

# Roofing and Guttering



Malaysia's leading property inspection and building advisory service provider

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

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

## ROOF LEAKING

### Detection

Evidence of water penetration can be all too easy to observe; stains on the ceiling for example. To discover the source of leaks, the best approach is to examine the roof from underneath, in the roofspace, preferably on a very rainy day. You will probably be able to discover any water leaks and trace them back to their source. If it isn't raining, you can sometimes locate the origin of a roof leak by examining the roof framing timbers. White powdery trails of mineral salt deposits can sometimes be left behind after water evaporates from the timbers. Brown stains on timber can also be a guide, though sometimes these stains have nothing to do with the roof leaking.

Holes or rust decay in metal roofs will show up brightly if you are in the roofspace during the day.

### 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 when walking 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 joints 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 roofspace, to minimise deterioration of the silicone 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.

Slipped tiles most often occur when fixings deteriorate or mortar joints break down. Such tiles need to be re-bedded in new mortar or re-fixed by re-nailing or renewing the ties.

Tiles which slip into a gutter through mishandling whilst climbing on the roof for example may often be simply repositioned.

### Repair – 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. These "slips" need to match the profile of the existing corrugations. Silicone sealant and paint can sometimes extend the life of a partly decayed metal roof, otherwise replacement will be your best option.

## 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 through deterioration due to age, or when lightweight roofing materials like corrugated has been replaced with heavier materials like concrete 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.

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

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

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### ROOF "GROWTHS"

Some home owners prefer not to have greenish lichen or dark mould on their roofs, while others think lichen is attractive. 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 by the home owner with copper sulphate ('bluestone') from a hardware store (2 kg to 45 litres of water to treat an average house). Lichens may also succumb to household bleach, but there is no long-term eradication effect, so is not as suitable. In both cases the solutions will corrode the coating on gutters. This can be minimised by running water through the gutters during the operation, but light corrosion could occur subsequently, as the growths may retain some corrosive solution whilst dying and dispersing. In both cases, disconnect gutters from any rainwater tanks until after the first rainfall to avoid poisoning.

Be warned that whilst cleaning the tiles you may crack them, causing leaks. This could also occur if employing roof cleaners.

### ROOF "REJUVENATION" (TILES)

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. However their high pressure sprays can sometimes blast holes in your gutters and valley flashings if they are in the process of rusting out. Home owners can obtain the same kind of sprayers from hire companies.

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.

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

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 guarantee expiry 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 ROOFING MATERIAL WITH ANOTHER

Architect Centre has found in the course of thousands of home inspections, that the biggest single cause of framing failures is the replacement of a lightweight roofing material, like metal with a heavy one, like 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 prop up and additional timbers will simply hold the roof in the current position.

### A ROOM IN THE ROOF?

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

Architect Centre is available to 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 framing timbers.

Houses with a steeper pitch stand to gain more space, and these days liberalised building regulations allow greater freedom with such practical design features as skylights.

### RE-ROOFING - CHOICE OF MATERIALS

#### (a) Metal roofing

Metal roofing is becoming more common in Malaysia nowadays than in past decades. 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 and industrial pollution, and

if the surface is scratched, corrosion can set in almost immediately. It also makes more noise 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 would reduce noise.

#### **(b) 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 come-back due to technological improvements. Concrete tiles are now stronger, more colour-fast than before and, significantly, 75-150% cheaper than their terra cotta equivalents. They also offer a wider selection of colours.

#### **(c) 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.

#### **(d) Slate roofs**

Slate roofs offer a high standard of weatherproofing, look good, but are very expensive and are not common in Malaysia. An imitation of slate is available in concrete tiles and in fibre cement sheet or in a composite type material.

#### **(e) Pressed metal tiles**

Pressed metal tiles are lightweight, leading to savings in transport and framing costs. They have similar qualities to metal roofing.

#### **(f) 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.

#### **(g) Shingles**

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

## **GUTTERS**

Rusted or poorly installed gutters are common problems for the home buyer. In some suburbs, Architect Centre 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 patched by appropriate tapes or silicone sealants from hardware stores.

Indications of more disastrous guttering faults are stains around windows, sometimes down the walls and even on the ceilings, in the case of flat roofs. 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 towards the downpipe may be insufficient. Blocked downpipes and drains may also lead to water overflowing gutters. Or a guttering overflow may occur during a downpour because the large volume of water can't drain away fast enough. This occurs most often in older houses, or after an extension has been added to the house, increasing the roof size and thus the total run-off. An 'overloaded' roof drainage system will need more downpipes installed.

Overflow faults are worsened when the outside edge of the spouting is higher than the inside edge, a common installation fault. Problem installations of this kind can often be remedied by loosening the gutter brackets so that the outside edge of the gutter becomes lower than the inside edge. Alternatively, overflow outlets could be drilled into the gutter, below the danger level.

The 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

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timber-rot problems exist as a result. It is also a good idea to check the inside of gutters. Scrape away the dirt and look for signs of ponding, this could indicate that the gutters 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 Zinalume, 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.

PVC gutters are a relatively new development and could also be worth considering.

### MAINTENANCE OF ROOFS AND GUTTERS

All roofing and guttering will deteriorate in time. Metal surfaces can deteriorate very quickly if not looked after. A seemingly 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.

It is recommended that you cut back overhanging trees and place mesh over gutters to extend their working lives. Many modern gutters are designed to shed leaves more effectively.

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, Architect Centre recommends that all home owners check their roofs and guttering after such events, and on a regular basis. Deterioration faults can then be detected at an early stage so that repairs can be undertaken before more costly damage occurs.

Remember that the best way of avoiding expensive problems is to be aware of them before you purchase your house. Architect Centre has carried out thousands of home inspections for home owners and prospective buyers, to help them make a realistic appraisal of the property before buying, renovating or repairing.