

4.2 FOUNDATIONS ON NON-FROST-SUSCEPTIBLE GROUND OR FILL MATERIAL

Foundations placed on a layer of well-drained, undisturbed ground or fill material that is not susceptible to frost shall have the thickness of such a layer included in meeting the design frost depth defined in Section 3.2. Undisturbed granular soils or fill material with less than 6% of mass passing a #200 (0.074 mm) mesh sieve in accordance with ASTM D422 and other approved non-frost-susceptible materials shall be considered non-frost-susceptible. Classification of frost susceptibility of soil shall be determined by a soils or geotechnical engineer, unless otherwise approved.

4.3 FOUNDATIONS WITH INSULATION TO PREVENT GROUND FREEZING

Frost-protected shallow foundations (FPSF) shall be designed in accordance with the following sections of this Standard using the design data from Appendix A:

- Section 5 Simplified FPSF Design Method for Heated Buildings with Slab-on-Ground Foundations
- Section 6 FPSF Design Method for Heated Buildings
- Section 7 FPSF Design Method for Unheated Buildings
- Section 8 Special Design Conditions for FPSF

Buildings with foundations designed in accordance with Section 5 or 6 that are not completed and not heated before the time of first ground freezing shall have additional temporary ground protection or temporary heating of internal space in accordance with Table 1, or the foundation shall be designed in accordance with provisions for unheated buildings (Section 7).

5. SIMPLIFIED FPSF DESIGN METHOD FOR HEATED BUILDINGS WITH SLAB-ON-GROUND FOUNDATIONS

Designs based on the following simplified procedure shall be permitted to be used to specify insulation for slab-on-ground foundations of heated buildings, in lieu of the detailed design in Section 6. Design procedures of Section 6 shall be used when buildings include suspended floors. Unheated areas, such as attached garages, shall be designed in accordance with Section 7, except when designed in accordance with Section 4.2 or when the foundation of the unheated area extends below the design frost depth. Cold-bridges shall be prevented (see Section 8.4).

Step 1: Select the Site's Design Air-Freezing Index, F_{100}

The 100-year mean return period AFI, F_{100} , shall be selected from Figure A1 or Table A3 of Appendix A.

Step 2: Determine Insulation R-Value, Dimensions, and Footing Depth

Using F_{100} from Step 1, select vertical and horizontal insulation R-values, horizontal insulation dimensions, and minimum footing depth from Table 4. Verti-

TABLE 4. Minimum Insulation Requirements for Frost-Protected Shallow Foundations of Heated Buildings¹

Air-Freezing Index, F_{100} ($^{\circ}$ F-days)	Vertical Insulation R-value, R_v	Horizontal Insulation R-value, R_h ($\text{hr} \cdot \text{ft}^2 \cdot ^{\circ}\text{F/Btu}$)		Horizontal Insulation Dimensions per Figure 1 (in)			Minimum Footing Depth (in)
		Along Walls	At Corners	D_h	D_{hc}	L_c	
500 or less	0	NR	NR	NR	NR	NR	12
1,500	4.5	NR	NR	NR	NR	NR	12
2,000	5.6	NR	NR	NR	NR	NR	14
2,500	6.7	1.7	4.9	12	24	40	16
3,000	7.8	6.5	8.6	12	24	40	16
3,500	9.0	8.0	11.2	24	30	60	16
4,000	10.1	10.5	13.1	24	36	60	16
4,500	12.0	12.0	15.0	36	48	80	16

¹ Insulation requirements are for protection against frost damage in heated buildings. Interpolation between values is permissible. For interpolation purposes, NR = 0 (NR = not required).