

# Anchor Fuel Tanks



FEMA

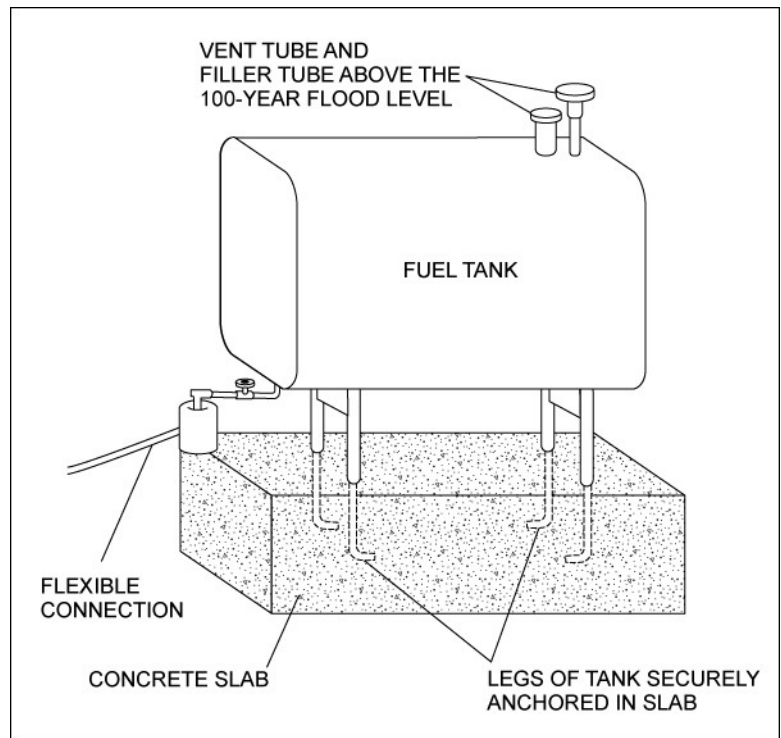
## PROTECTING YOUR PROPERTY FROM FLOODING

Unanchored fuel tanks can be easily moved by flood waters, posing serious threats not only to you, others, and your property, but also to public safety and the environment. An unanchored tank outside your building can be driven into the building walls by flood waters, or it can be swept downstream, damaging other houses. When an unanchored tank in your basement is moved by flood waters, the supply line can tear free and your basement can be contaminated by oil. Even a buried tank can be pushed to the surface by the buoyant effect of soil saturated by water.

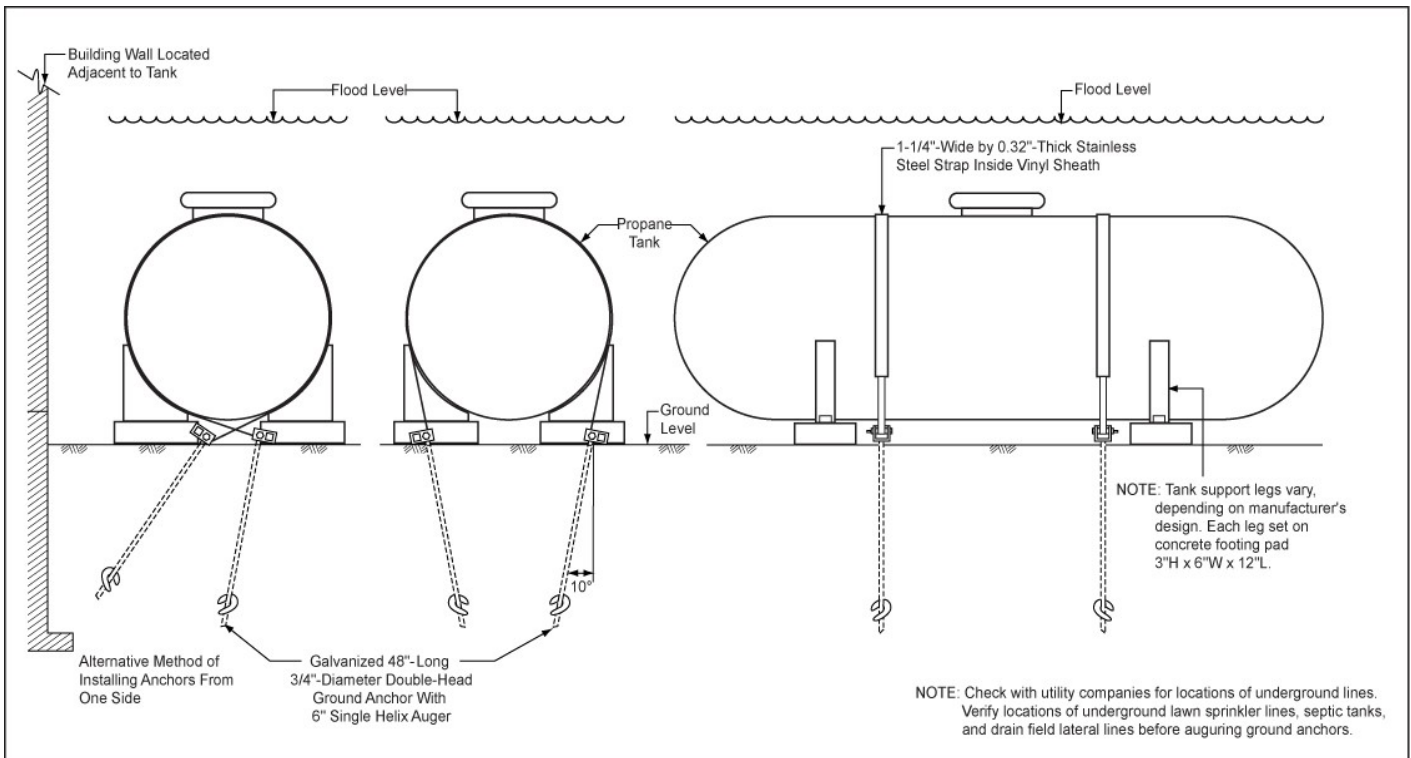
As shown in the first figure, one way to anchor a fuel tank is to attach it to a large concrete slab whose weight is great enough to resist the force of flood waters. This method can be used for all tanks above ground, both inside and outside your property. You can also anchor an outside tank by running straps over it and attaching them to the concrete slab by using turnbuckles.

Propane is stored in pressurized vessels as liquefied petroleum gas (LPG), which can be extremely volatile and potentially explosive if the tank is ruptured and the escaping LPG is ignited by a spark. As shown in the second figure (next page), an inexpensive way to secure a horizontal outside propane tank is to install four ground anchors connected across the top of the tank with metal straps. Secure a vertical tank (120-gallon, 420 lb. size) with two ground anchors. Set each anchor on opposite sides of vertical tank. Attach a strap from each anchor to the collar secured around top of the tank. Attach another metal

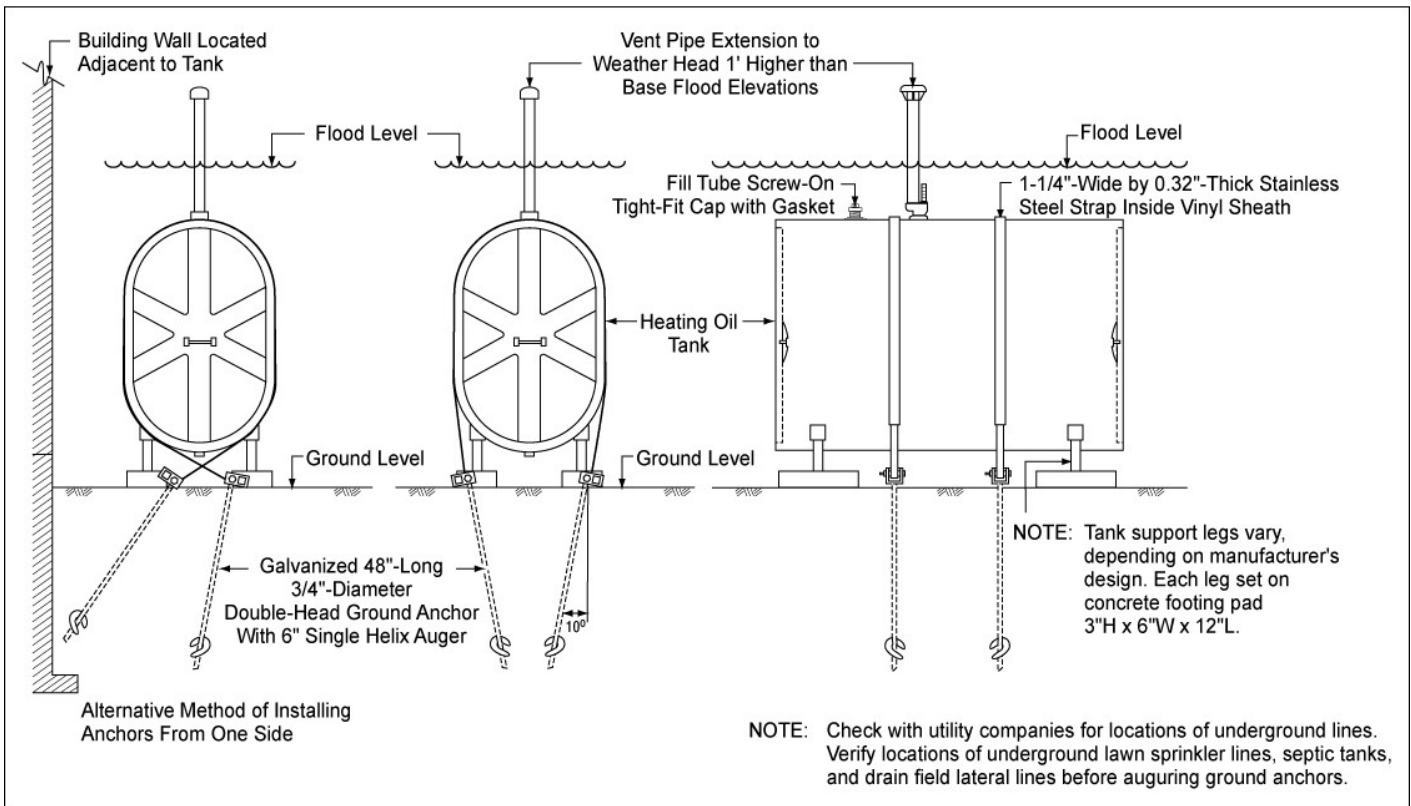
strap connected from one anchor to the other through tank base. The ground anchors and straps described below are the same products that are required by building codes to tie down mobile homes. These products are available from suppliers and installers that service the manufactured housing industry. Similar products can be used to anchor an outside heating oil tank. As is illustrated in the third figure (next page), one way to secure the oil tank is by running straps over it and attaching them to ground anchors.



Anchoring a fuel tank.



**Anchoring an outside propane tank.**



**Anchoring an outside heating oil tank.**

## BENEFITS OF UTILIZING THIS MITIGATION STRATEGY

- Helps to prevent damage and contamination to a structure and neighboring structures
- Helps to protect public health and safety, as well as those of the structure's occupants, in addition to protecting the environment

## TIPS

Keep these points in mind when you anchor a fuel tank:

- ✓ If you prefer not to do this work yourself, you can have a handyman or contractor anchor your tank.
- ✓ Extend all filling and ventilation tubes above the 100-year flood level so that flood waters cannot enter the tank.
- ✓ Close all connections when flood warnings are issued.

## ESTIMATED COST

Anchoring a 1,000-gallon fuel tank to a concrete base will cost approximately \$300 to \$500.

## OTHER SOURCES OF INFORMATION

FEMA 259, *Engineering Principles and Practices for Retrofitting Flood Prone Residential Buildings*, January 1995, <http://www.fema.gov/library/viewRecord.do?id=1645>. (New FEMA 259 will be available in the Fall of 2011.)

FEMA 348, *Protecting Building Utilities from Flood Damage*, Chapter 3, November 1999, <http://www.fema.gov/library/viewRecord.do?id=1750>.

FEMA P-499, *Home Builder's Guide to Coastal Construction*, "Protecting Utilities," Technical Fact Sheet No. 8.3, December 2010, <http://www.fema.gov/library/viewRecord.do?id=2138>.

FEMA 481, *Anchoring Home Fuel Tanks* (DVD), <http://www.fema.gov/library/viewRecord.do?id=2021>.

FEMA, *Anchoring Home Fuel Tanks* (Video), <http://www.youtube.com/watch?v=qVTSWXnLmC4>

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