

Renovating for Sustainability

2016



The renovation of this home was complete in every sense. Our clients wanted to transform a poorly performing and aged dwelling into something that was energy efficient with room configurations that suited their lifestyle and gave a revamped aesthetic feel that reflected their personality. The renovation and re-roofing of the existing House has completely changed the functionality and thermal efficiency of the house.

This house started its life as an Army barrack and was transported to site many years ago. Clad in Asbestos sheeting with a room layout that used space badly, the house lacked access to natural light, insulation in the walls and amenity that we now consider as important.

The Clients have strongly considered views regarding sustainability, something reflected in the exemplary management they've applied to their farming property surrounding the house. They wanted to recycle the existing house when others would have demolished it. They didn't want to expand the footprint of the building but felt the existing space under roof had great potential for more efficient use. Improving the function of the house with upgraded water harvesting, improved cross ventilation and an effective wood heater would all contribute to reducing the energy consumption of the house and creating new comfort levels.

The original layout included a large under used Living room, a Kitchen/Meals area with limited light, two Bedrooms, a large Sun Room and a combined Bathroom and Laundry. The floor areas totalled 126.6m² or 13.61 squares of Living area with a total area under roof of 193.79m² or 20.83 squares.

In pursuing an improvement thermally, care was taken to cater for the clients lifestyle as dedicated small lot farmers who seek a sustainable path in providing food to the table.

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- The North facing Sun room gave a glimpse of what could be achieved with a new layout that took advantage of solar passive principles of design. A huge expansion of North facing glass is complemented by a conservative amount of glazing to the South, providing for maximum heat gain in Winter and reducing temperature loss through the shaded Southern glass.
- The foot print of the House was treated as virtually a blank canvas when it came to rearranging the floor plan. Living and Kitchen areas were relocated to the Western end of the House where solar access from the North was possible. This included providing a large amount of Northern glass with a Sliding Door and a Stacker door providing light, ventilation and ease of access.
- A Mudroom that serves as an air lock was established, providing immediate access to the large Vegetable garden and the farm beyond. This space also contains the Laundry and Hot water service and forms the utilitarian section of the House where boots, coats and tools can be left behind, secluding the house from the inevitable dust and mud of farm life.
- The Bathroom became a reduced space in it's original location but a more effective use of space. Costs were reduced by taking advantage of the original plumbing. Extensive tiling included a walk in Shower with facility for Japanese style bathing. The sewer system was completely renewed to the extent of the installation of a new septic tank.
- In built storage, previously not available, was provided in all three new bedrooms and also in the Hall. The Carport situated adjacent to the house included further external storage, capping off the introduction of an important missing element to the House design.
- The North facing Pergola and paved deck provided the Outdoor living area, so valued by Australians and completely absent in the existing home.
- A formal Entry provides visitors with a clear path to the house. Designed, like the Mudroom, as an air lock, the Entry again provides thermal efficiencies with practical function.
- The remaining part of the old Sunroom became a functioning Office, taking advantage of the Northern light to create a comfortable and light workspace, set apart from the Living areas but still inherent to the clients needs.

There is a significant amount of feature detail internally and externally that has been successfully executed to a very high standard. The Clients had a very clear vision of the style and interior decoration of the House. We worked with them to fashion a blend of rustic features against a backdrop of highly finished surfaces.

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- Structurally there has been an extensive rebuild of the roof and wall frames.
 - The existing walls were very light on for timber given the initial construction as a temporary Army barrack.
 - The wall frames have all been brought up to a contemporary standard.
 - The roof frame has been strengthened with a significant amount of additional rafters
 - The floor frame bolstered with new stumps under load points.
 - Additional framing has enclosed the sub floor.
 - All new framing timber is T2 Termite resistant plantation grown product.
- New Colorbond roof sheeting was fitted to the entire roof over a layer of foil backed fibreglass blanket to mitigate condensation. The climate in Gapsted can be relatively cold and the house site is sheltered from Winter Sun to some extent. Addressing the risk of condensation was a clear imperative.
- The existing Hardwood floors, full of character after years of use, were sanded and oiled to provide a rustic but functional floor that made the most of what we had to work with.
- New glazing was introduced, with provision of Rylock AA series double glazed Windows and sliding doors and 'E' tech toughened glass top Louvres.
- Wall Claddings were provided right around the house, fitted over a breathable membrane which was sealed to openings
 - Radial Timbers Silvertop Ash Shiplap board
 - Colorbond Corrugated Iron and flashings
- Retaining walls to site cuts as required at House and Carport.
- High levels of insulation were introduced:
 - Anticon Light duty 55 (Bradford glasswool blanket with an impermeable foil facing) to House main roof.
 - CSR Proctorwrap Residential Breathable Wall Wrap with tape joints to external
 - 80m² of R2.5 Polymax Wall batts
 - 16m² of R2.0 Polymax Wall batts
 - 111m² of R4.5 Polymax Ceiling batts



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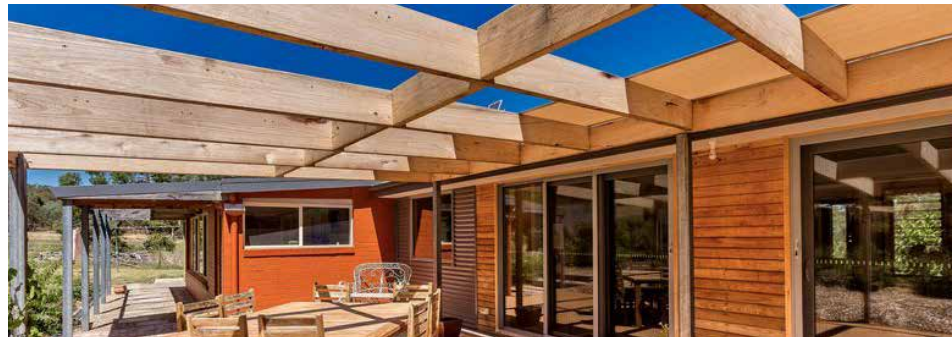
- Renovation and refitting of recycled doors internally and externally, with provision of Kiln dried hardwood architraves and skirting.
- Cabinets made from low VOC materials and made from natural timbers or plys. No melamine, chipboards or MDF products were used.

Introducing products and techniques to the project that met the clients expectation of a smarter and more environmentally sustainable build was at the forefront of our minds entering into this contract.

Sustainability in construction was an important facet of the build. Sourcing products that went outside the norm in terms of embodied energy and impact on the broader environment was an important aspect to the whole approach to this project

- Polymax batts were used for bulk insulation. Polymax products are manufactured from 100% polyester fibre. Their credentials as one of the most sustainable insulation products available has been verified by an independent environmental assessment by Ecospecifier.
 - 100% recyclable
 - Highly reusable
 - No chemicals used in the manufacturing process
 - No phenol formaldehyde resin binders
 - Odourless, no volatile organic compounds (VOCs)
 - No water is used and no waste is generated in the manufacturing process
 - No ozone-depleting gases are used and no chlorides or ammonia are present in the products
- Radial Timbers Shiplap board used as a feature cladding. This product is made from sustainably harvested and processed radially sawn Silvertop ash. The process of radial sawing was specifically designed to maximise the recovery of sawn timber from smaller logs. This means:
 - More timber out of a log
 - High value products from younger trees means less pressure on old growth forests as quality timber requirements can be met from plantation and regrowth forests.
 - Timber products with consistent growth ring orientation providing more stable products as growth stresses are released evenly in each timber section

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- Sealing of vapour barriers to windows and door frames to reduce uncontrolled air flow using CSR Proctorwrap Residential Breathable Wall Wrap. This product is designed to reduce the risk of condensation forming on surfaces within the building frame while allowing moisture to pass outward from the inside of the building.
- Sealing of openings between Door and Window joinery and timber frames with expanding foam.
- Evacuated Solar tube collectors for the hot water unit to maximise water heating efficiency even on cloudy days.
- A Solartube skylight with highly reflective Spectralight Infinity tubing bounces the day light right into dark space of the Bathroom.
- Installation of a Solar Whiz roof ventilation and exhaust fan assists ventilation in the roof space. The solar powered unit prevents heat build up in the roof space and reduces the heat load on the ceiling, preventing heat from penetrating into the living space. This results in lower roof space temperatures as well as lower internal temperatures.
- A low profile static roof vent provides a discreet and effective alternative to the standard whirly bird.
- Boral ENVIRO Regular® plasterboard which contains a minimum of 10% overall recycled content and is accredited with the Green Energy Council of Australia.
- Floor sanding was finished with the low impact Whittle wax floor treatment, reducing the normally high levels of VOC associated with solvent based finishes.
- Installation of cabinetry that used natural timbers and plys over high formaldehyde MDF and particle board was important aesthetically and well as environmentally. The inclusion of a duct for cool air for the concealed fridge and cool cupboard provides a low cost, low maintenance form of climate control in the Pantry cupboard.
- Installation of Leaf eater fittings to Down pipes for improved water quality
- Wood fired heating using a highly efficient Nectre freestanding heater
- Specification of Low VOC paints internally and externally

The end result has been a dwelling with a level of functionality, country style and thermal efficiency that means comfort and lifestyle are catered for in a high quality home that complements their property.

