

Preparing a Building that was Flooded for Winter

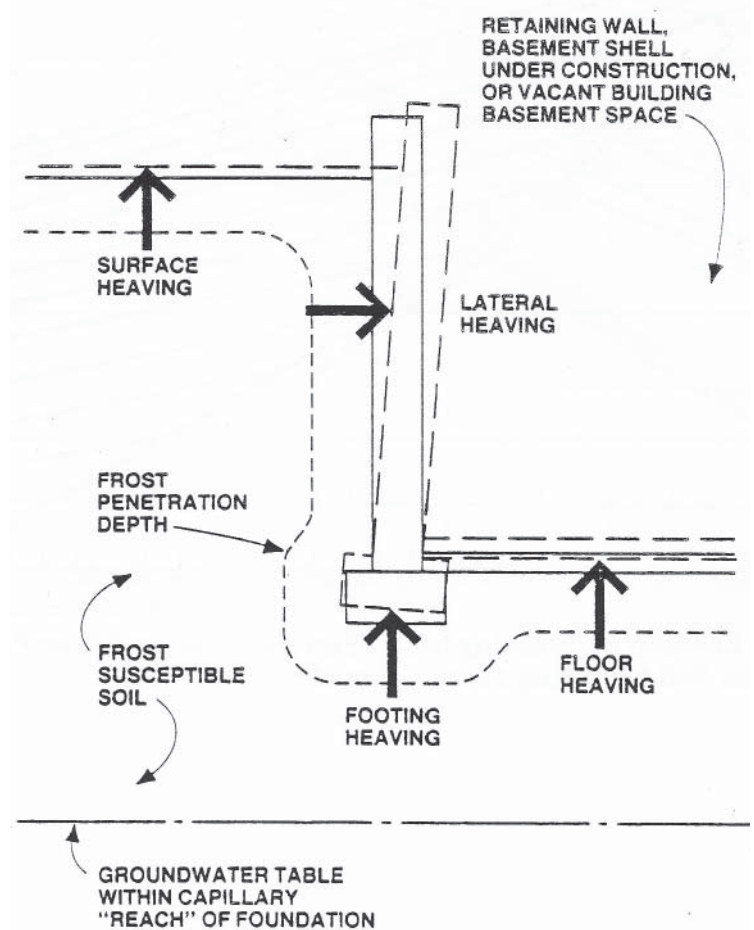
Kenneth Hellevang, Ph.D., P.E.
NDSU Extension Service

Homeowners need to consider a few things when preparing a flooded home for winter if the plan is to not rebuild until next year.

Frost heaving may lift the foundation and basement wall, causing damage to the foundation, wall and other parts of the structure. Frost heaving also may lift a basement floor, causing bulging and breaks in the concrete. Frost heaving occurs when ice layers form that lift the soil. This occurs when the frost line is near the groundwater table. The frost line is the depth to which the soil freezes. Normally this is prevented by having the foundation footing below the frost line. Frost heaving is more likely in clay and silt soils than in well-drained gravel.

Very wet soils will expand when water in the soil freezes. This can create a force that will push the wall laterally. The basement wall movement may be enough to crack the basement wall and damage the house structure. This is more likely to occur in low porosity soils, such as clay or silt. This may be more of a concern with concrete block walls than with poured concrete walls.

Insulating the basement ceiling in addition to placing insulation on the soil surface exterior to the basement will reduce the potential for frost heaving, but may not be adequate to prevent frost heaving in an unheated home. Increasing the amount of insulation reduces the heat loss from the soil, reducing the potential for problems from freezing. However, insulating the inside of the basement wall reduces heat loss to the soil and may increase frost penetration.



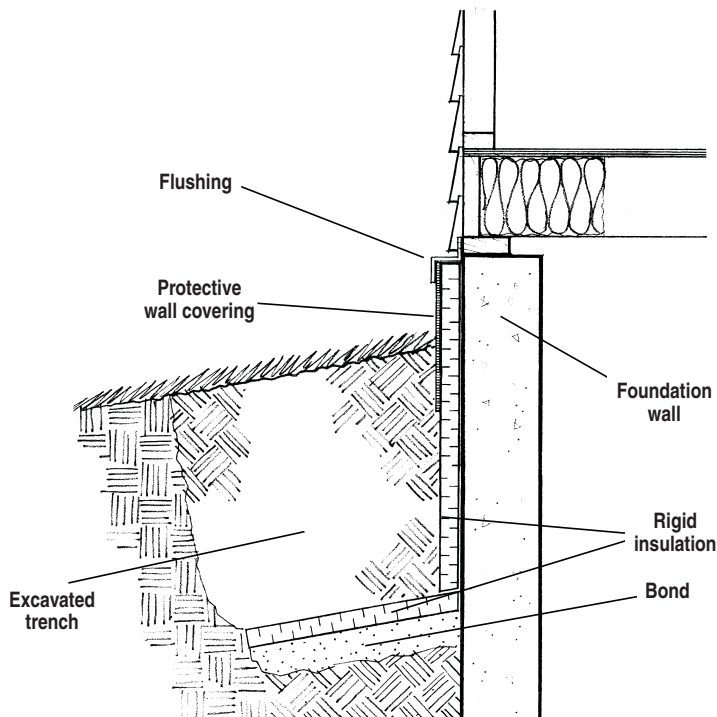
Building Foundation Design Handbook: U.S. Dept. of Energy and U.S. Dept. of Commerce



Photo courtesy of Morton County Emergency Management and FEMA

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For more information,
www.ag.ndsu.edu/flood



Home Energy Guide Techniques Tactics and Tips:
Minnesota Dept. of Commerce Energy Information Center

Adding heat to keep the temperature in the basement above freezing in addition to adding insulation is the best method to limit the potential for frost heaving that will affect the house. The potential for frost heaving also can be limited by assuring that the soil contains little moisture. This is accomplished by using granular fill along the basement wall and footing as well as under the basement floor and using drain tile and a pump to remove the water from the granular material.

Frost penetration under the basement floor may freeze water in the water line (pipe) if it is under the floor or near the basement wall where the ground will freeze. Also, the water line is generally exposed in the basement. The basement needs to be kept above freezing or the water shut off at the street and the water drained from the pipe or antifreeze intended for water pipes added to the water line. Also, freezing is a concern for all sewer drains. Water remains in water traps, the U-shaped pipes that keep sewer gas from entering the home. These traps need to be filled with RV antifreeze to keep the pipe from freezing and damaging the pipe.

Make sure to insulate the area being heated to reduce the amount of heat required to keep the basement above freezing. Soil only has an insulation value of about R-1 per foot, a poor insulation, so it is important to place insulation on the exterior of the house next to the basement wall. Loose hay or straw is an inexpensive insulation, but will attract rodents. Snow is an excellent insulation, so piling snow near the house is an option. Insulating the basement ceiling or main level floor will reduce the amount of insulation needed in comparison to insulating the house walls. Of course, using more insulation will reduce the amount of heat required.

Place a vapor retarder (a polyethylene sheet) on the warm side of the insulation to limit the amount of moisture that may move through the insulation and condense on the cold surface behind the insulation. This condensation can create an environment conducive to mold growth.

A non-vented space heater will produce about one-half gallon of water for each gallon of fuel burned, which will introduce a large amount of moisture into the heated space. A vented heater that discharges the moisture vapor and other combustion products outdoors is preferred. Carbon monoxide is a concern with all combustion heaters, so it is recommended to place a detector in the heated space.

Moisture vapor from the wet soil will continue to come through the basement wall and floor, creating a damp environment, so it is important to provide a little ventilation to remove the moisture. Many dehumidifiers will not operate properly at temperatures near freezing, so using a dehumidifier may not be feasible.

The exterior sheathing on a house provides structural strength for a house. Studs provide vertical strength but not lateral strength. Attach sheathing on all corners of a house if the exterior sheathing has been removed or use another method of providing lateral bracing.

About an inch of water is in each 10 inches of snow, so snow should not be allowed to melt inside the house. Wrapping a house in plastic will prevent snow from entering the house. Remove any snow that enters the house.

For more information on this and other topics, see: www.ag.ndsu.edu

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