ALTERNATE TANK INSTALLATION METHODS

SUPPLEMENTAL INSTRUCTIONS

1. INTRODUCTION

1.1. Fiberglass underground tanks must be installed according to these instructions and NFPA 30, 30A and 31, OSHA and all applicable Federal, State, Local, or Provincial, construction, safety and environmental codes and regulations.

1.2. Follow these Supplemental Instructions as well as all instructions covered in the most recent edition of Containment Solutions™ Tank Installation Instructions (Pub. No. INS1300).

1.3. The following instructions include alternative installation methods for: Deep Bury Tanks, Alternative Backfill Above Tank Top, Backfill on Perimeter of Excavation, and Backfill Depth Under and Around Tank.

1.4. Each of these alternative installations are unique only to that section. (If you have a deep bury tank and want to use alternative backfill above the tank top, each section must be followed independently.)

1.5. Safety

1.5.1. These instructions should not be interpreted in any way to put one's health at risk, or to harm property and/or the environment.

1.5.2. Keep this manual available at the installation site and refer to safety procedures as needed.

1.5.3. The following definitions will serve as a guide when reading this manual:

⚠WARNING

Indicates a potentially hazardous situation, which if not avoided could result in death or serious injury.

⚠CAUTION

Indicates a potentially hazardous situation, which if not avoided may result in minor or moderate injury.

NOTICE

Indicates a potentially hazardous situation, which if not avoided may result in property damage.

1.6. Important Information

1.6.1. Proper installation of each tank is essential:

1.6.2. To ensure the safety of all the individuals involved in the tank installation.

1.6.3. To prevent tank damage and/or failure, which could lead to product loss and environmental contamination.

1.6.4. To validate the tank limited warranty.

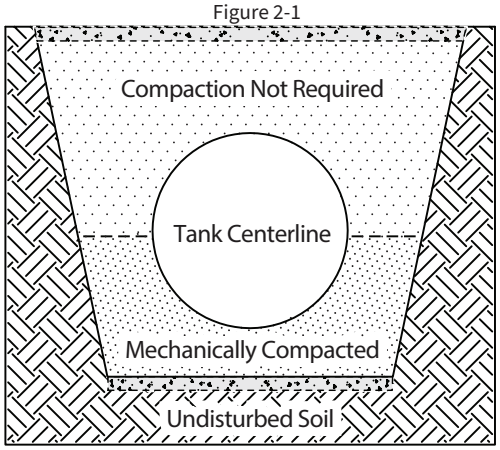
2. DEEP BURY TANKS

2.1. Tanks with a burial depth of greater than 7' from grade to tank top.

2.2. It is critical that special care be taken during the installation to properly place approved backfill (pea gravel or crushed stone) under the haunches of the tank. In addition, the backfill must be compacted in 12" lifts from the bottom of the tank to the vertical centerline with a vibrating plate compactor (see Figure 2-1).

2.3. Compaction may be accomplished by the use of handheld compaction equipment such as a mechanical plate compactor operating at 2,000 to 3,000 vibrations per minute.

Figure 2-1



3. ALTERNATE BACKFILL ABOVE TANK TOP

3.1. Normally fiberglass tanks are installed using pea gravel or crushed stone for the complete excavation. However, in certain areas of the United States, approved backfill material may be in short supply or too expensive. In these geographical areas, an alternate backfill material may be used above the tank tops.

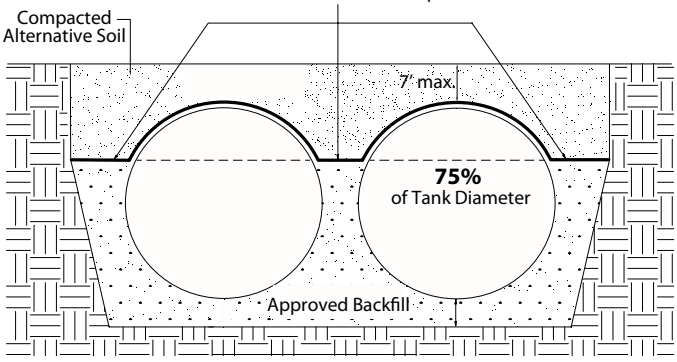
3.2. Although Fiber Glass Systems, L.P. (FGS) allows the use of this procedure, the installing contractor should consult with the tank owner's technical representative prior to installation for approval to use this alternate procedure for installation. Also, some tanks owners may require a written report to verify proper compaction of the backfill.

3.2.1. Use approved gravel or crushed stone as identified in INS1300 for bed and backfill material to a point at least 75% up the side wall of the tank(s). For example, 75% of an 8' tank is 6' up the side wall. Push the first two 12" lifts of backfill under the tank and endcaps to assure the tank bottom is supported.

3.2.2. After approved backfill has been placed around the tank (at least 75% of tank diameter), a layer of geotextile fabric must be installed (see Pub. No. INS1300).

3.2.3. Geotextile fabric must cover the entire surface of the approved backfill and tanks. All joints in the fabric must be overlapped a minimum of 12" (see Figure 3-1).

Figure 3-1
Geotextile Fabric with 12" Overlap at Seams



3.2.4. Alternative backfill may be used from this point to subgrade and must be compacted to a minimum 85% standard proctor density or higher as needed to support traffic loads. Soil should be compacted in maximum 12" lifts.

3.2.5. Ensure that no foreign objects larger than 1", such as large stones, concrete clumps, tree roots/limbs, or debris is in the alternate backfill.

3.3. No vehicular traffic or surface loads imposed by vehicle compaction equipment may be applied to the tank prior to placement of at least 3' of cover over the tank. Soil must be consolidated such that rutting of the soil will not occur from any equipment or vehicles.

3.4. Be sure to consider the submerged weight of the native backfill when doing tank anchoring calculations.

3.5. In some areas, frost heave may be encountered when using secondary backfill. Consider any frost related problems that may occur.

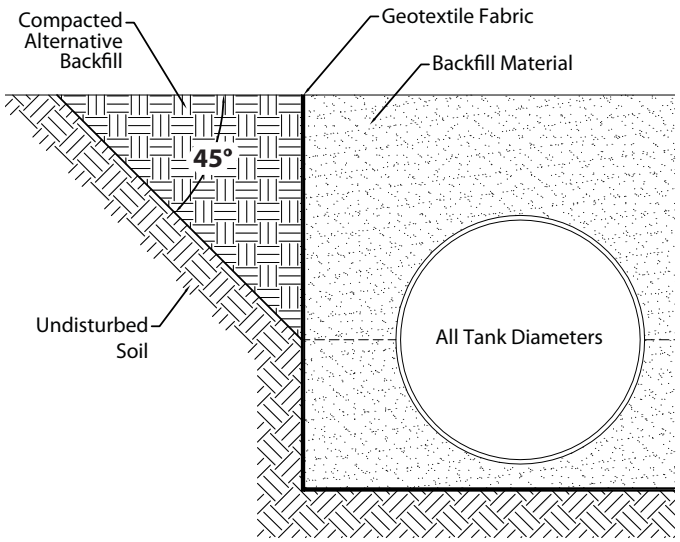
3.6. Native backfill shall not be frozen or contain lumps of frozen material at any time during the tank installation.

4. BACKFILL ON PERIMETER OF EXCAVATION

4.1. If alternative backfill material is used on the perimeter of the installation, it must be placed and compacted at a minimum 85% Proctor Density.

4.2. Geotextile fabric must be used between alternative backfill and tank excavation where backfill materials are different (see Figure 4-1).

Figure 4-1



5. BACKFILL DEPTH UNDER AND AROUND TANK

5.1. It is necessary that the bottom of the excavation and the backfill under the tank properly support the tank and provide a stable base to prevent future settling. The instructions currently require the following:

5.1.1. The backfill bed (a layer of backfill filling the bottom of the excavation between the tank and the soil) is limited to:

5.1.1.1. 12" to 24" for a dry hole

5.1.1.2. 18" to 24" for a wet hole

5.1.1.3. The soil in the excavation bottom and sides is undisturbed native soil.

5.1.2. Additional requirements for Unstable Excavations:

5.1.2.1. Containment Solutions™ Tank Installation Instructions (Pub. No. INS1300) provide direction for stabilizing the excavation sides and bottom.

5.1.2.2. A soils consultant is suggested for additional recommendations.

5.1.2.3. Geotextile fabrics and concrete pads under the tank may be required.

5.2. The FGS installation materials and methods are designed to allowed for a slight amount of consolidation over the life of the installation.

5.3. When it is desired to increase the backfill bed thickness, the controlling consideration is to provide stable backfill that will not consolidate over time and cause the tank to move. FGS will allow an increase in the backfill bed thickness as long as the Containment Solutions™ Tank Installation Instructions are followed along with the following additional requirements:

5.3.1. The soil in the bottom of the hole and the sides of the excavation must be undisturbed.

5.3.2. The soil under the tank can be level or on a slope.

5.3.3. The minimum backfill depth at any point under the tank is 12" in a dry hole and 18" in a wet hole.

5.3.4. If the backfill depth exceeds 24" at any point under the tank, the backfill under the tank (including in some cases the adjacent backfill) must be consolidated mechanically to the point that it will not further consolidate over the life of the installation. The area to be consolidated is shown on the included drawings.

5.3.5. The method and amount of consolidation is the responsibility of the customer, and a soils consultant should be used to provide specifications in this regard.

5.3.6. For approved pea gravel, the consolidation must be done in lifts of 12" or less.

5.3.7. For approved crushed stone or gravel, the consolidation must be done in lifts of 12" or less.

5.3.8. Consolidation can usually be accomplished with a vibrating plate compactor.

5.4. The following drawings show various allowed configurations as long as the Containment Solutions™ Tank Installation Instructions (Pub. No. INS1300) and these special instructions are followed.

5.5. The drawings shown depict two tanks of different diameters. Containment Solutions™ Tank Installation Instructions (Pub. No. INS1300) include tables showing the required A and B dimensions. These dimensions are dependent upon the tank diameter and the stability of the tank hole.

5.6. When the tank diameters differ, the B dimensions shown in the diagrams, are relative to the tank diameter to which it is referenced.

5.6.1. The B1 dimension for Tank 1 will be the B dimension in Table 5-1 for Stable Soil or Table 5-2 for Unstable Soil.

5.6.2. The B2 dimension will similarly be for Tank 2.

5.6.3. The A dimension is based on the larger diameter of adjacent tanks (see Tables 5-1 and 5-2) (see diagrams for Plan View and End View).

Table 5-1

STABLE SOIL

4', 6' Diameter Tanks		
	Minimum	w / 18" x 8" FGS Deadmen
A	18" (457mm)	36" (914mm)
B	18" (457mm)	24" (610mm)
8' Diameter Tanks		
	Minimum	w / 12" x 12" FGS Deadmen
A	18" (457mm)	24" (610mm)
B	18" (457mm)	18" (457mm)
10' Diameter Tanks		
	Minimum	w / 18" x 8" FGS Deadmen
A	18" (457mm)	36" (914mm)
B	18" (457mm)	24" (610mm)
12' Diameter Tanks		
	Minimum	w / 18" x 8" FGS Deadmen
A	24" (610mm)	36" (914mm)
B	24" (610mm)	24" (610mm)

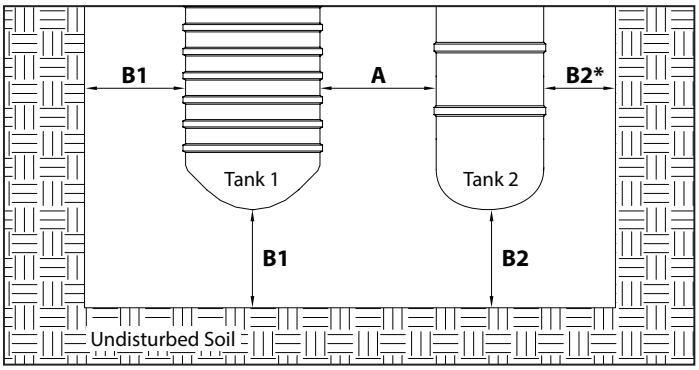
Table 5-2

UNSTABLE SOIL

4', 6' Diameter Tanks		
	Minimum	w / 18" x 8" FGS Deadmen
A	18" (457mm)	36" (914mm)
B	½ Tank Diameter	½ Tank Diameter
8' Diameter Tanks		
	Minimum	w / 12" x 12" FGS Deadmen
A	18" (457mm)	24" (610mm)
B	½ Tank Diameter	½ Tank Diameter
10' Diameter Tanks		
	Minimum	w / 18" x 8" FGS Deadmen
A	18" (457mm)	36" (914mm)
B	½ Tank Diameter	½ Tank Diameter
12' Diameter Tanks		
	Minimum	w / 18" x 8" FGS Deadmen
A	24" (610mm)	36" (914mm)
B	½ Tank Diameter	½ Tank Diameter

5. CONTINUED

Plan View



* See applicable end view for definition of B2

End View