

# Raising the Bar on home renovations

## House 2 – Post war (1945 – 1965)

### Typical post war style house

- Single storey, weatherboard, north facing
- Period - 1945-1965
- Existing house energy rating-2 Stars
- Floor area - 100m<sup>2</sup>

### Design brief for proposed renovation – single storey 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 (bedroom, rumpus, WC, laundry)
- Front façade (street frontage) to remain intact and existing garage and shed to remain.

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

- Add new open plan meals/living/kitchen
- Add new bathroom
- Add new bedroom
- Add new laundry
- Create an ensuite and robes for an existing bedroom and turn into a master bedroom
- Rumpus/play area
- Add outdoor deck area
- Redesign and reallocate internal space as required
- Potential to add 70-100m<sup>2</sup> of additional floor area.

#### Indicative Budget

- Project budget (design and construction) of \$250,000-\$300,000  
(Please note: this is a rough guide; not based on comprehensive cost estimates)

### Improving Comfort and Liveability while reducing Running Costs

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

### Existing floor plan

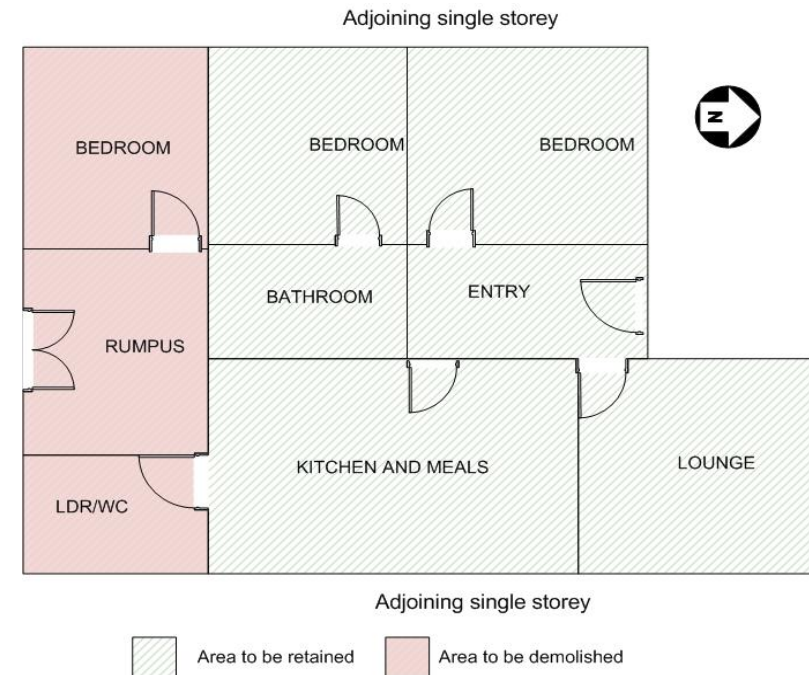


Figure 1: Post war style, existing floor plan

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### Proposed floor plan

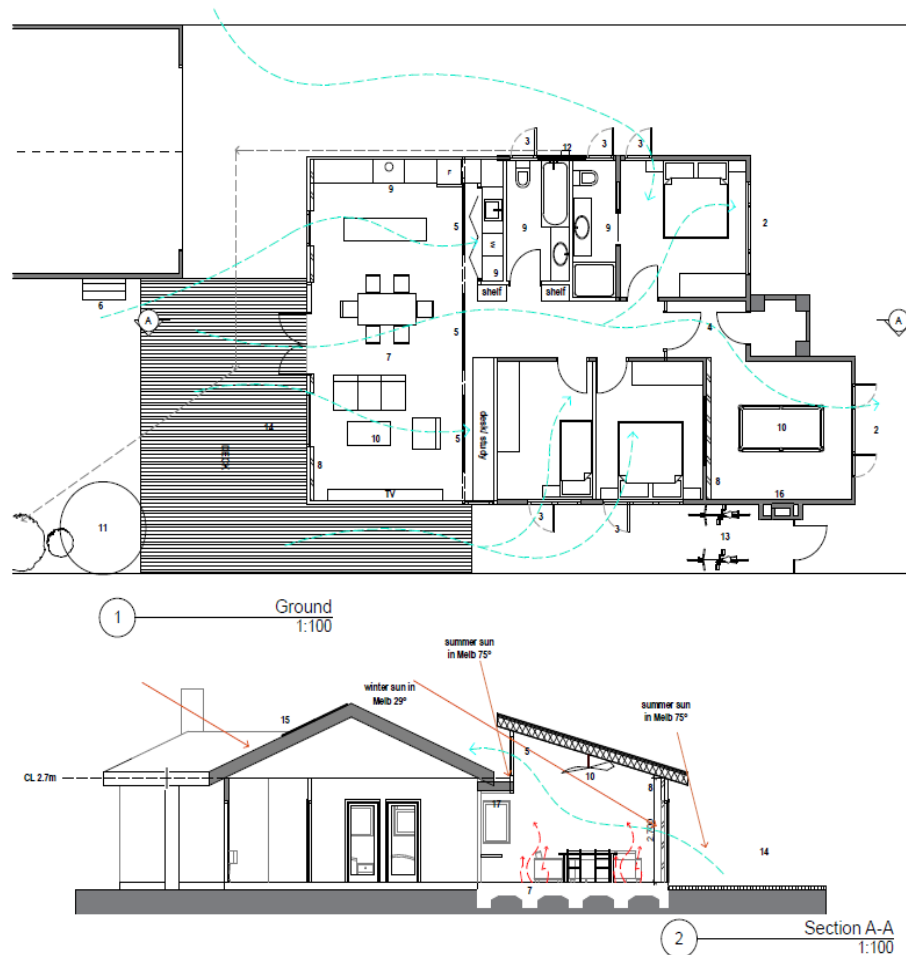


Figure 2: Proposed floor plan and section

### Design features

1. New living areas (living, dining, and kitchen) to have **glazing to the north** by way of clear storey windows. **Glazing area maximised** by raising the new roof above an existing structure.
2. Existing north eaves to be extended according to **45% rule** (45% of height of sill to bottom of eave), to shade out summer sun.
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. Security door would enable ventilation through them in summer for **night purging**.
5. **Clerestory windows** bring direct sunlight to southern rooms to fall on the reverse brick walls. They also aid **venting of hot air** in summer. **Eaves sized** to allow in winter sun (29° for Melbourne winter solstice), but to shade out summer sun.
6. Easy access to the backyard and clotheslines from the laundry facilitates clothesline use, reducing the reliance on tumble drying.
7. Concrete (polished or tiled) to the new extension area on concrete slab with 60% replacement content and recycled steel, 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 diverter** collecting from washing machine, laundry trough, bathroom shower and vanity is diverted to sub-surface irrigation, ideal for fruit trees, etc.
13. Secure covered **bike area** with quick and easy access to encourage use.
14. Recycled decking for alfresco dining/entertaining area with connection to backyard.
15. Location of **solar hot water and photovoltaic panels**.
16. **Chimney blocked**, fitted with damper or replaced with efficient gas heater.
17. New extension fits under the existing roofline, is **compact and affordable**.
18. Star rating of the proposed design is **7.7 stars**.

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### 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 floorboard 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 or other suitable product.

#### 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.

#### Also note

The reconditioned floor area approx. 45m<sup>2</sup>; new extension area approx. 47m<sup>2</sup>. Deck area approx. 46m<sup>2</sup>. The next step to perfect the energy performance of the house is to interrogate the elements (such as glazing area, wall type/ thermal mass) within energy rating software, such as Accurate, First Rate5 or similar approved software package.

### Further Improvements:

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

Base Design: 7.7stars 76.2MJ/m<sup>2</sup>

Action Trailed	New Score
Increase insulation to subfloor from R2.0 to R3.0	7.8stars 71.8MJ/m <sup>2</sup>
Increase insulation to Roof from R4.0 batts to R6.0 batts (Note, purlins may need to be upsided to fit R6.0 in flat framed construction.)	7.9stars 66.5MJ/m <sup>2</sup>
Increase wall insulation to new walls from R2.5 batts to R2.7	8stars 65.2MJ/m <sup>2</sup>
Change all external walls to the East and West of the Living/Kitchen area to also be Reverse Brick Veneer.	8.1stars 60.4MJ/m <sup>2</sup>
Increase the size of the 3 northern Clerestory windows over the Kitchen/Living area from 1000hx2000w to 1000hx2800h	8.2stars 56.9MJ/m <sup>2</sup>

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Figure 3: Montages, from top left, clockwise, south elevation, north elevation axial view, east elevation and north elevation.