

INSULATION

INSULATING FOUNDATIONS

Below-grade heat loss can be significant in colder climates. And as with any structure in the ground, you also have to pay close attention to water and moisture issues. But the marriage of moisture and insulation is not always a happy one.

INSULATING FOUNDATION WALLS

Foundation walls give up a significant amount of heat. Insulate poured-concrete and block foundation walls with a minimum of 1 in. of extruded polystyrene insulation. Expanded polystyrene (EPS), polyisocyanurate, and polyurethane rigid insulations are not recommended for below-grade applications.

COLD-CLIMATE FOUNDATION INSULATION

Install insulation running the full height of the foundation wall. In cold-climates, “taper” exterior foundation insulation as follows:

- Install 1-in.-thick 2x8-ft. tongue-and-groove sheets vertically from footing to sill plate.
- Next, place a second layer of half-sheets (2x4-ft.) extending down 4 ft. with joints offset.
- Follow with a third layer of 2x8 sheets running horizontally across the top of the foundation.

INSULATION PROTECTION

Protect vertical insulation on the exterior of foundation walls with 3/8- or 1/2-in. pressure-treated plywood or a parging coat of Type M or S mortar applied over expanded-wire metal lath (see Stucco).

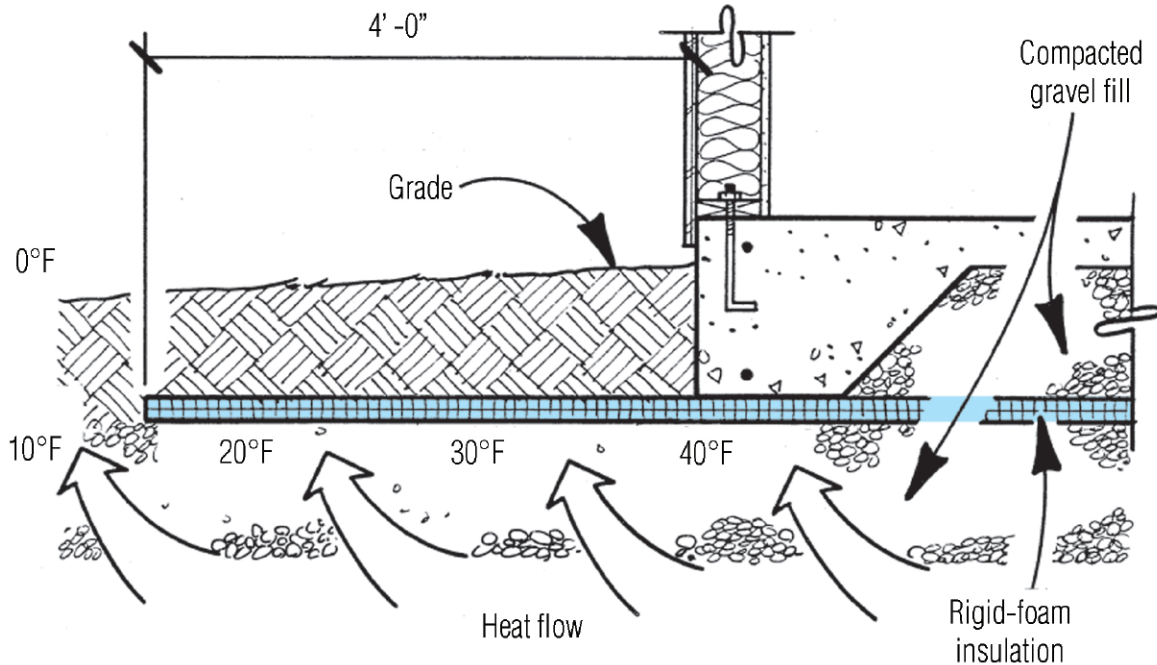
INSULATION FOR UNHEATED GARAGE SLABS

An unheated structure, such as a detached garage, needs continuous insulation under the entire slab, extending out beyond the perimeter (**below**). Since there is no building heat to capture, this insulation is intended to prevent earth heat from escaping.

Insulating
Foundation Walls

Insulation
For Unheated
Garage Slabs

FIGURE: INSULATION FOR UNHEATED GARAGE



Insulation
For Unheated
Garage Slabs

For unheated slabs-on-grade, high-compression foam is placed under the entire slab to retain ground heat. The insulation must extend horizontally 4 ft. beyond the footing.

FOAM FOR FROST-PROTECTED SHALLOW FOUNDATIONS

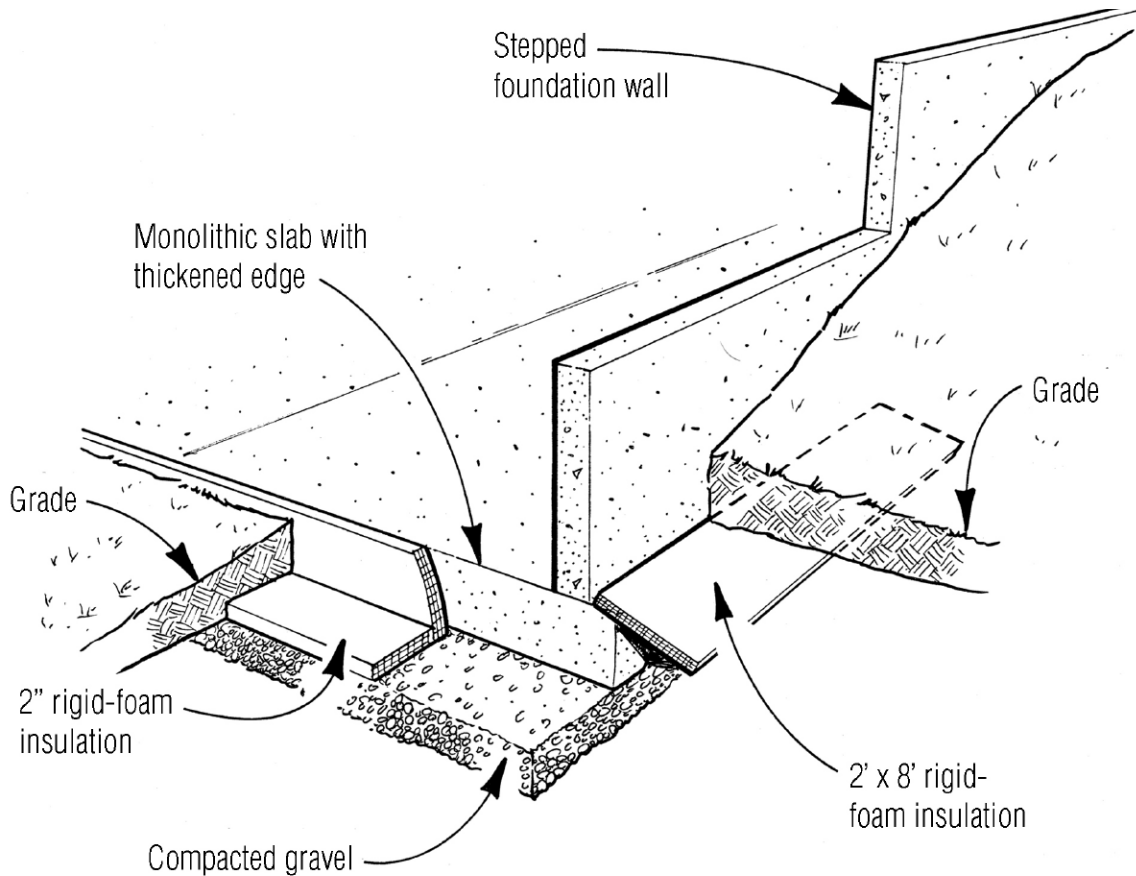
In this design, the footing and slab are bearing on the foam. By code, the foam used for frost-protected slabs must have a density of 2 lbs. per cu. ft. Most expanded foam stocked by lumberyards is only 3/4-lb. or 1-lb. density and lacks sufficient compressive strength. High-compression foam usually needs to be special-ordered.

INSULATION FOR WALKOUT BASEMENTS

The principle of frost protection can also be applied to special cases where foundation elements are vulnerable to frost, such as walkout basements (**below**). In these cases, carefully placed insulation can prevent frost action from damaging or moving structural elements.

Insulation For Walkout Basements

FIGURE: INSULATING WALK-OUT BASEMENTS



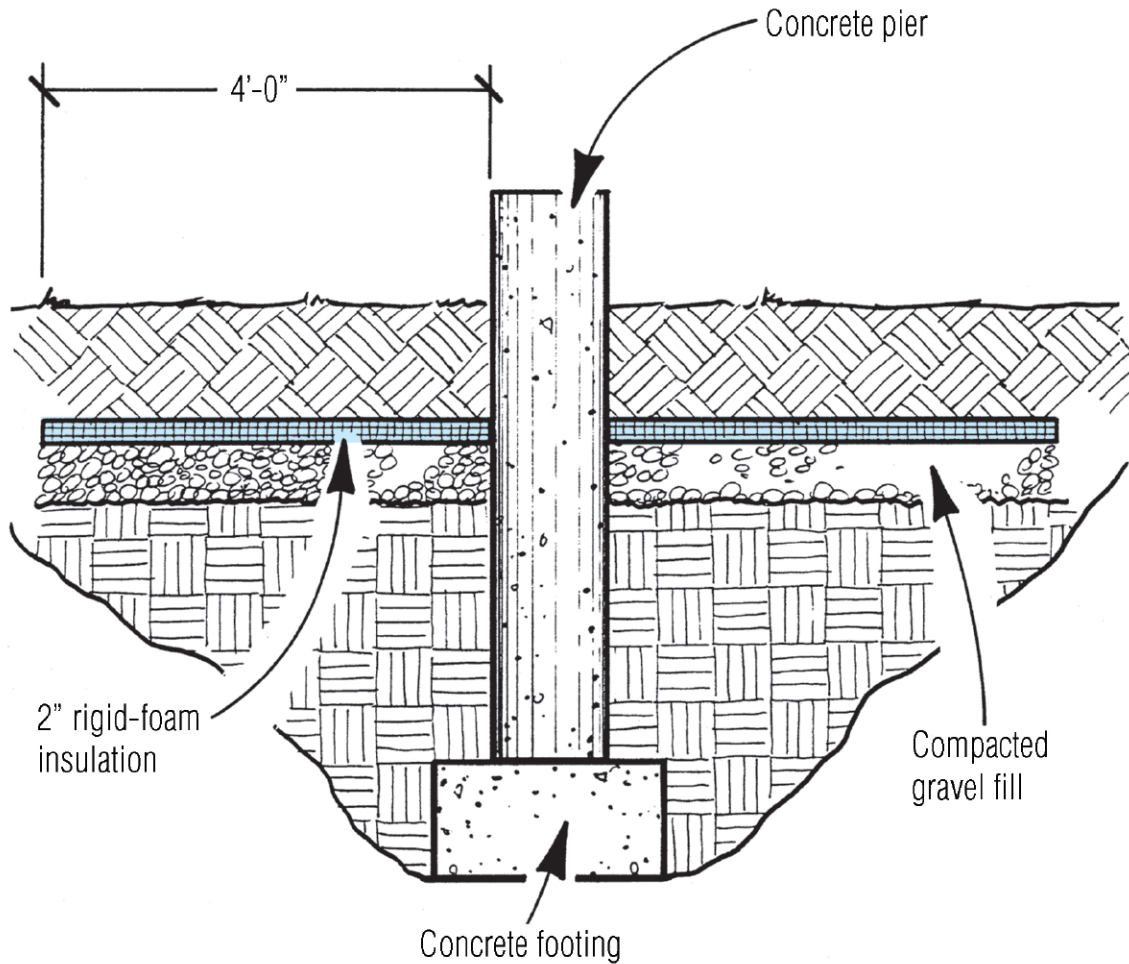
Insulate walk-out basement foundations with foam to avoid having to step down the excavation. A 2x8-ft. length of foam board protects the footing of the main wall at the corner where the backfill is shallow.

INSULATION FOR PIERS

In some soils, even a 48-in.-deep post footing will sometimes be heaved up by frost. Post-and-pier foundations for decks and porches can be frost-proofed, using a 4-ft. strip of foam around post footings to keep the ground below from freezing (**below**).

Insulation For Piers

FIGURE: INSULATING PIERS



To prevent frost heaving of pier foundations, place 2-in. foam horizontally around the piers about 1 ft. below grade, as shown.