

COOLTEK - a home with a mission

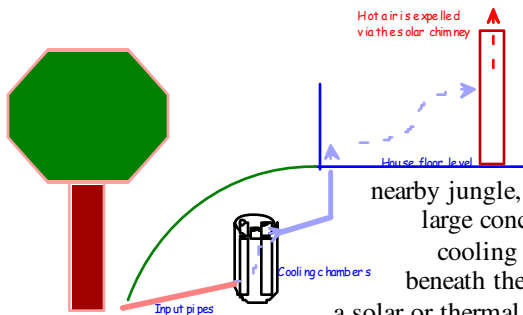
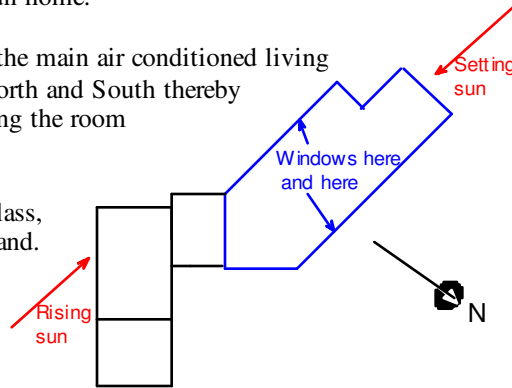
Built in 2005, COOLTEK was designed and built by us, after moving from Cambridge, England to retire in Malaysia. Loving everything about Malaysia but not the hot, humid conditions, we decided to use our experiences from English houses to build a comfortable, affordable and easy to run home.

The sun is the enemy here— so we orientated the main air conditioned living area, shown in blue, so most windows face North and South thereby preventing the hot rays entering and increasing the room temperature.

All windows and external doors are double glass, brought with our other belongings from England. The inside layer of glass has a special low emissive coating and the space between the two layers of glass is filled with argon gas, so that heat cannot easily pass to the inside.

The 250 mm thick walls in the air con area are built with lightweight aerated blocks and painted white on the outside to reflect the heat. Building with these aerated concrete blocks is quick and easy and they have insulating properties that resist the heat from outside transferring into the rooms and the air con coolness from escaping. They were laid as load bearing without any steel reinforced concrete skeleton and use special thin adhesive, both features to minimise heat transfer into the building.

Insulation above the ceiling helps to stop the heat from overhead radiating down on us and more importantly, insulation below the floor to resist the air conditioned cool air sinking down into the concrete foundations and heading down into the earth. These are essential features of the design.



All windows are fixed to stop insect and gecko infestation, as well as air leaks. We provided a ventilation system whereby fresh air is taken from underneath a large leafy tree in the nearby jungle, passes along giant plastic pipes into two large concrete chambers, circulates around upright cooling ceramic pipes then enters the house from beneath the floor. The warmer stale air is ejected up a solar or thermal chimney via large ceiling vents in the air conditioned area, wet kitchen and loft space.

The roof is probably a first for a Malaysia residence, being made from zinc aluminium coated steel and coloured white, with wide overhangs to add extra shading to every window and the walls. The white colour reflects much of the sun's heat and the steel structure allows any heat accumulated during the day to rapidly escape as soon as the sun disappears below the horizon. COOLTEK is located in the most wooded part of the Tiara Melaka Golf and Country Club and has large jungle trees on three sides, taking advantage of the nature's shading. The roof covering the sleeping area of the building loses direct sun radiation from four o'clock in the afternoon.

Many other aspects of the building have been incorporated to save and conserve energy, such as:-

- the air conditioning is a Toshiba multi split unit, using R410A non CFC refrigerant gas, which is claimed to be 40% more efficient than other types and the gas will not damage the ozone layer,
- the fridge/freezer is placed at the foot of the solar chimney, allowing the hot air from the compressor/condenser to escape upwards,
- all lighting is provided by very low energy electronic bulbs and fluorescent tubes without light consuming shades
- the windows are all large single pane, easy clean, clear glass, allowing in more light so are smaller than if they were tinted,
- all external doors have double rubber seals and have been arranged to have an 'air lock' between them and the air conditioned area
- all the toilets are fitted with flush valves, avoiding the use of tanks and permitting completely variable long or short flushes as needed.
- cleaning is done by a central house vacuum cleaning system, operating silently and not introducing heat into the living space.

Currently, we have lived in COOLTEK for only a short time, but already we realise we have a comfortable environment which we can control precisely to whatever temperature we choose at a very low cost. So far, we have run the air conditioned night and day to achieve a temperature of 24 °C, using just 8 units of electricity in a twenty-four hour period and at a cost of under RM2 (two ringgit) for a full 24 hours.

