



Keeping in character



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In *Build 186 Houses ripe for renovation*, we talked about renovating and refurbishing New Zealand character homes. Now, here is a closer look at some of the common tasks you may have to address.

FIRST ON THE LIST when it comes to the nitty gritty of renovating a character home is the thankless task of rectifying any faults to the existing foundations, piles and subfloor structure. This may include levelling the building and subfloor repair work, but it does have to be done.

Start by dealing with the piles

Almost all early villas and bungalows were built on native timber piles – often tōtara or pūriri – and after a century or so, many of these have deteriorated. Some may visually appear sound, but below ground level, they will have rotted away completely.

An early indicator of this problem can be identified within the rooms of the house. There may be a noticeable slope to the floor – usually indicating differential settlement – or springiness when you walk or jump on it. This is noticeable with pile settlement or failure or rotting of other subfloor timbers such as bearers or floor joists.

There may have been subfloor repairs since the building was originally constructed, and replacement treated pine piles or precast concrete piles may be present. Early in situ concrete piles can still be sometimes found cast in kerosene tins – approximately 300 mm square – with the rusting remains of the tin left as permanent formwork. These will all have to be evaluated to see if they are fit for purpose and meet current standards.

If remedial subfloor work must be undertaken, it is best left to an experienced repiling contractor.



Start with the piles – in situ concrete piles cast in kerosene tins can still be found.

They will be able to evaluate the condition of the piles, subfloor timber framing and any reinforced concrete perimeter foundation walls (which appear on some of the later bungalows).

There are also concrete pads sometimes present, usually redundant, where washhouse coppers or open fireplaces were supported. The repiling contractor will have the staff numbers, experience, expertise and equipment to elevate the dwelling (using jacks) and safely enable remedial work to be undertaken.

The other advantage of using a professional repiler is that they will be able to level the entire building while they are undertaking the remedial

work. This level platform will be crucial for the long-term success of all subsequent renovation work on the project.

Upgrade the drains

Subfloor remedial work may also uncover other elements of the house that have deteriorated or failed. Most issues of site settlement or slumping can be traced back to water, such as leaky pipework or drains from the rooms above. Old in-ground earthenware or ceramic drains do not last forever. They can fracture during seismic movement or be damaged by invasion of roots from nearby trees seeking water. It is generally

not worth trying to repair or salvage old earthenware drainage. Once it has been compromised, it will continue to leak, the tree roots will return and the cycle of repairs and maintenance is repeated. If possible, replacement with a modern PVC drainage system (possibly rerouted) is by far the best solution and will generally be the end of any subsequent work required on the drainage.

You should generally also replace any old galvanised water supply pipes present at this point. Even if they visually appear to be in good condition, they deteriorate from within. Replacement with a cost-effective modern material (such as polymeric pipes) will safely deliver water to the residence without having to worry about failure or reduction of flow rate in the future.

This will be important as the building renovation progresses, with the probable inclusion of high-pressure plumbing fittings and installation of one or more califont water heaters, which all require good water pressure and flow rate. Copper water supply lines, often considered the Rolls Royce option, are sometimes used but can be susceptible to acidic conditions so local water pH levels should be checked first.

Underfloor insulation and more

While considering subfloor work, don't miss the chance to install good-quality well-fitted under-floor insulation. This will improve the energy efficiency and comfort levels of the renovated home.

Install polythene sheet material over the bare earth beneath the house, including taping around each pile. This will ensure that any water evaporation from the ground is contained and prevented from entering the timber structure of the building. Again, for a very small cost, this will improve the energy efficiency and comfort of the home as the building reaches a new equilibrium point of lower moisture content (usually after approximately 1 year).

Finally, ensure the subfloor void is well ventilated – see NZS 3604:2011 *Timber-framed*



A character home typical of the type that will need significant renovation at some point to make it acceptable for modern living standards.

buildings 6.14.1 for guidance on perimeter ventilation requirements. Sometimes the subfloor structure is very close to ground level. While lifting the building for repiling and levelling, it can be reinstated at a slightly higher level to improve the space beneath the floor. Check that the building will not contravene the daylight recession planes or height limit for the site - discuss this with your local council first.

The roof

Now that the building has been made level, you should usually address the external fabric next – starting with the roof. If it is original, after 80 to 100 years or so, it will probably need to be replaced.

Corrugated iron roof

An original corrugated iron roof will have been installed using short-length sheets with overlaps and probably fixed with leadhead nails. Even if the roof has been subsequently replaced, unless this was recently, it will still comprise short-length sheets.

These roofs will usually have deteriorated due to lack of maintenance, damage from foot traffic or rusting where the sheets overlap. Again, the most prudent approach would be to reroof with modern long-run steel roofing installed over appropriate roofing underlay.

Tile roofs

Tile roofs on these period dwellings will be either concrete or clay tile systems. Both have a finite life expectancy and are often at the end of their life.

If the tiles are failing, it is usually futile to try to arrest the decline. Contractors often do as much damage to the remaining roof while repairing the failed sections. The tiles will all be at a similar level of deterioration, so when some start failing, the others are usually not far behind.

A traditional clay tile roof may have been part of the aesthetic factor that sealed the owner's purchase of the building. Before retiling, it is worth having a structural engineer check the existing roof framing to ensure it meets current requirements for a heavy roof. If the existing structure falls shorts, a partial rebuild may be required or consider replacement with a lightweight roof.

There are several lightweight roof tile systems that read – from ground level – as an old-style heavy roof, especially after weathering for a couple of years, and these are worth considering.

Opportunity to do more

While any roof is being replaced, it is a great time to check the roof framing for deterioration or any substandard modification work that may have been undertaken. ➤

Also remove any excess material in the roof void, such as old header tanks, and remove any redundant brick chimneys to avoid potential earthquake hazards.

This is also a great time to install ceiling insulation if you can stay ahead of the roofing contractors – especially into those tighter awkward spaces such as at the eaves.

Wall cladding

Repairs to the wall cladding will generally be a more piecemeal process.

Timber weatherboards

Most villas and bungalows will be clad with timber weatherboards, either rusticated or bevel-back. If they have been reasonably maintained, with regular painting and cleaning, they will often still be in original condition. There are 140-year-old New Zealand buildings with the original weatherboards still in perfect condition.

There may be occasional boards that have failed, but these can be individually replaced as necessary. It is important to obtain the exact same profile when marrying into existing weatherboard cladding.

While it is sometimes hard to spot, the original boards will inevitably be an imperial profile, and modern off-the-shelf weatherboards are metric. You may have to hunt around to find the right matching profile, but it is essential to do this if the work is to be done properly.

Feature claddings

There will sometimes be secondary cladding used on parts of the external wall façades, such as gable ends, columns or below bay windows.

The most common feature cladding on our early villas and bungalows are timber shingles. New Zealand native timbers such as kahikatea, kawaka and tōtara were used, along with imported redwood or western red cedar shingles

These shingled surfaces were typically painted – sometimes in garish colours and patterns – and consequently have often lasted reasonably well.

If repairs or replacements are needed, most commonly available now are imported cedar and sometimes H3.2 treated *Pinus radiata* shingles. These will probably be painted, so there's no need to colour match the timber.

On early buildings, shingles are often found installed on building paper/underlay over solid sarking (at the bottom edge) with spaced sarking further up the face. If possible, replace individual units or parts of the shingled surface as necessary over this substrate.

If applying shingles to larger areas or new surfaces to add character to a plain façade, a different system will be required. Many designers now tend to fix the shingles onto building wrap over a solid minimum H3 plywood sheathing substrate. This work is not covered by Acceptable Solution E2/AS1, so the compliance path is via an Alternative Solution.

One technique I've learned is to clad the façade completely with weatherboards – to a gable end, for example – then clad the uppermost triangle with plywood on face-fixed vertical battens, sometimes over a cavity, to receive another layer of building wrap, then the shingles. The simple plane of weatherboards remain the primary means of weathertightness for the building, and the outer shingled surface acts as an additional rainscreen. The plywood triangle can be 'belled' by fixing triangular packing fillets to the battens and dentils fitted below the bell to complete the period look.

Roughcast or spatterdash stucco

Roughcast or spatterdash stucco plasterwork is a far more problematic surface to work with. If the existing surfaces are in good condition, they will probably only need a thorough cleaning, prepping and application of a high-build elastomeric paint.

The plasterwork will probably be a traditional solid plaster system of usually three coats with some form of metal mesh reinforcing it. Sometimes there will be a solid substrate. Occasionally, this is asbestos sheet, so be cautious as this requires professional removal.

Sometimes there is hit and miss diagonal sarking, but often there is no solid support – just a heavy building paper across the studs.

If the old plasterwork is showing signs of age but still looks retrievable, repair work needs an experienced qualified plasterer knowledgeable in traditional solid plastering to make it good.

If the stucco is past salvaging and requires replacing, engage an experienced qualified plasterer. Best practice now recommends use of a rigid backing over a drained and vented cavity. Total replacement should be undertaken using one of the modern plaster systems, but a good plasterer will be able to faithfully reproduce the appearance of the original solid plaster finish.

Building paper

The original cladding may or may not have utilised a building paper (wrap) during construction. It may have deteriorated beyond any functional usefulness if it was installed.

Unless you are recladding an entire wall, the building wrap will have to be installed from inside the building. For a helpful guide to this work, see *Build 156, Wall insulation retrofit update*.

Source material for more detail

The following are helpful reference documents for this type of project:

- *BRANZ Good Repair Guides* – an excellent series of booklets looking at specific aspects of repair/restoration work on early New Zealand dwellings.
- *Maintaining your home* – this BRANZ book provides a more general overview to help tradies and homeowners with maintenance and renovation work.
- www.renovate.org.nz – this BRANZ website is a technical resource for industry. ◀

For more ▶ The next article in this series will look at the internal fit-out, including tips on what is worth salvaging from the original fit-out and how to integrate modern fixtures and features into a character period building.