OUT OF SIGHT BUT FRONT OF MIND

The selection and maintenance of building elements and materials is one situation where out of sight should not be out of mind. In many situations, corrosion and deterioration may be occurring that is difficult to detect or see.

By Trevor Pringle, BRANZ Principal Writer (ANZIA)

Reports on leaking buildings commonly mention that the homeowner, and sometimes professionals, saw no obvious signs of a problem. This is also true with corrosion of metals where the problem is hidden from view until it is too late to do anything about it except replace the item, if it is accessible.

Hidden corrosion
A typical situation that occurs outside is the corrosion and deterioration of parts of nail and bolt fixings embedded in H3.2 and above treated timber while the visible parts of the fixing appear to be in sound condition.

Metals may also corrode from the underside where the surface is exposed to the environment, such as the end of a sheet cantilevered past the fascia that can’t be readily cleaned or rainwashed. The situation will be made worse where water lies in poorly installed gutters providing a ready supply of moisture to activate the corrosion.

Corrosion also occurs from the underside where unpainted metal roofing is lapped and moisture becomes trapped in those lapped areas or if the underside is continually exposed to moisture from condensation.

Risky design areas
Corrosion may not be readily identified in some parts of a building because of the location of the component and, generally, the difficulty gaining access to inspect it. Designers need to be quite specific in the materials they select in these areas, ensuring the materials chosen can resist the level of corrosion risk present. These situations include:

- Joist hangers and fixings under a timber deck that is close to the ground – often hangers are only zinc plated and are not generally suitable for use with H3.2 and higher treated timber
- Inside metal gutters, particularly those with no fall to the outlet
- Spandrel panel fixing bolts located between the back of the panel and any wall framing
- Contact face between a nail plate and H3.2 and above treated timber used externally
- Where dirt accumulates, is not easily seen from the ground and lacks rainwashing or regular cleaning – typical situations are window head flashings located up under the eaves and portions of a roof tucked under an eaves overhang
- Galvanised brick veneer ties
- Exposed screw shanks between the roofing crest and the purlin in moist roof spaces
- Roofing tile clips, particularly in clay and concrete tile roofs installed without roof underlay
- Metal flashings or low slope roofing under a layer of leaves or dirt
- Metal drip or safety trays installed under hot water cylinders and header tanks where overflow water is not draining
- Within (old) galvanised steel water pipes
- Flues and flue liners for wood burners and gas appliances.

Water entry spots
Damage can be unseen when water gets into the building envelope as a result of:

- A concealed fascia gutter system overflowing into a soffit and accumulating above the soffit lining
- The cavity drainage in a brick veneer cladding being blocked or obstructed, for example, by mortar dropping
- Capillary water rise through open cladding joints
cracked concrete or clay roof tiles
sealant failure in lapped flashing joints – this may also lead to hidden corrosion or deterioration of the flashing
lifting of the soft or lead edge to flashings
blocked or partially blocked outlets from gutters (inspecting and cleaning gutters on 2-storey buildings can be difficult).

Other deterioration to watch
Besides the deterioration of timber within a wet wall or balcony assembly, other building elements may be deteriorating out of sight.

WOOD
Wood and wood-based products can be affected by:
borer in damp timbers, particularly subfloor
moisture getting into the mortised joints of window frames, usually through the end grain – the rot only becomes visible when it is too late
water seepage around the sealed edge of a bath or shower affecting linings, flooring and wall framing
pipes or plumbing fittings leaking and the moisture remaining within the wall, leading to toxic moulds when that moisture is present.
wet ground conditions when H4-treated timber, such as a low retaining wall, is embedded into the ground
failure of a waterproofing system applied under a tiled finish.

BRICK VENEER
Particular to brick veneer clad buildings is the problem where moisture from the subfloor space migrates via a brick veneer cavity into the roof space, resulting in excessive dampness. This can also occur where a 20 mm E2/AS1 type drained and vented cavity is not closed off from roof and eave spaces.

PLASTICS
Gutters, cladding and translucent sheets become more brittle over time due to UV exposure, increasing the risk of damage.

CLADDINGS
A cladding will deteriorate more quickly where a deck bearer or stringer has been attached to the wall and has trapped moisture – spacers should be installed to allow a drainage gap.

WRAP, FOIL AND WIRING
Other deterioration that will not be readily noticeable can include:
black building paper due to moisture within the wall or roof
wiring, particularly if old wiring or early TPS is still present and the insulation has degraded
underfloor foil being damaged by wind or tarnished to a level that destroys its insulation value.

WATER, DRAINS AND WASTE
Beside the environmental cost from increased water usage and disposal loads where water is being wasted, for example, an overflowing cistern or a failed pressure relief valve on a hot water cylinder, there are also undetected problems such as:
drains being progressively blocked by tree roots
build-up of sediments in an on-site sewage dispersal field.