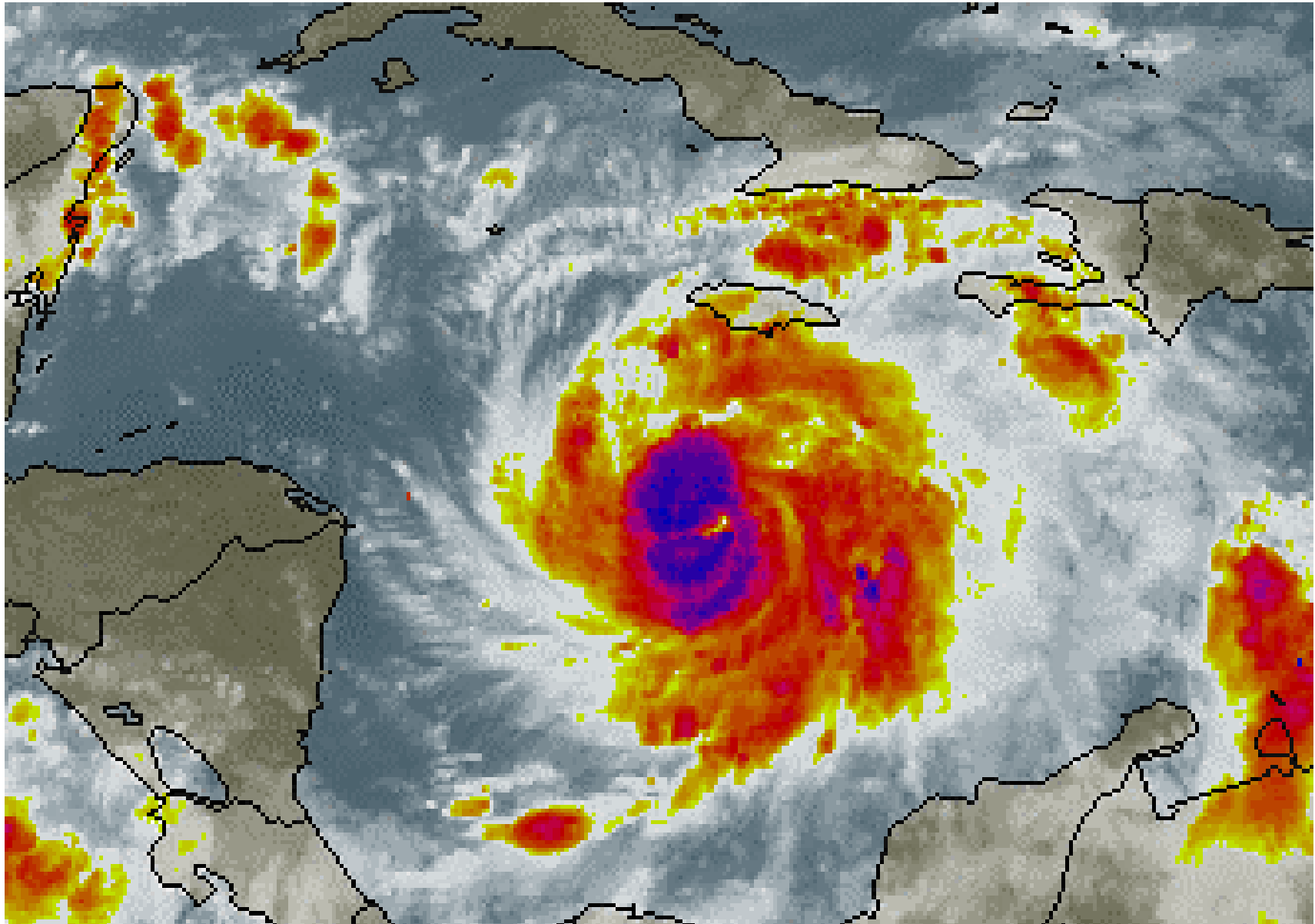


HOMEOWNERS GUIDE TO A SAFER HOUSE



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This guide tries to explain the vulnerabilities that may exist with your house when threatened by a hazards such as hurricanes, what you can do about them, and what activities to take if there is little time before a storm. In addition, it gives advice on what to make sure to put in if you are rebuilding after damage, so that your house is less vulnerable next time. A checklist is included to help you supervise the building work to make sure that “mitigation” is included in repair work.

Contents:

1. What hazards do we face
2. How vulnerable is your house
3. What you can do to strengthen your house
4. What to do first, if a storm is coming
5. How to repair damage so that it will be stronger another time
6. A checklist for monitoring builders and tradesmen so that your house is hurricane resistant

1 What Hazards do we face?

The most frequent hazard in our region is that of hurricanes. These bring not only high winds, but the possibility of flooding, storm surge and heavy seas, and cause secondary effects such as landslides due to the loosening of the soil. There are other hazards that affect our buildings, such as volcanoes, wildfires and, occasionally (but importantly), earthquakes. Earthquakes can also cause Tsunamis (tidal waves), as well as landslides and liquefaction of unstable ground.

None of these hazards are necessarily a disaster, if our houses are strong, on good foundations, and sited out of the danger area (for volcanoes, landslides, flooding and tidal waves).

2 How Vulnerable is your home.

How vulnerable your home is depends on three things. Firstly, damage is related to the forces it has to cope with, which are largely determined by the site. Secondly, the shape and design of the building can add to or limit the forces and the possibilities of progressive damage should something fail. Finally, the details are very important, connecting the building components together, and, like a chain, being all as strong as the weakest link.

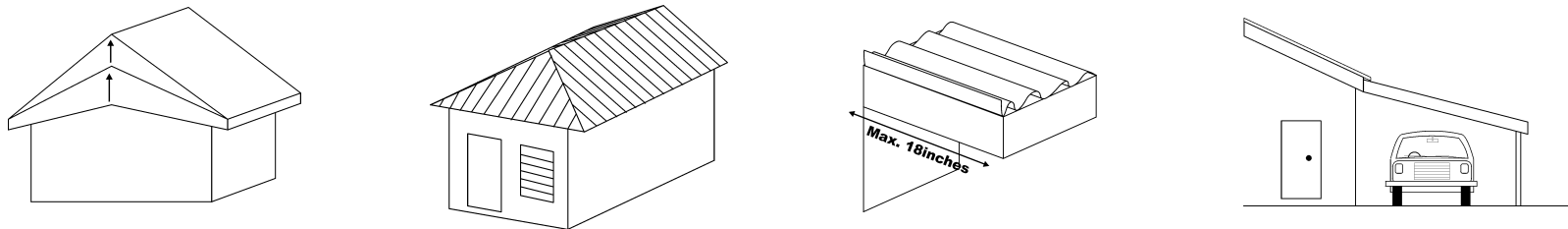
Site,

An assessment must be done to see if your house is prone to hazards which are impossible (or too expensive) to mitigate, such as flooding or landslides. If sited on the top of a hill, or with a view of the sea (where winds can come from without obstructions to slow them down), wind forces will be potentially much higher than in sheltered spots. Trees will protect from the wind, but can damage a building if too close



Design

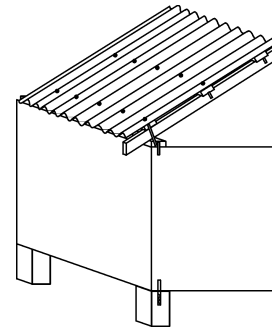
The design of the building will both affect the amount of force imposed on it, as well as how it behaves if it is damaged.



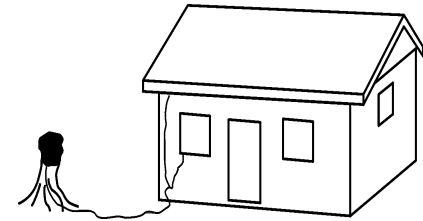
Steeper pitches, hip roofs and small overhangs all reduce the force on the roof compared with flat roofs, gable ends and large overhangs. Because the forces on verandahs and car ports are high, they should not be structurally linked with the house.

Details

The details, and particularly the connectors, transmit the forces from roof to ground. When a hurricane lifts the sheeting, this force and shaking must be resisted by the nails or screws, which hold the sheet to the purlins. These in turn must be firmly held down to the rafters, which attach to the wallplate, to the walls and to the foundations. This is the "Load Path", which must be maintained. Like a chain, any weak link will cause it to break. Good materials and connectors are your chain, and maintenance must include stopping termites, rot or corrosion from weakening the "links".



Load Path



Termite attack

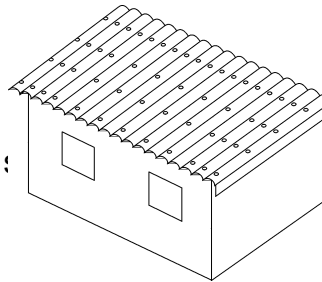
3 What you can do to strengthen your home

CHECK THE LOAD PATH!

This means:

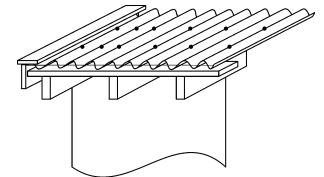
Sheeting

Fixings
Provide sufficient nails or :



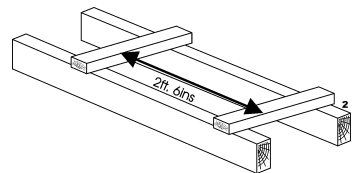
Edge details on sheeting

Hold down well



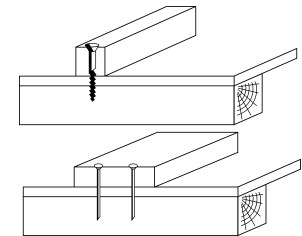
Purlins

spacing
closer provides more
strength



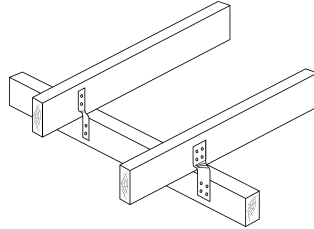
Fixings

Two nails or one screw
at each rafter crossing

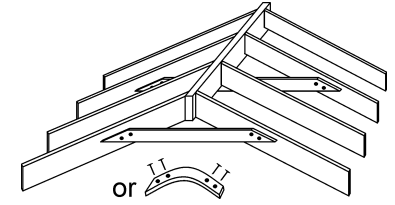


Rafter

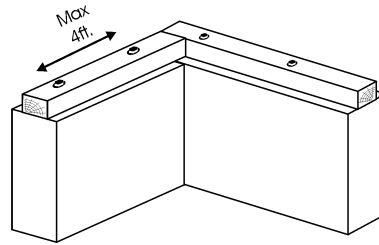
hurricane straps
one per rafter



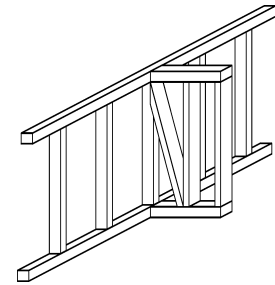
Collar ties between
rafters at the ridge



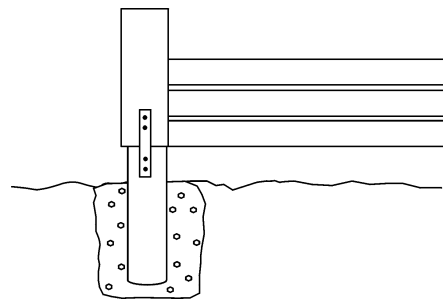
Hold down **wallplates** with bolts



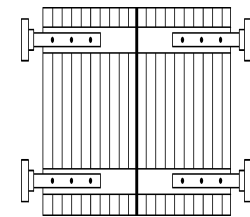
Brace timber walls
to resist wind pressure



Tie down to post foundations



Fit **Hurricane shutters**



4 What to do first, if a storm is coming – (see the Flyer)

URGENT Limb overhanging trees, Board up windows, Check nails in sheeting, If a board house and connection to footing is weak, bring heavy objects inside

IF YOU HAVE MORE TIME: Check edge cover of sheeting, Add nails to edge of sheeting, Install collar ties
Install hurricane clips on rafters, Strap board houses to footings

5 How to repair damage so it will be stronger next time

In the chaotic time after the storm, the priority is to get the house back into working order, to keep out the rain, or to secure the contents. Materials are purchased or otherwise obtained, and speed is important. The important things to remember are:

Reduce the forces on the roof.

- If there is major roof damage, consider replacing with a hip roof,
- Increase the roof pitch,
- Separate porch roofs from the main roof
- Reduce overhangs.

Strengthen the roof

- Close up purlin spacings, especially if they came off the rafters or the galvanize came off the purlins (not enough fixings per sheet).
- Use screws or two nails where each purlin crosses a rafter.
- Use a proper thickness of galvanize sheet (thin sheets tear off the fixings). If the galvanize is serviceable, nail down well – stop leaks with bitumen “flashband”
- Use more fixings per sheet for the galvanize