FEMA Fact sheet

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Secure Fuel Tanks and Hazardous Materials

Are You At Risk?

The use of raised fuel tanks to provide gravity flow to oil heaters is common throughout Alaska. Most parts of the state are vulnerable to earthquake or flooding disasters, and during past events many heating oil tanks have tipped over or slid from their supports. When that happens, there is considerable risk of other kinds of damage, soil and water contamination and loss of heating capacity.

Types of Support Structures

There are three main types of tank support structures that are found in Alaska: hand-built wood support, timber cradle support and fabricated steel support systems.

Many failures of the wood support systems occur because of inadequate cross-bracing, weak fasteners, or wood deterioration from rot or insect damage. Improving the diagonal bracing, adding gussets and using steel connecting plates, bolts and other sturdy fasteners can sometimes help. Be aware that wood fibers often split or tear when subjected to powerful earthquake forces.

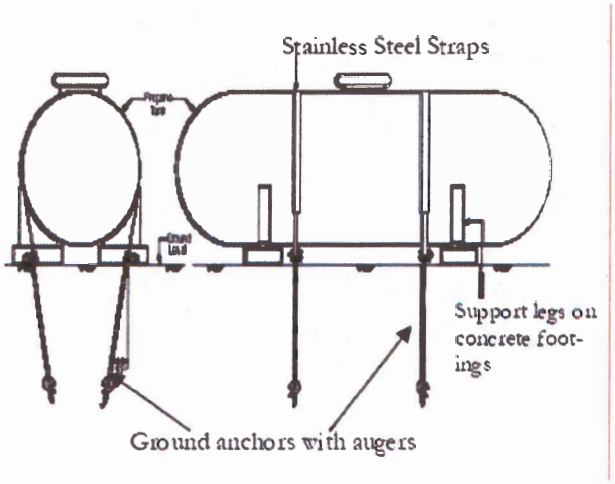
A timber cradle support may provide safety at low cost. Strength and stability are provided by the broad base and the crisscross stacking of the timbers. The timbers need to be pressure treated and should be 6" by 6" or larger. Each layer is spiked to the last with large spikes, pins or bolts that are driven into pre-drilled holes to prevent splitting. The tank must be strapped to the cradle with two steel bands. In a flood prone area, the bottom timbers should be fastened to the ground with sturdy helical ground anchors, several long rods (driven into the ground at an angle so they will not pull out during a flood) or duckbill type anchors.

Steel support systems are available from many fuel supply companies and other sources. They are generally fabricated with welded angle iron or heavy gauge pipe to provide rigidity and strength. To be safe during an earthquake or fast moving flood, a steel tank support must be designed with a wide footprint and good diagonal bracing. Stability can also be improved by securely bolting the steel support system to 6" by 6" pressure treated wood timbers or railroad ties on the ground. Again, in flood areas, fasten the timbers with ground anchors and make certain that the tank is banded to the support stand.

safety with a containment area under the tank. A soil or sand berm with a fuel resistant liner will catch spills before the oil enters the ground, groundwater, wells, septic systems, drainage ditches and so on. Finally, try to ensure that the tank fill cap and vent are located above the level of any possible flood.

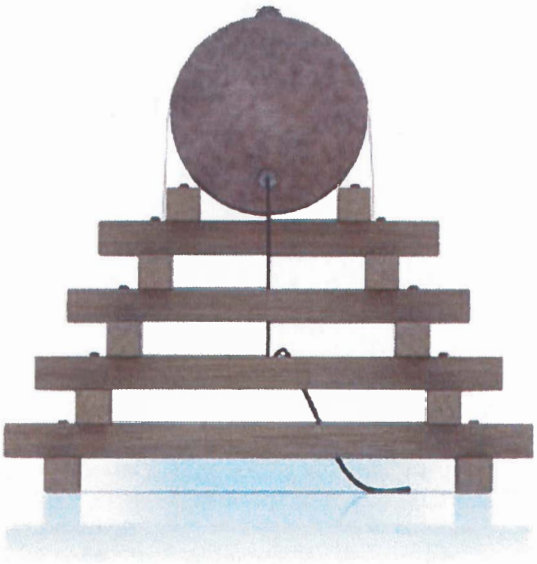
Steel Fuel Tank Stand

This diagram shows how a steel tank support can be improved to withstand large earthquakes. These supports are commercially fabricated using welded angle iron, and typically support 300 gallon tanks at heights of 3-5 feet. A wider base and bolting the support to pressure treated timbers provides more stability. Metal strapping is used to attach the tank to the stand. Use ground anchors in flood–prone areas.



Ground Auger Installation

This diagram shows an example of a propane tank that has been installed securely by using ground anchors and stainless steel straps. Materials for this can be usually found at building supply and heating contract shops.



Timber Cradle Fuel Tank Stand

This diagram shows how to build a timber cradle that is likely to withstand large earthquakes. The design uses commonly available materials and can be built by almost anyone. This stand is designed to support the average size fuel tank (300 gallons) at a typical height of 4 feet.
Metal strapping is used to attach the tank to the stand, and spikes, bolts, or pins are used to secure the wood structure (6" x 6" or larger pressure treated timbers or railroad ties). Ground anchors are needed in flood–prone areas to prevent spills.

Additional notes

Be sure to install a shutoff valve at the tank

outlet so the flow of oil can be turned off in case of a fuel line leak or rupture. The line between the tank and house should include a flexible loop of copper tubing to reduce the possibility of a rupture and oil spill. Also, it's important to protect both the tank and fuel line from heavy falling objects or any other source of damage (snow sliding from the roof, moose, bears, children, etc). Since fuel spill contamination is so difficult and expensive to remedy, consider adding back-up safety with a containment area under the tank. A soil or sand berm with a fuel resistant liner will catch spills before the oil enters the ground, groundwater, wells, septic systems, drainage ditches and so on. Finally, try to ensure that the tank fill cap and vent are located above the level of any possible flood.

Flooded hazardous materials container could be relocated or elevated.

Used oil container toppled during flood; it could be elevated and anchored.

Keep Products Containing Hazardous Materials Secure to Prevent Spills During a Flood, Fire or an Earthquake

- Never store hazardous products in food containers; keep them in their original containers and never remove labels.
- When leftovers remain, never mix household hazardous waste with other products. Incompatible products might react, ignite, or explode.
- Follow any instructions for use and disposal provided on product labels.
- Used motor oil is a major source of oil contamination of ground water and waterways. One gallon of spilled oil can contaminate over 1 million gallons of fresh water – a year's supply for 50 people.
- Check with your local environmental, health, or solid waste agency for more information on household hazardous waste management options in your area.

Source: Environmental Protection Agency
www.epa.gov