

This drawing is based on a design prepared by the Midwest Plan Service at Iowa State University. For more specific details concerning the design, refer to Midwest Plan Service Publication TR-9, Circular Concrete Manure Tanks.

This drawing may be used for tanks which are above or below ground. The design is in accordance with ultimate strength design requirements detailed in ACI 318-95.

Design Loading:

1. Manure load: 65 psf/ft. of depth.
2. Soil backfill loads: 85 psf/ft. of depth with no surcharge or 60 psf/ft. of depth with 120 psf lateral surcharge. This requires the structure backfill to be adequately drained. To meet this requirement, see backfill details on this sheet.

Construction Notes:

1. The concrete shall conform to Missouri Construction Specification 750 and have a minimum 28 day compressive strength of 4,000 psi. The mix shall be approved by NRCS prior to placement.
2. Reinforcing steel shall be grade 60.
3. Walls shall have the steel located in the center of the wall.
4. Reinforcing steel in the footing shall be placed 3 inches above the ground or base material.
5. Reinforcing steel in the floor shall be placed with 2 inches of cover from the top of the floor.
6. Construction joints may be used to ease construction. The location of construction joints shall be approved by the Natural Resource Conservation Service prior to placing the concrete.
7. Non-metallic waterstop shall equal or exceed the requirements of NRCS Material Specification 537.
8. The 1/4"x6" steel plate in the wall to ring foundation joint shall be continuous. Steel plate sections may be butt welded or lapped with a minimum lap length of 6" to make them continuous.
9. All concrete shall be properly cured for a minimum of 7 days. Acceptable curing methods include keeping the concrete wet by soaking or a continuous spray; leaving the forms in place; covering with a continuous layer of polyethylene sheets against the concrete; or a white pigmented spray-on curing compound.
10. Backfill shall be brought up uniformly around the tank. The maximum difference in the finished backfill elevations around the tank shall be three feet.
11. All construction methods shall meet OSHA regulations.
12. If tank is located in an area with a high water table, a sand drain will be required beneath the floor slab that is connected to the gravel drain underlying the wall footing and wall drain. The sand or gravel shall be a minimum of 6 inches thick. Geotextile shall be placed over sand or gravel prior to pouring concrete. Gravel shall be separated from soil material by Geotextile. See Sheet 3.
13. For additional details see Missouri Construction Specification 313.

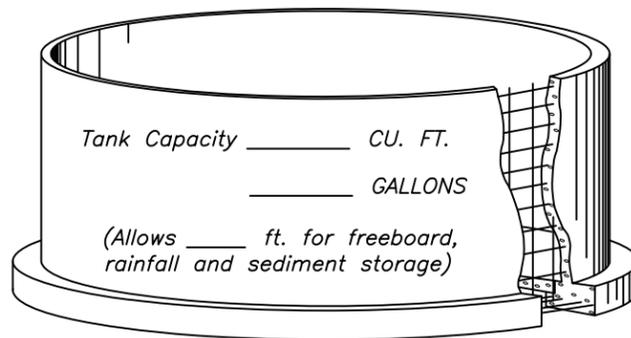
Safety Considerations:

If the tank will be located in an area where children or livestock could get to the tank, the tank should be surrounded by a chain link or wire fence.

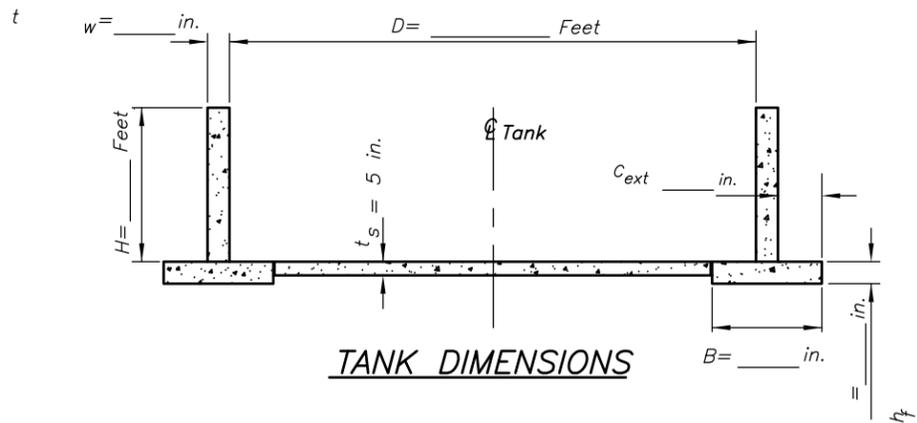
Signs should be erected stating that the tank contains animal waste materials and is hazardous.

Unloading Station:

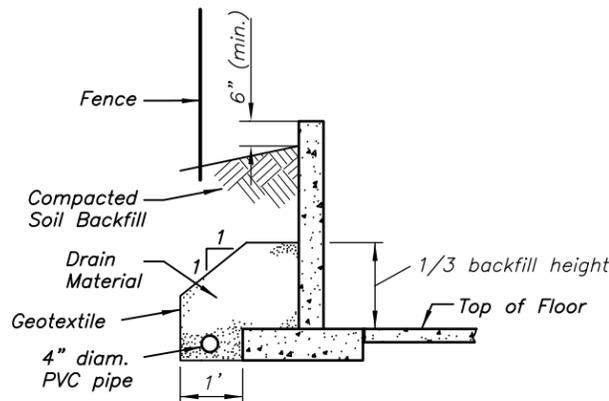
If tractors, heavy tank wagons, or trucks will be driven along the edge of the tank, cast a 6" thick concrete slab along the traffic route by the tank. The concrete slab should be large enough to eliminate any wheel loads directly on the natural ground or backfill by the tank. The purpose of the slab is to distribute the loading along the tank wall and prevent mud and erosion. The concrete slab should be reinforced with #4 Steel Reinforcement Bar on 18" C.C. in both directions. Gravel backfill is required under slab.



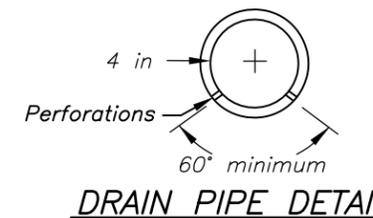
CIRCULAR CONCRETE MANURE TANK



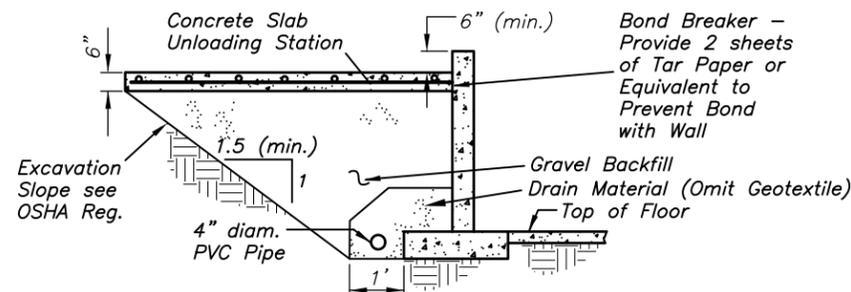
TANK DIMENSIONS



TYPICAL WALL BACKFILL DETAIL



1. Drain pipe is to be routed around the tank and to a protected outlet/s such that the ground water level is not any higher than the top elevation of the footing. Set drain pipe a minimum of 4 inches above bottom of drainfill.
2. Drain pipe shall be minimum 4 inch diameter Schedule 40(SDR=19) PVC pipe conforming to ASTM D1785 or equivalent plastic pipe. Perforations shall be 1/4 inch diameter in two rows separated by an arc of not less than 60°. Opening area shall be greater than 0.22 square inch per lineal foot. Perforations shall be clean cut and free of obstructions.
3. Geotextile shall be nonwoven and conform to Missouri Construction Specification 753. Fabric weight shall be a minimum of 6 ounce per square yard.
4. Drainfill shall be clean, well graded gravel with maximum size of 3 inches and less than 5 percent finer than 200 sieve size.
5. An alternate drain with slotted pipe may be used. The Slotted pipe shall be minimum 4 inch diameter Schedule 40 PVC with 0.030 inch wide slots uniformly spaced in 3 or more rows. Slots shall be clean cut with a minimum open area of 10 square inches per foot. Drainfill shall be ASTM C33 concrete sand. Geotextile is not required.
6. Provide minimum _____ feet of backfill over top of footing for frost protection.



WALL BACKFILL DETAIL-UNLOADING STATION

Date	
Designed	
Drawn	
Checked	
Approved	

CIRCULAR CONCRETE MANURE TANK



DRAFT

NOT FOR CONSTRUCTION

File Name	
Drawing Name	29-N-625
Sheet	of