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The Australian Mini-EconoSpace project:

1. Finished building sits lightly in its bushland setting.
2. Clay-straw infill can also be used for external walls.
3. Internal clay-straw with external timber cladding.
4. One unclad wall was plastered and treated with linseed oil.
5. Under construction - external timber cladding in place.
6. Internal clay plastering provided a fine finish.
7. Metal roof sheeting allows easy collection of rainwater.
8. The clay-straw infill and clay plaster allowed the creation of attractive organic-shaped window reveals.



EconoSpaceMaking

In TOB 149 Oct/Nov 2008 (p.33), Irish architect Peter Cowman wrote about his concept of an EconoSpace. Since then he has released a DVD instruction manual including his experiences building in Australia. This is an extract from the manual.

BY PETER COWMAN

The EconoSpace first came to life as an idea – the idea that it should be possible to construct a small habitable building with very little in the way of money.

Learning how to design and construct small buildings is essential for anybody wishing to embrace a sustainable way of life. When these skills have been mastered a person can then confidently tackle the more demanding task of creating larger buildings.

The EconoSpace design and construction process has been configured to be practical and realistic in respect of the skills, time and resources most people have available to them. It offers few excuses as to why we cannot construct the future according to our oft expressed desire to embrace a sustainable way of life.

Exempt development

Australia lent its influence to the EconoSpace concept in two ways. To meet the parameters of local exempt development regulations, I developed a Mini-Econo – a 10m² version. Almost all modern building activity is subject to legislative control administered by local authorities. This means that normally one has to obtain some form of permission in order to build something.

However there also exists a category of building activity which is largely free from legislative control called ‘exempt development.’

Exempt development is designed to facilitate small scale works within the boundaries of existing properties – for example the building of a shed or a studio behind an existing house. Generally there are limits to the floor area, the height, position and the use to which such small buildings can be put. Even a building of 10m², if it is well thought out, will facilitate many different uses and could be constructed very economically.

Editor's note: Check the Planning and Development Regulation relevant to your area, or ask your local council. For example, a block size of 500m² or less allows exempt development of a building no more than 10m² and 3m above natural ground, with relevant setbacks.

In Australia, I also met James Henderson of Henderson Clayworks. James had read my earlier article on the EconoSpace concept in *The Owner Builder* magazine. He believed that my framing system was the ideal partner for his beloved clay-straw, an old German system of natural building called *leichtlehm* that he had learned in the USA.

Costing

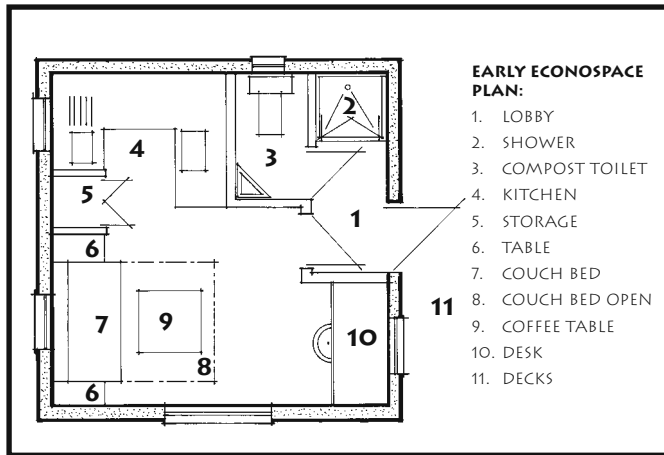
Cost is the constant companion of sustainable building. Oftentimes cost is the reason that people settle for inferior quality and consign themselves to live in unhealthy and impractical buildings.

Naturally enough, money needs to be spent on materials and on the hiring of skilled persons to carry out work that we do not have the skill or equipment to carry out ourselves. This expenditure does not have to be exorbitant however. The Australian 10m² EconoSpace has so far cost \$4000, including a new *Colorbond* roof; there is just the floor to buy now. This space should be completed within a budget of \$5000.

You could spend more on fancy products or on expensive labour. However, at the end of the day, it is not the level of expenditure which gives a building its charm; it is the intention and love that has gone into its making. These ingredients are priceless and can only be supplied from the bounty of our individual lives.

Bringing it to life

Begin by asking yourself a simple question – what is it I want this EconoSpace for? You might wish to create a personal retreat or you might wish to create a space for a creative



activity such as writing or painting. Or perhaps your need is for a facility to assist with the growing and processing of food. Or perhaps you just want to learn how to build or you need a site office to facilitate the construction of a larger building. The range of activities that can be accommodated in an EconoSpace is quite extensive and with good planning several different activities could be hosted quite successfully.

Furnishings

Caution has to be exercised in regards to size of furnishings. Generally, loose furniture devours space so it is best to install built-in units and to use foldable tables and chairs where required. Where built-in units are being installed these should be of a size similar to what one would find on a boat or in a caravan, rather than the full size units normally associated with regular buildings.

By using scaled-down built-in units the overall sense of space within an EconoSpace can be greatly increased. If careful attention is paid to the design of built-in units, enormous amounts of belongings can be neatly and effectively stored. This is particularly important if a wide range of activities is planned.

Size and budget

It is vital to appraise yourself of the regulations pertaining to exempt development in your area. Generally, height and floor area restrictions apply. For any building that is to be inhabited or that will have a commercial use, planning permission or a building permit must be obtained before construction can be undertaken.

For a 10m² building the internal floor area might be 3.16m x 3.16m

giving an external footprint of 3.76m x 3.76m. The overall footprint of that building with the addition of a 1.2m working zone all around the building would be 6.16m x 6.16m.

Editor's note: For exempt development, a 10m² figure would probably refer to the EXTERNAL area – so again, CHECK before going ahead.

EconoSpace construction involves the making of a series of components that are then assembled to form the building. It is feasible for components to be made at one location and transported to a different location for assembly. If this is to be the case it will be necessary to assess both locations as to their suitability.

Estimating your own time is also critical. The general rule with building work is that things always take longer to complete and cost more than expected! The EconoSpace is very suited to being built slowly but keeping costs down and momentum up is very important. A realistic timeframe for inexperienced builders working part time would be six months from start-up to completion.

Construction

Once a design has been evolved and a site selected, attention can turn to the issue of constructing the EconoSpace.

The selection of appropriate materials is mainly guided by the function of the building fabric while in use. Normally this will involve keeping heat either in or out of the building. The building fabric also serves a weatherproofing function.

The availability and cost of building materials are also matters which must now be closely investigated.

Structure and fabric

The EconoSpace structure and fabric are ideally formed from a combination of affordable, natural, simple and easily available components. Footings are either railway sleepers or timber trusses set out in rows, resting on either stone 'footings' or on a stone hardstand. The floor structure of the EconoSpace sits on these sleepers or trusses.

EconoSpace walls consist of a series of posts called 'Peter-posts' (see TOB 149 p.34). Peter-posts are easy to make, facilitate the jointing of the structure and the achievement of high insulation levels. Peter-posts are also light, strong and easily transportable. The Peter-posts making up the EconoSpace walls are assembled on top of the floor structure and connected with rails and diagonal bracing before being raised by hand into position. The rafters which form the roof slot into the Peter-posts in the walls. When the roof structure is in place it is then closed in. Next, the floor structure is completed and boarded to provide a covered work area. Window and door frames are then made and attached to the frame.

The infilling of the walls is next, followed by the infilling of the roof and floor. The finishing-out process then gets underway. All of the components of the basic frame can be prepared and temporarily stored prior to assembly. This incremental preparation technique will suit many self-builders. Even if only one component is made per day a person can make very good progress. Most components are manageable by one person working alone. It is only at the assembly and erection stage that additional help may be needed. Components can also be easily transported from one location to another.



Construction phases

Phase 1

- preparation and costing
- setting out
- footings
- the bench
- constructing Peter-posts, floor beams and foundation trusses
- framing up the walls
- framing up the roof

Phase 2

- installing the roof covering
- the closing in of the floor
- construction/installation of window and door frames
- the installation of services
- finishing
- occupancy

Phase 1 is about getting the EconoSpace structure assembled and erected while Phase 2 is about filling and covering this structure with the building 'fabric.' The climatic conditions your EconoSpace will be subjected to will influence the Phase 2 construction work as will your personal preferences.

A small timber building such as an EconoSpace is relatively lightweight and can rest on the ground with the minimum of fuss. Think of a load of timber delivered from the sawmill or timberyard – you can happily sit this on the ground on a few pieces of timber without wondering if it will sink or might require a concrete foundation under it!

Generally I would avoid the use of concrete for footings and instead use stone. I put railway sleepers or timber trusses on top of stone fill and rest the building on top of these.

The 10m² EconoSpace sits on foundation trusses. To keep overall height down, the gently sloping site was first levelled. No stone was used, other than a 50mm dressing of crushed basalt.

Opposite page: Sleepers create a firm base.

This page, clockwise from above left: ready to be closed in; a completed EconoSpace; Peter-post and external clay-straw infill; fun 'feet on' clay-straw mix making.

Progress to date

Over summer, we filled the walls with clay-straw, put the roof on and finished the external cladding. The infilling of a timber frame with a material such as clay-straw allows one to move from the precise world of plumb, level and square to the gentler world of imprecision. This evolution is driven by our intuition and it is this engagement which literally brings a building to life. Expensive materials or tradespersons simply cannot replicate the feeling of aliveness that an individual can bring to their own 'living' architecture.

James Henderson did a plastering course at our place so we plastered the inside. The back wall had no cladding so was plastered externally and treated with linseed oil.

The vernacular architecture tradition was oral and it died out when people became enmeshed in the job culture of the modern age. The overall effect of the Australian EconoSpace is stunning and the closest I've come to a truly vernacular experience. At times it was a little like working on a restoration project. I think the clay-straw/clay-plaster/timber frame combination is a winner. ■

The EconoSpaceMaking DVD can be purchased online for \$120. There is a special introductory offer of \$90.

For details of upcoming courses and workshops (from September 2010), as well as video of the building of various EconoSpace projects, see the Living Architecture Centre website. www.livingarchitecturecentre.com

