



## What should I be aware of when building on permafrost?

Permafrost is loosely defined as soil and/or rock that remain frozen for more than 2 years. In the Fairbanks area, permafrost tends to be discontinuous and is primarily concentrated on north-sloping hills, and in lower elevations with heavy ground cover. Big trees do not guarantee the absence of permafrost, it may also mean that permanently frozen ground or ice is down far enough that the soils in that spot will support a larger root system. The only way to be certain of what the ground contains is to have a soils test drilling done.

With permafrost, the safest bet is to avoid it altogether and move on to another piece of land. This is easier said than done, particularly due to the scarcity of buildable land near Fairbanks that can be affordably purchased. If you decide to build on permafrost, do so as strategically as possible. Smaller and simpler structures will tend to fare better than larger more complicated ones.

Minimal site disturbance is the accepted practice. The trees and the groundcover are your best friend. They protect and insulate the ground from the heat of the summer. A great example is the green moss that you find on many of the shaded low-level areas in Fairbanks. Moss has a high insulating value, and in many cases if, you can dig down a couple of feet the ground may still be frozen in the middle of summer.

Strategies for construction involving permafrost include:

- Elevating and properly insulating the bottom of your house and all pipes to prevent your house's heat from reaching the ground with an adjustable post-on-pad system;
- Using thick gravel pads (also insulated if possible) in order to stabilize the ground and spread building loads;
- Build using wood or steel piles, or helical piers that anchor in permafrost is an effective, but generally more expensive means of supporting a foundation;
- Installing thermosyphons to draw heat away from the soil – generally expensive;
- Avoiding cutting ground-covering vegetation, especially the moss and root layer, that helps to shield the ground from the sun's heat;
- Cutting trees sparingly (while permitting for a fire break);
- Building a wrap-around porch, which will help shade the ground around a house;
- Incorporate large roof overhangs to shed water away from the house and provide shade.
- Installing gutters and manage drainage well away from the house;
- Retain an engineer familiar with local soils conditions.

Additional information can be found on the US Permafrost Association website: <http://www.uspermafrost.org/education/PEEP/ptf-manuals.shtml> the CCHRC library, and UAF's Cooperative Extension Service (CES) online publications at <http://www.uaf.edu/ces>.

Ask a Builder articles promote awareness of home-related issues. If you have a question, contact the Cold Climate Housing Research Center at [info@cchrc.org](mailto:info@cchrc.org) or 907.457.3454.