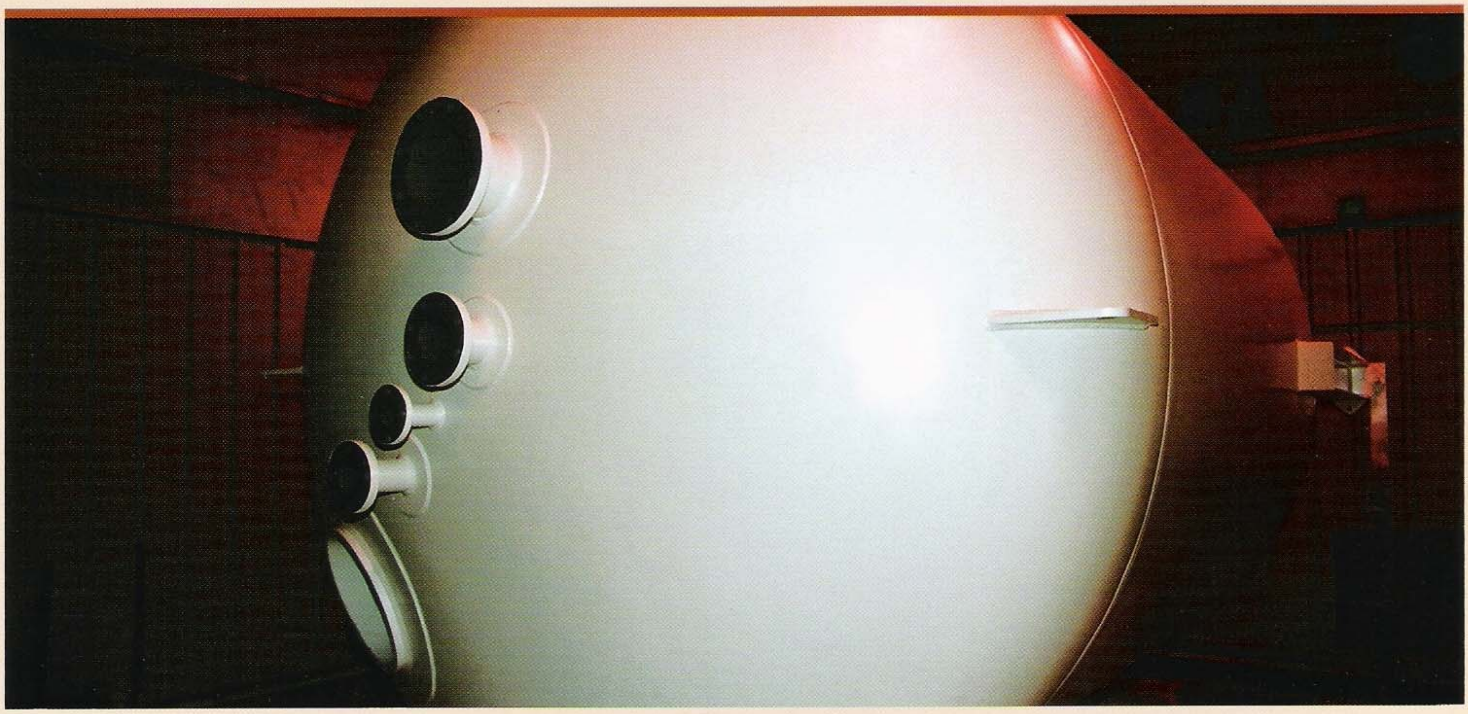
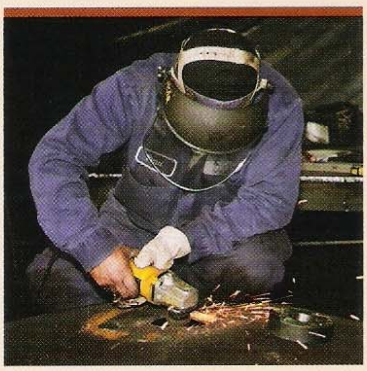
FROM DESIGN TO REALITY

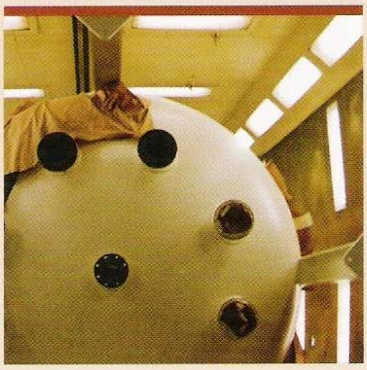
South Gate Engineering



ASME PRESSURE VESSELS • PLATFORMS • SKIDS • LADDERS • PIPING AND ASSEMBLY

DESIGN • ENGINEERING • MANUFACTURING





South Gate Engineering

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13477 YORBA AVE. CHINO, CA 91710 PHONE: 909.628.2779 FAX: 909.628.6779

www.southgateengineering.com

South Gate Engineering

To Our Valued Customer,

Thank you for your interest in South Gate Engineering, LLC as a potential source for your pressure vessel needs.

Please review the following pages which outline our plant resume that describes our new facility and capabilities. We have fabricated many pressure vessels for a variety of industries ranging from HVAC and Petrochemical, to Water Treatment and Municipal Markets.

We welcome the opportunity to give you quotes tailored to your specific needs and vessel requirements. It is our goal to provide you with economical options. Our locale can allow freight savings for Western United States projects, our labor rate rivals U.S. as well as Canadian fabricators, and our discount agreements with local raw material suppliers all help us to provide you with competitive pricing.

We also have an engineering department experienced in working with small businesses as well as large engineering, municipal, and petrochemical firms. Our engineering and manufacturing departments can quickly turn your specific requests into fabricated vessels. Our extensive employee involved safety program and excellent quality control department also helps facilitate production.

Our mission is to provide high quality pressure vessels on time, error free, and at a competitive price.

We look forward to working with you.

Best Regards,

Team South Gate Engineering

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S.G.E. CAPABILITIES AND PLANT FACILITIES

Thank you for your interest in *SOUTH GATE ENGINEERING, LLC.* South Gate Engineering's management team has over 100 years of combined experience designing and manufacturing pressure vessels. The company is located on 5 ½ acres in Chino, CA, which is just minutes from Ontario International Airport. We also have local freeway access for shipping large vessels, and are forty minutes from the Port of Los Angeles, facilitating overseas shipments. Our current manufacturing capabilities include vessels up to 18 feet in diameter and 60-ton in empty weight. Welding procedures for carbon steel, stainless steel and exotic metals using SMAW, SAW, FCAW, GMAW, and GTAW welding processes are approved for use on materials up to 8" thick.

South Gate Engineering specializes in designing, engineering and manufacturing Water Treatment Vessels, Hot Water Storage Tanks, Hydro-Pneumatic and Surge Tanks, Chlorine and SO_2 Bulk Storage Tanks, Hot Water and Steam Generators, Degasifiers, Deaerators, Flash Tanks, and Stainless Process Vessels of all types. All vessels will be manufactured to customer specifications and can be certified to meet ASME Section VIII, Division I; API.; or MILITARY Standards.

As a supplier of pressure vessels, *SOUTH GATE ENGINEERING, LLC* also has a line of packaged systems. Our list of packages includes, but is not limited to: Hydro-Pneumatic Tanks, Surge Arrestors, Chlorine & SO_2 Storage, Hot Water & Steam Generators, and Blowdown Tanks. Attention to detail is assured through the use of the latest computer technology in pressure vessel design and drafting. AutoCAD Release 2000 is used by a talented Engineering Department to produce all submittal drawings.

It is our *GOAL* to provide quality products that meet the highest Industry Standards, on time and error free. It is our *COMMITMENT* to meet your specific production schedules.

Thank you again for your interest in SOUTH GATE ENGINEERING, LLC, and please do not hesitate to call us if you have any additional questions.

Respectfully,

Team South Gate Engineering

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South Gate Engineering

Facility and Equipment Specification:

Land	5 ½ acres
Fabrication Bldgs	54,000 sq. ft.
Bridge Cranes	30 ton (24'-3" to hook) 15 ton (18'-6" to hook) 15 ton (18'-6" to hook) 10 ton (18'-6" to hook) 10 ton (18'-6" to hook) Portable 10 ton Yard Crane 5 ton (18'-6" to hook) 5 ton (18'-6" to hook) 3 ton (18'-6" to hook) (4) 1 ½ ton (18'-6" to hook)
Forming Rolls	5/8"x10' wide 3/4"x8' wide 1/4"x6' wide
Machine Shop	Lathe 35" Swing x 80" long, 48" & 72" Radial Drill, 16" Horizontal Band Saw, 30" Do-All Band Saw, Vertical Mill, 50 & 70 ton Ironworker, 20"Abrasive Cut-Off Saw, Crossfire 6"x10'x40', Trumph Nibbler 1 ½" x 5/8", Pipe Notcher 1" to 5 ½", 100 ton Type 'H' Press,
Cutting.....	CNC Oxy Fuel/ Plasma Shape Cutting Machine 4"x10'x40' w/ Water Table.
Forklifts	(1) 36,000 lb. Hyster (1) 18,000 lb. Apache/TCM (2) 9,000 lb. Catapillar (1) 10,000 lb Kamatsu Truck 24' Stakeside w/ Liftgate 15,000 lbs
Welding Equipment	4 Sub-Arc Welders w/ positioners 1 Sub-Arc Welder w/ track, portable 5 Tig Welders 34 Mig Wire Feeders 32 SMAW Welding Machines DC 600 3 ESAB Welding machine 22 Tank Turning Roller, 1 ton to 90 ton 3 Weld Positioners, 500, 2500 and 5000 lb.
Welding Stations	16 fit-up, 6 prefab
Cutting Stations	Portable Oxy Fuel and Plasma Equipment (3) Radiograph with Tracks
Sandblast Booth	20ft. x 60ft.
Spray Booth	21ft. x 64 ft.
Painting	Airless and Conventional equipment (vinyl ester, alkyd, polyurethane, epoxy coatings)
Insulation	Spray Urethane Foam Insulation, Fiberglass with Aluminum Jacket
Employees	99 production, 4 design and engineering, 15 office

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TANK SIZING GUIDE

Below is a table to aid in sizing a tank. In general, for a given capacity, it is more economical to select a smaller diameter tank with a longer shell than a larger diameter with a shorter shell. However, physical limitations such as available floor space, ceiling height, and door width sometimes dictate the size of a tank. Any intermediate sizes or larger and longer tanks may be specified if desired. Please consult factory for price and availability.

TABLE 2.1

	Model Number *	Diameter (inches)	Shell Length (inches)	Overall Length (inches)	Capacity ** (gallons)	Surface Area (sq. ft.)	Weight (lbs.) U,E,G[1]	Weight (lbs.) D[2]
18" Diameter	ST18-24( )	18	24	36	36	15	130	N/A
	ST18-36( )	18	36	48	49	20	165	N/A
	ST18-48( )	18	48	60	62	25	200	N/A
	ST18-60( )	18	60	72	75	30	235	N/A
	ST18-x( ) x=desired length	18	x	x+12	add 13 gal. per extra ft.	add 5 ft² per extra ft.	add 35 lbs. per extra ft.	N/A
24" Diameter	ST24-36( )	24	36	51	91	31	235	330
	ST24-48( )	24	48	63	115	37	285	400
	ST24-60( )	24	60	75	139	43	335	470
	ST24-72( )	24	72	87	163	49	385	540
	ST24-x( ) x=desired length	24	x	x+15	add 24 gal. per extra ft.	add 6 ft² per extra ft.	add 50 lbs. per extra ft.	add 70 lbs. per extra ft.
30" Diameter	ST30-48( )	30	48	66	185	47	380	525
	ST30-60( )	30	60	78	222	55	440	610
	ST30-72( )	30	72	90	259	63	500	695
	ST30-84( )	30	84	102	296	71	560	780
	ST30-x( ) x=desired length	30	x	x+18	add 37 gal. per extra ft.	add 8 ft² per extra ft.	add 60 lbs. per extra ft.	add 85 lbs. per extra ft.

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TABLE 2.1 Continued

	Model Number *	Diameter (inches)	Shell Length (inches)	Overall Length (inches)	Capacity ** (gallons)	Surface Area (sq. ft.)	Weight (lbs.) U,E,G[1]	Weight (lbs.) D[2]
36" Diameter	ST36-48( )	36	48	69	275	60	500	680
	ST36-60( )	36	60	81	328	70	573	785
	ST36-72( )	36	72	93	381	80	646	890
	ST36-84( )	36	84	105	434	90	719	995
	ST36-x( ) x=desired length	36	x	x+21	add 53 gal. per extra ft.	add 10 ft² per extra ft.	add 73 lbs. per extra ft.	add 105 lbs. per extra ft.
42" Diameter	ST42-60( )	42	60	84	457	86	950	1210
	ST42-72( )	42	72	96	529	97	1062	1355
	ST42-84( )	42	84	108	601	108	1174	1500
	ST42-96( )	42	96	120	673	119	1286	1645
	ST42-108( )	42	108	132	745	130	1398	1790
	ST42-120( )	42	120	144	817	141	1510	1935
	ST42-x( ) x=desired length	42	x	x+24	add 72 gal. per extra ft.	add 11 ft² per extra ft.	add 112 lbs. per extra ft.	add 145 lbs. per extra ft.
48" Diameter	ST48-60( )	48	60	87	605	97	1150	1445
	ST48-72( )	48	72	99	699	109	1278	1610
	ST48-84( )	48	84	111	793	121	1406	1775
	ST48-96( )	48	96	123	887	133	1534	1940
	ST48-108( )	48	108	135	987	145	1662	2105
	ST48-120( )	48	120	147	1075	157	1790	2270
	ST48-144( )	48	144	171	1263	181	2046	2600
	ST48-x( ) x=desired length	48	x	x+27	add 94 gal. per extra ft.	add 12 ft² per extra ft.	add 128 lbs. per extra ft.	add 165 lbs. per extra ft.

South Gate Engineering

TABLE 2.1 Continued

	Model Number *	Diameter (inches)	Shell Length (inches)	Overall Length (inches)	Capacity ** (gallons)	Surface Area (sq. ft.)	Weight (lbs.) U,E,G[1]	Weight (lbs.) D[2]
54" Diameter	ST54-60( )	54	60	88	767	110	1615	1945
	ST54-72( )	54	72	100	886	124	1800	2175
	ST54-84( )	54	84	112	1005	138	1985	2405
	ST54-96( )	54	96	124	1124	152	2170	2635
	ST54-108( )	54	108	136	1243	166	2355	2865
	ST54-120( )	54	120	148	1362	180	2540	3095
	ST54-144( )	54	144	172	1600	208	2910	3555
	ST54-x( ) x=desired length	54	x	x+28	add 119 gal. per extra ft.	add 14 ft² per extra ft.	add 185 lbs. per extra ft.	add 230 lbs. per extra ft.
60" Diameter	ST60-60( )	60	60	93	994	130	1795	2185
	ST60-72( )	60	72	105	1141	145	2000	2435
	ST60-84( )	60	84	117	1288	160	2205	2685
	ST60-96( )	60	96	129	1435	175	2410	2935
	ST60-108( )	60	108	141	1582	190	2615	3185
	ST60-120( )	60	120	153	1729	205	2820	3435
	ST60-144( )	60	144	177	2023	235	3230	3935
	ST60-x( ) x=desired length	60	x	x+33	add 147 gal. per extra ft.	add 15 ft² per extra ft.	add 205 lbs. per extra ft.	add 250 lbs. per extra ft.
66" Diameter	ST66-60( )	66	60	92	1202	141	2075	2500
	ST66-72( )	66	72	104	1380	158	2300	2775
	ST66-84( )	66	84	116	1558	175	2525	3050
	ST66-96( )	66	96	128	1736	192	2750	3325
	ST66-108( )	66	108	140	19147	209	2975	3600
	ST66-120( )	66	120	152	2092	226	3200	3875
	ST66-144( )	66	144	176	2448	260	3650	4425
	ST66-168( )	66	168	200	2804	294	4100	4975
	ST66-192( )	66	192	224	3160	328	4550	5525
	ST66-x( ) x=desired length	66	x	x+32	add 178 gal. per extra ft.	add 17 ft² per extra ft.	add 225 lbs. per extra ft.	add 275 lbs. per extra ft.

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TABLE 2.1 Continued

	Model Number *	Diameter (inches)	Shell Length (inches)	Overall Length (inches)	Capacity ** (gallons)	Surface Area (sq. ft.)	Weight (lbs.) U,E,G[1]	Weight (lbs.) D[2]
72" Diameter	ST72-60( )	72	60	97	1476	162	2255	2740
	ST72-72( )	72	72	109	1687	181	2500	3045
	ST72-84( )	72	84	121	1898	200	2745	3350
	ST72-96( )	72	96	133	2109	219	2990	3655
	ST72-108( )	72	108	145	2320	238	3235	3960
	ST72-120( )	72	120	157	2531	257	3480	4265
	ST72-144( )	72	144	181	2953	295	3970	4875
	ST72-168( )	72	168	205	3375	333	4460	5485
	ST72-192( )	72	192	229	3797	371	4950	6095
	ST72-216( )	72	216	253	4219	409	5440	6705
	ST72-240( )	72	240	277	4641	447	5930	7315
	ST72-x( ) x=desired length	72	x	x+37	add 211 gal. per extra ft.	add 19 ft² per extra ft.	add 245 lbs. per extra ft.	add 305 lbs. per extra ft.
84" Diameter	ST84-60( )	84	60	105	2112	211	3310	3945
	ST84-72( )	84	72	117	2400	233	3650	4350
	ST84-84( )	84	84	129	2688	255	3990	4755
	ST84-96( )	84	96	141	2976	277	4330	5160
	ST84-108( )	84	108	153	3264	299	4670	5565
	ST84-120( )	84	120	165	3552	321	5010	5970
	ST84-144( )	84	144	189	4128	365	5690	6780
	ST84-168( )	84	168	213	4704	409	6370	7590
	ST84-192( )	84	192	237	5280	453	7050	8400
	ST84-216( )	84	216	261	5856	497	7730	9210
	ST84-240( )	84	240	285	6432	541	8410	10020
	ST84-x( ) x=desired length	84	x	x+45	add 288 gal. per extra ft.	add 22 ft² per extra ft.	add 340 lbs. per extra ft.	add 405 lbs. per extra ft.

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TABLE 2.1 Continued

	Model Number *	Diameter (inches)	Shell Length (inches)	Overall Length (inches)	Capacity ** (gallons)	Surface Area (sq. ft.)	Weight (lbs.) U,E,G[1]	Weight (lbs.) D[2]
96" Diameter	ST96-60( )	96	60	108	2812	248	4750	5490
	ST96-72( )	96	72	120	3188	274	5225	6045
	ST96-84( )	96	84	132	3564	300	5700	6600
	ST96-96( )	96	96	144	3940	326	6175	7155
	ST96-108( )	96	108	156	4316	352	6650	7710
	ST96-120( )	96	120	168	4692	378	7125	8265
	ST96-144( )	96	144	192	5444	430	8075	9375
	ST96-168( )	96	168	216	6496	482	9025	10485
	ST96-192( )	96	192	240	6948	534	9975	11595
	ST96-216( )	96	216	264	7700	586	10925	12705
	ST96-240( )	96	240	288	8452	638	11875	13815
	ST96-x( ) x=desired length	96	x	x+48	add 376 gal. per extra ft.	add 26 ft² per extra ft.	add 475 lbs. per extra ft.	add 555 lbs. per extra ft.

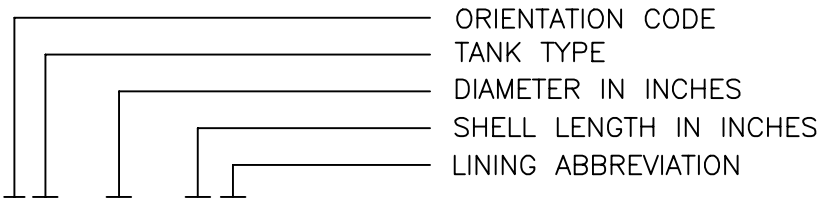
Larger Sizing: Consult with Factory

* See Tank Lining Options

** Listed capacities based on semi-elliptical style heads. Consult factory for capacities using other style heads.

1. Weight based on Linings: U=Unlined, E=Epoxy, G=Glass
2. Weight based on Lining: D=Cement

TANK MODEL NUMBER SCHEDULE



MODEL NUMBER: HST 42 –48E

POSITION ABBREVIATIONS	
H	= HORIZONTAL
V	= VERTICAL

TANK ABBREVIATIONS	
AR	= AIR RECEIVER TANK
AS	= AIR SEPARATOR
BD	= BLOWDOWN TANK
FT	= FILTER TANK
FP	= FIRE PROTECTION
OT	= OIL TANK
HP	= HYDROPNEUMATIC
SS	= STAINLESS STEEL
ST	= STORAGE TANK
XT	= EXPANSION TANK

LINING ABBREVIATIONS	
E	= ZINC EPOXY LINED
C	= COPPER LINED
D	= DURAMENT (CEMENT)
G	= GLASS LINED
P	= PHENOLIC LINED
R	= RUBBER LINED
U	= UNLINED

SOUTH GATE ENGINEERING

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South Gate Engineering

3. Standard Tank Linings

South Gate Engineering, LLC offers a wide variety of tank lining options to fit many different applications. Some of the many tank linings available from the factory are listed below.

Cold Water Epoxy

This polyamide epoxy is applied by spraying all internal surfaces of the vessel. With years of excellent field history as a coating for storing potable water in vessels, this epoxy is an excellent choice for commercial and domestic water applications. We strongly recommend this NSF 61 and AWWA D 102 approved coating on any water application operating at less than 120 degrees F.

Hot Water Epoxy Phenolic

This high solids epoxy phenolic is also applied by spraying all internal surfaces of the vessel. With 20 plus years of excellent field history as a coating for storing potable water in vessels, this phenolic epoxy is an excellent choice for commercial and domestic water applications. We strongly recommend this NSF approved coating on any water application operating at less than 200 degrees F.

Durament Cement

This lining is an excellent coating for water storage tanks and hot water generators. Durament is a low soluble hydraulic cement mixture with added special bonding agents. Durament is formulated with the same coefficient of expansion as the vessel's steel shell, and as such, is unaffected by extreme temperature changes. This lining is also approved for use under military specifications.

Glass Lining

This lining is identical to the one available on all domestic hot water heaters. The process consists of coating the interior of the vessel with a porcelain material and then firing it at 1500 degrees F to fuse the glass to the steel. Typically, this lining is applied at 0.006 to 0.015 inch for a single coat. Special applications of a double coat (0.012 to 0.025 inch) are available upon request. This lining meets military specification requirements.

South Gate Engineering

Rubber Lining

All commercial rubber linings are available upon request. If the type of rubber desired is not known, please provide solutions and concentrations of the liquid to be stored within the vessel. The proper lining material will then be specified and quoted based on the application. Operating temperature for rubber lined vessels should be less than 180 degrees F.

Hot Dip Galvanizing

This coating is applied by dipping the vessel into a hot molten solution of zinc in order to form a zinc coating that is metallurgically bonded to the steel's surface. The zinc coating provides corrosion protection to the steel in two ways: it shields the base metal from the vessel's contents, and because it is more electronegative than steel, the zinc gives cathodic or sacrificial protection. Hot dipped galvanizing can only be provided on vessels up to 48" in diameter.

Vinyl Ester

This vinyl ester resin epoxy with inert flake pigment has outstanding chemical and physical properties. It is a thick film lining which is designed for resistance to severe service exposure, and has excellent abrasive resistant qualities. It meets 21 CFR 175.300 and 177.2420 specifications. When force cured at 200 degrees F for four hours, it also meets NSF standard 61 for cold potable water. This is a favorite for offshore sea water or brine applications as well as for vessels containing filtration media such as carbon, due to its abrasion resistance.

Other linings are available upon request. Please contact the factory for further information.

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South Gate Engineering

STOCK HOT WATER STORAGE TANKS

South Gate Engineering offers a full line of stock hot water storage tanks. These tanks are available in eight sizes, ranging from 185 to 591 gallons. Stock hot water storage tanks are manufactured and certified to A.S.M.E. Code, with pressure ratings of up to 150 PSI. The following drawings show layouts of tanks with all the necessary openings required for easy installation with most water heaters, boilers, and other water-heating devices. Typical applications include residential apartments, commercial buildings, schools, hotels, and laundry facilities. These tanks come factory lined with a high performance epoxy phenolic coating that is NSF approved for potable water, and is excellent for temperatures of up to 200 degrees F. On the exterior, these tanks are finished with a coat of epoxy shop primer.

In addition, these tanks can be supplied with optional thermal insulation, either with polyurethane spray foam or rigid fiberglass with aluminum or metal jacketing.

South Gate Engineering stock tanks carry a 3-year conditional warranty. Please consult the factory for details concerning this warranty.

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South Gate Engineering

Stock Tank Sizing:

Size (inches)	Capacity (gallons)	Model Number	Shipping Weight (lbs.)	Price
30"Ø x 66"O.A.L.	185	VST30-48E	400	Call Factory
30"Ø x 78"O.A.L.	222	VST30-60E	475	Call Factory
36"Ø x 81"O.A.L.	328	VST36-60E	600	Call Factory
36"Ø x 93"O.A.L.	379	VST36-72E	650	Call Factory
36"Ø x 105"O.A.L.	430	VST36-84E	700	Call Factory
42"Ø x 85"O.A.L.	457	VST42-60E	925	Call Factory
42"Ø x 97"O.A.L.	529	VST42-72E	1000	Call Factory
42"Ø x 109"O.A.L.	591	VST42-84E	1200	Call Factory

Available Options:

1. Polyurethane spray foam insulation with acrylic sealer.
2. Rigid fiberglass insulation with aluminum or metal jacketing.
3. Magnesium anode.

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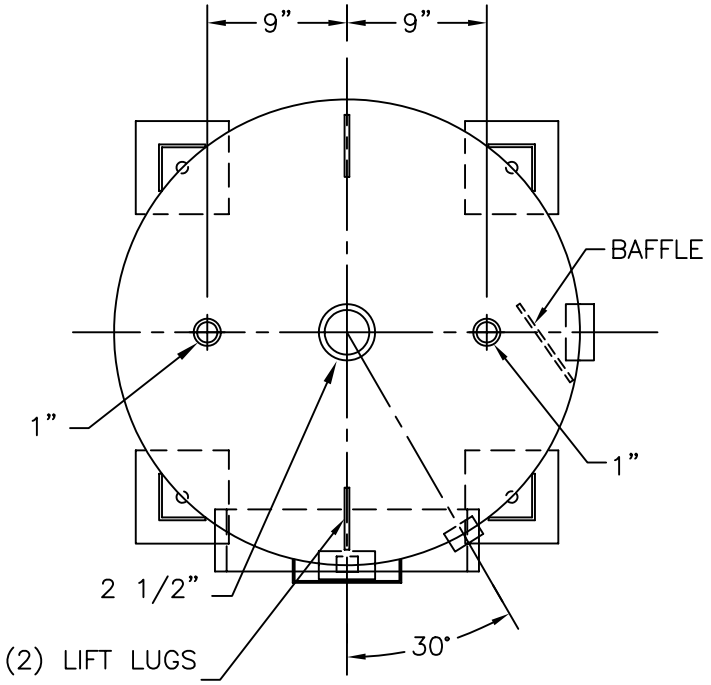

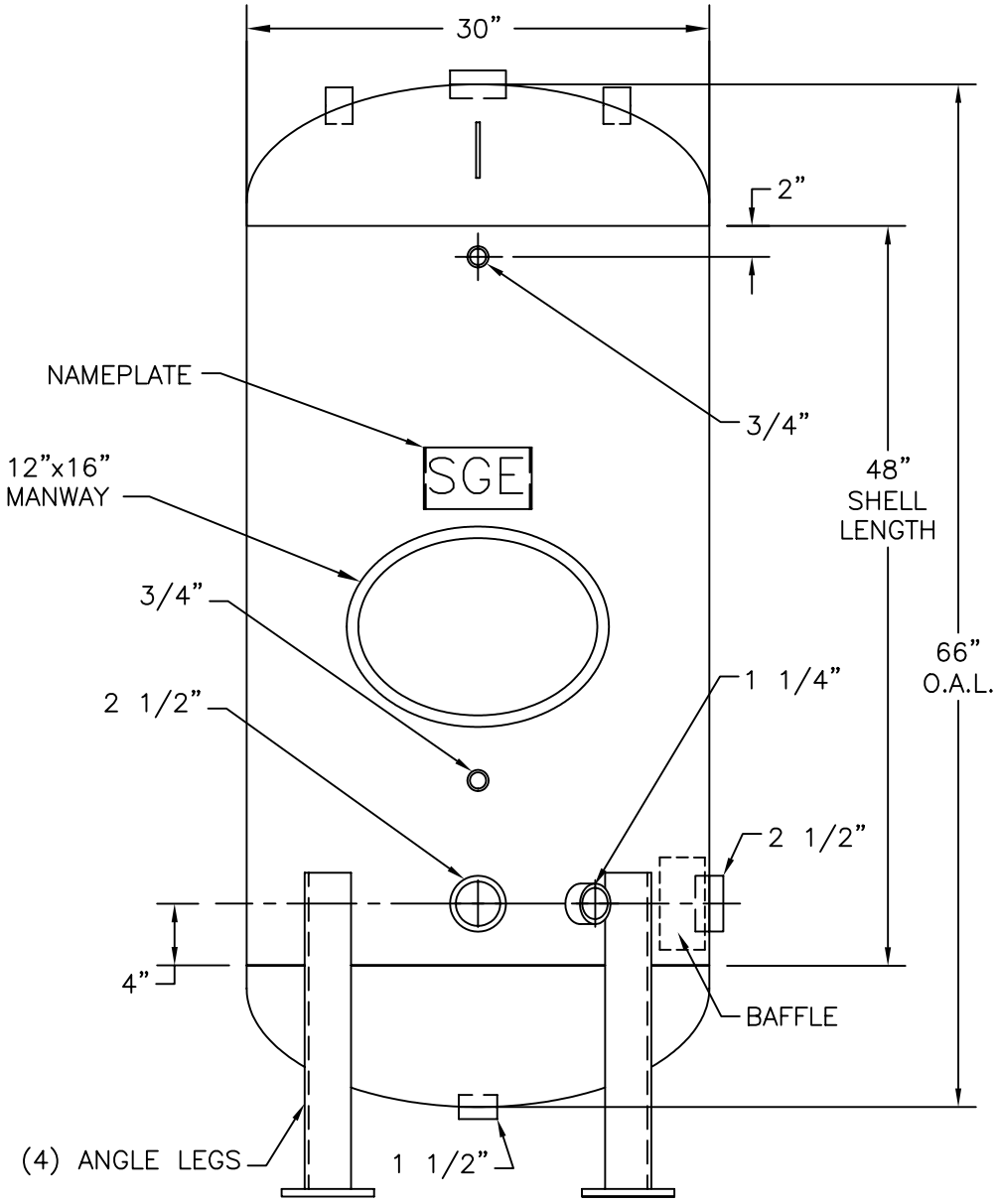

NOTES:

1. EPOXY LINING IS SUITABLE TO 200° F.
2. LINING APPROVED FOR POTABLE WATER.
3. CONTACT FACTORY FOR OPTIONAL INSULATION.

VST30-48E STOCK HOT WATER STORAGE TANK

SOUTH GATE ENGINEERING

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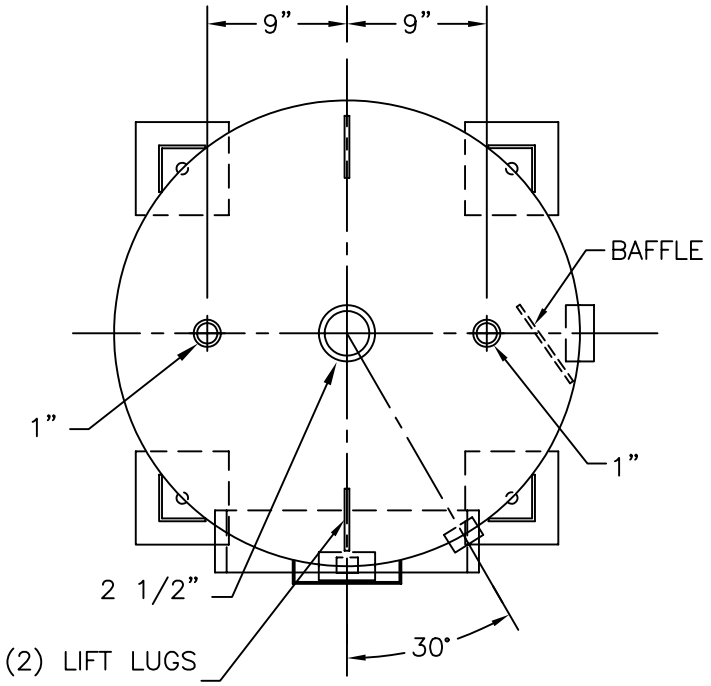
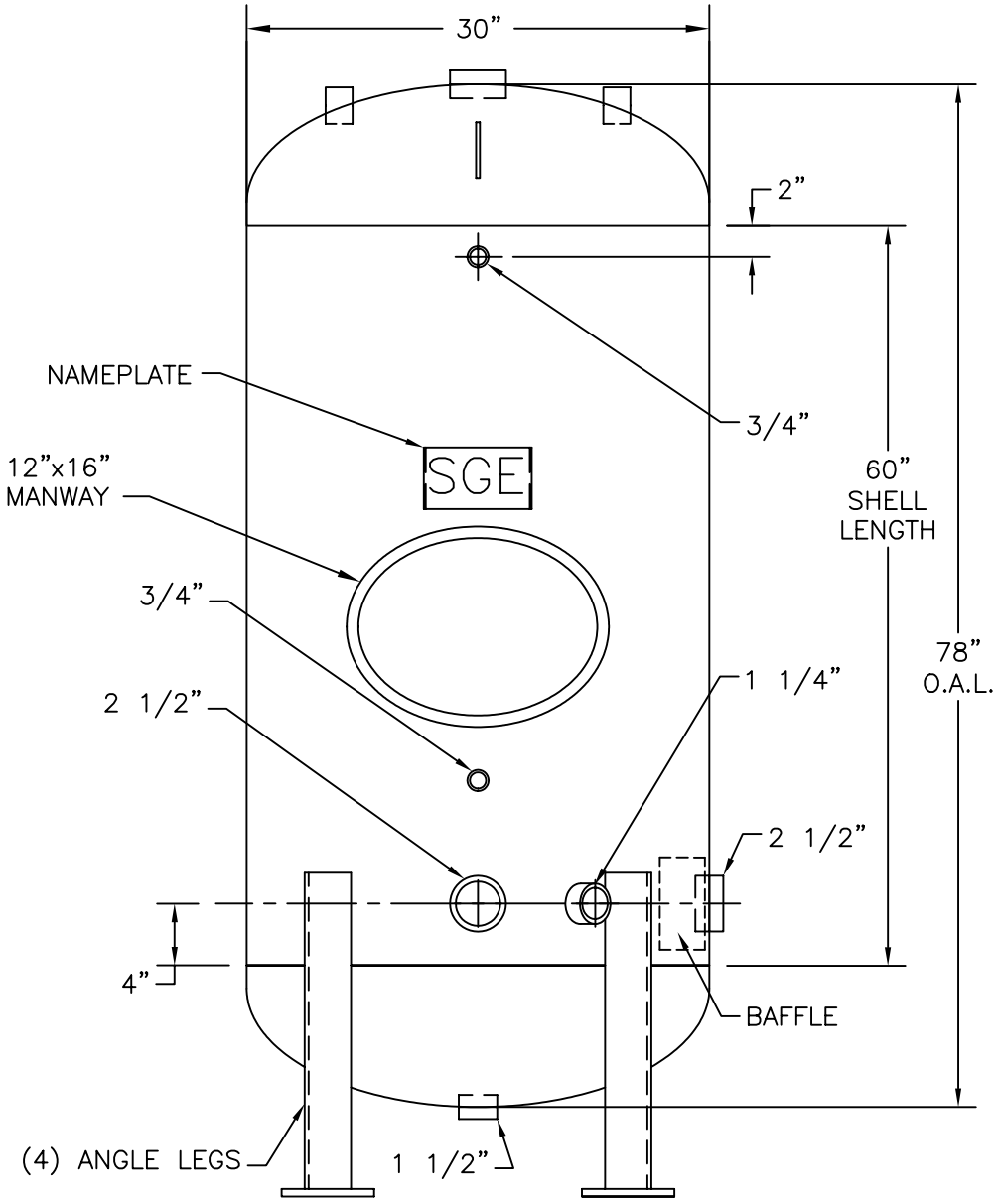
CHINO, CALIFORNIA
91710

PH.(909)628-2779
FAX.(909)628-6779

SUBMITTED BY:		
JOB NAME:		
SERIAL NO.: WILL ADVISE	CONSTRUCTION AND STAMPING PER	MODEL NO: VST30-48E
DATE:	A.S.M.E CODE, SECTION VIII, DIVISION 1	APPVD BY:
DESIGN/M.A.W.P. 150/150 PSI	WORKING TEMP. (Max./Min.) 200/-20 F°	LINING: EPOXY
TEST PRESSURE: 195 PSI	VOLUME: 185 GAL.	WEIGHT: 400 LBS





NOTES:

1. EPOXY LINING IS SUITABLE TO 200° F.
2. LINING APPROVED FOR POTABLE WATER.
3. CONTACT FACTORY FOR OPTIONAL INSULATION.

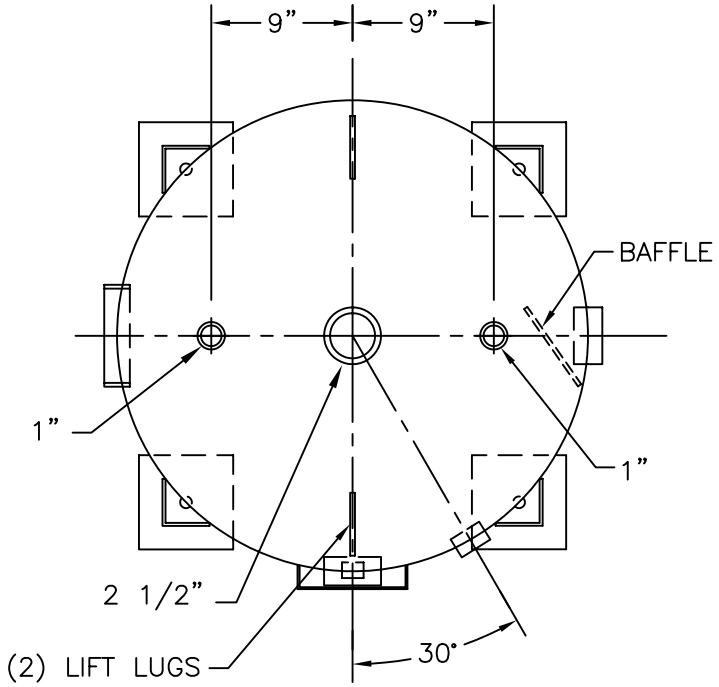
VST30-60E STOCK HOT WATER STORAGE TANK

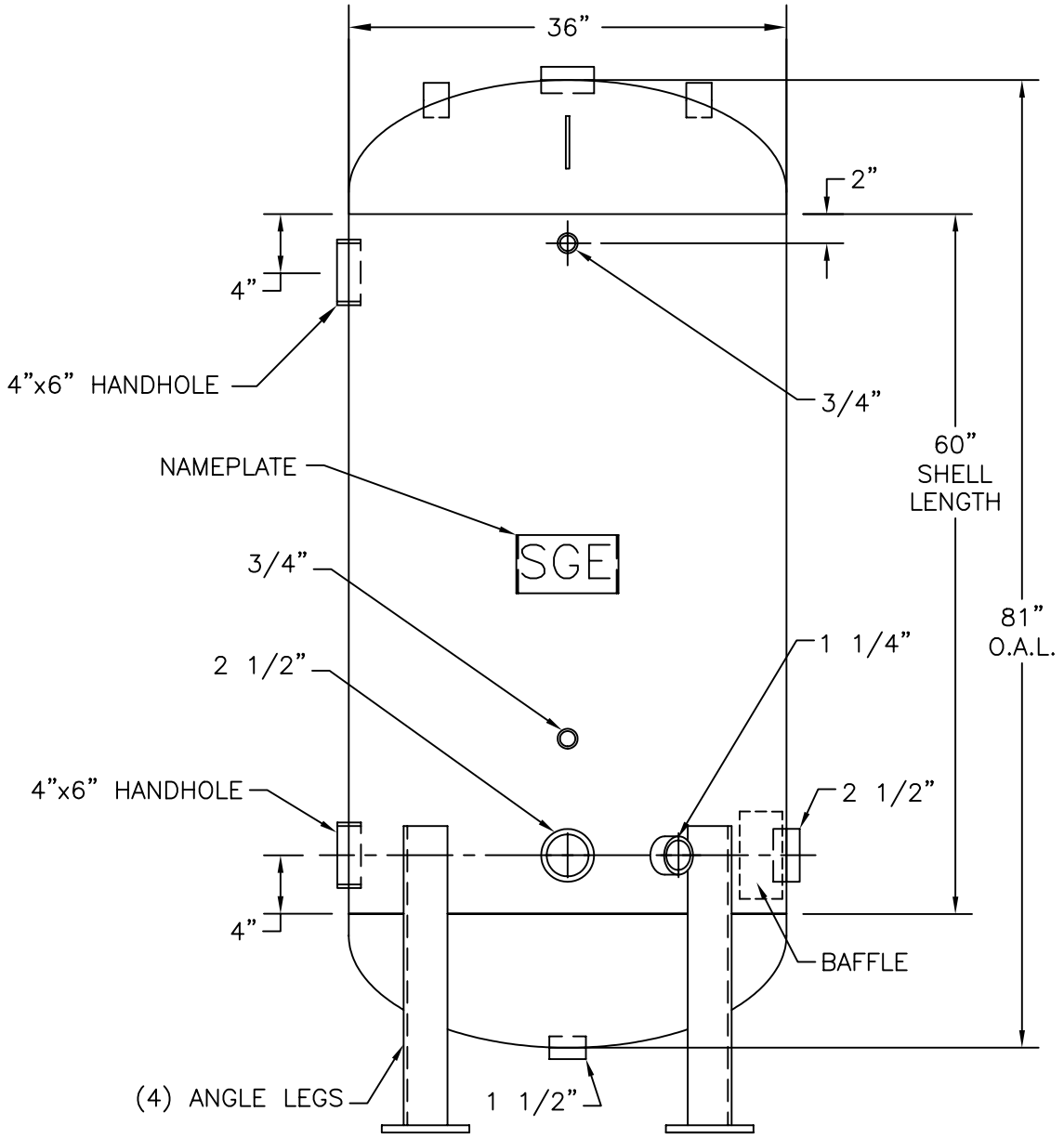
SOUTH GATE ENGINEERING

13477 YORBA AVENUE
CHINO, CALIFORNIA
91710

PH.(909)628-2779
FAX.(909)628-6779

SUBMITTED BY:		
JOB NAME:		
SERIAL NO.: WILL ADVISE	CONSTRUCTION AND STAMPING PER	MODEL NO: VST30-60E
DATE:	A.S.M.E CODE, SECTION VIII, DIVISION 1	APPVD BY:
DESIGN/M.A.W.P. 150/150 PSI	WORKING TEMP. (Max./Min.) 200/-20 F°	LINING: EPOXY
TEST PRESSURE: 195 PSI	VOLUME: 222 GAL.	WEIGHT: 475 LBS





NOTES:

1. EPOXY LINING IS SUITABLE TO 200° F.
2. LINING APPROVED FOR POTABLE WATER.
3. CONTACT FACTORY FOR OPTIONAL INSULATION.

VST36-60E STOCK HOT WATER STORAGE TANK

SOUTH GATE ENGINEERING

13477 YORBA AVENUE
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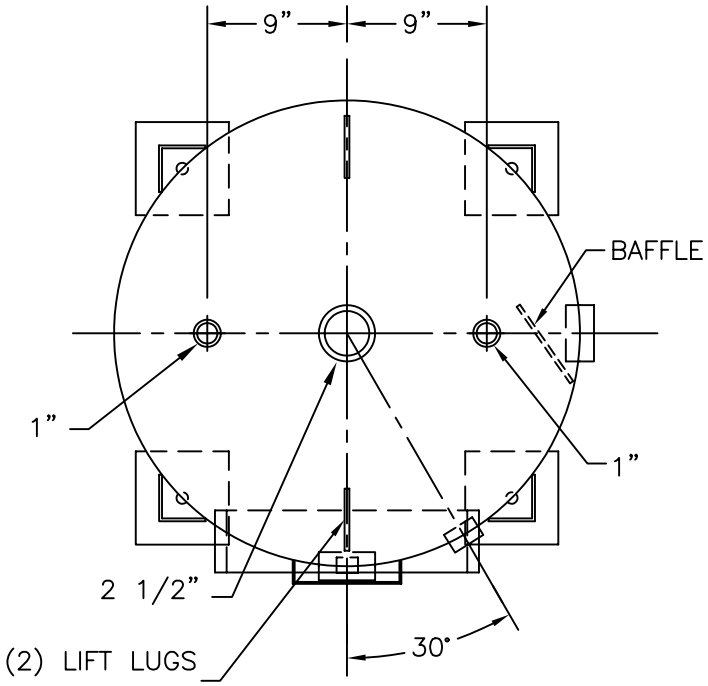
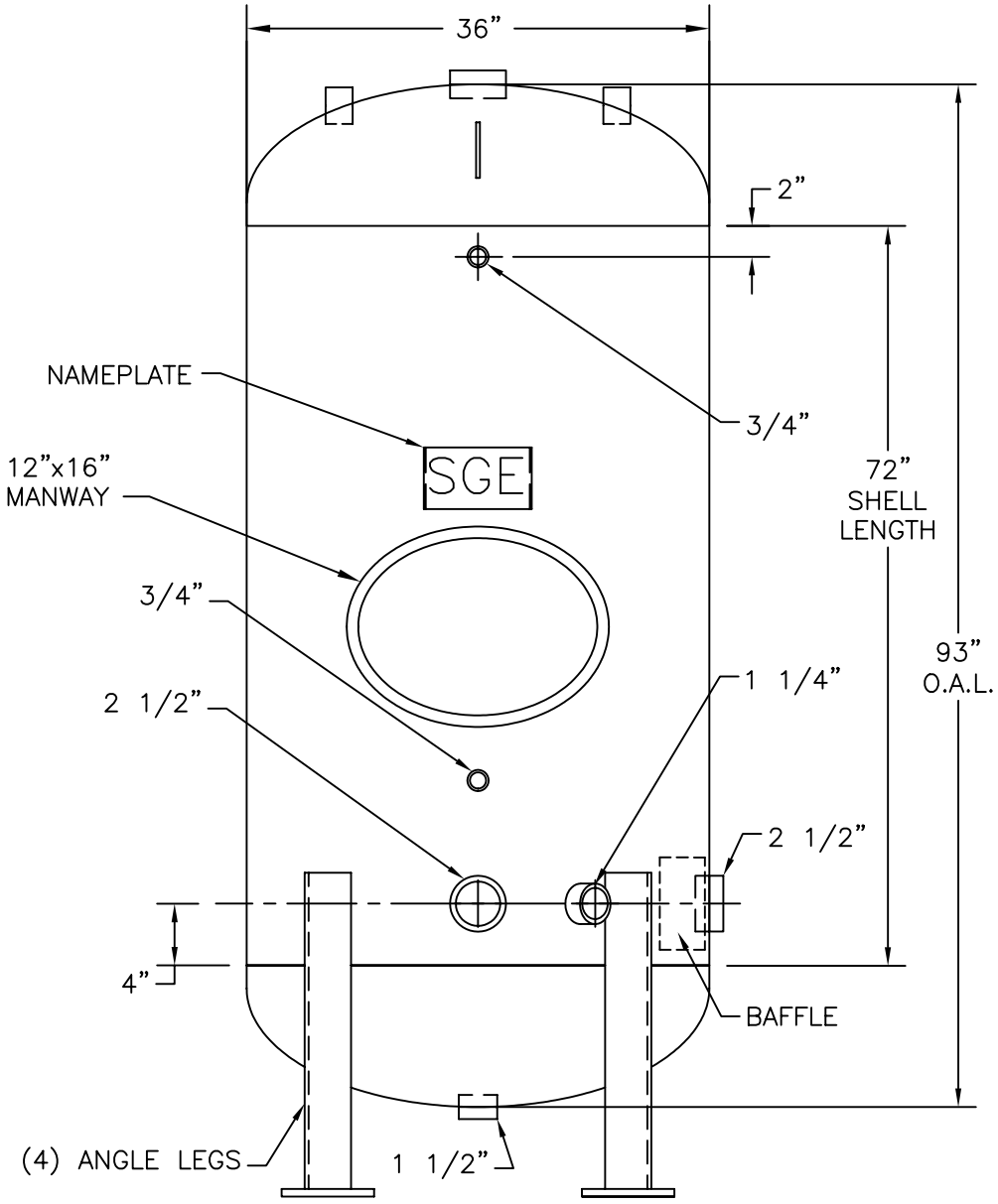
91710

PH.(909)628-2779
FAX.(909)628-6779

SUBMITTED BY:		
JOB NAME:		
SERIAL NO.: WILL ADVISE	CONSTRUCTION AND STAMPING PER	MODEL NO: VST36-60E
DATE:	A.S.M.E CODE, SECTION VIII, DIVISION 1	APPVD BY:
DESIGN/M.A.W.P. 150/150 PSI	WORKING TEMP. (Max./Min.) 200/-20 F°	LINING: EPOXY
TEST PRESSURE: 195 PSI	VOLUME: 328 GAL.	WEIGHT: 600 LBS





NOTES:

1. EPOXY LINING IS SUITABLE TO 200° F.
2. LINING APPROVED FOR POTABLE WATER.
3. CONTACT FACTORY FOR OPTIONAL INSULATION.

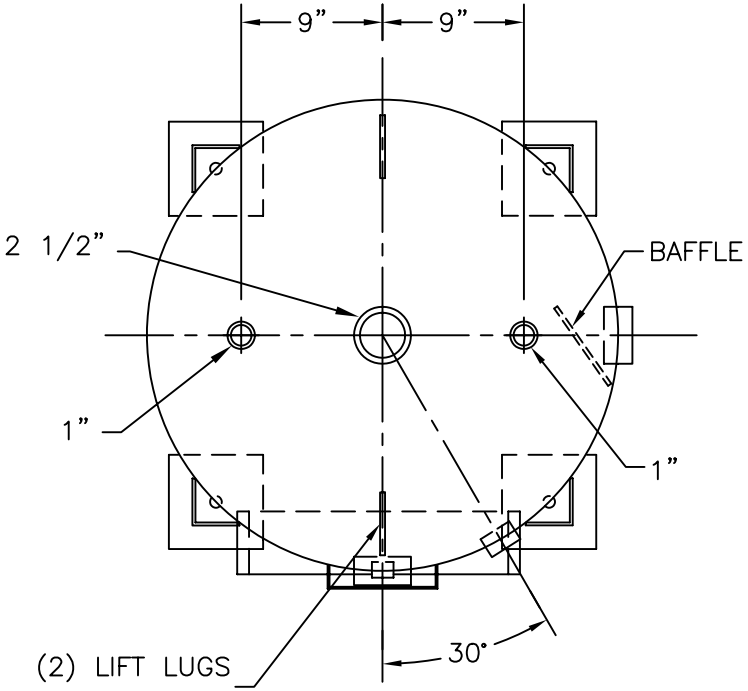
VST36-72E STOCK HOT WATER STORAGE TANK

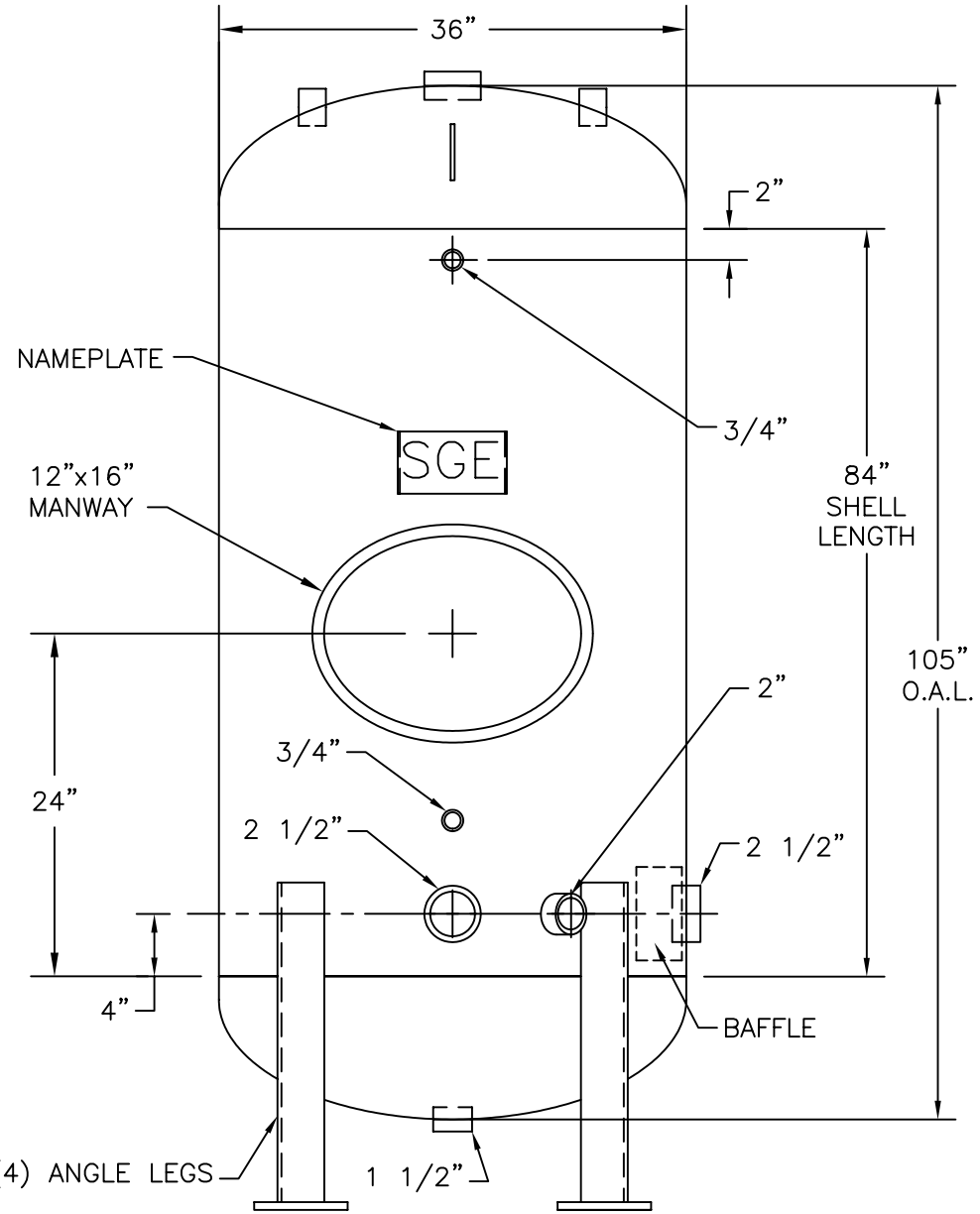
SOUTH GATE ENGINEERING

13477 YORBA AVENUE
CHINO, CALIFORNIA
91710

PH.(909)628-2779
FAX.(909)628-6779

SUBMITTED BY:		
JOB NAME:		
SERIAL NO.: WILL ADVISE	CONSTRUCTION AND STAMPING PER	MODEL NO: VST36-72E
DATE:	A.S.M.E CODE, SECTION VIII, DIVISION 1	APPVD BY:
DESIGN/M.A.W.P. 150/150 PSI	WORKING TEMP. (Max./Min.) 200/-20 F°	LINING: EPOXY
TEST PRESSURE: 195 PSI	VOLUME: 379 GAL.	WEIGHT: 650 LBS





NOTES:

1. EPOXY LINING IS SUITABLE TO 200° F.
2. LINING APPROVED FOR POTABLE WATER.
3. CONTACT FACTORY FOR OPTIONAL INSULATION.

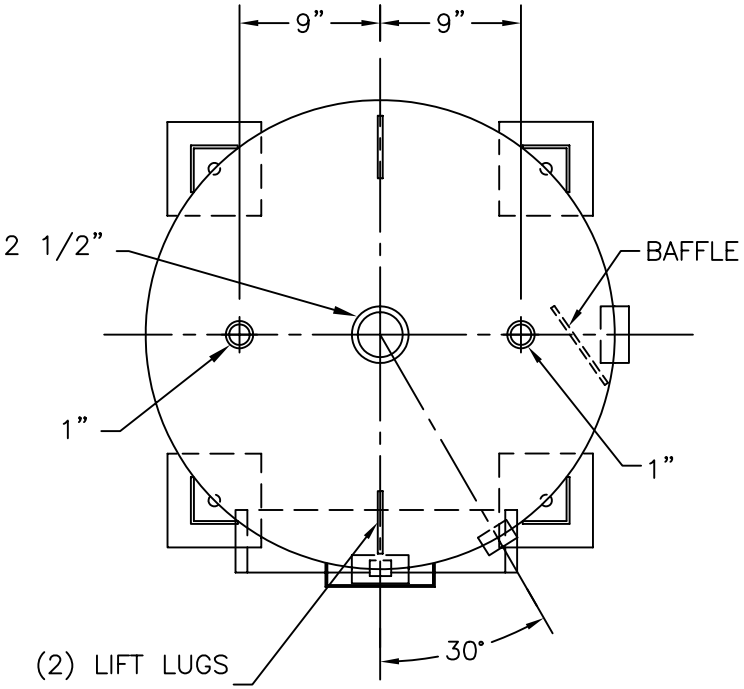
VST36-84E STOCK HOT WATER STORAGE TANK

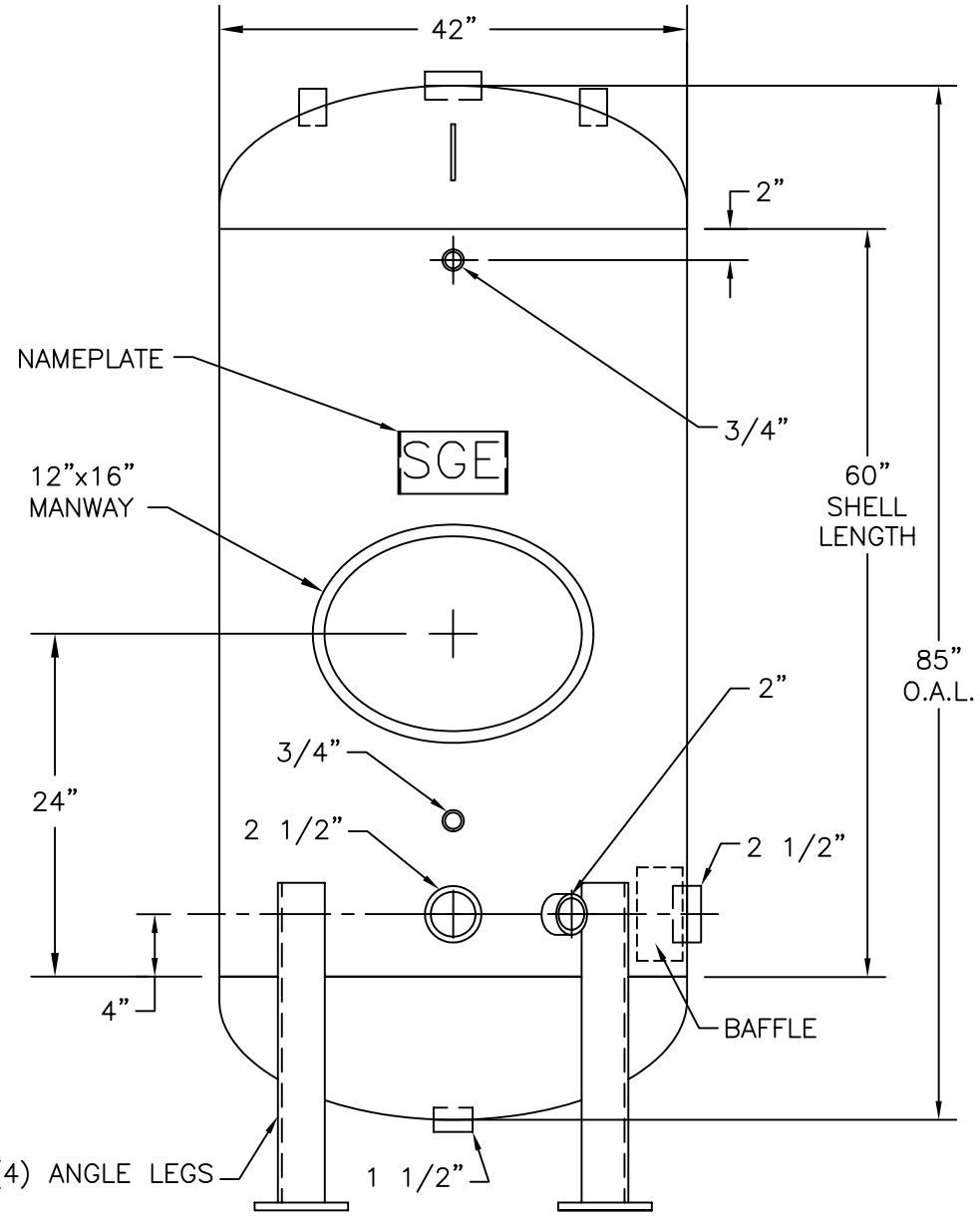
SOUTH GATE ENGINEERING

13477 YORBA AVENUE
CHINO, CALIFORNIA
91710

PH.(909)628-2779
FAX.(909)628-6779

SUBMITTED BY:		
JOB NAME:		
SERIAL NO.: WILL ADVISE	CONSTRUCTION AND STAMPING PER	MODEL NO: VST36-84E
DATE:	A.S.M.E CODE, SECTION VIII, DIVISION 1	APPVD BY:
DESIGN/M.A.W.P. 125/125 PSI	WORKING TEMP. (Max./Min.) 200/-20 F°	LINING: EPOXY
TEST PRESSURE: 163 PSI	VOLUME: 430 GAL.	WEIGHT: 700 LBS





NOTES:

1. EPOXY LINING IS SUITABLE TO 200° F.
2. LINING APPROVED FOR POTABLE WATER.
3. CONTACT FACTORY FOR OPTIONAL INSULATION.

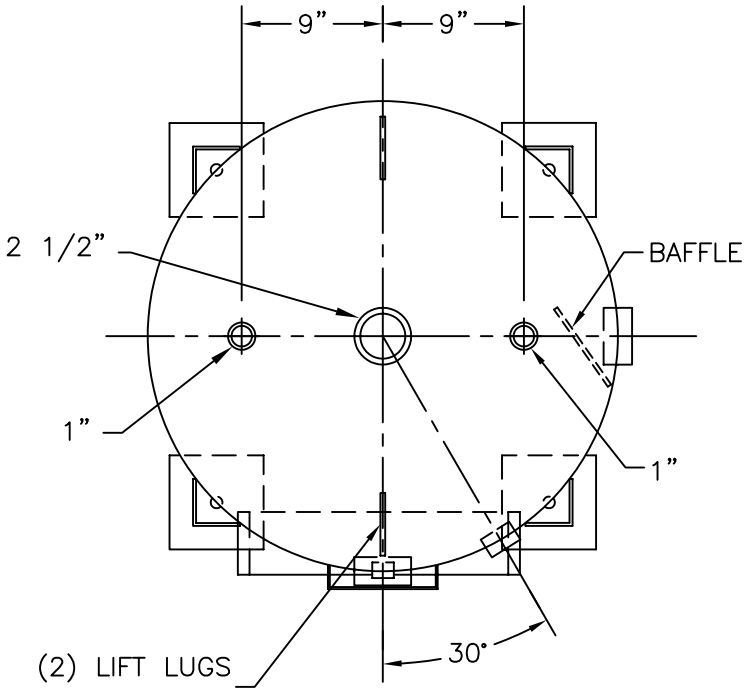
VST42-60E STOCK HOT WATER STORAGE TANK

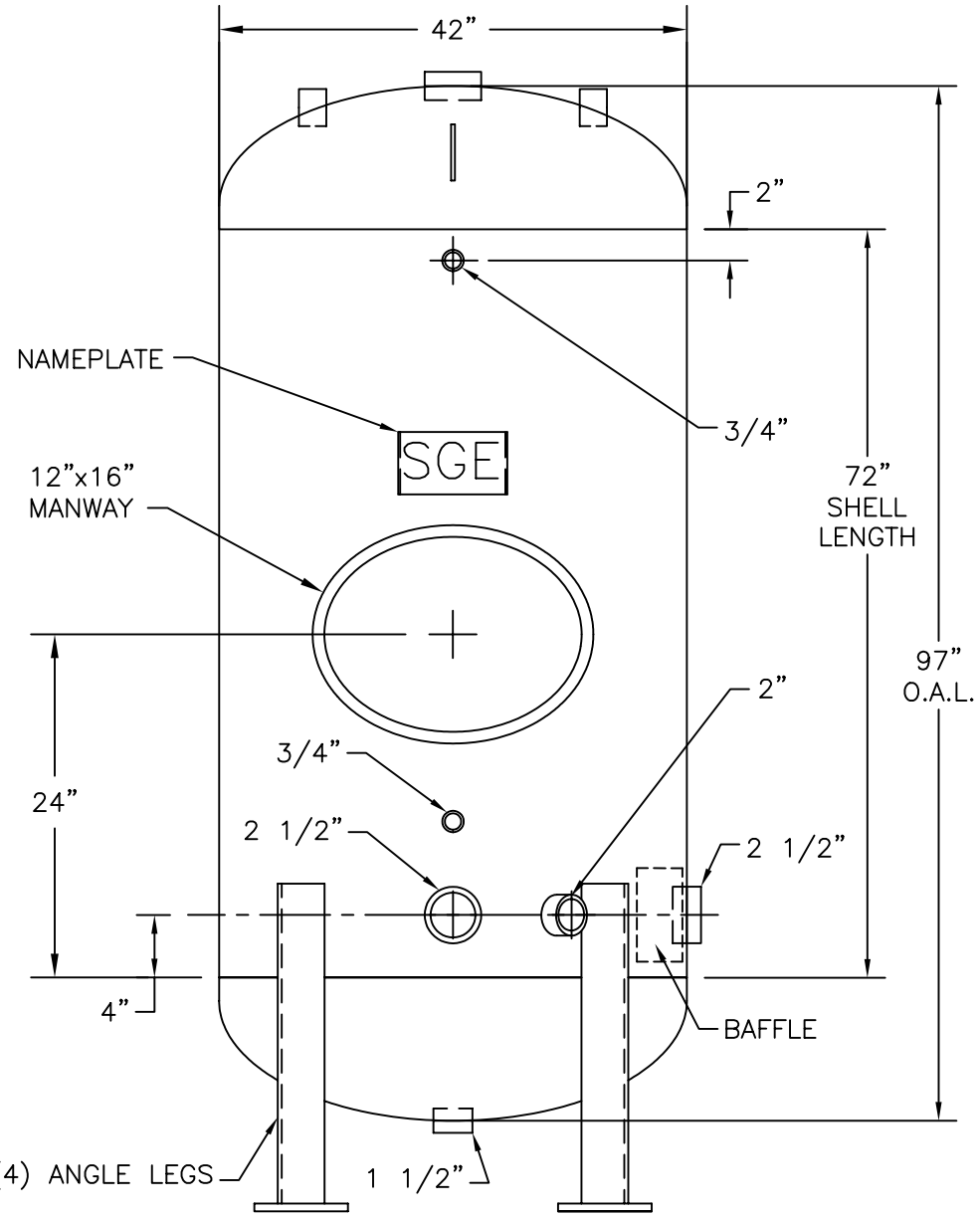
SOUTH GATE ENGINEERING

13477 YORBA AVENUE
CHINO, CALIFORNIA
91710

PH.(909)628-2779
FAX.(909)628-6779

SUBMITTED BY:		
JOB NAME:		
SERIAL NO.: WILL ADVISE	CONSTRUCTION AND STAMPING PER	MODEL NO: VST42-60E
DATE:	A.S.M.E CODE, SECTION VIII, DIVISION 1	APPVD BY:
DESIGN/M.A.W.P. 150/150 PSI	WORKING TEMP. (Max./Min.) 200/-20 F°	LINING: EPOXY
TEST PRESSURE: 195 PSI	VOLUME: 457 GAL.	WEIGHT: 925 LBS





NOTES:

1. EPOXY LINING IS SUITABLE TO 200° F.
2. LINING APPROVED FOR POTABLE WATER.
3. CONTACT FACTORY FOR OPTIONAL INSULATION.

VST42-72E STOCK HOT WATER STORAGE TANK

SOUTH GATE ENGINEERING

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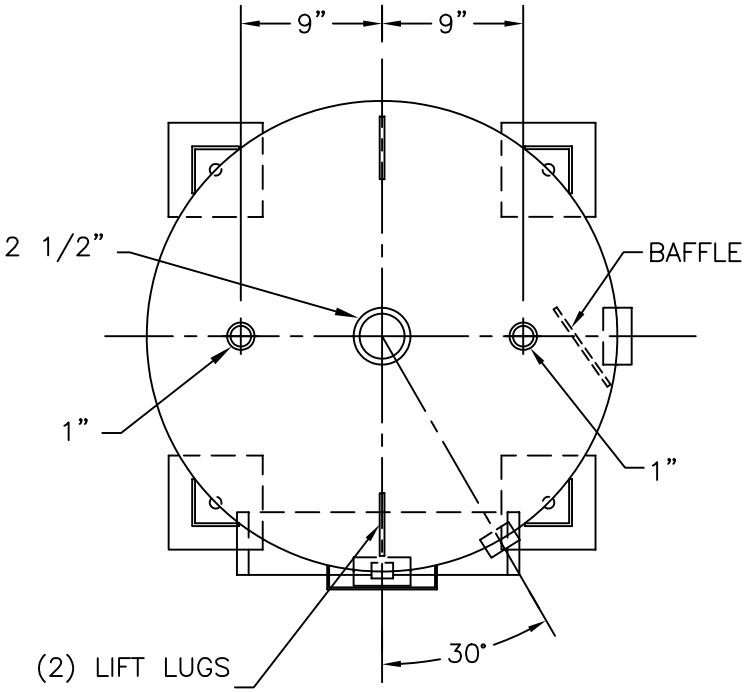
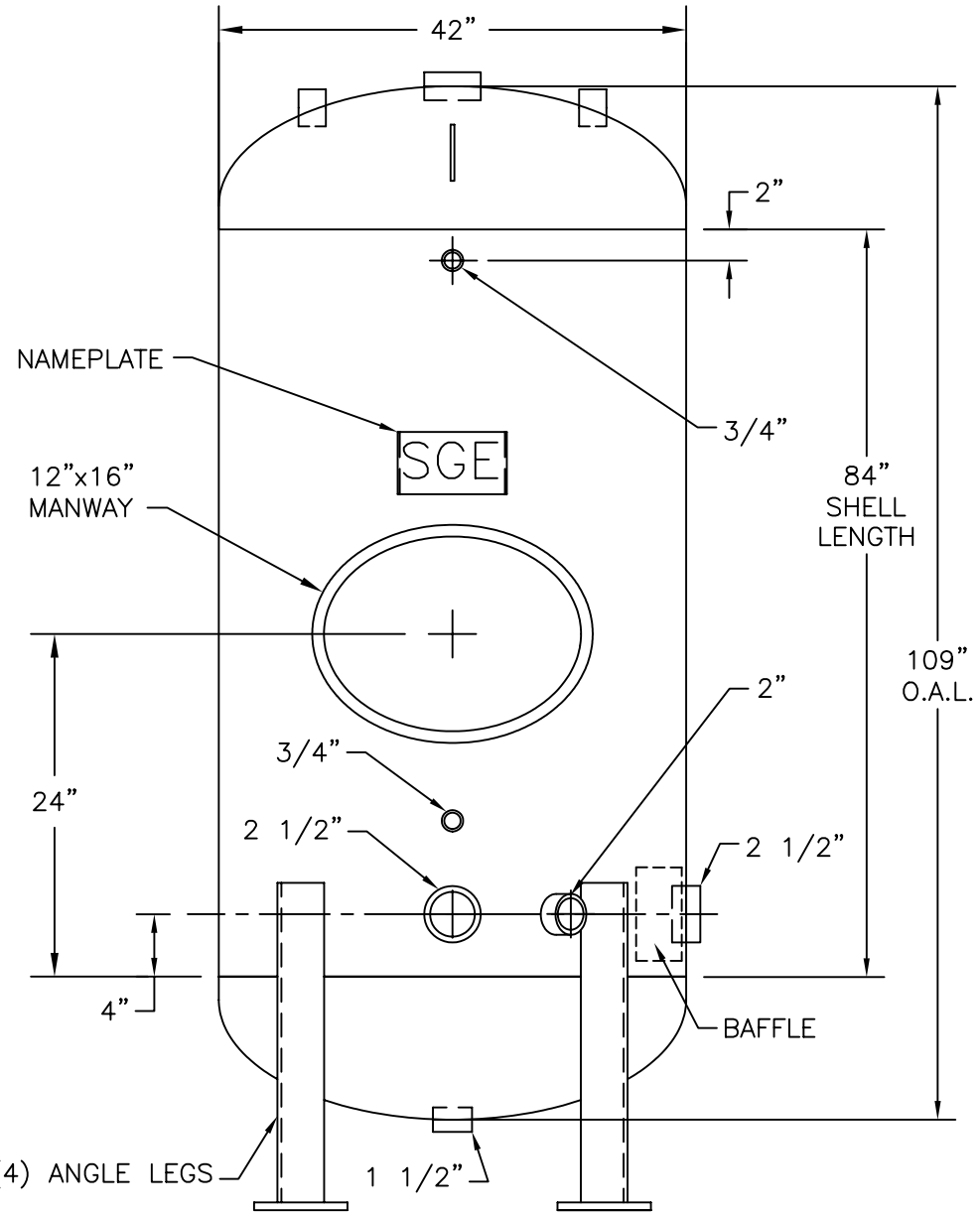
CHINO, CALIFORNIA
91710

PH.(909)628-2779
FAX.(909)628-6779

SUBMITTED BY:		
JOB NAME:		
SERIAL NO.: WILL ADVISE	CONSTRUCTION AND STAMPING PER A.S.M.E CODE, SECTION VIII, DIVISION 1	MODEL NO: VST42-72E
DATE:		APPVD BY:
DESIGN/M.A.W.P. 150/150 PSI	WORKING TEMP. (Max./Min.) 200/-20 F°	LINING: EPOXY
TEST PRESSURE: 195 PSI	VOLUME: 529 GAL.	WEIGHT: 1000 LBS





NOTES:

1. EPOXY LINING IS SUITABLE TO 200° F.
2. LINING APPROVED FOR POTABLE WATER.
3. CONTACT FACTORY FOR OPTIONAL INSULATION.

VST42-84E STOCK HOT WATER STORAGE TANK

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PH.(909)628-2779
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SUBMITTED BY:		
JOB NAME:		
SERIAL NO.: WILL ADVISE	CONSTRUCTION AND STAMPING PER A.S.M.E CODE, SECTION VIII, DIVISION 1	MODEL NO: VST42-84E
DATE:		APPVD BY:
DESIGN/M.A.W.P. 150/150 PSI	WORKING TEMP. (Max./Min.) 200/-20 F°	LINING: EPOXY
TEST PRESSURE: 195 PSI	VOLUME: 591 GAL.	WEIGHT: 1200 LBS

South Gate Engineering

CUSTOM HOT WATER STORAGE TANKS

With over 100 years of combined experience in manufacturing A.S.M.E. Code pressure vessels, quality and dependability can be assured in every vessel we build.

Custom hot water storage tanks are manufactured for pressures of 125 and 150 PSI, with layouts shown in the following drawings. These vessels can be specified with all the necessary connection required for easy installation with water heaters, boilers, or other water-heating devices. Typical applications include residential apartments, commercial buildings, schools, hotels, and industrial processes. Also available from the factory are other custom designs and fabrications for those tough projects. Please consult the factory with specification requirements.

DESIGN:

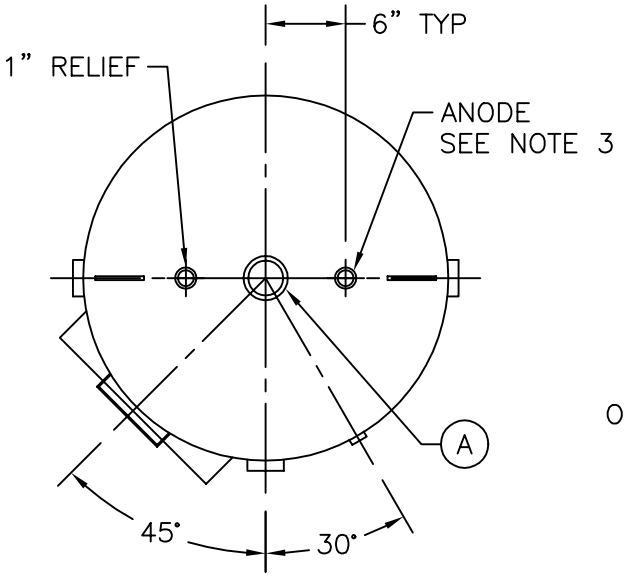
The first step in designing an efficient and economical hot water system requires an analysis of two variables: storage tank capacity and recovery rates. Tables showing the variable's relationship for various applications such as schools, hotels, apartments, etc., can be found in the latest edition of the ASHRAE Handbook. Our talented sales

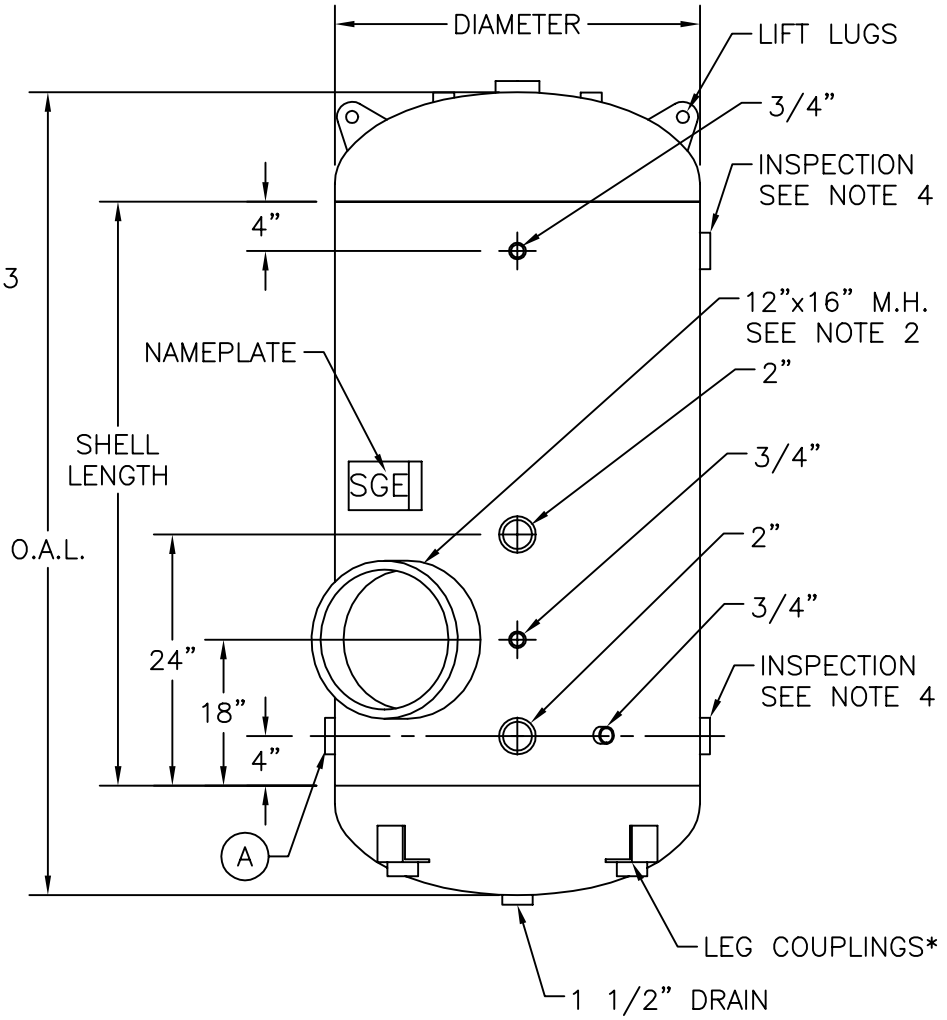
engineering staff is available to assist in determining proper storage requirements for your specific application.

Once the capacity has been determined, an economical selection focuses upon the physical limitations of the installation. Tank diameter and overall length are affected by accessibility, available floor space, ceiling height, and door width. As a general rule: for a given capacity, it is more economical to select a tank with a smaller diameter and longer shell. Please refer to the Tank Sizing Guide located in this catalog.

Additionally, lining choice will play an important role in both the total cost and the economic life of the vessel. Local water conditions, and accessibility for maintenance or repair, should be considered when choosing an appropriate protective lining. Please refer to the Standard Tank Lining Guide located in this catalog.

CUSTOM VERTICAL HOT WATER STORAGE TANKS





DIA	A	*LEGS
18"	1 1/2"	3 @ 1 1/2"
24"	1 1/2"	3 @ 1 1/2"
30"	2"	3 @ 2"
36"	2"	4 @ 2"
42"	2"	4 @ 2"
48"	2"	4 @ 2"
54"	2 1/2"	4 @ 2 1/2"
60"	2 1/2"	4 @ 2 1/2"
66"	2 1/2"	4 @ 3"
72" & UP	3"	4 @ 3"

NOTES:

1. VESSELS DESIGNED AND STAMPED IN ACCORDANCE WITH SECTION VIII, DIV. 1, A.S.M.E. PRESSURE VESSEL CODE.
2. 12"x16" MANHOLE IS STANDARD ON ALL TANKS 42" DIAMETER AND LARGER, OR ON PHENOLIC AND DURAMENT LINED TANKS.
3. ANODE STANDARD ON GLASS LINED TANKS ONLY.
4. 2" INSPECTION OPENINGS PROVIDED ON ALL TANKS WITHOUT MANHOLE.
5. SPRAY FOAM OR RIGID FIBERGLASS INSULATION IS OPTIONAL.

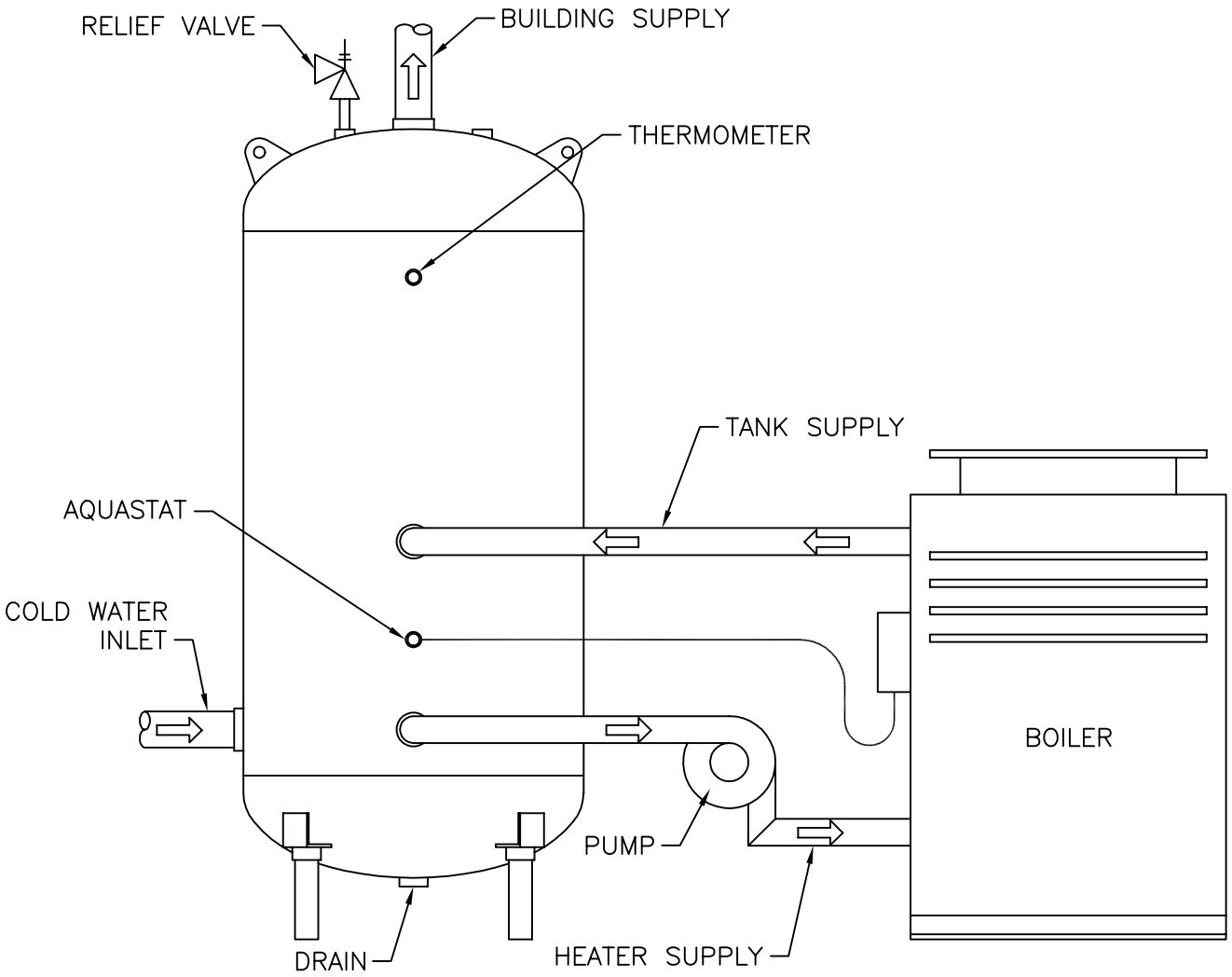
SOUTH GATE ENGINEERING

13477 YORBA AVENUE
CHINO, CALIFORNIA
91710

PH.(909)628-2779
FAX.(909)628-6779

SUBMITTED BY:		DATE:
JOB NAME:		
MODEL NO. VST		LINING:
CAPACITY:		DESIGN PRESSURE:
DIAMETER:	SHELL LENGTH:	O.A.L.:
QUANTITY:		VOLUME:

VERTICAL HOT WATER STORAGE HOOK–UP



TYPICAL SPECIFICATION WORKSHEET

FURNISH AND INSTALL WHERE INDICATED ON CONTRACT DRAWINGS, HOT WATER STORAGE TANK AS MANUFACTURED BY SOUTH GATE ENGINEERING, LLC., MODEL NO. _____.

THE STORAGE TANK SHALL BE (VERTICAL, HORIZONTAL), __ DIAMETER BY ___ OVERALL LENGTH, WITH A CAPACITY OF _____ GALLONS.

THE STORAGE TANK SHALL BE DESIGNED AND MANUFACTURED IN ACCORDANCE WITH SECTION VIII, DIVISION 1 OF THE A.S.M.E. CODE FOR PRESSURE VESSELS, STAMPED FOR A WORKING PRESSURE OF ___ PSI AND A TEST PRESSURE OF _____ PSI.

THE STORAGE TANK SHALL BE CONSTRUCTED OF (STEEL, STAINLESS) WITH (STEEL, STAINLESS) COUPLINGS. THE INTERIOR SHALL BE LINED WITH (DURAMENT, GLASS, EPOXY PHENOLIC) AND CARRY A FACTORY WARRANTY OF 3 YEARS. EXTERIOR OF THE TANK SHALL BE HAND TOOL CLEANED AND PRIMED WITH A COAT OF SHOP PRIMER.

STORAGE TANK SHALL BE FACTORY INSULATED WITH ___ OF FIBERGLASS INSULATION AND JACKETED WITH 0.020" ALUMINUM JACKET OR INSULATED WITH ___ POLYURETHANE SPRAY FOAM. FINISH WITH A COAT OF ACRYLIC SEALER.

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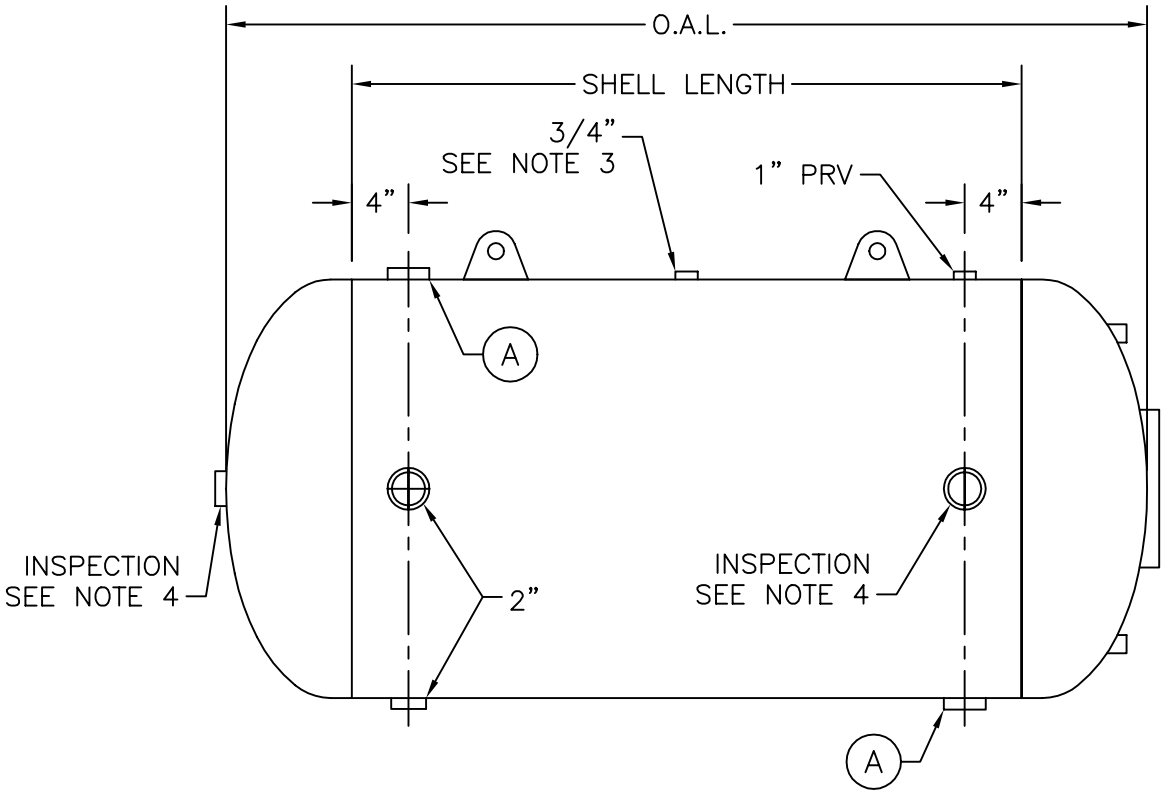
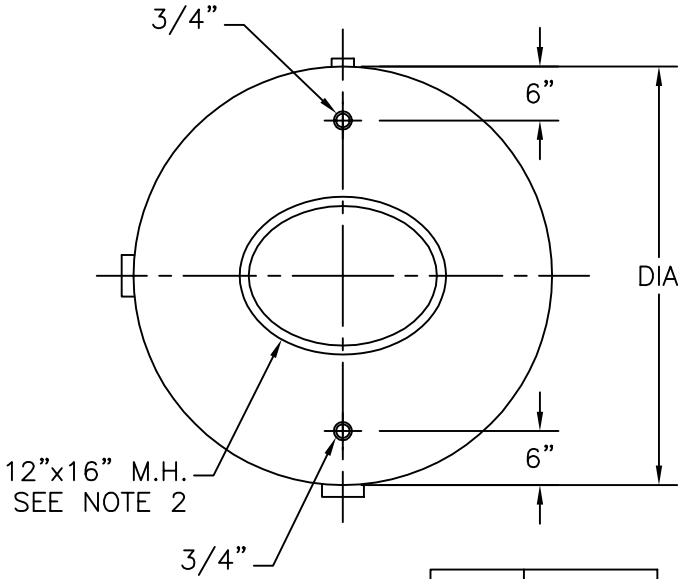
CUSTOM HORIZONTAL HOT WATER STORAGE TANKS





DIA	A
18"	1 1/2"
24"	1 1/2"
30"	2"
36"	2"
42"	2"
48"	2"
54"	2 1/2"
60"	2 1/2"
66"	2 1/2"
72" & UP	3"

NOTES:

1. VESSELS DESIGNED AND STAMPED IN ACCORDANCE WITH SECTION VIII, DIV. 1, A.S.M.E. PRESSURE VESSEL CODE.
2. 12"x16" MANHOLE IS STANDARD ON ALL TANKS 42" DIAMETER AND LARGER, OR ON PHENOLIC AND DURAMENT LINED TANKS.
3. ANODE STANDARD ON GLASS LINED TANKS ONLY.
4. 2" INSPECTION OPENINGS PROVIDED ON ALL TANKS WITHOUT MANHOLE.
5. SPRAY FOAM OR RIGID FIBERGLASS INSULATION IS OPTIONAL.

SOUTH GATE ENGINEERING

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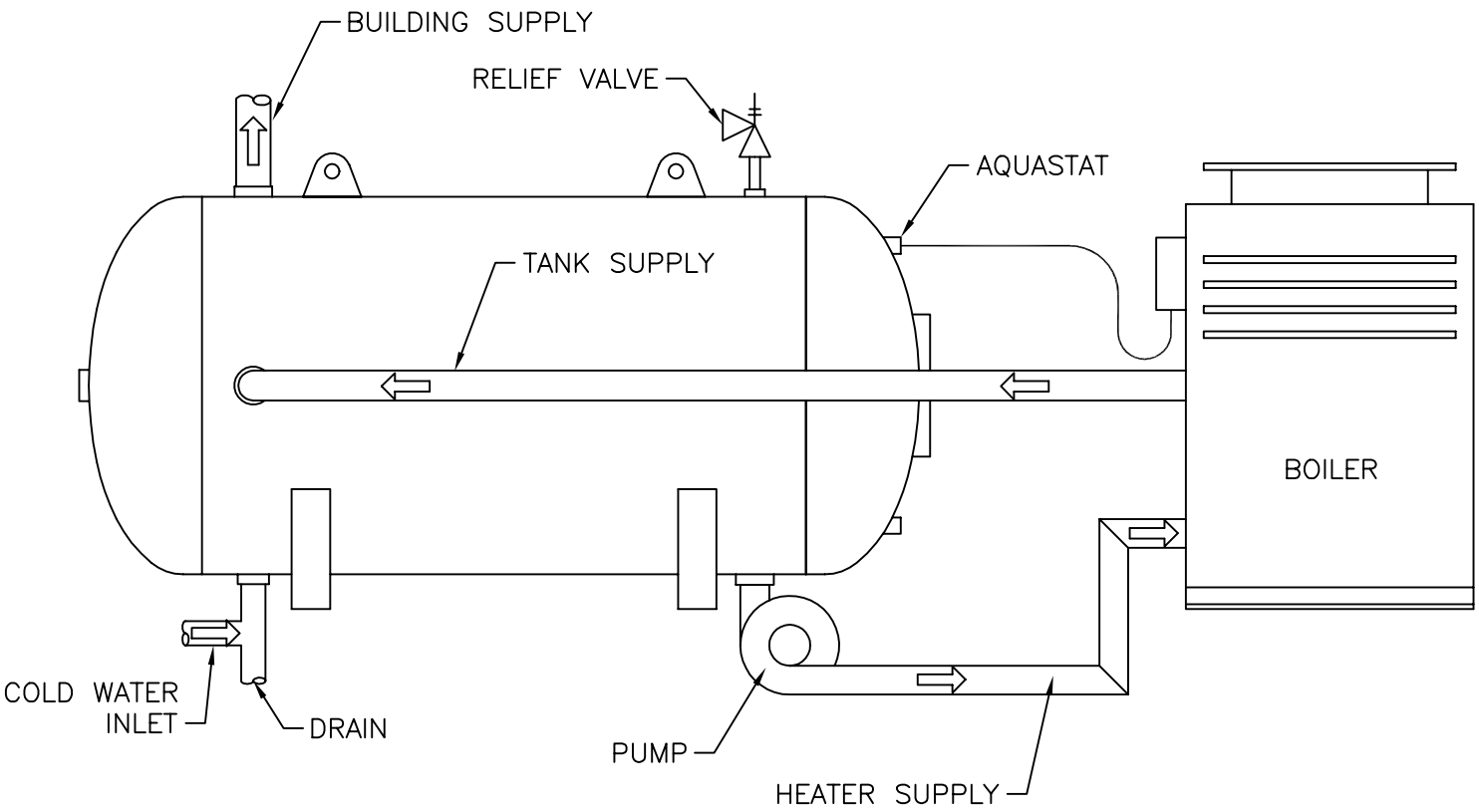
91710

PH.(909)628-2779
FAX.(909)628-6779

SUBMITTED BY:	DATE:	
JOB NAME:		
MODEL NO: HST	LINING:	
CAPACITY:	DESIGN PRESSURE:	
DIAMETER:	SHELL LENGTH:	O.A.L.:
QUANTITY:	VOLUME:	

HORIZONTAL HOT WATER STORAGE HOOK–UP



TYPICAL SPECIFICATION WORKSHEET

FURNISH AND INSTALL WHERE INDICATED ON CONTRACT DRAWINGS, HOT WATER STORAGE TANK AS MANUFACTURED BY SOUTH GATE ENGINEERING, LLC., MODEL NO. _____.

THE STORAGE TANK SHALL BE (VERTICAL, HORIZONTAL), __ DIAMETER BY ___ OVERALL LENGTH, WITH A CAPACITY OF _____ GALLONS.

THE STORAGE TANK SHALL BE DESIGNED AND MANUFACTURED IN ACCORDANCE WITH SECTION VIII, DIVISION 1 OF THE A.S.M.E. CODE FOR PRESSURE VESSELS, STAMPED FOR A WORKING PRESSURE OF ___ PSI AND A TEST PRESSURE OF _____ PSI.

THE STORAGE TANK SHALL BE CONSTRUCTED OF (STEEL, STAINLESS) WITH (STEEL, STAINLESS) COUPLINGS. THE INTERIOR SHALL BE LINED WITH (DURAMENT, GLASS, EPOXY PHENOLIC) AND CARRY A FACTORY WARRANTY OF 3 YEARS. EXTERIOR OF THE TANK SHALL BE HAND TOOL CLEANED AND PRIMED WITH A COAT OF SHOP PRIMER.

STORAGE TANK SHALL BE FACTORY INSULATED WITH ___ OF FIBERGLASS INSULATION AND JACKETED WITH 0.020" ALUMINUM JACKET OR INSULATED WITH ___ POLYURETHANE SPRAY FOAM. FINISH WITH A COAT OF ACRYLIC SEALER.

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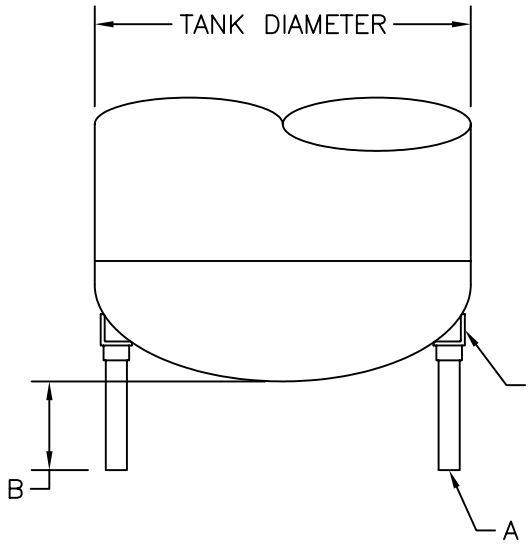
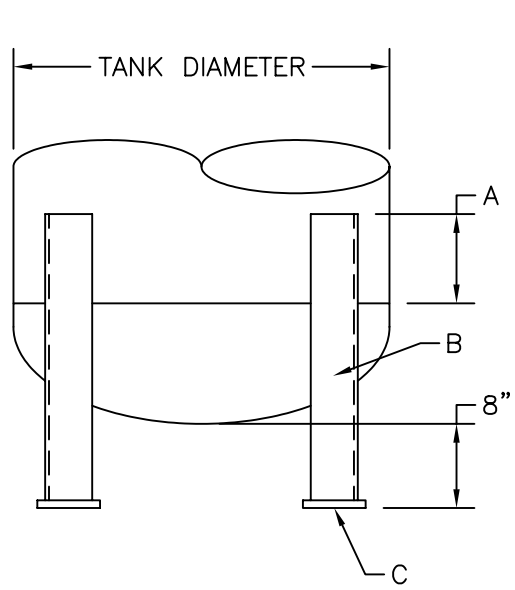
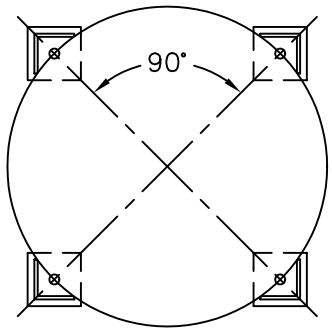
CUSTOM TANK ACCESSORIES

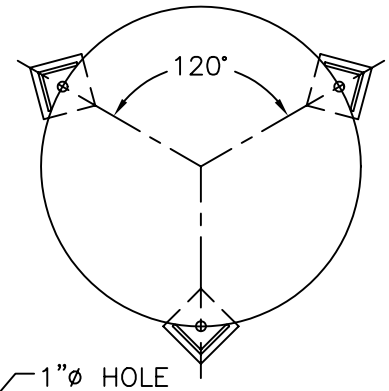


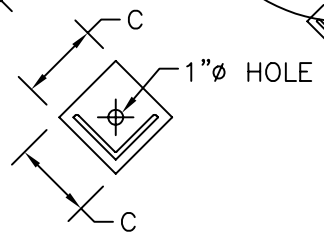
PIPE LEGS

DIA	A	B	NO.
18–24"	1 1/2"	6"	3
30–42"	2"	8"	4
48–60"	2 1/2"	8"	4









ANGLE LEGS

DIA	A	B	C	NO.
18–24"	4"	L3"x3"x1/4"	3/8"x6"x6"	3
30–42"	6"	L3"x3"x1/4"	1/2"x6"x6"	4
48–54"	6"	L3"x3"x3/8"	1/2"x6"x6"	4

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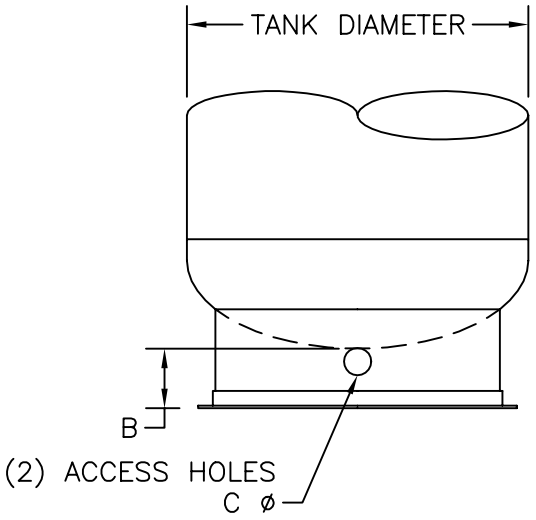
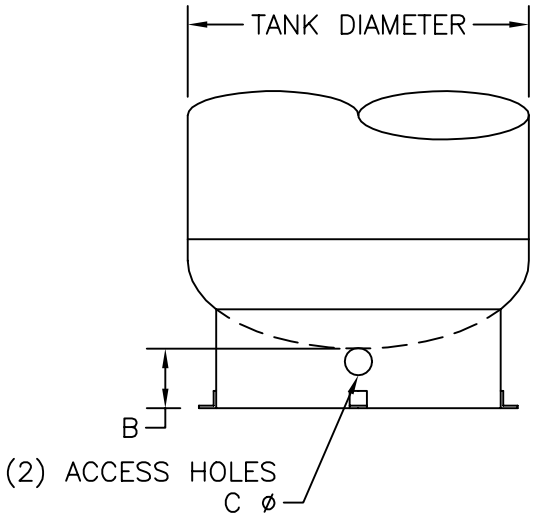
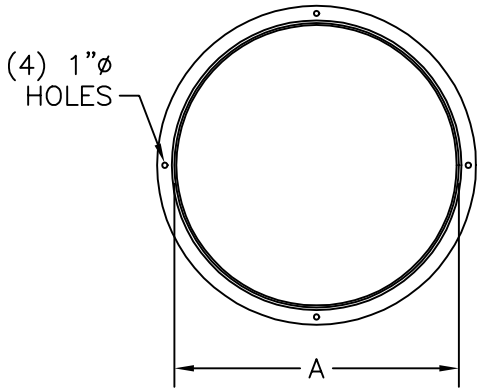
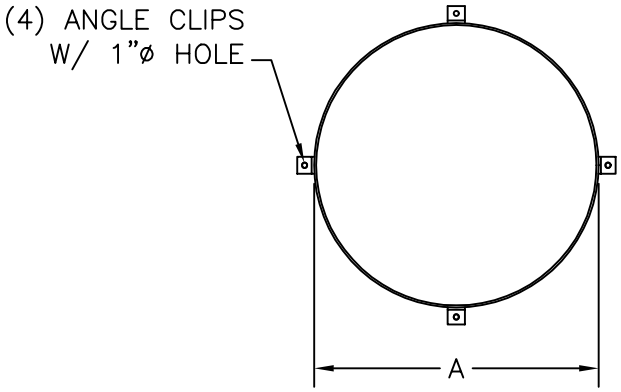
CUSTOM TANK ACCESSORIES









RING SKIRT

DIA	A	B	C
18"	10"	6"	2"
24"	16"	8"	3"
30"	22"	8"	3"
36"	28"	8"	3"
42"	34"	8"	4"
48"	40"	8"	4"
54"	42"	8"	4"
60"	48"	8"	4"

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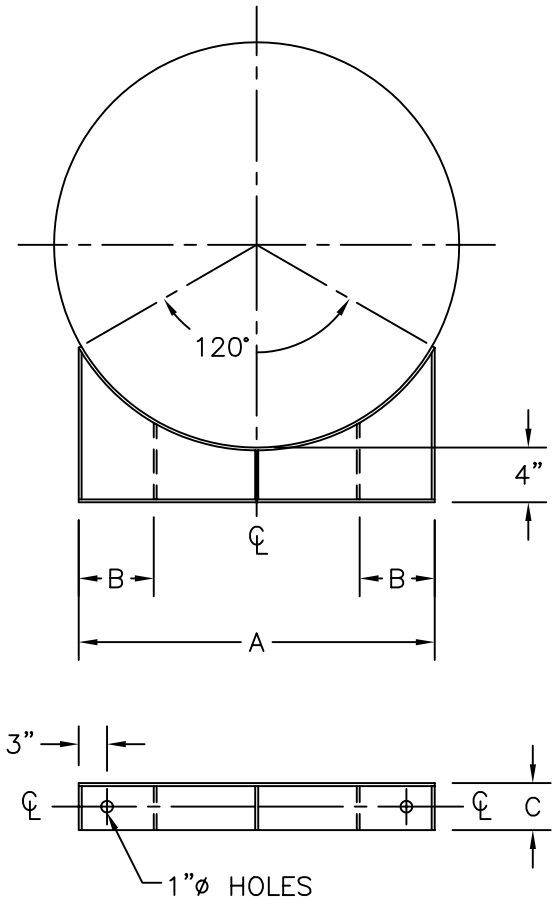
CUSTOM TANK ACCESSORIES



SADDLE SUPPORT

DIA	A	B	C
18"	16"	–	4"
24"	21"	–	4"
30"	26"	–	4"
36"	32"	–	4"
42"	37"	–	4"
48"	42"	–	4"
54"	47"	12"	6"
60"	52"	13"	6"

SOUTH GATE ENGINEERING

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South Gate Engineering

HOT WATER GENERATORS

South Gate Engineering Hot Water Generators are used as a domestic hot water source through the use of an integrated copper coil tube bundle. This tube bundle utilizes convection heat transfer to heat the water inside the vessel by either steam or heated water. South Gate Engineering's Hot Water Generators are designed and certified to the A.S.M.E. Pressure Vessel Code and are available in either vertical or horizontal styles. Standard Hot Water Generators come in pressures of 125 and 150 PSI at 200 degrees F. Other design pressures and temperatures are available. Copper tube bundles are also available in many sizes, with tube sheet materials ranging from carbon steel, stainless steel, and cuprous-nickel. Consult the factory with your custom requirements.

DESIGN:

When a copper coil tube bundle is installed into a horizontal tank, optimal heat transfer is obtained when the coil length is 2/3 of the tank length. Coils should not be less than half the tank length or greater than 80% of the tank length. When a copper coil tube bundle is installed into a vertical tank, the optimal coil length is equal to the tank diameter. Coils should not be less that half the tank diameter in length or longer than the tank diameter plus 6 inches.

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South Gate Engineering can provide hot water generators with a single wall tube bundle where local plumbing codes allow, or double wall tube bundles to meet current requirements that prevent the heating fluid from mixing with the potable fluid, should a failure occur in the heating element. Please contact the factory for pricing and further information. South Gate Engineering can also supply hot water generation packages complete with boiler, pumps, and piping conveniently skid mounted for easy installation. Again, please consult the factory for sizing and pricing.

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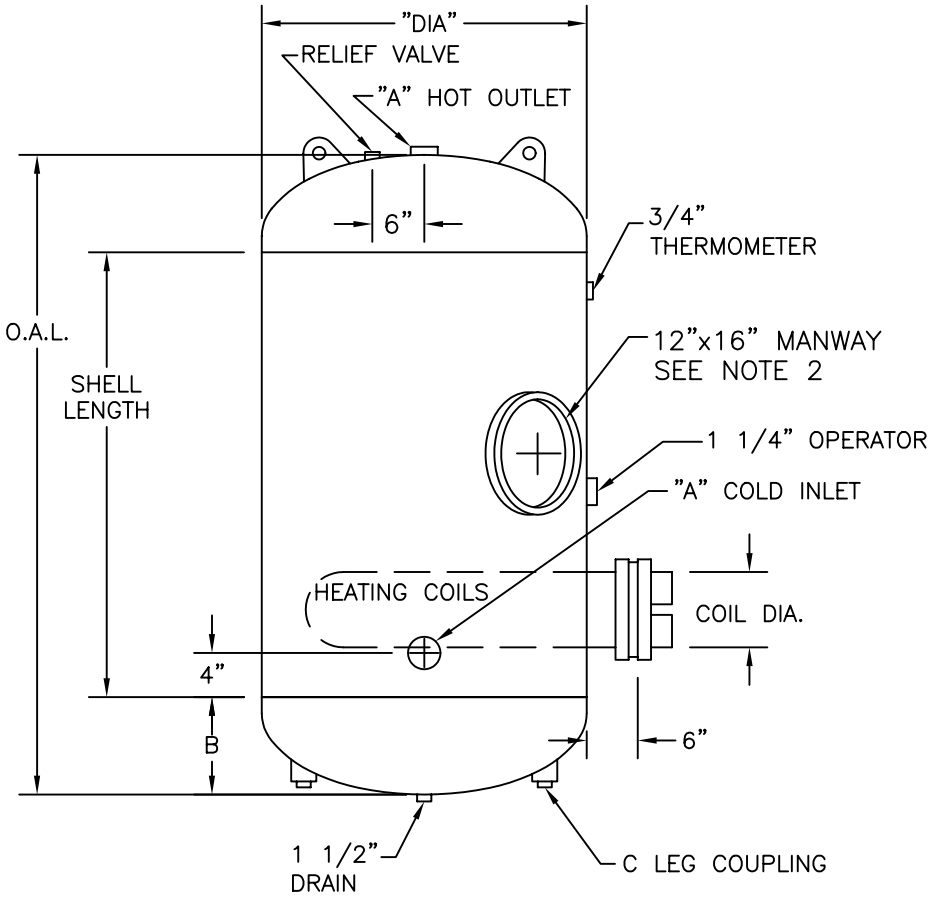
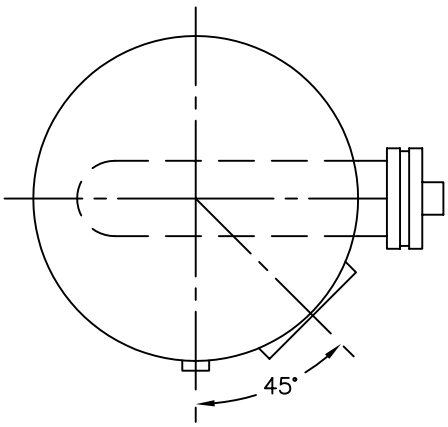
VERTICAL HOT WATER GENERATOR





2–PASS COILS ARE FURNISHED FOR ALL STEAM UNITS. MULTI–PASS COILS ARE NORMALLY FURNISHED FOR ALL HOT WATER BOILER UNITS. 2–PASS COILS WILL BE FURNISHED IF HEATING MEDIUM OR BOILER WATER FLOW IS UNKNOWN.

TANK DIA.	12"	18"	24"	30"	36"	42"	48"	54"	60"	66"	72"	84"	96"
A	1 1/2"	1 1/2"	1 1/2"	2"	2"	2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	2 1/2"	3"	3"
B	4 1/2"	6"	7 1/2"	9"	10 1/2"	12"	13 1/2"	15 1/2"	16 1/2"	17 1/2"	20"	22"	24 1/2"
C	(3) 1"	(3) 1"	(3) 1 1/2"	(3) 1 1/2"	(3) 1 1/2"	(3) 2"	(3) 2"	(3) 2"	(4) 2"	(4) 2 1/2"	(4) 2 1/2"	(4) 2 1/2"	(4) 2 1/2"

1. MANUFACTURED IN ACCORDANCE WITH SECTION VIII, DIV. 1, A.S.M.E. PRESSURE VESSEL CODE.
2. 12"x16" MANHOLE IS STANDARD ON ALL TANKS 42" DIAMETER OR LARGER, OR ON PHENOLIC AND DURAMENT LINED TANKS.
3. 2" INSPECTION OPENINGS PROVIDED ON ALL TANKS WITHOUT MANHOLE.

COIL INFORMATION:

DIAMETER _____ LENGTH _____ PASSES _____

HEATING MEDIUM _____STEAM_____LBS/HR @_____PSIG

OR _____BOILER WATER_____GPM _____°F TO _____°F

RECOVERY _____GPH _____°F TO _____°F

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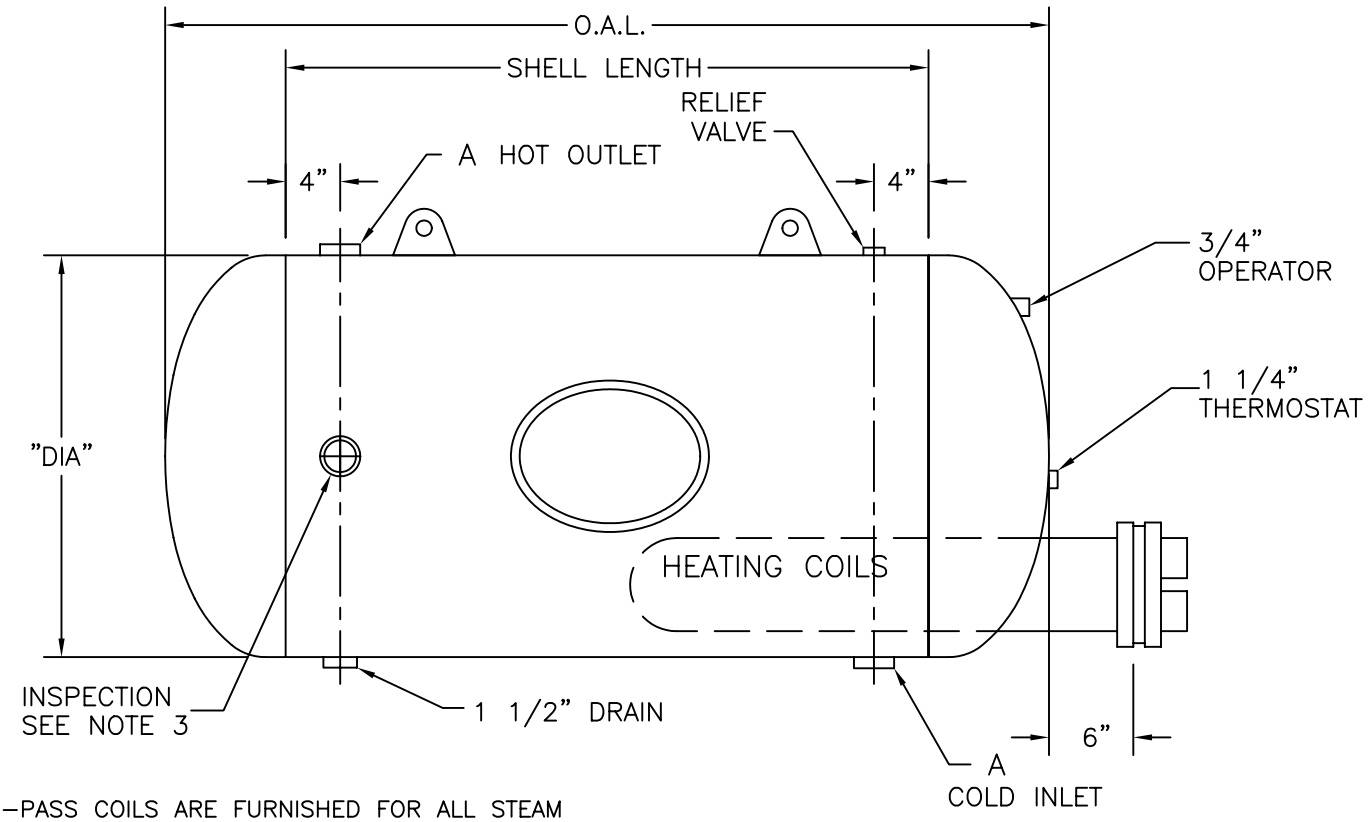
JOB NAME:		
SUBMITTED BY:		DATE:
MODEL NO.	LINING:	
CAPACITY:	DESIGN PRESSURE:	
DIAMETER:	SHELL LENGTH:	O.A.L.:
QUANTITY:		

HORIZONTAL HOT WATER GENERATOR



2–PASS COILS ARE FURNISHED FOR ALL STEAM UNITS. MULTI–PASS COILS ARE NORMALLY FURNISHED FOR ALL HOT WATER BOILER UNITS. 2–PASS COILS WILL BE FURNISHED IF HEATING MEDIUM OR BOILER WATER FLOW IS UNKNOWN.

"DIA"	A (NPT)
18"–24"	1 1/2"
30"–42"	2"
48"–72"	2 1/2"
84"–96"	3"

1. MANUFACTURED IN ACCORDANCE WITH SECTION VIII, DIV. 1, A.S.M.E. PRESSURE VESSEL CODE.
2. 12"x16" MANHOLE IS STANDARD ON ALL TANKS 42" DIAMETER OR LARGER, OR ON PHENOLIC AND DURAMENT LINED TANKS.
3. 2" INSPECTION OPENINGS PROVIDED ON ALL TANKS WITHOUT MANHOLE.

COIL INFORMATION:

DIAMETER _____ LENGTH _____ PASSES _____

HEATING MEDIUM _____STEAM_____LBS/HR @_____PSIG

OR _____BOILER WATER_____GPM _____°F TO _____°F

RECOVERY _____GPH _____°F TO _____°F

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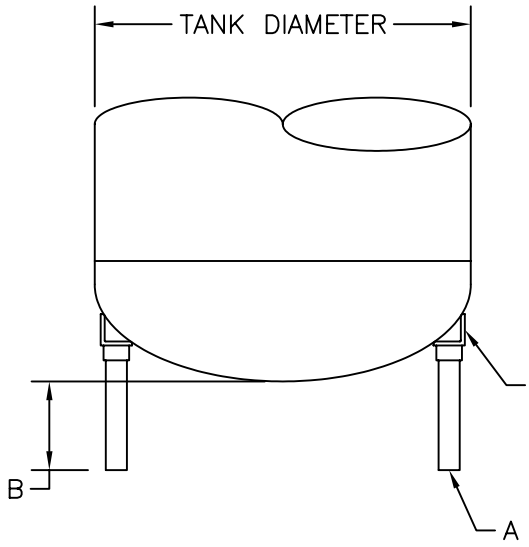
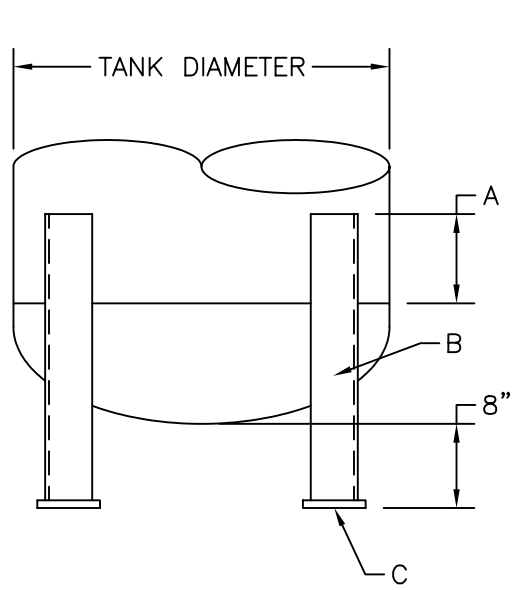
JOB NAME:		
SUBMITTED BY:		DATE:
MODEL NO.		LINING:
CAPACITY:		DESIGN PRESSURE:
DIAMETER:	SHELL LENGTH:	O.A.L.:
QUANTITY:		

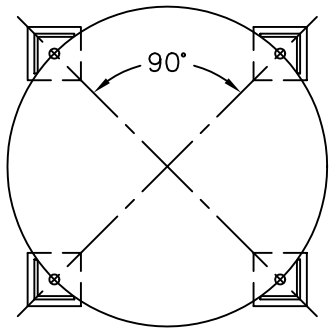
CUSTOM TANK ACCESSORIES

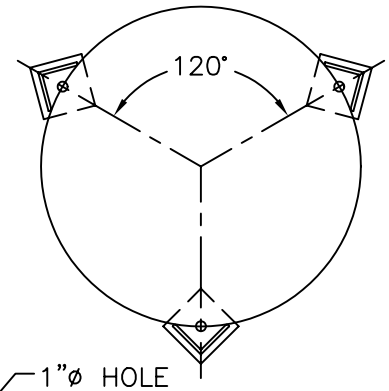


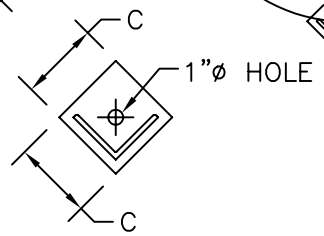
PIPE LEGS

DIA	A	B	NO.
18–24"	1 1/2"	6"	3
30–42"	2"	8"	4
48–60"	2 1/2"	8"	4









ANGLE LEGS

DIA	A	B	C	NO.
18–24"	4"	L3"x3"x1/4"	3/8"x6"x6"	3
30–42"	6"	L3"x3"x1/4"	1/2"x6"x6"	4
48–54"	6"	L3"x3"x3/8"	1/2"x6"x6"	4

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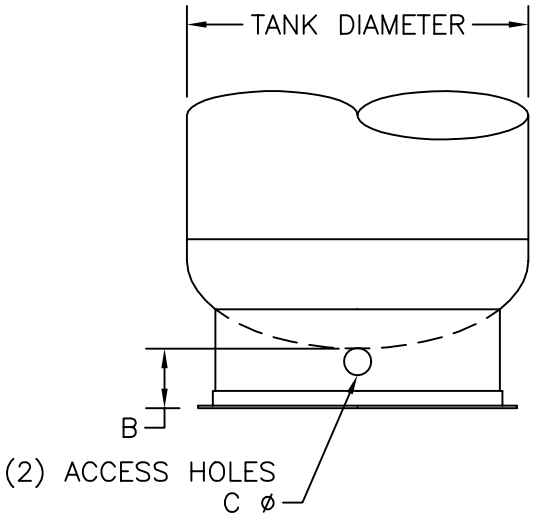
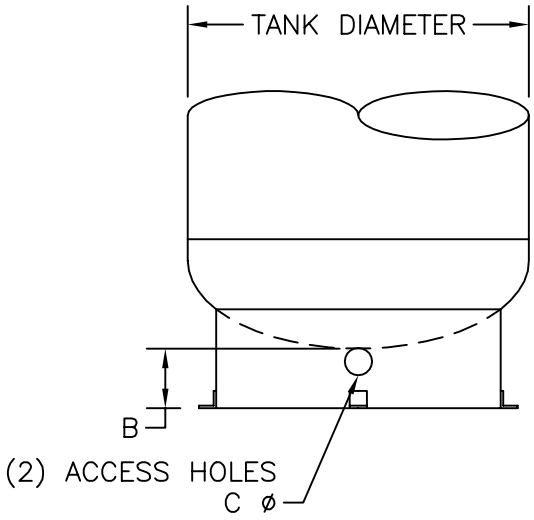
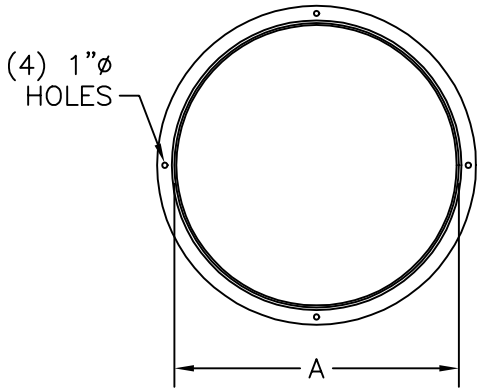
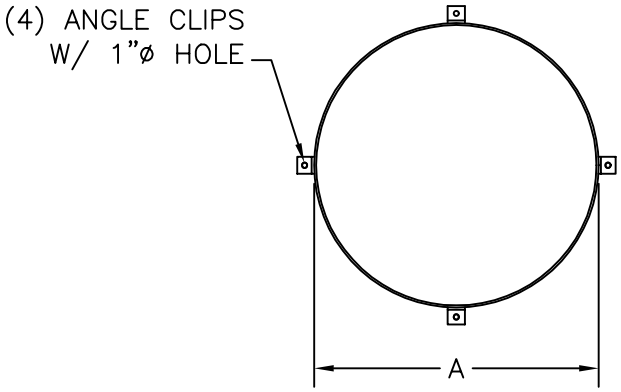
CUSTOM TANK ACCESSORIES









RING SKIRT

DIA	A	B	C
18"	10"	6"	2"
24"	16"	8"	3"
30"	22"	8"	3"
36"	28"	8"	3"
42"	34"	8"	4"
48"	40"	8"	4"
54"	42"	8"	4"
60"	48"	8"	4"

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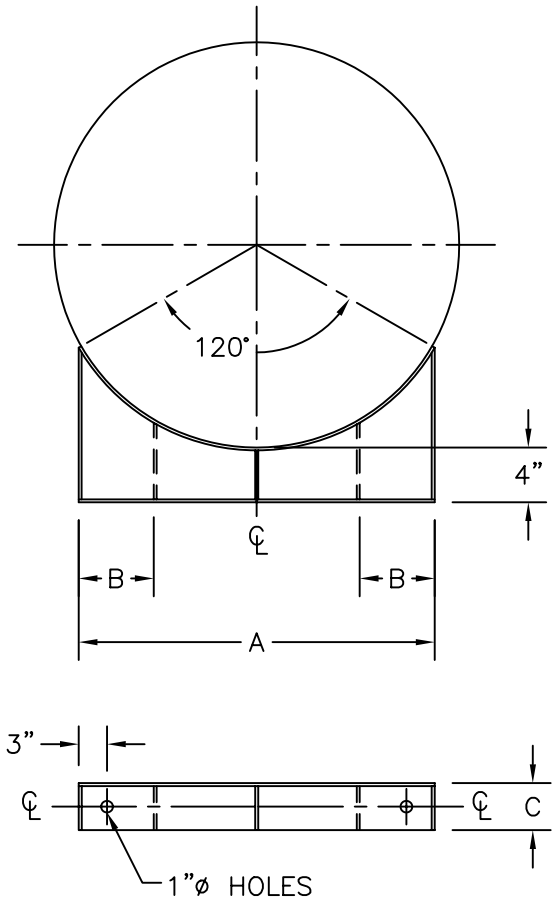
CUSTOM TANK ACCESSORIES



SADDLE SUPPORT

DIA	A	B	C
18"	16"	–	4"
24"	21"	–	4"
30"	26"	–	4"
36"	32"	–	4"
42"	37"	–	4"
48"	42"	–	4"
54"	47"	12"	6"
60"	52"	13"	6"

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South Gate Engineering

AIR RECEIVERS

South Gate Engineering manufactures both standard and custom A.S.M.E. Code Air Receivers for new and existing compressed air systems. Air Receivers are provided in all compressed air systems for the following reasons:

1. Storage capacity is essential in providing compressed air when short-term demand exceeds the compressor output.
2. Pulsation caused by compressor operation is reduced as a result of the proper selection of the air receiver.
3. Adequate storage allows the compressor to cycle and not operate continuously.
4. Moisture and oil entrained in the air are allowed to settle to the bottom of the air receiver where it can be periodically blown off.

Standard air receivers are available in both 125 and 150 PSI. Custom air receivers can be ordered with any pressure rating designed. All vessels are manufacture in accordance with the A.S.M.E. Code, Section VIII, Division 1 for unfired pressure vessels. Please consult the factory with the specification requirements for design and pricing.

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DESIGN:

The first step in designing a compressed air system focuses on determining the system's demand requirements. Once the demand has been determined, a compressor with sufficient output can be selected. It is recommended that the air receiver be sized to best supplement the air compressor operation, and a common approach is based on one minute of storage for the rated compressor output. The following formula can be used for this determination:

$$V = C_r \times (C_i / C_o)$$

V = Air Receiver Volume (cu. ft)
C_r = Compressor Rating (cfm free air)
C_i = Compressor Inlet Free Air (psia)
C_o = Compressor Outlet Pressure (psia)

Conversions:

Cubic Feet to Gallons: Multiply by 7.48
PSIG to PSIA: Add 14.7

After calculating the air receiver capacity, inlet and outlet connections should be selected based on the size of the compressor outlet connection. Safety valves should also be sized equal to or greater than the compressor capacity in cubic feet of free air. Please contact the factory with any additional questions.

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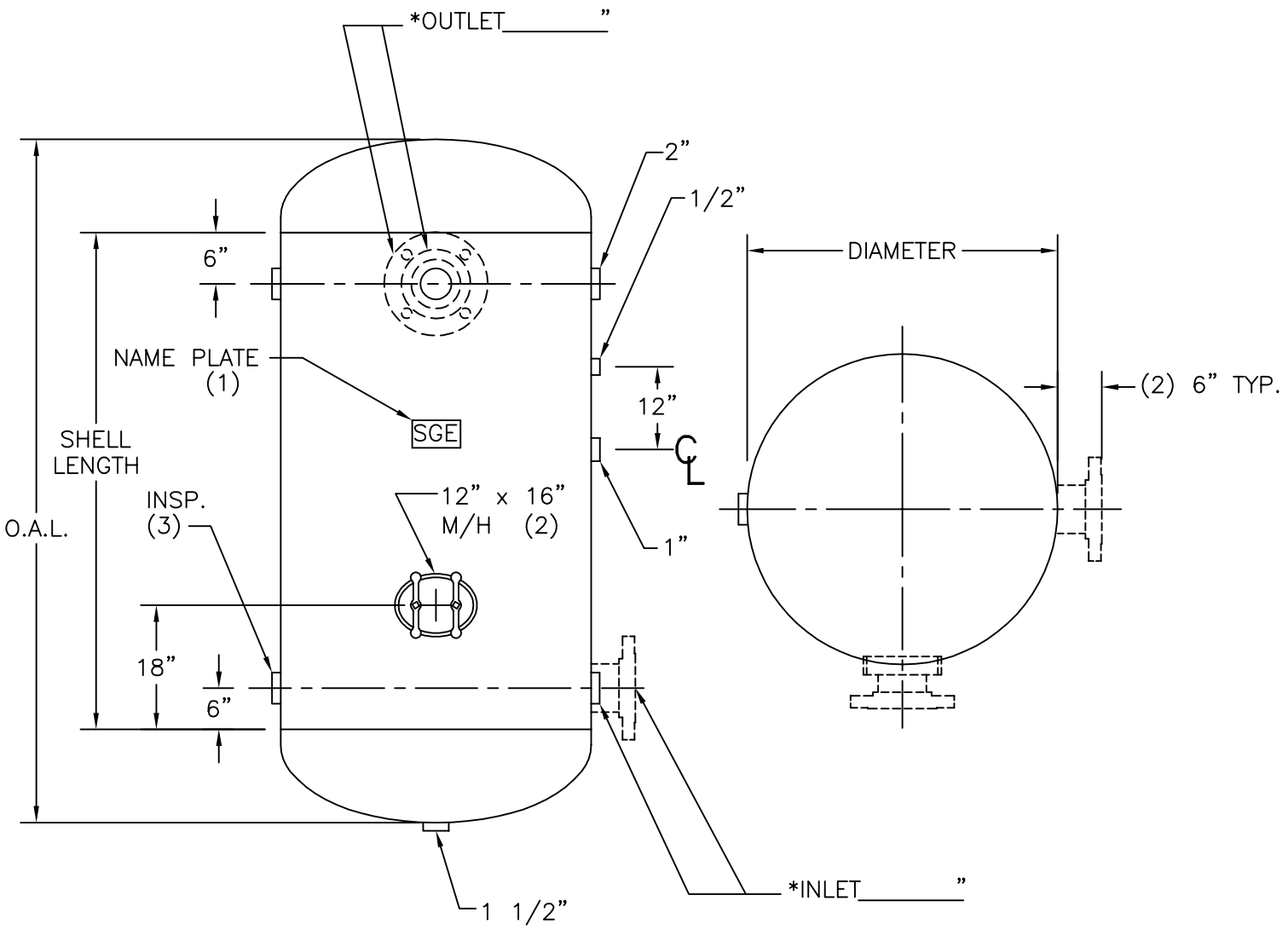
VERTICAL AIR RECEIVERS



*FLANGED INLET/OUTLET WILL BE RFSO

NOTES:

1. VESSELS DESIGNED AND STAMPED IN ACCORDANCE WITH SECTION VIII, DIV. 1, A.S.M.E. PRESSURE VESSEL CODE.
2. 12"x16" MANHOLE IS STANDARD ON ALL TANKS 42" DIAMETER AND LARGER, OR ALL EPOXY LINED TANKS.
3. 2" INSPECTION OPENINGS PROVIDED ON ALL TANKS WITHOUT MANHOLE.

SOUTH GATE ENGINEERING

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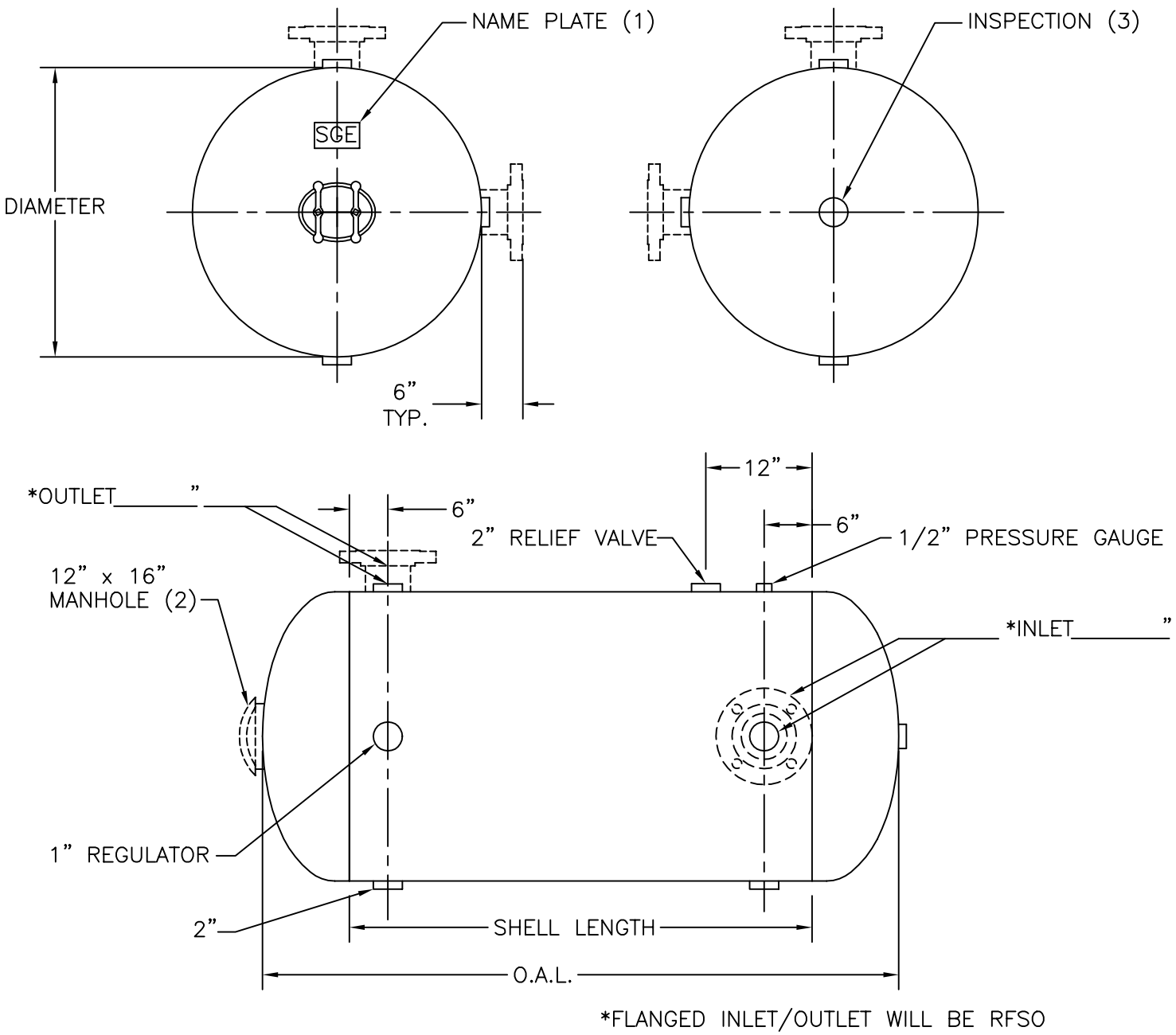
FAX.(909)628-6779

SUBMITTED BY:		DATE:
JOB NAME:		
MODEL NO.		LINING:
CAPACITY:		DESIGN PRESSURE:
DIAMETER:	SHELL LENGTH:	O.A.L.:
QUANTITY:		

HORIZONTAL AIR RECEIVERS



*FLANGED INLET/OUTLET WILL BE RFSO

NOTES:

1. VESSELS DESIGNED AND STAMPED IN ACCORDANCE WITH SECTION VIII, DIV. 1, A.S.M.E. PRESSURE VESSEL CODE.
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SUBMITTED BY:		DATE:
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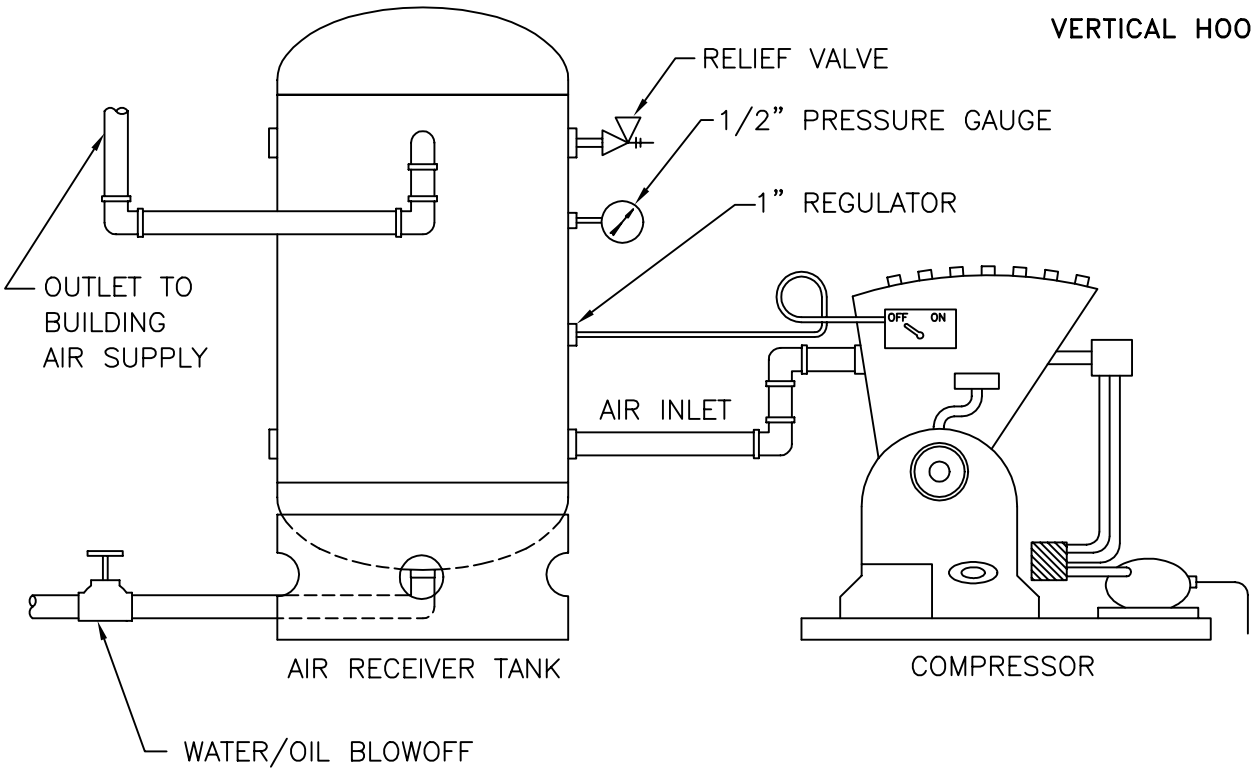
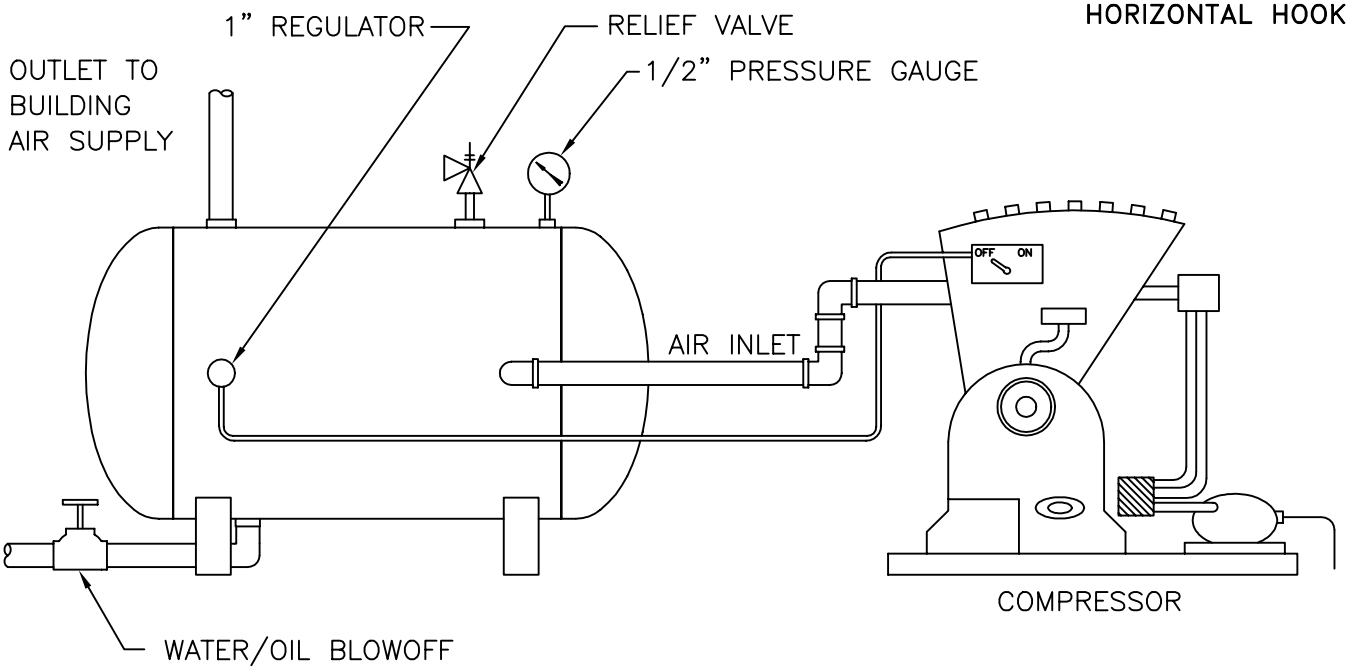
CAPACITY:		DESIGN PRESSURE:
DIAMETER:	SHELL LENGTH:	O.A.L.:
QUANTITY:		

AIR RECEIVERS

VERTICAL HOOK–UP



HORIZONTAL HOOK–UP



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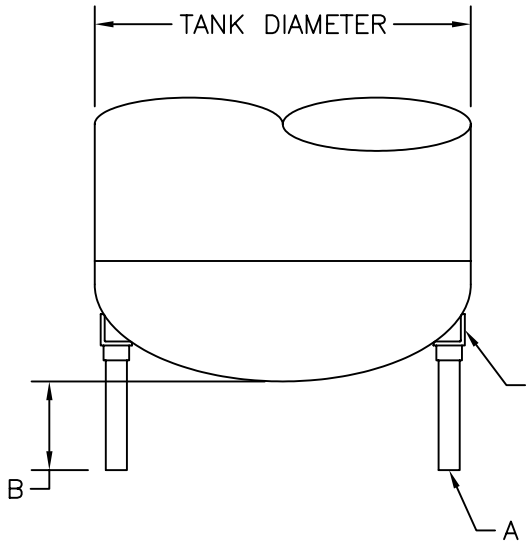
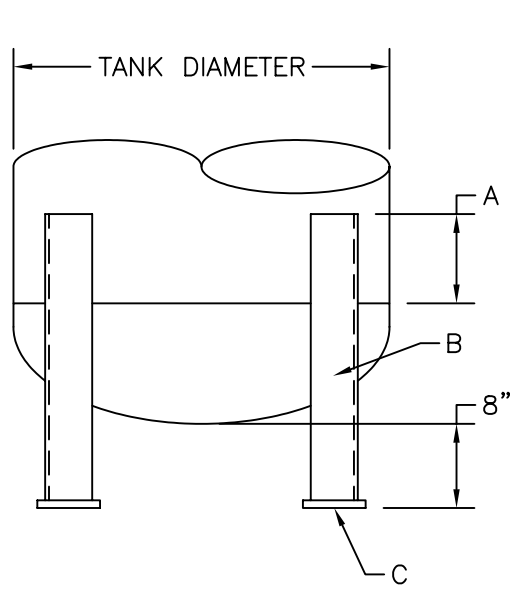
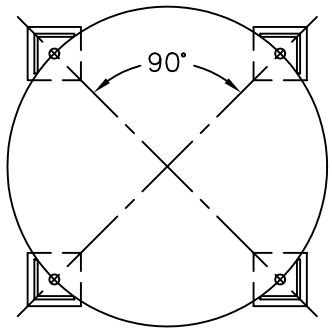
CUSTOM TANK ACCESSORIES

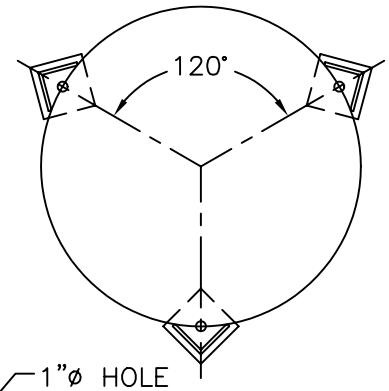


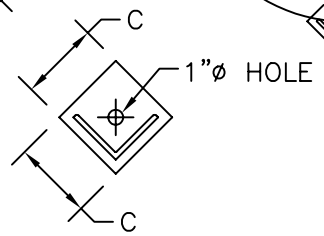
PIPE LEGS

DIA	A	B	NO.
18–24"	1 1/2"	6"	3
30–42"	2"	8"	4
48–60"	2 1/2"	8"	4









ANGLE LEGS

DIA	A	B	C	NO.
18–24"	4"	L3"x3"x1/4"	3/8"x6"x6"	3
30–42"	6"	L3"x3"x1/4"	1/2"x6"x6"	4
48–54"	6"	L3"x3"x3/8"	1/2"x6"x6"	4

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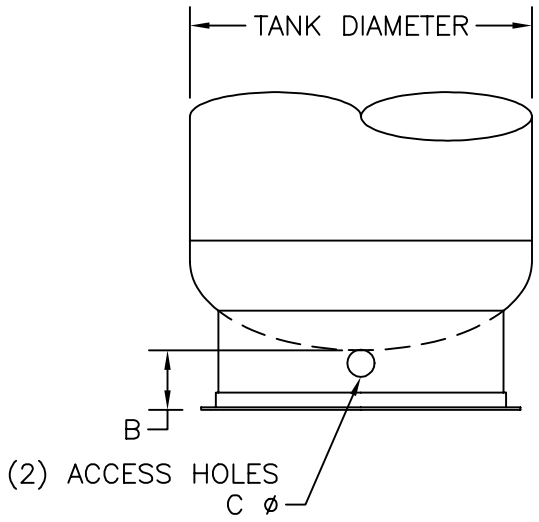
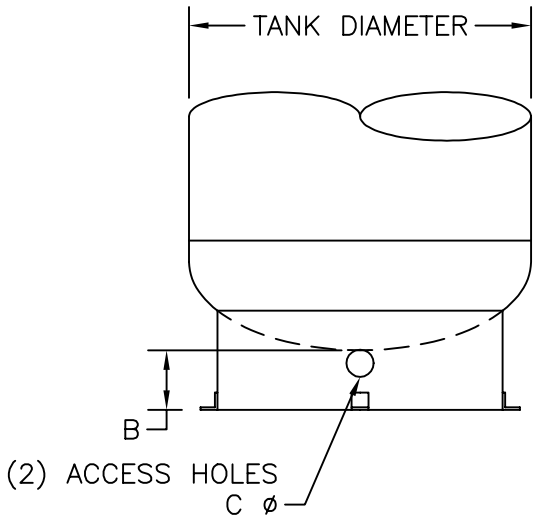
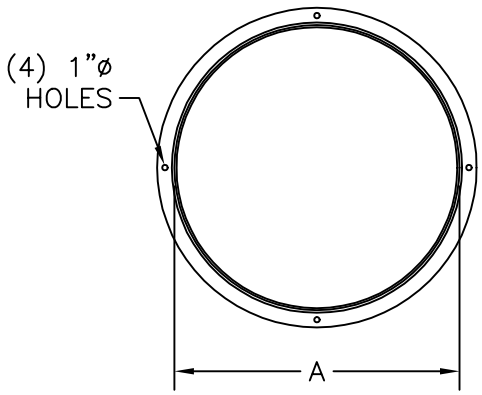
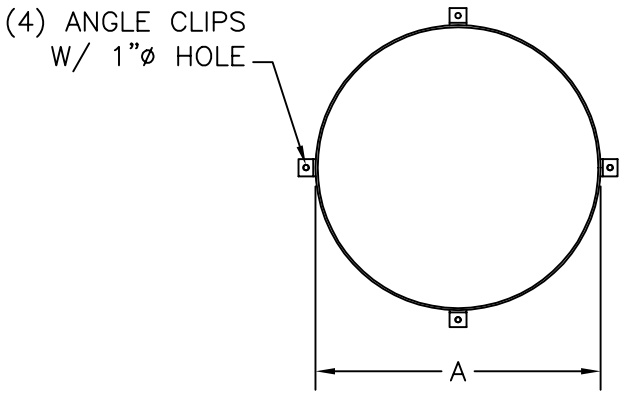
AIR RECEIVER ACCESSORIES









RING SKIRT

DIA	A	B	C
18"	10"	6"	2"
24"	16"	8"	3"
30"	22"	8"	3"
36"	28"	8"	3"
42"	34"	8"	4"
48"	40"	8"	4"
54"	42"	8"	4"
60"	48"	8"	4"

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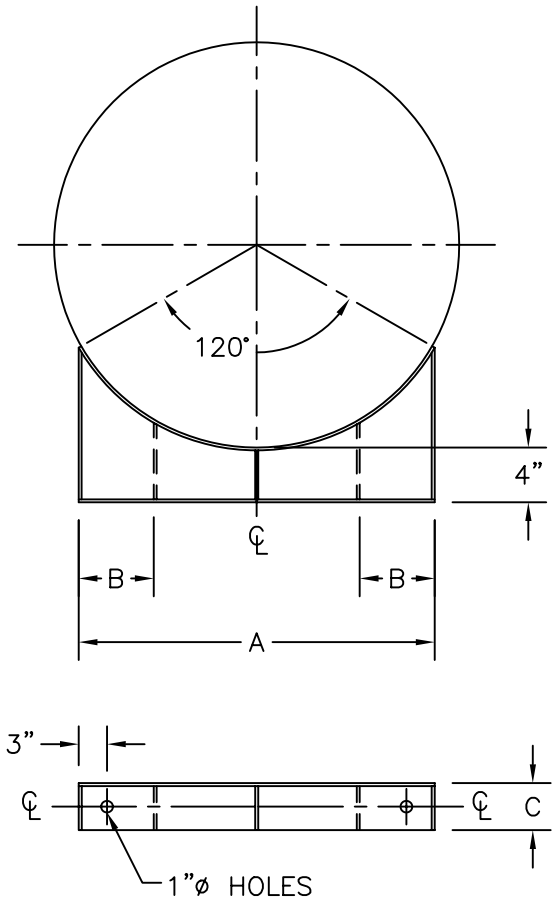
CUSTOM TANK ACCESSORIES



SADDLE SUPPORT

DIA	A	B	C
18"	16"	–	4"
24"	21"	–	4"
30"	26"	–	4"
36"	32"	–	4"
42"	37"	–	4"
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South Gate Engineering

TANGENTIAL AIR SEPARATOR

South Gate Engineering Tangential Air Separators are designed and fabricated in accordance with the A.S.M.E. Boiler and Pressure Vessel Code, Section VIII, Division 1. Standard Tangential Air Separators are designed for 125 PSI at 400 degrees F. Other design pressures and temperatures are available. Please consult the factory with your custom requirements.

The tangential design of South Gate Engineering's Air Separators creates a low velocity vortex in the center of the tank, which consists of lighter air entrained in water. The reduced velocity in this area allows the air to rise to the top of the air separator where it is vented to the atmosphere. The denser air-free water is then forced to the outside of the air separator and thru the outlet.

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South Gate Engineering

DESIGN:

The design of a Tangential Air Separator is determined by two factors: minimum water flow and water velocity. The GPM flow rate shown in the proceeding chart shows typical sizes for a given combination of velocity and flow rate. Non-standard air separators can be manufactured to specific customer requirements, and internal steel strainers are available upon request. Please consult the factory for pricing.

HOOK-UP:

For optimal performance, the air separator should be located as close as possible to the point of lowest air solubility within the system. In addition, it is important that the unit be located on the suction side of the pump. Typical application hook-ups are shown in the proceeding figures.

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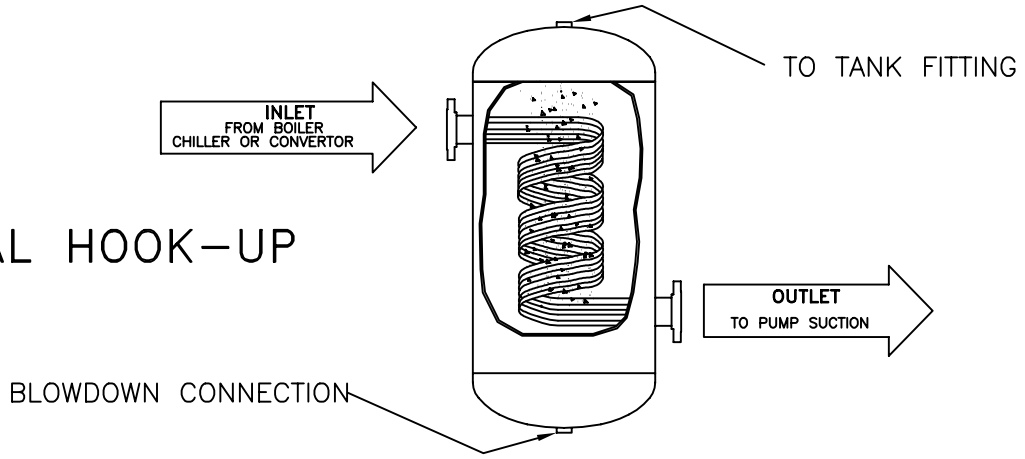
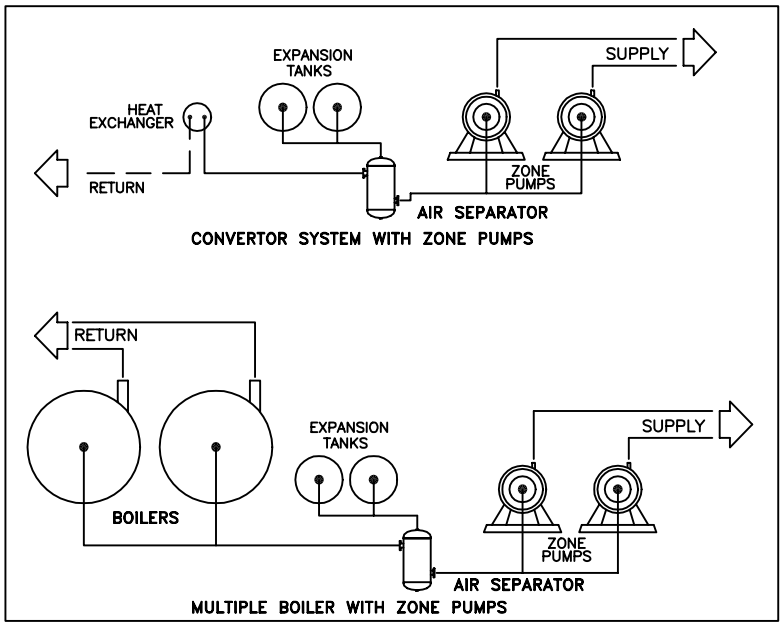
TANGENTIAL AIR SEPARATOR

GPM FLOW RATE CHART

MODEL NO.	INLET OUTLET	VELOCITY 6ft/sec	8ft/sec	10ft/sec	12ft/sec	14ft/sec
AS10–3S	3"	138	185	230	277	323
AS12–4S	4"	238	317	397	476	556
AS16–5S	5"	374	499	624	748	873
AS18–6S	6"	540	721	900	1081	1261
AS24–8S	8"	936	1247	1568	1871	2183
AS30–10S	10"	1475	1966	2458	2450	3441
AS36–12S	12"	2094	2791	3489	4187	4885
AS42–14S	14"	2880	3838	4798	5758	6718

TYPICAL HOOK–UP





TYPICAL INSTALLATION FOR BOTH BOILER AND CONVERTOR APPLICATIONS SHOWS SOUTH GATE ENGINEERING AIR SEPARATOR INSTALLED SO THE SYSTEM STRAINER IS ALWAYS ACCESSIBLE FOR CLEANING. NOTE SYSTEM PUMP ALWAYS OPERATES AWAY FROM AIR SEPARATOR.

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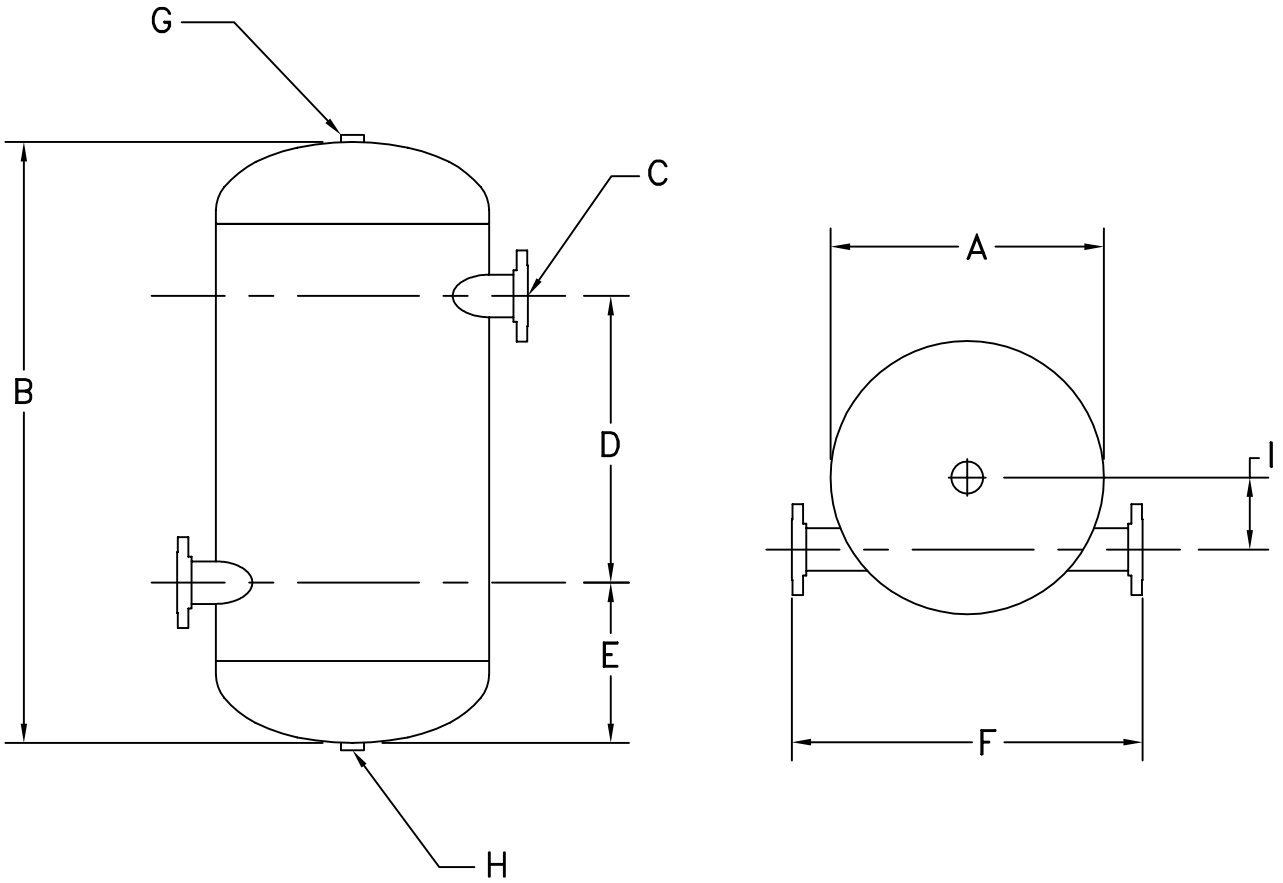
TANGENTIAL AIR SEPARATOR

A.S.M.E. SECTION VIII, DIVISION 1
WITHOUT STRAINER



MODEL NO.	A	B	C*	D	E	F	G	H	I	WT. LBS.
AS10–3	10.75	28	3	9	9.5	17	1	2	3.5	130
AS12–4	12.75	31	4	12	9.5	21	1 1/2	2	4	200
AS16–5	16	33.5	5	12	10.75	24	1 1/2	2 1/2	5	125
AS18–6	18	40.5	6	14	13.25	26	1 1/2	2 1/2	5.5	225
AS24–8	24	45.5	8	18	13.75	32	2	2 1/2	7.5	400
AS30–10	30	63	10	22	20.5	39	2	2 1/2	9.5	600
AS36–12	36	72	12	27	22.5	46	2	2 1/2	11.5	825
AS42–14	42	90	14	32	29	55	2	2 1/2	13.75	1425

*ALL INLET/OUTLET DIMENSIONS ARE 150# RAISED FACE SLIP–ON FLANGES.
NOTE: ALL DIMENSIONS ARE IN INCHES.

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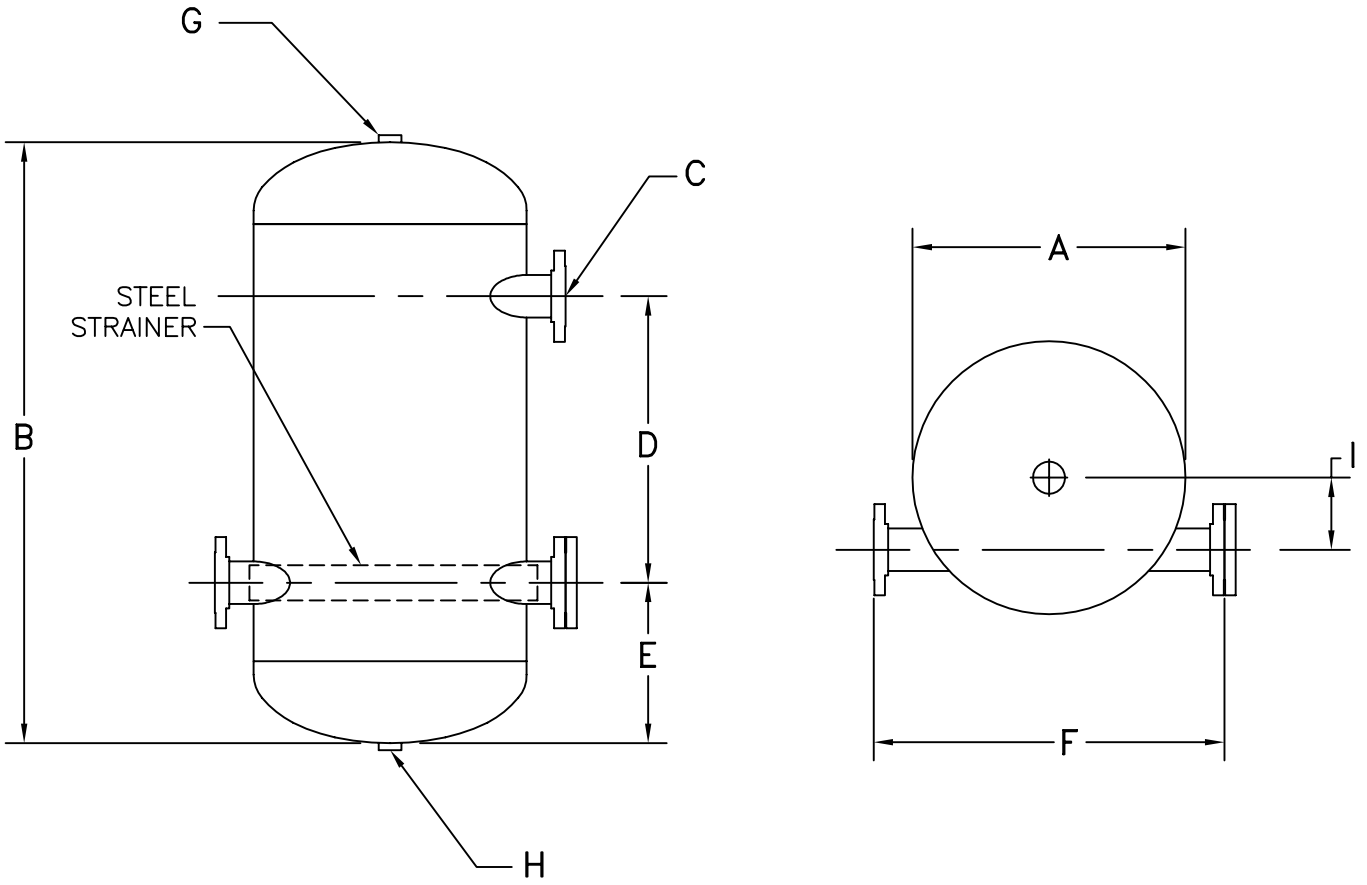
CUSTOMER NAME	DATE:
JOB NAME:	
MODEL NO.	SUBMITTED BY:
QUANTITY:	
FLOW RATE:	GPM @FT/SEC

TANGENTIAL AIR SEPARATOR

A.S.M.E. SECTION VIII, DIVISION 1
WITH STEEL STRAINER



MODEL NO.	A	B	C*	D	E	F	G	H	I	WT. LBS.
AS10–3S	10.75	28	3	9	9.5	17	1	2	3.5	175
AS12–4S	12.75	31	4	12	9.5	21	1 1/2	2	4	275
AS16–5S	16	33.5	5	12	10.75	24	1 1/2	2 1/2	5	200
AS18–6S	18	40.5	6	14	13.25	26	1 1/2	2 1/2	5.5	300
AS24–8S	24	45.5	8	18	13.75	32	2	2 1/2	7.5	525
AS30–10S	30	63	10	22	20.5	39	2	2 1/2	9.5	750
AS36–12S	36	72	12	27	22.5	46	2	2 1/2	11.5	1050
AS42–14S	42	90	14	32	29	55	2	2 1/2	13.75	1800

*ALL INLET/OUTLET DIMENSIONS ARE 150# RAISED FACE SLIP–ON FLANGES.
NOTE: ALL DIMENSIONS ARE IN INCHES.

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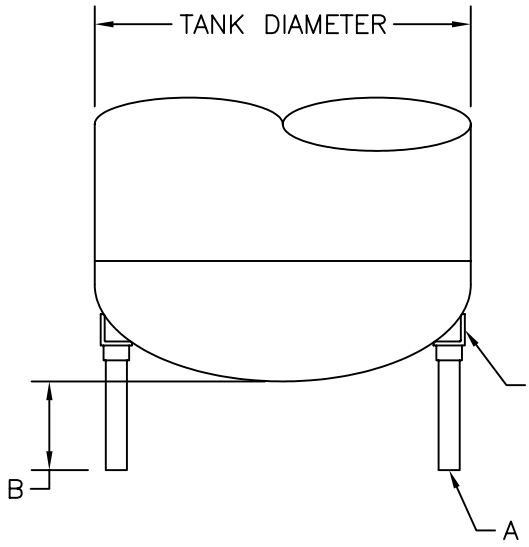
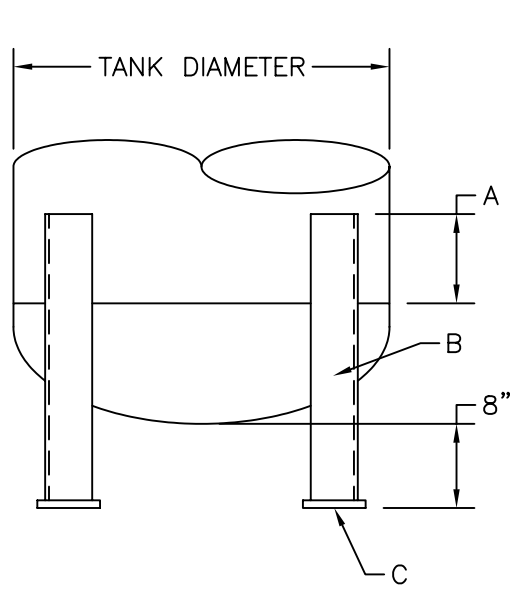
CUSTOMER NAME	DATE:
JOB NAME:	
MODEL NO.	SUBMITTED BY:
QUANTITY:	
FLOW RATE:	GPM @FT/SEC

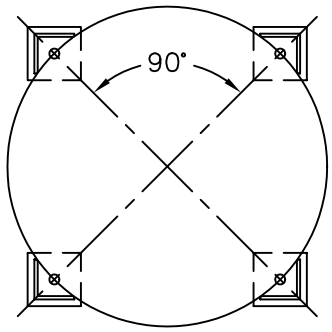
CUSTOM TANK ACCESSORIES

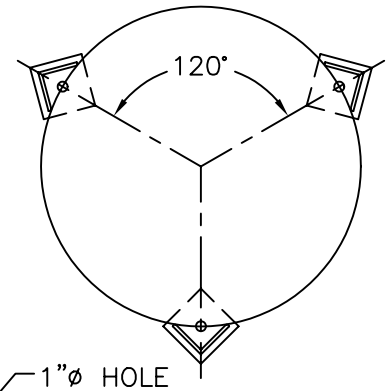


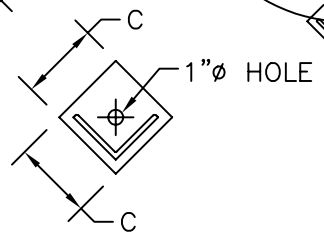
PIPE LEGS

DIA	A	B	NO.
18–24"	1 1/2"	6"	3
30–42"	2"	8"	4
48–60"	2 1/2"	8"	4









ANGLE LEGS

DIA	A	B	C	NO.
18–24"	4"	L3"x3"x1/4"	3/8"x6"x6"	3
30–42"	6"	L3"x3"x1/4"	1/2"x6"x6"	4
48–54"	6"	L3"x3"x3/8"	1/2"x6"x6"	4

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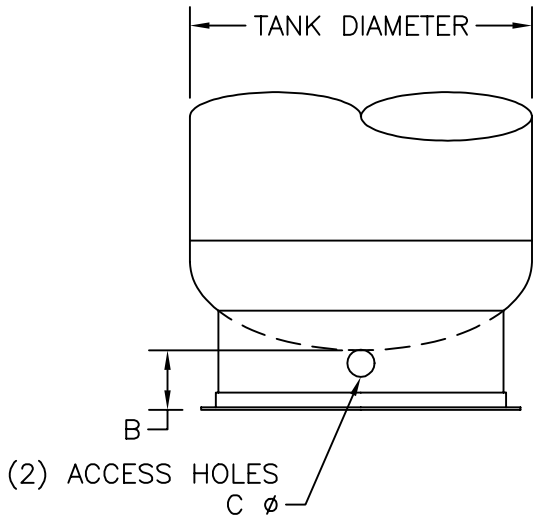
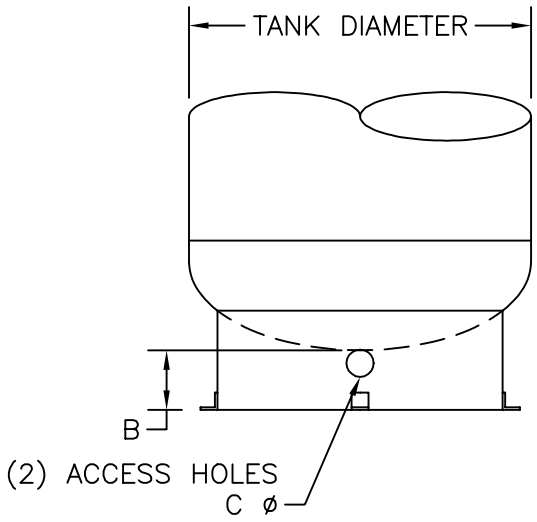
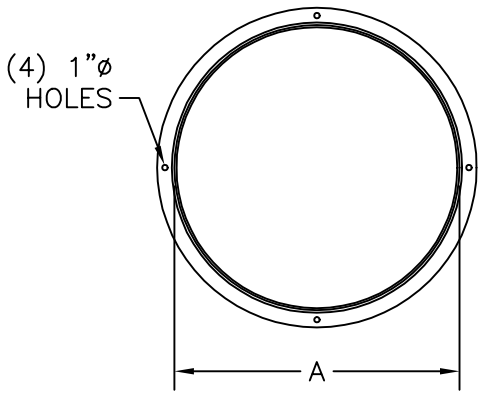
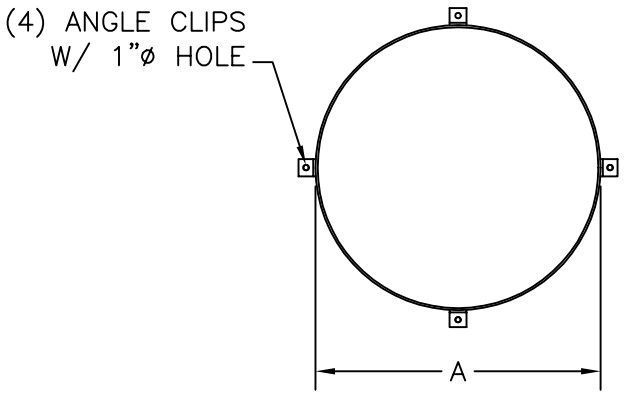
AIR RECEIVER ACCESSORIES









RING SKIRT

DIA	A	B	C
18"	10"	6"	2"
24"	16"	8"	3"
30"	22"	8"	3"
36"	28"	8"	3"
42"	34"	8"	4"
48"	40"	8"	4"
54"	42"	8"	4"
60"	48"	8"	4"

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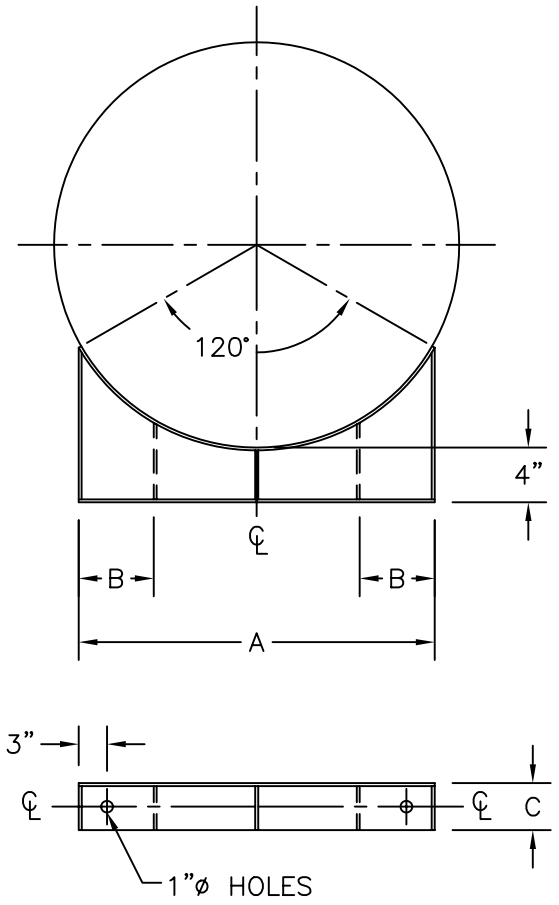
CUSTOM TANK ACCESSORIES



SADDLE SUPPORT

DIA	A	B	C
18"	16"	–	4"
24"	21"	–	4"
30"	26"	–	4"
36"	32"	–	4"
42"	37"	–	4"
48"	42"	–	4"
54"	47"	12"	6"
60"	52"	13"	6"

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South Gate Engineering

BOILER BLOWDOWN TANKS

Durability, safety, and quality are the essence of South Gate Engineering Boiler Blowdown Tanks. Durability has been achieved through a standard design that incorporates a concentric wear plate and a tangential blowdown inlet. Safety and quality are assured by 35 years of experience in manufacturing A.S.M.E. certified pressure vessels.

DESIGN

In many areas, Boiler Blowdown Tanks are required by law to reduce the temperature and pressure of blowdown from the boiler before it enters the sewer system. These laws should be carefully reviewed before designing the blowdown system. It is generally accepted that the temperature of the water leaving the blowdown equipment should not exceed 5 PSIG and 150 degrees F.

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South Gate Engineering

STANDARD

Standard blowdown tanks manufactured to A.S.M.E. code specifications are available, and comply with National Board registration criteria outlined below except for requirement #2. The minimum shell and head thickness will be designed as required by Section VIII, Division 1 of the A.S.M.E. Code. Please consult the factory if specification requirements require a shell thicker than what is required by A.S.M.E. Code.

NATIONAL BOARD

Vessels designed and constructed in accordance with the National Board of Boilers and Pressure Vessel Inspectors specifications must meet the following requirements:

1. The blowdown tank shall be designed in accordance with Section VIII, Division 1 of the A.S.M.E. Code for a working pressure 1/4 the maximum working pressure of the boiler.
2. The shell and head thickness shall be a minimum of 3/8".
3. A pressure gage shall be installed and graduated to read 0 to 25 PSI.
4. A thermometer well shall be located close to the water outlet connection and be in contact with the retained water within the tank.
5. The blowdown tank volume shall be equal to twice the volume of water removed from the boiler when the normal water level within the boiler is reduced at least 4".
6. The blowdown tank outlet shall be controlled such that it remains half full of water after each lowdown cycle.

The above criteria are for blowdown tanks connected to boilers operating at less than 399 PSI. For systems operating at higher pressures, or requiring multiple units, please consult the factory for sizing and pricing.

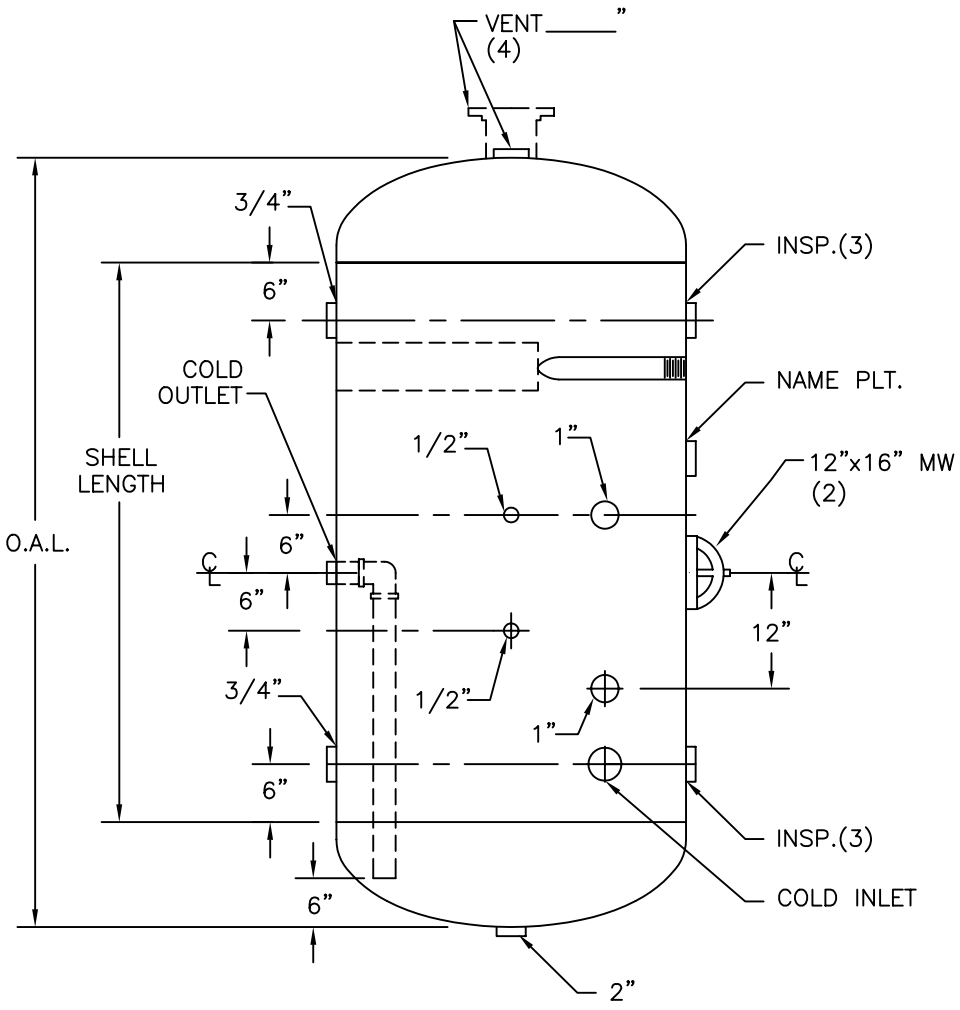
OPERATION

Boiler blowdown is piped directly to the tangential inlet of the blowdown tank. By using an inlet, two purposed are satisfied:

1. The entering blowdown begins a swirling action that increases mixing with the cold water in the lower portion of the tank.
2. The rapid erosion of the shell familiar to a perpendicular inlet is greatly reduced by the tangential entry of the blowdown and the standard wear plate provided on all South Gate Engineering blowdown tanks.

Since the blowdown tank is vented to the atmosphere, the incoming condensate, which has been maintained in the liquid state due to the high system pressure, flashes to steam and is partially released into the atmosphere. The remaining high temperature condensate is mixed with cold water in the lower portion of the blowdown tank. Due to the static layering of the water, it is necessary to use a dip tube on the outlet connection of the tank. This arrangement assures that only cold water is discharged into the sewer. In the event that the outlet temperature is still excessive, additional cooling units such as heat exchangers or water mixing devices, shown in the proceeding figures, should be considered.

BOILER BLOWDOWN TANKS



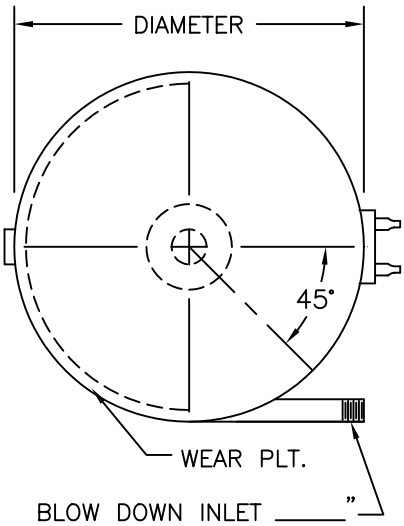


FIG. 5–4
VERTICAL BLOWDOWN TANK

NOTES:

1. VESSELS DESIGNED AND STAMPED IN ACCORDANCE WITH SECTION VIII, DIV. 1, A.S.M.E. PRESSURE VESSEL CODE.
2. 12"x16" MANHOLE IS STANDARD ON ALL TANKS 42" DIAMETER AND LARGER.
3. 2" INSPECTION OPENINGS PROVIDED ON ALL TANKS WITHOUT A MANHOLE.
4. 150# FLANGED CONNECTIONS FOR ALL OPENINGS THAT ARE 4" OR LARGER.

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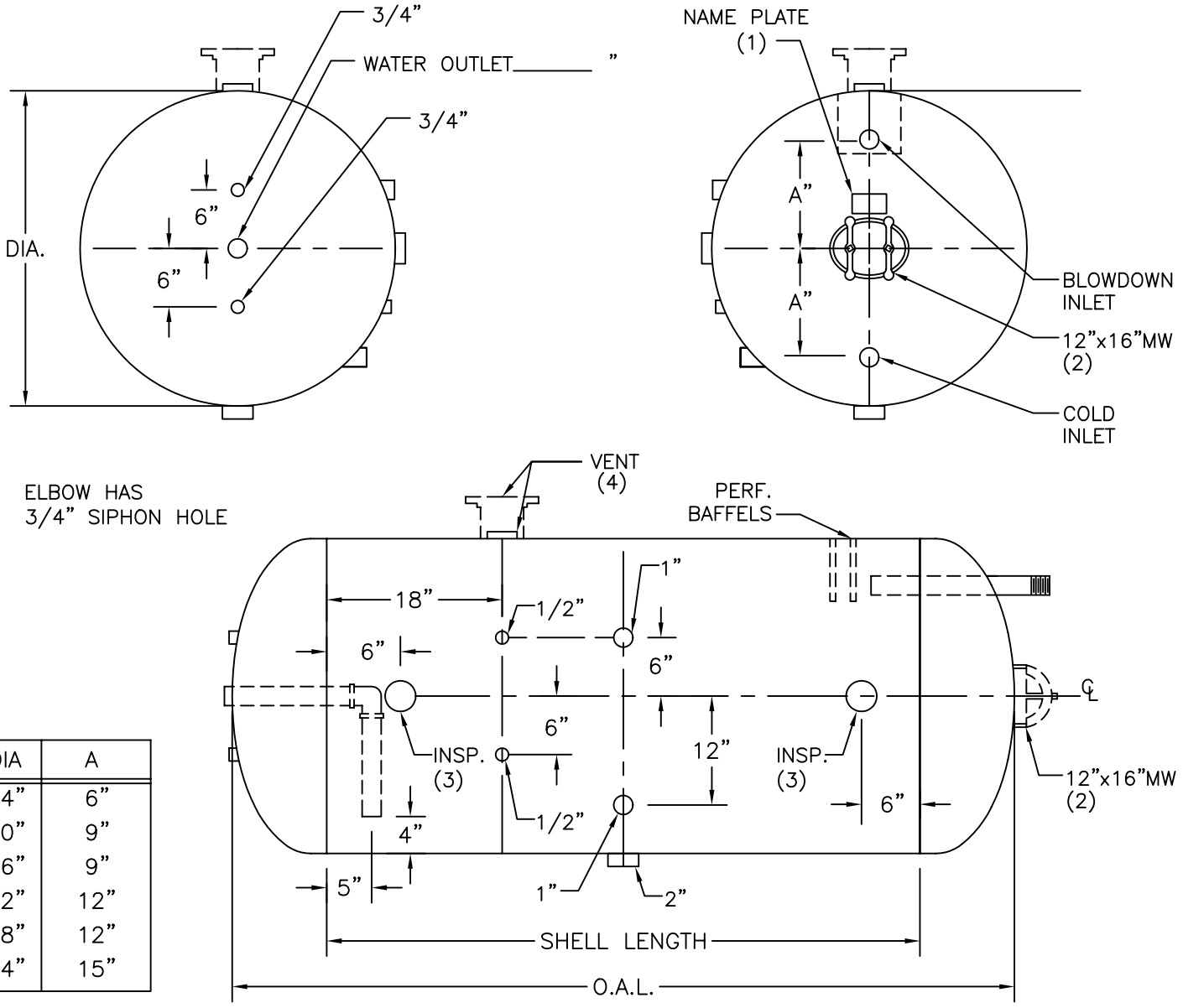
SUBMITTED BY:		DATE:
JOB NAME:		
MODEL NO.		LINING:
CAPACITY:		DESIGN PRESSURE:
DIAMETER:	SHELL LENGTH:	O.A.L.:
QUANTITY:		

BOILER BLOWDOWN TANKS

FIG. 5–5
HORIZONTAL BLOWDOWN TANK



DIA	A
24"	6"
30"	9"
36"	9"
42"	12"
48"	12"
54"	15"

NOTES:

1. VESSELS DESIGNED AND STAMPED IN ACCORDANCE WITH SECTION VIII, DIV. 1, A.S.M.E. PRESSURE VESSEL CODE.
2. 12"x16" MANHOLE IS STANDARD ON ALL TANKS 42" DIAMETER AND LARGER, OR ON PHENOLIC AND DURAMENT LINED TANKS.
3. 2" INSPECTION OPENINGS PROVIDED ON ALL TANKS WITHOUT A MANHOLE.
4. 150# FLANGED CONNECTIONS FOR ALL OPENINGS THAT ARE 4" OR LARGER.

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SUBMITTED BY:		DATE:
JOB NAME:		
MODEL NO. VST		LINING:
CAPACITY:		DESIGN PRESSURE:
DIAMETER:	SHELL LENGTH:	O.A.L.:
QUANTITY:		VOLUME:

BOILER BLOWDOWN TANKS

FIG. 5–2
TYPICAL HORIZONTAL HOOK–UP

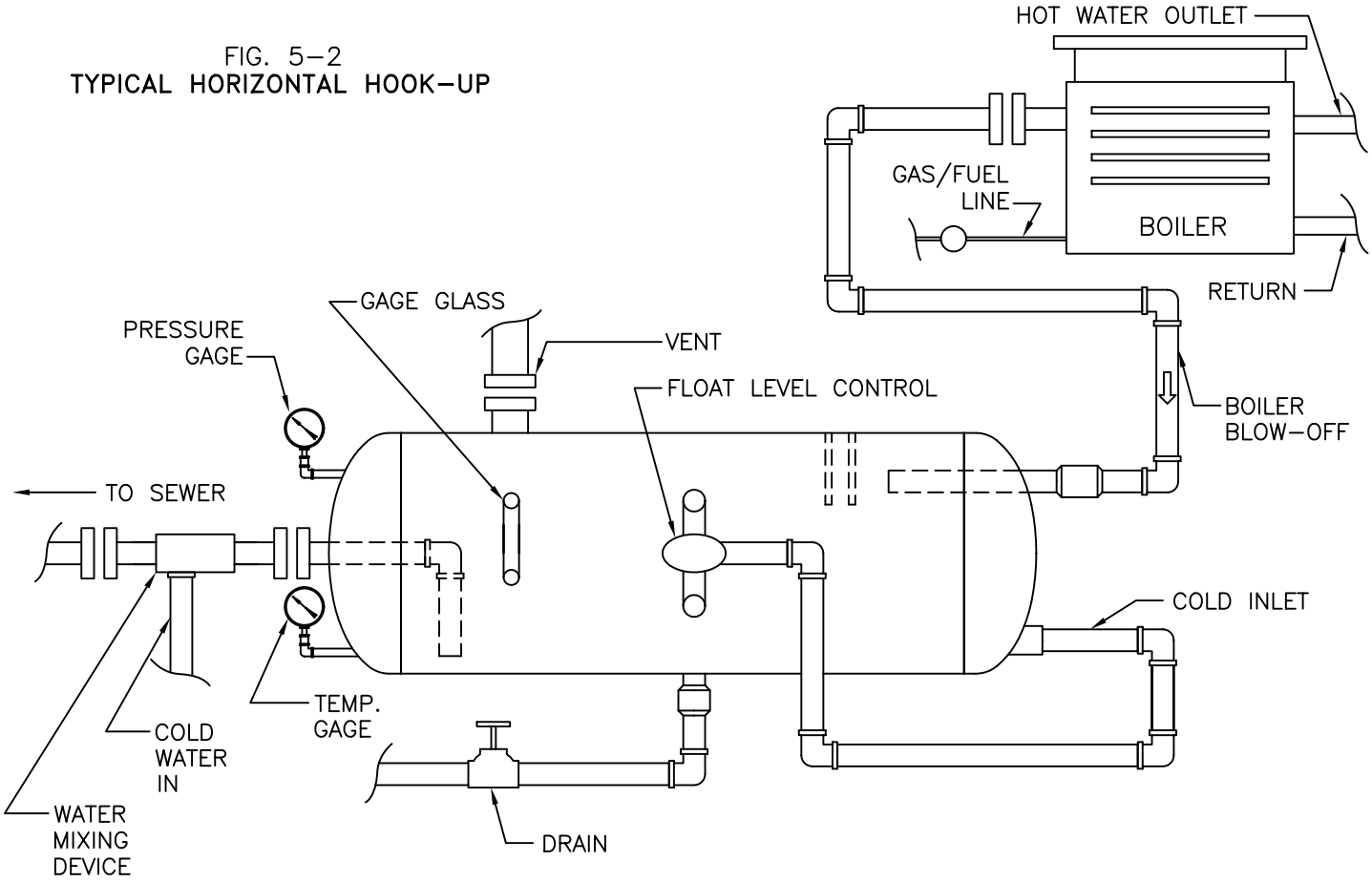
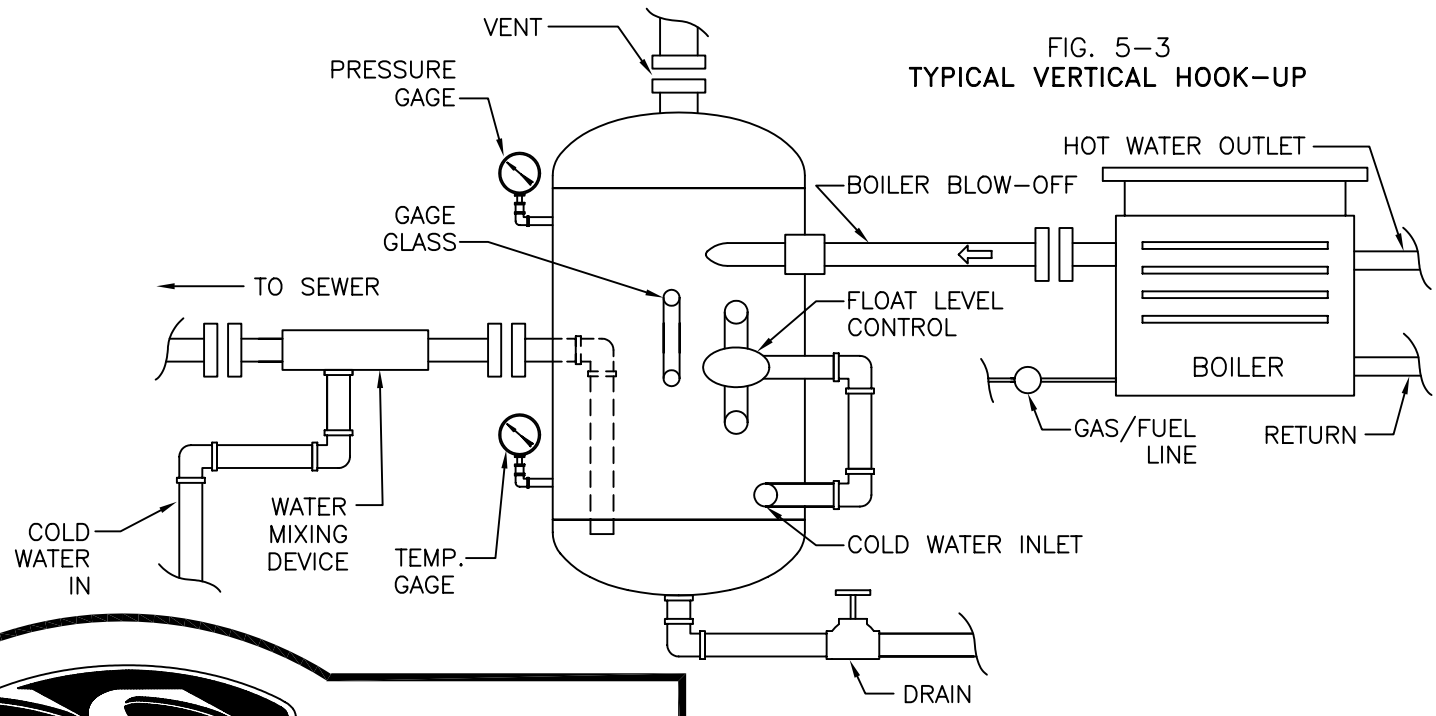


FIG. 5–3
TYPICAL VERTICAL HOOK–UP



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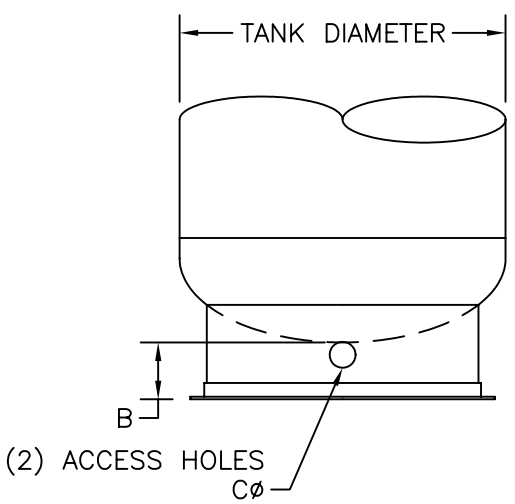
BOILER BLOWDOWN TANKS



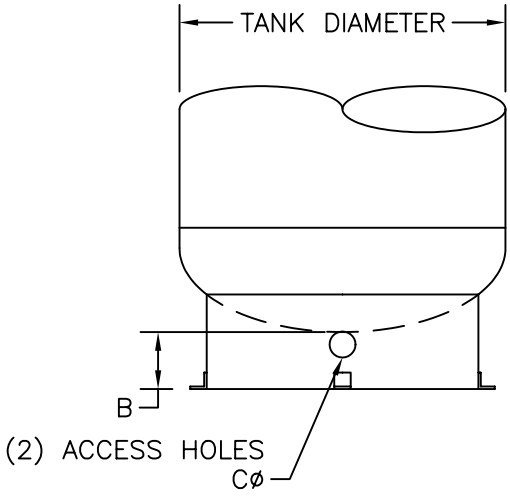


FIG. 5–8
RING BASE

DIA	A	B	C
18"	10"	6"	2"
24"	16"	8"	3"
30"	22"	8"	3"
36"	28"	8"	3"
42"	34"	8"	4"
48"	40"	8"	4"
54"	42"	8"	4"

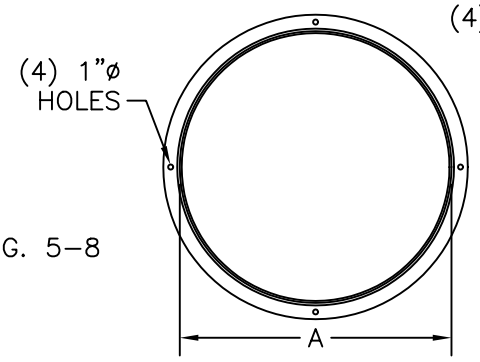
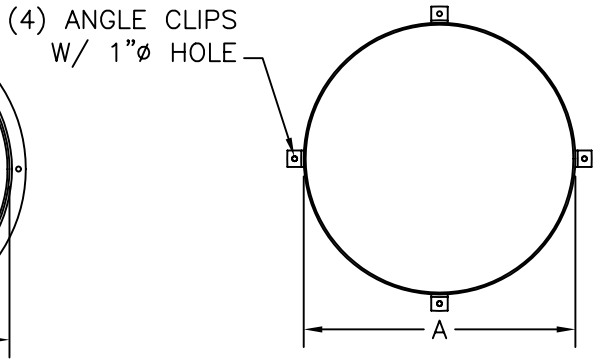
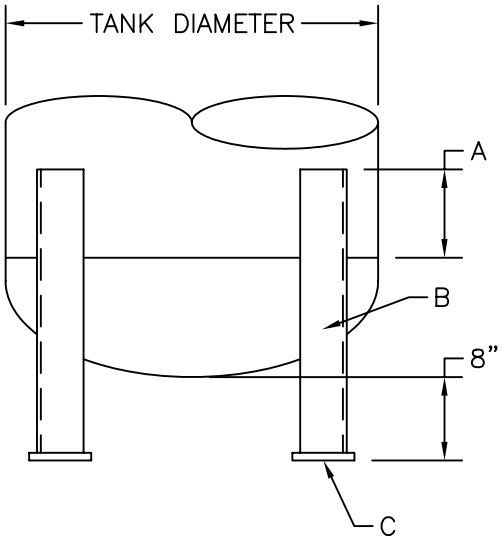


FIG. 5–8





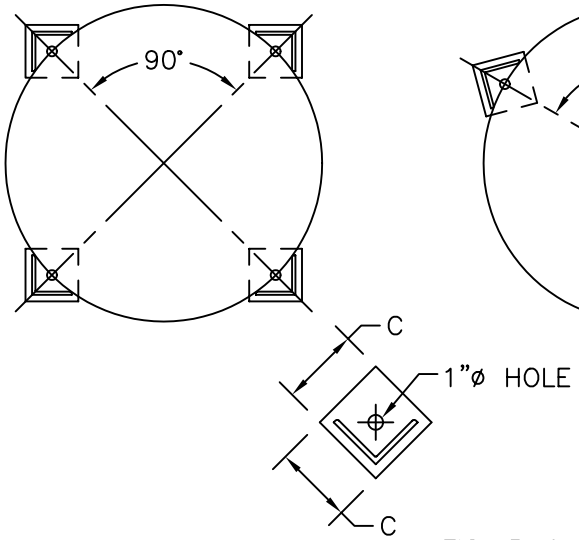


FIG. 5–9
ANGLE IRON LEGS

DIA	A	B	C	NO.
18–24"	4"	L3"x3"x1/4"	3/8"x6"x6"	3
30–42"	4"	L3"x3"x1/4"	1/2"x6"x6"	4
48–54"	6"	L3"x3"x3/8"	1/2"x6"x6"	4

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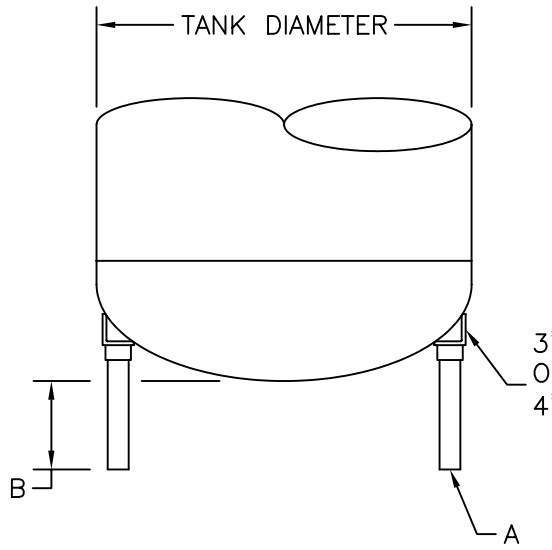

FIG. 5–6
PIPE LEGS

DIA	A	B	NO.
18–24"	1 1/2"	6"	3
30–42"	2"	8"	4
48–54"	2 1/2"	8"	4

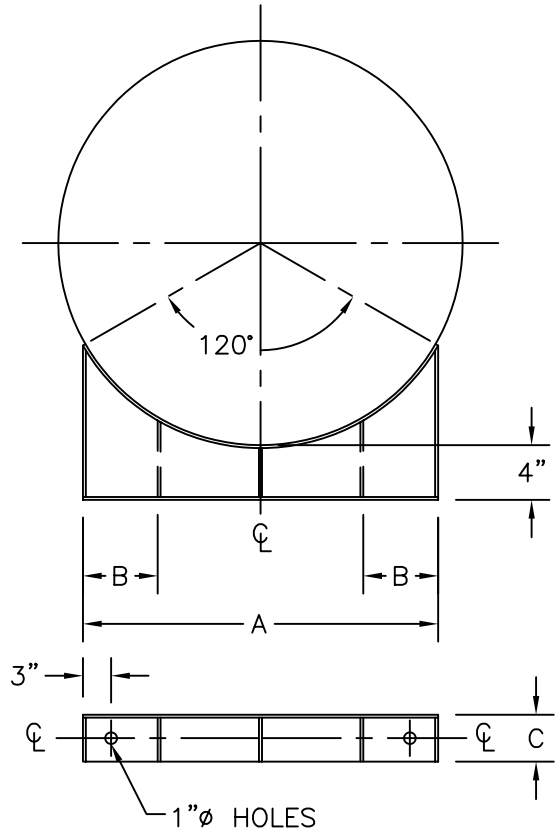

FIG. 5–7
SADDLE SUPPORT

DIA	A	B	C
18"	16"	–	4"
24"	21"	–	4"
30"	26"	–	4"
36"	32"	–	4"
42"	37"	–	4"
48"	42"	–	4"
54"	47"	12"	6"
60"	52"	13"	6"

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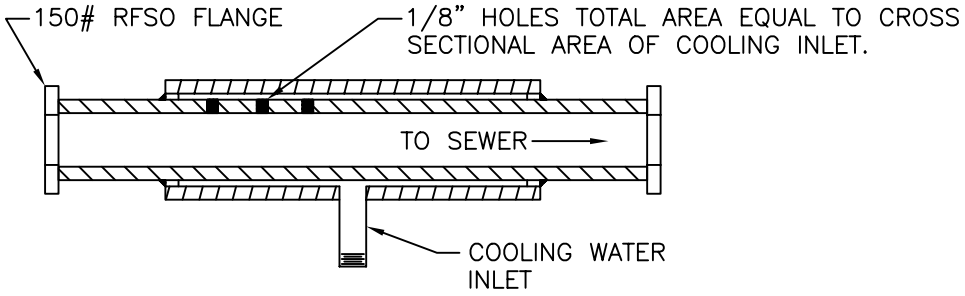
BLOWDOWN TANK OPENINGS

BLOWDOWN INLET*	WATER OUTLET	VENT
3/4"	1 1/4"	2"
1"	1 1/2"	2 1/2"
1 1/4"	2"	3"
1 1/2"	2 1/2"	4"
2"	3"	5"
2 1/2"	3 1/2"	6"
3"	4"	8"
4"	6"	10"

* BLOWDOWN INLET CONNECTION IS SIZED EQUAL TO THE SMALLEST PIPE BETWEEN THE BOILER AND THE BLOWDOWN TANK.



WATER MIXING DEVICE

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South Gate Engineering

EXPANSION TANKS

South Gate Engineering manufactures both closed and open type Expansion Tanks for hot water systems. All Expansion Tanks are built to stringent standards and quality control, developed with our 40 plus years of experience. Standard closed type Expansion Tanks are normally stocked in 15 to 100 gallon capacities and 125 PSI working pressures. Other capacities and working pressures are available upon request.

OPEN TYPE EXPANSION TANKS

Open type expansion tanks are utilized in heating and/or chilled water-cooling systems as a buffer for the thermal expansion and contraction of the heated or cooled water. Open type Expansion Tanks must be located at the highest point of each circulating zone to maintain a flooded system. Special controls are used to maintain the proper water level within the tank. In addition, the design of open expansion tanks shall include an indoor overflow and vent from the upper portion of the tank. Generally, the indoor overflow is carried within the building to a suitable plumbing fixture of basement.

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CLOSED TYPE EXPANSION TANKS

Closed Expansion Tanks are used in hot water systems to allow for the thermal expansion of hot water. Without a closed expansion tank, the increase in pressure created by the elevated temperatures of the hot water would cause periodic releasing of the pressure relief valve. Two types of hot water systems require this application: closed loop systems, and hot water supply systems using a check valve or pressure reducing valve in the cold water inlet line.

Specifying closed Expansion Tanks conforming to the A.S.M.E. boiler and pressure vessel code require different design pressures based on the system application. Expansion tanks used on closed loop hot water systems must be designed for a working pressure two-thirds (2/3) greater than the system operating pressure. Expansion tanks used in hot water supply systems with a check valve or pressure reducing valve located in the cold water inlet line, need only be designed for a working pressure equal to the design pressure of the hot water heater.

DESIGN:

The volume calculations for closed expansion tanks are the same for both types of systems. The following formula is used to calculate this capacity:

$$V_t = ((.0041 \times T - .0466) \times V_s)/((P_a/P_f)-(P_a/P_o))$$

V_t = Minimum Volume of Expansion Tank(s) (gallons)
V_s = Volume of System, not including tank(s) (gallons)
T = Average Operating Temperature (degrees F)
P_a = Atmospheric Pressure (psi)
P_f = Fill Pressure (psi)
P_o = Maximum Operating Pressure (psi)

All standard closed expansion tanks are provided with the necessary tappings for gauge glass assemblies, air charge fittings, and relief valves. These items of trim are available for packaging with the tank upon request.

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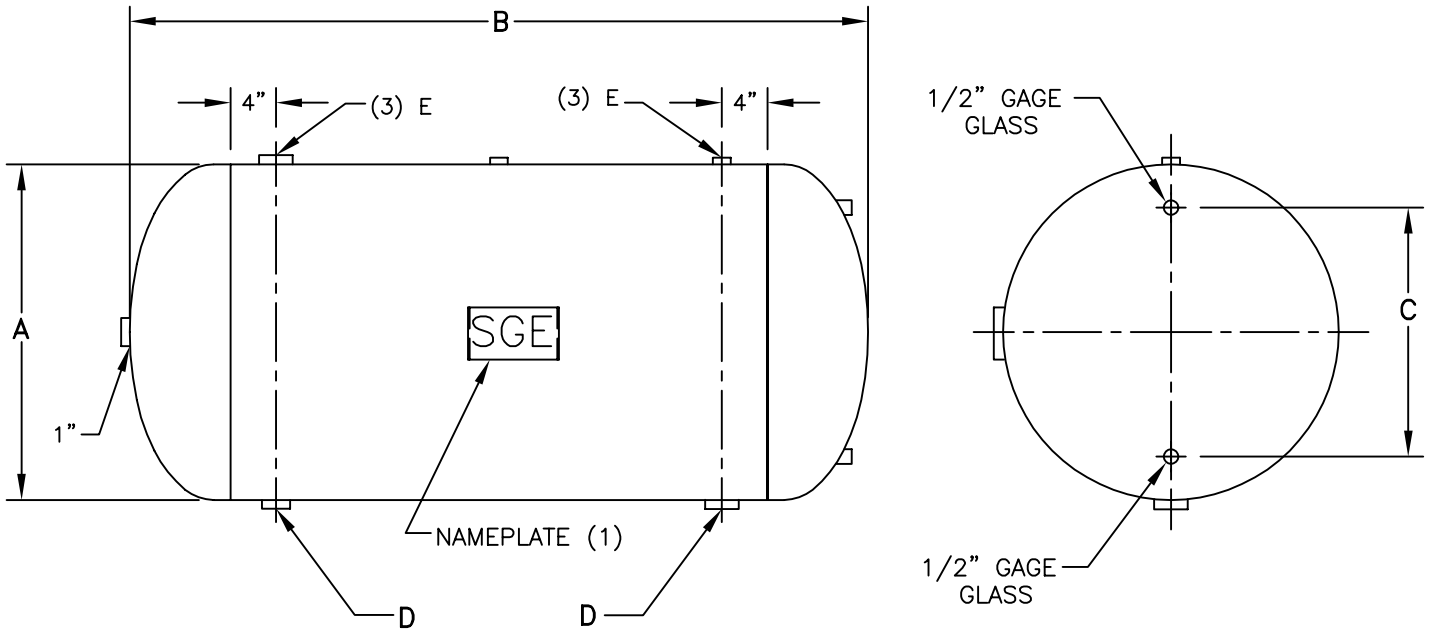
EXPANSION TANKS

HORIZONTAL



A.S.M.E. 125 PSI

MODEL NO.	CAPACITY GAL.	DIMENSIONS A	B	C	D	E	WEIGHT (5) (U)	(Z)
EX12–2 (*)	15	12"	33"	6"	3/4"	1 1/2"	70#	77#
EX12–2.5 ( )	18	12"	39"	6"	3/4"	1 1/2"	80#	88#
EX12–3.5 ( )	24	12"	51"	6"	3/4"	1 1/2"	105#	111#
EX14–3 ( )	30	14"	46"	8"	3/4"	1 1/2"	115#	126#
EX14–4.5 ( )	40	14"	64"	8"	3/4"	1 1/2"	155#	170#
EX16–5 ( )	60	16"	71"	10"	1"	2"	200#	220#
EX20–4.5 ( )	80	20"	66"	12"	1"	2"	250#	275#
EX20–5.5 ( )	100	20"	78"	12"	1"	2"	290#	319#
EX24–4.25 ( )	120	24"	66"	18"	1"	2"	300#	330#
EX24–5 ( )	140	24"	75"	18"	1"	2"	330#	363#

NOTES:

1. VESSELS DESIGNED AND STAMPED IN ACCORDANCE WITH SECTION VIII, DIV. 1, A.S.M.E. CODE FOR UNFIRED PRESSURE VESSELS.
2. TANKS ARE REGISTERED WITH NATIONAL BOARD OF BOILER INSPECTORS UPON REQUEST.
3. E–INSPECTION OPENINGS PER A.S.M.E. CODE SEC. UG–46.
4. LARGER CAPACITIES AND PRESSURES ARE AVAILABLE.
5. (U) UNLINED, (Z) GALVANIZED.

SOUTH GATE ENGINEERING

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91710

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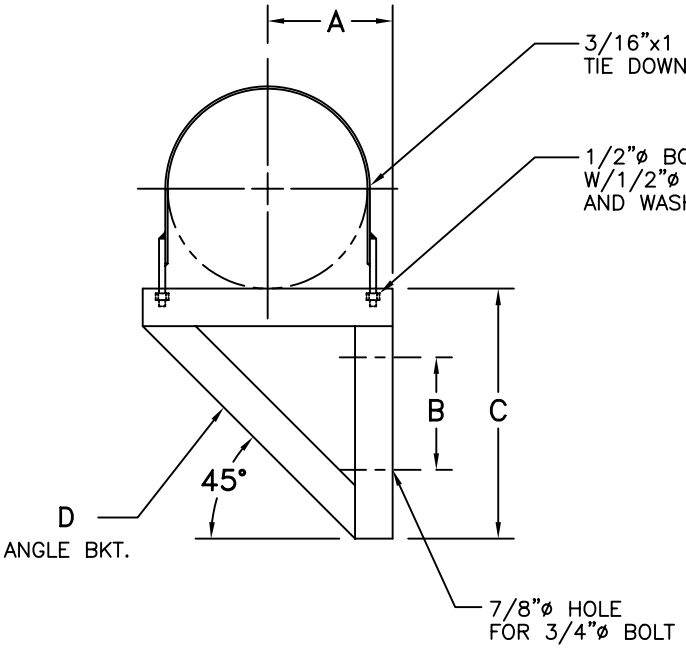
CUSTOMER NAME	DATE:
JOB NAME:	
MODEL NO.	SUBMITTED BY:
CAPACITY (GAL.)	QUANTITY:
LINING:	
ACCESSORIES:	

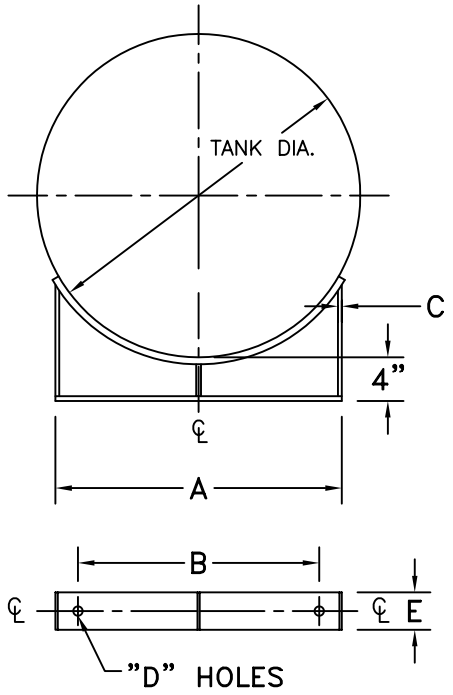
EXPANSION TANKS

WALL BRACKET W/TIE DOWN STRAPS



DIA	A	B	C	D
12"	8"	8"	16"	3"x3"x1/4"
14"	9"	10"	18"	3"x3"x1/4"
16"	10"	12"	20"	3"x3"x3/8"
20"	12"	16"	24'	3"x3"x3/8"
24"	14"	20"	28"	4"x4"x3/8"

SADDLES



DIA	12"	14"	16"	20"	24"
A	11"	12"	14"	18"	21"
B	7"	8"	10"	14"	17"
C	1/4"	1/4"	1/4"	1/4"	1/4"
D	5/8"	5/8"	5/8"	5/8"	5/8"
E	4"	4"	4"	4"	4"
LBS. EA.	10	12	14	16	20

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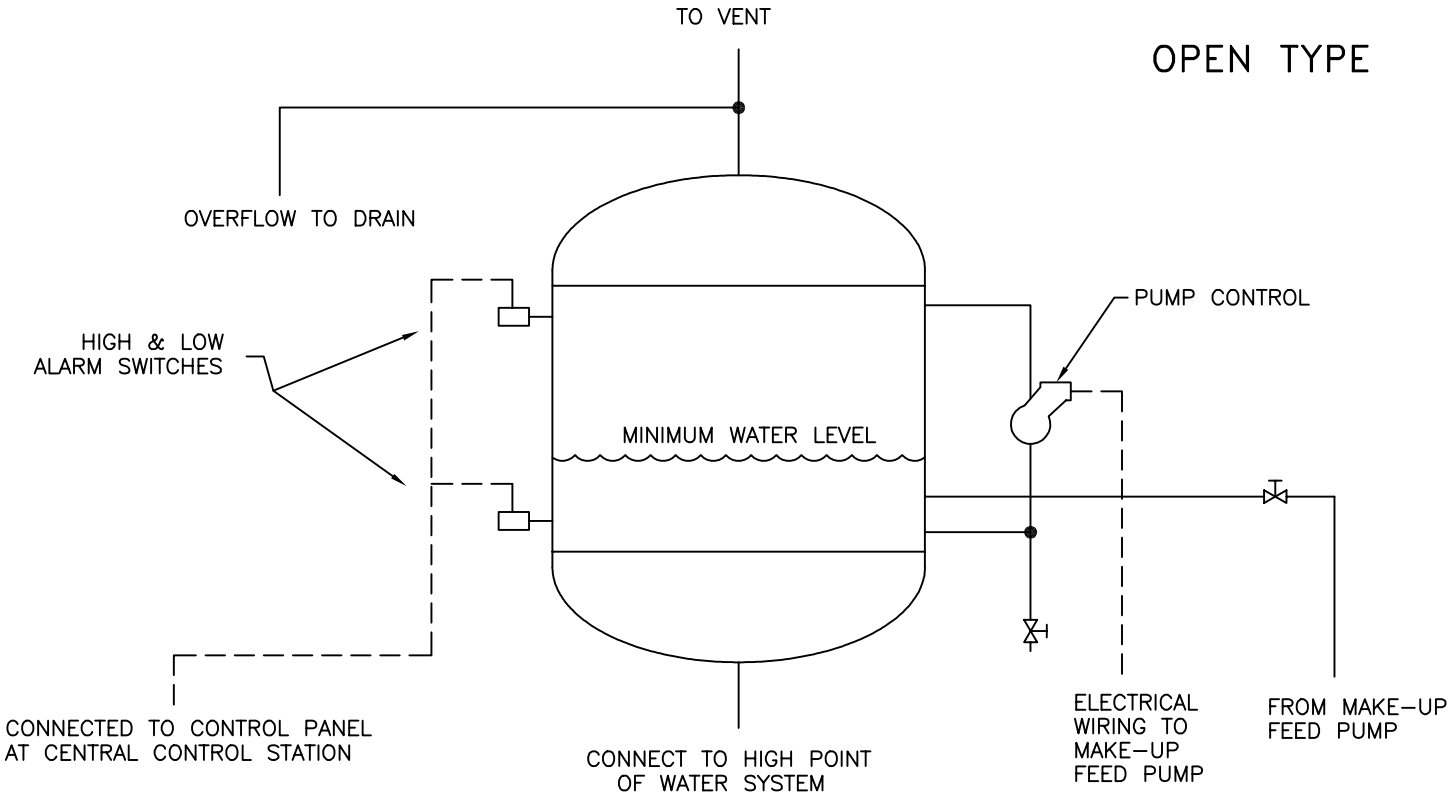
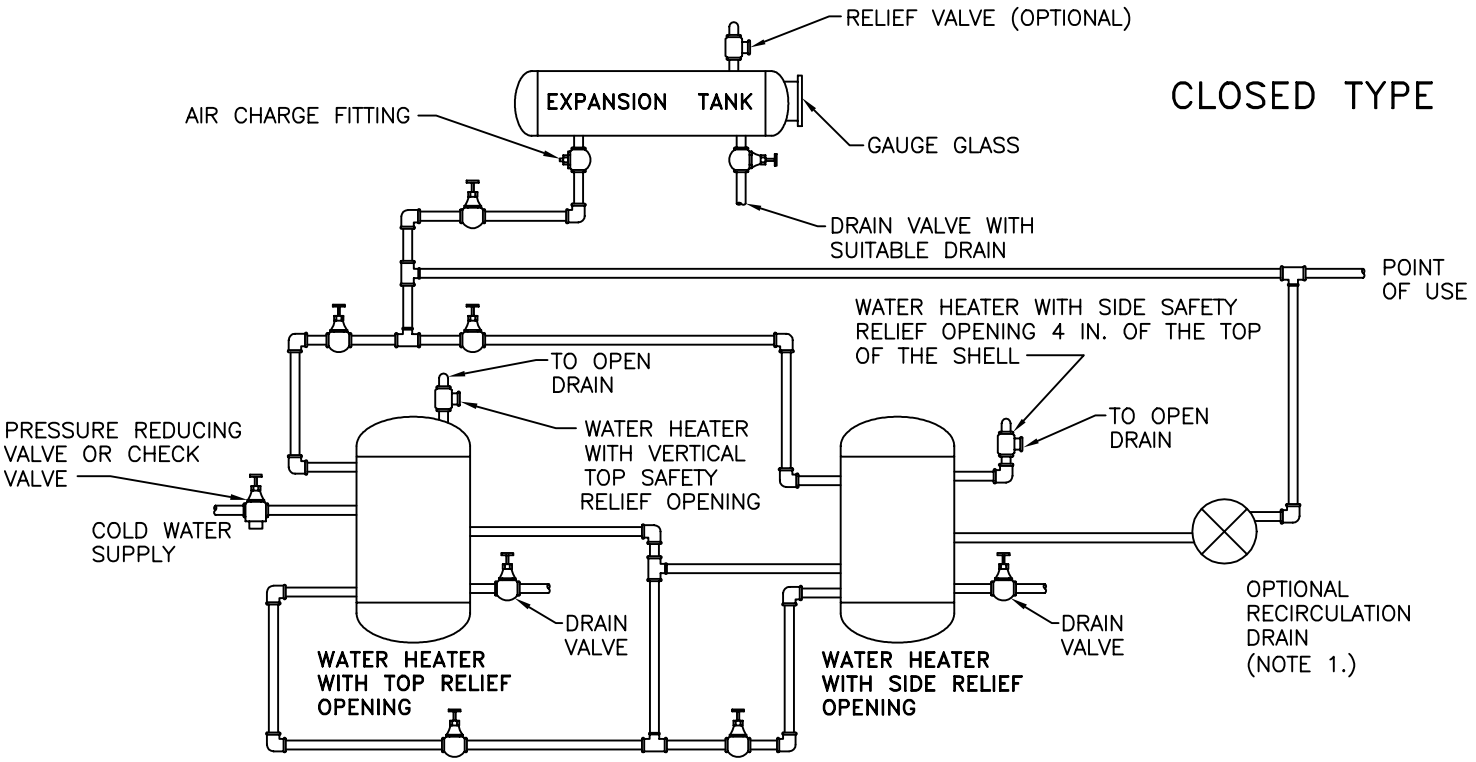
EXPANSION TANKS

OPEN TYPE



CLOSED TYPE



NOTE:

1. RECIRULATION SYSTEM MAY BE GRAVITY OR PUMP–ACTIVATED.

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