The way we build houses needs to be stronger. These are 8 key messages on how to repair your house and build back safer.

1. **BUILD ON STRONG FOUNDATIONS**
   - [Image of a strong foundation]

2. **TIE-DOWN FROM BOTTOM UP**
   - [Image of tie-downs]

3. **BRACE AGAINST THE STORM**
   - [Image of bracing]

4. **USE STRONG JOINTS**
   - [Image of strong joints]

5. **A GOOD HOUSE NEEDS A GOOD ROOF**
   - [Image of a good roof]

6. **SITE YOUR HOUSE SAFELY**
   - [Image of site safety]

7. **A SIMPLE SHAPE WILL KEEP YOU SAFE**
   - [Image of a simple shape]

8. **BE PREPARED**
   - [Icons for evacuation, communication, grab bag]
Build on strong foundations

Foundations are very important as they anchor your house to the ground. Ensuring foundations are suitable to your building’s location and ground conditions protect your house from strong winds, earthquakes and flooding.

A. Stops the building flooding
   - 1/4 post height

B. Protects the building from pests - like termites
   - or use chemical treatments

C. Keeps the timber away from water so it does not rot

D. Stops the building from being pushed over

E. Weights the building down so it can’t be sucked up

What can I use as a foundation for my house?

Above ground timber post
Below ground timber post
Anchors increase foundation strength
Treated hardwood post below ground protects from rotting
Hardwood post set into concrete foundation
Rebar set into concrete foundation
Steel strap bolted to post with gap to avoid rotting

Too Weak X
Strong ✓
Stronger ✓
Strongest ✓
Tie-down from bottom up

In a typhoon your house can be sucked apart or blown away by the wind. Tie every part of your building right through to the ground. Start thinking about this from the bottom up.

WHAT CAN I USE TO TIE-DOWN MY HOUSE?

- **Rope or nylon fishing wire**
- **Thick galvanized wire (multiple layers)**
- **Timber cleats**
- **Galvanized metal strap**

**Strong**

**Strongest**

STRONG WINDS COMING?

A. Tie the posts down to the foundation
B. Tie the floor joists down to the frame
C. Tie the roof beams down to the posts
D. Tie the roof frame down to the posts
E. Tie the roof battens down to the roof frame

Tie-down all the way to the ground
Brace against the storm

Strong bracing stops your house being pushed over or pulled apart by the wind. Bracing needs to be strong against being crushed along its length or pulled apart. Brace between the strong points of your house.
Use strong joints

Your house is only as strong as the weakest joint. Build every joint so it can’t be pushed or pulled apart. Horizontal nails are better as they can’t be pulled apart by the wind sucking your house up or pulling it down.

A. Extend timber past joints to stop nails splitting the timber

B. Don’t cut away too much of the main posts or beams

C. Offset nails to prevent timber splitting

D. Nailing at an angle will make the joint harder to pull apart

E. Fishplate/strap vertical and horizontal joints to increase strength

F. Use gusset plates to strengthen joints

WHAT CAN I USE TO STRENGTHEN JOINTS?

- Single nail
- Nails
- Screw
- Interlock joint and nail
- Fishplate or cleats
- Bolt

Too Weak ✗

Strong ✔

Stronger ✔

Strongest ✔
A good house needs a good roof

The way you design and build your roof is critical to protect you against strong winds and rain. Build your roof the right shape and pitch, and well nail down to protect against a storm.

WHAT CAN I USE TO SECURE MY ROOF?

- Regular nail
- Umbrella head nail and washer (good for bamboo)
- German wire
- Twisted umbrella head nail and washer
- Roofing screw and washer

WHAT ROOF SHAPE SHOULD I USE?

- Single slope roof
- Two sided gable roof
- Multiple roof slopes reduce the risks of your roof being pulled apart

- Keep eaves short to stop the roof being sucked away and long enough to protect the walls from rain
- Overlap roof sheets to strengthen joints
- Use rubber washer or silicone on roofing nails
- Use more nails at all the roof edges

The best roof pitch is 30°

- 15° Too flat
- 30° Strong
- 50° Too steep

Overlap roof sheets to strengthen joints

German wire (good for bamboo)

Use more nails at all the roof edges

Roofing screw and washer
Site you house safely

Identify the hazards in your location and build as well as you can to resist them.

A Raise your house above the floods

Don’t build too close to edges or where rocks might fall

Build away from large trees or remove trees near the house to reduce risk of damage

Reduce risks and build away from hazards where possible

Use wind breaks to protect your house from strong winds

B

D

C

E
Simple, compact shapes are the safest
Length no more than three times the width
Houses too close together trap the wind Spacing houses to let the wind pass
Overhangs weaken the strength of your house
Lean to roofs separate to main roof

A simple shape will keep you safe
The shape of your house is important to reduce damage in strong winds. Always keep the design simple and strong.

HOW SHOULD WE PLAN A GROUP OF BUILDINGS?

Houses too close together trap the wind
Spacing houses to let the wind pass
HOW CAN I PREPARE MYSELF AND COMMUNITY FOR A DISASTER?

BE PREPARED

Preparedness is critical because it is the main way to reduce the impacts of a disaster. It is important to start taking actions and prepare now.

A WHAT ARE THE HAZARDS IN MY LOCATION?
- Typhoon?
- Floods?
- Tidal surge?
- Tsunami?
- Earthquake?
- Landslide?
- Volcano?

B OVER TIME WHAT CAN I DO TO PREPARE MY HOUSE?
- Add bracing
- Add shutters to windows and openings
- Create wind breaks
- Prepare strong ‘safe room’
- Remove large trees close to house

C WHEN A DISASTER IS COMING WHAT CAN I DO TO MY HOUSE?
- Tie-down house
- Protect windows and openings
- Elevate valuable items during floods
- Secure loose items so they won’t be blown away
- Turn off or unplug all appliances

EVACUATION
- Make a plan and practice it
- Decide early if you will evacuate or stay in place
- Prepare safe evacuation route
- Know where the evacuation sites are
- Know what transport you can use

COMMUNICATION
- Know the disaster warnings signals
- Know how you can receive information about a disaster
- Inform your relatives and friends where you will evacuate to
- Know how you will communicate with relatives and friends after disaster
- Know how and who to inform of your situation after a disaster
- Know where to find information on missing persons

GRAB BAG
- Prepare a waterproof ‘grab bag’ prior to a disaster
- Make the ‘grab bag’ easy to carry and include:
  - medical kit
  - extra clothing and safe shoes
  - batteries
  - torch and matches
  - basic food
  - cooking equipment
  - basic tools
  - important personal records/ID
  - Don’t forget some water

HOW CAN I PREPARE MYSELF AND COMMUNITY FOR A DISASTER?