

WHAT TO DO WHEN DISASTER STRIKES YOUR PROPERTY



**David Kelly B.Eng, Master Builder
With Greg Keane**

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Foreword

When devastating flood waters descended on Queensland and Northern New South Wales in early January 2011, it was clear that it was going to be a tough year for many Australians. The devastation to property was significant and the interruption to hundreds of thousands of lives was profound. But the loss of life and the psychological damage inflicted by such events is an enduring legacy of these natural disasters.

The response of average Australians to the events shown so graphically on television screens around Australia (and around the world) is a positive outcome of these tragic events. The 'mud army' worked tremendously hard to assist in the initial cleanup and the response of all Australia (and the world) was amazing and included donations of money, goods and services.

I agreed to assist in the building recovery work in Brisbane and have been involved in over 70 projects since February 2011. During the process, I have met some fantastic characters and made new friends. However, there is still much to do as there are still many families that have not been resettled back into their homes. Sadly for those who did not have adequate insurance coverage, the timing of them being able to get back to normal is uncertain.

During the year it became evident to me that there is a gap in understanding. To address the gap I decided to write this book to provide some basic information for the home owner. It is deliberately non-technical: *a little bit of knowledge can be dangerous*, as the saying goes but I trust that it can be a useful publication. It's designed to provide working knowledge so that the affected parties can get moving again.

It is important to seek out reliable and professional assistance when the rebuilding work happens, but my hope is that this book will provide a valuable step in the right direction.

Dave Kelly

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Property Development Mastery

dave@propdeveloper.com.au

www.propdeveloper.com.au

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Introduction

We have created our Building Repair Guide to:

- Help home owners understand the process of property recovery after a flood.
- Provide information that will help you complete your building repairs successfully.
- Avoid future problems from incomplete or incorrect building repairs.
- Prevent unnecessary removal of materials when proper treatment could restore the material's safe use.

If you are reading this guide you have most likely had your home inundated by a flood which caused damage to your property. If your property damage is minor, you are one of the lucky ones. If your property damage is severe, be assured that many people have been through this process and have successfully rebuilt their property. Your goal should be a problem-free building repair.

This guide contains important information that will help you to recover your property in a way that will prevent future problems. You need to understand everything that needs to be done, and follow these guidelines or find a licensed building repair contractor who follows these guidelines. You want to put the flood behind you for good, and when you follow these guidelines you can achieve that goal.

Floods happen! You cannot prevent a flood as many floods occur when an area has received extremely heavy rainfall. Many types of flood cannot be predicted and you will have little or no advance warning. If you live near a river or stream that is known to flood routinely, you may have advance warning of possible flooding and may be able to take steps to avoid future flood damage.

The chapters in this Building Repair Guide cover the various areas of your home and what you need to know about flood damage to each of these areas of your property. We strongly recommend you get a home inspection and full assessment of your flood damage to ensure that critical problems are not overlooked.

If you are reading this prior to having suffered a disaster, congratulations! The chapter on 'Before Disaster Strikes' has some valuable advice that can speed your negotiations with your insurer, and prepare yourself in other ways.

I am grateful for having a friend like Greg Keane who has applied his wordly expertise in drafting this book.

My old mate Robert Archer who is a practicing loss adjustor assisted with the insurance sections.

Adam Gregor from effective organics is the best in the business and kindly contributed to the sanitation appendices.

Chapter 1: First Steps

If your home has sustained major damage, contact the State Emergency Services (SES). They may be able to assist you with tarpaulins to prevent further damage and assist with finding temporary accommodation.

1.1 Safety first

Do not re-enter your home unless:

- Flood water has receded and authorities have permitted access back into the area.
- A safety inspection has been carried out by the authorities. This includes the structural integrity of your home.
- Electricity is turned off.
- Gas is turned off.
- Water and sewage services are inspected and safe.

Do not empty pools before the ground water table has lowered. If you empty the pool too soon, it may lift out of the ground as a result of hydrostatic pressure, and cause additional unnecessary damage.

WARNING!

If you ceiling has been inundated do not enter the house. Water will be absorbed into the plaster or gypboard on the ceiling and the ceiling could collapse and injure you.

Find out if any of the materials in your home contain asbestos as you will need to hire specialists to remove the asbestos laden materials.

1.2 If you are insured

If you are insured:

- **Contact** your insurance company straight away and report the damage.
- Keep a **notebook** of the date and time you phoned, who you talked to and a brief record of the conversation that took place.
- Take plenty of **pictures**, inside and outside.
- **Measure and record** the depth of the water damage, but do not risk injury.
- Make any urgent **temporary repairs** to prevent further damage. For example, cover broken windows or other damage to prevent further water entering your home.
- **Keep a record** of your expenditures for emergency repairs and keep receipts.

DO NOT

Employ a contractor until your insurance assessor has inspected the damage and has given you instructions to begin the repairs.

Throw away any damaged property until your insurance inspector has instructed you to do so.

- **Photograph** the perishable food items and discard as soon as possible.
- **List** all items that are **destroyed or damaged**.
- When your insurance inspector arrives, ask for a list of **building repair contractors** and check to make sure of their **licensing**.
- Once you are given the go ahead by your insurance inspector remove all **water-laden materials** that can be removed. For example, furniture, carpets and window coverings.
- Air the structure as much as possible to speed up the drying process.

1.3 If you are not insured

- Engage a **licensed builder** or **building repair specialist** to assess the extent of your damages.
- Check their **qualifications** and get references before hiring them.
- Ask for their **license card** and check with licensing authorities to **ensure that their license is current and appropriate** for the work.
- If you have engaged a **structural engineer** they must be **licensed** with the Board of Professional Engineers. Ask for their license information and check their license. In addition, ask for a list of their previous clients and their phone numbers.
- Ask for a **detailed damage report** so you can get quotes for building repairs.
- Ask if you need to get plans drawn up for your repairs and if so get them drawn and approved by a **Building Certifier**. To get your plans drawn up consult with a building designer. You can then use the plans to get quotes and provide instructions to the builder you choose.
- Ask **how many trades** are required to complete the job.
- If more than one trade is required to complete the job, you can **appoint a licensed builder to supervise** the work and coordinate the various trades.
- You will need an **Owner Building Permit** whether you hire a licensed builder or complete the repairs yourself.
- **Remove all water-laden materials** that can be removed such as furniture, carpets and window coverings.
- **Air the structure** as much as possible to speed the drying process.

1.4 Immediate cleanup

- The personal safety of all occupants and workers in flood-affected buildings is of the utmost importance.
- During the immediate clean-up is when the presence of flood-borne bacteria and other contaminants are at their peak.
- Exposure to these micro organisms can lead to **infections and diseases** that are often fatal and in many cases doctors say that the only effective cure is **prevention**.

*While cleaning up all possible effort must be made to limit the exposure to these risks by **using Personal Protective Equipment (PPE)** in the forms of gloves, P2 respirators, safety glasses, Type 5 (Splash Resistant) disposable coveralls and gum boots.*

- Workers should have **clean fresh water, soap and a hand sanitiser** available to wash any contaminants from their body, particularly before eating.
- A well stocked **first aid kit** is a must. All injuries, even as small as a paper cut, need immediate first aid applied as it only takes one or two bacteria to enter the body via a small wound to cause an infection, which can be fatal.
- All cuts/wounds should be flushed with clean water immediately, have disinfectant and a dressing applied and be presented to the person responsible for the site for a decision on whether further medical treatment is required.
- The best time to **pressure clean the internal and external surfaces** is while the house is still wet from the flood.
- Ensure that the **power is disconnected**. Wear appropriate PPE equipment, and avoid applying bleach or chlorine to items or materials that could be damaged by them.
- It is essential to **dry out the structure as soon as possible** to minimise the damage to the house and stop the formation of mould. The process of drying will also kill most bacteria and micro organisms.

- Professional drying services are the best way to achieve this with the use of Dehumidifiers and Air Movers. Check with your insurer first as these services are expensive and are in high demand after a flood.
- Where plasterboard wall linings have been submerged it is advisable to **make ventilation holes** in these walls as soon as possible to assist the drying process.
- If left intact, waterlogged plasterboard will allow mould infestations to form on the reverse/internal side within 10 - 14 days. The sooner these cavities can be ventilated and allowed to dry the better chance you have of preventing a major mould infestation.

Chapter 2: Rebuilding Process Do's and Don'ts

Understand that the rebuilding process can take several months. To reduce damage and speed up the recovery of your home, begin as soon as the water has receded.

2.1 Hiring the tradesmen

- **Get written quotes** from at least 3 licensed builders or tradesmen.
- Ensure that the quotes **cover all of the repair work** you need to have done.
- Take the time to **check the license details** for all tradesmen to confirm that their license is current and appropriate for the work.
- Get a **written contract**.

DO NOT

Hire tradesmen or contractors that go door-to-door selling services. Their tactics are to force you to make a decision on the spot.

NOTE: In Queensland you have certain protections. One is that when the value of the job is over \$3,300, registration with the BSA is required and the insurance is paid for the project.

It is highly recommended for jobs up to \$3,300 that you get a detailed written quote with a fixed price.

If the job is over \$3,300, get a written contract and read it carefully. Before you sign the contract we advise to **seek legal advice**.

Look for these things in a building repair contract:

- There is a **cooling off period** of 5 business days after the work is completed.
- The total **price is clearly** stated and it is **fixed** price.
- There is a start date and a **completion date**.
- There are **plans and specifications**, and a detailed statement of the work to be done.

- Get a **signed copy of the contract** and an approved Contract Information Statement.
- Make sure all post-contract changes (**variations**) are in **writing, priced and signed**.
- If the work is over \$20,000 the deposit is not to exceed 5% of the total price of the job.
- For smaller jobs the deposit is not to exceed 10% of the total price of the job.
- **Do not pay ahead** of the progress on the job. If you do, you can be exposed to loss if the contractor leaves the area or fails to complete the work.
- The best policy is to **hire a local building repair contractor** with a history of quality work and a fine reputation.

2.2 Building inspections

If your repairs require a Building Certifier approval, make sure that your builder has complied with the necessary inspections or certifications. The contractor must supply you with copies of all of the certificates of inspections received.

2.3 Managing problems

- **If you have problems** during the building repair process or right after the work is finished, **advise the builder or contractor immediately**.
- **Confirm the problem in writing** and give them a reasonable time to respond, such as 2 weeks.
- **Sign and date** the letter and keep a copy.
- If these actions do not solve the problems, contact BSA or your local contractor licensing authority immediately.

2.4 Wait to decorate

- Patience will be of great benefit.
- If you paint and wallpaper too soon you could risk blistering, peeling and mould growth.
- Allow about 3 months before you decorate your home.

Chapter 3: Building Foundations

The purpose of your building foundation is to transfer the weight of your building to the soil. Your foundation is engineered for both total weight and weight distribution.

See *Figure 5: Typical wall and footings types*.

When an area is flooded, homes can be swept off their foundations or moved sideways. The need to repair or rebuild is obvious when the flood damage to your home is this severe.

Even if you do not have extreme flood damage to your home and foundations, it is still **important to have your home inspected to determine if the foundations have been compromised**.

Flood water increases hydrostatic pressure and this can affect a building in several ways; clay soils can swell (Class 'E' sites can swell to 140% of their initial volume) and sands can consolidate and dramatically reduce in volume. Flood water can erode or remove soil that normally surrounds your foundations.

In turn this can compromise the safety of the buildings foundations, resulting in instability and possibly even causing unsafe conditions for your home.

If your home is built on a slope, the rapidly moving flood waters can erode the soil and make the slope unstable, which in turn can make your home unstable.

You cannot assume that your house is safe even when your foundations are intact and your home is still on its foundations.

You will **need to have your foundations inspected** to assess any and consequential problems with the structural integrity of your home.

3.1 Building settlement

Building settlement occurs naturally, with or without a flood. When your home is exposed to flood water, the water saturates and can erode the soil that provides support to your home.

There are **several indications** that your home is damaged from building settlement after a flood, including:

- Cracks in the foundation.
- Cracks in walls.
- Gaps along door or window openings.
- Rubbing or jamming of doors or windows.
- Sloping floors.
- Steps or gaps in a porch now offset from the structure.

If any of these indications appear after your home has been affected by a flood, you need to have your foundations inspected to insure your structure is stable and safe.

Until you can employ a building engineer, measure and make a record of the size of each crack, the offset of steps or porches, and the degree of slope in steps or floors.

Make sure that you **record the date** for each measurement. This record will help your engineer to evaluate the extent of building settlement and identify if the building settlement is progressing.

3.2 Underpinning of footings

Underpinning is a process that provides stability for your home and can restore the required integrity to the soil around your foundations.

Various processes that can be used for underpinning include:

- Injecting a fine cement grout.
- Installing pilings to support your foundation.
- Jacking your foundations to put it back in place while it is being stabilised.

3.3 Undermining of foundations

- Flood water saturates the soil and moves with tremendous force. The volume of water moving across the ground can be compared to the water from a fire hydrant.
- What does this fast moving flood water do to the soil around your home? It can erode the soil that supports your foundation.
- Your home is engineered to transfer the weight of your home to the surrounding soil. Your home can become unstable, form cracks and develop problems from [Building Settlement](#) when that soil erodes.
- At the minimum it can create problems with cracks and ill-fitting doors and windows.
- This can develop into more severe problems, the ultimate being that your house becomes unstable and collapses.
- Obtaining a **home inspection** from a capable engineer makes good sense and will give you a full assessment of the flood damage for insurance and repair purposes.
- When you are dealing with the undermining of your foundation, the sooner that you can get the damage assessed the better. **Time is of the essence.**

Chapter 4: Structural Framework

The structure of your home is based on solid engineering and a complex series of supports and weight transfers to the foundation and the soil around your home.

When floodwater invades your home it can compromise the materials used in your home's construction.

Materials that absorb floodwater can swell and lose their strength, which can in turn affect the structural integrity of your framework.

You will need to **determine if the timber is still sound**, decayed or has lost its weight bearing capability.



Figure 1: Although heavily discoloured with surface mould and blue stain, the pine timber is still sound as shown by scraping back the surface layer



Figure 2: Decaying Timber is soft and spongy and can easily be penetrated with a knife or screwdriver

You will need to **examine the structural framework for swelling and shrinkage**. This is especially important when the timbers are in load bearing areas of your home, because it can reduce the structural stability of your home.



Figure 3: Expansion of the hardwood T&G floor above has caused the separation of double bearers.

4.1 Well engineered structural framework example

[*Figure 4: Glossary of terms for brick veneer construction*](#) illustrates a well engineered structural framework.

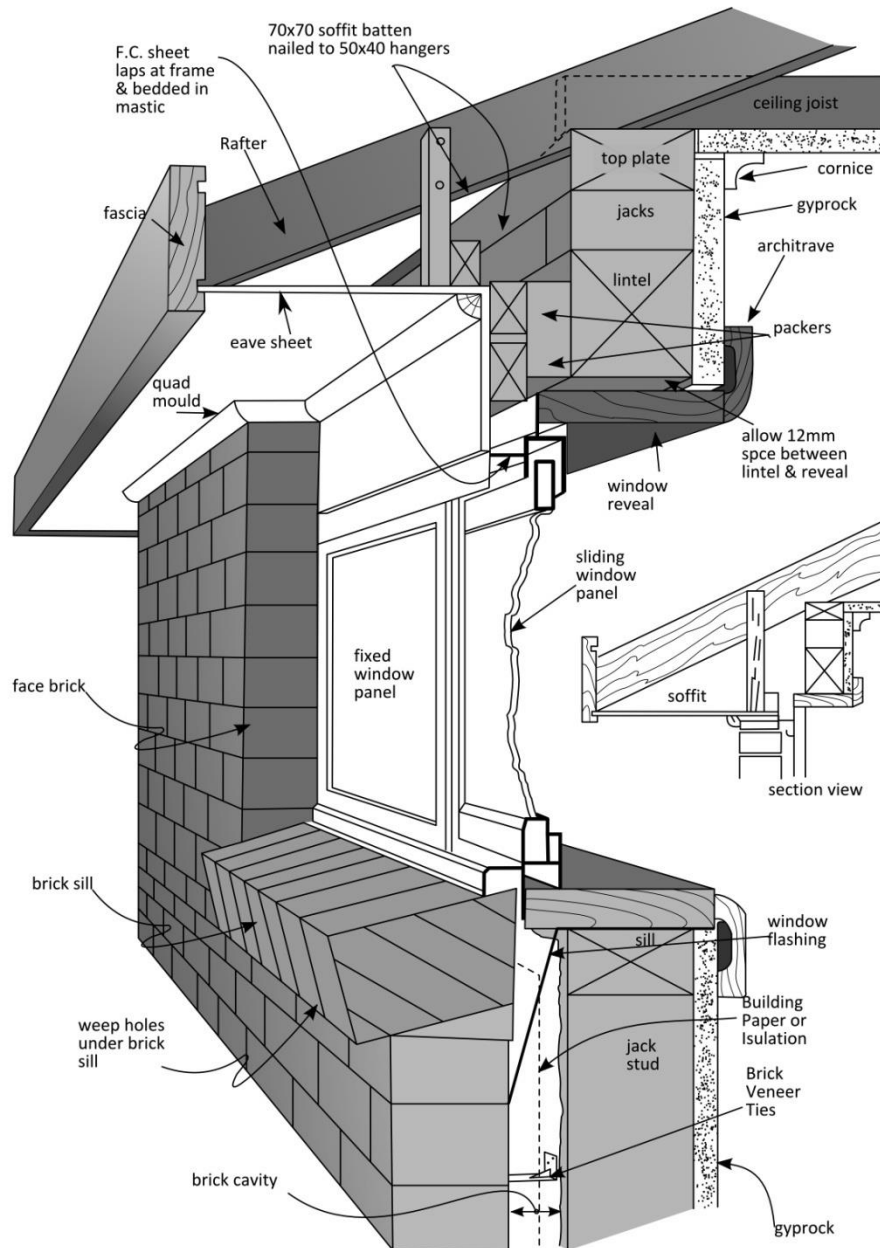


Figure 4: Glossary of terms for brick veneer construction

4.2 Foundation types and wall construction

The walls of your home may be constructed in a number of ways. [Figure 5: Typical wall and footings types](#) demonstrates the various types of wall constructions.

If materials that are used to support your walls and roof are weak from absorbing flood water, it can cause your structure or walls to crack or collapse.

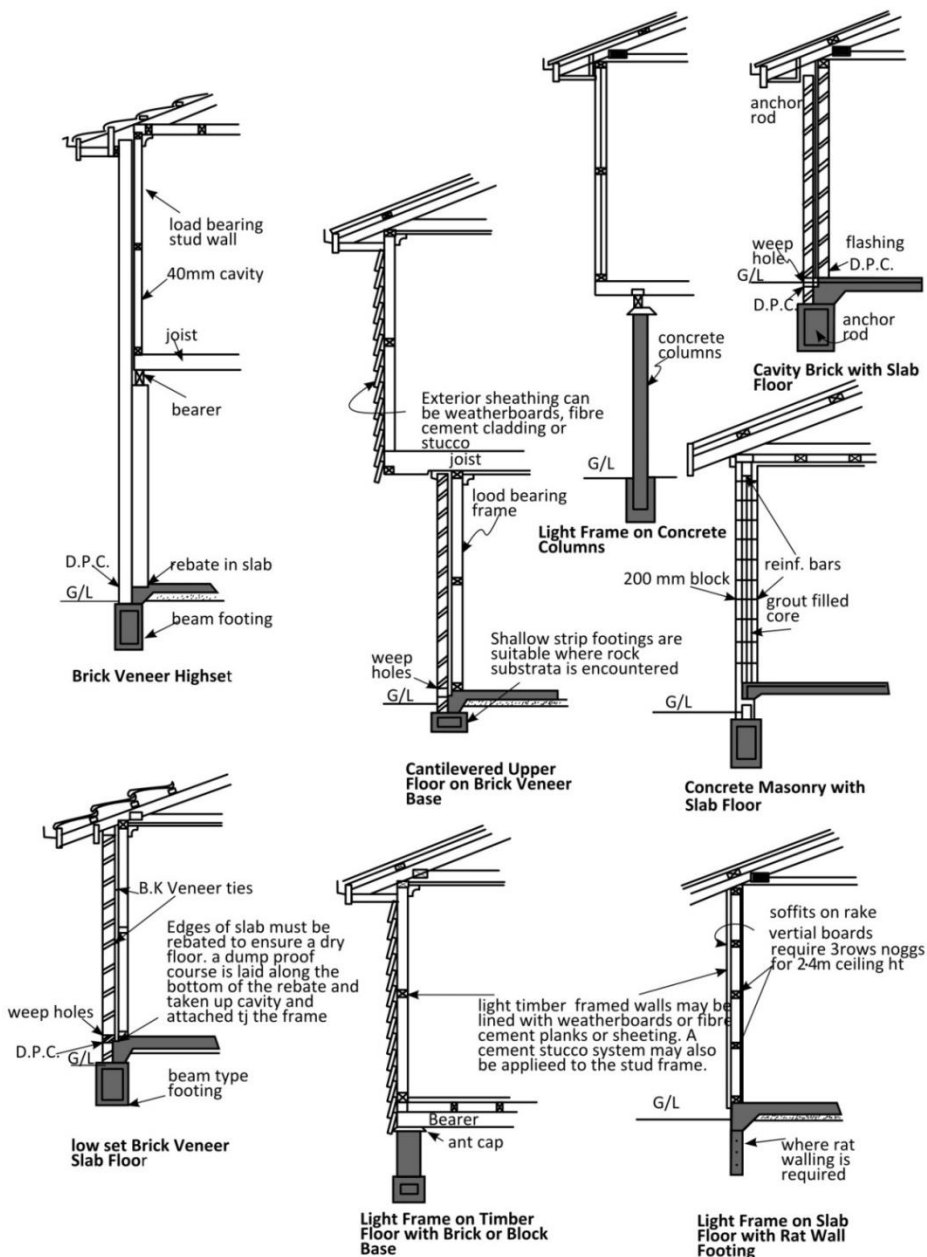


Figure 5: Typical wall and footings types

4.3 Moisture content

The frame of your house may not have lost its structural integrity due to the floods. The effect on timber structural framing which has been inundated by flood water varies from product to product.

The length of time that timber members were directly exposed to water can significantly influence the way that the member will perform in the short and long term.

In some cases that I have witnessed, timber members are now totally inadequate to carry structural loads and they must be removed and replaced.

In general, softwood products such as radiata pine, will absorb water at a greater rate than hardwood products.

The **target moisture content** of a timber framed building should **reduce to between 14 and 16%** before the frame is ready to accept new internal linings such as gyprock or cement sheet linings.

If you haven't yet found a builder, make sure that you find a qualified builder with a solid reputation, who knows how the various home building materials are affected by floodwater.

You want the most experienced and qualified building repair professionals working on your home to make sure your flood damage repairs solve your problems and don't add unnecessary expense.

Contact DTK (www.dtk.com.au) or have your insurance company or assessor call us to discuss your particular project in more detail.

Chapter 5: Sanitation from Floodwater Effects

Floodwater is called 'Black Water' for a very good reason. Do not make the mistake of thinking that it is just water: it is not!

Black water contains contaminants from every place that it has travelled. This means that black water contains chemicals, human and animal waste, refuse from trash dumps and all of the contaminants found in **things that people** have thrown out.

Unless your flood repairs are aggressive and thorough you will have problems. Incomplete recovery of your property will leave bacteria, mould and other unhealthy contaminants in your home.

Many flooded areas have an outbreak of respiratory problems after a flood, especially when flood damaged homes have been repaired but not properly sanitised.

Unless the bacteria, mould and other contaminants are completely removed, they get into the air in your home. When you breathe this **IT CAN MAKE YOU SICK!**

If you understand the risks and address them aggressively, you can make building repairs to your flood damaged property in a way that results in a safe and healthy home.

DO NOT USE CHLORINE (such as you use in a pool) to sanitise after inundation! Chlorine can corrode metal fasteners and can cause long-term damage.

Chapter 6: Concrete and Brickwork

Your concrete and brickwork can be severely affected by floodwater.

You may see cracks in your concrete or brickwork, or you may see shifting of the concrete blocks of your foundations.

This type of damage indicates that the weight from your home is not being properly supported. The weight of your home is transferred to the surrounding soil and cracks are an indication that the weight transfer has been changed by the flood.

This means you will need to hire a qualified engineer to determine if your home has building settlement from the flooding. Or if your home is still stable and if your home needs underpinning to return the needed support to your home.

DO NOT DELAY!

This may be the first indication of a much more serious problem.

6.1 Concrete cracks

If you see cracks in your concrete following a flood, you have damage to your concrete and possibly to the soil around your home that provides the required support for the structure.

Cracks are a clear indication that you need to have your home inspected not just for the apparent damage but for unseen damage for which the cracks may be the first indication. See [Building Settlement](#) and [Undermining of Foundations](#) for further information.

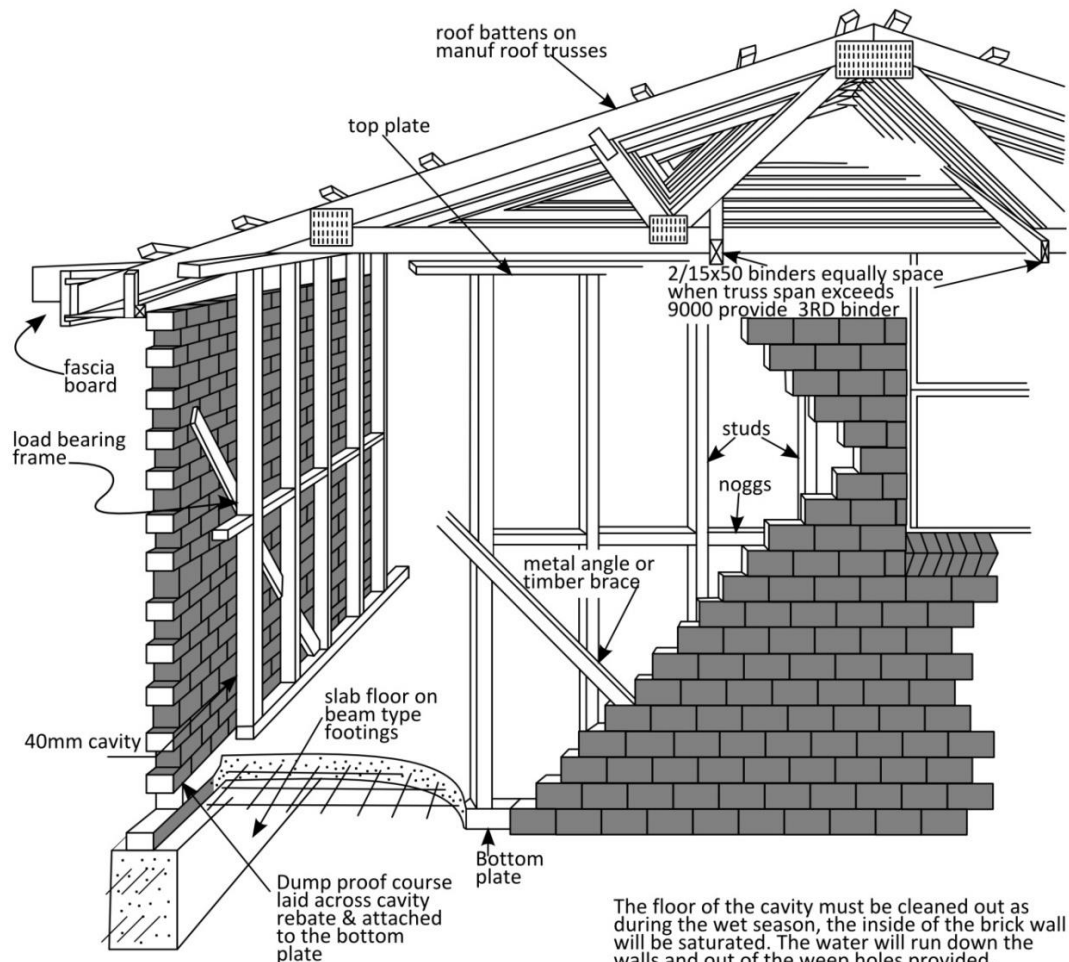
The damage may be repairable but **time is of the essence**. Left alone the cracks may get worse and can affect the structural integrity of your home.

6.2 Re-pointing cracked brickwork

The mortar between the bricks is the 'pointing'. Flood water can loosen and remove pieces of the mortar pointing. You may simply need to have the brickwork re-pointed, or the missing mortar and cracks in the mortar can be an indicator of more serious problems.

Before you try to 'patch up' your mortar pointing, **have the brickwork inspected**.

A full assessment of the damage to your brickwork can identify if there is further damage to the structure of your home ([Figure 6: Brick veneer construction method](#)).



What is Brick veneer?

It is a brick facade anchored to a timber frame with metal or wire ties regularly spaced. The timber frame does all structural load bearing work supporting the roof, ceiling and wall linings. A 40mm air space or cavity is provided between the frame and brick wall. This cavity acts also as a water barrier.

When is the brick Wall Constructed?

This is done in two stages. The first after the footings are complete. Brickwork is laid and terminated just below floor level. The second after the roof is framed and eaves constructed, windows framed and meter box installed. Interior linings should not be fixed until the veneer is complete. This is essential as access to the cavity is necessary in order to clean out mortar droppings. After eave framing is constructed, windows and door frames can be installed. Then brickwork can be continued. Prior to lining the inside surface of the frame, ensure all mortar droppings have been cleaned from veneer ties.

The floor of the cavity must be cleaned out as during the wet season, the inside of the brick wall will be saturated. The water will run down the walls and out of the weep holes provided. However, if lumps of mortar remain, they may form a bridge for water to cross and cause dry rot to the structural frame. Where sheet bracing is applied on the cavity side, the cavity is kept clean by laying battens to catch the mortar droppings.

Stages of Construction

1. Foundations and footings
2. Brick Base to Floor Level
3. Floor Laid Either Concrete or Timber
4. Timber Wall Frames Erected
5. Roof Framing Completed, Tiles & Sheathing Attached
6. Windows & External Doors Installed
7. Brick Veneer Walls Completed
8. Soffits framed and sheeted
9. Electrical Wiring & Plumbing Pipe Out with Drainage Carried Out Also
10. Ceilings and Walls Lined
11. Internal Doors, Bath, Shower, Kitchen Cupboards and all Mouldings Fitted
12. Plumbing & P.C. Items Completed
13. Decorating
14. Electrical Fittings & Switches Installed
15. Floor Sanding & Carpets Laid

Figure 6: Brick veneer construction method

Double Story Brick Veneer Construction

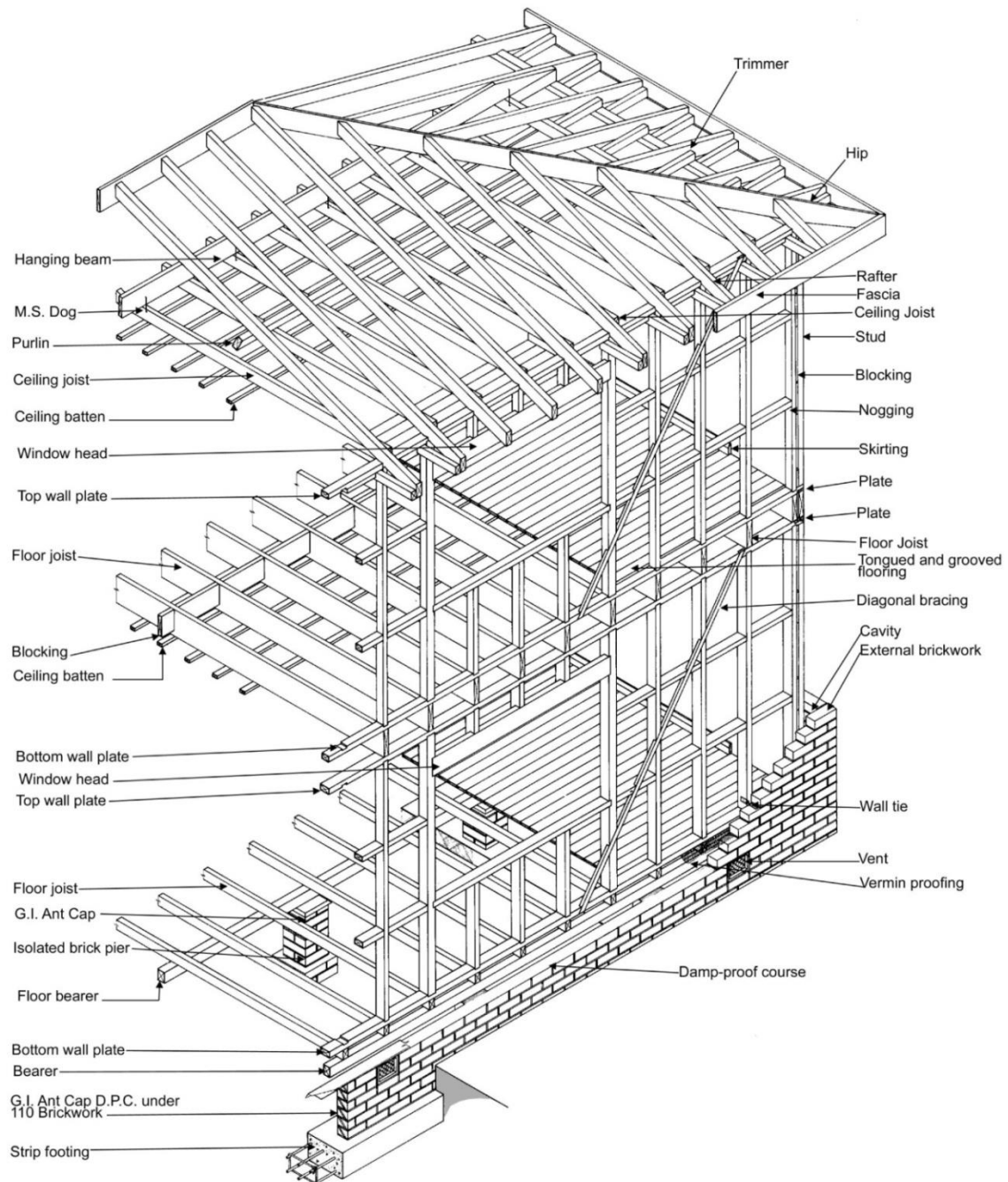


Figure 7: Double storey brick veneer frame

6.3 Brick 'growth'

Bricks contain water-soluble salts. When bricks become wet, these salts dissolve and rise to the surface, forming a white blush or brick growth.

This brick growth is harmless and the way that the bricks dry out, it can be brushed away or will fall away over time.

The moisture is trying to escape from the bricks and the brick growth becomes a problem when a water sealant (including paint) has been applied to the exterior of the bricks.

If the exterior surface of the bricks has been sealed the moisture cannot escape and it will cause spalling (the outside layer of the brick crumbles and pieces break off).

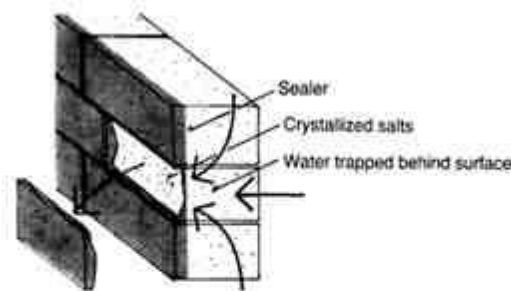


Figure 8: The outside surfaces of building materials such as brick and stone are sometimes sealed to prevent water from soaking in. Unfortunately if the sealer will not breathe moisture is prevented from migrating outwards and is trapped behind the sealer. When

Chapter 7: Internal Wall Linings

Your home's internal wall linings may be damaged in the flood water.

Most interior wall linings are not intended to be soaked in water and exposing them to water over prolonged periods of time can create even more damage.

Gyprock plasterboard interior wall linings may need to be removed or in some cases can be treated effectively (see [Appendix 6 Fixing Gyprock Plasterboard](#) for more detail).

The information in [Appendix 5](#) and [Appendix 6](#) are courtesy of the CSR Gyprock.

Other internal wall linings, such as panelling and plaster, should be assessed by a professional home builder. The interior wall lining materials behave differently when exposed to flood water and should be assessed to determine if they can be treated and dried or if they need to be replaced.

Your first step is to determine the type of interior wall lining.

If you have fibre cement sheet, you need to determine if whether it contains any asbestos. (**THIS IS VERY IMPORTANT**).

If you determine that the fibre cement sheet contains asbestos, hire a professional asbestos contractor to remove the material containing asbestos. Asbestos fibres can be inhaled and cause long-term health problems for you, so the professional removal of this material is a necessity.

If you have timber and fibrous plaster, you may not need to remove this material. It may be possible to sanitise it in place.

You need to ensure that it is treated for mould so that you do not have subsequent problems with mould growth. See [Appendix 4: Sanitation Treatment: Real Life Results](#) for further information.

Gyprock may need to be removed above the area of inundation. All Gyprock above the area of inundation needs to be appropriately cleaned and sanitised to prevent problems with mould down the road.

Chapter 8: Termites

Flooding may have damaged the termite management protection to your home. Homes and renovations since 1980 should have a notice fixed in the meter box or under the kitchen sink that describes the termite management system used.

Highset homes and timber homes with suspended floors on stumps typically use ground separation and ant caps or metal termite shields. These barriers and shield should be examined to ensure they are not damaged or covered with mud and that there is no access for termites to get into the house.

Houses built on slabs need to have a **licensed pest controller** inspect and assess the termite management system and reinstate the termite protection. Systems may have been compromised from water and mud, and chemical barriers may have been washed away. Physical barriers such as stainless steel mesh or stone may need to be replaced.

Termite-treated framework such as H2/T2 (true blue) relies on a termiticide preservative applied to the timber when it is manufactured.

Short-term inundation from flood water should not compromise this type of treatment, although you should have a licensed pest controller reinstate the termite management systems with additional physical or chemical termite barriers.

This is general information and should not be assumed to be complete, additional information is available from a licensed pest management controller.

8.1 Renewing termite treatments

If you previously had termite treatment applied to your home, the chemicals that you had applied to your home may have been compromised by the inundation.

Hire a licensed pest controller to reapply chemicals as needed to ensure that you do not have a termite infestation after the flood.

Additional physical barriers may be needed or recommended in addition to reapplying termiticide chemicals.

8.2 Testing for termites

Your licensed pest controller can test for termites when your flooded walls and floors are exposed for building repairs. **It is always a good idea to check for termites at any opportunity.**

You may notice signs of termite infestation. Look for wood that has the remains of mud tubes that appear in an irregular pattern on the wood. They are generally attached to wood tunnels. The tubes have a similar diameter to a pencil. You may see faecal pellets that look like salt and pepper.

You can inspect for damage with a knife or screwdriver and push it into the wood to check for softness. If you are not sure, call a licensed pest controller.

If you have termite damage, you will want the **infestation treated straight away** and then have the opportunity to **replace the damaged wood**. To prevent future damage, you may want to use timbers manufactured with a termiticide.

Chapter 9: Electrical

Electrical supply, switches, plates and fittings are not meant to get wet. If flood water has touched electrical switchboards and wall sockets, they must be **removed and safely re-fixed by a licensed electrician.**

DO NOT!

Assume that the electrical equipment will dry out and be usable.

You do not want to compromise the safety of your electrical equipment. It can cause electrical equipment to short out and start a fire. Any time that the wire, a fixture or a switch has been exposed to water, it has been damaged and should be replaced.

Any time that electrical material has been exposed to floodwater (even if it is not inundated but only exposed to the humidity from flood water standing in your home) it should be replaced.

The elevated humidity from the inundation in your home can cause corrosion of the switches, wall sockets, fittings and switchboards even if they did not get inundated by the flood water.

9.1 Test certification by an electrician

A licensed electrician needs to test your electrical supply, switchboards, switches, plates, fittings and wall sockets for shorts or other faults and provide you with a **safety certification**.

All other appliances need to be inspected, tested and certified safe. This includes refrigerators, washing machines and dryers, air conditioners and the like.

Chapter 10: Carpentry

You may need carpentry for your building repairs. Some hardwoods withstand inundation for a time without permanent damage. However, other types of wood, (such as pine) absorb moisture quickly and can swell and be permanently damaged.

A licensed building contractor can help you to determine if your wood framing, skirting, architraves, cornices, mouldings, windows and doors need to be replaced, or if they can be sanitised and dried to make them serviceable.

The type of material will determine if they need to be removed and replaced.

Serviceable carpentry should be **sanitised, sanded and refinished** to restore it to its former condition.

10.1 Internal mouldings, replacement of skirtings, architraves, door jambs

Check the carpentry in your home to find out if the material need to be removed and replaced or if it can be sanitised and reused.

- **Internal mouldings** may have absorbed water and warped. This means that they will be twisted, bent or warped. Once the internal moulding bends, it cannot be returned to its original straight shape.
- **Skirting boards** are used in the joint between the floor and walls. If you have timber floorboards you will have a different skirting board than you would have for floors with carpet.

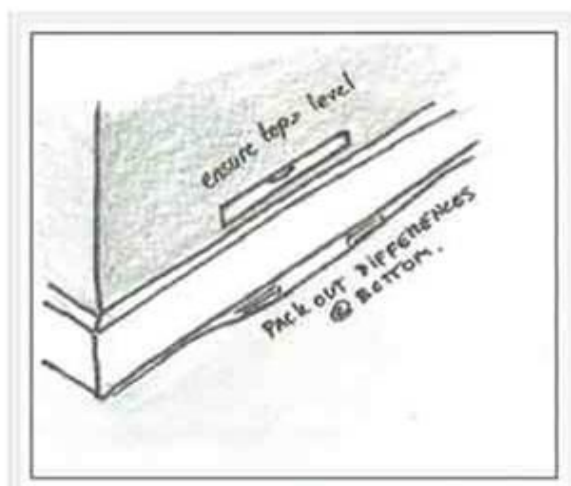


Figure 9: Ensure skirting is level

Inspect skirting boards to **see if there is a gap** between the floor and the skirting board, or between the wall and the skirting board.

If you see a gap, this means that the skirting board is swollen from the inundation and needs to be replaced. Moisture and swelling can cause the skirting board to be permanently bent or warped, and no longer useable.

- **Architraves** are used to finish the door or window frame and wall joint. The architraves are a timber moulding around the door frame or window frame.

Inspect the architraves in your home for spaces and warping that were not there before. If the architrave is bent, it will need to be replaced. Warping means that the architrave has absorbed moisture and has changed shape.

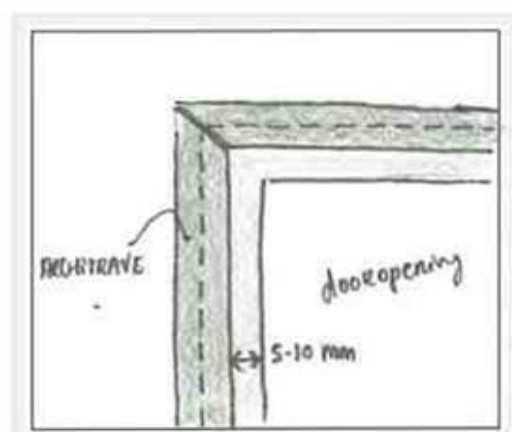


Figure 10: Architrave around door opening

- **Door jambs** are the frame where the door sits when it is closed.

If the door jamb is manufactured with hardwood and has been exposed to the inundation for a short period of time, it may be useable and will only need to be sanitised.

If the door jamb is swollen, has gaps or appears twisted, it will most likely not return to its former shape and should be replaced.

10.2 Replacement of door and window hardware

If you have wood windows and doors, keep them shut after the water has receded.

If you open them before they have dried, you will not be able to shut them again as they will have swollen out of the size of the frame.

If the hardware used for your doors and windows is a material that does not rust, you may be able to sanitise and lubricate and so that the hardware remains perfectly useable.

If the material rusts, you will likely have to replace the door and window hardware and you will also have to deal with any visible rust stains on the door or window jambs.

Good quality stainless steel and brass hardware does not rust. Ironwork hardware rusts more readily, although it may have a protective finish.

10.3 Servicing of doors

- Doors may need to be replaced: especially hollow core doors that are more likely to be ruined by the inundation.
- You can **remove hollow core doors to help with drying**. If the material is a soft wood it may never regain its previous shape or may start to come apart.
- You may be able to reuse solid hardwood doors if they have not been submerged for long periods of time.
- Drying a solid hardwood door too quickly can cause warping and cracking of the wood.
- Aluminium doors and windows may be bent and with servicing may return to their previous shape.
- **Adhesives may have been compromised**. It may be possible to restore a door to serviceability with proper servicing and reapplication of adhesives.
- Oil all locks and hinges immediately to prevent rust.
- If you have doors that are swollen and won't close, they may fit again after they dry.
- If you trim a door before it has completely dried, this may leave gaps between the door and the door jamb.

DO NOT!

Rush the drying.

Place a heater close to the door to speed drying.

Rush into refitting doors until they have completely dried.

Chapter 11: Preparing for Something that Might Not Happen

Nobody wants to be a victim of a disaster. Despite that disasters happen – and often to people who are ill prepared to cope with them.

There are some steps that you can take to lessen the impact of a disaster and to speed your recovery.

These are best taken well in advance when a disaster is imminent, the first and often only priority should be to preserve life.

11.1 Assessing the risk

The major disaster risks in Australia are flood, bushfire and cyclone. Thankfully Australia is relatively free of earthquake and tsunami risk.

Knowing the history of your area will allow you to assess which of these (if any) are potential risks.

While this is generally straight forward, be careful.

Cyclones can strike further south than the tropical regions traditionally troubled by cyclones.

A 1-in-100 year flood can affect properties well away from those regularly troubled by high creek and river levels. In a relatively flat area, properties kilometres away from a watercourse can be affected an additional metre in flood levels.

In a severe bushfire whole communities can be under threat: not just the properties that back onto bushland. Conservatism is advisable in assessing your risk.

11.2 Ensuring that you are insured

Once you have assessed your risk, check your policy to ensure that you are covered for the risks that you have identified.

As terminology can often be difficult for a layman to understand, talking through your concerns with your insurance broker can be an advantage.

Failing that, you can communicate with your insurer to clarify your cover.

Regardless of who you use, **communicate in writing** and **keep a copy of correspondence** so that in the event of a dispute, you have evidence that you have communicated to your insurer or broker your instructions for the risks you wish to be covered for.

Terminology regarding the source of water during flooding can be tricky, as many affected by the Queensland floods of 2011 can attest.

A policy that covers flooding regardless of source is worth consideration to simplify this issue.

11.3 Ensuring that you are prepared

If you are in an “at risk” area for a disaster, ensure that you know your nearest community evacuation centre, and the route there.

Ensure that you have a good quality radio and a supply of batteries so that you can stay up to date with conditions during an emergency, and allow yourself the opportunity to evacuate while it is safe to do so.

In the case of bushfire, knowledge of multiple routes may be required as some may be cut off when you wish to evacuate.

In the case of flood, be aware of levels between you and the evacuation centre. A valley or low bridge between you and the evacuation centre could mean that some routes are cut off.

Be aware that your evacuation may be at night, and practice the route at night so that you are not disoriented.

If an evacuation is imminent, consider packing a change of clothes and some basic supplies in your vehicle in advance of your departure.

11.4 Keeping records for recovering from your disaster

If your sole records of your insurance, assets, bank and credit card accounts, phone accounts, rates and other personal details are in your house, there is every chance that these could be lost in a disaster.

While there are ways around this, these can all take time and may be incomplete and compromise your chances of receiving your full entitlements or delay your recovery effort.

The best protection is to maintain an up-to-date copy of essential information in an off-site location. This could be in a safety deposit box at your bank, with a friend or relative or even in a web-based storage location.

Bear in mind that if your friend or relative is in the same general area as you, they may be subject to the same disaster risks as you and thus there is a risk that your back-up method could be compromised. A secure, reputable web storage site can overcome the risks of a physical location.

Copies that you should consider keeping include:

- Insurance policies.
- Superannuation accounts.
- Bank and credit card accounts.
- Birth certificates.
- Rates notice.
- Phone account details.
- Electricity account details.
- Gas account details if applicable.
- Sales dockets for major appliances, furniture items, electronic equipment, etc along with models and serial numbers where applicable.
- Photographs of major assets.

Apart from records that can assist in assessing your insurance claims, accessing your assets and communicating with your service providers, consider copying items that have sentimental rather than insurable value.

This could include photographs, certificates (qualifications or achievements), resumes and awards.

Scanners that are quite adequate for scanning your documents and photographs can be bought for \$100-200, and digital cameras for recording your assets can be bought for a similar amount: many of you will already own a scanner and digital camera.

11.5 Lodging your claim

Make contact with your insurer or insurance broker as soon as possible after the disaster.

There will be many other people lodging claims from the same disaster, and it will take time for all these claims to be processed.

Making early contact, and having information available to allow assessing of the claim, is a means of ensuring that your claim is processed promptly.

11.6 Not just the physical things

If you think that you will remember some or all of these details, don't be so sure. You will suffer shock during and after the disaster, and things that come easily to you now will often be more difficult when you are suffering shock.

Recovering from a disaster can be a long and painful process, of which physical recovery is just a part.

The sad fact is that for many disasters, the hidden toll of suicides, broken marriages and mental illness is often greater than the immediate death and injury toll.

The important things to remember are:

- You are not alone.
- You are not weak or unusual.
- There is help available.
- With help, most people recover.
- Don't push friends and family away: they can be a great comfort in times of stress.
- Talk about what is troubling you: don't keep it bottled up.

References

CONTACT DETAILS

Dave Kelly

0414 247 682

Property Development Mastery

dave@propdeveloper.com.au

www.propdeveloper.com.au/flood-book

BSA Disaster Recovery and Rebuilding Advice

[http://www.bsadisasterrecovery.qld.gov.au/Pages/Home\(default\).aspx](http://www.bsadisasterrecovery.qld.gov.au/Pages/Home(default).aspx)

Guides for Assessment and Repair of Flood Damaged Timber Homes

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Queensland Recovery Guidelines - Disaster Management

[http://www.disaster.qld.gov.au/Disaster%20Resources/Documents/Queensland Recovery_Guidelines.pdf](http://www.disaster.qld.gov.au/Disaster%20Resources/Documents/Queensland_Recovery_Guidelines.pdf)

Queensland Reconstruction Authority

<http://www.qldreconstruction.org.au/>

Insurance Council of Australia: Flood Policy

<http://www.insurancecouncil.com.au/industry-statistics-data/flood-cover>

Appendix 1: External Wall Cavities of Flood Affected Dwellings

The following sanitation topics include some case studies and have been prepared by industry experts at Effective Organics and are reproduced with their written permission.

CONTACT DETAILS

Effective Organics Pty Ltd

Sanitation Inspections, Treatment & Certificates, Moisture Testing

Phone: 0488 260 255 / Email: adam@effectiveorganics.com.au

Web: www.thesanitiser.com.au

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Sanitation Fact Sheet

To be able to carry out an effective sanitation of a flood affected dwelling that has suffered inundation above the skirting boards for any amount of time it is necessary to remove internal wall linings to expose the cavity, frame and bracing of all affected walls, in line with the BSA QLD's Guidelines for Repairing Flood Affected Houses.

There is no need to remove the external cladding as long as the internal wall linings of the house are removed and it is possible to sanitise the exposed cavities, steel / timber frame, bracing and sarking. This will allow sufficient access for the sanitiser to treat the affected cavities and surfaces.

In my opinion external wall cladding does not require removal due to the nature of the materials it is constructed of. As found in all houses the external wall cladding's main function is to repel or keep out the weather and the sarking layer and internal lining is to separate the human occupants in the living compartment of the dwelling from the creepy crawlies that exist in the outside world. The external wall cladding and cavity between it and the sarking form part of the exterior layer of the dwelling and as found in all houses flood affected or not, fauna such as ants, cockroaches, spiders, geckos, mice and the like frequent these cavities at any given time.

The act of sanitation of a flood affected dwelling is purely focused on treating the internal side of the sarking, the frame and bracing to combat mould, mould spores and any excessive amounts of bacteria or other microbial activity that may be present due to the flood. Along with successful drying of the affected structure an effective sanitation will reduce the amount of microbial activity or presence to an acceptable or reasonable level.

I strongly believe that if the restoration process has been carried out correctly that the occupants of a flood damage restored house would pose a far greater risk from microbial activity and contamination by undertaking any acceptable or reasonable everyday activity such as, working or playing in the garden, patting the family pet, holding on to the handle of a shopping trolley or basket, using an ATM or eftpos terminal. These everyday activities expose an individual to far greater levels of contaminants and are deemed as reasonable and acceptable exposure by society in general.

In general I believe that the removal of external cladding is an unreasonable and excessive action from a hygiene perspective.



Adam Gregor, Hygienist

Appendix 2: Floor Tiles that have be inundated by Black Water

Sanitation Fact Sheet

Tiles are a wet area cladding, by their very nature; they can be submerged in all manner of contaminants, be easily cleaned and disinfected, that is why we put them there in the first place. Tiles are manufactured for use in showers, toilets, laundries and kitchens, areas where they are exposed to faeces, urine, vomit and bacteria. Once contaminants have been cleaned off the tiled surface the application of your standard household disinfectant will penetrate just as far into the tile or grout as any floodwater / black water would have, rendering the surface effectively sanitised.

Floor tiles that are laid directly on to concrete slabs will show signs of structural failing in the form of “drummy” or “loose” tiles if the floodwater has managed to compromise the waterproof membrane or adhesive beneath the tiles. If no tiles are showing signs of structural failing and there is no moisture weeping from the edges of the tiled area then the simple act of applying an effective disinfectant to the tiled surface will penetrate just as far into even the most porous grout as any floodwater will. This will effectively sanitise the tiled surface even if it has been soaking in pure raw sewage.

Tiles that are laid on timber underlay that has absorbed floodwater will be evident again by structural failing of the tiles. Again this is caused by the waterproof membrane being compromised allowing floodwater to absorb into the underlay and generally causing it to swell and tiles to loosen.

With tiles laid over the top of old tiles it is difficult to give a definitive answer, as there are a number of variable factors, most relating to the quality of workmanship in the first place. As a rule I would generally say to remove tiles in this case as the fact that they were laid on top of old tiles, rather than removing them and preparing the surface properly generally indicates poor workmanship, but as always this should be accessed on a case-by-case basis.



Adam Gregor, Hygienist

Appendix 3: Flood Affected Particleboard Floor Sheeting

Sanitation Fact Sheet

Following the severe flooding of the Brisbane and Bremer Rivers in January 2011 a large number of houses with particleboard floors were inundated with floodwater for more than 24 hours. Sub floor inspections of the particleboard flooring were conducted on numerous houses with little or no mould observed at the time. The particleboard flooring appeared to have held up well structurally and was not removed as part of the restoration process.

As time passed it has come to our attention that black mould has begun to grow on the bottom side of the floor sheeting of some houses. It appears to have started proliferating from the joins between each sheet and has grown out towards the middle of the sheet. I conducted inspections on many of the houses that were flood affected. I took ATP swab tests underneath a number of the affected houses all of which returned positive results for actively growing mould. I have attached some photographs below as evidence.



Figure 11: Mould infestation spreading out from joins between particleboard floor sheets and Taking ATP Swab Test

Conclusion

Based on this precedent it is recommended that any dwelling that has a particleboard or yellow tongue floor that has been submerged in floodwater for a period of time over 24 hours be replaced in the process of flood restoration. As it is not possible to effectively sanitise the edges of the sheets where the tongue and groove joins create an environment that is conducive to mould growth.

For houses that have been repaired or are not having works carried out on them it is advisable that mould infestations are treated as soon as possible to control the spread of mould and follow-up treatments are carried out to reduce the infestation to an acceptable level. Keep in mind that every situation is different and should be assessed on a case-by-case basis.

Appendix 4: Sanitation Treatment: Real Life Results



Figure 12: Flooded house in Roma 2010 heavy mould infestation throughout



Figure 13: Same house flooded again just over a year later, only difference is after the first flood the timber frame was sanitised by Effective Organics. No mould growth whatsoever in the wall cavity or on the plasterboard.



Figure 14: Wider view of same kitchen



Figure 15: Last year's sanitation seal still intact



Figure 16: Last time the house was flooded, chlorine or bleach was used to sanitise the frame. As you can see from these photos not only has the chlorine corroded the metal bracing, it was not effective at dealing with the mould spores present on the frame

The active ingredient in the product we treat affected surfaces with is a Bioflavonoid Complex and is a plant extract. It is highly efficient at killing bacteria, mould and mould spores as opposed to chlorine, which is toxic, corrosive and does a poor job on eliminating mould spores. Bioflavonoids are found in all plants and are in very high concentrations in the coating around the plant's seeds. It is this coating that allows a seed to lay dormant in the soil for years protecting the seed from attack from fungus and bacteria. It is also in high concentrations in the pith of citrus, and is why horticulturalists say "not to throw your citrus peels in the compost bin as they don't breakdown". It's not that they won't break down; it's just that they are loaded with Bioflavonoids and it takes a long time for the fungus and bacteria to "wear out the Bioflavonoids. By the time this happens all of the other compost has been broken down for months. The product we use is non-toxic, non-corrosive, is extremely effective and does not bleach. It kills mould and mould spores but does not bleach them. The dead carcasses of the mould can be easily removed by wiping the surface with a damp cloth. As opposed to the old fashioned way of bleaching them to falsely believe that the spores have been neutralized and removed, when they have not, they have just been turned white.

Appendix 5: Replacement of Gyprock Linings and Cornices

When gyprock interior wall linings need to be removed, take it above the area of inundation to the nearest joint above the inundation level. If you do not remove wet gyprock the surface paper and delamination is almost sure to take place down the road. If the gyprock has been applied with adhesive, it can be compromised but will not show up until later.

The gyprock may have also been compromised by chemicals, sewage, toxins and other contaminants and your safety having these materials in your home should also be evaluated.

All wet insulation needs to be removed and replaced with new insulation.

Ceilings will have to be replaced in almost all cases as water ponds in the ceiling and gyprock will have absorbed too much moisture. Insulation will need to be removed and replaced as well.

All electrical in the ceiling needs to be inspected and likely replaced as moisture can cause the electrical fixings to corrode and create a fire danger down the track.

Removal of Gyprock

Damaged sheets need to be removed to about 300mm above the high water mark, selecting the nearest joint above the water inundation. The new sheet will be placed as a butt edge to the existing sheet and should be treated as a butt joint.

If damage is above the joint of the top gyprock sheet the sheets should be removed to the ceiling and any cornice should also be removed. If the ceiling does not need to be removed, this will also require repairs to the finish on the ceiling, unless a larger cornice than the previous cornice can be applied.

Before relining with new gyprock, be sure to hire an electrician to inspect the wiring. Studs must be dried to less than 16% moisture content and sanitised so they are not a source of mould. Any screws in the studs should be removed and any old adhesive can be removed making sure not to damage the studs.

All debris should be cleaned out and sanitised above and below the bottom plate. All wet insulation must be removed. If you leave wet material in the wall it will cause mould and an odour in your home.

Cornices

Cornices are made of a variety of materials. Some cornice materials do not absorb moisture and may be able to be reused. If the cornice absorbs water, especially if the ceiling has been damaged, you will have to replace the cornice. If your cornice is bent or bowed it has absorbed water and should be replaced. If in doubt, a qualified building repair specialist can advise you about the need to replace your cornices.

If you need to replace your cornices and have a length of cornice, you can craft a temporary support to hold the cornice in place until it can be affixed to the joint between the wall and the ceiling.

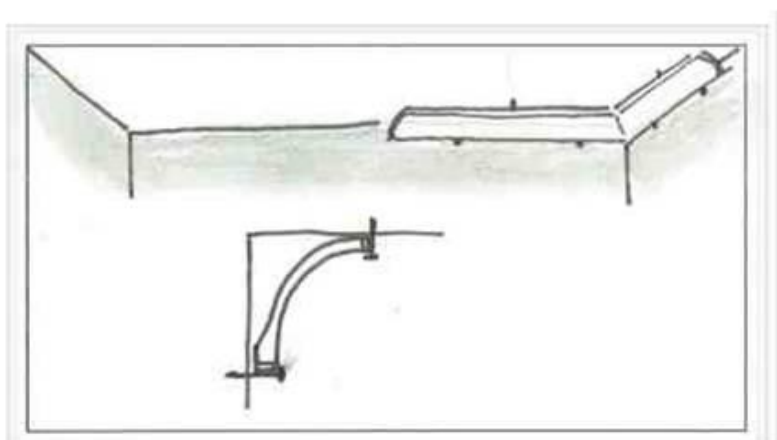


Figure 17: Temporary support for cornice

Appendix 6: Fixing Gyprock® Plasterboard

Adhesive Application

- Cut the Gyprock® plasterboard to length, either to fit neatly corner to corner, or so that the end will align with the centre of a stud.
- Using a 38mm broadknife, place 'daubs' of Gyprock Stud Adhesive about 25mm diameter and 15mm thickness on the studs at 300mm maximum spacing.
- Begin at least 200mm from where the edge of the sheet will go.
- Do not place adhesive on studs behind the ends of sheets, and always keep adhesive at least 200mm from any nail/screw location.

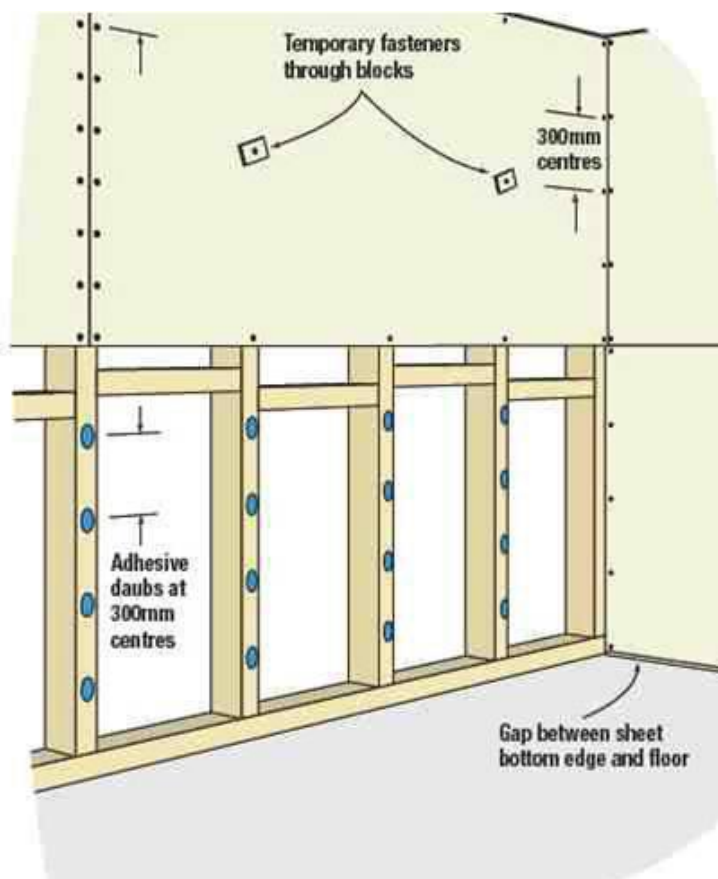
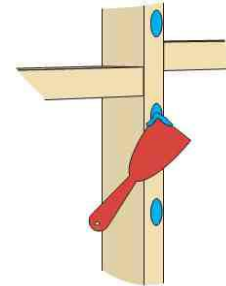


Figure 18: Adhesive application

Fixing to Walls

- Lift the sheet about 10mm from the floor by placing a few off-cuts of plasterboard beneath your sheet.
- But the sheet edge up to one corner. Apply the Gyprock® plasterboard horizontally, (paper bound edge at right angles to the studs).
- Using 30mm ring shank nails (or suitable screws) 10 to 16mm from sheet edges, fix one recessed edge at each stud. Press the sheet firmly against the studs and fix along the opposite edge.
- Where sheet ends butt together, nail/screw at 150mm centres. Nail/screw every 300mm around all doors, windows and other openings.
- Drive the fastener heads just below board surface taking care not to break the face paper.
- Drive nails/screws through small plasterboard off-cuts into every second stud to temporarily hold sheet firmly while adhesive dries (24hours minimum).

Fixing to Ceilings

- Apply adhesive at 230mm maximum centres and ensure all daubs are at least 200mm from any fastening point.
- Place sheet at right angles to the joists. Fasten one recessed edges at every joist, press the sheet firmly against the framing and fix the opposite edge to every joist.
- At the centreline of sheets, fasten with two nails 75mm apart or one screw to each joist.
- Fasten temporary plasterboard off-cuts to hold sheets firmly against joists whilst adhesive dries (up to 48 hours for ceiling). See illustration.

NOTE: To place ceiling sheets in position against joists requires a lift by two people. Alternatively a good idea is to hire a plasterboard lifter.

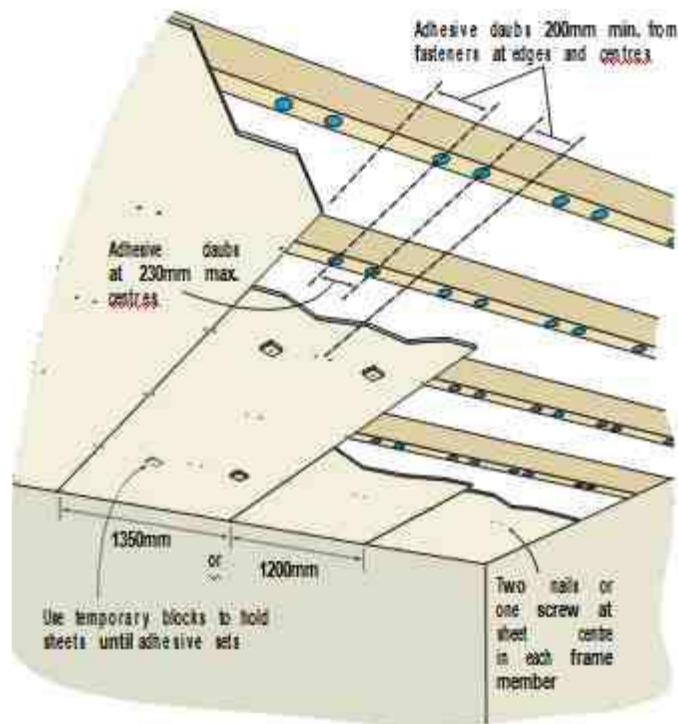


Figure 19: Placing Ceiling Sheets

Applying Adhesive



Figure 20: Applying adhesive

Back-Blocking of Recessed Joints on Ceilings

- When using Gyprock Easytape on joints, or where 3 or more recessed joints occur in a continuous ceiling area, all recess joints must be back-blocked.
- Cut back-blocks of at least 200mm width and long enough to fit loosely between the framing members.
- Apply Gyprock Cornice Cement to the entire face of back-block with a notched spreader. Form 6mm x 6mm beads at approximately 20mm centres at right angles to the joint.

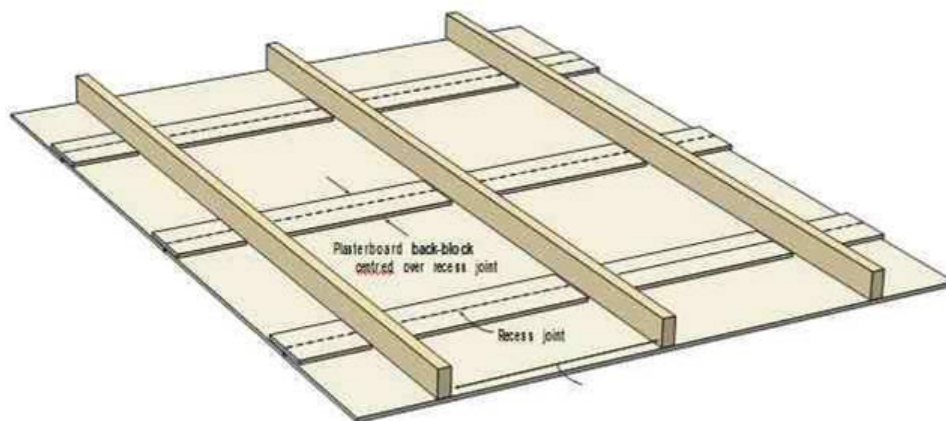


Figure 21: Back-blocking cut to fit loosely between framing members

Recess joints

- Apply Gyprock® plasterboard with the long edges at right angles to the joists or battens. Place back-blocks along the full length of the sheet joint. As soon as all the blocks are in position, install the adjoining sheet.
- If preferred, back-blocks may be cemented into position by working above the ceiling after the sheets have been fixed. Back-blocks must be cemented in position before the joints are finished.

NOTE: For best results on ceilings, it is preferable to use full length sheets which extend from wall to wall, to eliminate the need for butt joints. Where butt joints are necessary, for back-block installation advice please consult your Gyprock plasterboard supplier for installation advice.