

Michael and Karen van Beek moved into their 200m² adobe house (the second built in northland) at the end of 1994. Since then they've monitored the inside and outside temperatures for a year, being especially interested as their house was solar designed. Their recordings are shown on the following charts 1 to 5. The data shows what people have measured subjectively with their senses:

Solar designed earth houses are warm and even temperature. These features can be seen from the charts as follows:

1. Looking at chart 4: (monthly averages)

1.1 The inside end of day temperature is about 2 ½ degrees higher than the morning temperature. In other words, the house is working well, collecting the sun's heat during the day and providing a cosy evening environment.

1.2 In the mornings of the coldest months (June-Sept) the interior morning temperature is 7 to 8 degrees above the outside. In other words, although there was cooling heat loss (there was no heating done during the night) of about 2 ½ degrees, a lot of warmth was still retained in the house.

1.3 The difference between night time and morning temperatures inside is two or three times the difference outside. Or looking at it another way the outside morning and night temperatures don't differ much – morning recording time being 7:30am, night time being 9:30pm. The effect of the house heat gathering and storing is obvious.

2. Looking at the charts of daily temperature readings (charts 1,2,3 and 5) the following can be noticed:

2.1 Over the year, the normal peak inside temperature is about 26 degrees, (the peaks on 27 Feb, 18 March and 12 April of 28-29 degrees, Karen and Michael ascribe to possibly having an extra busy baking day, or being away all day with the house shut up and building up heat – no ventilation cooling).

2.2 The outside temperature varied some 22 degrees (25 max to 3 min) while the inside temperature varied by about 12 degrees – 26 “normal” peak to 14 minimum, only half that amount.

2.3 The minimum inside temperature was 11 degrees above the minimum outside temperature.

Relevant Data:

House Type: 300mm thick cement stabilised adobe walls (R=0.7) size 200m²,rectangular

Location : Northland

House Orientation: Long axis runs due east-west

Major heat stores: 100mm concrete (uninsulated) R=0.9 also adobe internal/external walls.

Roof: Conventional corrugated iron, insulation to R=3.0

Heating Source: Apart from sun, only modern kitchen woodstove (oven door left open after cooking on winter nights) Wetback heats hot water.

Main storage heat mechanics: Direct solar gain into concrete floor, secondary solar gain into adobe walls interior surfaces.

Location of thermometers about 2m above floor level, one inside, the other 3/4m from outside wall, underthe 1.8m wide south side verandah.

Thermometer type Dick Smith Electronics with digital readout screen inside house.

Other types of booster heating: None required

Solar Designer T Drupsteen

Chart 1

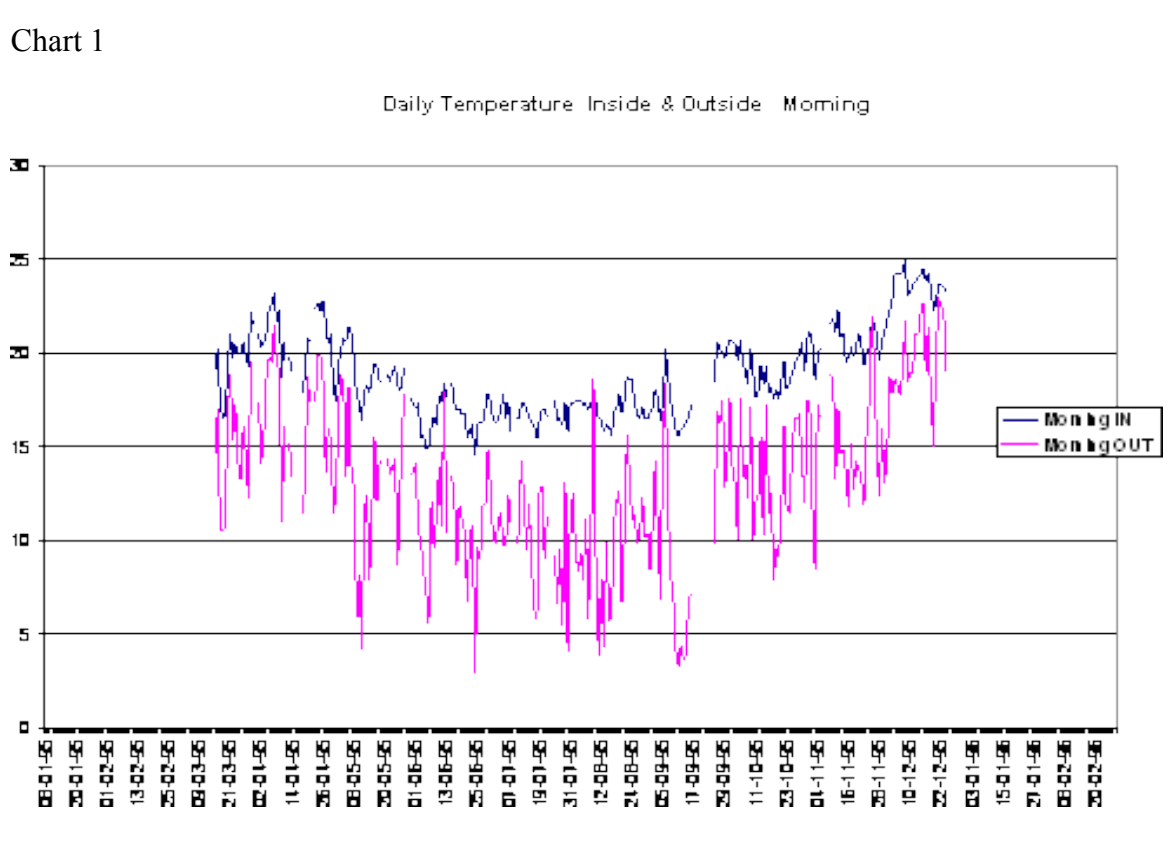


Chart 2

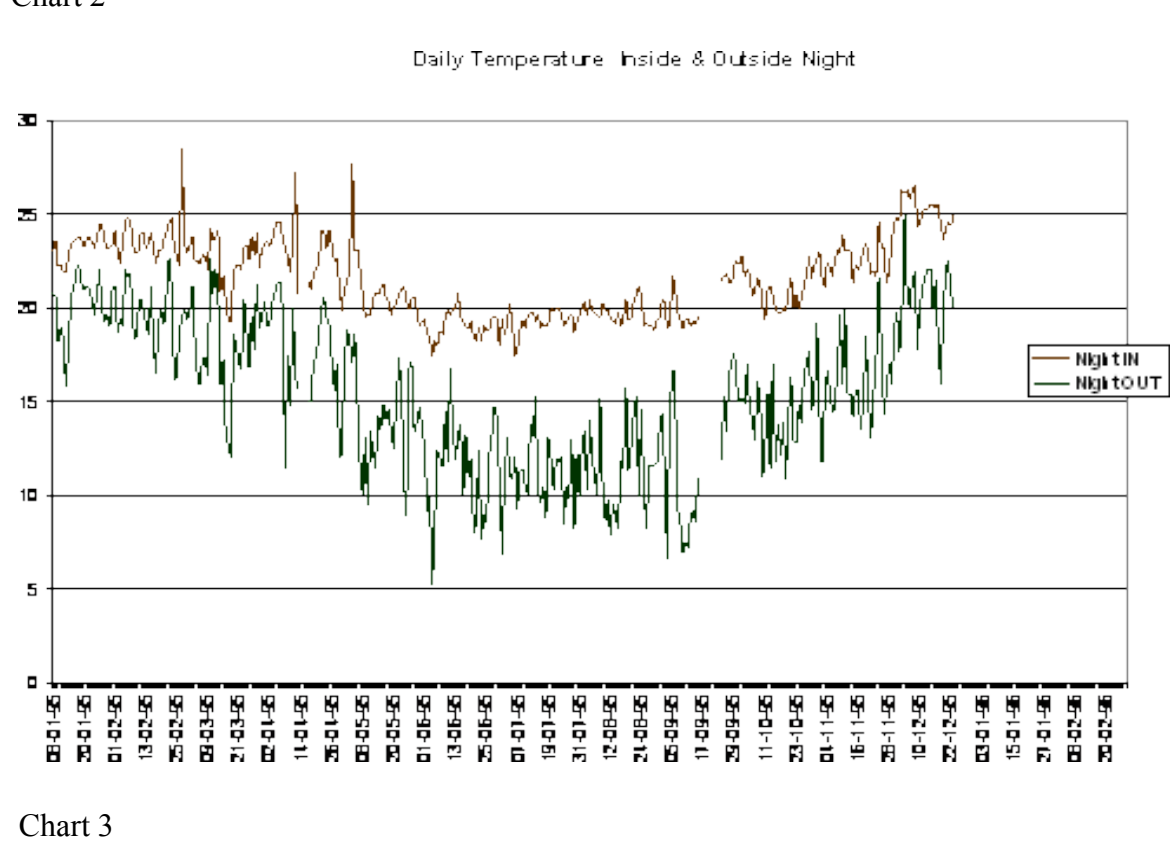


Chart 3

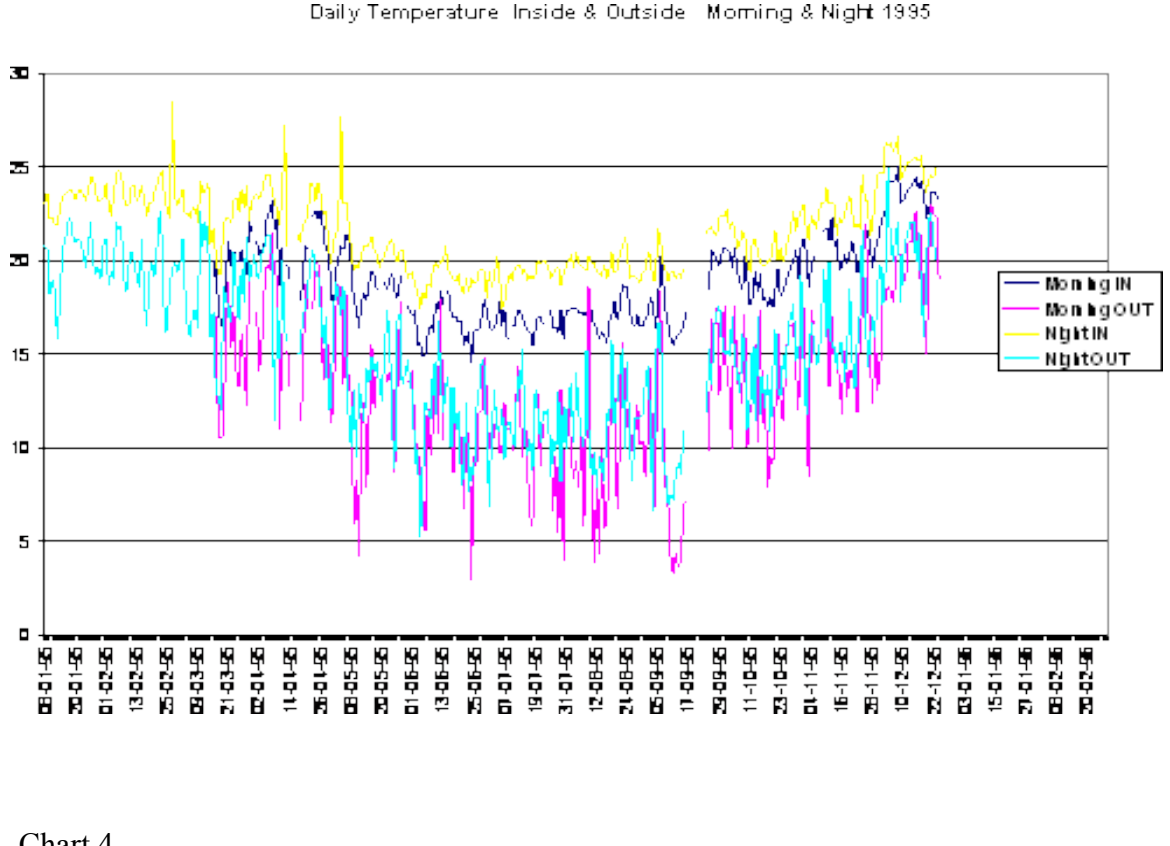


Chart 4

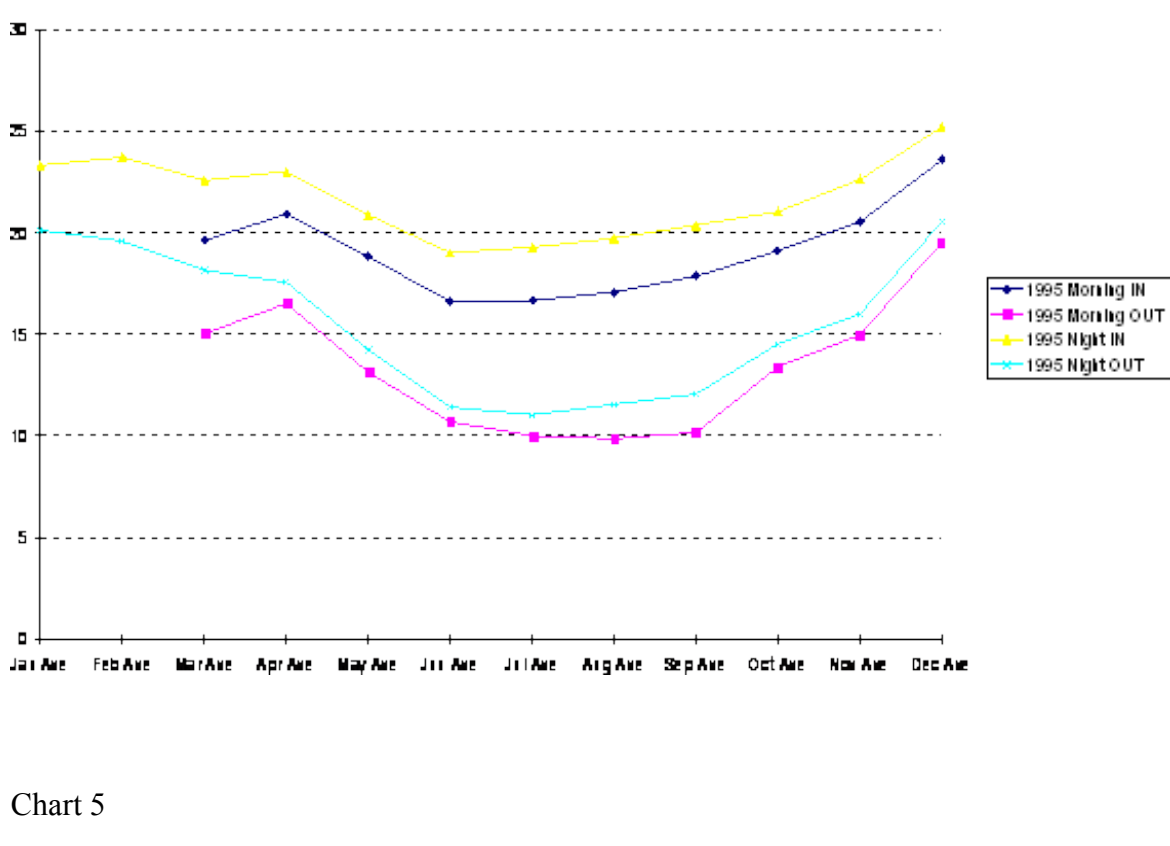


Chart 5

