

What can go wrong with roofs

Roofs carry out a critical function – they are the umbrella protecting the building from the outside environment with a particular focus on protection from water. Inspections carried out on roofs have identified a range of potential issues.

PROBLEMS can often be traced to design issues, installation issues or owner and maintenance issues among others.

Design issues

These include:

- generally poor design or detailing
- lack of sufficient roof slope/drainage leading to ponding of water on the roof and leaks
- corrosion or premature failure as a result of incorrect materials specified for the environment
- wind damage where:
 - recommended span for profile or substrate has been exceeded
 - material is the wrong thickness or grade
- insufficient drainage capacity – rainfall intensity not correctly allowed for
- deflection or sag as a result of undersized support members or the recommended spans being exceeded
- inadequate allowances for thermal movement, which can result in:
 - excessive noise
 - tearing of roofing at fixings
 - buckling of metal roofs and stressing of roof membranes.

Installation issues

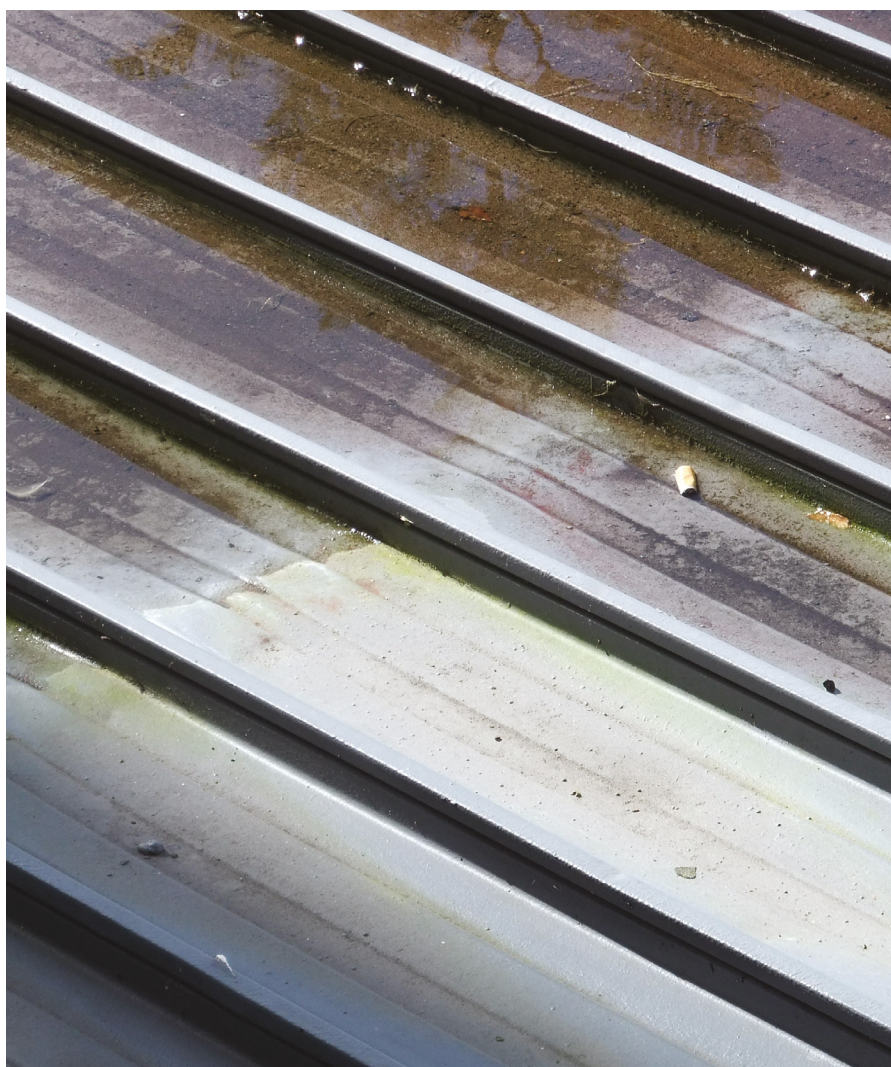
These include:

- wind damage where insufficient or incorrect fixings or adhesive used
- leaks from poor installation practices
- generally poor installation quality.

Owner/maintenance issues

These include:

- damage, deflection or sag to the roofing from excessive foot traffic or materials being stored on the roof



Exceeding recommended spans can result in damage.

- damage, deflection or sag from adding roof-mounted equipment where the weight may not have been allowed for or the installation was not effectively waterproofed where connected to the roof
- punctures from lack of care or protection to a membrane roofing system
- improper repairs such as repairing a leak with materials that are not compatible with the roof cladding
- moisture within the roof space – the

moisture typically comes from occupied areas below or even the subfloor (via wall cavities), but it may also result from wet materials or activities in the roof space itself

- corrosion as a result of damage to corrosion-resistant finishes, trapped moisture or dirt in crevices and the like
- moss and lichen growth, typically from a lack of regular maintenance
- leaks resulting from:
 - unrepaired cladding damage
 - blocked drainage
 - missing fixings not replaced
- general lack of maintenance.

Other issues

These include:

- end of serviceable life – all materials have a lifespan, and replacement should be programmed into maintenance
- wind damage where design wind speeds have been exceeded
- blocked drainage from a rare hail or snow event
- overloaded gutter and outlets from an extraordinary rainfall event
- deflection or sag as a result of the roof being overloaded by a rare snowfall
- UV degradation such as damage to the cap layer of bitumens, fading of the finished surface
- stress in membranes at substrate joints and intersections
- building movement resulting in cracked tiles or mortar, stressing of membranes
- abrasion of the roof surface by sand or overhanging branches
- vandalism and unauthorised access damaging the roof cladding
- splitting and cracking of timber shingles/shakes due to weather exposure
- integration with other building materials.



Tiles that are not appropriately fixed can be easily dislodged in an earthquake or by wind.



A relatively simple roof made complex by a wall cladding junction, a downpipe discharging from the roof above, penetrations, a satellite dish and multiple rooflights.



Internal gutters can deteriorate faster than the rest of the roofing and are difficult to repair.



Roof-mounted items like solar panels must have a gap under them. If fitted tight to the roof, this may accelerate deterioration of the roofing under them as the surface cannot be accessed for maintenance.

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ISSN 2463-672X

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