



CAGNEW
Energy Services

Storage Tank Presentation



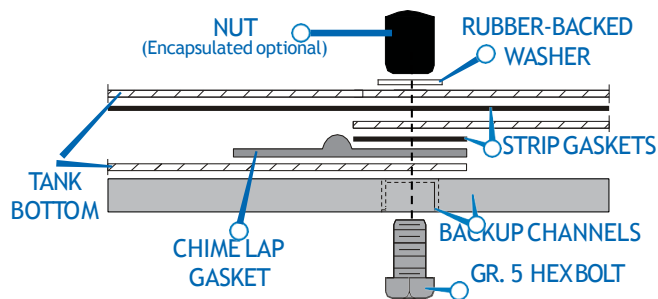


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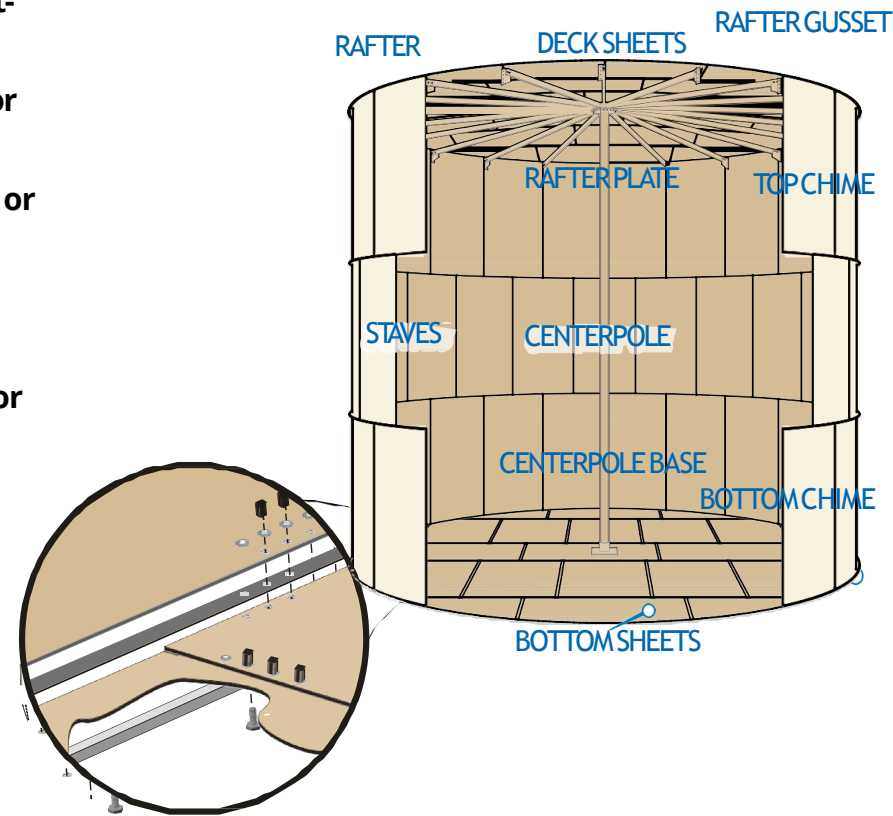
Energy Services

Storage Tank Presentation

- Various height/width ratios to fit space constraints
- Various interior and exterior colors & coatings available
- Specialized appurtenances and accessories
- Seismic, wind and snow load configurations
- Steel cone roofs with center pole support for superior strength, larger diameter tanks and elimination of roof lift-off in higher winds
- Floating roofs, dome roofs, and cone bottoms available for design flexibility
- Standardized panels facilitate tank expansion/relocation or replacement of damaged panels
- High tensile strength bolts -120,000 lbs per inch (encapsulated bolts optional)
- Single, double and triple row gaskets available for superior sealing



Bolted Tank Construction





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Assembly - 6,350 BBL Bolted Tank





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Assembly - 50,000 BBL Welded Tank





Bolted vs. Welded Comparison

Feature / Benefit		Bolted Construction Tanks		Welded Construction Tanks
Designed And Built To Meet Numerous Standards And Certifications	✓	AWWA, NSF, API, NFPA, FM Approvals	✓	AWWA, API, NFPA Approvals
Lifespan Cost	✓	Lower Initial Cost, Long Lifespan, Low Renovation Cost	✓	Higher Initial Cost, Long Lifespan, Higher Renovation Cycle
Standard Capacity Range 10,000 To 3,000,000 Gal (230 - 71,000 BBL)	✓	10,000 to 3,000,000 Gal (230 - 71,000 BBL)	✓	50,000 to 5,000,000 Gal (1,190 - 119,000 BBL)
Reservoir Capacity Range 2,000,000 to 50,000,000 Gal (47,000 - 1,190,000 BBL)	✗	Limited - 10,000 to 5,000,000 Gal (230 - 119,000 BBL) Due To Panel Design	✓	Extra Large Capacities From 100,000 To 5,000,000 Gal
Well Suited For Hydrocarbon Or Corrosive Chemical Storage	✓	Specially Formulated Powder Coating For Corrosive Materials And Hydrocarbon Liquids	✓	Specific Coatings Available For Hydrocarbon Storage
Construction Speed	✓	1/3 Of Time Required By Other Designs	✓	Meets Time Constraints Even With Welding / Grinding Of Each Seam
Equipment And Personnel Required For Installation	✓	No Special Equipment Or Certified Labor Required	✗	Automated Or Manual Welding With Certified Personnel Required. Large Heavy Duty Cranes Also Required
Easiest Installation	✓	Smaller Panels Are Easy To Set Up. No Welding Or Sparks To Ignite Surroundings	✓	Panels Require Standard Staging Area And Open Space To Maneuver Into Position
Difficulty Of Expansion	✓	Can Be Disassembled Quickly And Reinstalled. Additional Panels Can Be Inserted To Increase Tank Capacity	✓	Expansion Requires Cutting Shell, Then Removing Entire Roof, Adding Panels, Rewelding, Recoating And Sandblasting
Resistant To Weather Delays	✓	Prefinished, Smaller Panels Can Be Assembled In A Variety Of Conditions	✓	Caution Needed When Welding & Coating In Extremely Dry Areas Or With Excess Moisture Present
Meets Or Exceeds All Relevant Building Codes Including Wind, Seismic, And Snow Loads	✓	Internal Engineering Team Designs Tank Per Project	✓	Internal Engineering Team Designs Tank Specifications Per Project
Site Impact (Noise, Traffic, Dust, Space)	✓	Very Minimal Due To Factory Prefabrication And Bolt Together Assembly. On Site Welding Or Painting Not Required	✓	Typical Construction Impact: Heavy Delivery Traffic, Portable Generators For Welding And Compressors For Sandblasting Painting
Durable And Non-Seeping Seam Seal	✓	Heavy Duty Gasket Utilization - Depends Upon Tank Contents	✓	N/A
Ease Of Cleaning	✓	Non-Porous Powder Coating Is Easy To Clean	✓	Non-Porous Coating Is Easy To Clean
Corrosion Resistance & Coating Durability	✓	Even If Coating Is Damaged, Seals Will Isolate Corrosion To Local Area	✓	Traditional Liquid Coating Over Entire Surface
Field Repair Of Coating	✓	Easily Touched Up With Common Supplies	✓	Easily Touched Up With Common Supplies



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Standard Tank Sizes

TANK		Feet	Meters	Feet	Meters	Feet	Meters	Feet	Meters	Feet	Meters	Feet	Meters	Feet	Meters	Feet	Meters
DIAMETER (FEET)	DIAMETER (METERS)	8'-1/2"	2.451	16'-1"	4.901	24'-1 1/2"	7.353	32'-2"	9.805	40'-2 1/2"	12.255	48'-3"	14.707	56'-3 1/2"	17.158	64'-4"	19.609
9'-2 3/4"	2.813	4,023	15	8,047	30	12,073	46	16,097	61	20,121	76	24,145	91	28,169	107	32,193	122
12'-3 11/16"	3.751	7,155	27	14,309	54	21,468	81	28,624	108	35,780	135	42,936	163	50,092	190	57,248	217
15'-4 5/8"	4.69	11,181	42	22,362	85	33,549	127	44,733	169	55,915	212	67,099	254	78,282	296	89,464	339
17'-2 1/4"	5.239	13,955	53	27,910	106	41,874	159	55,832	211	69,789	264	83,747	317	97,705	370	111,662	423
18'-5 9/16"	5.628	16,104	61	32,208	122	48,322	183	64,429	244	80,535	305	96,643	366	112,751	427	128,857	488
21'-6 1/2"	6.567	21,920	83	43,841	166	65,775	249	87,701	332	109,624	415	131,550	498	153,476	581	175,399	664
23'-9 3/16"	7.244	26,679	101	53,359	202	80,055	303	106,741	404	133,424	505	160,110	606	186,796	707	213,478	808
25'-9 3/8"	7.859	31,396	119	62,792	238	94,208	357	125,612	476	157,012	595	188,416	713	219,820	832	251,220	951
26'-8 15/16"	8.153	33,788	128	67,576	256	101,385	384	135,182	512	168,974	640	202,770	768	236,567	896	270,359	1,024
29'-8 5/8"	9.059	41,720	158	83,440	316	125,186	474	166,917	632	208,642	790	250,373	948	292,103	1,106	333,829	1,264
32'-8 3/16"	9.962	50,454	191	100,908	382	151,393	573	201,860	764	252,320	955	302,786	1,146	353,253	1,337	403,713	1,528
34'-2"	10.415	55,143	209	110,286	418	165,464	626	220,620	835	275,770	1,044	330,927	1,253	386,084	1,462	441,234	1,671
38'-7 5/8"	11.777	70,508	267	141,016	534	211,568	801	282,094	1,068	352,611	1,335	423,137	1,602	493,662	1,869	564,179	2,136
40'-1 5/16"	12.226	75,991	288	151,982	575	228,020	863	304,030	1,151	380,030	1,439	456,040	1,727	532,049	2,014	608,050	2,302
41'-7 1/8"	12.679	81,722	309	163,444	619	245,217	928	326,959	1,238	408,691	1,547	490,434	1,857	572,176	2,166	653,908	2,476
44'- 6 3/4"	13.586	93,820	355	187,640	710	281,459	1,065	375,280	1,421	469,100	1,776	562,920	2,131	656,740	2,486	750,560	2,841
47'-6 3/8"	14.488	106,716	404	213,433	808	320,216	1,212	426,959	1,616	533,689	2,020	640,432	2,424	747,175	2,829	853,904	3,233
50'-6 1/16"	15.395	120,489	456	240,977	912	361,541	1,369	482,060	1,825	602,563	2,281	723,082	2,738	843,601	3,194		
54'-11 3/4"	16.759	142,781	541	285,563	1,081	428,433	1,622	571,249	2,163	714,048	2,703	856,865	3,244				
59'-5"	18.111	166,763	631	333,525	1,263	500,392	1,894	667,196	2,526	833,980	3,157	1,000,784	3,789				
65'-4 5/16"	19.922	202,403	764	404,805	1,528	607,334	2,292	809,787	3,056	1,012,215	3,820						
72'-9 7/16"	22.186	250,250	947	500,499	1,895	750,904	2,843	1,001,216	3,790	1,251,497	4,738						
74'-3 1/4"	22.639	260,565	986	521,130	1,973	781,857	2,960	1,042,487	3,947	1,303,084	4,933						
80'-2 9/16"	24.45	303,933	1,151	607,866	2,301	911,988	3,452	1,215,997	4,603								
86'-1 7/8"	26.261	350,630	1,327	701,259	2,655	1,052,107	3,983	1,402,824	5,311								
92'-1 3/16"	28.073	400,671	1,517	801,341	3,034	1,202,261	4,551										
95'- 0 3/16"	28.956	426,994	1,616	853,988	3,233	1,280,981	4,849										
103'-11 3/4"	31.676	510,776	1,933	1,021,551	3,867	1,532,327	5,800										
124'-9 5/16"	38.033	735,427	2,784	1,470,854	5,568	2,206,739	8,354										
		US Gallons	Cubic Meters	US Gallons	Cubic Meters	US Gallons	Cubic Meters	US Gallons	Cubic Meters	US Gallons	Cubic Meters	US Gallons	Cubic Meters	US Gallons	Cubic Meters	US Gallons	Cubic Meters



Tank Options



Liquid Level Indicators

- English or metric units
- Stainless steel internals
- Full or half travel



Cast Iron Flange

- 1/2" threaded connection
- 2" to 8" diameter
- Bolts through shell



Uni Tank Flange

- Threaded connection to tank
- 1" to 6" diameter
- Threaded through shell



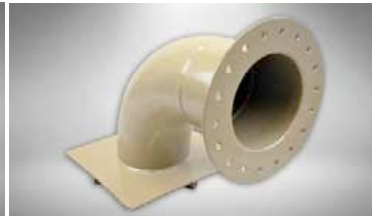
Vacuum Tester Box

- Ensures leak free tank bottom
- Operates on compressed air



Nozzle

- FPC or galvanized, stainless steel
- 6" to custom projections
- Bolted to tank



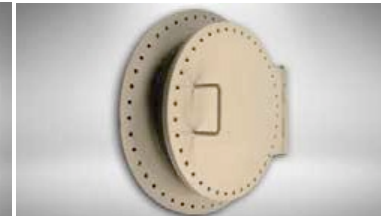
Anti-Vortex Outlet

- FPC or galvanized, stainless steel
- Eliminates cavitation of pumps



Weir Box/Cones

- Powder Coated or galvanized, stainless steel
- Overflow weir
- Custom sized to tank



Shell Manway (Hinged)

- FPC, galvanized, stainless steel
- 24" and 36" sizes
- Side hinge



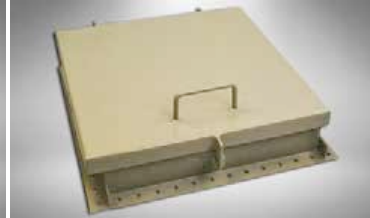
Sample Box

- FPC or galvanized
- Facilitates level sampling
- 5+ lines



Sample Tap Level Gauge

- Provides accurate level reading
- Convenient sampling



Roof Hatch

- FPC or galvanized, stainless steel
- 12" to 36" sizes
- Hinged & lockable



Cone Deck Manway

- FPC or galvanized, stainless steel
- 20", 24" and 36" sizes
- Sealed for API application



Floor Sump

- Collects settling sediment
- Facilitates sediment clean out



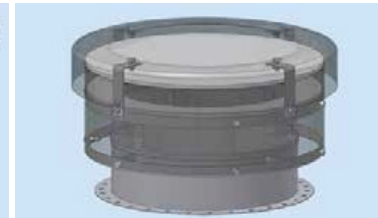
Step Off Platform

- Galvanized finish
- Custom sized to tank
- OSHA compliant



Stairway

- Galvanized finish
- Custom sized to tank
- OSHA compliant



Frost Free Roof Vent

- Powder coated or galvanized, stainless steel
- Aluminum dome
- Galvanized, nylon, stainless steel or fiberglass screen



Tank Options



Exterior/Interior Ladder

- FPC or galvanized, stainless steel
- Open or with back guard
- With or without anti-climb
- Saf-T-Climbs



Ladder Enclosures

- Lockable
- With or without anti-climb
- Auto close gates



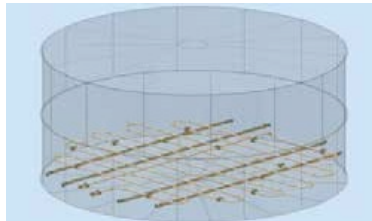
Inlet Air Gap

- Prevents back flow in potable water systems
- Improves air flow of tank when water level changes
- Galvanized, nylon, stainless steel or fiberglass screen



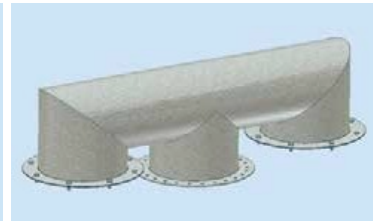
Roof Gap

- Powder coated or galvanized, stainless steel
- Aluminum dome
- Galvanized, nylon, stainless steel or fiberglass screen



Heater Coils

- Suitable for various liquids
- Carbon or stainless steel tubing
- API/AWWA Application



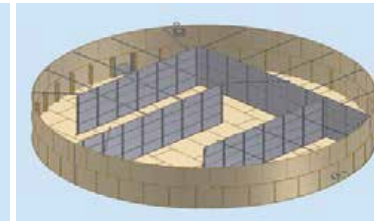
T-Vent

- Powder coated or galvanized, stainless steel
- Aluminum dome
- Galvanized, nylon, stainless steel or fiberglass screen



Extended Neck Cleanout

- Powder coated or galvanized, stainless steel
- 24" x 36" to 36" x 72"
- API Application



Baffle Systems

- Ensures sufficient retention time
- Designed to meet customer needs
- Bolt together assembly facilitates installation

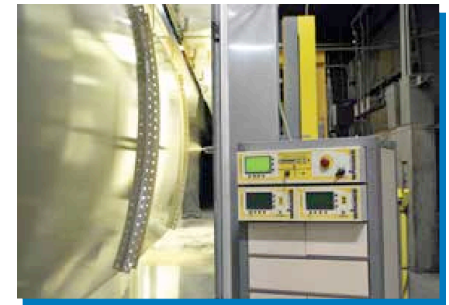


Tank Coatings and Colors

Every square inch is prepared for coating using sandblasting per the most stringent standard of Near White SSPC SP10/ NACE No.2. All coatings are applied in a special environmentally controlled area to ensure a defect free finish. Coatings are applied in two separate stages allowing for maximum durability of both interior and exterior surfaces. Interior coatings are selected for chemical resistance and hardness and exterior coatings are designed for UV and corrosion protection.

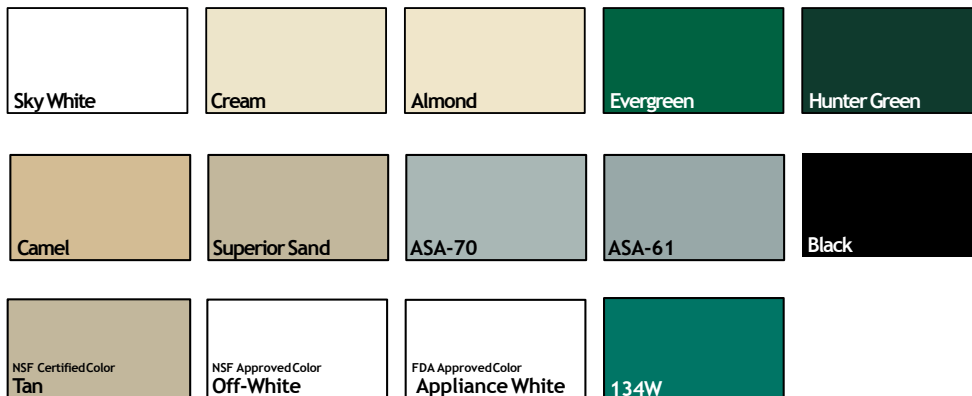
Our specially designed powder coated finish is distinct in numerous ways:

- Electrostatic application at factory in environmentally controlled conditions for 100% adherence and uniformity
- Heat cured immediately for outstanding bonding
- High impact and abrasion resistant
- Easy to repair in the field, if needed
- Environmentally safe (no site application permits required)
- Flexible with no cracking or sparring associated with other coatings
- Double edge coating (interior and exterior coating) for superior corrosion protection
- Thicker (5 mil) application for greater durability
- NAP-Guard system for outstanding protection against acids, hydrocarbons and inorganic compounds



Standard Powder Coatings:

Exterior - TGIC Polyester: (Shown colors are approximations.)

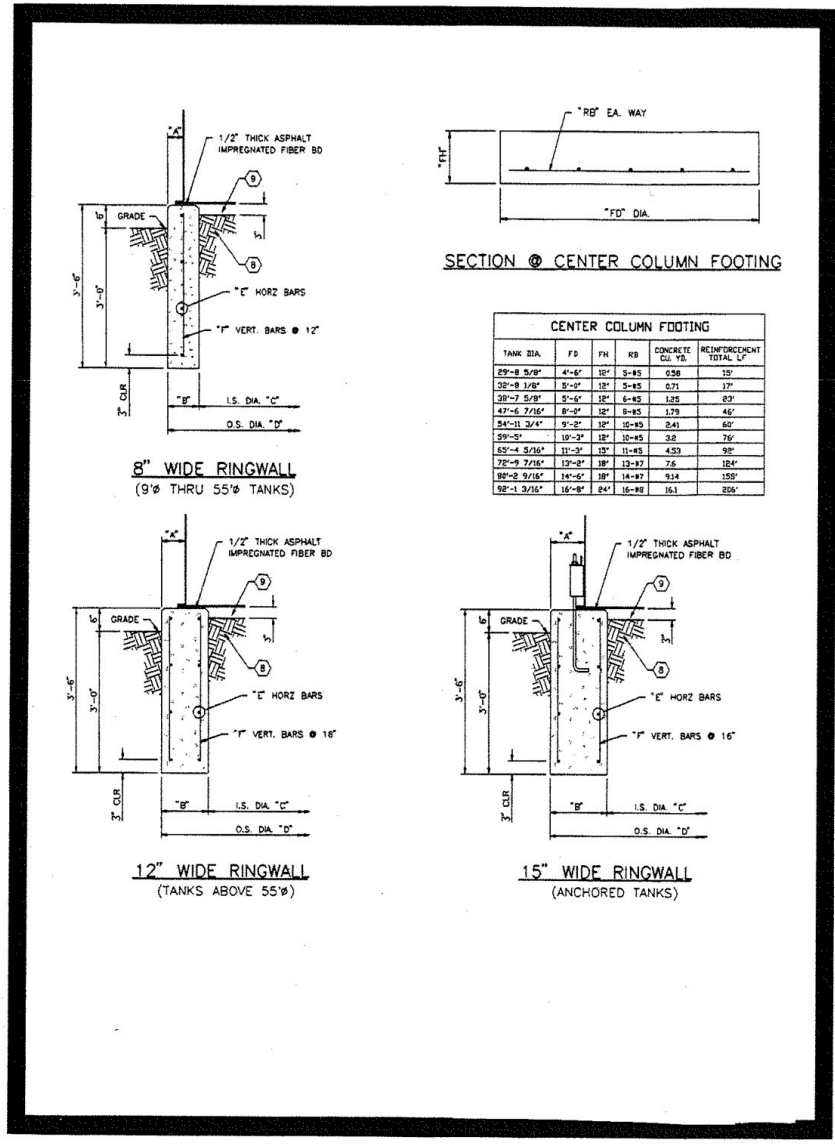


3M Scotchkote™ Premium Powder Coating also available!

- Best for storage of corrosive liquids.
- Best chemical resistance (tested with over 1000 chemicals).
- Tested to extreme conditions without blisters or coating loss: 300 degrees @ 3000psi.



Foundation Plans





Foundation Plans

TANK SIZE DIAMETER	HEIGHT	FOUNDATION				REINFORCING		CONCRETE		SOIL BRG PRESS. PSF	
		A	B	C	D	F	HORIZ	VERT	CU YD		
9'-2 3/4"	8'	4"	8"	8'-6 3/4"	9'-10 3/4"	4-#4	29-#4	116'	87'	2.51	500
	16'	4"	8"	8'-6 3/4"	9'-10 3/4"	4-#4	29-#4	116'	87'	2.51	1000
	24'	4"	8"	8'-6 3/4"	9'-10 3/4"	4-#4	29-#4	116'	87'	2.51	1500
12'-3 11/16"	8'	4"	8"	11'-7 11/16"	12'-11 11/16"	4-#4	39-#4	155'	117'	3.34	500
	16'	4"	8"	11'-7 11/16"	12'-11 11/16"	4-#4	39-#4	155'	117'	3.34	1000
	24'	4"	8"	11'-7 11/16"	12'-11 11/16"	4-#4	39-#4	155'	117'	3.34	1500
15'-4 5/8"	8'	4"	8"	14'-8 5/8"	16'-0 5/8"	4-#4	49-#4	193'	147'	4.18	500
	16'	4"	8"	14'-8 5/8"	16'-0 5/8"	4-#4	49-#4	193'	147'	4.18	1000
	24'	4"	8"	14'-8 5/8"	16'-0 5/8"	4-#4	49-#4	193'	147'	4.18	1500
18'-5 1/2"	8'	4"	8"	17'-9 1/2"	19'-1 1/2"	4-#4	58-#4	232'	174'	5.01	500
	16'	4"	8"	17'-9 1/2"	19'-1 1/2"	4-#4	58-#4	232'	174'	5.01	1000
	24'	4"	8"	17'-9 1/2"	19'-1 1/2"	4-#4	58-#4	232'	174'	5.01	1500
21'-6 1/2"	8'	4"	8"	20'-10 1/2"	22'-2 1/2"	4-#4	68-#4	271'	204'	5.85	500
	16'	4"	8"	20'-10 1/2"	22'-2 1/2"	4-#4	68-#4	271'	204'	5.85	1000
	24'	4"	8"	20'-10 1/2"	22'-2 1/2"	5-#4	68-#4	239'	204'	5.85	1500
26'-1 7/8"	8'	4"	8"	25'-5 7/8"	28'-9 7/8"	4-#4	83-#4	329'	249'	7.10	500
	16'	4"	8"	25'-5 7/8"	28'-9 7/8"	4-#4	83-#4	329'	249'	7.10	1000
	24'	4"	8"	25'-5 7/8"	28'-9 7/8"	5-#4	83-#4	311'	249'	7.10	2000
29'-8 5/8"	8'	4"	8"	29'-0 5/8"	30'-4 5/8"	4-#4	94-#4	373'	282'	8.07	1000
	16'	4"	8"	29'-0 5/8"	30'-4 5/8"	5-#4	94-#4	346'	282'	8.07	2000
	24'	4"	8"	29'-0 5/8"	30'-4 5/8"	7-#4	94-#4	353'	282'	8.07	2500
32'-8 1/8"	8'	4"	8"	32'-0 1/8"	33'-4 1/8"	4-#4	103-#4	411'	309'	8.87	1000
	16'	4"	8"	32'-0 1/8"	33'-4 1/8"	5-#4	103-#4	411'	309'	8.87	1500
	24'	4"	8"	32'-0 1/8"	33'-4 1/8"	5-#4	103-#4	513'	309'	8.87	2000
38'-7 5/8"	8'	4"	8"	37'-11 5/8"	39'-3 5/8"	4-#4	122-#4	485'	366'	10.49	1000
	16'	4"	8"	37'-11 5/8"	39'-3 5/8"	5-#4	122-#4	485'	366'	10.49	1500
	24'	4"	8"	37'-11 5/8"	39'-3 5/8"	4-#6	122-#4	485'	366'	10.49	2000
47'-8 7/16"	8'	4"	8"	46'-10 7/16"	48'-2 7/16"	4-#4	150-#4	597'	450'	12.91	1000
	16'	4"	8"	46'-10 7/16"	48'-2 7/16"	7-#4	150-#4	1045'	450'	12.91	1500
	24'	4"	8"	46'-10 7/16"	48'-2 7/16"	7-#6	150-#4	1045'	450'	12.91	2000
54'-11 3/4"	8'	4"	8"	54'-3 3/4"	55'-7 3/4"	4-#4	173-#4	691'	519'	14.92	1000
	16'	4"	8"	54'-3 3/4"	55'-7 3/4"	5-#4	173-#4	691'	519'	14.92	1500
	24'	4"	8"	54'-3 3/4"	55'-7 3/4"	4-#6	173-#4	691'	519'	14.92	2000
59'-5"	8'	6"	12"	58'-5"	60'-5"	8-#4	280-#4	1433'	840'	24.20	1000
	16'	6"	12"	58'-5"	60'-5"	10-#4	280-#4	1867'	840'	24.20	1500
	24'	6"	12"	58'-5"	60'-5"	14-#4	280-#4	2515'	840'	24.20	2000
65'-4 5/16"	8'	6"	12"	64'-4 5/16"	66'-4 5/16"	8-#4	308-#4	1643'	924'	26.62	1000
	16'	6"	12"	64'-4 5/16"	66'-4 5/16"	10-#4	308-#4	2053'	924'	26.62	1500
	24'	6"	12"	64'-4 5/16"	66'-4 5/16"	10-#6	308-#4	2053'	924'	26.62	2000
72'-9 7/16"	8'	6"	12"	71'-9 7/16"	73'-9 7/16"	8-#4	344-#4	1835'	1032'	29.64	1000
	16'	6"	12"	71'-9 7/16"	73'-9 7/16"	9-#4	344-#4	1835'	1032'	29.64	1500
	24'	6"	12"	71'-9 7/16"	73'-9 7/16"	8-#6	344-#4	1835'	1032'	29.64	2000
80'-2 9/16"	8'	6"	12"	79'-2 9/16"	81'-2 9/16"	8-#4	378-#4	2016'	1134'	32.67	1000
	16'	6"	12"	79'-2 9/16"	81'-2 9/16"	8-#5	378-#4	2016'	1134'	32.67	1500
	24'	6"	12"	79'-2 9/16"	81'-2 9/16"	8-#6	378-#4	2016'	1134'	32.67	2000
92'-1 3/16"	8'	6"	12"	91'-1 3/16"	93'-1 3/16"	8-#4	434-#4	2315'	1302'	37.51	1000
	16'	6"	12"	91'-1 3/16"	93'-1 3/16"	10-#6	434-#4	2893'	1302'	37.51	1500
	24'	6"	12"	91'-1 3/16"	93'-1 3/16"	12-#6	434-#4	3472'	1302'	37.51	2000

NOTES:
 1. Tank requires anchor bolts.
 2. Center column footing required.
 3. Foundation for single tank installation.
 4. Concrete: f'c=3000 psi at 28 days.
 5. Reinforcing: Fy=60000 psi.
 6. Frost line at foundation 36" maximum.
 7. The values on this drawing include for a standard wind load, seismic loads for zones 1 & 2, and the weight of water at 62.4 pcf. This drawing is for reference only, and a soil investigation and foundation design should be performed by a qualified engineer.
 8. Remove any unstable material and replace with suitable fill, then compact thoroughly.
 9. Provide a minimum 3" layer of compacted crushed stone or sand.