Architects Advisory Service

Roofing & Guttering

This technical information sheet constitutes a vital part of Archicentre Australia's recommendations to you. Failure to observe the provisions of the warning sheet could lead to premature deterioration of the home.

We all recognise the importance of having a "roof over our heads". Where defects appear in this most important of structures, we immediately become concerned.

Minor roofing faults can cause water damage and potentially serious structural damage if not rectified. If your inspector was unable to gain access to the roof during their inspection, it would be prudent to have the roof assessed by a roofing contractor with the appropriate access equipment. Once it has been assessed and any necessary repairs undertaken, you should carry out your own regular maintenance checks, especially after high winds and storms.

Where your inspector has noted restricted inspection access to your roof and / or guttering, it is probable that you too will find access difficult.

Do not access your roof unless it is safe to do so and fall prevention measures are in place. If in doubt, call in a tradesman with appropriate expertise and equipment.

Be mindful that working or walking on any roof, be it as part of regular maintenance or for the installation of equipment or appliances, can cause damage which may affect the integrity of the roofing material.

You can save time, effort and money by becoming well informed. Our technical sheet can help you diagnose and effect the most appropriate cures.

DETECTION OF ROOF LEAKS

Evidence of water penetration can be all too easy to observe; stains on the ceiling for example. However, discovering the source of the leaks can be more problematic. Water can travel quite lengthy distances along framing members before finding an entry point into the spaces below. Roof cladding, flashing condition, roof linings and insulation may hinder detection.

The safest way to examine the roof is by viewing the roofs pace from the ceiling access hole. Climbing into the roof space can be safely undertaken where access ways have been laid between framing - otherwise there is the danger of damaging or falling through the ceiling. If it isn't raining and where the roof space is unlined, newly dislodged or cracked tiles will permit increased light to filter through, and the timber frame may show white powder of mineral salt deposits or dark water stains which can be traced back up to cracked tiles, loose pointing, bedding, flashings or sealant (although brown stains sometimes have nothing to do with the roof leaking).

If you are in the roof space during the day, by simply turning off your torch, holes or rust decay in metal roofs will show up as bright pinpoints in the contrasting gloom.

ROOF REPAIR

Tiles

First, the good news: tiles rarely need repair. They do not become more porous over time. If anything, concrete tiles become more impermeable to water. The argument that "because a tile absorbs water it needs to be replaced" is not

valid, since all tiles absorb water. It is even normal for the underside of the tile to be damp, though if it drips water of course you have a problem. In such a case it is most likely that the tile is cracked.

Ageing tiles become more brittle, so the older they are the more likely you'll crack them if you walk on them. If you have to walk on the roof, tread where one tile overlaps the other (the tile "nose") as this is the strongest point.

Often minor leaks in tiled roofs occur through mortar cracking away from ridge or capping tiles or mortar joins near valley gutters etc. A simple remedy is to plug the (often hairline) cracks with a suitable silicone product. Preferably seal the cracks from the roof space, to minimise deterioration of the sealant product, and to avoid having to climb on the roof. Significant roof leaking may demand removal and re-bedding of all the capping or other tiles in new mortar. Minor mortar damage can escalate rapidly under storm conditions, particularly with high speed, directional, wind-blown rain.

Slipped tiles most often occur when fixings deteriorate or mortar joins break down. Such tiles need to be re-bedded in new mortar or re-fixed by re-nailing or renewing the ties. Edge tiles which slip into a gutter may often be simply repositioned. Slipped tiles can be an ideal entry point for vermin.

Metal Roofs

It is possible to insert "slips" of new corrugated iron between the overlaps of corroded metal sheets, this being a common deterioration site, as a temporary measure. These "slips" need to match the profile of the existing corrugations. This repair technique is especially common in Queensland. Silicone sealant and paint can sometimes extend the life of a partly decayed metal roof; otherwise replacement will be your best option.

Care must be taken when accessing a metal deck roof. Although you cannot crack the surface, you can damage or dent it. Metal roofs can rust quickly once their protective coating is scratched or abraded, and particularly where water is allowed to pond, such as in a dented or depressed area.

If replacing an area of 'flat' (low pitched) roofing, select a profile suitable for the slope: using an inappropriate profile can lead to roof leakage.

ROOF SAGGING

The other main concern with roofs is sagging. A roof has to sag noticeably before any serious framing problem exists. When significant sagging occurs, tiled roofs will deflect, admitting windblown water. You may decide, before this stage, that the appearance of the roof is unsatisfactory, and replace it for this reason alone.

A sag may occur where the framing has deteriorated due to age, or when lightweight roofing materials, like corrugated iron or slate, have been replaced with heavier materials, like concrete or terracotta tiles. The roof framing should have been reinforced during the change-over, but often this is not done.

Sagging can also be caused by purlins incorrectly affixed to the house frame. Purlins support the roof frame and should be attached to the tops of walls, not to the ceiling joists which will bow under such weight.

Weakening and sometimes sagging of the roof frame can also be caused by tradesmen who have cut too deeply into rafters to make way for wiring, pipes, ductwork and vents.

The above structural defects can lead to costly repairs and should be professionally assessed before they are rectified.

ROOF “GROWTHS”

Some home owners prefer not to have greenish lichen or dark mould on their roofs, while others think lichen is attractive. People in South Australia have been known to "seed" their roofs with spores to give them character. Roof growths do not damage your roof. Furthermore they would be unlikely to make any significant difference to water absorption through the tile, even though they obviously will hold more water against the tile for a longer period.

Moulds and lichens can be removed, but be careful with the method selected. Some preparations are highly corrosive and may cause significant damage to your guttering and flashings. Seek expert advice before proceeding and always ensure you have fall prevention systems in place before working at heights. Be warned that whilst cleaning the tiles you risk cracking some, possibly causing leaks. This may also occur if employing others to clean or 'rejuvenate' the roof.

ROOF "REJUVENATION" (TILES)

You might consider repainting the roof for cosmetic/resale purposes, but there is no substance in the claim that this "waterproofs" or extends the life of the roof. A roof's "waterproofness" comes from its ability to shed water quickly - think thatched or timber shingled roofs.

Loss of the glaze on a tile does not make it significantly more porous. A tile which has lost its glaze can only absorb roughly 5 more water than a glazed tile. This extra weight of water is unlikely to add significantly more stress to the roof frame.

Repainting or cleaning may have the reverse effect to waterproofing if tiles are cracked in the process. Removing old mortar and re-bedding ridge tiles in new mortar will, however, extend the life of a roof which is leaking from these locations.

Cleaning, painting and re-capping tiles are done in whole or part by roof "rejuvenators". They clean growths off roofs with high-pressure water sprays and they sometimes apply a fungicide paint or coating to inhibit regrowth (home owners can obtain the same kind of sprayers from hire companies). However, their high-pressure sprays can sometimes blast holes in your gutters and valley flashings if they are already in the process of rusting out, or exacerbate cracking in already fragile tiles, while further tile damage may occur if you or the tradesman have to physically access the roof. It would be advisable to obtain a written statement from roof rejuvenators as to their obligation to replace tiles cracked whilst "rejuvenating". Some also offer guarantees on other aspects of the job. However, you should investigate the company behind the guarantee, as some have been known to go out of business before the expiration of the guarantee period.

Since rejuvenating a roof can cost up to two thirds that of a new roof, which will be more resilient, you should carefully consider the benefits of rejuvenation versus re-roofing.

REPLACING ONE ROOF MATERIAL WITH ANOTHER

Archicentre Australia has found, in the course of thousands of home inspections, that the biggest single cause of framing failure is the replacement of a lightweight roofing material, for example sheet metal with a heavy one, for example tiles. The extra weight stresses the roof frame and requires extra rafters and supporting framework. A roof which has bowed under such circumstances will be difficult to straighten up with supporting props, as the additional timbers will simply hold the roof in the current deformed position. In some States, building approval is necessary before new roofing materials can be substituted, reducing the incidence of this defect.

WHAT ABOUT A ROOM IN THE ROOF?

Before re-roofing, and especially if you are re-framing, you could consider the possibility of creating a usable attic space.

Archicentre Australia can offer advice if you feel you need expert guidance. On the question of costs, an upstairs renovation compares well with extending out, provided that the house does not require too many structural modifications to cope with the added weight and repositioning of new framing timbers or steelwork, notwithstanding the ground floor space lost to the interconnecting stairs. Houses with a steeper pitch stand to gain more space, incorporating practical design features – preferably dormer roofs with associated windows. Skylights or sky windows are best utilized for service rooms such as attic stores or bathrooms, laundry and toilet compartments.

RE-ROOFING – CHOICE OF MATERIALS

Metal Roofs

Metal roofing is more common nowadays than in past decades, particularly with the improved performance of the surface coatings and extended range of colours and profile. Its advantages, compared to tiles, are design flexibility and ease of installation. Metal roofing is the best option when the pitch (slope) of the roof is less than fifteen degrees from horizontal.

The disadvantages of metal roofing are the greater susceptibility to weathering, industrial pollution, and localised surface corrosion. It can also be noisier in the rain than tiles, but to some people that is an attraction rather than a distraction. An insulating blanket fixed to the underside of the roof can help reduce noise.

If considering total tile roof replacement be aware that your existing roof has likely settled over time. While this is unlikely to have reduced the integrity of the framing, it may be difficult to achieve a perfectly level or even result without replacing the roof framing as well. To avoid disappointment, select a replacement tile that will camouflage rather than reveal any irregularities - a variegated colour, rather than flat tone; a high profile, rather than flat one.

Concrete Tiles

Concrete tiles were previously much maligned as a roof material. Over the years they lost both tensile strength and colour. Today, however, they are enjoying a comeback due to technological improvements. Concrete tiles are now stronger and more colour-fast than before and, significantly, 25-30 cheaper than their terra cotta equivalents. They also offer a wider selection of colours and profiles.

Terra Cotta Tiles

Terra cotta tiles, as well as being more expensive, are slightly heavier than concrete. They have a reputation for their long-life qualities, and are the traditional favourites. Terra cotta tiles are available in a number of different profiles and colours.

Slate Roofs

Slate roofs offer a high standard of weatherproofing, look good, but are very expensive. Similar flat profiles are available in fibre cement sheet, concrete and terra cotta tiles.

Pressed Metal Tiles

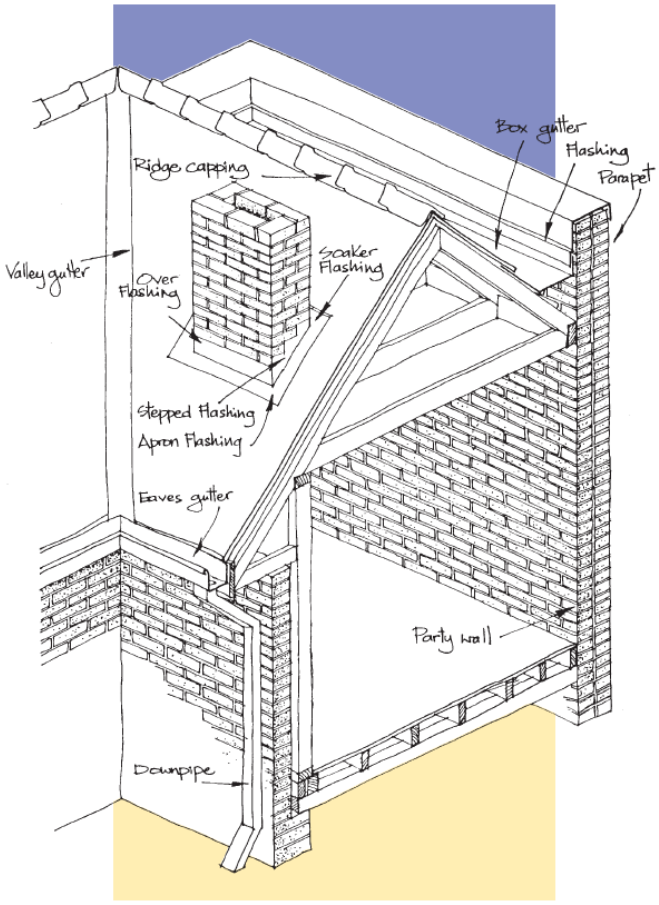
Pressed metal tiles actually cost more than terra cotta tiles but are lightweight, leading to savings in transport and framing costs.

Stone-chip Metal Tiles

Metal tiles with real stone chips bound in acrylic may be more expensive than terracotta in most cases. But costs may be saved on timber framing when cladding a new house because of the tiles' lighter weight.

Shingles

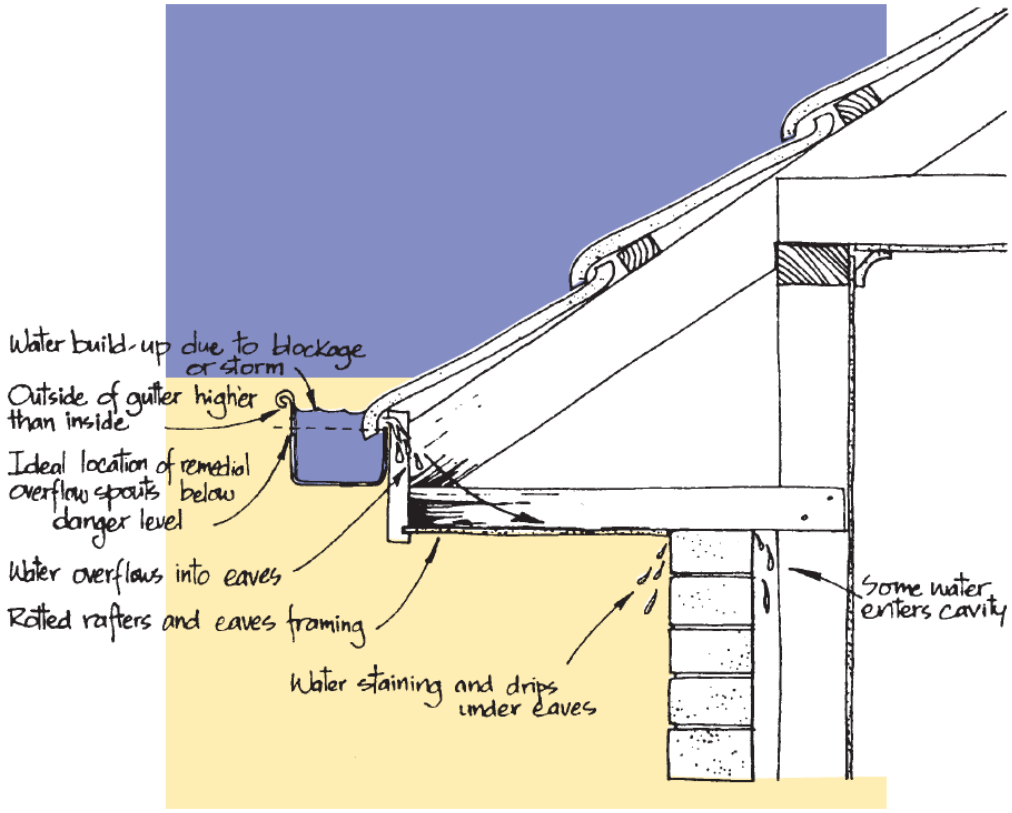
Shingles can be made of timber or fibrous cement. Generally, both last well and have good insulating properties.



GUTTERS

Rusted or poorly installed gutters are common problems for the home owner. In some suburbs, Archicentre has found that half of the homes inspected needed repairs or replacement.

Some of the easily recognisable signs of deterioration are bubbling paint or rust on the underside of the gutters, stains on the underside of eaves, and the presence of rust in general.



If the problem is minor, small holes in gutters may be temporarily patched by appropriate tapes or silicone sealants available from hardware stores.

Indications of more disastrous guttering defects are stains to eaves' linings, sometimes around windows, down the walls and even on the ceilings. Such leaks are most likely to be caused by gutter overflow. Gutters overflow for a number of reasons. They may be clogged with debris, or the slope (fall) of the gutter towards the downpipe may be insufficient. Blocked downpipes and drains may also lead to water overflowing gutters. Guttering overflow may also occur during a heavy downpour because the large volume of water can't drain away fast enough (roof plumbing is designed to meet local rainfall conditions based on a 20 year ARI - the average or expected interval between events of a given rainfall intensity being exceeded).

An 'overloaded' roof drainage system commonly occurs in older houses, after an extension has been added to the house, or where an upper level roof drains directly onto a lower level roof via a 'spreader' down pipe, all of which often increase the roof size (and thus the total run-off) without a similar necessary increase in the size or number of downpipes.

Overflow defects are worsened when the outside edge of the gutter or spouting is higher than the inside edge, a common installation defect. In these cases, the backlogged water can flow over the inside edge of the gutter and into the adjacent eaves lining, ceiling space or wall cavity. Problem installations of this kind can often be remedied by loosening the gutter brackets so that the outside edge of the gutter drops lower than the inside edge. Alternatively and more effectively, overflow outlets can be drilled into the gutter, below the danger level (refer illustration).

Overflow defects are also common where a veranda or house extension is built against an existing roof. Not only does the new roof will make it extremely difficult to gain access to clean the existing gutter, leading to leaf litter build up and eventual overflow, but often the extension roof will drain back to the existing gutter, increasing its water volume load.

One way to discover an overflow problem is to climb a ladder and carefully lift one of the roof tiles. A look inside the eaves should reveal if leaks have occurred and if any timber-rot problems exist as a result. It is also a good idea to check the inside of gutters. Look for signs of ponding, leaf litter build up, localized dirt build up or rusting. If water remains in the gutter a day or two after rain, this could indicate that the gutters are inadequately graded or flow the wrong way!

Additional guttering problems may occur in a house with a party wall. A rusting valley gutter or box gutter is a serious problem in this case, as the water will run straight into the ceiling. The rusted sections should be replaced and the flashing removed from the mortar between the bricks. The replacement flashing must be installed correctly so that it sheds water safely.

Gutter Replacement

The cheapest and most commonly used guttering has traditionally been galvanised iron. However, this has been largely superseded by Zincalume, a zinc and aluminium coating to steel. Aluminium eaves gutters are being used increasingly, their big advantage being that they are less prone to corrosion, and therefore have a longer life expectancy. Their disadvantage is that they are more expensive. pve gutters are also worth considering.

Take care when replacing or repairing either sheet metal roofing or guttering that materials are compatible. Zincalume sheeting is incompatible with galvanised iron guttering as well as lead flashing.

MAINTENANCE OF ROOFS AND GUTTERS

All roofing and guttering will deteriorate in time. Metal surfaces can deteriorate very quickly if not looked after. A seerninqly sound metal roof or gutter can show an advanced state of decay in just six months. Debris in rusting gutters, for example, can accelerate deterioration considerably, particularly where the leaf litter creates an acidic reaction, as in the case of pine needles

It is recommended that you cut back overhanging trees. Many modern gutters are designed to shed leaves more effectively. There are also various gutter guard systems on the market, from lengths of spiral brush or plastic mesh placed within the gutters, to fixed metal mesh covers, all designed to assist in shedding airblown, or tree dropped, debris. In selecting the most appropriate system for your situation, consider the type of litter to be shed and the ease of maintenance of the gutter. Despite the best of protection, there may be long periods of still air and/or dry weather periods which may allow the litter to mulch and sink as soil like particles through the mesh or brush fibres, building up a solid layer within the gutter. This layer, which will be out of sight, should not be out of mind, as it can cause premature corrosion to the gutters if it is not removed.

Roof mounted swimming pool solar heating strapping or panel mounting brackets may also catch leaf litter, reducing effective shedding of water and leading to possible roof leakage as water backs up behind the leaf build-up. Care should also be taken to maintain roof-mounted solar hot water units or pool heating systems to avoid leaks, particularly where the recirculating water may contain corrosive chemicals which may affect flashings and guttering.

Deterioration to roofs and gutters can be suddenly accelerated by storm and high winds. While these factors are beyond the means of the home owner to control, Archicentre Australia recommends that all home owners check their roofs and guttering after such events, and on a regular basis. Deterioration defects can then be detected at an early stage so that maintenance and repairs can be undertaken before more costly damage occurs.

Remember regular and preventative maintenance is the best way of avoiding expensive problems is your home. Archicentre Australia has carried out thousands of home assessments for home owners and prospective buyers and can help you make a realistic appraisal of the property before renovating or repairing.