



Harmonious contrast

A 20-year-old extension makes way for a far more sustainable solution

// **words** rocky amatulli // **images** sid thoo

Since he was as young as he could remember, Patrick Hubble always knew that he wanted to practice architecture and design buildings. Making a difference to people's lives through the design of their homes, workplaces and social spaces has been Patrick's priority ever since. Patrick has a fervent belief that the environment we live in can be improved by architecture and building, bringing the latest technology to bear. Patrick's practice, Hubble Design, prides itself in designing specifically for the requirements and tastes of its clients, including as a priority designing sustainably.

The clients, Jamie and Sally approached Patrick and project co-architect, Sid Thoo to design an extension to their early 1900 home. The house had an existing 20 year old extension which Patrick describes as "poorly designed". He goes on to say of the old extension, "There was little natural light, and the spatial proportions were not practical. Furthermore, aspects of the site such as views, ventilation and northern light were simply not being utilised." It was decided that rather than replicate the style of the original home in the extension, the project would be best served by what Patrick describes as "harmonious contrast that reinforced the home's sense of history".

There were numerous sustainable objectives on the table from the outset of the project. Both the owners being working professionals

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with environmental and electrical engineering backgrounds, they were keen to introduce new technology into their home that clearly demonstrated sustainable living and energy efficiencies via low embodied energy design. Not only did the Patrick and Sid do the architectural design for the project, but they also carried out the thermal performance analysis which predicts temperature at any time of day using climate data. As a significant influence on the project, sustainability outcomes became the major goal for the many design decisions during the course of the project. Thermal modelling using Ecotect was used to build a virtual thermal model of the house as precisely as possible. This enabled design decisions, such as the reverse brick veneer, internal ponds, and location and type of thermal mass and insulation, to be made in an informed manner. Utilising these new modelling methods to determine temperatures and comfort levels throughout the life of the home, and new configurations of

innovative materials in its construction, the architects were able to satisfy (if not surpass) the clients’ requirements and expectations.

The extension itself is constructed in “reverse brick-veneer”. This form of construction ensures that the thermal mass is on the inside of the building where it is most effective, and not on the outside as in traditional brick-veneer construction. The exterior cladding is then covered by a layer of insulation, using a product called Weathertex (which is a recycled timber cladding with very low embodied energy). Ceilings and walls are further insulated using EarthWool, a product made from the glass from recycled bottles. The stairwell, which is a double height void volume, uses a translucent cladding called Danpalon, which was filled with a translucent insulation called Danpatherm. This allowed the double height volume to be well lit during the day, and transmit light at night, but without any reduction in thermal quality. In ▶



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in addition to having some translucent walls which allow winter sun into the home, the home also incorporates hydroheat pipes that can heat and cool the concrete slab, reducing electricity costs. The home also has a dual circulating hot water system to save water. This is all, of course, over and above the standard features of ceiling fans, natural ventilation and north and south only facing glazing.

The home also includes a suite of other sustainable and low energy features. It includes a rainwater tank where drinking water is harvested, and has an inside pond for natural air-conditioning. Materials such as the kitchen floors and benchtops are salvaged karri, and window frames are made from sustainable harvested cedar. Paints and other finishes are zero VOC, and exposed concrete floors are dark in colour to absorb more solar radiation and provide thermal mass.

What is evident straight away is when walking from the old part of the house (which uses standard brick construction) to the new part, is that there is a noticeable drop in temperature and much more light, openness and useability. This indicates anecdotally that the results of the thermal modelling have been successful and realistic, and the efforts placed in design at the start of the

building process are well worth the outcomes when the project is completed.

“All in all, the modern architectural form of the extension was integrated with as much technology to create measurable sustainable outcomes. Whilst all building projects have challenges,” says Patrick, “the commitment to the project of Jamie and Sally and the principles it tested was enough to withstand any challenges that presented themselves.”

Patrick started his own firm soon after graduating and has established many industry contacts over that time. He also lectures at UWA and Curtin University in the fields of architectural design, technology and computing, giving a unique insight into the up-and-coming issues facing the industry and the profession in general. Patrick finds that being in touch with students keeps design ideas fresh and new for him. Hubble Design is currently working on many more extension projects, but has also started to work on prefabricated projects. With factory built, high precision made structures it is possible to achieve cost savings and integrate yet more technology into future dwellings. **BC**

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