

Spring and summer floods are coming: Are your tanks anchored?



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All fuel tanks are subject to damage due to flooding. Whether your tank is aboveground or belowground, proper anchorage is important.

The Petroleum Equipment Institute's (PEI) RP100, *Recommended Practice for Installation of Underground Liquid Storage Systems*, includes an Appendix A for calculating proper anchorage. The calculation is based on determining the empty tank weight and soil overburden load and comparing it to the buoyancy force due to the tank geometry.



As shown in this picture, even the largest tanks can be moved off their foundations by the force of floodwaters. Several significant codes and recommended practices feature the importance of anchoring AST's to prevent displacement by flooding or wind.



A concrete deadman with anchor straps may be needed to prevent an underground tank from floating out of the ground should it be empty during a flood event.



The anchoring of **aboveground shop-fabricated tanks** varies and is based on the method of fabrication. Horizontal steel tanks are fitted with steel saddles with base plates suitable for anchorage.



Large vertical tanks are anchored most commonly with anchor chairs. These anchor chairs are designed to withstand the uplift force due to buoyancy as well as the overturning force and horizontal sliding of the tank due to unequal forces on it. The concrete foundation must also be properly designed.



Rectangular steel tanks are fitted with steel channels that are also suitable for anchorage.



Although heavier than steel tanks of the same size, **concrete-encased tanks** may also require anchorage. The same buoyancy forces affecting all-steel tanks applies to concrete-encased tank installations, as well.