



Self-contained

Made from repurposed steel shipping containers fitted off-site and constructed in record time, ANU's new Ursula Hall – Laurus Wing student accommodation brings 120 extra rooms to the campus.

“A great epoch has begun. There exists a new spirit... We shall arrive at the ‘house machine’ a mass-produced house, healthy and beautiful.” — Le Corbusier, *Towards a New Architecture* (1923; English translation, 1927)

Since Le Corbusier made his predictions in 1923, there have been valiant efforts to explore the machine, prefabricated, or factory-made house. Most notably, in 1967 the Exposition in Montreal, Canada, produced *Habitat*: a visionary housing development, designed by Moshe Safdie, consisting of 354 precast concrete boxes organised in a seemingly random but poetic manner along a promenade in front of the Old Port of Montreal.

The development inspired town planners and architects of the time to think about housing in a different and creative manner. During this period, Archigram drew inspiration from technology to create lightweight modular buildings offering a glamorous vision of a future machine age; and Harry Seidler developed highly modulated apartments like Blues Point Tower. Constructed in 1962, at the time, the tower was Australia's tallest residential building and first strata-title apartment complex.

By the 1970s, Renzo Piano and Richard Rogers won the competition for the Pompidou Centre in Paris, which expressed all the building's hardware on the outside. They were exciting times, but mainstream housing continued on its conventional path.

During the 1980s, architects explored the idea of converting shipping containers into habitable dwellings. Containers are made to standard dimensions, are durable, stackable and relatively inexpensive to produce. In 2006, the Dutch company Tempohousing completed a village for 1,000 students in the Netherlands, made from modified shipping containers from China.

The key issues in housing today are sustainability and affordability. The median house price in Canberra is currently the highest in Australia. As an indication, a detached house in Canberra costs 7.5 times the average individual income. (Source: *MacroPlan Australia*.) Building land is becoming scarcer and more expensive, and infrastructure more sophisticated. The land release program in Canberra anticipates 4,250 dwelling sites being required every year to 2013–2014 and beyond. (Source: *Land Development Agency*.) The pressure to reduce the cost of construction and to produce an environmentally sensitive result is making planners and architects revisit the notion of the ‘house as machine’.

Other issues contributing to this interest are time and the inconvenience of having large construction sites disrupting the workings of a neighbourhood.

The machine or prefabricated house is moving back into our consciousness. At the small scale, architects Donovan Hill designed the Happy Haus launch series of prefabricated homes, evoking the nostalgia of caravans by the beach; Durbach Block is also designing for the company. If you ask around, you'll find many individual small practitioners are experimenting with single-dwelling prefab prototypes. The nature of the built form is also being challenged by Fender Katsalidis who are developing modular apartments in Melbourne: a nine-storey factory-built apartment building in Russell Place off Little Collins Street. Each of the 63 apartments is fully fitted and assembled in less than two weeks.

The recent Laurus Wing student housing project for the Australian National University (ANU) also applies prefabricated processes to the multiple-housing scale. The university is unique in that 60 per cent of its students are from out of town. As ANU has a policy of accommodating all first-year students – preferably on campus – the shortage of student accommodation became critical in recent years.

Most of its traditional student housing is located between the university and the city, >

Project time line

Phase 1: first 70 rooms

Dec 2008

Initial discussions with ANU commenced prior to DA approvals, based on a similar pre-existing design. ANU had to finish the project for its January 2010 intake.

May 2009

Design negotiations worked in tandem with production and internal layouts for the DA.

Quicksmart Homes (QSH) and Hutchinson Builders (HB) worked with ANU to reduce contract lead times.

24 June 2009

Production order placed. QSH and HB began procuring materials to ensure delivery of modules by planned date of 16 October 2009.

30 June 2009

Design freeze.

1 July 2009

Production starts.

14 September 2009

First delivery to site.

16 October 2009

Last delivery to site.

16 December 2009

Completion on site.

Total weeks: 27

Previous estimate for the project built using traditional building methods was 48 weeks.



1-5. The pre-fitted containers assembled on site. 6-8. Finished exterior and interiors. Photos: courtesy QuickSmart Homes.



> and has been sited to promote a breakdown of the university walls and the development of a 'town and gown' culture. On a site at the other end of the campus facing Clunies Ross Street and adjoining the CSIRO, a new student housing development has been constructed from modified steel shipping containers.

The questions are whether modular or container units, like the ANU student housing development, can help address the affordability and timing requirements, and can they be realised in a way that meets the expectations of the community for the construction of environmentally responsible buildings?

The ANU student housing project is made up of more than 200 shipping containers repurposed in China, delivered to the site in Canberra, and stacked to form a six-storey building.

Australian company Quicksmart Homes is the manufacturer, and they specially modified the containers to the requirements of the ANU's student housing program. The building contractors, Hutchinson Builders, erected up to 18 container units per day on site, and the project was built with minimal disruption to a tight and congested site. Adding the grace notes to the project, Architectus worked with Hutchinson to orientate the buildings on site, and design the service cores, and the privacy/shade fins and cantilevered roof that unifies and finesses the final structure.



The container rooms are fitted out in China with walls of double 16 millimetre gyprock and 50 millimetre rockwool to provide thermal and acoustic insulation. Bathroom, kitchen and built-in furniture are all completed in China, with televisions, whitegoods and cooking facilities fitted on site.

As compact living spaces, the units are light, airy and quite commodious. Each base unit (a single shipping container, 2.4m wide x 12m) includes a bathroom, kitchen space, study and sleeping alcove. Each unit opens on to a private balcony big enough to accommodate a table and chair. The four different floor plans range in size from 22 square metres up to 35 square metres.

Completion time for the ANU project was estimated at 30-50 per cent faster than a traditionally built structure of this scale; it was also estimated to have come in at about 80 per cent of the cost. The student accommodation buildings can be re-used and fully recycled, and there is minimal waste.

Buildings constructed prior to the industrial revolution have proved to be sustainable and able to be adaptively re-used in a number of ways over time. The Place des Vosges in Paris, for example, was built at the beginning of the 17th century as a group of individual town houses, and over the past 400 years has been adapted as offices, apartments and retail and hotel spaces. This has been possible because the building fabric is robust



and the floor-to-floor heights have allowed the spaces to be retrofitted with contemporary service technologies.

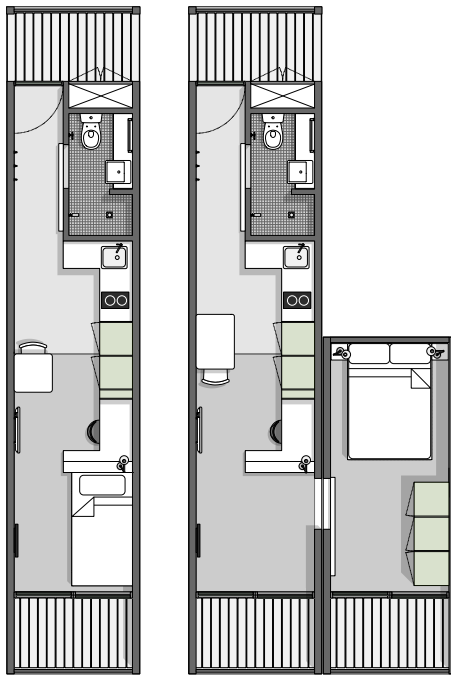
Modular buildings may need to consider the long-term benefits of a loose-fit system with generous proportions to allow for adaptive re-use. Alternatively, maybe they could just be recycled, like cars.

The next generation of modular or container housing is likely to include purpose-built modular systems that can be manufactured close to the site. Hopefully, the additional labour cost will be offset by the transport costs from China.

In 1927 Le Corbusier said: "We must create the mass-production spirit. The spirit of constructing mass-production houses. The spirit of living in mass-production houses."

Eighty-three years after Le Corbusier's predictions, I'm not sure we are significantly closer (at least in Australia) to his notion of the 'house machine', but the ANU project is an encouraging exemplar, and certainly worth a visit. ■■

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Module details

- Standard ISO 12.2m x 2.4m units
- Main modules made from coated corten steel
- 90-minute fire rating DTS
- Acoustics - 65db room to room and module to module (tested)
- Joinery included for bathroom, kitchen, desk and bed with under-base storage
- Plumbing and electrical installations all to Australian standards and certified

Above: Plans of a self-contained studio version (left) and 1-bedroom (right). Courtesy QuickSmart homes.