

Energy Efficient Houses

For sale — energy home

PROJECT home buyers will be able to choose their home according to its energy rating, just as they can now select their refrigerator.

Architect Garry Baverstock, who designed the Solar Energy Information Centre in South Perth, has written a computer program. It assesses every aspect of a plan and

By CLAIRE BRAMLEY

rates its potential for energy conservation, telling the builder or designer, or the potential buyer, how good or bad things are energywise.

The comprehensive analysis takes the climatic region into account — what is right for Perth could be wrong for Karratha.

The customer gets

an analysis with recommendations on where to increase or decrease windows, what insulation is required, how much "thermal mass" needs to be increased, where eaves should be positioned — even color of walls and roof.

One project builder has already had a plan assessed and will market the home as an energy-



□ Architect Garry Baverstock with the building in South Perth that will house the Solar Energy Information Centre.

approved design.

The program is not looking just for low-energy consumption, but reduced energy consumption together with the comfort of the people who will live in the building.

Solar Information Centre director, Dr Bill Parker, explains that in terms of heat loss or gain, a building becomes complicated as soon as windows are included.

There is even an

added factor in appliances (cookers, refrigerators, washing machines), and many people will be surprised to learn that the human body at rest generates about 100 watts of energy or heat.

Energy Management Design For New School

A LOW technology solution obtained by high technology means is the way in which the passive solar addition to the East Beechboro Primary School was achieved when the Building Management Authority commissioned architect Garry Baverstock to design the four-teaching-area structure.

Passive solar buildings are those which through design and siting enable the sun's light and heat to be controlled effectively for the operation of the building and for the comfort of its users.

It does not involve mechanical means of heating and cooling.

"The principles are really all there in the BMA's volume, 'Energy Management in the Design of New Buildings,'" Garry Baverstock said.

"In the preliminary discussions with the BMA on the East Beechboro Primary School project, it was decided that the nature of the requirements lent itself to the passive solar path.

"In passive solar designs, the details are all important. You can have the principles correct but the total project can fail because the details are not similarly accurate.

"At East Beechboro, we made sure we covered all relevant matters.

"For example, we first met teachers and Parents and Citizens representatives to discuss the concept after we had circulated a questionnaire on requirements.

"We gave careful consideration to the layout of the classrooms and at the same time educated the

teachers on the benefits of the passive solar approach.

"Obviously, it is critical that the areas of glass are correct and that they face the right directions, that the angles and extent of eaves and other controls are accurate and that the insulation is sufficient.

"But this is not as difficult as it sounds because there is now a large body of knowledge about these designs and the requirements of the various components.

"Also, the advent of computer analysis for all the variables and factors involved has meant that the architect can confidently go ahead with the final design and not have to rely on any intuitive approach."

At East Beechboro Primary, Garry's ideas have resulted in vaulted ceilings which provide twice as much air volume as there would be in the standard class room.

Fifty per cent of the northern facade is glass, which is fully shaded in summer while the glass areas have been minimised on the south, east and west.

Two "solar pergolas" shade the north eastern and north western entrances to the building, these being translucent sheeting with carefully angled aluminium slats above to control the direct sun falling on the sheeting.

The angles of these slats allow winter sun to shine directly onto the translucent sheeting while protecting it from the summer light.

The \$430,000 project, which includes a

big, covered assembly area, has been well received by teachers.

The school principal, Mr Tiny Barker, and his deputy, Mr Colin McGinniss, both say that the new addition works well both for teaching staff and for students.

For his part, Garry Baverstock believes that the principles utilised in the East Beechboro addition will find much greater application in public sector buildings in the future.

He considers that the quantity of accurate data now available on all considerations of

such designs will mean that architects and clients will be much more ready to go the passive solar way of construction.

The BMA's Project Liaison Architect for the East Beechboro additions, Mike Couche, said that the Authority had encouraged innovation in the design.

"There's no doubt that some of the features could be more widely adopted, for example, the good daylighting system," Mike said.

"But how commonly used the various features might become depends on assessing them over time," he said.

Rammed earth is all-round winner

MOST Perth people who have an interest in rammed earth as a building material have seen it at Margaret River.

Steven Dobson, who was responsible for public buildings such as the Margaret River Catholic Church, said people in the area saw rammed earth as something that characterised the town.

He built his first rammed earth house in Darwin in 1976. He had never seen one before.

Since that time Mr Dobson has been responsible for buildings all over the State, including about 100 scattered around metropolitan Perth.

"People who live in rammed earth houses know how comfortable they are — warm in winter and cool in summer," he said.

But he said the thermal properties are not very well understood.

The U factor — the transfer of heat — can be measured, but the thermal storage side of the calculations is complicated.

It is known that a big thermal mass evens out day and night temperature fluctuations.

And rammed earth walls are the most economical way of achieving that mass, Mr Dobson said.

The use of this mass, while paying attention to basic solar principles, can achieve outstanding results.

"We tend to dodge expensive gimmicks and go with passive solar design," he said.

For those who like to heat their homes with wood burning, cooker-type stoves, the addition of a tank or unit for heating water at the same time is good economy.

Mud bricks are popular in other States where clay is a major component of the soil, but in WA the soils are more sandy and lend themselves to rammed earth.

Where local soil contains too much clay, as in Broome, river sand improves the properties.

Rammed earth structures are stabilised, usually with cement because it is the most cost effective. But other additives, such as lime or chemicals, can be used.

A recent brief in which the client wanted to achieve a particular color effect resulted in a mix of clay, coarse sand, gravel, cement and water.

Mixing ingredients not only varies color, but improves strength and lessens shrinkage.

Mr Dobson will be guest speaker at a seminar at Home-maker City on October 12 from 1pm to 4pm.

Cells a power house

PHOTOVOLTAICS is one of the new words to have entered our language.

PVs have only been available since the mid-1950s, though a French scientist discovered the principle in 1839.

PV cells are growing cheaper and joined together in series can provide useful voltages.

The panels collect solar energy and store it in specially designed lead-acid batteries.

With the use of an inverter, the low-voltage DC power from the batteries can be transformed into high voltage AC power for general domestic consumption.