New Mexico Solar Energy Association
Passive Solar FAQ Sheet

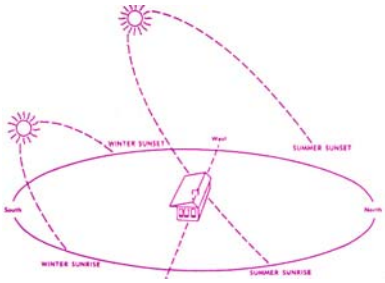
How much energy does a well-designed passive solar home in New Mexico save in comparison to an average home?

⇒ ***About 80% on average:*** This is because New Mexico has cold but *sunny* winters.

The Three Pillars of good Passive Design	*Winter*	*Summer*
Adequate Thermal Mass	Releases energy for warmth at night	Absorbs energy during day for coolness
Sufficient Insulation	Keeps the heat in	Keeps the heat out
Properly Controlled Solar Gain	Take advantage of the Sun's seasonal path to let sun in	Take advantage of the Sun's seasonal path to block the sun

How large should the south-facing windows be?

⇒ Up to 7% of the floor area of the solar heated rooms ***if*** the house lacks "extra" thermal mass (thermal mass beyond what sheetrock, wooden floors, and typical furnishings provide), and up to 12% of the floor area if the house has adequate extra thermal mass (see thermal mass dimensions below).



How large should the non south-facing windows be?

⇒ West windows should be no larger than 2% of the floor area of the solar rooms unless shading (trees, reflective shades, etc) is used to prevent overheating. North and East windows should be no larger than 4%.

How large should any indirect gain (trombe wall) collector area be?

⇒ Up to 8% of the floor area of the solar heated rooms.

What should the dimensions of "extra" thermal mass be for adequate performance?

⇒ Thermal mass should be at least 4 inches thick: *Additional thickness is not significant in the daily temperature cycle*, but can help during extended cloudy periods. The extra thermal mass should have a total surface area at least 6 times the area of the south windows, and more ideally about 9 times. Thermal mass that is directly lit (i.e. floors located directly behind south windows) or in ***line of sight*** of directly lit mass (e.g. walls in line of sight of floors located directly behind south windows) is the most effective. Floor area that is neither lit nor in line of sight of lit mass is surprisingly ineffective.

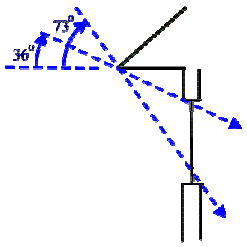
What color should thermal mass surfaces be?

⇒ Thermally massive floors should be darkly colored, and thermally massive walls should be lightly colored, unless the total thermal mass surfaces are small, in which case walls should be dark as well.

What types of windows should be used?

⇒ Thermal pane windows should be used everywhere. Low-E windows can be used everywhere as well, and are especially effective on the non-south facing windows.

What should the dimensions of south-facing overhangs be?



⇒ Overhangs should be used in New Mexico, due to the warm summers. In northern NM, these should be designed as shown at right with the angles 36° and 73°, so as to provide a full 8 weeks of sun around the winter solstice and 8 weeks of full shade around the summer solstice, instead of full effect only on the solstices (in this case the angles would be 30° and 77°, respectively). ***Note that this produces an overhang that is significantly higher and of greater horizontal extension than overhangs which have full effect only on solstices.***

Where can I find further information?

⇒ A more extensive presentation of these guidelines, and other passive solar primers as well, can be found at WWW.NMSEA.ORG.