RIC RESTORATION INDUSTRY CONSULTANTS

If in Doubt, Don't Just Rip it Out: Assessing Salvageability of Water-affected Building Materials

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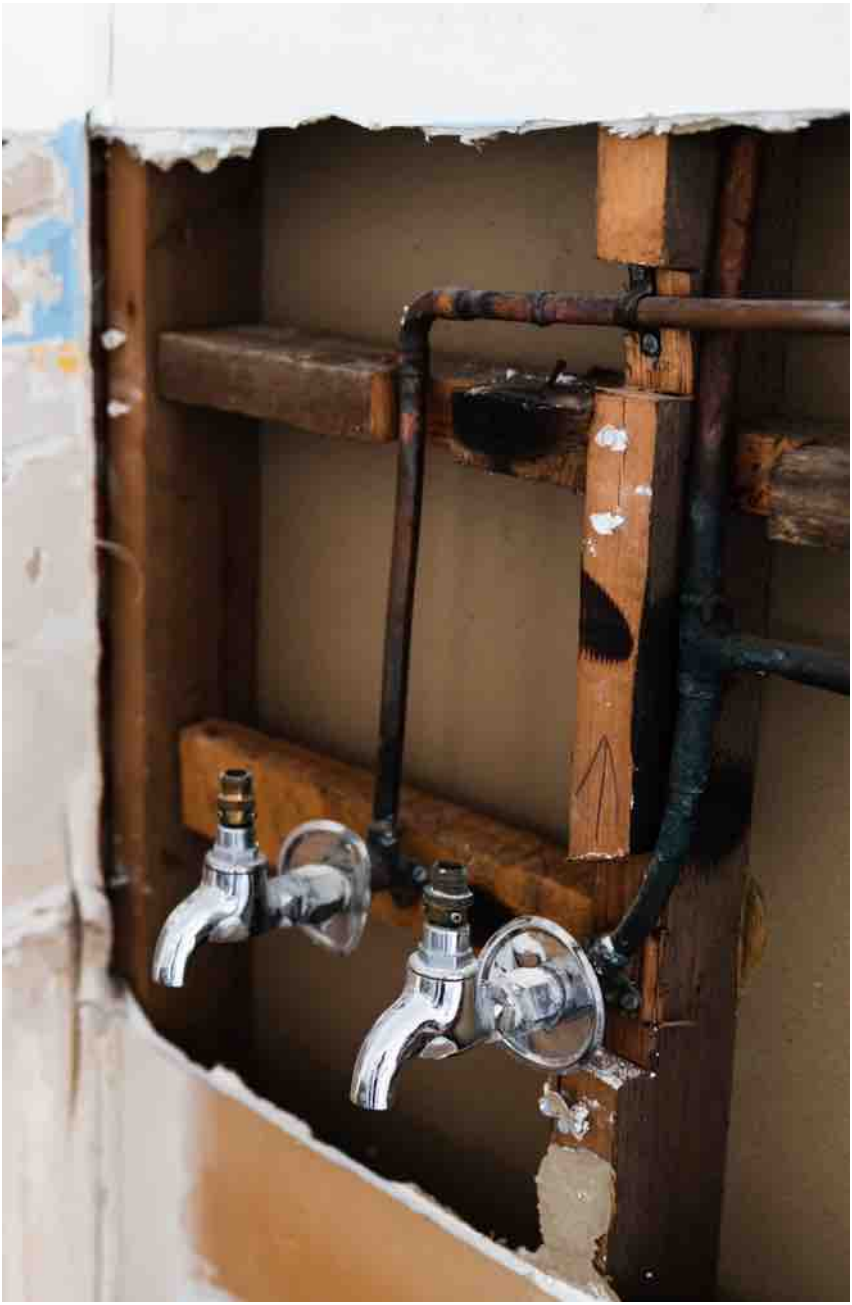


Intended audience

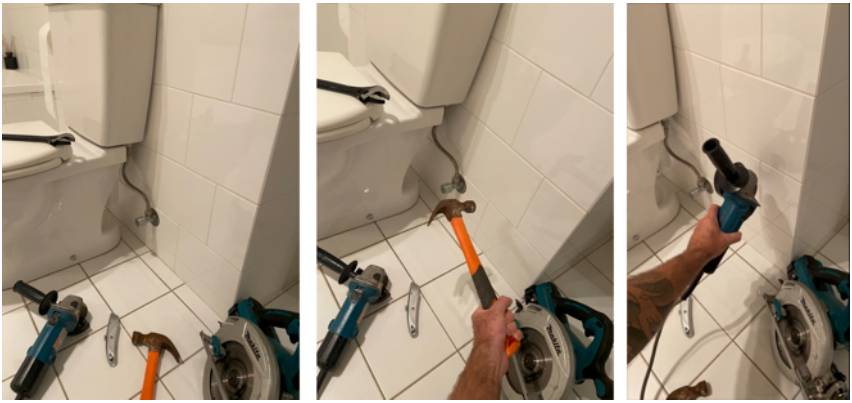
Restoration industry: property restorers and insurers

Purpose of document

This document explains the range of considerations that should form an essential part of the decision process and risk mitigation matrix in evaluating the salvageability or "restorability" of building materials affected by water damage and any resultant microbial contamination.

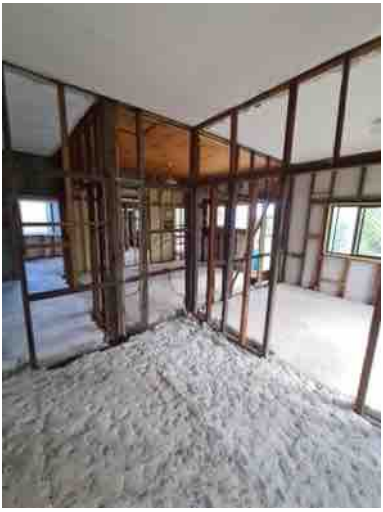
General considerations

In the context of the property restoration industry for buildings that have been affected by water ingress, especially during large flood events, there has often been blanket removal of certain water-affected materials.



The removal of these materials seems to have been based on limiting the risk of contamination or recontamination from materials that, by virtue of their geometry, position, porosity and other properties, cannot be economically or easily returned to an acceptable pre-event condition.

Whilst the decision to remove and dispose of highly porous water affected/damaged materials such as plasterboard, insulation and some cabinetry that are readily determinable as unsalvageable, there are some materials including floor tiles, bracing sheets, particle board flooring, etc. that may not require removal in every instance of water damage.



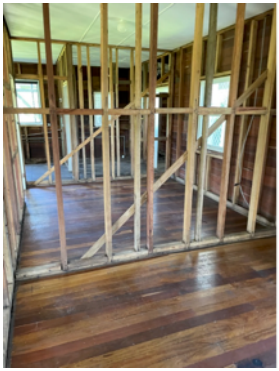
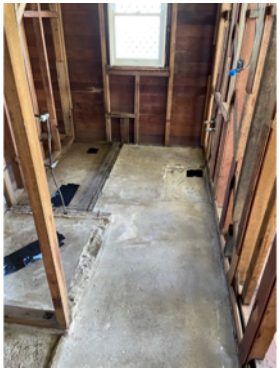
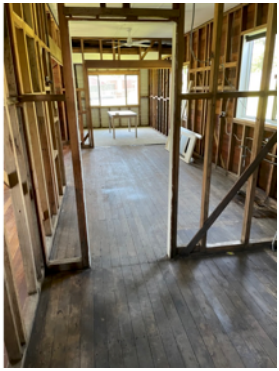
Before the removal of materials is determined, there needs to be an assessment that the material is not merely water-affected (with signs such as water stains, superficial mould growth, flood debris or elevated moisture content), but that it is unsalvageable in that it is actually damaged or contaminated to the point at which restoration or remediation would not likely provide a satisfactory result or not be economically feasible.

With semi-porous materials such as concrete and timber framing, it should be noted that there is no need to return the building to an "as-new" condition since there will invariably be some form of microbial loading on building materials over the elapsed time from construction till the occurrence of the insured event.

On a further note, even a new building does not necessarily present all materials in a clean or "hygienic" condition.

Exposure of cellulose-based building materials (timber framing, particleboard flooring, bracing ply, etc.) to inclement weather is typical throughout the construction phase before lockup. It follows that a degree of microorganisms on building materials can be considered the reference condition of 'normal microbial ecology' to which materials are restored to after a water ingress event.

What is difficult to ascertain as there has been little to no research conducted (at the time of writing) as to what "normal" levels of pre-existing microbial loadings are on structural elements at the point of construction and throughout the various stages of a building's lifecycle.

With regards to determining salvageability, there are many semi-porous materials affected by water (and even bacteria and mould) that can be economically restored and remediated without the need for removal thus saving time and expense on restoration projects.

Briefly, the pre-qualifying criteria for assessing salvageability are an affirmative answer to the following questions:

1. Is it a 'structural' material?
2. Is the material considered 'contaminated'?
3. Is it considered a semi-porous material — which is defined as a material that absorbs or adsorbs moisture slowly and, if organic, can support microbial growth?

Specific considerations

Following from the prequalification, a risk-weighted approach can be applied to determine salvageability materials. This approach considers:

1. Affectability
2. Restorability
3. Replaceability
4. Availability, and
5. Sustainability

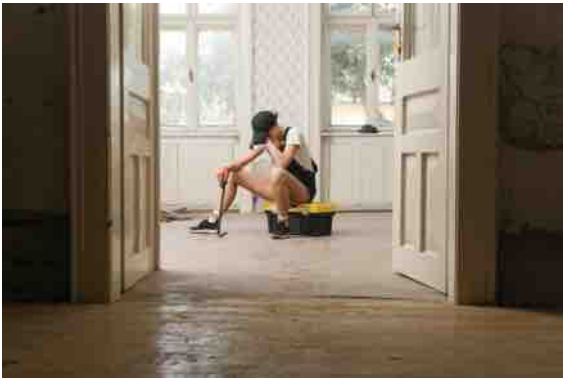
Affectability

After a building has been constructed, some elements, by virtue of their inaccessibility after being constructed over, become much more costly to replace. Further to this, the inaccessibility of these materials may also limit the occupants' exposure risk when

subsequent building works prevent direct pathways for any residual "contamination" (claim or non-claim related) to affect occupants appreciably, compared to background levels.

'Affectability' means the ability of an occupant to be affected by any residual contamination that may not be fully removed by cleaning alone and sanitizing. Just as the correct type of PPE (Personal Protective Equipment) to be used by restorers depends on the anticipated exposure, the likelihood of an occupant being affected by microbial remnants from materials that have been cleaned depends on exposure pathways more so than the presence or absence of the contamination.

To illustrate, resilient materials such as concrete slabs and timber framing, after exposure to floodwater, present a different risk if left exposed, compared to those intended to be concealed under or behind new floor and wall coverings. The risk of any remaining contamination within or on the concrete slab or timber is mitigated by obstructing the pathway where any remaining contamination can affect the occupant.



The Indoor Environmental Professional (IEP) thus needs to consider which pathways remain accessible between contamination and occupant, and to what extent it can affect the occupant, to decide how much risk is presented by restored building elements.

The ANSI/IICRC S500:2021 Standard for Professional Water Damage Restoration (ed. 5) provides the criteria for which the property should be evaluated to once the appropriate cleaning and drying has been undertaken. It states that the "…..structure, systems or contents have been returned to a level that no longer poses a substantial risk from dermal, ingestion, or inhalation exposure."

Restorability

In assessing a material's restorability, it is insufficient to evaluate a material's porosity alone, but also its susceptibility to microbial contamination. Susceptible building materials include those which have the requisite nutrients for fungal growth when in the presence of high humidity or excess moisture.

For example, wall linings can be in the form of plasterboard, MDF (medium density fibreboard) cement sheet or MgO (magnesium oxide) boards. Plasterboard panels are typically paper-faced and highly susceptible to mould growth in humid environments or damp. Cement sheet and MgO boards are both less porous (being denser) and less susceptible (lacking organic material). Under identical conditions, cement sheet and MgO boards will have a better chance of being restored.

The IEP should always evaluate the porosity and susceptibility of a contaminated element when evaluating if the material should be recommended for restoration.

Replaceability

In easily accessible cases, replacement of some materials not only eliminates subsequent contamination risk from the original materials, but can be straightforward, cost-effective and time-saving.

To illustrate, when water is entrapped between the top surface of the flooring and the underside of bottom plate of the wall framing, any resultant contamination on those surfaces is largely inaccessible for effective cleaning. Regardless of any cleaning methods, there will always be some residual contamination that cannot be removed. If the wall is an internal non-loadbearing wall, it can be straightforward to remove the timber frame bottom plate, clean the floor surface, conduct any required drying (when needed), replace the bottom plate and reinstate the rest of the materials.

However, if the same were to occur in an external loadbearing wall with provisions for structural members (bracing, tie downs/brackets for roof/floor loads), weather-proofing (wall sarking, drained cavities) and/or condensation (vapour permeable pliable building membranes), the affected timber framing becomes far more complex to replace. Although replacement of the bottom plate may remove the risk of contamination from this source, it exposes all the other systems to compromise – structural, weatherproofing and condensation.

When a water-damaged building element is a component of other complex systems, the additional risk of replacing it, and thus compromising those systems, outweighs the mitigated risks of retaining materials must be considered.

Availability

When a scope of works involves a complex replacement strategy, it can result in delayed project completion due to material sourcing issues.

The situation has become particularly serious throughout Australia post COVID–19, with a considerable number of builder insolvencies (about 10 builder insolvencies per week in Victoria alone) arising from building material price hikes and supply chain disruptions. For example, laminated veneer lumber (LVL) has an approximate waiting period of 16 weeks (ABC News, 2022).

When an overly cautious or overly risk adverse approach is taken that demands extensive replacement, this might leave the insurer's builder unable to proceed with the rebuild in a timely manner, and the insured out of their home for much longer than anticipated. As such, those making these determinations should be cognizant if materials being called up for replacement can be sourced in a timely manner.

Sustainability

Construction and demolition accounts for about 44% of Australia's total waste (Department of Agriculture, Water and the Environment, 2020). Building materials also have a high embodied energy and carbon. Although sustainability may not be at the forefront of making determinations on salvageability, it is a worthwhile consideration as many insurers and local government have waste reduction policies.

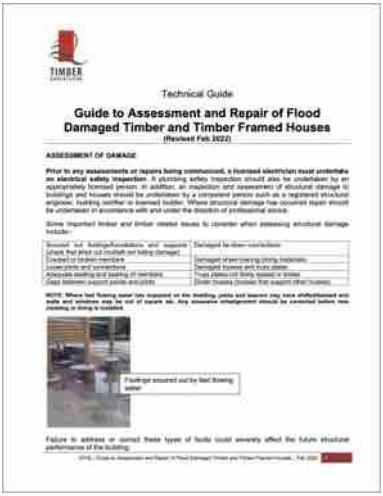
Conclusion and limitations of document

This document is intended to increase awareness around the salvageability of building materials in context with insurance claim related property restoration. It explains why the indiscriminate disposal of water-affected materials can be inappropriate and how claim related contamination cannot be the sole criteria for determining whether a material should be discarded.

This document describes the range of considerations that accounts for whether building elements should be restored and retained or removed and disposed. Even when something may be salvageable, it may not be practical or cost-efficient to restore it. A nuanced and qualified approach is warranted to ascertain the risk weighting of each factor evaluated on a case-by-case basis.

This document has largely been written in the context of microbial contamination. There are other considerations such as fungal decay of structural timber that should be separately considered. See for example Guide to Assessment and Repair of Flood Damaged Timber and Timber Framed Houses (Timber QLD, 2022 on the QBCC website).

For more information regarding the services that Restoration Industry Consultants can provide in assisting with decisions regarding salvageability of materials or general queries on restoration and remediation, please contact us on 1300 376 666 or info@callricfirst.com.



Technical Guide

Guide to Assessment and Repair of Flood Damaged Timber and Timber Framed Houses

(Revised Feb 2022)

ASSESSMENT OF DAMAGE

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