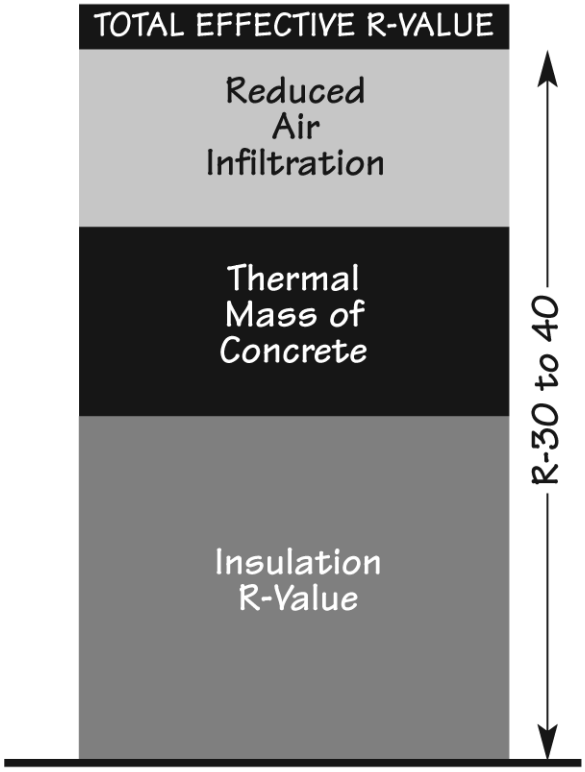
A.4 POLYSTEEL IS SUPER ENERGY EFFICIENT

What is the R-Value of PolySteel?



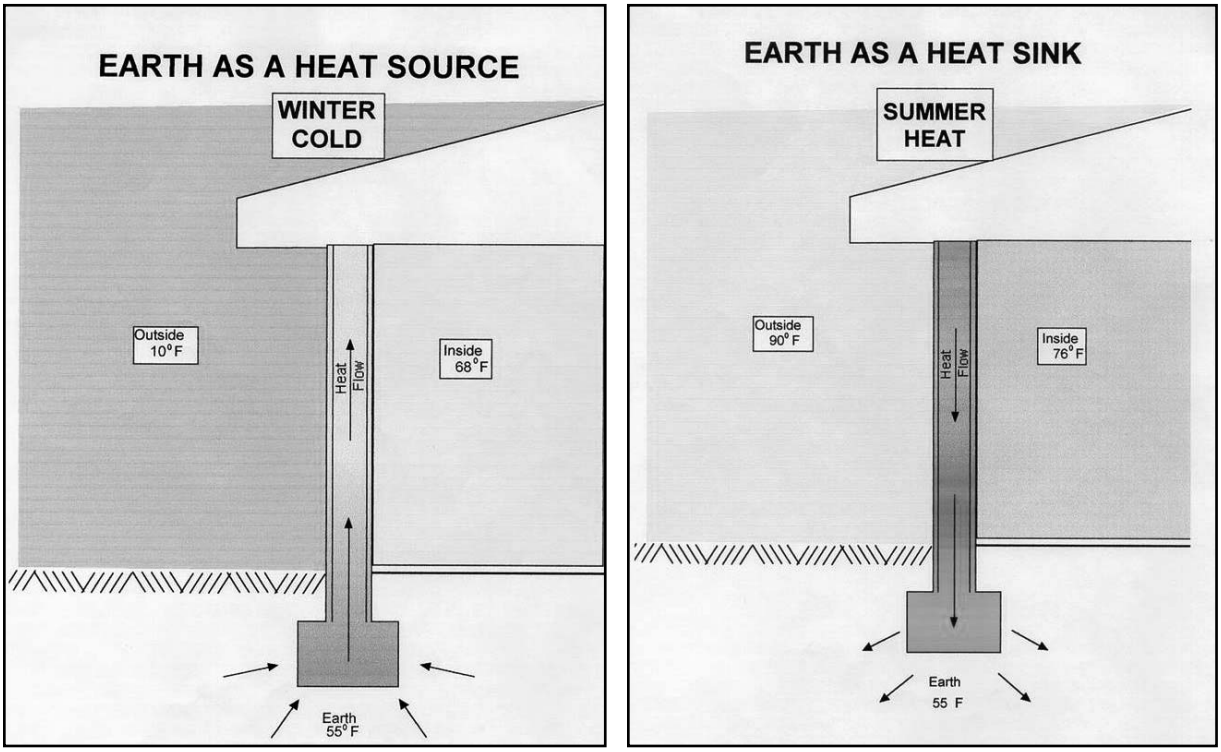
Walls made of PolySteel perform, on an average, like a wood frame wall constructed with R-40 insulation. This is because the Total Effective R-Value performance of PolySteel consists of three factors: (1) the inherent R-Value of the expanded polystyrene, (2) the thermal mass of the concrete, and (3) the enormous reduction in air leakage. First, the nominal R-Value of the high-density polystyrene on both sides of the wall is R-20 to R-25. Secondly, the thermal stability of massive concrete walls reduces the temperature fluctuations inside, and, consequently, the heat load requirements, so common to wood-frame buildings. Finally, air leakage (infiltration) can account for 20% to 40% of the heat load requirements of a wood-framed building. PolySteel reduces this air infiltration by 75%!

The three factors above are additionally enhanced when a PolySteel wall is constructed from the footing all the way to the roof (Figure 1.3). This allows the system to utilize the stabilizing temperature of the earth below the frost line by encapsulating it in insulation and allowing it to travel through the wall. This "thermo coupling" effect minimizes the heating and cooling load on the interior of the structure by better utilizing the thermal mass properties of the concrete to stabilize the temperature of the wall.

A.4 POLYSTEEL IS SUPER ENERGY EFFICIENT (continued)

As a result of these dynamic performance benefits, PolySteel walls actually perform as high as a framed wall insulated to R-50, or more, in some areas of the country. We even guarantee, in writing, that a homeowner will save at least 33% of their energy costs over 2x6 construction with R-19 insulation throughout the United States.

Figure 1.3 CONNECTING TO THE EARTH



The stabilizing effect of encapsulating the concrete in PolySteel forms below the frost line provides benefits in both winter and summer. The earth below remains at a relatively constant temperature below the frost line (e.g. 55°, as shown above). This constant temperature travels up through the concrete mass inside the insulated wall and offsets the effect of outside temperature fluctuations, and, thus, minimizes the energy required to keep the inside of the structure at a stable comfortable level. When it is 10° outside, for example, the insulated concrete wall creates a thermal barrier that does not fluctuate the way a low mass frame wall, or an exposed concrete or masonry wall does, thus minimizing the energy needed to heat the inside. The same dynamic applies in the summer months, when the relatively cool insulated concrete wall provides a barrier from the heat.

"After an ice storm in New Hampshire that cut power for five days in 10° weather, the PolySteel home we built remained at a 55° temperature until power was restored."

R. Nichols
Newport, New Hampshire