this field | Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	52	7000521	6" PIPE X 0.188 WALL X-42	ACTIVE	6"	0.188	X-42	953	6.29%	10.49%	FBE Coated

THE LOWEST DESIGN PRESSURE: 953 6% 10%

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, PO#, or "PO" in this field | Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	49	6000762	6" X60 Degree, Elbow, Weld X 0.28 WALL Y-42	ACTIVE	6"	0.28			Y-42	X60 Degree, Elbow, Weld	1420	4.23%	7.04%	

THE LOWEST DESIGN PRESSURE: 1420 4% 7%

Table 3 - Rated Fittings Rated Pressure

Enter MID#, PO#, or "PO" in this field | Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
1	48	7800779	6" Stopper, B/O Mueller, H-17261 CLASS 300 WOP 720PSIG	ACTIVE	6"	CLASS 300	Stopper, B/O	Mueller, H-17261	720	
1	50	Salvaged	6" Valve, Plug Nordstrom, Fig. 2045-1/4 CLASS 300 WOP 740PSIG	ACTIVE	6"	CLASS 300	Valve, Plug	Nordstrom, Fig. 2045-1/4	740	

THE LOWEST PRESSURE RATING: 720

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	Main ID 020,AC-1,B
Facility Type	HP PIPE SEGMENT

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compileded By	Compilation Completion Date	Reviewed By	Review Completion Date
1	9705121	Install 6" HP gas main	9705121	7/30/2000	R Nekano	7/22/2011	G Koo	7/22/2011

Facility Evaluation Summary

Facility Design Pressure	720
Design Factor	0.4 (Class 4 Location)
Pipe Design Pressure	953.6
Non-Rated Fitting Design Pressure	1420.0
Rated Fitting Rated Pressure	720.0
Branch Connection Design Pressure	N/A
Current System MAOP	180.0
The Highest % SMYS of the Facility at the Current System MAOP	6.3%
Proposed system MAOP	260.0
The Highest % SMYS of the Facility at the Proposed System MAOP	10.5%

Table 1 - Pipe Design Pressure

Enter MIDH, PO#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	52	7000521	6" PIPE X 0.188 WALL X-42	ACTIVE	6"	0.188	X-42	953	6.26%	10.49%	

THE LOWEST DESIGN PRESSURE: 953 6% 10%

Table 2 - Non-Rated Fitting Design Pressure

Enter MIDH, PO#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	49	6000782	6" X 90 Degree Weld Elbow X 0.28 WALL Y-42	ACTIVE	6"	0.28			Y-42	X 90 Degree Weld Elbow	1420	4.23%	7.04%	

THE LOWEST DESIGN PRESSURE: 1420 4% 7%

Table 3 - Rated Fittings Rated Pressure

Enter MIDH, PO#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
1	48	7000779	6" Stopper, B/O Mueller, H-17261 CLASS 300 WOP 720PSIG	ACTIVE	6"	CLASS 300	Stopper, B/O	Mueller, H-17261	720	

THE LOWEST PRESSURE RATING: 720

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	020.AS-1
Facility Type	HP PIPE SEGMENT

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Completion Completion Date	Reviewed By	Review Completion Date
1	916-876	Install 2" IP Gas main	916-876	1/2/1992	R Nakano	5/25/2011	C Koo	5/25/2011
2	9705121	Retire 2" IP Gas Main	9705121	5/11/1997	R Nakano	5/25/2011	C Koo	5/25/2011
3	9705121	Uprate to HP	N/A	11/21/1999	C Koo	5/25/2011	C Koo	5/25/2011

Facility Evaluation Summary

Facility Design Pressure	1440
Design Factor	0.4 (Class 4 Location)
Pipe Design Pressure	N/A
Non-Rated Fitting Design Pressure	1816.0
Rated Fitting Rated Pressure	1440.0
Branch Connection Design Pressure	N/A
Current System MAOP	150.0
The Highest % SMYS of the Facility at the Current System MAOP	3.3%
Proposed system MAOP	250.0
The Highest % SMYS of the Facility at the Proposed System MAOP	5.6%

Table 1 - Pipe Design Pressure

Job Key	ITEM #	Enter MID#, PO#, or "PO" in this field: MID	Description	Select Data from the drop down manual: Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments

THE LOWEST DESIGN PRESSURE:

Table 2 - Non-Rated Fitting Design Pressure

Job Key	ITEM #	Enter MID#, PO#, or "PO" in this field: MID	Description	Select Data from the drop down manual: Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	6	7600800	2" Transition Fitting, HDPE to ST X 0.154 WALL Gr.B	ACTIVE	2"	0.154			Gr.B	Transition Fitting, HDPE to ST	1816	3.30%	5.51%	Only short section of the ST portion of the transition fitting left.
2	41	6200675	2" Cap, Weld X 0.154 WALL WPB	ACTIVE	2"	0.154			WPB	Cap, Weld	1816	3.30%	5.51%	

THE LOWEST DESIGN PRESSURE: 1816 3% 5%

Table 3 - Rated Fittings Rated Pressure

Job Key	ITEM #	Enter MID#, PO#, or "PO" in this field: MID	Description	Select Data from the drop down manual: Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
1	13	7800711	2" Service Tee Mueller, H-17601 WOP 1440PSIG	ACTIVE	2"		Service Tee	Mueller, H-17601	1440	

THE LOWEST PRESSURE RATING: 1440

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID: 020 AT-1
Facility Type: HP PIPE SEGMENT

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	9308077	Install 2" IP Gas main	9308077	4/21/1993	R Nakano	5/20/2011	G Keo	5/20/2011
2	9705121	Retire 2" IP Gas Main & Uprate to HP	9705121	5/11/1997	R Nakano	5/20/2011	G Keo	5/20/2011

Facility Evaluation Summary

Facility Design Pressure	1440
Design Factor	0.4 (Class 4 Location)
Pipe Design Pressure	N/A
Non-Rated Fitting Design Pressure	1816.0
Rated Fitting Rated Pressure	1440.0
Branch Connection Design Pressure	N/A
Current System MAOP	160.0
The Highest % SMYS of the Facility at the Current System MAOP	3.3%
Proposed system MAOP	250.0
The Highest % SMYS of the Facility at the Proposed System MAOP	5.6%

Table 1 - Pipe Design Pressure

Enter MID#, PO#, or "PO" in this field. Select Data from the drop down manual.

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments

THE LOWEST DESIGN PRESSURE:

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, PO#, or "PO" in this field. Select Data from the drop down manual.

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	6	7800800	2" Transition Fitting, HDPE to ST X 0.154 WALL Gr.B	ACTIVE	2"	0.154			Gr.B	Transition Fitting, HDPE to ST	1816	3.30%	5.51%	Only short section of the ST portion of the transition fitting left.
2	1	6200675	2" Cap, Weld X 0.154 WALL WPB	ACTIVE	2"	0.154			WPB	Cap, Weld	1816	3.30%	5.51%	

THE LOWEST DESIGN PRESSURE: 1816 3% 6%

Table 3 - Rated Fittings Rated Pressure

Enter MID#, PO#, or "PO" in this field. Select Data from the drop down manual.

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
1	Not Noted	7800711	2" Service Tee Mueller, H-17501 WOP 1440PSIG	ACTIVE	2"		Service Tee	Mueller, H-17501	1440	Per Store Ticket - Mains & Service form

THE LOWEST PRESSURE RATING: 1440

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	Main ID 020 AB-1
Facility Type	HP PIPE SEGMENT

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Complied By	Completion Completion Date	Reviewed By	Review Completion Date
1	804-408	Install IP gas main	Main Card	6/27/1960	R Nakano	6/3/2011	C Koo	7/1/2011
2	815-178	Retire portion of IP main	Main Card	12/18/1960	R Nakano	6/3/2011	C Koo	7/1/2011
3	9705121	Retire portion of IP main	9705121	11/21/1999	C Koo	7/1/2011	C Koo	7/1/2011

Facility Evaluation Summary

Facility Design Pressure		
Design Factor	0.4	(Class 4 Location)
Pipe Design Pressure	631.8	
Non-Rated Fitting Design Pressure	1816.0	
Rated Fitting Rated Pressure	250.0	
Branch Connection Design Pressure	N/A	
Current System MAOP	150.0	
The Highest % SMYS of the Facility at the Current System MAOP	5.7%	
Proposed system MAOP	250.0	
The Highest % SMYS of the Facility at the Proposed System MAOP	9.5%	

Table 1 - Pipe Design Pressure

Enter MID#, POA or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	Not noted	Not Noted	2" PIPE X 0.125 WALL Gr.A25	ACTIVE	2"	0.125	Gr.A25	632	5.70%	9.50%	Used specs for weakest hist pipe

THE LOWEST DESIGN PRESSURE: 632 6% 10%

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, POA or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
2	Not Noted	Not Noted	2" Cap, Weld X 0.164 WALL WPB	RETIRED	2"	0.164			WPB	Cap, Weld		3.30%	5.51%	Pipe specs assumed
3	Not Noted	6200876	2" Cap, Weld X 0.164 WALL WPB	ACTIVE	2"	0.164			WPB	Cap, Weld	1816	3.30%	5.51%	

THE LOWEST DESIGN PRESSURE: 1816 3% 6%

Table 3 - Rated Fittings Rated Pressure

Enter MID#, POA or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
1	Not Noted	Not Noted	2" Valve WOP N/APSIG	RETIRED	2"		Valve		N/A	Retired on job 9705121
1	Not noted	Not noted	2" Service Tee H-17500 WOP 250PSIG	ACTIVE	2"		Service Tee	H-17500	250	Pressure Rating based on HP upsrte research completed on 2/18/1998 (107001429) Branch to 020AB-1

THE LOWEST PRESSURE RATING: 250

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	020.AV-1
Facility Type	HP PIPE SEGMENT

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	109068555	Bottom-out Relocation	795-373	TBD	D Frieze	6/13/2012	D Frieze	6/13/2012

Facility Evaluation Summary

Facility Design Pressure	740	
Design Factor	0.4	(Class 4 Location)
Pipe Design Pressure	1420.1	
Non-Rated Fitting Design Pressure	1758.0	
Rated Fitting Rated Pressure	740.0	
Branch Connection Design Pressure	1026.6	
Current System MAOP	150.0	
The Highest % SMYS of the Facility at the Current System MAOP	4.0%	
Proposed system MAOP	250.0	
The Highest % SMYS of the Facility at the Proposed System MAOP	7.0%	

Table 1 - Pipe Design Pressure

Enter MID#, PO#, or "PO" in this field — Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	12	7000510	6" PIPE X 0.28 WALL X-42	ACTIVE	6"	0.28	X-42	1420.07	4.00%	7.00%	

THE LOWEST DESIGN PRESSURE: 1420.07 4.00% 7.00%

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, PO#, or "PO" in this field — Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	17	9996780	6" Elbow X 0.28 WALL Y-52	ACTIVE	6"	0.28			Y-52	Elbow	1758	3.41%	5.69%	

THE LOWEST DESIGN PRESSURE: 1758 3% 6%

Table 3 - Rated Fittings Rated Pressure

Enter MID#, PO#, or "PO" in this field — Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Rated Pressure	Comments
1	15	6800841	2" Save-A-Valve Mueller H-17491 WOP 1440PSIG	ACTIVE	2"		Save-A-Valve	Mueller H-17491	1440	1440	Branch Fitting
1	16	7600787	6" Bottom-Out Mueller H-17281 CLASS 300 WOP 740PSIG	ACTIVE	6"	CLASS 300	Bottom-Out	Mueller H-17281	740	740	

THE LOWEST PRESSURE RATING: 740

Design Pressure Calculation on a Branch

Design Factor (F)	0.4
Current MAOP	150
Proposed MAOP	250

Dimensions			
	Job Key of the Header Pipe	1	
	Header OD (inch)	6.625	
	Header Wall Thickness (inch)	0.28	
	Header Yield Strength	42000	
	Header Longitudinal Joint Factor	1	
	Job Key of the Branch	1	
	Branch Fitting Description	2" Save-A-Valve	
	Branch OD (inch)	2.219	
	Branch Wall Thickness (inch)	0.234375	
	Branch Yield Strength (psi)	36000	
	Branch Longitudinal Joint Factor	1	1
	Temperature Derating Factor (from Header)	1	1
	Tap Size (Maximum) (inch)	1.75	0
	Tap Size (inch)	1.75	0
	Recommended Fitting Weld Leg (in)	0.25	0.25
	Fitting Weld Length (in)	0.25	0
Effective A3 Provided by Additional Reinforcement			
	Max 'Usable' Length (OD) of additional Reinforcement	3.5	0
	OD of Additional Reinforcement (inch)	0	0
	Thickness of Additional Reinforcement M (inch)	0	0
	Yield Strength of Additional Reinforcement (psi)	0	0
Effective A3 Provided by Weldments			
	Max Header Weld Leg Length for A3 (inch)	0.25	0.25
	Header Weld Leg Length for A3 (inch)	0	0
	Max Branch Weld Leg Length for A3 (inch)	0.25	0.25
	Branch Weld Leg Length for A3 (inch)	0	0
Conclusion and Calculation Summary			
	Design Pressure (psig)	1026.623596	
	L (inch)	0.5859375	0
	d – OD/2 (Max Reinforcement Width)	0.640625	0
	t (inch)	0.202422063	#DIV/0!
	tb (inch)	0.079091011	#DIV/0!
	Ar (sq in)	0.354238611	#DIV/0!
	A1 (sq in)	0.135761389	#DIV/0!
	A2 (sq in)	0.181973425	#DIV/0!
	A2' (sq in)	0.155977222	#DIV/0!
	A3 (Fitting Weld Material)	0.0625	0
	A3 Reinforcement (sq in)	0	#DIV/0!
	A3 Weldment (sq in)	0	0
	A3 (sq in)	0.0625	#DIV/0!
	Status (Branch Status from Calculation Worksheet)	Active	Active
	Design Pressure Evaluation	1026.623596	

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	Main ID: 020,AW-1
Facility Type	HP PIPE SEGMENT

Job Key	Job Number	Job Description	Drawing Number	Installation Date	Reviewed By	Review Completion Date	Reviewed By	Review Completion Date
1	816-178	Install 2" IP gas main	816-178	12/31/1980	R.Nakano	5/13/2011	G.Koo	7/1/2011
2	9705121	Retire 2" IP gas main & uprate Ra-in to HP	9705121	11/21/1999	R.Nakano	5/13/2011	G.Koo	7/1/2011

Facility Evaluation Summary

Facility Design Pressure	250	
Design Factor	0.4	(Class 4 Location)
Pipe Design Pressure	N/A	
Non-Rated Fitting Design Pressure	1816.0	
Rated Fitting Rated Pressure	250.0	
Branch Connection Design Pressure	N/A	
Current System MAOP	150.0	
The Highest % SMYS of the Facility at the Current System MAOP	3.3%	
Proposed system MAOP	250.0	
The Highest % SMYS of the Facility at the Proposed System MAOP	5.5%	

Table 1 - Pipe Design Pressure

Enter MIDs#, PO#, or "PO" in this field | Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments

THE LOWEST DESIGN PRESSURE:

Table 2 - Non-Rated Fitting Design Pressure

Enter MIDs#, PO#, or "PO" in this field | Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
2	41	7600575	2" Cap, Weld X 0.154 WALL WPB	ACTIVE	2"	0.154			WPB	Cap, Weld	1816	3.30%	5.51%	
2	41	7600800	2" Transition Fitting X 0.154 WALL Gr.B	ACTIVE	2"	0.154			Gr.B	Transition Fitting	1816	3.30%	5.51%	PE portion of the fitting was cut away.

THE LOWEST DESIGN PRESSURE: 1816 3% 6%

Table 3 - Rated Fittings Rated Pressure

Enter MIDs#, PO#, or "PO" in this field | Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
1	3	76710	2" Service Tee Mueller, H-17500 WOP 250PSIG	ACTIVE	2"		Service Tee	Mueller, H-17500	250	Branch of the 6"

THE LOWEST PRESSURE RATING: 250

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	RS-2658 - Inlet
Facility Type	REGULATOR STATION

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	9705121	Install RS-2658	3D09-604	8/24/1998	R Nakano	5/11/2011	C Koo	5/11/2011

Facility Evaluation Summary

Facility Design Pressure	500
Design Factor	0.4 (Class 4 Location)
Pipe Design Pressure	1403.7
Non-Rated Fitting Design Pressure	1420.0
Rated Fitting Rated Pressure	500.0
Branch Connection Design Pressure	1394.9
Current System MAOP	180.0
The Highest % SMYS of the Facility at the Current System MAOP	4.3%
Proposed system MAOP	250.0
The Highest % SMYS of the Facility at the Proposed System MAOP	7.1%

Table 1 - Pipe Design Pressure

Job Key	ITEM #	Enter MID#, PO#, or "PO" in this field: MID	Description	Select Data from the drop down manual: Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	31	7000440	4" PIPE X 0.188 WALL X-42	ACTIVE	4"	0.188	X-42	1404	4.27%	7.12%	

THE LOWEST DESIGN PRESSURE: 1404 4% 7%

Table 2 - Non-Rated Fitting Design Pressure

Job Key	ITEM #	Enter MID#, PO#, or "PO" in this field: MID	Description	Select Data from the drop down manual: Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	70	6000760	6" X 4" X 90 Degree, Elbow, Reducing, Weld 0.28 X 0.237 WALL Y-42	ACTIVE	6"	0.28	4"	0.237	Y-42	X 90 Degree, Elbow, Reducing, Weld	1420	4.23%	7.04%	
1	68	6000697	4" X 90 Degree, Elbow, Weld X 0.237 WALL Y-42	ACTIVE	4"	0.237			Y-42	X 90 Degree, Elbow, Weld	1770	3.39%	5.65%	
1	64	7600412	4" Tee, Weld X 0.237 WALL Y-42	ACTIVE	4"	0.237			Y-42	Tee, Weld	1770	3.39%	5.65%	
1	63	6200719	4" Cap, Weld X 0.237 WALL Y-42	ACTIVE	4"	0.237			Y-42	Cap, Weld	1770	3.39%	5.65%	
1	35	7200502	4" X 2" Reducer, Weld 0.237 X 0.154 WALL Y-42	ACTIVE	4"	0.237	2"	0.154	Y-42	Reducer, Weld	1770	3.39%	5.65%	
1	25	6800235	TH_1/2" X 6" Nipple (Cut in half), Sch 20 X 0.07153 WALL Gr.A	ACTIVE	TH_1/2"	0.07153			Gr.A	X 6" Nipple (Cut in half), Sch 20	2244	2.67%	4.46%	Branch on the 4"
1	67	6000672	4" X 45 Degree Elbow X 0.237 WALL Y-42	ACTIVE	4"	0.237			Y-42	X 45 Degree Elbow	1770	3.39%	5.65%	

THE LOWEST DESIGN PRESSURE: 1420 4% 7%

Table 3 - Rated Fittings Rated Pressure

Job Key	ITEM #	Enter MID#, PO#, or "PO" in this field: MID	Description	Select Data from the drop down manual: Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
1	62	7600787	6" Stopper, B/O, T/W Mueller, H-17281 CLASS 300 WOP 720PSIG	ACTIVE	6"	CLASS 300	Stopper, B/O, T/W	Mueller, H-17281	720	
1	61	6600764	4" Valve, Plug Nordstrom, Fig 2045-1/2 CLASS 300 WOP 740PSIG	ACTIVE	4"	CLASS 300	Valve, Plug	Nordstrom, Fig 2045-1/2	740	
1	55	7400370	2" Regulator Mooney, FG-30 CLASS 300 WOP 720PSIG	ACTIVE	2"	CLASS 300	Regulator	Mooney, FG-30	720	
1	24	6400360	4" Flange, WN CLASS 300 WOP 740PSIG	ACTIVE	4"	CLASS 300	Flange, WN		740	
1	23	6400186	2" Flange, WN CLASS 300 WOP 740PSIG	ACTIVE	2"	CLASS 300	Flange, WN		740	
1	22	6200825	2" Strainer Brooks, D2-600 CLASS 300 WOP 720PSIG	ACTIVE	2"	CLASS 300	Strainer	Brooks, D2-600	720	
1	17	6600776	4" Valve, Plug Nordstrom, Fig 625 WOP 500PSIG	ACTIVE	4"		Valve, Plug	Nordstrom, Fig 625	500	
1	14	6600342	1/2" Valve, Ball Legend, Fig 113-103 WOP 1000PSIG	ACTIVE	1/2"		Valve, Ball	Legend, Fig 113-103	1000	
1	12	6600841	2" Salva A Valve H-17491 WOP 1440PSIG	ACTIVE	2"		Salva A Valve	H-17491	1440	Branch on the 2"
1	33	7200010	1/4" Pete's Plug WOP 1000PSIG	ACTIVE	1/4"		Pete's Plug		1000	

THE LOWEST PRESSURE RATING: 500

Design Pressure Calculation on a Branch

Design Factor (F)	0.4
Current MAOP	150
Proposed MAOP	250

Dimensions		
Job Key of the Header Pipe	1	1
Header OD (inch)	4.500	4.500
Header Wall Thickness (inch)	0.237	0.237
Header Yield Strength	42000	42000
Header Longitudinal Joint Factor	1	1
Job Key of the Branch	1	1
Branch Fitting Description	2" Save-A-Valve	1/2" Nipple
Branch OD (inch)	2.219	0.840
Branch Wall Thickness (inch)	0.234375	0.109
Branch Yield Strength (psi)	36000	30000
Branch Longitudinal Joint Factor	1	1
Temperature Derating Factor (from Header)	1	1
Tap Size (Maximum) (inch)	1.75	0.622
Tap Size (inch)	1.75	0.622
Recommended Fitting Weld Leg (in)	0.25	0.25
Fitting Weld Length (in)	0.25	0.25
Effective A3 Provided by Additional Reinforcement		
Max 'Usable' Length (OD) of additional Reinforcement	3.5	1.244
OD of Additional Reinforcement (inch)	0	0
Thickness of Additional Reinforcement M (inch)	0	0
Yield Strength of Additional Reinforcement (psi)	0	0
Effective A3 Provided by Weldments		
Max Header Weld Leg Length for A3 (inch)	0.25	0.25
Header Weld Leg Length for A3 (inch)	0	0
Max Branch Weld Leg Length for A3 (inch)	0.25	0.25
Branch Weld Leg Length for A3 (inch)	0	0
Conclusion and Calculation Summary		
Design Pressure (psig)	1304.9389	1387.333796
L (inch)	0.5859375	0.2725
d – OD/2 (Max Reinforcement Width)	0.640625	0.202
t (inch)	0.174768603	0.185803633
tb (inch)	0.100532402	0.048556683
Ar (sq in)	0.305845055	0.11556986
A1 (sq in)	0.108904945	0.03184414
A2 (sq in)	0.156846794	0.032941608
A2' (sq in)	0.134440109	0.02352972
A3 (Fitting Weld Material)	0.0625	0.060196
A3 Reinforcement (sq in)	0	0
A3 Weldment (sq in)	0	0
A3 (sq in)	0.0625	0.060196
Status (Branch Status from Calculation Worksheet)	Active	Active
Design Pressure Evaluation	1304.9389	1387.333796

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	HPS-0001 1408 S 66.St, Tacoma
Facility Type	HP SERVICE

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compiled Completion Date	Reviewed By	Review Completion Date
1	9506629	Install IP Service	None	1/10/1995	R Nakano	4/27/2011	C Koo	5/26/2011
2	9706121	Retire Service	9705121	6/23/98	R Nakano	4/27/2011	C Koo	5/26/2011

Facility Evaluation Summary

Facility Design Pressure	1440	
Design Factor	0.4	(Class 4 Location)
Pipe Design Pressure	N/A	
Non-Rated Fitting Design Pressure	N/A	
Rated Fitting Rated Pressure	1440.0	
Branch Connection Design Pressure	N/A	
Current System MAOP	150.0	
The Highest % SMYS of the Facility at the Current System MAOP	9.0%	
Proposed system MAOP	250.0	
The Highest % SMYS of the Facility at the Proposed System MAOP	0.0%	

Table 1 - Pipe Design Pressure

Job Key	ITEM #	MID (Enter MID#, PO#, or "PO" in this field)	Description	Status (Select Data from the drop down manual)	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments

THE LOWEST DESIGN PRESSURE:

Table 2 - Non-Rated Fitting Design Pressure

Job Key	ITEM #	MID (Enter MID#, PO#, or "PO" in this field)	Description	Status (Select Data from the drop down manual)	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments

THE LOWEST DESIGN PRESSURE:

Table 3 - Rated Fittings Rated Pressure

Job Key	ITEM #	MID (Enter MID#, PO#, or "PO" in this field)	Description	Status (Select Data from the drop down manual)	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
2	Not Noted	Not Noted	2" nipple, Sav-A-Valve Mueller, H-17491 WOP 1440PSIG	ACTIVE	2"		nipple, Sav-A-Valve	Mueller, H-17491	1440	Save-a-valve was installed over the retired service tee

THE LOWEST PRESSURE RATING: 1440

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	HPS-0602 1410 S 96 St, Tacoma
Facility Type	HP SERVICE

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	Not noted	Install IP Service	D-4	6/17/1966	R Nakano	4/27/2011	C Koo	5/26/2011
2	9705121	Retire IP Service for Uprating the tie-in to HP	9705121	6/23/1998	R Nakano	4/27/2011	C Koo	5/26/2011

Facility Evaluation Summary

Facility Design Pressure	1200	
Design Factor	0.4	(Class 4 Location)
Pipe Design Pressure	1291.4	
Non-Rated Fitting Design Pressure	3013.0	
Rated Fitting Rated Pressure	1200.0	
Branch Connection Design Pressure	N/A	
Current System MAOP	150.0	
The Highest % SMYS of the Facility at the Current System MAOP	2.8%	
Proposed system MAOP	250.0	
The Highest % SMYS of the Facility at the Proposed System MAOP	4.8%	

Table 1 - Pipe Design Pressure

Job Key	ITEM #	MID (Enter MID#, PO#, or "PO" in this field)	Description (Select Data from the drop down manual)	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	Not Noted	Not Noted	3/4" PIPE X 0.113 WALL Gr.A25	ACTIVE	3/4"	0.113	Gr.A25	1291	2.79%	4.65%	Pipe grade & thickness are based on Hist Spec

THE LOWEST DESIGN PRESSURE: 1291 3% 5%

Table 2 - Non-Rated Fitting Design Pressure

Job Key	ITEM #	MID (Enter MID#, PO#, or "PO" in this field)	Description (Select Data from the drop down manual)	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
2	Not Noted	Not Noted	3/4" Cap, Weld X 0.113 WALL WPB	ACTIVE	3/4"	0.113			WPB	Cap, Weld	3013	1.99%	3.32%	

THE LOWEST DESIGN PRESSURE: 3013 2% 3%

Table 3 - Rated Fittings Rated Pressure

Job Key	ITEM #	MID (Enter MID#, PO#, or "PO" in this field)	Description (Select Data from the drop down manual)	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
1	Not Noted	Not Noted	3/4" Tee, Service Mueller H16101 WOP 1200PSIG	ACTIVE	3/4"		Tee, Service	Mueller H16101	1200	Model number is based on Standards research

THE LOWEST PRESSURE RATING: 1200

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	HPS-0003 1415 S 96 St, Tacoma
Facility Type	HP SERVICE

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Complied By	Completion Completion Date	Reviewed By	Review Completion Date
1	Not noted	Install IP Service	D-4	6/11/1971	R Nakano	4/27/2011	C Koo	6/25/2011
2	9709121	Retire IP Service for Uprating the tie-in to HP	9709121	6/23/1998	R Nakano	4/27/2011	C Koo	6/25/2011

Facility Evaluation Summary

Facility Design Pressure	1200	
Design Factor	0.4	(Class 4 Location)
Pipe Design Pressure	1557.1	
Non-Rated Fitting Design Pressure	3013.0	
Rated Fitting Rated Pressure	1200.0	
Branch Connection Design Pressure	N/A	
Current System MAOP	160.0	
The Highest % SMYS of the Facility at the Current System MAOP	2.3%	
Proposed system MAOP	250.0	
The Highest % SMYS of the Facility at the Proposed System MAOP	3.9%	

Table 1 - Pipe Design Pressure

Enter MIDs, POs, or "PO" in this field | Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	Not Noted	Not Noted	1/2" PIPE X 0.109 WALL Gr.A25	ACTIVE	1/2"	0.109	Gr.A25	1557	2.31%	3.85%	Pipe grade & thickness are based on Hist Spec

THE LOWEST DESIGN PRESSURE: 1557 2% 4%

Table 2 - Non-Rated Fitting Design Pressure

Enter MIDs, POs, or "PO" in this field | Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
2	Not Noted	Not Noted	3/4" Cap, Weld X 0.113 WALL WPB	ACTIVE	3/4"	0.113			WPB	Cap, Weld	3013	1.99%	3.32%	

THE LOWEST DESIGN PRESSURE: 3013 2% 3%

Table 3 - Rated Fittings Rated Pressure

Enter MIDs, POs, or "PO" in this field | Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
1	Not Noted	Not Noted	3/4" Tee, Service Mueller H-16101 WOP 1200PSIG	ACTIVE	3/4"		Tee, Service	Mueller H-16101	1200	Model number is based on Standards research

THE LOWEST PRESSURE RATING: 1200

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	HPS-0004 1425 S 66 St, Tacoma
Facility Type	HP SERVICE

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Complied By	Compilation Completion Date	Reviewed By	Review Completion Date
1	Not noted	Install IP Service	D-4	10/29/1969	R Nakano	4/27/2011	C Koo	8/25/2011
2	9705121	Retire IP Service for Upgrade the tie-in to HP	9705121	6/24/1998	R Nakano	4/27/2011	C Koo	8/25/2011

Facility Evaluation Summary

Facility Design Pressure	1200	
Design Factor	0.4	(Class 4 Location)
Pipe Design Pressure	1557.1	
Non-Rated Fitting Design Pressure	3013.0	
Rated Fitting Rated Pressure	1200.0	
Branch Connection Design Pressure	N/A	
Current System MAOP	150.0	
The Highest % SMYS of the Facility at the Current System MAOP	2.3%	
Proposed system MAOP	250.0	
The Highest % SMYS of the Facility at the Proposed System MAOP	3.8%	

Table 1 - Pipe Design Pressure

Enter MID#, POM, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	Not Noted	Not Noted	1/2" PIPE X 0.109 WALL Gr.A25	ACTIVE	1/2"	0.109	Gr.A25	1557	2.31%	3.85%	Pipe grade & thickness are based on Hist Spec

THE LOWEST DESIGN PRESSURE: 1557 2% 4%

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, POM, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
2	Not Noted	Not Noted	3/4" Cap, Weld X 0.113 WALL WPB	ACTIVE	3/4"	0.113			WPB	Cap, Weld	3013	1.99%	3.32%	

THE LOWEST DESIGN PRESSURE: 3013 2% 3%

Table 3 - Rated Fittings Rated Pressure

Enter MID#, POM, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
1	Not Noted	Not Noted	3/4" Tee, Service Mueller H-18101 WOP 1200PSIG	ACTIVE	3/4"		Tee, Service	Mueller H-18101	1200	Model number is based on Standards research

THE LOWEST PRESSURE RATING: 1200

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	HPS-0005.1438 S 66 St, Tacoma
Facility Type	HP SERVICE

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compilted By	Compilation Completion Date	Reviewed By	Review Completion Date
1	9606634	Install IP Service	None	1/10/1995	R Nakano	4/27/2011	G Kos	5/9/2011
2	9705121	Retire Service	9705121	6/23/98	R Nakano	4/27/2011	G Kos	5/9/2011

Facility Evaluation Summary

Facility Design Pressure	1440	
Design Factor	0.4	(Class 4 Location)
Pipe Design Pressure	N/A	
Non-Rated Fitting Design Pressure	N/A	
Rated Fitting Rated Pressure	1440.0	
Branch Connection Design Pressure	N/A	
Current System MAOP	160.0	
The Highest % SMYS of the Facility at the Current System MAOP	0.0%	
Proposed system MAOP	250.0	
The Highest % SMYS of the Facility at the Proposed System MAOP	0.0%	

Table 1 - Pipe Design Pressure

Enter MID#, PO#, or "PO" in this field — Select Date from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments

THE LOWEST DESIGN PRESSURE:

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, PO#, or "PO" in this field — Select Date from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments

THE LOWEST DESIGN PRESSURE:

Table 3 - Rated Fittings Rated Pressure

Enter MID#, PO#, or "PO" in this field — Select Date from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
2	Not Noted	Not Noted	2" nipple, Sev-A-Valve Mueller, H-17491 WOP 1440PSIG	ACTIVE	2"		nipple, Sev-A-Valve	Mueller, H-17491	1440	Seve-a-valve was installed over the retired service tee

THE LOWEST PRESSURE RATING: 1440

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID HPS-0006,1433.5 66 St, Tacoma
Facility Type HP SERVICE

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Complied By	Compilation Completion Date	Reviewed By	Review Completion Date
1	Not Noted	Install IP Service	D-4 card	8/9/1988	R Nakano	4/28/2011	C Koo	6/25/2011
2	9706121	Uprate to HP & Retire HP service	9706121	8/9/1988	R Nakano	4/28/2011	C Koo	6/25/2011

Facility Evaluation Summary

Facility Design Pressure	1200	
Design Factor	0.4	(Class 4 Location)
Pipe Design Pressure	1557.1	
Non-Rated Fitting Design Pressure	3013.0	
Rated Fitting Rated Pressure	1200.0	
Branch Connection Design Pressure	N/A	
Current System MAOP	150.0	
The Highest % SMYS of the Facility at the Current System MAOP	2.3%	
Proposed system MAOP	250.0	
The Highest % SMYS of the Facility at the Proposed System MAOP	3.9%	

Table 1 - Pipe Design Pressure

Enter MID#, PO#, or "PO" in this field

Select Date from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	Not Noted	Not Noted	1/2" PIPE X 0.109 WALL Gr.A25	ACTIVE	1/2"	0.109	Gr.A25	1557	2.31%	3.86%	Pipe grade & thickness are based on mill Spec

THE LOWEST DESIGN PRESSURE: 1557 2% 4%

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, PO#, or "PO" in this field

Select Date from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
2	Not noted	Not Noted	3/4" Cap, Weld X 0.113 WALL WPB	ACTIVE	3/4"	0.113			WPB	Cap, Weld	3013	1.99%	3.32%	

THE LOWEST DESIGN PRESSURE: 3013 2% 3%

Table 3 - Rated Fittings Rated Pressure

Enter MID#, PO#, or "PO" in this field

Select Date from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
1	Not Noted	Not Noted	3/4" Tee- Service Mueller H-16101 WOP 1200PSIG	ACTIVE	3/4"		Tee- Service	Mueller H-16101	1200	Model number is based on Standards research

THE LOWEST PRESSURE RATING: 1200

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	HPS-0007
Facility Type	HP SERVICE

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Reviewed By	Review Completion Date	Reviewed By	Review Completion Date
1	None	IP Service to 125 E 98 St	D-4 card	11/2/1992	R Nakano	5/11/2011	C Koo	5/25/2011
2	9705121	Retire IP Service for Uprating the Re-tie to HP	9705121	5/11/1998	R Nakano	5/11/2011	C Koo	5/25/2011

Facility Evaluation Summary

Facility Design Pressure	1012	
Design Factor	0.4	(Class 4 Location)
Pipe Design Pressure	1012.0	
Non-Rated Fitting Design Pressure	3104.0	
Rated Fitting Rated Pressure	1440.0	
Branch Connection Design Pressure	N/A	
Current System MAOP	150.0	
The Highest % SMYS of the Facility at the Current System MAOP	3.6%	
Proposed system MAOP	250.0	
The Highest % SMYS of the Facility at the Proposed System MAOP	5.9%	

Table 1 - Pipe Design Pressure

Enter MID#, PO#, or "PO" in this field — Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	Not Noted	Not noted	1-1/4" PIPE X 0.14 WALL Gr.A25	ACTIVE	1-1/4"	0.14	Gr.A25	1012	3.60%	5.93%	Pipe grade & thickness are based on Hist Spec

THE LOWEST DESIGN PRESSURE: 1012 4% 6%

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, PO#, or "PO" in this field — Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
2	Not Noted	Not Noted	1-1/4" Cap, Weld X 0.14 WALL WPR	ACTIVE	1-1/4"	0.14			WPR	Cap, Weld	3104	1.93%	3.22%	

THE LOWEST DESIGN PRESSURE: 3104 2% 3%

Table 3 - Rated Fittings Rated Pressure

Enter MID#, PO#, or "PO" in this field — Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
1	Not Noted	Not Noted	1-1/4" Tee, Service Mueller, H-17601 WOP 1440PSIG	ACTIVE	1-1/4"		Tee, Service	Mueller, H-17601	1440	Model number is based on Standards research

THE LOWEST PRESSURE RATING: 1440

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	HPS-0008 1442 S 96 St, Tacoma
Facility Type	HP SERVICE

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	Not noted	Install IP Service	D-4	11/21/1980	R Nakano	4/28/2011	C Koo	6/17/2011
2	9705121	Retire HP Service & Uprate tie-in to HP	9705121	6/24/1998	R Nakano	4/28/2011	C Koo	6/17/2011

Facility Evaluation Summary

Facility Design Pressure	1200
Design Factor	0.4 (Class 4 Location)
Pipe Design Pressure	1291.4
Non-Rated Fitting Design Pressure	3013.0
Rated Fitting Rated Pressure	1200.0
Branch Connection Design Pressure	N/A
Current System MAOP	150.0
The Highest % SMYS of the Facility at the Current System MAOP	2.8%
Proposed system MAOP	250.0
The Highest % SMYS of the Facility at the Proposed System MAOP	4.6%

Table 1 - Pipe Design Pressure

Enter MID#, PO#, or "PO" in this field — Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	Not Noted	Not Noted	3/4" PIPE X 0.113 WALL Gr.A25	ACTIVE	3/4"	0.113	Gr.A25	1291	2.79%	4.65%	

THE LOWEST DESIGN PRESSURE: 1291 3% 5%

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, PO#, or "PO" in this field — Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
2	Not Noted	Not Noted	3/4" Cap, Weld X 0.113 WALL WPB	ACTIVE	3/4"	0.113			WPB	Cap, Weld	3013	1.99%	3.32%	

THE LOWEST DESIGN PRESSURE: 3013 2% 3%

Table 3 - Rated Fittings Rated Pressure

Enter MID#, PO#, or "PO" in this field — Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
1	Not Noted	Not Noted	3/4" Tee, Service H-1801 WOP 1200PSIG	ACTIVE	3/4"		Tee, Service	H-1801	1200	Confirmed 887025940

THE LOWEST PRESSURE RATING: 1200

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	HPS-0009 1443 S 68 St, Tacoma
Facility Type	HP SERVICE

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	Not Noted	Install IP Service	D-4	8/9/1966	R Nakano	4/28/2011	C Koo	6/26/2011
2	9706121	Retire IP Service for Uprating the tie-in to HP	9706121	6/24/1996	R Nakano	4/28/2011	C Koo	6/26/2011

Facility Evaluation Summary

Facility Design Pressure	1200	
Design Factor	0.4	(Class 4 Location)
Pipe Design Pressure	1291.4	
Non-Rated Fitting Design Pressure	3013.0	
Rated Fitting Rated Pressure	1200.0	
Branch Connection Design Pressure	N/A	
Current System MAOP	150.0	
The Highest % SMYS of the Facility at the Current System MAOP	2.8%	
Proposed system MAOP	250.0	
The Highest % SMYS of the Facility at the Proposed System MAOP	4.6%	

Table 1 - Pipe Design Pressure

Enter MID#, PO#, or "PO" in this field. Select Date from the drop down manual.

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	Not Noted	Not Noted	3/4" PIPE X 0.113 WALL Gr.A25	ACTIVE	3/4"	0.113	Gr.A25	1291	2.79%	4.65%	Pipe grade & thickness are based on Hist Spec

THE LOWEST DESIGN PRESSURE: 1291 3% 5%

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, PO#, or "PO" in this field. Select Data from the drop down manual.

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
2	Not Noted	Not Noted	3/4" Cap, Weld X 0.113 WALL WPB	ACTIVE	3/4"	0.113			WPB	Cap, Weld	3013	1.99%	3.32%	

THE LOWEST DESIGN PRESSURE: 3013 2% 3%

Table 3 - Rated Fittings Rated Pressure

Enter MID#, PO#, or "PO" in this field. Select Data from the drop down manual.

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
1	Not Noted	Not Noted	3/4" Tee, Service Mueller H-16101 WOP 1200PSIG	ACTIVE	3/4"		Tee, Service	Mueller H-16101	1200	Model number is based on Standards research

THE LOWEST PRESSURE RATING: 1200

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	HPS-0010 1627 S 96 St, Tacoma
Facility Type	HP SERVICE

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	Not noted	Install IP Service	D-4	3/10/1994	R Nakano	4/28/2011	C Koo	5/26/2011
2	9705121	Retire IP Service for Uprating the tie-in to HP	9705121	6/26/1998	R Nakano	4/28/2011	C Koo	5/26/2011

Facility Evaluation Summary

Facility Design Pressure	250
Design Factor	0.4 (Class 4 Location)
Pipe Design Pressure	1291.4
Non-Rated Fitting Design Pressure	3013.0
Rated Fitting Rated Pressure	250.0
Branch Connection Design Pressure	N/A
Current System MAOP	150.0
The Highest % SMYS of the Facility at the Current System MAOP	2.8%
Proposed system MAOP	250.0
The Highest % SMYS of the Facility at the Proposed System MAOP	4.8%

Table 1 - Pipe Design Pressure

Enter MID#, PO#, or "PO" in this field | Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	Not Noted	Not Noted	3/4" PIPE X 0.113 WALL Gr.A25	ACTIVE	3/4"	0.113	Gr.A25	1291	2.78%	4.65%	Pipe grade & thickness are based on Hist Spec

THE LOWEST DESIGN PRESSURE: 1291 3% 5%

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, PO#, or "PO" in this field | Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
2	Not Noted	Not Noted	3/4" Cap, Weld X 0.113 WALL WPB	ACTIVE	3/4"	0.113			WPB	Cap, Weld	3013	1.99%	3.32%	

THE LOWEST DESIGN PRESSURE: 3013 2% 3%

Table 3 - Rated Fittings Rated Pressure

Enter MID#, PO#, or "PO" in this field | Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
1	Not Noted	Not Noted	3/4" Tee, Service Mueller H-17500 WOP 250PSIG	ACTIVE	3/4"		Tee, Service	Mueller H-17500	250	Model number is based on Standards research

THE LOWEST PRESSURE RATING: 250

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	HPS-0011 1639 S 96 St, Tacoma
Facility Type	HP SERVICE

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	Not noted	Install IP Service	D-4	12/2/1980	R Nakano	4/28/2011	C Koo	6/17/2011
2	9705121	Retire HP Service & Uprate tie-in to HP	9705121	6/25/1998	R Nakano	4/28/2011	C Koo	6/17/2011

Facility Evaluation Summary

Facility Design Pressure	1200	
Design Factor	0.4	(Class 4 Location)
Pipe Design Pressure	1291.4	
Non-Rated Fitting Design Pressure	3013.0	
Rated Fitting Rated Pressure	1200.0	
Branch Connection Design Pressure	N/A	
Current System MAOP	150.0	
The Highest % SMYS of the Facility at the Current System MAOP	2.8%	
Proposed system MAOP	250.0	
The Highest % SMYS of the Facility at the Proposed System MAOP	4.6%	

Table 1 - Pipe Design Pressure

Enter MID#, PO#, or "PO" in this field — Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	Not Noted	Not Noted	3/4" PIPE X 0.113 WALL Gr.A25	ACTIVE	3/4"	0.113	Gr.A25	1291	2.79%	4.65%	Historical Spec

THE LOWEST DESIGN PRESSURE: 1291 3% 5%

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, PO#, or "PO" in this field — Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
2	Not Noted	Not Noted	3/4" Cap, Weld X 0.113 WALL WPB	ACTIVE	3/4"	0.113			WPB	Cap, Weld	3013	1.99%	3.32%	

THE LOWEST DESIGN PRESSURE: 3013 2% 3%

Table 3 - Rated Fittings Rated Pressure

Enter MID#, PO#, or "PO" in this field — Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
1	Not Noted	Not Noted	3/4" Tee, Service Mueller H-18101 WOP 1200PSIG	ACTIVE	3/4"		Tee, Service	Mueller H-18101	1200	Confirmed 8870259941

THE LOWEST PRESSURE RATING: 1200

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	HPS-0012 1705 S 96 St, Tacoma
Facility Type	HP SERVICE

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Complied By	Compilation Completion Date	Reviewed By	Review Completion Date
1	Not noted	Install IP Service	None	11/29/1974	R Nakano	4/29/2011	C Koo	
2	9705121	Retire Service	9705121	6/29/1998	R Nakano	4/29/2011	C Koo	

Facility Evaluation Summary

Facility Design Pressure	1440	
Design Factor	0.4	(Class 4 Location)
Pipe Design Pressure	N/A	
Non-Rated Fitting Design Pressure	N/A	
Rated Fitting Rated Pressure	1440.0	
Branch Connection Design Pressure	N/A	
Current System MAOP	160.0	
The Highest % SMYS of the Facility at the Current System MAOP	0.0%	
Proposed system MAOP	250.0	
The Highest % SMYS of the Facility at the Proposed System MAOP	0.0%	

Table 1 - Pipe Design Pressure

Enter MIDP, POP, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments

THE LOWEST DESIGN PRESSURE:

Table 2 - Non-Rated Fitting Design Pressure

Enter MIDP, POP, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments

THE LOWEST DESIGN PRESSURE:

Table 3 - Rated Fittings Rated Pressure

Enter MIDP, POP, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
2	Not Noted	Not Noted	2" nipple, Sav-A-Valve Mueller, H-17491 WOP 1440PSIG	ACTIVE	2"		nipple, Sav-A-Valve	Mueller, H-17491	1440	Sav-a-Valve over service tee

THE LOWEST PRESSURE RATING: 1440

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID: HPS-0013 1720 S 56 St, Tacoma
Facility Type: HP SERVICE

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	Not noted	Install IP Service	D-4	11/18/1964	R Nakano	4/29/2011	C Koo	5/26/2011
2	9705121	Retire IP Service for Uprating the tie-in to HP	9705121	6/29/1998	R Nakano	4/29/2011	C Koo	5/26/2011

Facility Evaluation Summary

Facility Design Pressure	250	
Design Factor	0.4	(Class 4 Location)
Pipe Design Pressure	1291.4	
Non-Rated Fitting Design Pressure	3013.0	
Rated Fitting Rated Pressure	250.0	
Branch Connection Design Pressure	N/A	
Current System MAOP	150.0	
The Highest % SMYS of the Facility at the Current System MAOP	2.8%	
Proposed system MAOP	250.0	
The Highest % SMYS of the Facility at the Proposed System MAOP	4.6%	

Table 1 - Pipe Design Pressure

Enter MID#, POI#, or "PO" in this field. Select Data from the drop down manual.

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	Not Noted	Not Noted	3/4" PIPE X 0.113 WALL Gr.A25	ACTIVE	3/4"	0.113	Gr.A25	1291	2.79%	4.65%	Pipe grade & thickness are based on Hist Spec

THE LOWEST DESIGN PRESSURE: 1291 3% 5%

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, POI#, or "PO" in this field. Select Data from the drop down manual.

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
2	Not Noted	Not Noted	3/4" Cap, Weld X 0.113 WALL WPB	ACTIVE	3/4"	0.113			WPB	Cap, Weld	3013	1.99%	3.32%	

THE LOWEST DESIGN PRESSURE: 3013 2% 3%

Table 3 - Rated Fittings Rated Pressure

Enter MID#, POI#, or "PO" in this field. Select Data from the drop down manual.

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
1	Not Noted	Not Noted	3/4" Tee, Service Mueller H-17500 WOP 250PSIG	ACTIVE	3/4"		Tee, Service	Mueller H-17500	250	Model number is based on Standards research

THE LOWEST PRESSURE RATING: 250

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	HPS-0014 1751.S 85 St, Tacoma
Facility Type	HP SERVICE

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	Not noted	Install IP Service	None	1/19/1978	R Nikano	4/29/2011	C Ko	5/11/2011
2	9705121	Retire IP Service for Uprating the tie-in to HP	9705121	7/13/1998	R Nikano	4/29/2011	C Ko	5/11/2011

Facility Evaluation Summary

Facility Design Pressure	1440
Design Factor	0.4 (Class 4 Location)
Pipe Design Pressure	N/A
Non-Rated Fitting Design Pressure	N/A
Rated Fitting Rated Pressure	1440.0
Branch Connection Design Pressure	N/A
Current System MAOP	150.0
The Highest % SMYS of the Facility at the Current System MAOP	0.0%
Proposed system MAOP	250.0
The Highest % SMYS of the Facility at the Proposed System MAOP	0.0%

Table 1 - Pipe Design Pressure

Enter MID#, PO#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments

THE LOWEST DESIGN PRESSURE:

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, PO#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments

THE LOWEST DESIGN PRESSURE:

Table 3 - Rated Fittings Rated Pressure

Enter MID#, PO#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
2	Not Noted	Not Noted	2" nipple, Sav-A-Valve Mueller, H-17491 WOP 1440PSIG	ACTIVE	2"		nipple, Sav-A-Valve	Mueller, H-17491	1440	Save-a-valve was installed over the drilled service tee

THE LOWEST PRESSURE RATING: 1440

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	HPS-0015 1766 S 96 St, Tacoma
Facility Type	HP SERVICE

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	Not noted	Install IP Service	None	7/21/1998	R Nakano	4/29/2011	C Koo	5/11/2011
2	9705121	Reline Service	9705121	7/23/1998	R Nakano	4/29/2011	C Koo	5/11/2011

Facility Evaluation Summary

Facility Design Pressure	1440	
Design Factor	0.4	(Class 4 Location)
Pipe Design Pressure	N/A	
Non-Rated Fitting Design Pressure	N/A	
Rated Fitting Rated Pressure	1440.0	
Branch Connection Design Pressure	N/A	
Current System MAOP	160.0	
The Highest % SMYS of the Facility at the Current System MAOP	0.0%	
Proposed system MAOP	250.0	
The Highest % SMYS of the Facility at the Proposed System MAOP	0.0%	

Table 1 - Pipe Design Pressure

Enter MID#, POR, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments

THE LOWEST DESIGN PRESSURE:

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, POR, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments

THE LOWEST DESIGN PRESSURE:

Table 3 - Rated Fittings Rated Pressure

Enter MID#, POR, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
2	Not Noted	Not Noted	2" nipple, Sav-A-Valve Mueller, H-17491 WOP 1440PSIG	ACTIVE	2"		nipple, Sav-A-Valve	Mueller, H-17491	1440	Save-Valve over service tee

THE LOWEST PRESSURE RATING: 1440

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	HPS-0016 2015 S 96 St, Tacoma
Facility Type	HP SERVICE

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	Not Noted	Install IP service	D-4	7/16/1985	R Nakano	5/3/2011	C Koo	6/17/2011
2	9705121	Retire IP service & uprate tie-in to HP	9705121	8/20/1998	R Nakano	5/3/2011	C Koo	6/17/2011

Facility Evaluation Summary

Facility Design Pressure	1200
Design Factor	0.4 (Class 4 Location)
Pipe Design Pressure	1213.7
Non-Rated Fitting Design Pressure	2832.0
Rated Fitting Rated Pressure	1200.0
Branch Connection Design Pressure	N/A
Current System MAOP	150.0
The Highest % SMYS of the Facility at the Current System MAOP	3.0%
Proposed system MAOP	250.0
The Highest % SMYS of the Facility at the Proposed System MAOP	4.9%

Table 1 - Pipe Design Pressure

Enter MID#, PO#, or "PO" in this field — Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	Not Noted	Not Noted	1" PIPE X 0.133 WALL Gr.A25	ACTIVE	1"	0.133	Gr.A25	1214	2.97%	4.94%	Historic pipe specs

THE LOWEST DESIGN PRESSURE: 1214 3% 5%

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, PO#, or "PO" in this field — Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
2	Not Noted	Not Noted	1" Cap, Weld X 0.133 WALL WPB	ACTIVE	1"	0.133			WPB	Cap, Weld	2832	2.12%	3.53%	

THE LOWEST DESIGN PRESSURE: 2832 2% 4%

Table 3 - Rated Fittings Rated Pressure

Enter MID#, PO#, or "PO" in this field — Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
1	Not noted	Not noted	1" Service Tee Mueller H-18101 WOP 1200PSIG	ACTIVE	1"		Service Tee	Mueller H-18101	1200	Confirmed 987025942

THE LOWEST PRESSURE RATING: 1200

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	HPS-0017 2102 S 96 St, Tacoma
Facility Type	HP SERVICE

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	Not noted	Install IP Service	D-4	6/25/1969	R Nakano	5/3/2011	C Koo	5/25/2011
2	9705121	Relire IP Service for Uprating the tie-in to HP	9705121	8/21/1998	R Nakano	5/3/2011	C Koo	5/25/2011

Facility Evaluation Summary

Facility Design Pressure	250
Design Factor	0.4 (Class 4 Location)
Pipe Design Pressure	1012.0
Non-Rated Fitting Design Pressure	2361.0
Rated Fitting Rated Pressure	250.0
Branch Connection Design Pressure	N/A
Current System MAOP	150.0
The Highest % SMYS of the Facility at the Current System MAOP	3.6%
Proposed system MAOP	250.0
The Highest % SMYS of the Facility at the Proposed System MAOP	5.9%

Table 1 - Pipe Design Pressure

Enter MID#, PO#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	Not Noted	Not Noted	1-1/4" PIPE X 0.14 WALL Gr.A25	ACTIVE	1-1/4"	0.14	Gr.A25	1012	3.56%	5.93%	Pipe grade & thickness are based on Hist Spec

THE LOWEST DESIGN PRESSURE: 1012 4% 6%

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, PO#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
2	Not Noted	Not noted	1-1/4" Cap, Weld X 0.14 WALL WPB	ACTIVE	1-1/4"	0.14			WPB	Cap, Weld	2361	2.64%	4.23%	Retirement method not noted on as-built, but the c&c location is noted on the D-4. Based on D-4, Service retirement is concluded to be C&C

THE LOWEST DESIGN PRESSURE: 2361 3% 4%

Table 3 - Rated Fittings Rated Pressure

Enter MID#, PO#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
1	Not Noted	Not noted	1-1/4" Service Tee Mueller H-17500 WOP 250PSIG	ACTIVE	1-1/4"		Service Tee	Mueller H-17500	250	Confirmed 887025944

THE LOWEST PRESSURE RATING: 250

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID HPS-0018 > HP service to 9804 22 Ave S
Facility Type HP SERVICE

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	Not Noted	Install IP Service	D-4 card	8/30/1979	R Nakano	6/13/2011	C Koo	6/1/2011
2	9705121	Retire IP Service for Uprating the tie-in to HP	9705121	8/19/1989	R Nakano	6/13/2011	C Koo	6/1/2011

Facility Evaluation Summary

Facility Design Pressure	250
Design Factor	0.4 (Class 4 Location)
Pipe Design Pressure	1012.0
Non-Rated Fitting Design Pressure	2361.0
Rated Fitting Rated Pressure	250.0
Branch Connection Design Pressure	N/A
Current System MAOP	150.0
The Highest % SMYS of the Facility at the Current System MAOP	3.6%
Proposed system MAOP	250.0
The Highest % SMYS of the Facility at the Proposed System MAOP	5.9%

Table 1 - Pipe Design Pressure

Enter MID#, POP, or "PO" in this field | Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	Not Noted	Not Noted	1-1/4" PIPE X 0.14 WALL Gr.A25	ACTIVE	1-1/4	0.14	Gr.A25	1012	3.56%	5.93%	Pipe grade & thickness are based on Hist Spec

THE LOWEST DESIGN PRESSURE: 1012 4% 6%

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, POP, or "PO" in this field | Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
2	30	6200836	1-1/4" Cap, Weld X 0.14 WALL WPB	ACTIVE	1-1/4"	0.14			WPB	Cap, Weld	2361	2.64%	4.23%	

THE LOWEST DESIGN PRESSURE: 2361 3% 4%

Table 3 - Rated Fittings Rated Pressure

Enter MID#, POP, or "PO" in this field | Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
1	Not Noted	Not Noted	1-1/4" Service Tee Mueller H17500 WOP 250PSIG	ACTIVE	1-1/4"		Service Tee	Mueller H17500	250	Model number is based on Standards research

THE LOWEST PRESSURE RATING: 250

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID HPS-0019 / HP service to 2426 S 65 St, Tacoma
Facility Type HP SERVICE

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	Not Noted	Install IP Service	D-4 card	6/14/1974	R Nakano	6/13/2011	C Koo	6/1/2011
2	9705121	Retire IP Service for Uprating the tie-in to HP	9705121	8/31/1998	R Nakano	6/13/2011	C Koo	6/1/2011

Facility Evaluation Summary

Facility Design Pressure	250
Design Factor	0.4 (Class 4 Location)
Pipe Design Pressure	1012.0
Non-Rated Fitting Design Pressure	2361.0
Rated Fitting Rated Pressure	250.0
Branch Connection Design Pressure	N/A
Current System MAOP	150.0
The Highest % SMYS of the Facility at the Current System MAOP	3.6%
Proposed system MAOP	250.0
The Highest % SMYS of the Facility at the Proposed System MAOP	5.9%

Table 1 - Pipe Design Pressure

Enter MID#, POB, or "PO" in this field. Select Data from the drop down manual.

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	Not Noted	Not Noted	1-1/4" PIPE X 0.14 WALL Gr.A25	ACTIVE	1-1/4"	0.14	Gr.A25	1012	3.66%	5.83%	Pipe grade & thickness are based on Hist Spec

THE LOWEST DESIGN PRESSURE: 1012 4% 6%

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, POB, or "PO" in this field. Select Data from the drop down manual.

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
2	80	6200835	1-1/4" Cap, Weld X 0.14 WALL WPB	ACTIVE	1-1/4"	0.14			WPB	Cap, Weld	2361	2.64%	4.23%	

THE LOWEST DESIGN PRESSURE: 2361 3% 4%

Table 3 - Rated Fittings Rated Pressure

Enter MID#, POB, or "PO" in this field. Select Data from the drop down manual.

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
1	Not Noted	Not Noted	1-1/4" Service Tee Mueller H17600 WOP 250PSIG	ACTIVE	1-1/4"		Service Tee	Mueller H17600	250	Model number is based on Standards research

THE LOWEST PRESSURE RATING: 250

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	HPS-0020 - HP service to 2425 S 96 St, Tacoma
Facility Type	HP SERVICE

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	Not Noted	Install IP Service	D-4 card	7/10/1974	R Nakano	5/13/2011	C Koo	6/17/2011
2	9705121	Retire IP service, uprate tie-in to HP	9705121		R Nakano	5/13/2011	C Koo	6/17/2011

Facility Evaluation Summary

Facility Design Pressure	250
Design Factor	0.4 (Class 4 Location)
Pipe Design Pressure	1012.0
Non-Rated Fitting Design Pressure	2361.0
Rated Fitting Rated Pressure	250.0
Branch Connection Design Pressure	N/A
Current System MAOP	150.0
The Highest % SMYS of the Facility at the Current System MAOP	3.6%
Proposed system MAOP	250.0
The Highest % SMYS of the Facility at the Proposed System MAOP	5.9%

Table 1 - Pipe Design Pressure

Enter MID#, PO#, or "PO" in this field — Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	Not Noted	Not Noted	1-1/4" PIPE X 0.14 WALL Gr.A25	ACTIVE	1-1/4"	0.14	Gr.A25	1012	3.56%	5.93%	Historic Pipe Specs

THE LOWEST DESIGN PRESSURE: 1012 4% 6%

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, PO#, or "PO" in this field — Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
2	30	6200635	1-1/4" Cap, Weld X 0.14 WALL WPB	ACTIVE	1-1/4"	0.14			WPB	Cap, Weld	2361	2.54%	4.23%	Confirmed 887025943

THE LOWEST DESIGN PRESSURE: 2361 3% 4%

Table 3 - Rated Fittings Rated Pressure

Enter MID#, PO#, or "PO" in this field — Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
1	Not Noted	Not Noted	1-1/4" Service Tee Mueller H-17500 WOP 250PSIG	ACTIVE	1-1/4"		Service Tee	Mueller H-17500	250	Model number per Standard's research

THE LOWEST PRESSURE RATING: 250

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID: HPS-0021; 3119 S 96 St, Lakewood
Facility Type: HP SERVICE

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	0406106	Install IP service	D-4	2/15/1994	R Nakano	6/17/2011	G Koo	6/16/2011
2	9705121	Retire IP service & uprate tie-in to HP	9705121	8/18/1998	R Nakano	6/17/2011	G Koo	6/16/2011

Facility Evaluation Summary

Facility Design Pressure	1012
Design Factor	0.4 (Class 4 Location)
Pipe Design Pressure	N/A
Non-Rated Fitting Design Pressure	1012.0
Rated Fitting Rated Pressure	1440.0
Branch Connection Design Pressure	N/A
Current System MAOP	150.0
The Highest % SMYS of the Facility at the Current System MAOP	3.6%
Proposed system MAOP	250.0
The Highest % SMYS of the Facility at the Proposed System MAOP	5.9%

Table 1 - Pipe Design Pressure

Enter MID#, PO#, or "PO" in this field | Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments

THE LOWEST DESIGN PRESSURE:

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, PO#, or "PO" in this field | Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	Not Noted	Not Noted	1-1/4" Transition Fitting, Steel Portion X 0.14 WALL Gr.A25	ACTIVE	1-1/4"	0.14			Gr.A25	Transition Fitting, Steel Portion	1012	3.66%	5.93%	Historical Spec
2	30	6200835	1-1/4" Cap, Weld X 0.14 WALL WPB	ACTIVE	1-1/4"	0.14			WPB	Cap, Weld	2351	2.54%	4.23%	

THE LOWEST DESIGN PRESSURE: 1012 4% 6%

Table 3 - Rated Fittings Rated Pressure

Enter MID#, PO#, or "PO" in this field | Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
1	Not Noted	Not Noted	1-1/4" Tee, Service Mueller H17601 WOP 1440PSIG	ACTIVE	1-1/4"		Tee, Service	Mueller H17601	1440	Model Number based on Standards research

THE LOWEST PRESSURE RATING: 1440

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID HPS-0022 (Inlet) = Pierce Transit
Facility Type HP SERVICE

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Reviewed By	Review Completion Date
4	107007682	Install 8" Turbine (HP-/P) Pierce Transit	4D28-371	11/21/1999	Srini Pandikatla	3/3/2011

Facility Evaluation Summary

Facility Design Pressure	400
Design Factor	0.4 (Class 4 Location)
Pipe Design Pressure	953.6
Non-Rated Fitting Design Pressure	1420.0
Rated Fitting Rated Pressure	400.0
Branch Connection Design Pressure	807.5
Current System MAOP	180.0
The Highest % SMYS of the Facility at the Currant System MAOP	0.1
Proposed system MAOP	250.0
The Highest % SMYS of the Facility at the Proposed System MAOP	0.0

Table 1 - Pipe Design Pressure

Enter MID#, PO#, or "PO" in this field — Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	10	70-00521	6" PIPE X 0.188 WALL X-42	ACTIVE	6"	0.188	X42	953	6.28%	10.48%	
1	53	70-00510	6" PIPE X 0.188 WALL X-42	ACTIVE	6"	0.188	X-42	953	6.28%	10.48%	
1	52	70-00435	4" PIPE X 0.188 WALL X-42	ACTIVE	4"	0.188	X-42	1404	4.27%	7.12%	

THE LOWEST DESIGN PRESSURE: 953 0 0

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, PO#, or "PO" in this field — Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP
1	5, 47	80-00752	6" 90 elbow X 0.28 WALL X-42	ACTIVE	6"	0.28			X-42	90 elbow	1420	4.23%	7.04%
1	22	80-00742	6" 45 elbow X 0.28 WALL X-42	ACTIVE	6"	0.28			X-42	45 elbow	1420	4.23%	7.04%
1	11	78-00419	6" X 4" weld tee 0.28 X 0.237 WALL X-42	ACTIVE	6"	0.28	4"	0.237	X-42	weld tee	1420	4.23%	7.04%
1	61	72-00520	6" X 2" reducer 0.28 X 0.154 WALL X-42	ACTIVE	6"	0.28	2"	0.154	X-42	reducer	1420	4.23%	7.04%
1	52	72-00502	4" X 2" reducer 0.237 X 0.154 WALL X-42	ACTIVE	4"	0.237	2"	0.154	X-42	reducer	1770	3.39%	5.65%

THE LOWEST DESIGN PRESSURE: 1420 0.033905967 0.056509946

Table 3 - Rated Fittings Rated Pressure

Enter MID#, PO#, or "PO" in this field — Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
1	20	78-00796	6" Bottom Out H17281 CLASS 300 WOP 720 PSIG	ACTIVE	6"	CLASS 300	Bottom Out	H17281	720	This item # is 8" B/O
1	3	RO	6" Plug Valve Nordstrom Fig 4249 1/2 CLASS 300 WOP 740 P	ACTIVE	6"	CLASS 300	Plug Valve	Nordstrom Fig 4249 1	740	
1	4	56-00883	6" Plug Valve Nordstrom Fig 4246 CLASS 300 WOP 740 PSIG	ACTIVE	6"	CLASS 300	Plug Valve	Nordstrom Fig 4245	740	
1	55	84-00450	6" WN flange CLASS 300 WOP 740 PSIG	ACTIVE	6"	CLASS 300	WN flange		740	
1	81	RO	6" Filter Kleanline KL-6-720 CLASS 300 WOP 720 PSIG	ACTIVE	6"	CLASS 300	Filter	Kleanline KL-6-720	720	
1	72	76-00447	2" Regulator Axial Flow CLASS 300 WOP 720 PSIG	ACTIVE	2"	CLASS 300	Regulator	Axial Flow	720	
1	53	84-00185	2" WN flange CLASS 300 WOP 740 PSIG	ACTIVE	2"	CLASS 300	WN flange		740	
1	8	84-00380	4" WN flange CLASS 300 WOP 740 PSIG	ACTIVE	4"	CLASS 300	WN flange		740	
1	21	56-00770	4" Plug Valve Nordstrom Fig 305 NA WOP 400 PSIG	ACTIVE	4"	NA	Plug Valve	Nordstrom Fig 305	400	

THE LOWEST PRESSURE RATING: 400

Design Pressure Calculation on a Branch

Design Factor (F)	0.4
Current MAOP	150
Proposed MAOP	250

Dimensions			
	Job Key of the Header Pipe	1	1
	Header OD (inch)	6.625	6.625
	Header Wall Thickness (inch)	0.188	0.188
	Header Yield Strength	42000	42000
	Header Longitudinal Joint Factor	1	1
	Job Key of the Branch	1	2
	Branch Fitting Description	3/4" RTU Inlet	1/2" purge point
	Branch OD (inch)	1.050	0.840
	Branch Wall Thickness (inch)	0.113	0.109
	Branch Yield Strength (psi)	35000	35000
	Branch Longitudinal Joint Factor	1	1
	Temperature Derating Factor (from Header)	1	1
	Tap Size (Maximum) (inch)	0.824	0.622
	Tap Size (inch)	0.824	0.622
	Recommended Fitting Weld Leg (in)	0.25	0.25
	Fitting Weld Length (in)	0	0
Effective A3 Provided by Additional Reinforcement			
	Max 'Usable' Length (OD) of additional Reinforcement	1.648	1.244
	OD of Additional Reinforcement (inch)	0	0
	Thickness of Additional Reinforcement M (inch)	0	0
	Yield Strength of Additional Reinforcement (psi)	0	0
Effective A3 Provided by Weldments			
	Max Header Weld Leg Length for A3 (inch)	0.25	0.25
	Header Weld Leg Length for A3 (inch)	0	0
	Max Branch Weld Leg Length for A3 (inch)	0.25	0.25
	Branch Weld Leg Length for A3 (inch)	0	0
Conclusion and Calculation Summary			
	Design Pressure (psig)	607.4668867	642.8551263
	% SMYS at the Current System MAOP	0.098770816	0.093333626
	% SMYS at the Proposed System MAOP	0.164618026	0.155556044
	L (inch)	0.2825	0.2725
	d – OD/2 (Max Reinforcement Width)	0.299	0.202
	t (inch)	0.119775837	0.126753429
	tb (inch)	0.022780008	0.019285654
	Ar (sq in)	0.09869529	0.078840633
	A1 (sq in)	0.05621671	0.038095367
	A2 (sq in)	0.050974295	0.048894319
	A2' (sq in)	0.042478579	0.040745266
	A3 (Fitting Weld Material)	0	0
	A3 Reinforcement (sq in)	0	0
	A3 Weldment (sq in)	0	0
	A3 (sq in)	0	0
	Status (Branch Status from Calculation Worksheet)	Active	Active
	Design Pressure Evaluation	607.4668867	642.8551263

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	HPS-0023 (Relied)
Facility Type	HP SERVICE

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Completion Date	Reviewed By	Review Completion Date
1	N/A	HPS-0023 Installation	D-4	5/7/1993	C Keo	7/15/2011	C Keo	7/15/2011
2	9705121	HPS-0023 Retirement	9705121	6/16/1998	C Keo	7/15/2011	C Keo	7/15/2011

Facility Evaluation Summary

Facility Design Pressure	1440	
Design Factor	0.4	(Class 4 Location)
Pipe Design Pressure	N/A	
Non-Rated Fitting Design Pressure	N/A	
Rated Fitting Rated Pressure	1440.0	
Branch Connection Design Pressure	N/A	
Current System MAOP	160.0	
The Highest % SMYS of the Facility at the Current System MAOP	0.0%	
Proposed system MAOP	260.0	
The Highest % SMYS of the Facility at the Proposed System MAOP	0.0%	

Table 1 - Pipe Design Pressure

Job Key	ITEM #	Enter MIDit, POit, or "PO" in this field: MID	Description	Select Data from the drop down manual: Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments

THE LOWEST DESIGN PRESSURE:

Table 2 - Non-Rated Fitting Design Pressure

Job Key	ITEM #	Enter MIDit, POit, or "PO" in this field: MID	Description	Select Data from the drop down manual: Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments

THE LOWEST DESIGN PRESSURE:

Table 3 - Rated Fittings Rated Pressure

Job Key	ITEM #	Enter MIDit, POit, or "PO" in this field: MID	Description	Select Data from the drop down manual: Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
2	N/A	6800841	2" Save-A-Valve Mueller WOP 1440PSIG	ACTIVE	2"		Save-A-Valve	Mueller	1440	The Fitting was Installed over the relied service tee

THE LOWEST PRESSURE RATING: 1440

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID: HPS-0024 (Retired)
Facility Type: HP SERVICE

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	N/A	Installation	D-4	7/16/1996	G Koo	7/15/2011	C Koo	7/15/2011
2	9705121	Retirement	9705121	6/20/1998	G Koo	7/15/2011	C Koo	7/15/2011

Facility Evaluation Summary

Facility Design Pressure	1440
Design Factor	0.4 (Class 4 Location)
Pipe Design Pressure	N/A
Non-Rated Fitting Design Pressure	N/A
Rated Fitting Rated Pressure	1440.0
Branch Connection Design Pressure	N/A
Current System MAOP	150.0
The Highest % SMYS of the Facility at the Current System MAOP	0.0%
Proposed system MAOP	250.0
The Highest % SMYS of the Facility at the Proposed System MAOP	0.0%

Table 1 - Pipe Design Pressure

Enter MID#, PO#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments

THE LOWEST DESIGN PRESSURE:

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, PO#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	½ SMYS at Current System MAOP	½ SMYS at Proposed System MAOP	Comments

THE LOWEST DESIGN PRESSURE:

Table 3 - Rated Fittings Rated Pressure

Enter MID#, PO#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
2	N/A	8600841	2" Save-A-Valve Mueller WOP 1440PSIG	ACTIVE	2"		Save-A-Valve	Mueller	1440	The Fitting was installed over the retired service tee

THE LOWEST PRESSURE RATING: 1440

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	HPS-0025 (Retired)
Facility Type	HP SERVICE

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	N/A	Installation	D-4	7/20/1991	C Keo	7/15/2011	C Keo	7/15/2011
2	9705121	Retirement	9705121	8/8/1998	C Keo	7/15/2011	C Keo	7/15/2011

Facility Evaluation Summary

Facility Design Pressure	1440	
Design Factor	0.4	(Class 4 Location)
Pipe Design Pressure	N/A	
Non-Rated Fitting Design Pressure	N/A	
Rated Fitting Rated Pressure	1440.0	
Branch Connection Design Pressure	N/A	
Current System MAOP	150.0	
The Highest % SMYS of the Facility at the Current System MAOP	0.0%	
Proposed system MAOP	250.0	
The Highest % SMYS of the Facility at the Proposed System MAOP	0.0%	

Table 1 - Pipe Design Pressure

Enter MID#, PO#, or "PO" in this field

Select Date from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments

THE LOWEST DESIGN PRESSURE:

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, PO#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments

THE LOWEST DESIGN PRESSURE:

Table 3 - Rated Fittings Rated Pressure

Enter MID#, PO#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
2	N/A	6800841	2" Save-A-Valve Mueller WOP 1440PSIG	ACTIVE	2"		Save-A-Valve	Mueller	1440	The Fitting was installed over the retired service tee.

THE LOWEST PRESSURE RATING: 1440

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	HPS-0026 (Retired)
Facility Type	HP SERVICE

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	N/A	Installation	D-4	7/18/1997	C Koo	7/15/2011	C Koo	7/15/2011
2	9705121	Retirement	9705121	6/11/1998	C Koo	7/15/2011	C Koo	7/15/2011

Facility Evaluation Summary

Facility Design Pressure	1440
Design Factor	0.4 (Class 4 Location)
Pipe Design Pressure	N/A
Non-Rated Fitting Design Pressure	N/A
Rated Fitting Rated Pressure	1440.0
Branch Connection Design Pressure	N/A
Current System MAOP	150.0
The Highest % SMYS of the Facility at the Current System MAOP	0.0%
Proposed system MAOP	250.0
The Highest % SMYS of the Facility at the Proposed System MAOP	0.0%

Table 1 - Pipe Design Pressure

Enter MID#, POR, or "PO" in this field | Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments

THE LOWEST DESIGN PRESSURE:

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, POR, or "PO" in this field | Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments

THE LOWEST DESIGN PRESSURE:

Table 3 - Rated Fittings Rated Pressure

Enter MID#, POR, or "PO" in this field | Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
2	N/A	6800841	2" Save-A-Valve Mueller WOP 1440PSIG	ACTIVE	2"		Save-A-Valve	Mueller	1440	The Fitting Was Installed over the retired service tee

THE LOWEST PRESSURE RATING: 1440

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	HPS-0027 (Retired)
Facility Type	HP SERVICE

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Completion Completion Date	Reviewed By	Review Completion Date
1	N/A	Installation	D-4	9/17/1991	C Koo	7/15/2011	C Koo	7/16/2011
2	9705121	Retirement		8/11/1998	C Koo	7/15/2011	C Koo	7/16/2011

Facility Evaluation Summary

Facility Design Pressure	1440
Design Factor	0.4 (Class 4 Location)
Pipe Design Pressure	N/A
Non-Rated Fitting Design Pressure	N/A
Rated Fitting Rated Pressure	1440.0
Branch Connection Design Pressure	N/A
Current System MAOP	150.0
The Highest % SMYS of the Facility at the Current System MAOP	0.0%
Proposed system MAOP	250.0
The Highest % SMYS of the Facility at the Proposed System MAOP	0.0%

Table 1 - Pipe Design Pressure

Enter MID#, PO#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments

THE LOWEST DESIGN PRESSURE:

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, PO#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments

THE LOWEST DESIGN PRESSURE:

Table 3 - Rated Fittings Rated Pressure

Enter MID#, PO#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
2	N/A	9800641	2" Save-A-Valve Mueller WOP 1440PSIG	ACTIVE	2"		Save-A-Valve	Mueller	1440	The Fitting was Installed over the retired service tee

THE LOWEST PRESSURE RATING: 1440

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	HPS-0026 (Retired)
Facility Type	HP SERVICE

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	N/A	Installation	D-4	1/23/1992	C Koo	7/15/2011	C Koo	7/16/2011
2	9705121	Retirement	9705121	6/11/1998	C Koo	7/15/2011	C Koo	7/16/2011

Facility Evaluation Summary

Facility Design Pressure	1440
Design Factor	0.4 (Class 4 Location)
Pipe Design Pressure	N/A
Non-Rated Fitting Design Pressure	N/A
Rated Fitting Rated Pressure	1440.0
Branch Connection Design Pressure	N/A
Current System MAOP	150.0
The Highest % SMYS of the Facility at the Current System MAOP	0.0%
Proposed system MAOP	250.0
The Highest % SMYS of the Facility at the Proposed System MAOP	0.0%

Table 1 - Pipe Design Pressure

Enter MID#, PO#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments

THE LOWEST DESIGN PRESSURE:

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, PO#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments

THE LOWEST DESIGN PRESSURE:

Table 3 - Rated Fittings Rated Pressure

Enter MID#, PO#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
2	N/A	6800841	2" Save-A-Valve Mueller WOP 1440PSIG	ACTIVE	2"		Save-A-Valve	Mueller	1440	The Fitting was installed over the retired service tee

THE LOWEST PRESSURE RATING: 1440

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	HPS-0029 [Retired]
Facility Type	HP SERVICE

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	N/A	Installation	O-4	4/17/1995	G Koo	7/15/2011	C Koo	7/15/2011
2	9705121	Retirement		8/19/1998	G Koo	7/15/2011	C Koo	7/15/2011

Facility Evaluation Summary

Facility Design Pressure	1440	
Design Factor	0.4	(Class 4 Location)
Pipe Design Pressure	N/A	
Non-Rated Fitting Design Pressure	N/A	
Rated Fitting Rated Pressure	1440.0	
Branch Connection Design Pressure	N/A	
Current System MAOP	150.0	
The Highest % SMYS of the Facility at the Current System MAOP	0.0%	
Proposed system MAOP	250.0	
The Highest % SMYS of the Facility at the Proposed System MAOP	0.0%	

Table 1 - Pipe Design Pressure

Enter MID#, PO#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments

THE LOWEST DESIGN PRESSURE:

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, PO#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments

THE LOWEST DESIGN PRESSURE:

Table 3 - Rated Fittings Rated Pressure

Enter MID#, PO#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
2	N/A	6800641	2" Save-A-Valve Mueller WOP 1440PSIG	ACTIVE	2"		Save-A-Valve	Mueller	1440	The Fitting was installed over the retired service tee

THE LOWEST PRESSURE RATING: 1440

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	HPS-0030 (Retired)
Facility Type	HP SERVICE

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Complied By	Compilation Completion Date	Reviewed By	Review Completion Date
1	N/A	Installation	D-4	12/14/1994	C Koo	7/16/2011	C Koo	7/16/2011
2	#706121	Retirement	#706121	6/16/1998	C Koo	7/16/2011	C Koo	7/16/2011

Facility Evaluation Summary

Facility Design Pressure	1440
Design Factor	0.4 (Class 4 Location)
Pipe Design Pressure	N/A
Non-Rated Fitting Design Pressure	N/A
Rated Fitting Rated Pressure	1440.0
Branch Connection Design Pressure	N/A
Current System MAOP	150.0
The Highest % SMYS of the Facility at the Current System MAOP	0.0%
Proposed system MAOP	250.0
The Highest % SMYS of the Facility at the Proposed System MAOP	0.0%

Table 1 - Pipe Design Pressure

Enter MID#, PO#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments

THE LOWEST DESIGN PRESSURE:

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, PO#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments

THE LOWEST DESIGN PRESSURE:

Table 3 - Rated Fittings Rated Pressure

Enter MID#, PO#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
2	N/A	6800841	2" Save-A-Valve Mueller WOP 1440PSIG	ACTIVE	2"		Save-A-Valve	Mueller	1440	The Fitting was installed over the relied service tee

THE LOWEST PRESSURE RATING: 1440

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID: HPS-0031 (Retired)
Facility Type: HP SERVICE

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	N/A	Installation	D-4	9/14/1998	C.Koo	7/15/2011	C.Koo	7/15/2011
2	9705121	Retirement	9705121	9/14/1998	C.Koo	7/15/2011	C.Koo	7/15/2011

Facility Evaluation Summary

Facility Design Pressure	1440	
Design Factor	0.4	(Class 4 Location)
Pipe Design Pressure	N/A	
Non-Rated Fitting Design Pressure	N/A	
Rated Fitting Rated Pressure	1440.0	
Branch Connection Design Pressure	N/A	
Current System MAOP	150.0	
The Highest % SMYS of the Facility at the Current System MAOP	0.0%	
Proposed system MAOP	250.0	
The Highest % SMYS of the Facility at the Proposed System MAOP	0.0%	

Table 1 - Pipe Design Pressure

Enter MID#, POS#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments

THE LOWEST DESIGN PRESSURE:

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, POS#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments

THE LOWEST DESIGN PRESSURE:

Table 3 - Rated Fittings Rated Pressure

Enter MID#, POS#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
2	N/A	8600841	2" Save-A-Valve Mueller WOP 1440PSIG	ACTIVE	2"		Save-A-Valve	Mueller	1440	The Fitting was installed over the retired service tee

THE LOWEST PRESSURE RATING: 1440

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	HPS-0032 (Retired)
Facility Type	HP SERVICE

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	N/A	Installation	D-4	6/6/1960	C Koo	7/15/2011	C Koo	7/15/2011
2	9705121	Retirement	9705121	8/14/1998	C Koo	7/15/2011	C Koo	7/15/2011

Facility Evaluation Summary

Facility Design Pressure	1440
Design Factor	0.4 (Class 4 Location)
Pipe Design Pressure	N/A
Non-Rated Fitting Design Pressure	N/A
Rated Fitting Rated Pressure	1440.0
Branch Connection Design Pressure	N/A
Current System MAOP	150.0
The Highest % SMYS of the Facility at the Current System MAOP	0.0%
Proposed system MAOP	250.0
The Highest % SMYS of the Facility at the Proposed System MAOP	0.0%

Table 1 - Pipe Design Pressure

Enter MID#, POI#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments

THE LOWEST DESIGN PRESSURE:

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, POI#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments

THE LOWEST DESIGN PRESSURE:

Table 3 - Rated Fittings Rated Pressure

Enter MID#, POI#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
2	N/A	6800841	2" Save-A-Valve Mueller WOP 1440PSIG	ACTIVE	2"		Save-A-Valve	Mueller	1440	The Fitting was installed over the retired service tee

THE LOWEST PRESSURE RATING: 1440

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID HPS-0033 (Retired)
Facility Type HP SERVICE

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	N/A	Installation	D-4	2/18/1998	C Koo	7/15/2011	C Koo	7/15/2011
2	9705121	Retirement	9705121	7/14/1998	C Koo	7/15/2011	C Koo	7/15/2011

Facility Evaluation Summary

Facility Design Pressure	1440	
Design Factor	0.4	(Class 4 Location)
Pipe Design Pressure	N/A	
Non-Rated Fitting Design Pressure	N/A	
Rated Fitting Rated Pressure	1440.0	
Branch Connection Design Pressure	N/A	
Current System MAOP	150.0	
The Highest % SMYS of the Facility at the Current System MAOP	0.0%	
Proposed system MAOP	250.0	
The Highest % SMYS of the Facility at the Proposed System MAOP	0.0%	

Table 1 - Pipe Design Pressure

Enter MIDs, POs, or "PO" in this field. Select Data from the drop down manual.

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments

THE LOWEST DESIGN PRESSURE:

Table 2 - Non-Rated Fitting Design Pressure

Enter MIDs, POs, or "PO" in this field. Select Data from the drop down manual.

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments

THE LOWEST DESIGN PRESSURE:

Table 3 - Rated Fittings Rated Pressure

Enter MIDs, POs, or "PO" in this field. Select Data from the drop down manual.

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
2	N/A	6808661	2" Save-A-Valve Mueller WOP 1440PSIG	ACTIVE	2"		Save-A-Valve	Mueller	1440	The Fitting was installed over the retired service tee

THE LOWEST PRESSURE RATING: 1440

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	HPS-0034 (Retired)
Facility Type	HP SERVICE

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	N/A	Installation	D-4	2/12/1987	C Koo	7/15/2011	C Koo	7/15/2011
2	9705121	Retirement	9705121	8/17/1998	C Koo	7/15/2011	C Koo	7/15/2011

Facility Evaluation Summary

Facility Design Pressure	1200	
Design Factor	0.4	(Class 4 Location)
Pipe Design Pressure	1291.4	
Non-Rated Fitting Design Pressure	2583.0	
Rated Fitting Rated Pressure	1200.0	
Branch Connection Design Pressure	N/A	
Current System MAOP	150.0	
The Highest % SMYS of the Facility at the Current System MAOP	2.8%	
Proposed system MAOP	250.0	
The Highest % SMYS of the Facility at the Proposed System MAOP	4.6%	

Table 1 - Pipe Design Pressure

Enter MID#, PO#, or "PO" in this field — Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	N/A	N/A	3/4" PIPE X 0.113 WALL Gr.A25	ACTIVE	3/4"	0.113	Gr.A25	1291	2.79%	4.65%	

THE LOWEST DESIGN PRESSURE: 1291 3% 5%

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, PO#, or "PO" in this field — Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	N/A	N/A	3/4" Transition Fitting X 0.113 WALL Gr.A	ACTIVE	3/4"	0.113			Gr.A	Transition Fitting	2583	2.32%	3.87%	PE portion is cutted
2	N/A	N/A	3/4" Weld Cap X 0.113 WALL WPB	ACTIVE	3/4"	0.113			WPB	Weld Cap	3013	1.99%	3.32%	Confirmed 887026259

THE LOWEST DESIGN PRESSURE: 2583 2% 4%

Table 3 - Rated Fittings Rated Pressure

Enter MID#, PO#, or "PO" in this field — Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
1	N/A	N/A	3/4" Service Tee Mueller H-18101 WOP 1200PSIG	ACTIVE	3/4"		Service Tee	Mueller H-18101	1200	Confirmed 887026259

THE LOWEST PRESSURE RATING: 1200

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	HPS-0335 (Retired)
Facility Type	HP SERVICE

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Complied By	Compilation Completion Date	Reviewed By	Review Completion Date
1	N/A	Installation	D-4	7/16/1967	C Koo	7/15/2011	C Koo	7/15/2011
2	9705121	Retirement	9705121	6/13/1998	C Koo	7/15/2011	C Koo	7/15/2011

Facility Evaluation Summary

Facility Design Pressure	1200	
Design Factor	0.4	(Class 4 Location)
Pipe Design Pressure	1557.1	
Non-Rated Fitting Design Pressure	3013.0	
Rated Fitting Rated Pressure	1200.0	
Branch Connection Design Pressure	N/A	
Current System MAOP	150.0	
The Highest % SMYS of the Facility at the Current System MAOP	2.3%	
Proposed system MAOP	250.0	
The Highest % SMYS of the Facility at the Proposed System MAOP	3.9%	

Table 1 - Pipe Design Pressure

Enter MID#, POR, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	N/A	N/A	1/2" PIPE X 0.109 WALL Gr.A25	ACTIVE	1/2"	0.109	Gr.A25	1557	2.31%	3.85%	Hist Spec

THE LOWEST DESIGN PRESSURE: 1557 2% 4%

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, POR, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
2	N/A	N/A	3/4" Weld Cap X 0.113 WALL Gr.B	ACTIVE	3/4"	0.113			Gr.B	Weld Cap	3013	1.89%	3.32%	

THE LOWEST DESIGN PRESSURE: 3013 2% 3%

Table 3 - Rated Fittings Rated Pressure

Enter MID#, POR, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments Per Standards Research
1	N/A	N/A	1/2" Service Tee Mueller H-18101 WOP 1200PSIG	ACTIVE	1/2"		Service Tee	Mueller H-18101	1200	

THE LOWEST PRESSURE RATING: 1200

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	HPS-0036 (Retired)
Facility Type	HP SERVICE

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	N/A	Installation	D-4	10/16/1959	G Koo	7/15/2011	G Koo	7/15/2011
2	9705121	Retirement	9705121	7/14/1999	G Koo	7/15/2011	G Koo	7/15/2011

Facility Evaluation Summary

Facility Design Pressure	1200	
Design Factor	0.4	(Class 4 Location)
Pipe Design Pressure	1557.1	
Non-Rated Fitting Design Pressure	3633.0	
Rated Fitting Rated Pressure	1200.0	
Branch Connection Design Pressure	N/A	
Current System MAOP	160.0	
The Highest % SMYS of the Facility at the Current System MAOP	2.3%	
Proposed system MAOP	250.0	
The Highest % SMYS of the Facility at the Proposed System MAOP	3.9%	

Table 1 - Pipe Design Pressure

Enter MID#, POR, or "PO" in this field | Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	N/A	N/A	1/2" PIPE X 0.109 WALL Gr.A25	ACTIVE	1/2"	0.109	Gr.A25	1557	2.31%	3.85%	Hist Spec

THE LOWEST DESIGN PRESSURE: 1557 2% 4%

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, POR, or "PO" in this field | Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
2	N/A	N/A	1/2" Weld Cap X 0.109 WALL Gr.B	ACTIVE	1/2"	0.109			Gr.B	Weld Cap	3633	1.65%	2.75%	

THE LOWEST DESIGN PRESSURE: 3633 2% 3%

Table 3 - Rated Fittings Rated Pressure

Enter MID#, POR, or "PO" in this field | Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
1	N/A	N/A	1/2" Service Tee Mueller H-16101 WOP 1200PSIG	ACTIVE	1/2"		Service Tee	Mueller H-16101	1200	Per Standard Research

THE LOWEST PRESSURE RATING: 1200

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	HPS-0037 (Retired)
Facility Type	HP SERVICE

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Complied By	Compilation Completion Date	Reviewed By	Review Completion Date
1	N/A	Installation	D-4	11/11/1994	C Koo	7/16/2011	C Koo	7/16/2011
2	9705121	Retirement	9705121	7/14/1998	C Koo	7/16/2011	C Koo	7/16/2011

Facility Evaluation Summary

Facility Design Pressure	1200	
Design Factor	0.4	(Class 4 Location)
Pipe Design Pressure	1291.4	
Non-Rated Fitting Design Pressure	3013.0	
Rated Fitting Rated Pressure	1200.0	
Branch Connection Design Pressure	N/A	
Current System MAOP	150.0	
The Highest % SMYS of the Facility at the Current System MAOP	2.8%	
Proposed system MAOP	250.0	
The Highest % SMYS of the Facility at the Proposed System MAOP	4.6%	

Table 1 - Pipe Design Pressure

Enter MID#, PO#, or "PO" in this field. Select Data from the drop down manual.

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	N/A	N/A	3/4" PIPE X 0.113 WALL Gr.A25	ACTIVE	3/4"	0.113	Gr.A25	1291	2.76%	4.66%	HH Spec

THE LOWEST DESIGN PRESSURE: 1291 3% 5%

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, PO#, or "PO" in this field. Select Data from the drop down manual.

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	N/A	N/A	3/4" Weld Cap X 0.113 WALL WPB	ACTIVE	3/4"	0.113			WPB	Weld Cap	3013	1.95%	3.32%	

THE LOWEST DESIGN PRESSURE: 3013 2% 3%

Table 3 - Rated Fittings Rated Pressure

Enter MID#, PO#, or "PO" in this field. Select Data from the drop down manual.

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments Per Standard Research
1	N/A	N/A	3/4" Service Tee Mueller H-18101 WOP 1200PSIG	ACTIVE	3/4"		Service Tee	Mueller H-18101	1200	

THE LOWEST PRESSURE RATING: 1200

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	HPS-0038 (Retired)
Facility Type	HP SERVICE

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	N/A	Installation	D-4	2/21/1957	C Keo	7/15/2011	C Keo	7/15/2011
2	9705121	Retirement	9705121	9/22/1998	C Keo	7/15/2011	C Keo	7/15/2011

Facility Evaluation Summary

Facility Design Pressure	1200	
Design Factor	0.4	(Class 4 Location)
Pipe Design Pressure	1557.1	
Non-Rated Fitting Design Pressure	3633.0	
Rated Fitting Rated Pressure	1200.0	
Branch Connection Design Pressure	N/A	
Current System MAOP	150.0	
The Highest % SMYS of the Facility at the Current System MAOP	2.3%	
Proposed system MAOP	250.0	
The Highest % SMYS of the Facility at the Proposed System MAOP	3.9%	

Table 1 - Pipe Design Pressure

Enter MID#, POS#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	N/A	N/A	1/2" PIPE X 0.109 WALL Gr.A25	ACTIVE	1/2"	0.109	Gr.A25	1557	2.31%	3.85%	Hist Spec

THE LOWEST DESIGN PRESSURE: 1557 2% 4%

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, POS#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	¼ SMYS at Current System MAOP	¼ SMYS at Proposed System MAOP	Comments
2	N/A	N/A	1/2" Weld Csp X 0.109 WALL WPB	ACTIVE	1/2"	0.109			WPB	Weld Csp	3633	1.65%	2.76%	

THE LOWEST DESIGN PRESSURE: 3633 2% 3%

Table 3 - Rated Fittings Rated Pressure

Enter MID#, POS#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
1	N/A	N/A	3/4" Service Tee Mueller H-16101 WOP 1200PSIG	ACTIVE	3/4"		Service Tee	Mueller H-16101	1200	Per Standard Research

THE LOWEST PRESSURE RATING: 1200

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	HPS-0039 (Retired)
Facility Type	HP SERVICE

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	N/A	Installation	D-4	8/29/1973	C Koo	7/18/2011	G Koo	7/16/2011
2	9705121	Retirement	9705121	8/22/1998	C Koo	7/15/2011	G Koo	7/16/2011

Facility Evaluation Summary

Facility Design Pressure	1200	
Design Factor	0.4	(Class 4 Location)
Pipe Design Pressure	1557.1	
Non-Rated Fitting Design Pressure	3633.0	
Rated Fitting Rated Pressure	1200.0	
Branch Connection Design Pressure	N/A	
Current System MAOP	150.0	
The Highest % SMYS of the Facility at the Current System MAOP	2.3%	
Proposed system MAOP	250.0	
The Highest % SMYS of the Facility at the Proposed System MAOP	3.8%	

Table 1 - Pipe Design Pressure

Enter MID#, PO#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	N/A	N/A	1/2" PIPE X 0.109 WALL Gr.A25	ACTIVE	1/2"	0.109	Gr.A25	1557	2.31%	3.85%	Hot Spec

THE LOWEST DESIGN PRESSURE: 1557 2% 4%

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, PO#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
2	N/A	N/A	1/2" Weld Cap X 0.109 WALL WPB	ACTIVE	1/2"	0.109			WPB	Weld Cap	3633	1.65%	2.75%	

THE LOWEST DESIGN PRESSURE: 3633 2% 3%

Table 3 - Rated Fittings Rated Pressure

Enter MID#, PO#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
1	N/A	N/A	3/4" Service Tee Mueller H-18101 WOP 1200PSIG	ACTIVE	3/4"		Service Tee	Mueller H-18101	1200	Per Standard Research

THE LOWEST PRESSURE RATING: 1200

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	HPS-0040 (Retired)
Facility Type	HP SERVICE

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	N/A	Installation	D-4	9/11/1969	C Koo	7/16/2011	C Koo	7/16/2011
2	9705121	Retirement	9705121	7/14/1998	C Koo	7/15/2011	C Koo	7/16/2011

Facility Evaluation Summary

Facility Design Pressure	1200	
Design Factor	0.4	(Class 4 Location)
Pipe Design Pressure	1557.1	
Non-Rated Fitting Design Pressure	3633.0	
Rated Fitting Rated Pressure	1200.0	
Branch Connection Design Pressure	N/A	
Current System MAOP	150.0	
The Highest % SMYS of the Facility at the Current System MAOP	2.3%	
Proposed system MAOP	250.0	
The Highest % SMYS of the Facility at the Proposed System MAOP	3.9%	

Table 1 - Pipe Design Pressure

Enter MID#, PO#, or "PO" in this field | Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	N/A	N/A	1/2" PIPE X 0.109 WALL Gr.A25	ACTIVE	1/2"	0.109	Gr.A25	1557	2.31%	3.85%	Hist Spec

THE LOWEST DESIGN PRESSURE: 1557 2% 4%

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, PO#, or "PO" in this field | Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
2	N/A	N/A	1/2" Weld Cap X 0.109 WALL WPB	ACTIVE	1/2"	0.109			WPB	Weld Cap	3633	1.65%	2.75%	

THE LOWEST DESIGN PRESSURE: 3633 2% 3%

Table 3 - Rated Fittings Rated Pressure

Enter MID#, PO#, or "PO" in this field | Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
1	N/A	N/A	3/4" Service Tee Mueller H-16101 WOP 1200PSIG	ACTIVE	3/4"		Service Tee	Mueller H-16101	1200	Per Standard Research

THE LOWEST PRESSURE RATING: 1200

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	HPS-0041 (Retired)
Facility Type	HP SERVICE

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	N/A	Installation	D-4	10/27/1998	C Koo	7/16/2011	C Koo	7/16/2011
2	9705121	Retirement	9705121	6/23/1998	C Koo	7/15/2011	C Koo	7/15/2011

Facility Evaluation Summary

Facility Design Pressure	1012	
Design Factor	0.4	(Class 4 Location)
Pipe Design Pressure	1012.0	
Non-Rated Fitting Design Pressure	2024.0	
Rated Fitting Rated Pressure	1440.0	
Branch Connection Design Pressure	N/A	
Current System MAOP	150.0	
The Highest % SMYS of the Facility at the Current System MAOP	3.6%	
Proposed system MAOP	250.0	
The Highest % SMYS of the Facility at the Proposed System MAOP	5.9%	

Table 1 - Pipe Design Pressure

Enter MID#, POR, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	N/A	N/A	1-1/4" PIPE X 0.14 WALL Gr.A25	ACTIVE	1-1/4"	0.14	Gr.A25	1012	3.56%	5.93%	Hist Spec

THE LOWEST DESIGN PRESSURE: 1012 4% 6%

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, POR, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
2	N/A	N/A	1-1/4" Weld Cap X 0.14 WALL WPB	ACTIVE	1-1/4"	0.14			WPB	Weld Cap	2381	2.54%	4.23%	
2	N/A	N/A	1-1/4" Transition Fitting X 0.14 WALL Gr.A	ACTIVE	1-1/4"	0.14			Gr.A	Transition Fitting	2024	2.96%	4.94%	PE Portion was cut off

THE LOWEST DESIGN PRESSURE: 2024 3% 5%

Table 3 - Rated Fittings Rated Pressure

Enter MID#, POR, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
1	N/A	N/A	1-1/4" Service Tee Mueller H-17601 WOP 1440PSIG	ACTIVE	1-1/4"		Service Tee	Mueller H-17601	1440	Per Standard Research

THE LOWEST PRESSURE RATING: 1440

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	HPS-0042 (Retired)
Facility Type	HP SERVICE

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Completion Date	Reviewed By	Review Completion Date
1	N/A	Installation	D-4	9/10/1998	C Koo	7/15/2011	C Koo	7/15/2011
2	9705121	Retirement	9705121	8/23/1998	C Koo	7/15/2011	C Koo	7/15/2011

Facility Evaluation Summary

Facility Design Pressure	1440	
Design Factor	0.4	(Class 4 Location)
Pipe Design Pressure	N/A	
Non-Rated Fitting Design Pressure	N/A	
Rated Fitting Rated Pressure	1440.0	
Branch Connection Design Pressure	N/A	
Current System MAOP	150.0	
The Highest % SMYS of the Facility at the Current System MAOP	0.0%	
Proposed system MAOP	250.0	
The Highest % SMYS of the Facility at the Proposed System MAOP	0.0%	

Table 1 - Pipe Design Pressure

Enter MIDs, POs, or "PO" in this field | Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments

THE LOWEST DESIGN PRESSURE:

Table 2 - Non-Rated Fitting Design Pressure

Enter MIDs, POs, or "PO" in this field | Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments

THE LOWEST DESIGN PRESSURE:

Table 3 - Rated Fittings Rated Pressure

Enter MIDs, POs, or "PO" in this field | Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
2	N/A	660084	2" Save-A-Valve Mueller WOP 1440PSIG	ACTIVE	2"		Save-A-Valve	Mueller	1440	The Fitting was installed over the retired service tee

THE LOWEST PRESSURE RATING: 1440

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	HPS-0043 (Retired)
Facility Type	HP SERVICE

Job Key	Job Number	Job Description	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	N/A	Installation	D-4	8/4/1953	C Koo	7/15/2011	C Koo	7/15/2011
2	9705121	Retirement	9705121	8/23/1998	C Koo	7/15/2011	C Koo	7/15/2011

Facility Evaluation Summary

Facility Design Pressure	1440
Design Factor	0.4 (Class 4 Location)
Pipe Design Pressure	N/A
Non-Rated Fitting Design Pressure	N/A
Rated Fitting Rated Pressure	1440.0
Branch Connection Design Pressure	N/A
Current System MAOP	150.0
The Highest % SMYS of the Facility at the Current System MAOP	0.0%
Proposed system MAOP	250.0
The Highest % SMYS of the Facility at the Proposed System MAOP	0.0%

Table 1 - Pipe Design Pressure

Enter MIDK, PO#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments

THE LOWEST DESIGN PRESSURE:

Table 2 - Non-Rated Fitting Design Pressure

Enter MIDK, PO#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments

THE LOWEST DESIGN PRESSURE:

Table 3 - Rated Fittings Rated Pressure

Enter MIDK, PO#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
2	N/A	5800641	2" Save-A-Valve Mueller WOP 1440PSIG	ACTIVE	2"		Save-A-Valve	Mueller	1440	The Fitting was installed over the retired service tee

THE LOWEST PRESSURE RATING: 1440

IGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	HPS-0044 (Retired)
Facility Type	HP SERVICE

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	N/A	Installation	D-4	10/29/1999	C Koo	7/15/2011	C Koo	7/15/2011
2	9705121	Retirement	9705121	8/24/1998	C Koo	7/15/2011	C Koo	7/15/2011

Facility Evaluation Summary

Facility Design Pressure	1200
Design Factor	0.4 (Class 4 Location)
Pipe Design Pressure	1557.1
Non-Rated Fitting Design Pressure	3633.0
Rated Fitting Rated Pressure	1200.0
Branch Connection Design Pressure	N/A
Current System MAOP	150.0
The Highest % SMYS of the Facility at the Current System MAOP	2.3%
Proposed system MAOP	250.0
The Highest % SMYS of the Facility at the Proposed System MAOP	3.9%

Table 1 - Pipe Design Pressure

Enter MID#, PO#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	N/A	N/A	1/2" PIPE X 0.109 WALL Gr.A25	ACTIVE	1/2"	0.109	Gr.A25	1557	2.31%	3.85%	Hist Spec

THE LOWEST DESIGN PRESSURE: 1557 2% 4%

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, PO#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
2	N/A	N/A	1/2" Weld Cap X 0.109 WALL WPB	ACTIVE	1/2"	0.109			WPB	Weld Cap	3633	1.65%	2.75%	

THE LOWEST DESIGN PRESSURE: 3633 2% 3%

Table 3 - Rated Fittings Rated Pressure

Enter MID#, PO#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments Per Standard Research
	N/A	N/A	3/4" Service Tee Mueller H-18101 WOP 1200PSIG	ACTIVE	3/4"		Service Tee	Mueller H-18101	1200	

THE LOWEST PRESSURE RATING: 1200

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	HPB-0045 (Retired)
Facility Type	HP SERVICE

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	N/A	Installation	D-4	6/4/1992	C Koo	7/16/2011	C Koo	7/16/2011
2	9705121	Retirement	9705121	7/20/1998	C Koo	7/15/2011	C Koo	7/16/2011

Facility Evaluation Summary

Facility Design Pressure	1012	
Design Factor	0.4	(Class 4 Location)
Pipe Design Pressure	1012.0	
Non-Rated Fitting Design Pressure	2024.0	
Rated Fitting Rated Pressure	1440.0	
Branch Connection Design Pressure	N/A	
Current System MAOP	150.0	
The Highest % SMYS of the Facility at the Current System MAOP	3.6%	
Proposed system MAOP	250.0	
The Highest % SMYS of the Facility at the Proposed System MAOP	5.9%	

Table 1 - Pipe Design Pressure

Enter MID#, PO#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	N/A	N/A	1-1/4" PIPE X 0.14 WALL Gr.A25	ACTIVE	1-1/4"	0.14	Gr.A25	1012	3.56%	5.93%	Hilti Spec

THE LOWEST DESIGN PRESSURE: 1012 4% 6%

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, PO#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
2	N/A	N/A	1-1/4" Weld Cap X 0.14 WALL WPB	ACTIVE	1-1/4"	0.14			WPB	Weld Cap	2361	2.54%	4.23%	
1	N/A	N/A	1-1/4" Transition Fitting X 0.14 WALL Gr.A	ACTIVE	1-1/4"	0.14			Gr.A	Transition Fitting	2024	2.98%	4.94%	PE Portion was cut off.

THE LOWEST DESIGN PRESSURE: 2024 3% 5%

Table 3 - Rated Fittings Rated Pressure

Enter MID#, PO#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments Per Bilstein's Research
1	N/A	N/A	1-1/4" Service Tee Mueller H-17601 WOP 1440PSIG	ACTIVE	1-1/4"		Service Tee	Mueller H-17601	1440	

THE LOWEST PRESSURE RATING: 1440

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	HPS-0048 (Retired)
Facility Type	HP SERVICE

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	N/A	Installation	D-4	3/11/1966	C Koo	7/15/2011	C Koo	7/15/2011
2	9705121	Retirement	9705121	8/18/1998	C Koo	7/15/2011	C Koo	7/15/2011

Facility Evaluation Summary

Facility Design Pressure	1440
Design Factor	0.4 (Class 4 Location)
Pipe Design Pressure	N/A
Non-Rated Fitting Design Pressure	N/A
Rated Fitting Rated Pressure	1440.0
Branch Connection Design Pressure	N/A
Current System MAOP	150.0
The Highest % SMYS of the Facility at the Current System MAOP	0.0%
Proposed system MAOP	250.0
The Highest % SMYS of the Facility at the Proposed System MAOP	0.0%

Table 1 - Pipe Design Pressure

Enter MID#, POI#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments

THE LOWEST DESIGN PRESSURE:

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, POI#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments

THE LOWEST DESIGN PRESSURE:

Table 3 - Rated Fittings Rated Pressure

Enter MID#, POI#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
2	N/A	6800841	2" Save-A-Valve Mueller WOP 1440PSIG	ACTIVE	2"		Save-A-Valve	Mueller	1440	The Fitting was installed over the retired service tee.

THE LOWEST PRESSURE RATING: 1440

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	HP8-0047 (Retired)
Facility Type	HP SERVICE

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	N/A	Installation	D-4	9/28/1990	C Koo	7/15/2011	C Koo	7/15/2011
2	9705121	Retirement	9705121	8/19/1998	C Koo	7/15/2011	C Koo	7/15/2011

Facility Evaluation Summary

Facility Design Pressure	1440
Design Factor	0.4 (Class 4 Location)
Pipe Design Pressure	N/A
Non-Rated Fitting Design Pressure	N/A
Rated Fitting Rated Pressure	1440.0
Branch Connection Design Pressure	N/A
Current System MAOP	180.0
The Highest % SMYS of the Facility at the Current System MAOP	0.0%
Proposed system MAOP	250.0
The Highest % SMYS of the Facility at the Proposed System MAOP	0.0%

Table 1 - Pipe Design Pressure

Enter MID#, PO#, or "PO" in this field

Select Data from the drop down menus

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments

THE LOWEST DESIGN PRESSURE:

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, PO#, or "PO" in this field

Select Data from the drop down menus

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments

THE LOWEST DESIGN PRESSURE:

Table 3 - Rated Fittings Rated Pressure

Enter MID#, PO#, or "PO" in this field

Select Data from the drop down menus

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
2	N/A	5600841	2" Save-A-Valve Mueller WOP 1440P8IG	ACTIVE	2"		Save-A-Valve	Mueller	1440	The fitting was installed over the retired service tee

THE LOWEST PRESSURE RATING: 1440

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	HPB-0048 (Retired)
Facility Type	HP SERVICE

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	N/A	Installation	O-4	9/28/1990	C Koo	7/15/2011	C Koo	7/15/2011
2	9705121	Retirement	9705121	8/18/1998	C Koo	7/15/2011	C Koo	7/15/2011

Facility Evaluation Summary

Facility Design Pressure	1440	
Design Factor	0.4	(Class 4 Location)
Pipe Design Pressure	N/A	
Non-Rated Fitting Design Pressure	N/A	
Rated Fitting Rated Pressure	1440.0	
Branch Connection Design Pressure	N/A	
Current System MAOP	150.0	
The Highest % SMYS of the Facility at the Current System MAOP	0.0%	
Proposed system MAOP	250.0	
The Highest % SMYS of the Facility at the Proposed System MAOP	0.0%	

Table 1 - Pipe Design Pressure

Job Key	ITEM #	MID (Enter MID#, PO#, or "PO" in this field)	Description	Status (Select Data from the drop down manual)	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments

THE LOWEST DESIGN PRESSURE:

Table 2 - Non-Rated Fitting Design Pressure

Job Key	ITEM #	MID (Enter MID#, PO#, or "PO" in this field)	Description	Status (Select Data from the drop down manual)	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments

THE LOWEST DESIGN PRESSURE:

Table 3 - Rated Fittings Rated Pressure

Job Key	ITEM #	MID (Enter MID#, PO#, or "PO" in this field)	Description	Status (Select Data from the drop down manual)	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
2	N/A	6800841	2" Save-A-Valve Mueller WOP 1440PSIG	ACTIVE	2"		Save-A-Valve	Mueller	1440	The Fitting was installed over the retired service tee

THE LOWEST PRESSURE RATING: 1440

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	HPS-0049 (Retired)
Facility Type	HP SERVICE

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	N/A	Installation	D-4	9/28/1990	C Koo	7/15/2011	C Koo	7/15/2011
2	9705121	Retirement	9705121	8/19/1998	C Koo	7/15/2011	C Koo	7/16/2011

Facility Evaluation Summary

Facility Design Pressure	1440	
Design Factor	0.4	(Class 4 Location)
Pipe Design Pressure	N/A	
Non-Rated Fitting Design Pressure	N/A	
Rated Fitting Rated Pressure	1440.0	
Branch Connection Design Pressure	N/A	
Current System MAOP	150.0	
The Highest % SMYS of the Facility at the Current System MAOP	0.0%	
Proposed system MAOP	250.0	
The Highest % SMYS of the Facility at the Proposed System MAOP	0.0%	

Table 1 - Pipe Design Pressure

Enter MID#, POR, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments

THE LOWEST DESIGN PRESSURE:

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, POR, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments

THE LOWEST DESIGN PRESSURE:

Table 3 - Rated Fittings Rated Pressure

Enter MID#, POR, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
1	N/A	6800641	2" Save-A-Valve Mueller WOP 1440PSIG	ACTIVE	2"		Save-A-Valve	Mueller	1440	The Fitting was installed over the retired service line.

THE LOWEST PRESSURE RATING: 1440

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID: HP8-0060 (Retired)
Facility Type: HP SERVICE

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	N/A	Installation	D-4	10/12/1994	C Koo	7/15/2011	C Koo	7/15/2011
2	9705121	Retirement	9705121	8/13/1998	C Koo	7/15/2011	C Koo	7/15/2011

Facility Evaluation Summary

Facility Design Pressure	1440
Design Factor	0.4 (Class 4 Location)
Pipe Design Pressure	N/A
Non-Rated Fitting Design Pressure	N/A
Rated Fitting Rated Pressure	1440.0
Branch Connection Design Pressure	N/A
Current System MAOP	150.0
The Highest % SMYS of the Facility at the Current System MAOP	0.0%
Proposed system MAOP	250.0
The Highest % SMYS of the Facility at the Proposed System MAOP	0.0%

Table 1 - Pipe Design Pressure

Enter MIDR, POR, or "PO" in this field. Select Data from the drop down manual.

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments

THE LOWEST DESIGN PRESSURE:

Table 2 - Non-Rated Fitting Design Pressure

Enter MIDR, POR, or "PO" in this field. Select Data from the drop down manual.

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments

THE LOWEST DESIGN PRESSURE:

Table 3 - Rated Fittings Rated Pressure

Enter MIDR, POR, or "PO" in this field. Select Data from the drop down manual.

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
1	N/A	6800841	2" Save-A-Valve Mueller WOP 1440PSIG	ACTIVE	2"	11	Save-A-Valve	Mueller	1440	The Fitting was installed over the retired service tee

THE LOWEST PRESSURE RATING: 1440

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	HPS-0051 (Retired)
Facility Type	HP SERVICE

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	N/A	Installation	D-4	7/7/1966	C Koo	7/15/2011	C Koo	7/15/2011
2	9705121	Retirement	9705121	11/21/1999	C Koo	7/15/2011	C Koo	7/15/2011
3	887026285	Modified Retirement Method	N/A	9/16/2011	D Frieze	9/16/2011	D Frieze	4/25/2012

Facility Evaluation Summary

Facility Design Pressure	250
Design Factor	0.4 (Class 4 Location)
Pipe Design Pressure	1291.4
Non-Rated Fitting Design Pressure	N/A
Rated Fitting Rated Pressure	250.0
Branch Connection Design Pressure	N/A
Current System MAOP	150.0
The Highest % SMYS of the Facility at the Current System MAOP	2.8%
Proposed system MAOP	250.0
The Highest % SMYS of the Facility at the Proposed System MAOP	4.6%

Table 1 - Pipe Design Pressure

Enter MID#, PO#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	N/A	N/A	3/4" PIPE X 0.113 WALL Gr.A25	ACTIVE	3/4"	0.113	Gr.A25	1291	2.79%	4.65%	Hist Spec

THE LOWEST DESIGN PRESSURE: 1291 3% 5%

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, PO#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments

THE LOWEST DESIGN PRESSURE:

Table 3 - Rated Fittings Rated Pressure

Enter MID#, PO#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
1	N/A	N/A	3/4" Service Tee Mueller H-17500 WOP 250PSIG	ACTIVE	3/4"		Service Tee	Mueller H-17500	250	Per Standard Research
3	N/A	N/A	3/4" Socket Cap WOP 3000PSIG	ACTIVE	3/4"		Socket Cap		3000	

THE LOWEST PRESSURE RATING: 250

HIGH PRESSURE FACILITY DESIGN PRESSURE CALCULATION (DRAFT01142011)

Descriptions of the Facility

Facility ID	HPS-0052 (Retired)
Facility Type	HP SERVICE

Job Key	Job Number	Job Descriptions	Drawing Number	Installation Date	Compiled By	Compilation Completion Date	Reviewed By	Review Completion Date
1	N/A	Installation	D-4	8/29/1996	C Koo	7/15/2011	C Koo	7/15/2011
2	9705121	Retirement	9705121	8/13/1996	C Koo	7/15/2011	C Koo	7/15/2011

Facility Evaluation Summary

Facility Design Pressure	1200	
Design Factor	0.4	(Class 4 Location)
Pipe Design Pressure	1291.4	
Non-Rated Fitting Design Pressure	2583.0	
Rated Fitting Rated Pressure	1200.0	
Branch Connection Design Pressure	N/A	
Current System MAOP	150.0	
The Highest % SMYS of the Facility at the Current System MAOP	2.8%	
Proposed system MAOP	250.0	
The Highest % SMYS of the Facility at the Proposed System MAOP	4.6%	

Table 1 - Pipe Design Pressure

Enter MID#, PO#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD	Th	Gr	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
1	N/A	N/A	3/4" PIPE X 0.113 WALL Gr.A25	ACTIVE	3/4"	0.113	Gr.A25	1291	2.79%	4.65%	Hint Spec

THE LOWEST DESIGN PRESSURE: 1291 3% 5%

Table 2 - Non-Rated Fitting Design Pressure

Enter MID#, PO#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	OD 1	Th 1	OD 2	Th 2	Gr	Fitting Type	Design Pressure	% SMYS at Current System MAOP	% SMYS at Proposed System MAOP	Comments
2	N/A	N/A	3/4" Weld Cap X 0.113 WALL WPB	ACTIVE	3/4"	0.113			WPB	Weld Cap	3013	1.99%	3.32%	
1	N/A	N/A	3/4" Transition Fitting X 0.113 WALL Gr.A	ACTIVE	3/4"	0.113			Gr.A	Transition Fitting	2583	2.32%	3.87%	Only steel portion of the fitting remain

THE LOWEST DESIGN PRESSURE: 2583 2% 4%

Table 3 - Rated Fittings Rated Pressure

Enter MID#, PO#, or "PO" in this field

Select Data from the drop down manual

Job Key	ITEM #	MID	Description	Status	Size	Class Rating	Fitting Type	Manufacturer and Model Number	Rated Pressure	Comments
	N/A	N/A	3/4" Service Tee Mueller H-18100 WOP 1200PSIG	ACTIVE	3/4"		Service Tee	Mueller H-18100	1200	Per Standard Research

THE LOWEST PRESSURE RATING: 1200