RETROFITTING INSULATION CORRECTLY

Major projects retrofitting insulation in older uninsulated or poorly insulated homes are currently underway. To do this right, there are installation pitfalls that need to be avoided.

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A well insulated house can be a warm home that benefits the occupants with improved health and cheaper heating costs. But to offer these advantages, insulation needs to be correctly installed.

Downlights to comply with NZECP 54

The installation of downlights in a home must comply with the New Zealand Electrical Code of Practice 54 (NZECP 54). When retrofitting insulation, these same limitations on downlights apply:

- for safety reasons, such as to minimise fire risk
- to maintain the thermal insulation value of a ceiling – clearances around light fittings would impact on this
- to stop heat being trapped around light fittings, especially by poorly installed insulation
- to prevent moist air entering the roof space from a space below, particularly with skillion roofs.

CHECK DOWNLIGHTS ARE CA OR RA TYPE

For a safe and effective installation, retrofit insulation installers must first check that CA or RA type fittings are installed. If they have not been used in a ceiling that will form part of the new thermal envelope, the existing fittings will need to be replaced or altered. The manufacturers of downlight fittings within New Zealand will be able to advise whether the fitting can be upgraded (by the fitting of a proprietary heat can) or if the light fitting will require replacement.

Avoid insulation gaps

Any gaps in insulation (where insulation is missing between segments, or between segments and the framing) significantly downgrade the building's thermal performance.

One area to check when retrofitting wall thermal insulation is the wall framing above the soffit (see Figure 1). This will not normally be a problem when the internal linings are removed and insulation installed, but if insulation is being fitted from the exterior, this area can often be missed.

25 mm gap with roof underlay

When retrofitting insulation to a roof space or skillion roof, at least a 25 mm gap is needed between the insulation and the flexible roof underlay. This is because roof underlay, which is paper-based, frequently becomes damp. If there is no gap, moisture can wick into the insulation material, causing it to become wet and lose its insulation value. Dampness trapped there →

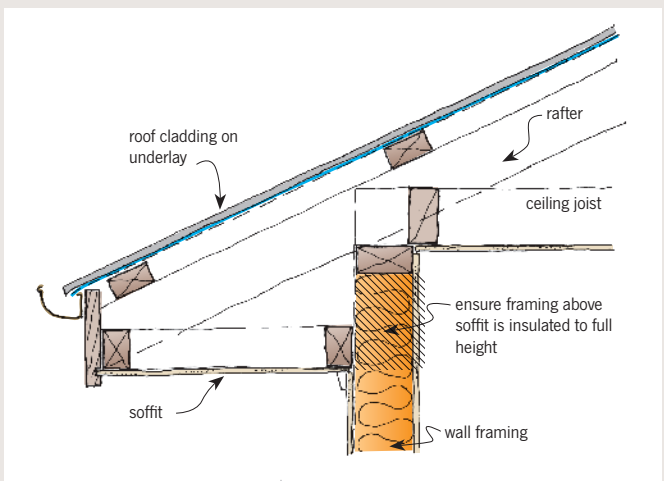

Figure 1: Common construction of eaves framing and placement of linings in existing homes. It is important that the area shaded is insulated when retrofitting wall thermal insulation.

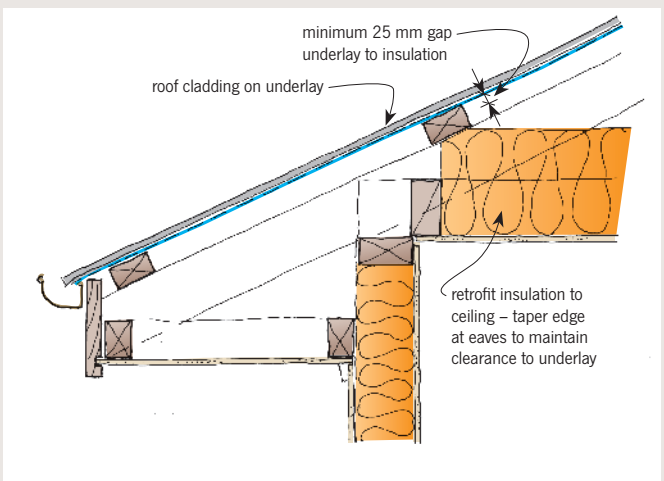

Figure 2: Shape or restrain the edge of the insulation to fit the limited space available at the perimeter of the roof space.

KEY POINTS FOR DOWNLIGHTS IN THERMAL ENVELOPE

There are a few simple rules for successful installation of insulation when downlights are fitted.

ALWAYS:

- use CA type downlight fittings in insulated ceilings (see page 19).

NEVER:

- leave insulation gaps around CA or RA light fittings
- cover any recessed downlight fitting with insulation
- use open downlights.

may also cause damage to the roof or ceiling structure or the lining.

It is important to remember that the insulation material may also increase slightly in thickness (loft) after it is placed as it reaches its full unrestrained dimensions.

For many retrofits, this 25 mm gap will limit the thickness of the insulation that can be used around the perimeter of the roof space. To obtain the best R-value possible, the edge of the insulation can be shaped or restrained to conform to the limited space available (see Figure 2). Alternatively, a higher value rigid insulation material (polystyrene or similar) could be used around the perimeter of the roof space. This will help reduce the heat loss at the perimeter compared to the remainder of the roof space.

It is recommended that the roof/ceiling insulation be laid across at least half the width of the top plate, but sometimes this may not be possible due to access (for example, a framing member or services in the way) or space limitations, as the 25 mm gap must be maintained.

WHAT IS CA AND RA?

CA – Closed Abutted, where the insulation can be fitted hard against the perimeter of the light fitting and the fitting has 5% maximum open area.

RA – Restricted Abutted, where the insulation can be fitted hard against the perimeter of the light fitting and the fitting has 5–15% open area.