

Brinemakers by Design Tanks, Inc.

Design Tanks, Inc. has over 40 years of fiberglass manufacturing experience. Centrally located in Sioux Falls, South Dakota, we can provide National exposure to our Valued Customers. With responsive sales/service, value added Engineering and streamlined manufacturing processes, we will satisfy our customer's needs with the most cost effective brine making solution available.

Whether you need a brine storage tank or a complete operating system, we can customize our product with components (pneumatic fill line, vent/dust collection, brine plenum, automatic liquid level system, etc.) to meet your specific requirements.

When given the opportunity, our Brinemaker's allow Companies to realize the benefits of saturated brine. In addition to obvious bulk salt advantage, consistency of product and meeting "peak-demand" requirements, Company's quickly recognize increased warehouse space and decreased work related injuries versus handling individual salt bags.

Over the years, meeting soft water requirements has been a difficulty for a variety of industries; laundries, correctional facilities, etc. Furthermore, with our FDA compliant resins and post curing, we offer the Food Industry a cost effective FRP alternative.

For high usage (100 GPM and over) demand customers, **Design Tanks, Inc.** recommends; in conjunction with our Brinemaker, incorporating a brine day tank (reservoir) within the brine withdrawal system. In some cases, Companies make unrealistic demands upon Brinemakers. To ensure saturation and avoid channeling, the brinemaking rate should not exceed 0.5 gpm per square foot of cross-sectional area. Be aware, with vacuum granulated salt, the maximum brine-making rate is 40 gpm for a 10'-0" diameter tank and 50 gpm for a 12'-0".

Brinemaker components/nomenclature:

Pneumatic Fill Line-

Air unloading salt creates an abrasive situation. To remedy, we utilize a Type 304 stainless steel fill line. Bolted to the center of the tank top, a typical fill line consists of; one-180 degree radius section, one-vertical straight section with 1" water injection port and one-Kamlock adaptor with screened/vented cap.

Note:

Depending upon truck accessibility, our radii fill line can be one piece (180 degree radius) or two-piece (90 degree). With a two-piece radius and a horizontal straight run, we can customize the fill line to meet your specific tank placement.

Water Spray Ring-

To increase the efficiency of the Brinemaker, the water is induced through a 1 1/2" polyethylene spray ring which is mounted around the interior circumference of the tank with 3/16" holes on 12" centers. For a consistent saturated brine supply, the liquid level should be held to 6'-0" minimum depth. Regarding the undissolved salt, this level should be held to a 5'-0" minimum depth. To eliminate potential channeling and bridging issues, a Design Tanks, Inc. automatic liquid (brine) and/or solid (salt) level system is recommended. Contact a Design Tanks, Inc. Salesperson for details and pricing.

Brine collection system-

Located on the tank bottom, our brine collection system consists of a center plenum with six lateral slotted PVC filter arms. From the top of the center plenum, brine will flow (pumped or gravity) through an internal bolted piping to an external sidewall attachment flange. When the brine is pumped directly to the in-plant usage points, to avoid line solidification, contact your Salt Supplier for a pump recommendation. Depend upon the quality of the salt, Design Tanks, Inc. recommends "back flushing" our brine collection system with a low-pressure water source. Understandably, this periodical process will enhance your Brinemaker's efficiency by dissolving solidification within the brine lines and slots.

Venting/Dust Control-

To eliminate tank pressurizing in the filling phase, an 8" U-Type vent and 24" hinged manway with weighted cover is mounted on the tank's top. Connected to the U-Type vent is clamped a flexible rubber boot, which is attached to a side mounted, bracketed vertical PVC downpipe, and a polyester bag for dust control. To minimize the dust, the 1/2" water injection port on the pneumatic fill assembly should be utilized. Also, **Design Tanks, Inc.** recommends having the bag cleaned (soak in water for 4-8 hours) after each salt loading.

Options:

Pneumatic Fill Line Post-

Depending upon the Brinemaker's support pad/floor, Design Tanks, Inc. offers two versions; new concrete galvanized post with two fill line clamps or existing concrete galvanized post with base pad, sidewall support brackets and two fill line clamps.

Access Ladder Assembly-

When the installation requires accessibility to the tank's top, an OSHA approved ladder assembly constructed of steel (galvanized or epoxy coated), aluminum or FRP (Fiberglass Reinforced Plastic). Depending upon the tank's height, a safety cage and/or intermediate platform may be required. In all cases, stand-offs are located, with a maximum center to center distance of 6'-0", on the tank's sidewall.

Freeze Protection System-

In Northern climates, a heating system with insulation is required to prevent contents for freezing. Our system consists of the following:

Insulation: Our insulation package is located around the circumference of the tank and up 5'-0" on the tank sidewall. It consists of a two part spray-on polyurethane foam with an insulation R- value of 7.1/inch of thickness (k value of 0.14). To protect the insulation, we utilize a spray-on overcoat. The overcoat is a polyurethane elastomer base coat overlaid with a white Hypalon elastomer, totaling 20 mils dry thickness. Besides excellent UV protection, the overcoat materials are rated as Class A flame retardant materials, per UL 790.

Heating: Our heating system consists of electrical (20 amp/120V) panels with a single master control thermostat. To eliminate potential tank damage, each individual panel is equipped with a "high temperature shut-down" feature. By locating the panels on the lower sidewall, the panels can be periodically checked. After years of service, an individual panel can be replaced by; cutting the insulation, removing the old panel, installing the new and replacing the old insulation.

Automatic Liquid (brine) Level Control System-

In order to maintain a constant liquid level in our Brinemaker, we incorporate a pressure transducer, which sends a signal to a digital panel meter to open or close a solenoid valve located in the water supply line, to regulate/control the system. Additionally, the digital panel meter is capable of sending a 4-20 ma output (remote PC or laptop) and optional relays for visual on/off light/s and /or audible alarm.

Automatic Solid (salt) Level Control System-

Several systems are available. Contact **Design Tanks, Inc.** for information.

Saturated Brine Facts:

- **One gallon of saturated brine weighs 10.027 pounds.**
- **One gallon of saturated brine contains 2.647 pounds of salt.**
- **One gallon of water will produce 1.13 gallons saturated brine.**
- **One gallon of water will dissolve 2.991 pounds of salt.**
- **One ton of salt will produce 755.5 gallons of saturated brine.**
- **Freezing point of saturated brine is minus (-) 6 degree Fahrenheit**

Salt Facts:

Southern Rock (44% void volume)

- **Maximum brine making rate**
 - 10'-0" diameter tank-20GPM
 - 12'-0" diameter tank-25 GPM
- **Weight per foot of tank height**
 - 10'-0" diameter tank-2.7 ton
 - 12'-0" diameter tank-3.8 ton

Vacuum Granulated (40% void volume)

- **Maximum brine making rate**
 - 10'-0" diameter tank-40 GPM
 - 12'-0" diameter tank-50 GPM
- **Weight per foot of tank height**
 - 10'-0" diameter tank-3.0 ton
 - 12'-0" diameter tank-4.2 ton

CHOP/HOOP FILAMENT WOUND FIBERGLASS FABRICATION NOTES

1. LINER TO BE VINYL ESTER/C-VEIL WITH MEKP CURE, 100 MIL THICK.
2. STRUCTURAL TO BE VINYL ESTER WITH MEKP CURE, 0.07" PER LAYER.
3. EXTERIOR NATURAL WAX COAT TO CONTAIN 3% STYWAX.
4. FABRICATED TO APPLICABLE SECTIONS OF ASTM D3299.
5. SOME ITEMS MAY BE ROTATED OR OMITTED IN ELEVATION VIEW FOR CLARITY. SEE PLAN VIEW FOR TRUE ORIENTATION.
6. ELEVATIONS ARE FROM OUTSIDE BOTTOM.
7. PROJECTIONS ARE FROM OUTSIDE SHELL.
8. ALL NOZZLE LOADS TO BE INDEPENDENTLY REACTED BY OTHERS.
9. ALL NOZZLES ARE ASA 150# HOLE PATTERN, FLAT FACE UNLESS OTHERWISE NOTED.
10. ALL FLANGED NOZZLES TO BE SPOT FACED.
11. BOLT HOLES TO STRADDLE RADIAL CENTERLINES UNLESS OTHERWISE NOTED.
12. ALL FLANGES WITHOUT BLINDS TO BE COVERED WITH PLYWOOD PRIOR TO SHIPMENT.
13. FASTENERS AND GASKETS FOR SERVICE BY OTHERS UNLESS OTHERWISE NOTED.
14. FASTENERS TO BE 304SS UNLESS OTHERWISE NOTED.

LAMINATE SEQUENCE SYMBOLS

- V - 10 MIL THICK "C" GLASS VEIL 7% GLASS CONTENT.
- C - 45 MIL THICK 1.5 OZ./SQ. FT. CHOPPED "E" GLASS ROVING 30% GLASS CONTENT.
- M - 38 MIL THICK 1.5 OZ./SQ. FT. CHOPPED "E" GLASS MAT 30% GLASS CONTENT.
- R - 70 MIL THICK 24 OZ./SQ. YD. GLASS WOVEN ROVING 45% GLASS CONTENT.
- N - 15-20 MIL THICK APERTURED NEXUS VEIL.
- CH - 70 MIL THICK 2.4 OZ./SQ. FT. CHOPPED "E" GLASS ROVING AND 68 STRANDS OF 250 YIELD CONTINUOUS "E" GLASS HOOP STRANDS 50% GLASS CONTENT.

WARNING NOTES - FAILURE TO COMPLY WITH THE FOLLOWING NOTES WILL VOID WARRANTY

VENT DESIGNED FOR COMPRESSED AIR UNLOADING.

FOUNDATION PAD MUST BE FABRICATED UNIFORM IN TEXTURE AND APPEARANCE, AND MEET A SURFACE PLANE TOLERANCE (1/8" IN 10 FEET). PAD MUST BE DESIGNED FOR A FULLY LOADED TANK, SOIL PROPERTIES AND FREEZE/THAW FORCES.

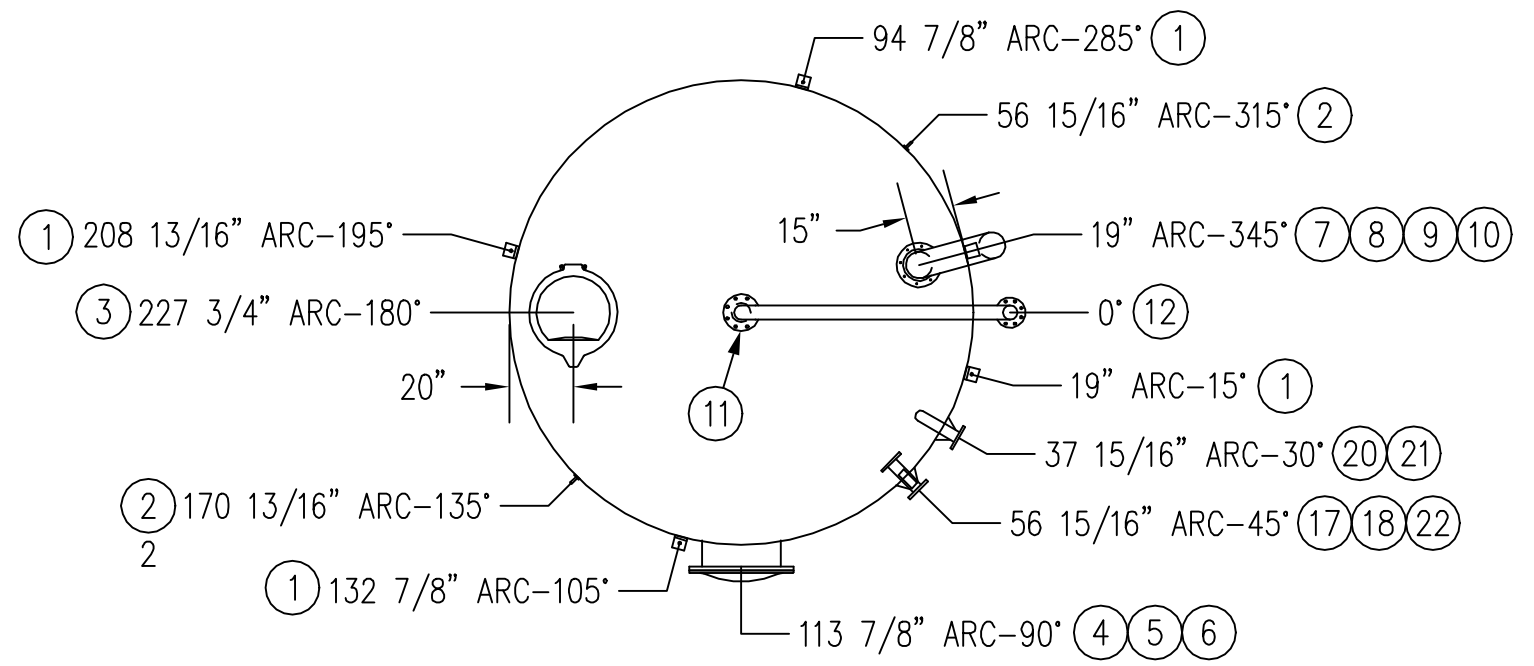
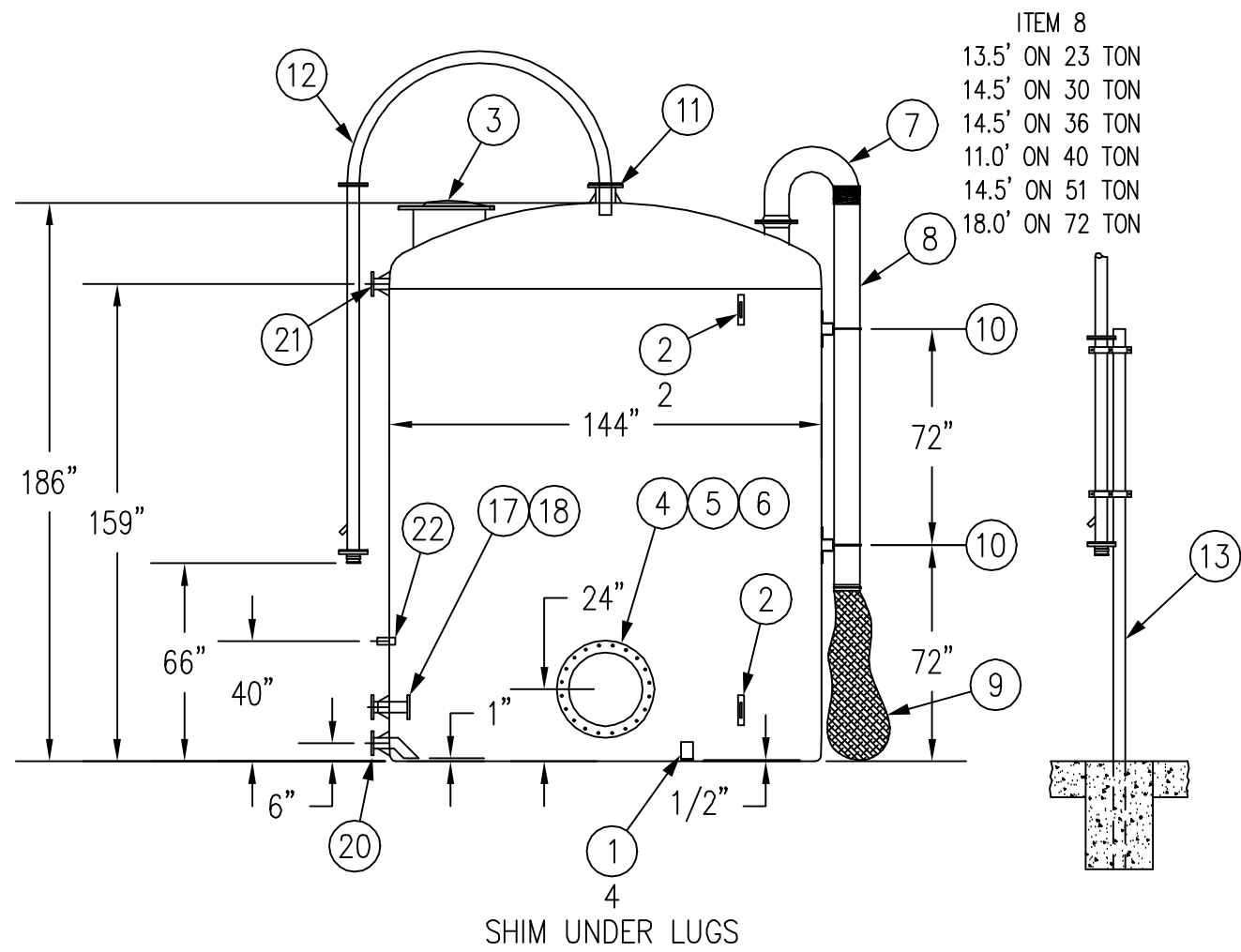
DESIGN CONDITIONS MUST BE PROVIDED TO CONFIRM CORROSION RESISTANCE OF RESIN SELECTION WARRANTY VOID IF DESIGN CONDITIONS ARE NOT SUPPLIED

DESIGN CONDITIONS

CHEMICAL ENVIRONMENT: SALT BRINE
 MAX. TEMPERATURE: AMBIENT
 PRESSURE: ATMOSPHERIC
 VACUUM: NONE
 SPECIFIC GRAVITY: 1.3
 WIND: ---
 SEISMIC ZONE: ---
 CAPACITY: 12,000 GALLONS
 EMPTY WEIGHT: 2400 POUNDS
 FILLED W/WATER WEIGHT: 102,480 POUNDS

EQUIPMENT NO.: --
 SERIAL NUMBER: --

				PROJ. MGR.	GCF	DESIGN TANKS		SIOUX FALLS, SOUTH DAKOTA			
				PROPRIETARY NOTICE		TITLE		FBDT 12'-0" X 15'-6" 12,000 GALLON 40 TON BRINEMAKER			
				NOTICE: THIS DRAWING WAS ORIGINATED BY AND IS THE PROPERTY OF DESIGN TANKS INC., WHO RESERVES ALL PATENT, PROPRIETARY DESIGN, USE, SALE, MANUFACTURING, AND/OR REPRODUCTION RIGHTS THERETO. UNDER PENALTY OF LAW MAY NOT BE USED IN ANY FORM BY ANY COMPANY WITHOUT THE EXPRESSED WRITTEN CONSENT OF DESIGN TANKS INC.		COLOR: NATURAL		DATE: 07/22/02	TANK ASSY#	NO. OF TANKS: 1	DRAWN BY: MSG
DESCRIPTION OF CHANGES						NAME	DATE	LTR.	CUSTOMER:		SIZE
DRAWING REVISIONS								B 33828			
						RFQ #		P.O. #	SCALE 1= NA	SHEET 1 OF 4	



NOTES:
 1. ALL VOLUMES ARE BASED ON BULK DENSITY OF 70lbs./ft.³
 2. ALL VOLUMES ARE BASED ON USEABLE STORAGE.
 3. OPTIONAL SIZES ARE AVAILABLE UPON REQUEST.

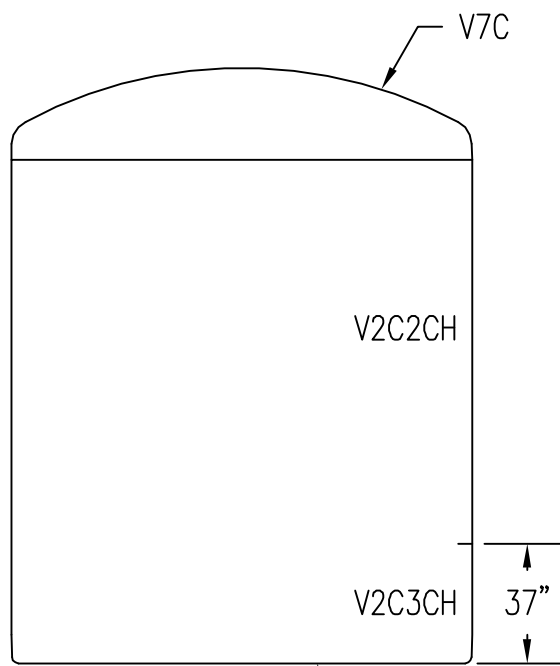
TONS	TANK PART#	SIZE DIA. X HT.
23	F086DT	8'-0" X 16'-11"
30	F098DT	9'-0" X 17'-11"
36	F1010DT	10'-0" X 18'-3"
40	F1212DT	12'-0" X 15'-6"
51	F1214DT	12'-0" X 18'-0"
72	F1218DT	12'-0" X 22'-7"

VINYL ESTER/C-VEIL LINER/MEKP CURE

DESIGN TANKS		SIOUX FALLS, SOUTH DAKOTA	
TITLE FBTD 12'-0" X 15'-6" 12,000 GALLON 40 TON BRINEMAKER			
COLOR: NATURAL		DATE: 07/22/02	TANK ASSY#
CUSTOMER:		NO. OF TANKS: 1	DRAWN BY: MSG
RFQ #		P.O. #	SCALE 1= 60 SHEET 2 OF 4
SIZE B		DRAWING NO./REVISION NO. 33828	

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NOTE: SOME ITEMS MAY BE ROTATED OR OMITTED IN ELEVATION VIEW FOR CLARITY SEE TOP VIEW FOR PROPER ORIENTATION



TANK CONSTRUCTION - REF.
LAMINATE SEQUENCE ON SHT. 1 OF 4

PART SCHEDULE

ITEM NO.	QTY. REQ'D.	NOTE	PART NUMBER	DESCRIPTION	PROJECTION	ORIENTATION	ELEVATION	RADIUS FROM EDGE	NOTES
1	4			GALV. HOLD-DOWN LUG WITH 7/8" HOLE					
2	3			GALVANIZED LIFT LUG					
3	1			24" QUICK ACCESS MANWAY	STD.	180°		20"	WITH 50# WEIGHTED COVER/NO LATCH
4	1			24" NON-GUSSET FLANGE, 25 PSI	8"	90°	24"		SIDE MANWAY (5 REIN.)
5	1			24" BLIND FLANGE, 25 PSI					
6	1			1/8" THK. X 24" EPDM FLANGE GASKET					
7	1			8" FRP U-VENT, DUCT STYLE FLANGE		345°		15"	
8	1			8" PVC VENT PIPE, BOOT AND CLAMPS					11 FT. LONG
9	1			DUST BAG					
10	2			GALVANIZED MOUNTING LUG, 4" PROJ.					
11	1			6" BLADE GUSSET FLANGE	6"	TDC			SALT FILL
12	1			4" SS SALT FILL PIPE WITH CLAMPS					
13	1			4" X 15' LONG SCH 40 PIPE					EPOXY PAINT WHITE
14	1			FRP BRINE PLENUM					WITH HOLD-DOWN CLIPS, SEE DETAIL
15	1			6" SCH 80 PVC FILTER PIPE WITH CAPS					SEE DETAIL, 49" LONG
16	1			3" INTERNAL BRINE PLENUM PIPING					SEE DETAIL, SHT. 4 OF 4
17	1			3" BLADE GUSSET FLANGE	6"	45°	18"		BRINE OUTLET (3 REIN.)
18	1			3" NON-GUSSET FLANGE	6"	45°	18"		INNER FLANGE
19	2			1/8" THK. X 3" EPDM FLANGE GASKET					
20	1			3" BLADE GUSSET SIPHON FLANGE	6"	30°	6"		DRAIN (3 REIN.)
21	1			3" BLADE GUSSET FLANGE	6"	30°	159"		OVERFLOW
22	1			1 1/2" NPT FULL COUPLING	4"	45°	40"		WATER SPRAY INLET (2 REIN.)
23	1			1 1/2" POLYETHYLENE PIPE					SPRAY RING, SEE DETAIL
24	1			1 1/2" PVC TEE, (HB X HB X MPT)					FOR SPRAY RING (1403-015)
25	2			1 1/2" SCH 80 PVC HB INSERT PLUG					FOR SPRAY RING (1449-015)
26	12			FRP SPRAY RING MOUNTING LUG			40"		2" X 4" X 2" PROJECTION, SEE DETAIL
27	1			CONTENTS LABEL					
28	1			DESIGN TANKS LOGO PELLON LABEL					

VINYL ESTER/C-VEIL LINER/MEKP CURE

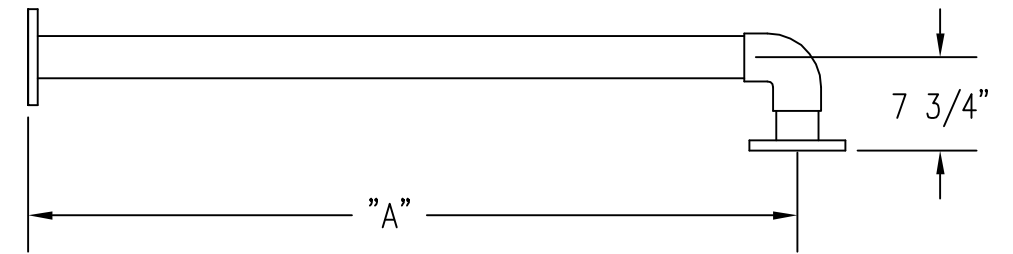
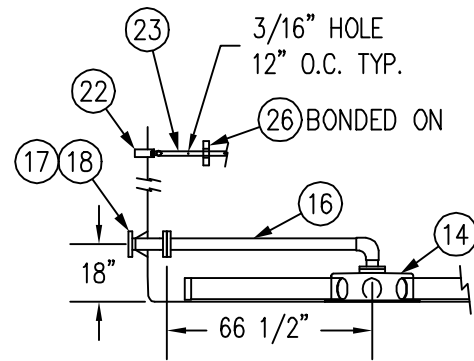
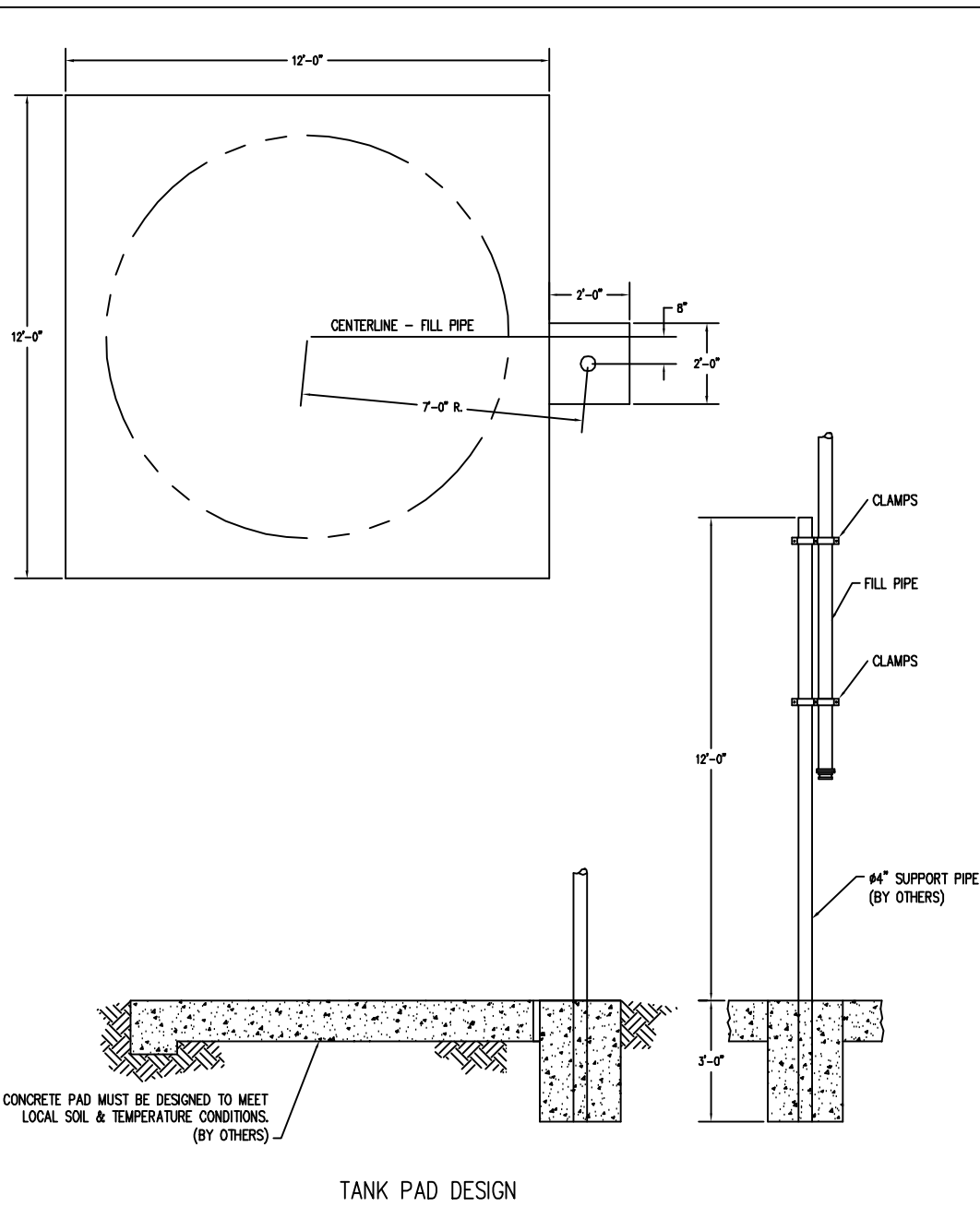
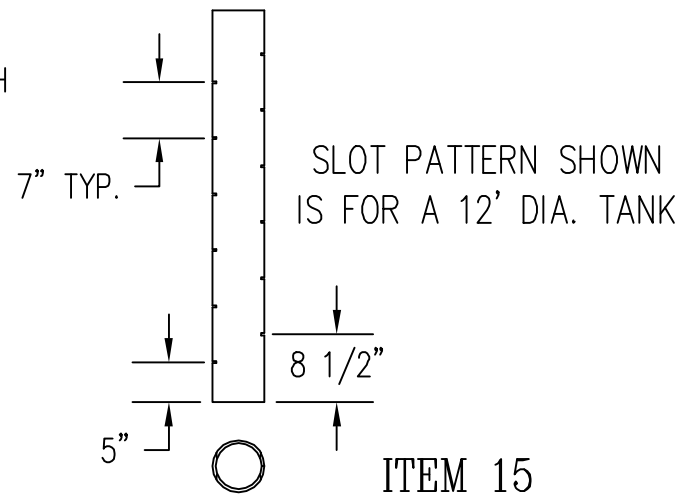
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TITLE FBDT 12'-0" X 15'-6" 12,000 GALLON 40 TON BRINEMAKER			
			NO. OF TANKS: 1
COLOR: NATURAL	DATE: 07/22/02	TANK ASSY#	DRAWN BY: MSG
CUSTOMER:		SIZE B	DRAWING NO./REVISION NO. 33828
RFQ #	P.O. #	SCALE 1= 60	SHEET 3 OF 4

PROPRIETARY NOTICE

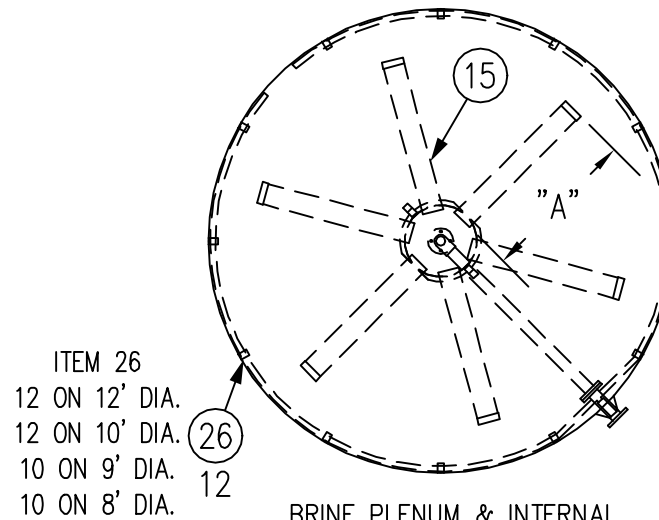
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"A" LONG X 6" DIA. PIPE WITH
(12) 2" SLOTS

- ITEM 15
 "A" = 49" ON 12' DIA.
 "A" = 37" ON 10' DIA.
 "A" = 31" ON 9' DIA.
 "A" = 25" ON 8' DIA.

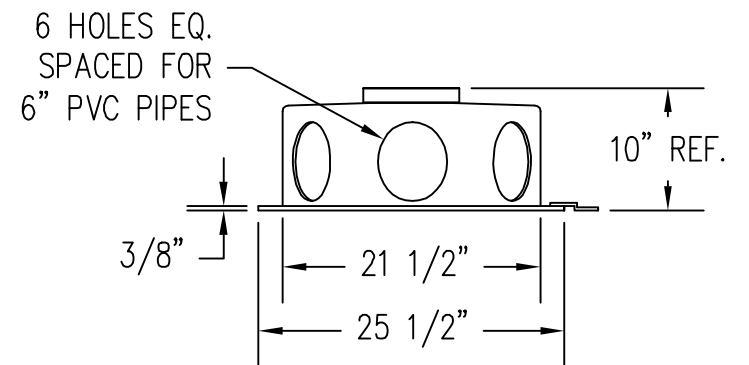
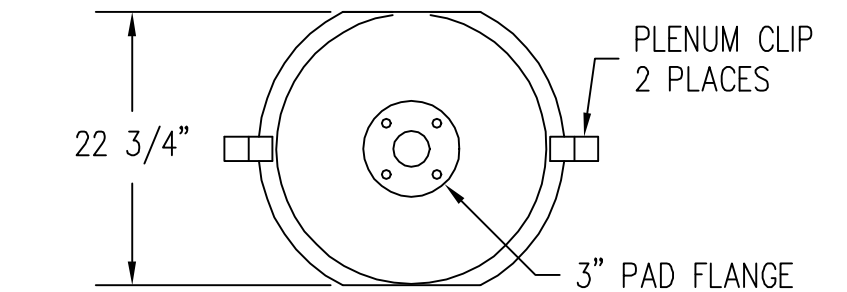


- ITEM 16 - SCALE 1:16
 "A" = 66 1/2" ON 12' DIA.
 "A" = 54 1/2" ON 10' DIA.
 "A" = 48 1/2" ON 9' DIA.
 "A" = 42 1/2" ON 8' DIA.



- ITEM 26
 12 ON 12' DIA.
 12 ON 10' DIA.
 10 ON 9' DIA.
 10 ON 8' DIA.

BRINE PLENUM & INTERNAL
 SPRAY RING ASSEMBLY
 ITEM 15
 "A" = 49" ON 12' DIA.
 "A" = 37" ON 10' DIA.
 "A" = 31" ON 9' DIA.
 "A" = 25" ON 8' DIA.



ITEM 14

VINYL ESTER/C-VEIL LINER/MEKP CURE

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