

Raising the bar on home renovations

House 1 – Post war (1945 – 1965)

Typical single storey, weatherboard post war style house

- East facing
- Period - 1945-1965
- Existing house energy rating - **2 Stars**
- Floor Area - 100m², Allotment area - 200m²

Design brief for proposed renovation – single story addition and internal refurbishment

(Refer to Figure 1 – Post war style, existing floor plans)

Overall design seeks a balance between achieving good passive design and the re-use/retention of existing structure.

Demolition works

- Demolish back of house lean-to (kitchen, bath, laundry, WC)
- Front façade (street frontage) to remain intact.

Addition of new floor area and re-allocation of existing space

- Create new open plan kitchen/living/entertainment area
- Create ensuite and walk in robe for a bedroom
- New laundry, bathroom, study/play room, outdoor deck area
- Re-design, reallocate internal space
- Potential to add 70-100m² of additional floor area.

Indicative Budget

- Project budget (design and construction) of \$250,000
(Please note: this is a rough guide only and not based on comprehensive cost estimates)

Improving Comfort and Liveability while reducing Running Costs

- Minimise heating cooling energy consumption
- Good thermal comfort with opportunity for cross ventilation
- Optimal daylight and connection with indoors and outdoors.

Existing floor plan

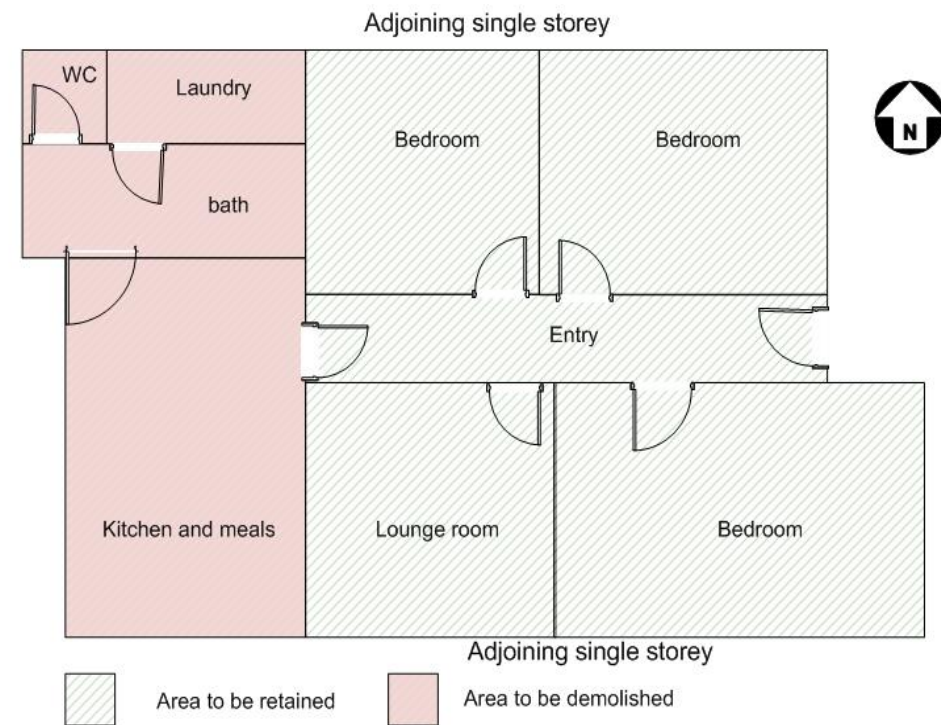


Figure 1: House 1 - Post war style, existing floor plans

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Proposed floor plan

Figure 2 is the proposed floor plan and a section for the renovation. The numbers correspond to the listed design features.

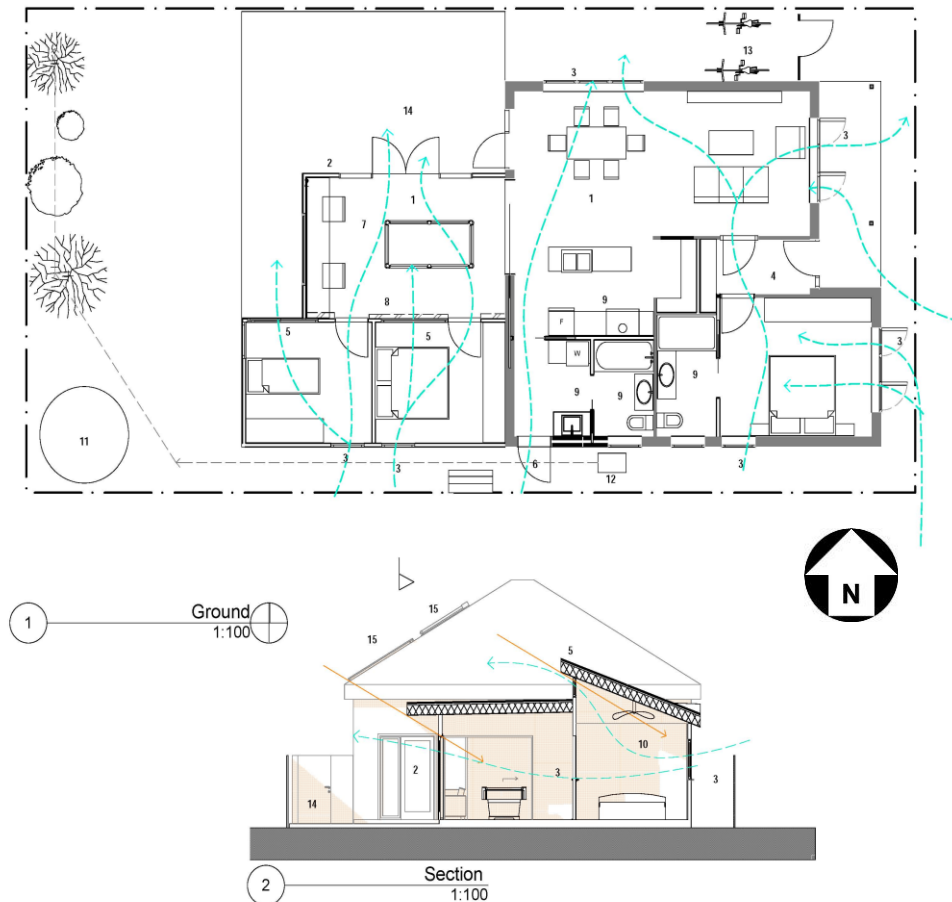


Figure 2: House 1 - Proposed floor plan and section

Design features

1. Living areas (living, dining and rumpus) **oriented to the north** of the house. Glazing area **increased** on the north to allow solar access into rooms.
2. Northern wall **setback** from its boundary to minimise the effect of overshadowing by the northern neighbor and the boundary fence. Outdoor alfresco entertaining deck on the north connects living areas outside & inside.
3. Existing window sashes changed to casement opening to enable the **scooping of passing wind** particularly on east and west walls. Windows placed to facilitate prevailing southerly breezes (Melbourne) to flow through living spaces in summer. Larger windows opening on the downwind side to encourage breezes into the house.
4. Airlock to the frequently used front door, to **minimise air leakage** in winter.
5. Clerestory windows bring **direct sunlight** to southern rooms. **Eaves sized** to a low in winter sun (29° for Melbourne winter solstice), but to shade out summer sun.
6. **Easy access** to the backyard & clotheslines from the laundry facilities clothes line use, reducing the reliance on tumble drying.
7. Concrete (polished or tiled) to the new extension area provides **internal mass** to stabilise temperature. Ventilation to allow **night purging** is essential for areas with thermal mass.
8. Potential **addition of thermal mass** by way of internal brick wall between the new bedroom and the rumpus area.
9. Utility and wet areas grouped close together to **minimise hot water pipe run**. Similarly, the collection of grey water is made easier. Saves energy and water and is more cost effective for plumbing.
10. **Ceiling fans** for additional cooling in the living and sleeping areas.
11. **100% rainwater** from roof can be collected via a charged system and plumbed to flush toilets, and to supply cold laundry tap and garden tap.
12. **Grey water divert** or collecting from washing machine, laundry trough, bath room shower and vanity is diverted to sub-surface irrigation, ideal for fruit trees, etc.
13. Secured covered **bike area** with quick and easy access to encourage use.
14. Recycled decking with retractable awnings for alfresco dining and total shade control
15. Location of **solar hot water and photovoltaic panels**.
16. Star rating of the proposed design is **7.4 stars**.

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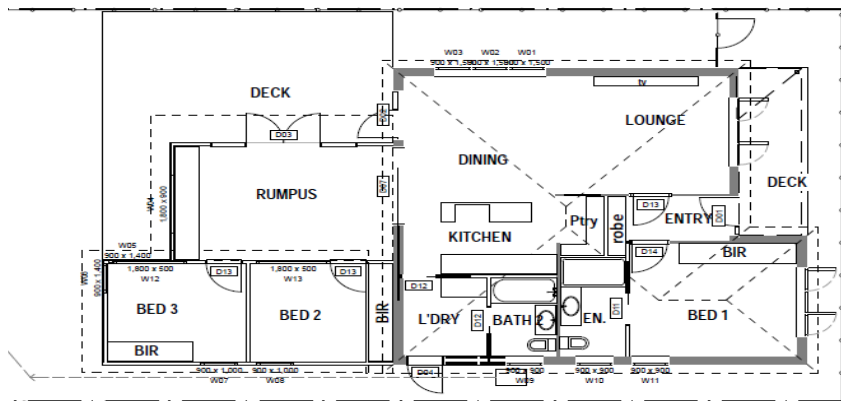


Figure 3: House 1 - Proposed floor plan with windows

General insulation notes

Floor insulation for existing structure:

- If subfloor access is available, consider R2.0 batts stapled between floor joists
- If no subfloor access & floor boards have a lot of gaps, consider new floor (e.g. bamboo) to overlay existing on underlay or rigid foam
- If polished floorboards are in good condition, caulk any gaps that may exist between floor board and skirting board.

Wall insulation:

- New walls - R2.5 batts and vapour permeable reflective foil
- Existing walls – consider using blown in foam which gives equivalent to R2.5 insulation.

Ceiling insulation:

- Existing ceiling - R4.0 in roof space
- New - R1.5 foil-backed blanked under metal roof sheet and R3.5 batts between rafters.

General notes for windows

- New windows - choose **double-glazed** low emissivity argon-filled 12mm air gap
- Existing windows - **secondary double glazing** if in good condition, or replace window when budget allows.

Please Note: The reconditioned floor area approx. 75m²; new extension area approx. 43m². Deck area approx. 35m². The next step perfecting the energy performance of the house is to interrogate the elements (such as glazing area, wall type/ thermal mass) with the [Nationwide House Energy Rating Scheme](#) (NatHERS) energy rating software

Further Improvements:

Further improvement options to the house energy rating were also looked at. Below are the actions trailed and the energy rating results.

Base Design: 7.4stars 84.6MJ/m²

Action Trailed	New Score
Increase insulation to subfloor from R2.0 to R3.0	7.5 stars, 82.5MJ/m ²
Increase insulation to Roof from R4.0 batts to R6.0 batts (Note, purlins may need to be up sided to fit R6.0 in flat framed construction.)	7.7 stars, 77.4MJ/m ²
Increase wall insulation to new walls from R2.5 batts to R2.7	7.7 stars, 76.8MJ/m ²
Change all external walls on new slab to Reverse Brick Veneer versions.	6.9 stars, 68.6MJ/m ²
Retrofit Reverse Brick Veneer walls to Kitchen/Living external walls	8.2 stars, 56.9MJ/m ²

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Figure 4: House 1-Montages, from left to right, clockwise. 3D floor plan, north elevation axial View, north elevation