

Highlights of Conference 2009 - Speakers

Peter Hickson

Earth building is the practice of building using unfired earth. The most common techniques being used in Australia today are rammed earth and earth brick (mud brick and pressed earth brick) though other techniques presently used include cob and poured earth, wattle and daub to mention a few.

Earth is a material that can be the structural element, the fabric, lining, insulation, thermal mass, a membrane that automatically balances both temperature and humidity.

Earth can be varied in thickness and density to vary thermal performance by adjusting insulation and thermal mass values.

Earth is very durable, non combustible, rot, termite and vermin proof. It shields against electromagnetic radiation is a great sound insulator and is unlike modern building components it is free of volatile organic compounds (VOCs). A material hugely undervalued in our modern world. A material that needs to be rediscovered and better appreciated.

Earth is a beautiful looking creative medium that can be moulded, rammed, formed, shaped, applied and worked to create any form of building any desired finish to suit any style of architecture.

Earth building is appropriate, renewable and sustainable technology.

Earth is an abundant and widespread sustainable resource available to all rich and poor alike. Earth building materials are borrowed from the earth for the desired life of the building then the material can be reused, recycled or simply returned to the earth. Earth buildings are sun dried, and exposed to the sun earth is a solar collector and battery and radiator. Earth is the ultimate green building material.

The Earth Building Association of Australia is the peak body representing our industry. EBAA's aim is to promote and foster the use of unfired earth in Australia and worldwide.

Somehow EBAA needs to find the necessary resources for research and engineering needed to keep current with changes in legislation. We need to develop education and training and we need to promote our industry. We need to be lobbying for a partnership between our industry, research and training institutions and government to achieve our goals.

Our conference this year focuses on sustainability, energy efficiency and bushfires.

Sustainability is the challenge and therefore opportunity of the 21st century. How do we maintain our lifestyle in the first world and how does the developing world improve their lifestyles when resource and energy flows need to be cut dramatically? The Organisation for Economic Cooperation and Development (OECD) recommends first world countries like Australia cut resource and energy flows by 90%.

The focus is now with energy efficiency but it will not be long before we need to look at the enormous amounts of energy and resources used to create buildings, transport of materials, how long buildings last and how resources and energy is recycled or captured at the end of the building's useful life. We need to be creating buildings that are autonomous in heating and cooling not merely energy efficient.

The Australian colonies were founded with earth building. In recessions, depressions, and in the aftermath of wars and fuel crisis we always turn to earth. Now we are bushed, lost and up the creek, we need to look more seriously at proven and viable sustainable alternatives like earth building. There is no doubt in my mind that earth building can meet the sustainability challenges we face because it always has. It can make a significant difference in reductions in resource and energy flows in the built environment.

Australia has slipped way behind the rest of the world in terms of sustainable building in mainstream construction. Earth building has always led and continues to lead sustainable building in this country

and around the world. EBAA has a leadership role to play in promotion, education, research and development and lobbying and participating in a regulatory framework.

Energy efficiency of buildings has been a focus of governments and therefore authorities in Australia for some years now.

Part 2.6 of BCA, Energy Efficiency Provisions aim to reduce GHG emissions.

"The Objective of this Part is to reduce greenhouse gas emissions by efficiently using energy."

The Functional Statement reads, "To reduce greenhouse gas emissions, a building, including its services, is to be capable of efficiently using energy"

This has meant a focus on sealing and insulation of buildings. It has meant a focus on minimum "R" values in walls. The introduction and evolution of computer simulated design tools and minimum "R" values has damaged the earth building industry in Victoria especially.

The insulate and sealed building approach has failed to curb ever-increasing energy demands, has punished viable alternatives and legitimised bad building design. It has also put energy efficiency provisions at direct odds with health and amenity provisions. How can a sealed building achieve 1 to 2 ach (air changes) per hour needed for health and amenity? Who is monitoring indoor air quality in sealed buildings? What are the long-term health affects of sealed modern buildings full of volatile organic compounds? What is the real value of insulation if buildings are not sealed but allowed to breathe, as they should?

I believe the answer to energy efficiency lies in design principles for the various climates or in other words appropriate climate responsive designs. In colder climates like in Victoria and Tasmania that means passive and active solar designs. Suntraps, conservatories, Tromme walls, air locks and solar or ground loop hydronic heating need to be added to basic passive solar design principles. In more temperate climates

passive solar design is the answer. In the tropics, tropical design. In the centre of Australia at various latitudes we need design principles. The science is proven. It is why vernacular designs have developed worldwide over thousands of years.

I believe there is something wrong when the same buildings are being erected the length and breadth of this vast land in so many different climates. That these buildings are being approved by rating tools is a clear sign that something is wrong with the approach to date. To me an air-conditioner is a technological fix for poor building design.

Any attempt to create buildings with a degree of free running or autonomy in heating and cooling needs thermal mass for storage. Earth is the most sustainable form of thermal mass available.

The draft proposed changes to the BCA Energy Efficiency Provisions are encouraging. In deemed to comply changes light weight and heavy weight walls are dealt with very differently and according to climate. It is an encouraging sign of change in thinking and approach towards appropriate climate responsive design principles.

It wasn't an issue when we first started planning this conference but the Black Saturday fires have made it an area of intense interest. It is a very sensitive issue here in Nillumbik and in neighbouring Shires, at this conference and amongst our members and guests who have lost family, friends and possibly clients.

We will go as gently and sensitively as possible. However, we need to understand how earth performs and how earthbuilding systems can be improved or used to save lives and protect assets in future. Bush fires are part of the Australian landscape and therefore part of our lives.

New regulations have been rushed into force to try and avoid the same sorts of losses. It is the role of governments to do this. We wish to ensure people are able to rebuild their lives and rebuild their homes if they chose to. If governments regulate for change they need to fund the research to provide the solutions. If the policy to leave early or else stay and defend is maintained as I feel it should then

people need the confidence in their building and the necessary training to survive.

I hope this conference answers questions, educates and provides a friendly forum that encourages discussion and debate.

Greg Slingsby

President, Nillumbik Mud Brick Association



The Nillumbik Mudbrick Association (NMA) was formed in June 2004. Formed in response to energy rating impact to ensure dialogue on the systems developed.

NMA Mission Statement

To protect and promote the mudbrick building industry.

The NMA welcomes members from within and outside the Nillumbik Shire who share their concern for the future of the earth building industry.

The NMA supports EBBA aims and objectives:

- (a) To promote the informed use of unfired earth as a building material within Australia.
- (b) To liaise with other groups or individuals, both in Australia and internationally, who have interests in promoting earth building.

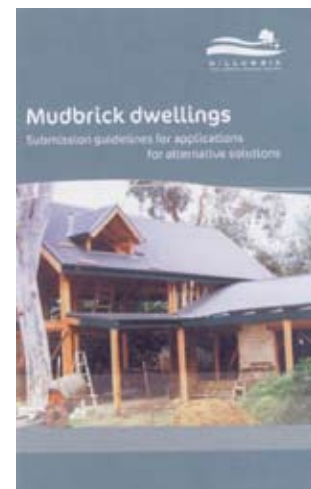
Greg also spoke later in the conference about innovative ways that earth could be used in current commercial house construction and that we need to continue to think outside the square as we face the challenges ahead.

Margaret Abbey

General Manager Environment and Planning - Nillumbik Shire Council



Margaret told the audience that Nillumbik Shire is proud of the contribution mud brick has made to the built environment of the local area. She re-affirmed that EBAA and stakeholders will be involved in work with Victorian Planning in better defining and facilitating places where mud bricks can be produced. With earth being non combustible and allowable in all Bushfire Attack Levels (BAL) it will hopefully be utilised in rebuilding after the fires. Mudbrick is still having some difficulties in passing Energy Efficiency Assessments and Council has been looking at ways of addressing this.



Dennis Hogan

Acting Director, Regulatory Department-
Building Commission of Victoria



Dennis Hogan from Victorian Building Commission gave us an overview of changes to the Building Code of Australia for this year. Bushfire standards and energy efficiency were of particular interest to members. Earth building is recognized as a good material for use in bushfire prone situations and has been given the recognition it deserves. If the draft E.E. Provision changes go ahead then all new buildings will need to earn 6 stars through computer simulated rating software or by meeting the new deemed-to-satisfy provisions. These changes are very interesting to the committee because thermal mass walls are being valued at last and light-weight walls require much greater levels of insulation.

Peter Ho

Phooney Architects



Peter talked about international award winning projects with a particular interest in the recycling of otherwise waste material.

Stephen Dobson

Ramtec Pty Ltd

Keynote Address

*Rammed Earth Buildings in
Western Australia and overseas*

Steve spoke about the attributes of rammed earth and how it compares with other earth building types. Pictures of rammed earth buildings were projected as he spoke and an impressive presentation of a body of work followed.

Steve said, "Rammed earth can be defined as a precisely controlled mixture of gravel, sand, silt, clay, water and sometimes cement, lime or chemical admixtures which is carefully proportioned, mixed to the correct moisture content, and then compacted in removable formwork to yield a dense, hard, stone-like wall. The walls are massive, fireproof, waterproof, load bearing, durable, long lasting and above all, quite beautiful."

The bushfire resistance of (rammed) earth construction was further shown from the numerous examples from testing and experience cited.

The role that (rammed) earth's mass could play in the thermal performance of buildings was also well outlined.

Steve's significant contribution to rammed earth in Australia has seen not only over 700 buildings with rammed earth walls but also the evolving of efficient construction systems that are now commonly used in WA and the rest of Australia.

His passion for rammed earth was communicated well and I think many earth builders/designers saw the value in, and possibility of adding rammed earth to their palette of preferred options.

We featured some of Steve Dobson's work in *Dirt #34* and will look at more WA rammed earth in *Dirt #37*.



Ken Hickson

www.abccarbon.com

*The impact an emissions trading
scheme will have on the building
industry and the advantages of earth
building*

Ken is the author of *ABC of Carbon* and the producer of a weekly eco newsletter. He has owned and lived in a SE QLD rammed earth home built by John Oliver and knows the comfort and efficiency of an earth home.

He was able to give us a wider perspective of some of the global issues and let us know how well placed earth construction is in providing an appropriate green building option.

Hence the importance of, partnerships with similar associations and working with all levels of government to ensure they are aware of the benefits of earth building.

Jason Veale

AECOM (also BASIX NSW author)

*What is required to raise earth
buildings acceptance and working with
energy efficiency*

Earth buildings can provide excellent thermal comfort and they are low greenhouse and deserve more credit. They can have a superb cooling effect in summer and with regular solar gain in winter can perform well.

Passive solar design is vital, especially the north orientation of living room windows, the location of mass with summer night ventilation and appropriate summer shading.

Jason recommends, "Stay within the current framework and run the greenhouse performance argument for concessions". The evidence is relatively easy to gather from billing/fuel use data.

BASIX DIY earth walls do not require insulation, however it increases ceiling insulation and glazing requirements to partially compensate.

(The BASIX DIY tool is also being considered as one of the accessible options in the national energy rating framework because of its flexibility, scope and outcomes.)

James Stockwell

architect, Wilkinson Award winner for rammed earth building

Wilcox House, Leura, NSW

The Wilkinson Award is the highest award for residential architecture in Australia and is awarded on a state basis. The Wilcox House presented by James showed rammed sandstone (earth) incorporated into a building to an exceptional level of architectural detail and refinement.

Photographs top right and front and back covers - from James Stockwell

Ian Redfern

architect, Earth Building association of NZ
Getting earth construction through the planning process in NZ

Ian showed us pictures of a 130 year old cob and earth straw cottages in excellent condition in their very wet and earthquake prone country and some of the issues for approvals within the planning process.

Ray Trappel

architect, EBAA vice president
EBAA newsletter (DIRT) editor

The DIRT newsletter and its recent explorations.

Geoff Mortimer

retired scientist

Surviving bushfires in earth buildings
See pictures and story back page.

Ralph Webster

www.greenroofsaustralia.com.au

Green roofs and walls can help cool hot cities and delay stormwater runoff 2-4 hours which can reduce peaks to a third. They can also add to a cities bio diversity, aesthetics and green space.

Dean Farago

Earth render specialist

Traditional surface treatments in the MiddleEast and alternative options for industry

A feast of finishes, many thousands of years old, using clay, lime or Roman cement.

Peter Hickson

builder, EBAA president

Earthquake resistant bamboo reinforced cob

A prototype for earthquake prone tropical areas of the world.
Photographs to right.

Rob Freeland

Amcer P/L

Research into the results of buildings after the bush fires

The exceptional performance of earth buildings and the failure of many other building types was found.

Jason Dash

EBAA committee member

Cob construction and working with a school

Jason spoke about a recent project.

John Zhang

engineer, School of Engineering UWS

Perception of risks associated with alternative building systems

The total load on the lower bricks in a two storey construction is 142.5KPa while typical strengths of earth walls are 1000-3000KPa. So John asks, "Where is the risk?"

Karl Apted

Engineer specialising in earth construction

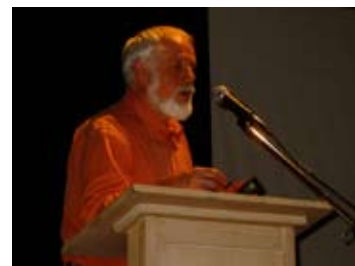
Performance of earth in bush fires
Local observations.

Alan Grimes

Grimes and Sons Paints

Detailing of earth houses in bushfire prone areas

The sealing of ridge capping and fire resistant sarking key areas for earth houses.



Ian Redfern

