

# Frost Protected Shallow Foundations -- and water pipes

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## Frost Protected Shallow Foundations

The foundation for a house is generally poured below the soil grade level so that the footing itself is well below the frost depth for any given region and soil type. This protects the house from frost heaving caused by expanding soils beneath the foundation.

There are a number of situations, particularly with a slab on grade construction, where it would be useful to find a different way to prevent frost under a foundation. For this reason a lot of research has been undertaken and a number of building research institutes have gotten together to develop insulation techniques for what is called "Frost Protected Shallow Foundations".

Essentially it is possible to put a horizontal skirt of foam insulation only a few inches below protective landscaping that would provide the same insulation value to the footings that would be gained by about 4 feet of soil, allowing the footing to be just below the insulation, not 4 feet in the ground. In fact, just for a general idea but not specific enough for a building permit, you can count on about 2 inches of extruded polystyrene to equal about 4 feet of soil.

You can get a lot of information simply by running Frost Protected Shallow Foundations through Google -- although the official documents for North America can be purchased from the US National Home Builder's Association. Probably the best simplified explanation of all of this can be found in a Canada Mortgage and Housing Corporation document developed for housing in the far north of Canada -- which you can download [here](#).

## Protecting shallow plumbing lines

All of this research is extremely useful beyond foundations. A water line from a well or lake should be buried 4 feet in the ground to assure that it will not freeze. Actually if you dig a trench down one foot and put the pipe in the bottom, then widen the trench to 4 feet wide - 2 feet on either side of the water line - and then install 4 inches of polystyrene foam insulation and cover it with 6 inches of soil, the line will not freeze anywhere in the run. Good snow cover actually helps to insulate it even more.

### **Keywords:**

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