

TEN THINGS NOT TO DO IN HERITAGE BUILDINGS

Ten common mistakes in repairing and caring for old buildings can cause more problems than they solve. Though unintentional, the resulting damage can be substantial, difficult and expensive to rectify, and in some cases may lead to permanent disfigurement.

1. Don't sandblast masonry (or timber) Sandblasting is often used to remove dirt, paint, plaster and render from masonry surfaces and also paint from timber. It is quick, relatively cheap and very damaging! It will remove the outer surfaces of bricks and stones, surfaces that may be critical to their durability. Mortar joints can be deeply eroded, and the combined damage to bricks and mortar can lead to excessive water penetration through walls. Much of the damage done is due to the very high water pressures used. The use of apparently-benign sodium bicarbonate as an abrasive (*sodablasting*) can be double trouble, due to the damage caused by the residue of salt in the walls, in addition to the abrasive action.

2. Don't replace a timber floor with poured-on-fill concrete One of the worst mistakes of renovators is to remove a ventilated timber floor and replace it with a concrete slab poured on sand or other fill. The concrete and its associated damp-proof membrane prevent evaporation, and the soil moisture rising beneath the building becomes focused on the walls. Rising damp problems are almost guaranteed, whereas before there may have been no significant damp, even though the walls may have lacked effective damp-proof courses. External concrete paving against old walls will compound the problem.

3. Don't install a damp-proof course without also taking the salt out Rising damp carries soluble salts up into walls. Most decay of masonry materials is due to salts which form crystals in the pores of the material and cause fretting and loss of surfaces as the crystals grow with periodic wetting and drying. Once there is enough salt in a wall, damage due to crystal growth can happen simply from changes in humidity - and a dampcourse will not prevent that. Successful treatment of salt attack and rising damp (*salt damp*) requires dealing with the salt, as well as the damp. Sacrificial mortars and plasters (which need to be replaced as they fail) are used to manage salt attack and to prevent it damaging adjacent masonry. Salts can be extracted by captive-head washing and absorbent poultices.

4. Don't repoint lime mortar joints with cement Replacing lime mortar with lime mortar is correct from a technical as well as a philosophical point of view. Mortars should always be weaker than the surrounding bricks or stones, so that any structural cracking occurs through the joints, rather than the masonry units. Mortars should also behave sacrificially in relation to the masonry, they should decay first and so protect the adjacent masonry. Further, permeable mortars have an important role in the way a wall dries out after rain. For each of these reasons, lime mortars should always be repaired with lime, rather than with cement which is too strong, and too impermeable.

5. Don't seal walls with water repellents or modern impervious paints Masonry walls 'breathe' as the air in their pores expands and contracts with changes in temperature. Moisture moves in and out of walls with natural changes in temperature and humidity. Attempts to 'seal' or 'protect' walls with water repellent coatings or modern impervious paints risk trapping moisture behind the coatings, which may lead to damage to the masonry. The problem is made much worse when the masonry contains salt, and the older the wall, the more salt it is likely to contain. Salt blocks pores in the coatings and prevents breathing, leading to failure of the coatings and increased damage to the masonry that you're trying to protect. Acrylic paints have some breathing capacity (*vapour permeability*), yet they perform poorly when salt is present, they should not be used on valuable old walls. Use traditional lime washes instead.

6. Don't mulch walls and block underfloor ventilation Garden beds look nice against walls and the plants hide the decay of brickwork, that they are helping create! Heavy mulching may be good for the garden but is bad for walls, whether masonry or timber. Watering of garden beds increases the rising damp 'stress' on masonry walls, while salts in the soils and in fertiliser lead to inevitable salt attack on the masonry. Floor and wall timbers are at risk from fungal rot, borers and termites, due to the elevated moisture levels in the wood. Higher moisture levels may be caused by direct contact of garden beds with walls, and also by overspray from watering. Keep garden beds and plantings a minimum of 300 mm from walls and unblock air vents which are designed to allow ventilation so that the humidity of the underfloor spaces is kept reasonably low.

7. Don't mix dissimilar metals on the roof drainage system When pairs of dissimilar metals like copper and zinc are in electrical contact in water, the less noble metal (the zinc) corrodes rapidly and in doing so protects the more noble (the copper). This principle of galvanic corrosion is used to protect steel by coating it with zinc in a process known as galvanising. Mixing metals on a roof risks causing galvanic corrosion, even though the metals may not be in direct contact. For example, if a copper roof has galvanised (i.e. zinc-coated) steel gutters, water flowing over the more noble copper will lead to rapid corrosion of the zinc coating and then the steel of the gutters. Roofs and their drainage systems should preferably be made of a single metal type throughout.

8. Don't coat valuable timber floors with polyurethane Old timber floors were left bare, oiled, waxed, stained, or covered with rugs or carpet. Current taste often favours a hard gloss finish produced by tough durable coatings like polyurethanes which soak into the tongue and groove joints and glue adjacent boards together. The result is a tightly sealed floor (at least on the top surface) which stays tightly sealed until the next big dry spell, when the boards shrink. Under normal circumstances the shrinkage would be taken up by tongues moving slightly in the grooves. But now that the tongues are firmly glued into the grooves, the weakest points are the upper parts of the groove, the ones that have been sanded down - and so the boards split a few millimetres in from their edges, through the groove. Then, after 15 or 20 years when the polyurethane finish is worn through and needs redoing, the floor is sanded down (again) and the floor boards get progressively thinner and thinner until the tops of the grooves are lost -leaving tongues showing and the floor has to be replaced.

9. Don't remove complete elements just because they're a bit damaged Repair only the section that is damaged. For example, if the bottom of a verandah post has rotted, then replace only a section of it, scarfing the new piece in with traditional joinery details. The same approach applies to an area of failed plaster on a wall - don't replace the plaster from the whole wall just because it sounds a bit drummy in places. Patch repair only the area that really needs it. If done well the new patch will help stabilise the rest of the plaster. These cases are examples of a key maxim in building conservation - *do as much as necessary but as little as possible*, so that valuable existing fabric can be retained.

10. Don't forget routine maintenance of roofs, gutters and drains This really should be the first one on the list, as failure to do basic maintenance is the main cause of much damage to old buildings. Keeping roof drainage systems working effectively is critical to maintaining a building in good condition. Regular inspections should be made of roofs, flashings, gutters, downpipes and drains. Get inside the roof space to check for leaks after heavy rains, and go outside *during* the heavy rain to look for blocked downpipes and overflowing gutters. Clean gutters regularly and adjust the cleaning regime to suit the season and the location of trees close to the building. Ensure that roof water is taken well away from the base of walls. Clear sumps and storm water drains regularly.

(Sources: David Young conservation training notes, Heritage Network Seminars, 2010)