Dirt

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Bamboo and Cob in the Phillipines

AGM 2011

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Dirt

Dirt is the quarterly Newsletter of EBAA.

Please feel free to contribute.

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Mudmap

By Peter Hickson
President

Day Three of the Conference
Day three of the EBAA conference 2010 was hosted at Rob Freeland's place in Nutfield outside Eltham, home of Amcer. A hearty breakfast was followed by workshops.

James Henderson of Henderson's Clayworks gave us a very entertaining and interesting run down on what can be done with clay from paints through plasters and renders to walls to cob/daub and mudbrick composition.

Cal Earth Super Adobe
Readers may like to familiarise themselves with Cal Earth SuperAdobe. It is an earth building technique that can be best described as rammed earth in a permanent endless coiled bag formwork. It was developed, in California, by Iranian born architect Nader Khalili in conjunction with NASA for human settlement on the Moon. Check out Cal Earth videos on google or visit www.calearth.org

It has been used for crisis housing around the world and is becoming popular with sustainable builders because it uses not much else than earth.

I have been corresponding with Cal Earth for several years now and attended Cal Earth's first Australian workshop in Melbourne in February. I was curious to assess for myself just how practical the system really was.

My conclusion is that Superadobe is the fastest, simplest, cheapest, safest, self-help form of earth building available. The ability to immediately start and quickly build earth domes from foundation through walls to the roof using earth with very few tools utilising unskilled labour is the key to its brilliance and success.

It is instant and monolithic like cob but it suits a wider selection of earth material, doesn't need straw and is physically easier. Like mudbrick it can be used to build domes but instantly and with less skill. Being monolithic, footings are not as critical. It is a form of rammed earth but doesn't need expensive formwork or machinery. It best builds domes and this is its strength and limitation I believe. It performs well in earthquakes, is brilliant for small buildings like fire bunkers and sprawling low houses consisting of connected domes, and very good for climates with a high diurnal fluctuation. It may not suit all climates and is not for all tastes aesthetically. It may be more difficult to mechanise than rammed earth but I think it is appropriate in many ways for low cost self-help building in the desert.

NatHers moves from 5 to 6 Stars
The National Housing Energy Rating Scheme NatHers has now reduced the energy allowance target for new homes as measured in MJ per square metre and relative to climate. The energy allowance for heating and cooling loads

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are tightened. To the layman this means a jump from 5 to 6 Stars in the standard of construction for new homes in regards energy efficiency. In reality it means, if you opt for a NatHers assessment, the computer will be more difficult to please. The computer is more likely than ever to say "No".

The Ebaa submission to the National Strategy on Energy Efficiency requested the government ascertain whether the real energy consumption of NatHers 5 Star Energy Efficient housing is in line with computer modelling predictions. We wanted this research done as a valid part of the Regulatory Impact Statement. An RIS is required when making changes to the BCA. Increasing the energy efficiency target from 5 Star to 6 Star will have a huge impact on the cost of new buildings.

I am informed that the government did in fact call for tenders for such a survey to support the RIS. Unfortunately the budget on offer was insufficient to support a successful tenderer. We hope a larger budget is supplied and fresh tender documents are once again advertised.

The Master Builder's Association commissioned a report that looked at the cost benefit analysis of moving from 5 to 6 Stars energy target in NatHers. The Centre for International Economics compiled the report for the MBA. It is easy to find the survey by a web search. There are some interesting points some of which we have already made in previous Ebaa submissions.

The Australian housing stock is 7,000,000 and new residential housing is 100,000 (representing just 1.42%) per year. Clearly concentrating on new homes doesn't address the great bulk of the problem.
The energy efficiency gains possible by advancing older existing houses from 1 to 2 Stars has five times the gain made by advancing homes from 4 to 5 stars. The current energy efficiency star rating settings are at or above optimal levels in most climates. Any further increases in energy efficiency requirements for new homes will result in larger and larger costs for smaller and smaller benefits.

I still argue that the so-called 'Pink Batts Scheme' was a good thing. It was unfortunately mishandled and mismanaged, from a media point of view, by a fledgling and inexperienced government wanting to change the world quickly. I insulated the ceilings of four homes under the scheme without ripping off consumers, starting a house fire or harming, killing or taking advantage of employees. I did this at a time when the building industry was slow due to the GFC and I appreciated the work. I was stimulated.

A WA government official said jokingly, "You (thermal mass guys) must be pleased it was a Pink Batt that killed off a Minister for Climate Change (and NatHers)".

State OH&S Authorities, Department's of Fair Trading and Licensing Authorities are in control of all of the issues that brought the downfall of the scheme. A federal government department that makes a budget available is never responsible for what happens in areas outside its responsibility. I digress, but this sort of remedial work to existing buildings is where real substantial energy savings can be made easily whilst helping the public deal with rising energy bills.

Building Product Innovation Council - Seminar 12th April, Sydney 2011
The federal government through the Department of Climate Change is working towards an incredible range of sustainable outcomes across many industries. It is interesting to keep an eye on their website.

The time will eventually come when Australia will be more interested in embodied energy. The public is already hungry for sustainable products. Architects, designers and builders are keen to win them as clients.

Ray Trappel, Tony Cox and I attended a Building Products Innovation Council Seminar in Sydney 11th April. We represented Ebaa members and made contacts there that we will continue to pursue on your behalf. Ebaa would like to hear from any member who may be interested in assisting us in compiling embodied energy figures for earth products and processes. This could be rammed earth operations, brick making, render or earth based paints.
Some information on BPIC from their website www.bpic.asn.au:
"The Building Products Innovation Council (BPIC) is Australia's peak body representing the building materials sector. We provide a unified and coordinated approach to the rapid pace and expanding scope of regulatory change in the Australian building industry and the need for better environmental outcomes."
"BPIC has completed a 3-year project, in partnership with the Federal Government, to provide "Australian" Life Cycle Inventory data for building materials. The Building Products Life Cycle Inventory will assist Life Cycle Assessment practitioners, architects, designers, engineers, builders, developers and regulators to more accurately assess the impact building products and buildings have on the environment."
"The BPLCI is a living method and database – it will develop and evolve in the national interest for:

Use in LCA Tools
Use in Design Tools
Use by environmental assessment suppliers (EDP, Ecolabelling)

Industry process improvement
Industry engagement and education
Inclusion of more product categories
Inclusion in building regulation "

You can see why we would like to be involved in this process.

Kindlehill Steiner School

article and photographs by
Anthony Cox

Photo 1: View of the school from the street.

Kindlehill is a Rudolf Steiner School located in the Blue Mountains of New South Wales. Lynn, the Principal and teacher, capably leads the staff of five teachers. Over the past few years a number of small and large constructions have taken place on the site. These have been accomplished through the work of staff, parents and students using a number of alternative building methods.

Photo 2: Straw bale wall ready for rendering.

As the school is approached from the roadway, the spiral structure of the building immediately draws ones attention.

Photo 3: Internal view looking up into the spiral.

The spiral is reflective of the Steiner school philosophy of the unfolding nature of children as they move through the three main stages of their lives, will, heart and mind. Children's imagination is encouraged through creative use of the arts. Development is believed to take place in seven-year cycles. Firstly, in the kindergarten they explore their will.
Children are involved in doing and exploring through play. This is a very hands-on stage and at Kindlehill has naturally included some of the building processes.

The children have worked at making some of the cob blocks within the building, as well as the earth floor of a classroom.

Photo 4: Earth floor of a classroom.

They have had their playtime houses tested while the school building itself was being tested. Parents and teachers have added to the environment by creating organic shapes as decoration on the classroom walls.

Photo 5: A classroom wall with a tree sculpted into the wall.

Photo 6: View into centre of spiral

Students continue to be involved with the physical aspects of the school such as landscaping the site and growing vegetables.

Photo 7: Bridge to classrooms as part of landscaping.

As the building unfolds to the primary school area the heart aspect is explored. Students encounter feelings through relationships including their connection with the environment. In the school construction stage children were able to participate in working with some of the machinery. A sense of power was experienced using the compactor. During the primary school stage they also help look after the roof top garden.

Photo 8: Roof top garden above the volunteers living quarters.

In the classroom parents and students have also helped produce some of the furniture.
After the primary school stage, the focus is on the mind and intellectual endeavours, being reflective and thinking through consequences.

Being a community build has allowed the school to benefit far more from the Federal Government's Education Revolution stimulus contribution package. The school has been able to build a performance area, two classrooms, a common area, extend and renovate the existing school building. Parents and friends have been able to use their skills and abilities to work on aspects of the building due to the low embodied energy nature of the construction. The school was fortunate to have Jason Dash, guiding the project through to completion.

Photo 9: Performance area built under the classrooms.

Photo 10: Southern view of main building.

Jason as builder was able to access recycled and local building materials. Matt Fenn has contributed greatly to the integrity of the building by using traditional carpentry skills to build the frame sections of the building using timber that needed to be removed from the car parking area or local highway widening.

Photo 11: Traditional timber framing.

In addition other schools helped out with the materials. The earth works from a local school became the building materials for Kindlehill.

Photo 12: Old tyres and fill used to create a large retaining wall.

Working with materials as they were available was a challenge for Jamie, however this enabled the school community to have input in the fit out, leading to the creation of a very individual building.

Volunteers from overseas using HelpX often stay onsite and like to add their contribution to the school. For example travellers and students produced the earth roof.

Photo 13: Mud ceiling formed over wire mesh.

This was a real "people power" project. By working together people have been able to create structures that are not only functional, but communicators of a sense of calm – revealing the inherent beauty to be found in natural and recycled materials. This site has used everything from earth floors, local timber, straw bales, cob, poured earth through to an earth roof.

The design of these building was a joint venture between Jamie Brennan of SixB Architecture and Simon Hearn of Sunlab Architecture.

Bamboo and Cob in the Phillipines

photographs and details supplied by Michael Dindo Pillora

Bamboo structural frame with split bamboo woven infill

Bamboo structural frame posts to have well detailed base for moisture and termite/insect control, and structural connection.

Bamboo structural frame to have adequate bracing

Clay, sand and water are placed/mixed in half drum

Straw is coated with mud mix

Cob "sausage" is formed ... *(continued over)*

... lifted up ...

... and then tied around bamboo frame/lattice

remaining space is filled with cob

completed wall panel to right

Earth Building Association of Australia
AGM, Forum and house tour 8-9 Oct 2011
South Coast, St Georges Basin/Nowra, NSW