



Assessing and remediating water damage to plasterboard linings

The information offered in this bulletin is intended to assist with the assessment and remediation of gypsum plasterboard linings that have been exposed to potable, grey, waste, or flood water.

Whether from a leaking or burst pipe, drain, overflowing grey waste water or from widespread catastrophic regional flooding, the damage caused to your house or building by water can be an extremely traumatizing event. The ability of gypsum plasterboard linings to deliver and retain their performance depends on dry conditions of use. Plasterboard linings must be protected from moisture in accordance with NZ Building Code Clauses E2 and E3, relevant technical literature, and associated verification such as BRANZ Appraisals.

ESSENTIAL READING

Before attempting assessment or repairs, put safety first and isolate the affected area at the mains electricity board, or turn off the mains supply to the entire building. Call your registered electrician if necessary to do this.

Following widespread flooding, it may not be safe to enter the building until given the green light by the emergency services or local authority.

Consult your insurance assessor or Loss Adjuster to seek advice and/or approval before proceeding with clean up or attempting repairs.

This Information Bulletin deals specifically with assessing and remediating gypsum plasterboard linings. For more comprehensive information, including managing buildings following the 2023 North Island floods, the following publications and websites provide updates and essential reading.

- MBIE <https://www.building.govt.nz/managing-buildings/managing-buildings-in-an-emergency/north-island-severe-weather-events-2023/>
- BRANZ Bulletin BU666 (2021) 'Restoring a Home after Flood damage'. Free download from the BRANZ website <https://www.branz.co.nz/pubs/bulletins/bu666/>
- GIB® Site Guide www.gib.co.nz/site-guide-and-install/

ASSESSING WATER DAMAGE TO PLASTERBOARD LININGS

Gypsum plasterboard can be exposed to water due to several causes, such as incorrect storage, inadequate weather protection during or post installation, plumbing leaks, or from more widespread flooding.

When gypsum plasterboard has been exposed to water for extended periods it may need to be replaced depending on the source of the moisture and the subsequent condition of the board.

Gypsum plasterboard temporarily exposed to clean potable water, such as from a temporary plumbing leak, can sometimes be left to dry and will in most cases recover its original properties once fully dried. However, when the face and back cardboard liners (PLB or Plaster Liner Boards) become saturated, the board will lose most of its tensile and bending strength. When plasterboard is impacted when wet, it is easily damaged. Plasterboard installed in a horizontal orientation when water spillage occurred, such as a ceiling lining, is likely to sag under the weight of

ponding water, self-weight, and any wet insulation material, and replacement will most likely be required.

If the framing cavity contains fibrous insulation material, and this has also become wet, then plasterboard linings must be removed to allow the cavity and insulation material to dry out. Remove and dry or replace insulation material and reinstall only when the framing has fully dried out. Lining reinstatement then follows the procedure outlined for contaminated water damage below.

Gypsum plasterboard that has been exposed to grey, waste or flood water containing contaminants, is not salvageable, and those parts that have been submerged, or have soaked up water, must be replaced. As a minimum, remove and replace any wet plasterboard on walls to a minimum of 300 mm above the high-water line. If this 'replacement line' is less than 1200 mm from floor level, then ideally removal and replacement should allow for installation of a full horizontally fixed 1200 mm wide sheet. Note that a 1350 mm sheet width is also available in 10 and 13mm GIB® Standard, 10 mm GIB Aqualine®, and 10 mm GIB Braceline® / GIB Noiseline®.

DRAINING AND DRYING

The following are general recommendations. For further detail see 'ESSENTIAL READING'.

- Identify and eliminate sources of water entry
- Remove standing water
- Drain any freestanding water from wall and ceiling cavities (for walls cut a hole in each cavity between the studs just above the bottom plate). Wet ceilings can be dangerous due to the weight or volume of water that can be held. Start by driving a sharp nail into a broom handle and carefully push it into the edge of the ceiling areas. DON'T start this process at the center of any wet ceiling areas that appear to have 'bellied' as these may collapse. As the water drains out then progressively punch nail holes closer to the center of the ceiling.
- Remove all soaked and/or dirty materials including wet wall coverings and carpet
- Remove defective plasterboard

- Remove wet cavity insulation
- Open cupboards and doors between rooms
- Note that heating without adequate ventilation is not always effective, particularly when gas fired heaters are used

After cleaning surfaces, ventilate the building until it is completely dry (this could take several weeks or months, depending on environmental conditions such as humidity and temperature). When the outdoor weather permits, open doors and windows and use fans to improve air movement. Do not attempt to replace or repair gypsum plasterboard linings until any underlying timber framing has reached a moisture content of 18% or less, this should be assessed using moisture measurements taken by a trained user from multiple points in the framing and including those more likely to hold moisture such as base plates and junctions. Also check that the framing does not show any signs of damage such as fastener corrosion, rot, or mould. Note that most types of mould and mildew survive in a moist environment.

REPAIR

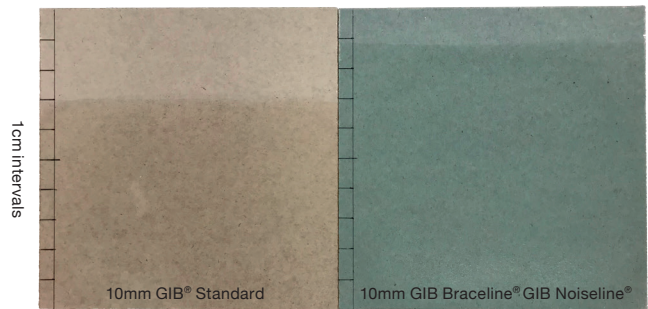
The correct repair strategy will depend on the performance function of the gypsum plasterboard linings. If available, check consented building plans to identify bracing, fire and/or noise control applications. If this information is not readily available, such as for older homes, a conservative approach is recommended.

Repairs must ensure that building performance is at least the same as it was prior to the flooding, and all work must be carried out in accordance with the requirements of the Building Code. Some work may require a building consent, check with your local Council.

Different GIB® plasterboard lining types can be identified by face paper colour. After lining removal this may be visible behind tapered joint compound or around the tapered edge. The back paper is 'buff' for most GIB® lining types and does not permit similar identification by colour. However, printing on the back of the board may be visible and show the lining type. Another way to simply identify lining type is by board weight. For

example, at over 9 kg/m² 10 mm GIB Braceline® is much heavier than 10 mm GIB® Standard which weighs in at around 7 kg/m². This equates to about 90 and 70 grams respectively for a 100 x 100mm sample.

Without scales, another simple method to determine board weight is to cut a board sample, hold it lightly and let it freely sink vertically into a bucket of water. The % submerged gives a good indication of 10mm board weight. The example shows 10mm GIB® Standard and GIB Braceline® at approximately 7 and 9 kg/m² respectively. For other thicknesses (t in mm) use $t \times \% \text{ submerged} / 100$ to estimate the board weight in kg/m².



Approximately 70% submerged for the 10mm GIB® Standard and approximately 90% submerged for the 10mm GIB Braceline® GIB Noiseline®.

REPAIR STRATEGIES DEPEND ON PERFORMANCE REQUIREMENTS

Common to all (before installing replacement linings)

Remove damaged linings below the 'high-water plus 300mm' replacement line and follow the draining and drying recommendations before starting repairs. When removing linings, use a spirit level and straight edge to ensure board is cut in a tidy horizontal line. Use a gypsum plasterboard rasp to smooth the cut edge to ensure a touch fit joint is created between the existing and replacement linings.



General applications

Where no specific performance is required, the best option is to install 300mm wide gypsum plasterboard back-blocks behind the horizontal joint between studs. Use GIB-Cove® Bond for back-blocking. Do not use conventional solvent or water-based adhesives. See the GIB® Site Guide for back-blocking details. Check fastener holes of the removed board and fix at the same or at no more than 300mm centres to perimeter framing and at sheet joints. Where the replacement lining exceeds 300mm in height use wallboard adhesive at 300mm centres to intermediate studs.



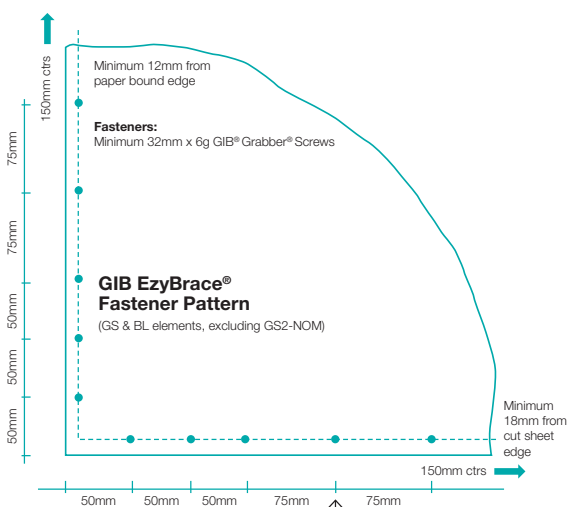
Wet area applications

Wet area applications can be treated as for general applications above, unless behind tiled areas or areas otherwise requiring a waterproof membrane. Tiled areas may require closer fastener centres, and reinstatement of the waterproof membrane may also be required to ensure continuity is maintained. After removal of tiles, vinyl or acrylic liners, the best option will most likely be full replacement. For details see 'GIB® Wet Area Systems, 2021'.

Bracing applications

Identify bracing applications from building plans, board type used, previous fastener centres, or additional hardware in the framing cavity, such as stud-to-bottom-plate straps or brackets such as the GIB Handibrac®. If in doubt, assume a bracing application and use the same board type as the existing lining. Proceed with back-blocking as outlined for general applications and fix the replacement lining in the GIB EzyBrace® fastener pattern. Note that the minimum part sheet replacement in a bracing element is 300mm. For details see 'GIB EzyBrace® Systems, 2016'.

Consider installation of temporary bracing if gypsum plasterboard has been used for bracing, and a substantial area of wall linings is water-damaged and needs to be replaced.

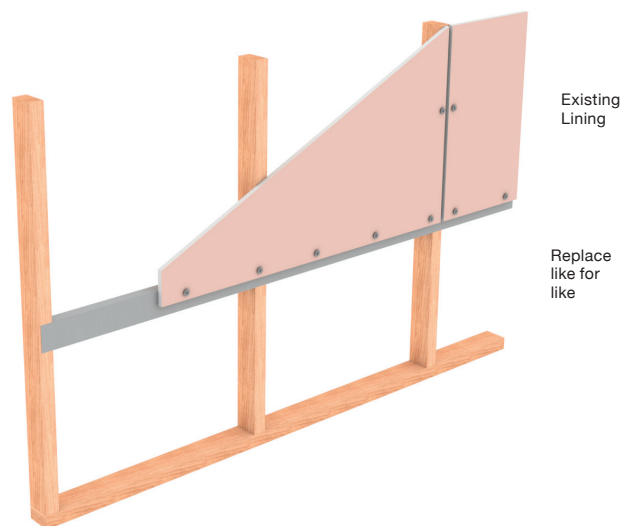


Note: For panels between 400mm and 450mm place this fastener centrally

Fire-rated applications

Applications requiring a Fire Resistance Rating (FRR) can be identified from building plans, board type, or layers used. If unsure, check with your local authority or competent expert. For residential applications FRRs commonly apply to inter-tenancy walls, or external walls close to a property boundary.

During fire-resistance testing gypsum plasterboard gradually degrades. Back-blocking which is not independently supported adds weight to linings which can cause earlier failure in a fire test. For applications requiring an FRR, install solid nogging, supported by framing, behind the horizontal sheet joint. Use full framing depth timber noggs with a minimum width of 45mm, or 70x35mm timber noggs on edge. Another simple method is to install noggs using nominally 64x30x0.5mm metal channels. The channel legs facing the cavity are removed where the channel crosses a stud. The sheet joint is formed centrally on the noggs. Fix the appropriate replacement lining as detailed for the relevant specification, including along noggs. For details see 'GIB® Fire Rated Systems, 2018'.



Noise control applications

Noise control applications often also require an FRR, and repair of single layers follows the method outlined for fire-rated applications.

Noise control systems commonly have double layers on one or both sides of the frame, and their repair strategy will depend on the required FRR and system specification details. Inner and outer layers need to be cut at different heights to ensure joint overlap with replacement linings. A minimum lap of 150mm is recommended. Back-blocking of the inner layer may or may not be required depending on the required FRR as sometimes the second layer adds mass for noise control and is not critical for the FRR. Double layers can also be fixed to furring channels or resilient rails. Given the many possible variations, double layer fire and noise control applications are best assessed on a case-by-case basis.

Another common inter-tenancy noise control specification involves GIB Barrierline® installed between gypsum plasterboard lined apartment frames.

Remediation options are best determined on a project specific basis, and depend on the flood-water contaminants, and the condition of the GIB Barrierline® and metal framing after drying.

Contact the GIB® Helpline for assistance.

Common to all (finishing)

Adjacent surfaces must be clean and free of paint or wallpaper. Tape and stop the sheet joint conventionally using two coats of setting compound, such as GIB Tradeset®. Once dry, topcoat with an air-drying compound such as GIB Plus 4®. In some cases, and depending on the required quality of finish, it may be preferred to skim coat the entire wall to even out the texture and porosity of the existing and replacement linings. Details on joint taping, stopping, finishing, and skim coating can be found in the GIB® Site Guide.

When a replacement sheet is installed next to an earlier painted sheet, finishing is more complicated. Remove any dirt from the old lining with diluted detergent, and dry well. Exposed plaster in the old lining near the joint can be repaired with a setting compound like GIB Tradeset®, scraped to a smooth finish. Scuff the painted side. Seal the entire area with a pigmented sealer if surface imperfections such as protruding fibres exist. Use an air-drying compound to stop the joint between the existing and replacement linings (setting compounds like GIB Tradeset® do not stick well to painted surfaces). Sand the entire area, skim coat, and when dry sand again and paint.