



INTRODUCTION

1.0 Proper installation is essential to the expected product life and performance on Modern's Glasteel II Underground Storage Tank. This tank must be installed in accordance with these installation instructions, the latest issue of N.F.P.A. 30 and 31 pamphlet, the PEI/RP-100 and local authorities having jurisdiction over underground tank installations and codes. Although the instructions are clear and precise, unexpected conditions often occur and thus prudent thought, coupled with extreme care become the proper procedure.

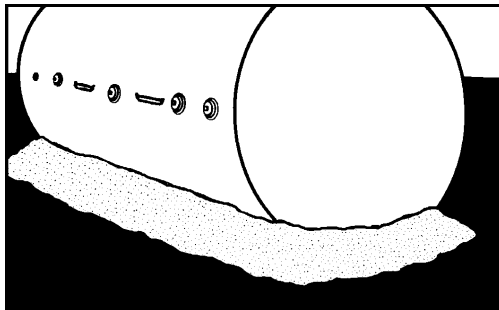
TANK HANDLING

- 2.0 Extreme caution shall be used when handling the tank. Do not drop or roll the tank.
- 2.1 Equipment to lift and lower the tank shall be of sufficient capacity to do so without dragging or dropping the tank.
- 2.2 The tank shall be lifted and lowered using the lifting lugs or lifting plugs provided. Cables or chains used shall be of adequate length. No circumstances warrant the use of chains or slings around the tank shell. Maximum angle of the sling shall be 60 degrees.

TANK STORAGE

3.0 If tank is stored on site prior to installation, a secure area shall be chosen. Special attention shall be placed in selecting the storage location to assure the absence of rocks and foreign objects that might cause damage to the tank exterior.

INSPECTION



4.0 Visually inspect the tank exterior for damage. Any extreme gouging or abrasion should be carefully reviewed and appropriate action taken.

- 4.1 Remove thread protectors and shipping plugs from all openings (except vacuum gage fitting assembly). Using compatible, non-hardening pipe sealant, install permanent metal plugs in all unused openings.
- 4.2 Refer to Modern Welding Company's publication, "Finishing Instructions" for proper installation of permanent coverings for unused openings and lifting lugs.
- 4.3 For Glasteel II tanks fabricated without dielectric isolation, (threaded nylon bushings or flange isolation kits) this tank must use either:
 - A) Non-metallic piping, or
 - B) Conductive piping must be isolated from the backfill material and any other metal or grounding device.

TESTING

5.0 Glasteel II tanks are shipped with a vacuum gauge assembly which shows the amount of vacuum within the tank's annular space. Tightness testing shall be as follows:

- 1. Tank's initial vacuum must be a minimum of 12" Hg. (Use the higher vacuum reading on tank at time of delivery. Do not reduce vacuum.)
- 2. A test period of one hour shall be used.
- 3. If the initial vacuum reading remains the same or drops less than 1" Hg during the test period, the tank is considered tight.

However, if the vacuum reading drops 1" Hg or more, then additional testing shall be required:

- 1. The tank's initial vacuum shall be reestablished. This process may take several attempts until the vacuum stabilizes.
- 2. Restart the one hour test time.
- 3. At the end of the one-hour test duration, a vacuum loss of less than 1" Hg reading must be maintained.

NFPA-30,2008, Section 21.5.1 states, "All tanks shall be tested before they are placed in service."

NFPA-30,2008, Section 21.5.2.6.1 states, The interstitial space (annular) of such (secondary containment) tanks shall be tested in accordance with the manufacturer's instructions.

CAUTION: Do Not Pressure Test Interstitial (Annular) Space.

Note that fluctuations in interstice vacuum are caused by temperature and barometric pressure changes.

5.1 Installers / owners shall note and document the tank's interstitial (interstice) vacuum at the time of delivery to satisfy tank tightness requirements.

Installers/Owners may leave the vacuum and vacuum gauge assembly on the tank to monitor for possible damage during the installation process. If the interstitial vacuum level changes significantly, investigate and contact the tank manufacturer.

5.2 Vacuum Gauge Assembly Removal: The interstitial precision tightness test gauge assembly is not for long term monitoring of the tank's interstitial (annular) space. This gauge assembly shall be removed when the backfill and associated piping is complete. This will confirm that no damage has occurred to the tank's secondary containment during installation. The annular space monitor opening shall be accessible at grade. This opening must be closed to the atmosphere and protected from external loads and movement.

5.3 Be sure to confirm that monitor pipe connection to tank and at grade are water and vacuum tight. It is recommended that monitor pipe grade access be locked and secured from tampering. This will prevent accidental introduction of water or product into tank's annular space.

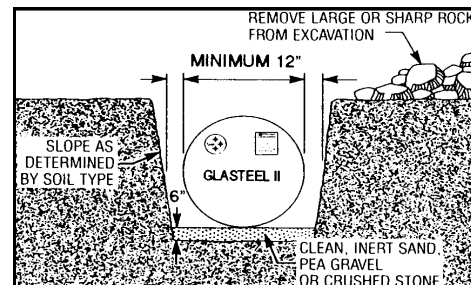
EXCAVATION AND BEDDING

6.0 Glasteel II underground storage tanks are designed to withstand a maximum burial depth of 60". If a greater burial depth is required, contact the manufacturer.

6.1 The excavation shall be properly prepared and free from any material or objects that would cause damage to the tank exterior.

6.2 The bottom of the excavation shall be suitably graded and leveled. The foundation for the tank shall be a minimum of 6 inches of clean, inert, compacted sand, pea gravel, or gravel crushings. See chart in "Backfill Section for maximum and minimum sizes of backfill material."

6.3 There shall be a minimum of 12 inches from the outside edge of the tank to the inside edge of the excavation. This distance shall remain true for the entire perimeter surrounding the tank. Multiple tank installations will also require a minimum of 12 inches between tanks measured from each outside edge.



BACKFILL

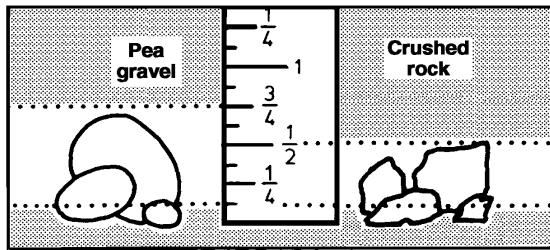
7.0 Only the following approved backfill materials may be used.

- 1. Clean washed sand.
- 2. Pea Gravel - (particle size must be not less than 1/8 inch or more than 3/4 inch)
- 3. Washed stone or gravel crushings (angular particle size required to be not less than 1/8 inch or more than 1/2 inch)

These materials shall be clean, well granulated, free-flowing, non-corrosive and inert. The back fill material shall be free of debris, rocks, concrete, ice, snow or organic materials that could damage the tank or its coating and interfere with proper compaction of backfill materials.

7.1 Flowable fill can be used as an alternative to 7.0 backfill above. Flowable fill shall meet the National Ready Mixed Concrete Association for Controlled Low Strength materials (CLSM) with strength ranging from 70 to 150 psi and shall be installed in accordance with good engineering practice.

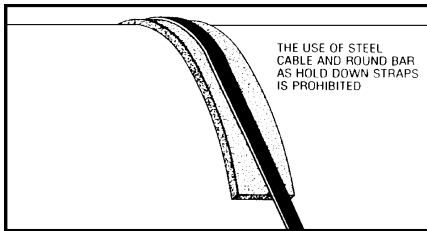
BACKFILL (continued)



ANCHORING

8.0 Certain situations require the use of properly designed anchor straps to overcome existing buoyant forces. The straps are used in conjunction with a concrete holddown slab or deadman anchors. All straps must be installed without twists or knots.

8.1 A pad of inert, isolation dielectric material must be used to separate the steel anchor strap from the tank. Isolation pads are not required for holddown strap materials of approved fiberglass or polyester webbing.

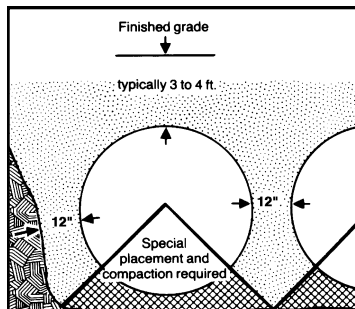


8.2 Do not over tighten hold-down straps beyond snug to tank surface and do not re-tighten straps after ballasting.

8.3 **CAUTION: Hold down strap material made of steel cable or round bar is prohibited.**

BACKFILLING

9.0 Special care should be taken to ensure that the backfill is properly installed to evenly support the bottom quadrant of the tank. Utilizing equipment other than a portable (hand held) tamping machine in the placement and compacting of backfill or dropping backfill material directly on the tank's surface can cause vacuum loss and holiday formation. Subjecting the tank's surface to these conditions when backfilling may damage the tank and void the warranty.



NOTE: Do not backfill in layers using different backfill materials.

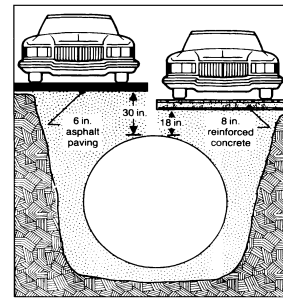
9.1 If the tank must be water ballasted during the backfill procedure, use only potable water. Ballast water shall not remain in the tank for longer than 60 days. When ballasting a compartment tank, fill and remove ballast from each compartment uniformly. Once installation is complete and prior to introducing product, the tank must be flushed clean. If product is used as ballast, proper precautions must be taken to prevent fires, spills, leaks and other associated accidents. Monitor product level frequently to ensure there has been no loss of product. **Warning:** Some regulatory agencies prohibit ballasting with product. Check local regulations before ballasting with product.

9.2 The tank shall be encompassed by the proper backfill and extending to a minimum of 12 inches over the top of the tank.

9.3 Areas subject to heavy vehicular traffic shall have a protective cover of at least 18 inches clean, compacted backfill with 8 inches of reinforced concrete.

9.4 Areas not subject to heavy vehicular traffic shall have a protective cover of a minimum 18 inches of clean compacted backfill covered by 4 inches of reinforced concrete or 6 inches of asphalt paving. If compacted backfill is the only cover, it shall be a minimum of 24 inches deep.

Caution: Be sure sufficient anchorage is in place to withstand any buoyancy forces exerted by tank.



FINISHING INSTRUCTIONS

10.0 Finishing Instructions; A fibreglassing kit is shipped with tank and provides materials to cover unused openings and external attachments, such as lifting lugs. All finishing work will be done prior to backfilling.

10.1 This tank requires venting. Refer to applicable local codes and PEI RP-100 for proper installation.

TANK WARRANTY ACTIVATION

11.0 **FOR GLASTEEL II WARRANTY TO BE INITIATED, THE INSTALLATION CHECKLIST MUST BE PROPERLY FILLED OUT BY THE CUSTOMER, AND RETURNED TO THE MODERN WELDING CO. SUBSIDIARY THAT MANUFACTURED THE TANK. THE INSTALLATION CHECKLIST MUST BE RETURNED WITHIN 30 DAYS AFTER DATE OF INSTALLATION. IF THE GLASTEEL II TANK HAS NOT BEEN INSTALLED WITHIN 90 DAYS OF DELIVERY FROM THE MANUFACTURER, IT IS REQUIRED THAT THE TANK BE RE-CERTIFIED BY THE MANUFACTURER AT THE OWNER'S EXPENSE PRIOR TO INSTALLATION.**

MAINTENANCE

12.0 Maintenance of Underground Storage Tanks. Both the Environmental Protection Agency (EPA) and the American Petroleum Institute (API) recommend that periodic maintenance be performed on all underground fuel storage tanks. The Petroleum Equipment Institute (PEI) and the Steel Tank Institute (STI) require prompt removal of water bottoms regardless of materials used for tank construction. **The tank owner is solely responsible for the proper operation and maintenance of the storage tank system.** The primary tank should be inspected for the presence of water bottoms and sludge buildup on a regular basis. Lack of such maintenance and inspection control measures by the owner and operator may invalidate the Modern Welding Company Limited Warranty. Maintenance type and scheduling must be performed as outlined and recommended in either STI Storage Tank Maintenance R-111 <http://www.steel tank.com> or PEI's recommended practice, RP-900, Appendix A-1, Appendix A-2 and Appendix A-3 <http://www.pei.org>.

12.1 The publications listed below outline usual and customary storage tank maintenance best practices. Failure to implement and follow these guidelines could negate the manufacturers warranty.

12.2 Safety considerations and controls should be established prior to undertaking physical activities associated with underground storage tanks. Some hazards associated with USTs are, but not limited to, confined space entry, cleaning, inspection, moving and any other aspect of in-service work.

12.3 Contact tank manufacturer before moving tank for information on recertifying tank for continued use.

Publication Lists

Listed below are publications containing recommended practices and procedures for the proper maintenance of storage tank systems.

- API Recommended Practice 1621, Bulk Liquid Stock Control at Retail Outlets, Website: api-ec.api.org
- STI Document R-111, Storage Tank Maintenance
- API Recommended Practice 2610, Design, construction, operation, Maintenance and Inspection of Terminal and Tank Facilities. Website: api-ec.api.org
- EPA's "Operating and Maintaining Underground Storage Tank Systems", a copy of the manual can be downloaded at: Website: www.epa.gov/swerst1/pubs/ommanual.pdf
- ASTM Standard D6469-69, Standard Guide for Microbial Contamination in Fuels and Fuel Systems. Website: www.astm.org
- *PEI, RP-900, Recommended Practices for the Inspection and Maintenance of UST Systems. Forms for recording maintenance can be printed off PEI web site at www.pei.org/RP900.