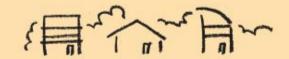
Sustainable Building & Design

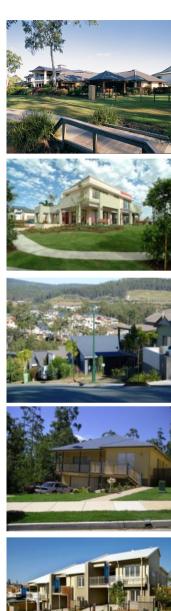
Timber - part of the solution in managing and solving the challenges going forward

Michael Chapman Delfin Lend Lease 30 July 2010





Trends, Challenges and Solutions





Timber - part of the solution in managing and solving the challenges going forward

Trends, Challenges and Solutions Trends

- Thermal Efficiency & Star rating increases
- Rating Greenhouse Gas Emissions
- Move to Carbon targets for Communities
- Move to Carbon Neutral Homes
- Move to Embodied Carbon measurement











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Challenges

- Different approaches heating and cooling
- Availability of flat land
- Changing household and house size
- Density requirements
- Availability of on site trades











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Challenges

- Different approaches heating and cooling
- Availability of flat land
- Changing household and house size
- Density requirements
- Availability of on site trades

Solutions

- A better Carbon solution
- Response to Slope Issues
- Ability to work with all other parts of the solution
- Ease of sealing and opening













Clay Street Eco Haus

















AusZEH Demonstration House @ Laurimar

8-STAR SMART DESIGN

The AusZEH, designed by Henley Property Group in consultation with CSIRO and Delfin Lend Lease, has achieved an 8-star energy rating using the 'Acoullate' assessment tool.

A house energy rating is an index of a building's thermal performance (i.e. heating and cooling requirements) for residential homes in Australia.

Developed by the CSIRO, the 'AccuRate' software has been designed to simulate the heating and cooling energy efficiency of residential buildings.

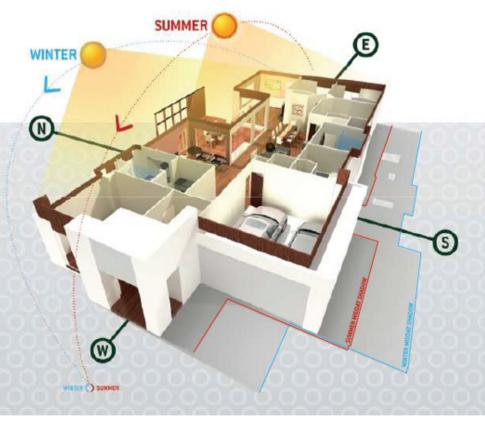
When you walk into the AusZEH, it may look like any other new home. The difference, however, hes within - its thermal performance. With an 8-star energy rating, the AusZEH relies on the combination of the following features:

- northern attentation and retractable shading options
 brick construction and higher levels of insulation to the wall and the ceiling
- double glazing to all windows and sliding doors
 insulated waffle pad concrete slab (foundation)









AUS**ZEH** PERFECTLY IN ITS ENVIRONMENT

ORIENTATION AND SHADING OF THE AUSZEH

Good orientation works on the basis of designing a home which takes advantage of its almosts and regional conditions. Good orientation increases the energy efficiency of a home by reducing the need of additional heating and cooling, resulting in decreased GHG and lower energy bills.

The AusZEH is located in a climate that requires more heating than cooling to keep the home at a comfortable temperature. The AusZEH uses the sun as a natural source of free heating during the winter (a.k.a: passive heating). The smart design therefore makes the most of the suns warmth to heat the home with the living rooms' windows facing north. The windows transfer winter solar energy when the sun sits low in the sky and excludes summer sun when it's sitting directly above the house.

The northern windows are also shaded from the hot summer sun using an extendable awning and exterior blinds by Helioscreen. The exterior blinds are made from a fabric that reduces the sun's heat by up to 90 per cent.









mirvac

harmony 9

Marriage S is a materiage brane designed and hull: by Marriage

The house is designed to be 'sero carbon' in operation (i.e the > 11 maximizes the possible NatioDis nating. emblethed amount of energy required to run the house is met by reasonable energy generated on site) and 4.52 MoSSES Site raths, The design also tonographies worther safety and re-sident raths, The design also tonographies worther safety and reto complete, low trackly and encycled materials, Beddle twen

New potents, low trackly and encycled materials, Beddle twen

New recommendately available it uses recycled materials, planning and user behaviour changing sechnologies.

New potentials a common sense amount to a producted

As part of Marver's ongoing commitment to sustainability, the Harmony 9 prototype house was created as a research and development platform to foster sustainable design initiatives. John School Regions

The Stanmony 9 desire is based on the following mischales. > The model is a four bedroom two storey family home - a

- odel that has commercial acceptance at Weverley Park.
- > It forms part of an established integrated housing
- > It uses standard domestic construction materials and

- domestic construction market,

- > It meletains a common sense approach to embodied

To achieve the 9.2 Star NatHERs rating the design process used

"Accurate" NetHERs software to inform design decisions. Third Size Sustainability Consulting it Design worked with Manus: Design to set the broader strategy beyond the NotHERs siting.

The design of Harmony 9 was completed in August 2008. Construction was completed in November 2009.

Harmony 9 is a pictotype home and as such is not one of the standard Mirvec homes available for sale. The ideas and technologies in Harmony 9 inform the Harmony range of frames currently for sale at Waverley Fork and for fature Mirver

Rermony 9 - NatlEEs rating

Stem D7 Stem

Cooling (sensible) 2.9 Mj/m2 per annum, (latent) 0.8 Mj/m2 per annum Total 21.9 MI/m2 per entern

BUILDING

Structure Concrete welfle-ood slab on ground / Timber structural walls and internal walls / Timber framed first floor and roof trusses / Seed roof.

Shading All windows are shaded to maximize the potential passive design, such as allowing full sunlight penetration from 26 May to 19 July and no santight penetration 17 October to 26

Severce Veneer External walls place the masonry well leaf mass to regulate the internal temperature and stone winter passive solar gatro.

Windows Stegber western red ceder timber frames with high performance argon filled double pleping units*. Insulation External wells RS-D Roof RB-D Glass wool - First

Floor PB.D Internal Walls P2.5 Glass word. Tot Floor Timber Flooring Australian Forestry Standard (AFS)

treats gave water from the showers, basins and the bath.

Caspet No carpet has been used to minimise VOC empotons. External Cladding times Haske factory are-finished / are-out Eithe cernent sheet minimising on site uncontrolled finishing, disposel, spills and clean up.

Clear Finishing Timber cledding/window Intenes use a natural oil to seel.

RENEWABLE POWER

Solar Cells 3.6kw testern, located on the roof and the lagade

ENERGY USE

Hot water Service Pheem Solar Hot Water system 80% ethdent, gas boosted.

Internal biohting All internal lights are bold Emitting Diodes. Daylight Appropriately shaded skylights provide natural

none unreceier*, a unique recycled concrete slab I incorporating 100% recycled aggregates and 60% certest substitutes. Clab Borol Devices sate/W is preferab sacrafact concrete clab flow

Number Recycled timbers of various species for the external cladding, pergolas and sun screens. Mixed species it states for the cladding is a result of using the off cuts and 'left overs' from the supplier

Bricks Recycled bricks are used for all internal reverse veneer walls, exposed in the lamily room flustrating.

- > Vousi example of sevene wereas
- > Vauel example of veryded brick;
- > Artistic composition as décor.

BUILDING

Structure Concrete waffle-pod slab on ground / Timber structural walls and internal walls / Timber framed first floor and roof trusses / Steel roof.

Shading All windows are shaded to maximise the potential passive design, such as allowing full sunlight penetration from 26 May to 19 July and no sunlight penetration 17 October to 26 February.

Reverse Veneer External walls place the masonry wall leaf inside the insulation barrier to increase the internal thermal mass to regulate the internal temperature and store winter passive solar gains.

Windows Stegbar western red cedar timber frames with high performance argon filled double glazing units*.

Insulation External walls R5.0 Roof R8.0 Glass wool - First Floor R8.0 Internal Walls R2.5 Glass wool.

1st Floor Timber Flooring Australian Forestry Standard (AFS) Certified.





Innovative external features

Externally, Harmony 9 features specific shading techniques designed to control solder energy, adjustable louvers on east-facing windows, lightweight diabiling, recycled timber for garden decking and locally made pavers. The hardscaping takes advantage of the supply of rain and recycled water.

Water tank

A 20 CDDL Insecutor hank is located under the Obsession life in stress of seater collected from the cost and the Clean W recycled water from the grey set is treater as disjoint Making the from the grey set is treater as only given Making the from the seater from the profession of the seater from the first the from the first the seater from the first the first the seater for the first the first the seater for the first the first the seater for the first the seater for the first the first the first the seater for the first the

Recycled water

A Nublen Dass W' recyclectwater system treats grey water from the showers, busine and the bath to suppliement the reinwater re-use.

3 Solar rooms

A 3.5Md Sales Pared system provide clean pases for the amount of energy regulated by the forms, making to operation set Carbon Nestral. In addition the pasets act as the sen shading for the Northernal Indiana and as averagy table use of the technology.

4 Solar hot wate

SDN efficient Rheses 500 Libe capacity gas boosted soler hat wat system with two soler penels.

Double claring

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Recycled construction materials - Timber

Recycled finites of vertice species as used for the external clading peoples and an external clading peoples and an external filter threbet species and since sead for the clading its mouth of full falling the off cuts and superfluctual lengths from this member.

7 Shadine

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Rain sarden

Chem and callects observey water you of titled superdesign in a size focused on producing a high yould by last less togged garden to mode is the cooling effect of the micro climat amount the house, utilizing the water or lateral water is not on one or lateral water is not on.

Toxicity ninimisation features External FC sheet

james Hatch factory pre-finished igh-besight fibre cament abert actives cladding with Low Vicinitio deganic Coe promise VIX (cament into history could be uncontrolled paint finishing of size uncontrolled paint finishing disposel, spills and deem or Marthy (LOP paint used internally have low VIXC contains and in external by VIXCA for the low impact on the servicement.

Reverse brick venes wall construction

water consequences.
The believes to the initial sales of others become ethic sales and these or when the consection advantage of the thermal mans properties of dig believes the little are result in lease than average a rangy do manda for both hearing and cooling.



OUTSIDE

Pioneering internal design

The interior of Harmony's features energy efficient appliances, low VOC (Volatile Organic Compound) materials, low energy light fittings and tapscare specific to the highest WELS (Water Efficiency Labelling and Standards rating available in addition to the homes unique environmental design features.

Toxicity minimisation features - Timber flooring

features – Timber Bootin, No composite teach or capeta used infamily in order to sold or the security OCC product. One of the control of CCC product. One of the control to only free Austinian speaks and a Austinian Private Standard Confride. Timber Storting uses support of all suits the have effectively are formaticity de analysis. Private place control of each mark is a control of control one formaticity cannot say the control of country of control of country of control of country of control of country of count

12 Energy efficient

Intiffigs
LED (Light Emitting Discher) or compact if screament light fittings a used throughout the borne to ensure informer electricity use for lighting culturi.

13 Natural light

Aind Verticiation

North feeing living some and skylights resolute he natural light internally all indows with corns: shading and locations may be access wer flation.

Liser behavior

Cas-Valor electric areat meters system inch alassesses, electricly and gen usage a wolf leg the occupants with feedback about the consumption patterns.

15 Water saving

In Internal thermal mas 8 A spin of Blanton will act an a thermal bettey. Do inguarana it is protected from client multiple and being maintain a combratale bouss beingstatus. In wider the same

18 Superior insulation Highly insulated extend wells sale R 50 bets and R 50 Generacol in the cort space. Internationals consist.

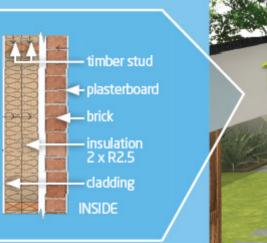
19 Recycled construction

Fight use of recycled and sustainable restartate, including plantachesed or harring recycled materials and the rea of a TODK recycled concerts stall aggregate into lates the architical mangy in the materials in the

20 Recycled construction materials - Brick

Regulard i sectionard bricks from various construction of the are used to from inverse brickwesser well construction and used partly at an eritable carposation in densely; good on a supposition in densely; good on a supposition in densely; producer I supposed brickwesser an scoop Christ Floriertum appoint brick months second there of these has been a second.

21 Toxicity minimisation features







Jade 909 - 9 Star, Carbon Neutral Display Home



Ausbuild throws down welcome mat at new display homes

PROMINENT bayside- centrally located gourmet based property development and home building company, Ausbuild has opened the front doors to its two newest display homes - both located at its ultra-leafy Eprapah residential community at Victoria Point.

The two new homes one of which leads the industry with an Eight Star Energy Efficiency rating are from Ausbuild's outstanding Urban Traditional range developed for homesites with street frontages of around 18 metres.

Both of the company's latest displays feature a Kidzone - Ausbuild's design strategy of providing three bedrooms radiating around an area flexible enough to be used for everything from studying to Playstations, from a "time out" zone to indoor games.

Ausbuild partnered building materials manufacturer, Austral Bricks to develop the Eight Star Energy Efficiency rating for the Everton which is one of the two display homes.

The Everton, which covers around 220sg m, has a

kitchen and with a "squarer" floor plan, offers tremendous flexibility to people wanting a home that has to accommodate constraints such as a services easement or generous clearance from a retaining wall.

The Montego is a larger home of around 243sq m while simultaneously having the capacity to be sited on narrower allotments.

Both homes also feature almost seamless access to the alfresco area by having sliding doors that meet in a borderless corner towards the rear of the home.

The Montego also follows Ausbuild's commitment to energy efficient designs by achieving a Six Star Energy Efficiency rat-

Ausbuild's energy efficiency achievements have drawn on a six-year research program undertaken by the University of Newcastle, the Australian Research Council and brick industry body. Think Brick Australia that looked Au at the thermal perform- res ance of homes and ab optimum designs for the



AUSBUILD'S Everton with an Eight Star Energy Efficiency rating is now open as a display home at the Eprapah estate at

Brisbane's climate.

The energy ratings system is a design schedule for new homes independently regulated by the board of the Building Code of Australia on behalf of the Federal Government as well as all state and territory governments.

The higher energy and cooler in summer, but also in markedly reduced energy bills.

Eprapah's greenery has been a major drawcard for purchasers of the land, house and land packages and fully completed homes being offered for

Ausbuild, in conjuncdevelopment ex, is planting 350 trees and ell as around nd covers and

undertaking bank stabilisation work beside the creek and ornamental pond.

In addition to planting hundreds of eucalypts including tallowwood, scribbly gum and hybrid species sought out by koalas, Ausbuild is creating a parkland of four hectares tracking beside Eprapah Creek.

Eprapah also is a Telstra Smart Community with the telco providing a \$1500

credit on Telstra services for each homesite.

The new display homes are in Estuary Avenue, off Bunker Road at Victoria Point. The sales and information centre at Eprapah can be contacted on 3890 8601 or 3890 7539.

Ausbuild has won the Housing Industry Association's national Professional Major Builder of the Year award as well as having won the state title three times.

Building with you



The Code for Sustainable Homes Setting the standard in sustainability for new homes

Table 2: Code Levels for Mandatory Minimum Standards in CO ₂ Emissions	
Code Level	Minimum Percentage reduction in Dwelling Emission Rate Over Target Emission Rate
Level 1 (★)	10
Level 2 (★★)	18
Level 3 (★★★)	25
Level 4 (★★★★)	44
Level 5 (★★★★★)	100
Level 6 (★★★★★)	'Zero Carbon' Home

www.communities.gov.uk community opportunity, prosperity



Timber - part of the solution in managing and solving the challenges going forward



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