TACKLING COMMON BUILDING PROBLEMS

There are a number of common building problems that are likely to need solving when undertaking renovation design and construction. We take a look at a few, including their solutions.

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One mantra with renovation work is always expect the unexpected. No matter how good the initial survey and the details provided, something unexpected is always going to happen once work gets under way.

Rising damp

Buildings built well into the 1940s, and possibly even later, commonly have a brick base for the open fire, copper and coal range (see Figure 1). Typically, these do not have any form of damp-proofing, or if they do, it no longer works.

Moisture from the ground is readily drawn up through the bricks. This can also occur where the foundation walls and piers are also brick.

While the bricks are usually (but not always) relatively sound, any floor framing timbers adjacent to the bricks may have rotted because of this moisture. It is difficult to determine the full extent of rotting before work has started.

Figure 1: Moisture can be seen rising up through the base of this chimney brickwork. The height of the brickwork minimises the risk of moisture damage to framing.

THE SOLUTION

The rotted timber obviously must be replaced. Where the brickwork is to remain:

- replace rotted timber with H3.2 treated timber or H5 if it is in contact with the ground
- provide a separation (if possible between the timber and the brick) or ensure there is a damp-proof course (DPC) between the timber and the brick.

Where rising damp is occurring with brick foundations, any rotted timber will need to be replaced. Where there is damp but the timber is still sound, release any subfloor fixings, gently lift the timber off the brick, insert a DPC, lower the timber back into place and refix.

Rotted timber

There are a number of other areas where rot may readily occur in older buildings, such as:

- at the foundation/wall framing interface, particularly with a stucco-clad 1930s house
- morticed joints in window sashes
- jamb sill junction in timber windows (see Figure 2)
- mitred corners and scarfed joints in timber weatherboards
- wall framing behind baths, basins and kitchen sink benches
- the base of timber claddings that are close to, or in contact with, the ground
- window reveals, particularly with early aluminium windows without any form of condensation drainage and where MDF reveals remain
- internal gutter support framing
- roof framing around chimney and roof-light penetrations
- floor framing under baths and showers
- wall framing behind mitred cladding corners, particularly where no back flashing was installed.

Material unavailability

Many of the materials used in older buildings can no longer be purchased new.

THE SOLUTION

There are a few options to match existing materials:

- Source second-hand materials, such as roof tiles, windows and doors, weatherboards and flooring.
- Manufacture a special run – while this can be readily done for machined timber, it is expensive.
- Totally replace the material in one or more areas – it may be reusable for repairs in other parts of the building.

Matching material sizes

New Zealand changed from imperial to metric measurements in 1967, but a number of materials were supplied in imperial dimensions well after that date. Most of the industry now manufactures using metric dimensions, making it difficult to get an exact match between old and new materials.

THE SOLUTION

The most common size differences to be accommodated include:

- framing timber – older timber was rough sawn and varied in width and depth, and new framing is significantly smaller and may need to be packed to match, or change the framing at a wall junction (see Figure 3) where the size difference can be masked (some existing framing may need to be replaced to do this)
- profiled internal and external finishing timbers
- cladding profiles
- timber flooring
- corrugated steel – one or two new sheets of metric profile corrugated steel may be able to be lapped with an existing imperial profile to accommodate the difference. This won't work where extensive end-lapping is required and the roof will need to be replaced.

Sagging structure

Sagging of rafters and ceiling framing is a common occurrence in houses with heavy (clay or concrete tile) roofs, particularly buildings built in the 1940s through to the 1960s. This generally occurs because the framing members are undersized by current standards.

While minor sagging may not be that noticeable, sagging of up to 60 mm is not uncommon.

THE SOLUTION

For severe sagging, the repair options are to prop the existing structure to lift it back to as near as straight as possible and:

- add strongbacks off which new struts or props are supported (see Figures 4 and 5)
- add beams supported off gable-end walls
- install new rafters or ceiling joists fixed alongside the existing
- add struts under purlins supported off internal loadbearing walls
- replace the existing structure with bigger framing
- replace the heavy roof with lighter roofing material. →

Figure 2: Rot in the sill and facing resulting from water being trapped in the joints and being absorbed into the timber.

Figure 3: Staggering the new internal wall framing at an external wall corner to accommodate the smaller new framing and allow for the fixing of new linings.

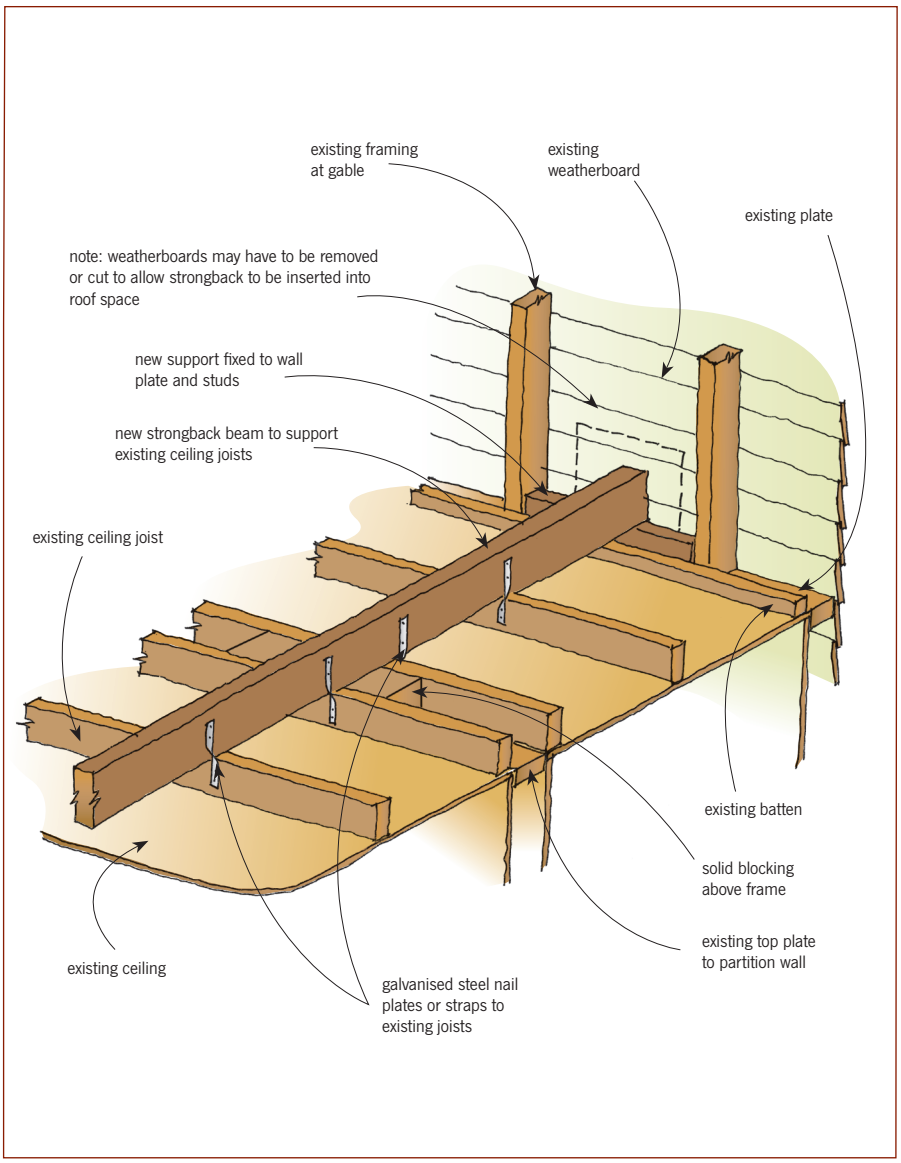

Figure 4: Strongback and new structure added to an existing ceiling to remove deflection in original framing.

Lack of foundation lateral support

While many buildings will have had the original foundations replaced, many do not have sufficient lateral support to resist earthquake loads.

Some buildings built before 1940 may not have had the bearers tied to all of the piles.

THE SOLUTION

Build 121 December 2010/January 2011 (pages 31–32) gave some options for improving the lateral stability of existing suspended floors.

It is easy to add straps or ties to timber piles but concrete piles will require holes drilled in them to allow a tie wire to be installed (see Figure 6).

Wet or damp subfloor spaces

Many houses have insufficient subfloor ventilation, allowing moisture to build up under the floor. It is also common to find water and waste pipes or stormwater leaking under the building. This can lead to internal moisture problems such as mould, deterioration of floor framing timber and corrosion of fixings and wire ties.

THE SOLUTION

It is simple to add ventilation where there is timber jack framing to the foundation but is more difficult where there is a continuous concrete, brick or concrete masonry foundation wall.

Adding polythene over the ground will significantly reduce the amount of moisture under the floor.

Roof space moisture in brick veneer claddings

Houses built up until the 1970s often had the base of the brick veneer cavity open to the subfloor space and open to the roof space. Any moisture in the cavity drained under the house and the moist air from the subfloor rose up through the veneer cavity and condensed on the underside of the roof cladding resulting in a significant moisture problem (the moisture was typically thought to result from a roof leak).

THE SOLUTION

There are three parts to solving this problem:

1. Block off the base of the cavity from the subfloor. Ensure that there are top and bottom ventilation openings to the outside in the veneer.
2. Cover the ground with polythene.
3. Block off the top of the veneer cavity from roof and soffit spaces.

No building paper

It was common for houses built up until the 1960s not to have building paper behind the cladding. Adding a wall underlay is generally not practicable unless the cladding is being replaced when it has reached the end of its serviceable life.

THE SOLUTION

Build 118 June/July 2010 (page 24) describes an option to remove internal wall linings and install wall insulation. This gives details of how to fold wall underlay into the framing space before installing the insulation.

An alternative is to use rigid sheet insulation, such as expanded polystyrene, that is 25 mm narrower that the framing depth (with the 25 mm gap between the insulation and the back of the cladding) provided a plasterboard lining (flame barrier) is installed.

Even more to consider

Other common problems that may need to be addressed include:

- corrosion of metal components – flashings, fixings, metal roofing and hinges (see Figure 7)
- borer
- mould and mildew, particularly in modern, airtight homes
- seized windows – double-hung and casement sashes unable to be opened because of paint build-up over time
- broken sash cords in double-hung windows
- timber floor and wall framing too close to the ground
- retaining walls that are tilting or cracked
- deteriorated wiring and pipework
- excessive draughts
- lack of insulation
- presence of asbestos in building and finishing materials
- presence of toxic moulds
- presence of lead in paints, flashings and waste pipes.

More information on these and other problems likely to be faced during renovation are given in the BRANZ Renovate series of publications – Renovate villas, Renovate bungalows *and* Renovate art deco – *and on the website www.renovate.org.nz.*

Figure 5: Trussed strongback supporting ceiling joists.

Figure 6: Replacement precast concrete piles with wire ties to the bearers. Original timber piles are also visible.

Figure 7: Corrosion of head flashing.