

Energy Efficiency - Home Positioning on the Building Lot

The first consideration in home energy efficiency is the design of the home and the placement of the home (relative to compass direction) on the building lot. A [passive solar home](#) represents the ultimate in combining home design and site placement to enhance energy efficiency.

Prescott has an ideal climate for incorporating [passive solar design elements](#) in a home i.e., your home's windows, walls, and floors can be designed to collect, store, and distribute solar energy in the form of heat in the winter and reject solar heat in the summer.

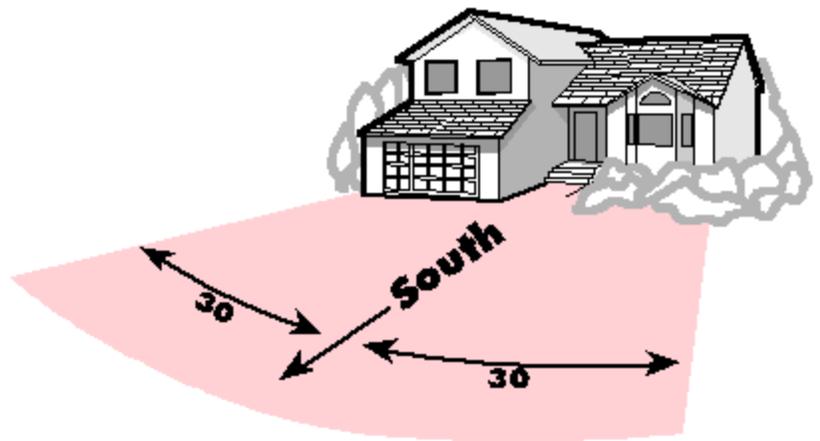
However, for passive solar designs to work there must be an integrated approach to home design. An integrated design seeks multiple energy-efficiency benefits from each home design feature.

The following design and lot-placement factors should be considered prior to initiating construction:

Site Considerations

A site visit can provide answers to the following questions:

- What are the characteristics of the **building site's solar exposure**? A site which has limited solar access due to trees, buildings or topography may not have the opportunity to take advantage of "free energy".
- Can the **long axis of the house face due south** or at least within 30° of true south? With proper design elements, a south-facing home minimizes unwanted solar heat gain in summer and maximizes desirable solar heat gain in winter.
- Are **there existing trees and vegetation** nearby which could limit summer heat gain on the roof and west wall? If so, this vegetation should be flagged and protected from heavy equipment used in the building process.



Home Design Considerations

House plans should include information from which answers to the following primary questions can be derived:

- What is the surface area of the home's **south-facing windows**? Windows and patio doors are collectors in a passive solar home.... However, too much solar glazing can overheat a home even in winter.
- Are **window surface areas minimized on the north, west and east** facing sides of the home? These windows represent areas for higher heat gain (summer) or heat loss (winter) in the home.
- Are windows and walls shaded from direct summer solar gain by properly sized [overhangs](#)? Conversely, are the overhangs sized to allow direct solar gain through south-facing windows?
- Is there sufficient and properly situated [thermal mass](#) that can buffer interior temperature swings by absorbing, storing, and releasing heat? Concrete floors directly exposed to sunlight are examples of thermal mass.
- Are walls, ceilings, floors, foundations, and windows insulated according to IECC 2009 recommendations for the [home's climate zone](#)? Additional discussions relative to insulation are presented [here](#).