



Subject: Determine minimum soil covering for Hoot 750 GPD concrete unit with 1400TT/1700 EQ to prevent floatation.

Assumptions:

1. Concrete unit has a 5" lid and weights 17,920 lbs empty per Hoot Aerobic Systems, overall dimensions are L = 179", W = 83.5", H = 75".
2. Unit contains a minimum of 1400 gals of water under operation conditions.
3. Soil in the southwest Louisiana and southeast Texas area has a specific gravity of 1.45 to 1.60. A specific gravity of 1.40 will be used.
4. Water has a density of 62.4 lbs/cubic ft and one gal weights 8.34 lbs.
5. The unit has one [1] 20" riser and four [4] 12" risers that go to grade.
6. When weight of tank + water contained + soil covering exceeds water displaced by tank, the tank will not float.

Calculation:

Weight of water displaced: 14.92' x 6.96' x 6.25' x 62.4 lbs/cu ft = **40,500 lbs**

Weight of empty tank = **20,462 lbs**

Weight of water in tank: 1400 gal x 8.34 lbs/gal = **11,676 lbs**

Required soil weight = **8,362 lbs**

Soil foot print: Tank: 14.92' x 6.96' = 103.8 sq ft

Less Risers:

20" 1 x [20/12 x 1/2]Sq x 3.14 = 2.2 sq ft

12" 4 x [12/12 x 1/2]Sq x 3.14 = 3.2 sq ft

Total foot print = **98.4 sq ft**

Required min height of soil cover [Hs]:

$$1.4 \times 62.4 \text{ lbs/cu ft} \times 98.4 \text{ sq ft} \times H_s = 8,362 \text{ lbs}$$

$$H_s = 0.97 \text{ ft or } 12"$$

Conclusion: The 750 GPD Hoot system described above with a minimum of 13" of soil cover will not float at operating conditions.



K. Gary Scroggs 6/25/08



Subject: Determine minimum soil covering for Hoot 750 GPD concrete unit with 1400TT/1700 EQ to prevent floatation.

Assumptions:

1. Concrete unit has a 3" lid and weights 17,920 lbs empty per Hoot Aerobic Systems, overall dimensions are L = 179", W = 83.5", H = 72".
2. Unit contains a minimum of 1400 gals of water under operation conditions.
3. Soil in the southwest Louisiana and southeast Texas area has a specific gravity of 1.45 to 1.60. A specific gravity of 1.40 will be used.
4. Water has a density of 62.4 lbs/cubic ft and one gal weights 8.34 lbs.
5. The unit has one [1] 20" riser and four [4] 12" risers that go to grade.
6. When weight of tank + water contained + soil covering exceeds water displaced by tank, the tank will not float.

Calculation:

Weight of water displaced: 14.92' x 6.96' x 6' x 62.4 lbs/cu ft = **38,879 lbs**

Weight of empty tank = **17,920 lbs**

Weight of water in tank: 1400 gal x 8.34 lbs/gal = **11,676 lbs**

Required soil weight = **9,283 lbs**

Soil foot print: Tank: 14.92' x 6.96' = 103.8 sq ft

Less Risers:

20" 1 x [20/12 x 1/2]Sq x 3.14 = 2.2 sq ft

12" 4 x [12/12 x 1/2]Sq x 3.14 = 3.2 sq ft

Total foot print= **98.4 sq ft**

Required min height of soil cover [Hs]:

$$1.4 \times 62.4 \text{ lbs/ cu ft} \times 98.4 \text{ sq ft} \times Hs = 9,283 \text{ lbs}$$

$$Hs = 1.08 \text{ ft or } 14"$$

Conclusion: The 750 GPD Hoot system described above with a minimum of 15" of soil cover will not float at operating conditions.



[Handwritten signature]
6/29/08