

Sanctuary

MODERN GREEN HOMES

ISSUE
61

UNIVERSAL DESIGN
SPECIAL

PLUS: Three urban renos fit for the future; ecovillage home; upgrading to induction; design for active bushfire defence

DESIGN FOR EVERYONE

Accessible, flexible, sustainable

PUBLISHED BY **renew.**
SUMMER 2022/23 • AU/NZ \$13.95
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ISSN 1833-1416



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PROJECT TYPE

Renovation

LOCATION

Ferntree Gully, VIC

DESIGNER

New Ground Design

EXISTING HOUSE SIZE

192m²

PROPOSED HOUSE SIZE

166m²

LAND SIZE

1,076m²

BUDGET

\$400,000



↑

Single-storey at the front, the house has a double-storey extension at the rear. Caroline says that while the large covered deck to the north is a lovely space, the west-facing balcony is too small to be really useful.

Caroline and Eric are keen to renovate their dated 1970s house in leafy outer Melbourne to improve its functionality and energy efficiency. They want to stay in it for the long term, so universal design expert Mary Ann Jackson helps out with suggestions for building in accessibility and adaptability from the outset.

THE BRIEF

- Renovate existing house without overcapitalising
- Incorporate adaptability and accessibility so the house suits the family for the long term
- Reduce the overall size and improve layout for better flow
- Focus on energy efficiency and thermal performance
- Address acoustic liveability

The family of four have been living in their house for six years, and appreciate its large windows and the natural light that floods the north-facing rooms. “We love the views out to the horizon and of the treetops from our rear living room,” says Caroline. “But some rooms are incredibly cold and dark, particularly the downstairs rumpus room, and the living areas are dispersed, with the kitchen at one end

of the house and indoor/outdoor living at the other.” She says that the house is spacious enough for the family – “too spacious even!” – but they would like it to function better, and accommodate one family member who is hard of hearing and has trouble managing lots of noise, finding large open plan living areas with hard surfaces especially challenging.

Having investigated doing a

knockdown-rebuild, Eric and Caroline instead decided to make the most of what they already have, retaining as much as possible of the existing house and improving its flow and functionality as well as its thermal performance. “We want to settle here for the long term as we love the area, so whatever renovations we do, we’d like to make the house liveable for us into older age,” says Caroline.

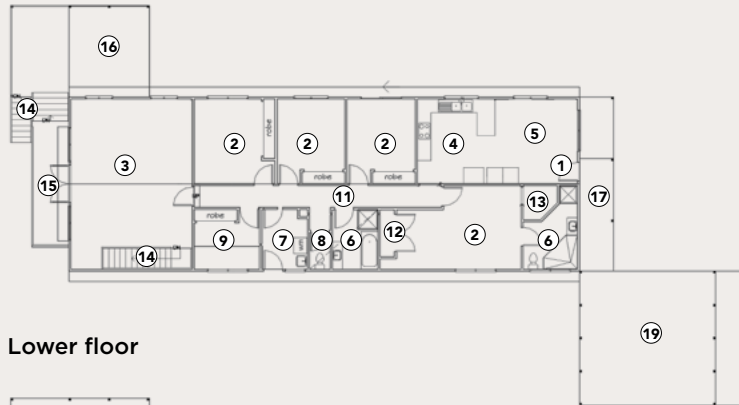
Working with local firm New Ground Design, they have come up with a proposed design that actually makes the house smaller, turning the current kitchen into an alfresco space to allow northern light into the main bedroom. The kitchen has been moved into the double-storey extension at the rear, but the couple are wondering about how best to deal with the split level between this and the bedroom part of the house. They also have questions about the best way to tackle acoustic liveability, as well as improving the airtightness of the house, maximising natural ventilation, and choosing materials – especially for the exterior, for which they are considering low-maintenance metal cladding.

MARY ANN’S RESPONSE

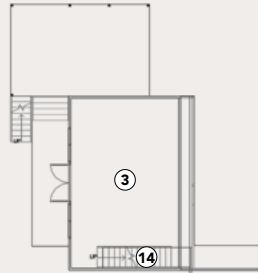
Planning a family’s accommodation for now and the future is a significant undertaking requiring multi-faceted consideration, especially when renovating an existing house with all its shortcomings. Although not easily measurable, the environmental, social, economic, and cultural sustainability of ‘living-in-place’ (my tweak of the more common term ‘ageing-in-place’) should not be underestimated – in fact, it can be said that ‘if it is not accessible, it is not sustainable’ – and considering accessibility at the outset of a renovation project is most definitely worthwhile. I commend Caroline and Eric’s willingness to embark on this journey, and they are fortunate that their current house is already well orientated for passive solar performance – unlike much existing housing stock.

Caroline and Eric have already put a lot of thought into their current proposed design. My suggested interventions are refinements aimed at enhancing

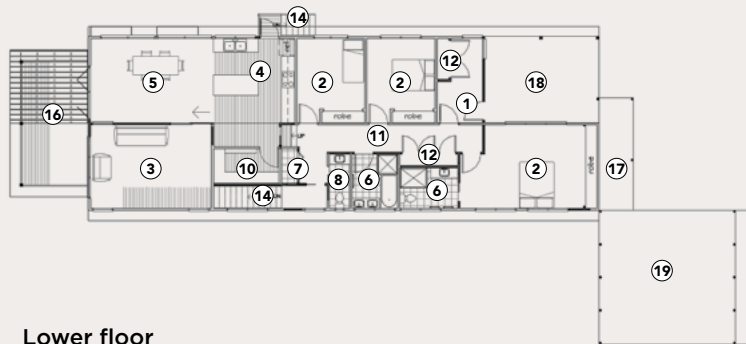
EXISTING PLAN
Ground floor



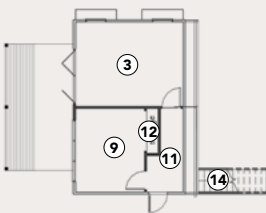
Lower floor



CAROLINE AND ERIC’S PROPOSED DESIGN
Ground floor



Lower floor



LEGEND

- | | | |
|------------|----------------|----------------|
| ① Entry | ⑧ Toilet | ⑮ Balcony |
| ② Bedroom | ⑨ Study | ⑯ Covered deck |
| ③ Living | ⑩ Pantry | ⑰ Porch |
| ④ Kitchen | ⑪ Hallway | ⑱ Alfresco |
| ⑤ Dining | ⑫ Storage | ⑲ Carport |
| ⑥ Bathroom | ⑬ Walk-in robe | |
| ⑦ Laundry | ⑭ Stairs | |

adaptability, a critical element of living-in-place. Although one never knows exactly what is around the corner, becoming a full-time wheelchair user is relatively uncommon. I have, therefore, opted to retain the slightly raised floor level of the main kitchen and living area, as lowering it would also require the lowering of the downstairs floor level, a big job. Stair design is important though: include handrails on both sides, with extensions at top and bottom; generous treads with contrasting edges; closed-in risers that are not too high; and adequate approach space at top and bottom.

Congested space is the enemy of accessibility. Having several small, separate wet area rooms leads to congestion as the additional walls and fixtures needed eat up the available footprint. While I would not suggest eliminating the powder room, I champion the concept of a family bathroom in a family house, so I have included one large bathroom near the bedrooms. The larger room will be less prone to fogging up, and natural cross ventilation is facilitated through strategically placed, full-height windows and an internal fanlight above the door. A translucent glazed door at the end of the hallway means that guests can access the powder room without disturbing residents who have gone to bed, and the latter can access the main bathroom in privacy. This door, placed well away from the stairs for safety and accessibility, also aids heating and cooling management.

Direct circulation paths, both horizontal and vertical, enhance functionality, hence my suggested relocation of the main bedroom door and the insertion of a lift (which could be done as part of a later stage). The laundry has been moved out of the circulation route; its new location will enable direct step-free access to natural drying as well as washing and maintenance of camping and sporting gear stored in the adjacent alfresco area. Removable joinery allows for the creation of more space to manoeuvre in the hallway near the main bedroom, should it ever be required.

In the kitchen, I have relocated the

refrigerator to an easily accessible location that is not part of a main circulation route, and moved the northern external door out of the kitchen entirely. The island bench is designed to provide work surfaces at different levels and can also be disassembled should more manoeuvring space be required in the future. Except for bin areas, all under-bench storage should be in drawers. I have also moved the cooktop to the external wall to assist with installing extraction.

Achieving accessibility does not mean leaving delight at the front gate. While universal design is commonly interpreted as just designing for people with disability, a more intriguing interpretation considers the universality of design rather than pigeon-holing functionality. I have endeavoured to create delight by incorporating curved elements and by skewing the gaze off the rectilinear to the diagonal on entering the rear living area. This 'turn' to the north-west creates more usable width in the dining area and allows more strategic placement of west-facing windows. Display shelving, the 'art wall' downstairs, and crafted acoustic panelling are all designed to create further delight.

Thoughtful design considers both the big picture and small details simultaneously. Dark hallways are an accessibility issue as well as an energy use issue. I therefore recommend that all stairwell doors are glazed. Central hallways, while excellent for circulation, can make cross ventilation difficult. Fortunately, the existing ceiling height allows installation of fanlights (potentially louvred) above all hall doors. I also suggest a north-facing sky window over the kitchen aisle area: although heat gain and loss will need to be managed by careful product selection and operation, Melbourne's parade of passing clouds provides delight. A sky window here will also bring additional daylight into the centre of the house and add spatial drama on emerging from the confines of the hallway.

Designing in the potential for adaptation in the future is important, and properly executed universal design facilitates multi-generational living. The balcony running along the north facade outside the bedrooms could be part of a

later stage when the younger generation need more space of their own; these bedrooms could also be reconfigured to contain mezzanine sleeping platforms, freeing up the space underneath for work/leisure areas suited to young adults.

When it comes to the performance of the building envelope, I believe in working with the benefits of lightweight construction rather than trying to insert thermal mass. This requires the ability both to compartmentalise (reducing the area needing to be heated or cooled) and to cross ventilate. Closing the house up during the day to keep the heat out and opening up at night to facilitate natural cooling is a tried and tested technique that has fallen by the wayside somewhat; along with the internal fanlights mentioned previously, Caroline and Eric could consider a two-in-one front door incorporating security screening for ventilation. This would avoid the accessibility nightmare of wrestling with two doors at once.

Working with lightweight construction also requires paying attention to the environment surrounding the building, as it impacts both building envelope performance and liveability. It is imperative, therefore, that detailed attention is paid to landscaping, a component that is often 'value-managed' out of building projects. Planting trees strategically will provide shade and wind breaks as well as minimising day-night fluctuations in temperature. On the terrace outside the living area, external shade structures, vines, and herb and vegetable beds could be used to create a beautiful and cooling 'garden in the sky' rather than just an expanse of decking. The alfresco, while designed to be a shady retreat on hot summer afternoons with its overhead fans and misted planting, is also a hard-working utility area. External window coverings such as blinds or shutters for keeping out hot summer sun should be considered.

When it comes to thermal comfort, sedentary behaviour and draughts are the enemy. Caroline and Eric have said they are an active family, but even so, things like sitting still undertaking computer-based

working from home tend to make one feel cold. I suggest that under-desk floor mat heaters and/or heated vests could be considered as low energy use solutions, as well as being able to close off the work room. Commercial quality door and window seals are recommended, along with carefully selected double glazing to all external windows and insulation wherever possible in walls (including internal hallway walls), ceilings, between floors, and under the ground floor. Providing an entry airlock and hallway and stairwell doors further assists in managing thermal comfort and energy use.

Eric and Caroline asked about the suitability of metal cladding. Although it is attractive as it requires little maintenance, it does not add anything to the insulative value of walls. I recommend timber cladding of some sort, perhaps with a charred finish to avoid the need for painting. Internally, I suggest lining all walls and ceilings with simple plasterboard as it can easily be repainted, it lets artwork shine, and it allows the furnishings to do the aesthetic work. Plasterboard comes in different types including products for wet areas and high impact risk areas. Selecting the right plasterboard for the particular

application is worthwhile.

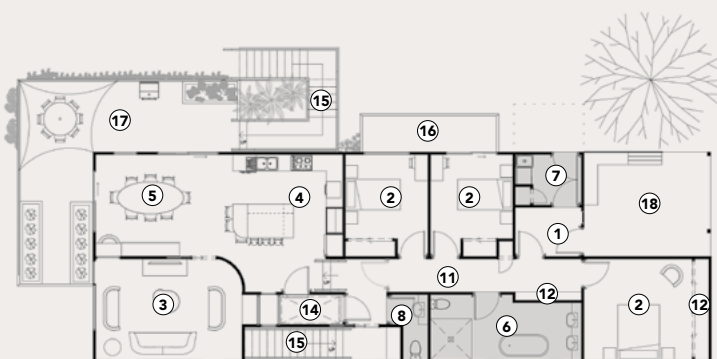
For sound management, consider the strategic placement of acoustic panels such as those used in theatres, or opt for hanging padded craftwork (such as quilts). Rugs on hard floors will assist with sound deadening but are a potential trip hazard and difficult for wheelchair users to negotiate. Therefore, softer resilient floor finishes such as cork tiles should perhaps be considered from the outset.

With my suggestions, I have concentrated on universal design aspects; endeavouring to achieve cost-effective energy efficiency is a given, but obviously needs fine-tuning. I am empathetic to budget concerns. In fact, the mantra in my introduction should probably be expanded to 'if it is not accessible and affordable, it is not sustainable'. Nonetheless, I also want to be provocative and encourage homeowners to look with fresh eyes. In my opinion, a significant part of true adaptability is the ability to work through a master plan in discrete stages. Achieving the best outcome for a particular project is not a case of 'compromise', but in-depth exploration of the hierarchy of priorities is definitely required. ❸



Mary Ann Jackson is a built environment accessibility specialist and director of transdisciplinary consultancy Visionary Design Development. An internationally recognised architect, urban planner, and access consultant, her work, publications, and PhD studies revolve around the disability/built environment intersection. www.vdd.com.au

MARY ANN'S ALTERNATIVE DESIGN Ground floor



Lower floor



LEGEND

- | | | | |
|-----------|------------|------------|------------|
| ① Entry | ⑥ Bathroom | ⑪ Hallway | ⑬ Balcony |
| ② Bedroom | ⑦ Laundry | ⑫ Storage | ⑭ Deck |
| ③ Living | ⑧ Toilet | ⑬ Art wall | ⑮ Alfresco |
| ④ Kitchen | ⑨ Study | ⑭ Lift | |
| ⑤ Dining | ⑩ Cellar | ⑮ Stairs | |