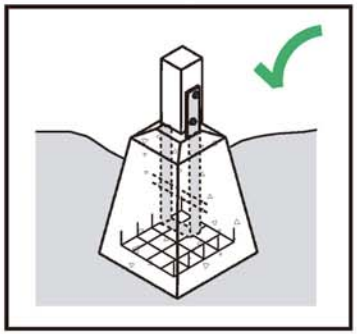
8 BUILD BACK SAFER KEY MESSAGES

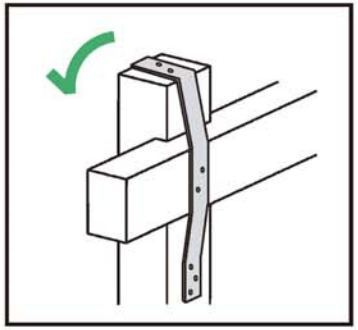
V1.1

Maria showed us that the way we build houses needs to be stronger. These are 8 key messages on how to repair your house and build back safer.

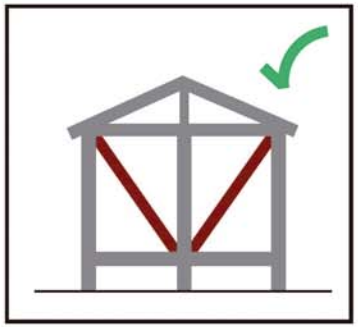
1 BUILD ON STRONG FOUNDATIONS



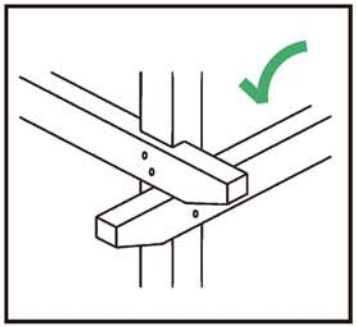
2 TIE-DOWN FROM BOTTOM UP



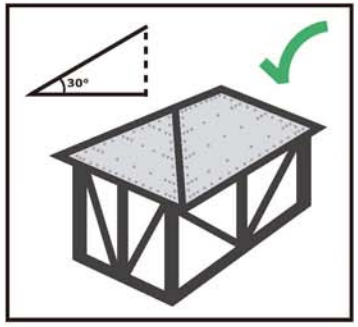
3 BRACE AGAINST THE STORM



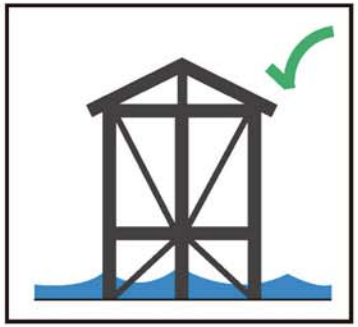
4 USE STRONG JOINTS



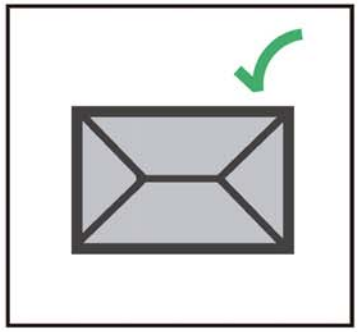
5 A GOOD HOUSE NEEDS A GOOD ROOF



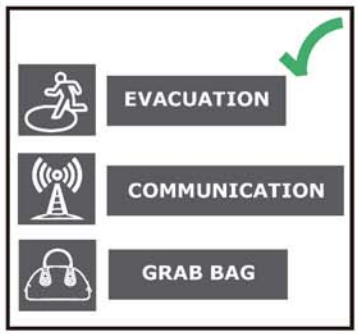
6 SITE YOUR HOUSE SAFELY



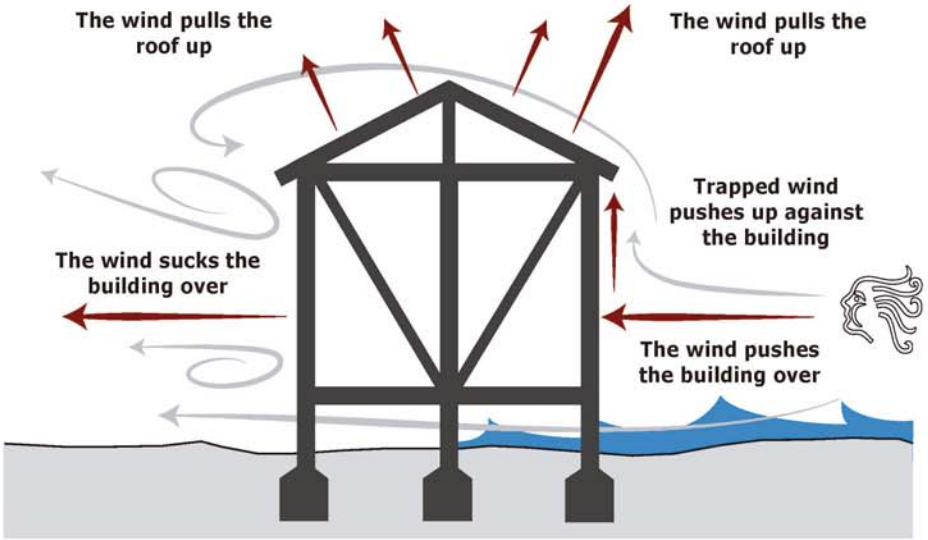
7 A SIMPLE SHAPE WILL KEEP YOU SAFE



8 BE PREPARED



HOW DOES A HURRICANE AFFECT YOUR HOUSE?



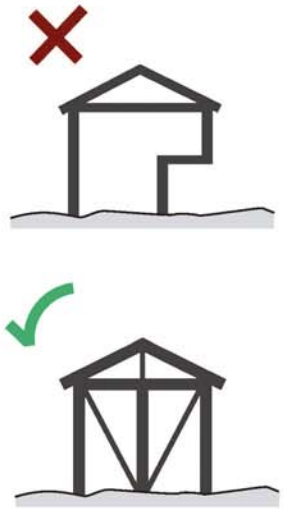
Global Shelter Cluster
ShelterCluster.org
Coordinating Humanitarian Shelter

Dominica Hurricane Maria

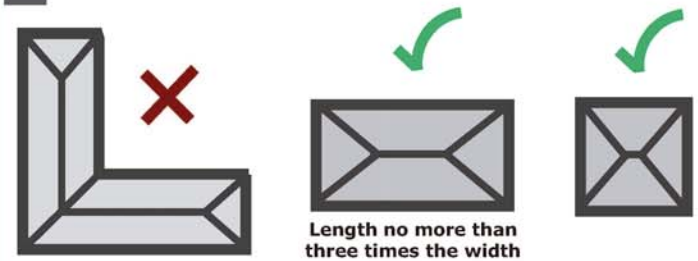
A simple shape will keep you safe

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

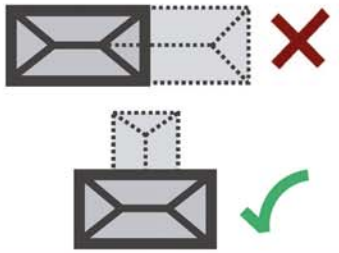
A Overhangs weaken the strength of your house



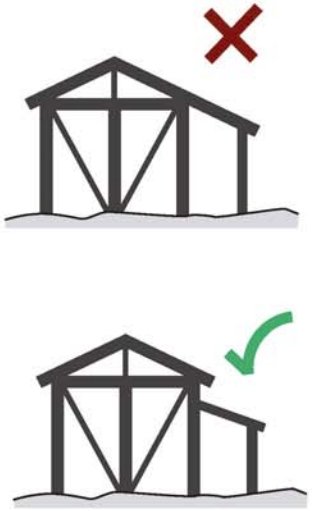
B Simple, compact shapes are the safest



C Don't extend too long

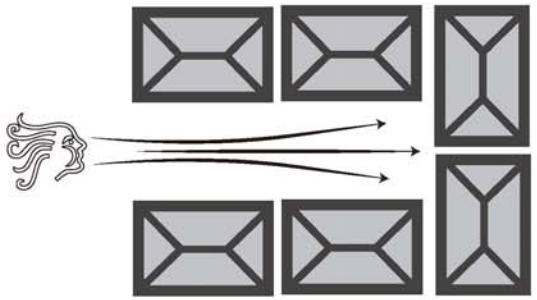


D Lean to roofs separate to main roof

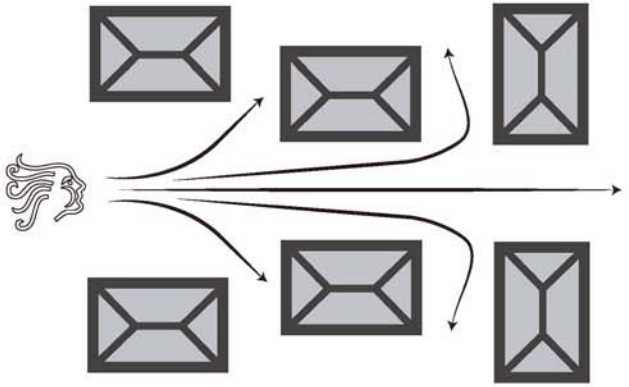


HOW SHOULD WE PLAN A GROUP OF BUILDINGS?

Houses too close together trap the wind



Spacing houses to let the wind pass



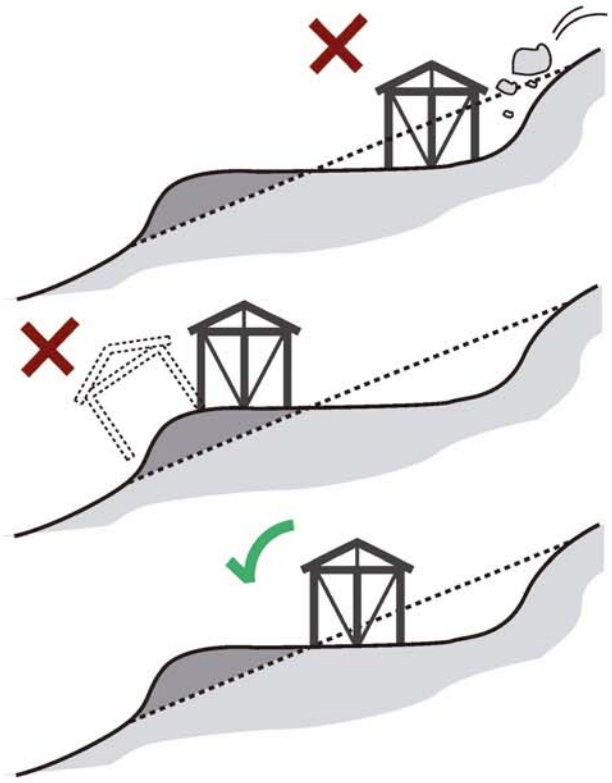
Site you house safely

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

A Raise your house above the floods

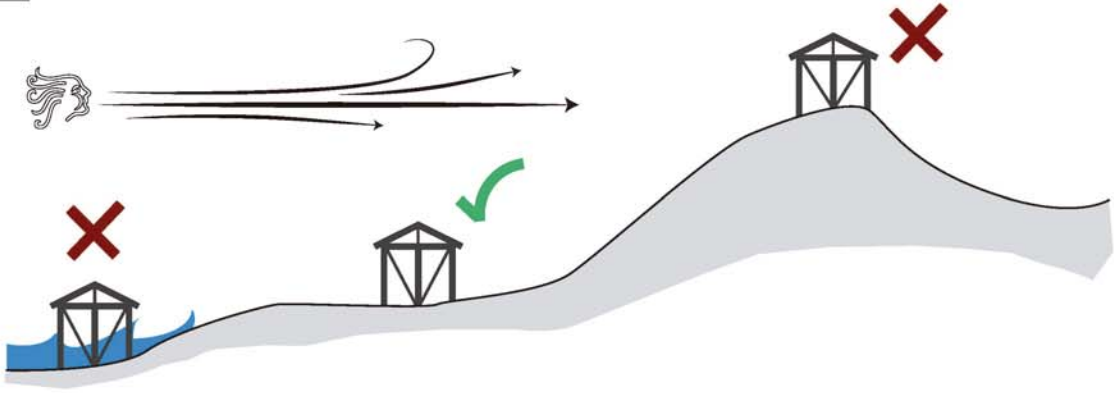
E Use wind breaks to protect your house from strong winds

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



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

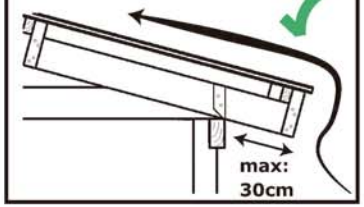
C Reduce risks and build away from hazards where possible



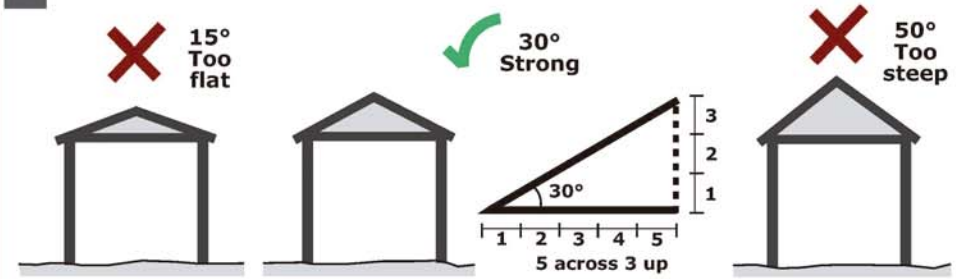
A good house needs a good roof

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.

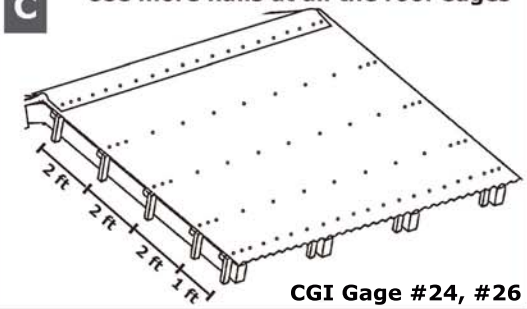
A Keep eaves short to stop the roof being sucked away and long enough to protect the walls from rain



B The best roof pitch is 30°

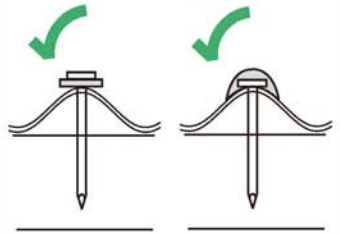


C Use more nails at all the roof edges

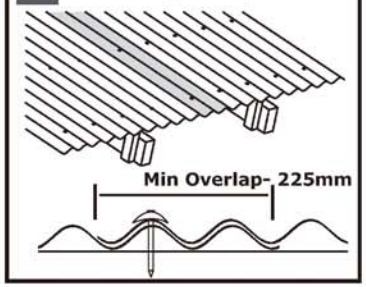


CGI Gage #24, #26

D Use rubber washer or silicone on roofing nails

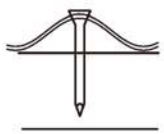


E Overlap roof sheets to strengthen joints



WHAT CAN I USE TO SECURE MY ROOF?

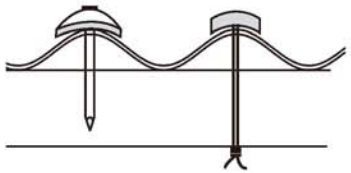
Regular nail



Too Weak ✗

Umbrella head nail and washer

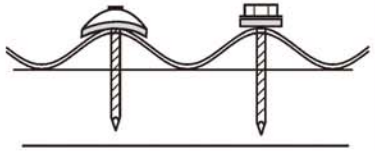
German wire (good for bamboo)



Strong ✓

Twisted umbrella head nail and washer

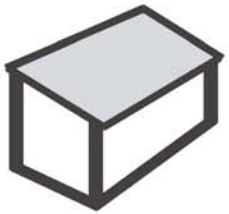
Roofing screw and washer



Strongest ✓✓

WHAT ROOF SHAPE SHOULD I USE?

Single slope roof

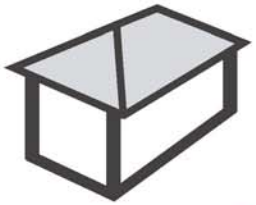


Too Weak ✗

Two sided gable roof

Strong ✓

Multiple roof slopes reduce the risks of your roof being pulled apart

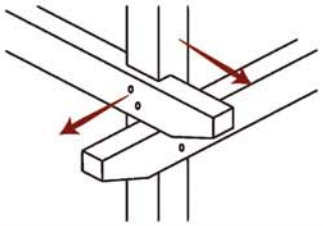


Strongest ✓✓

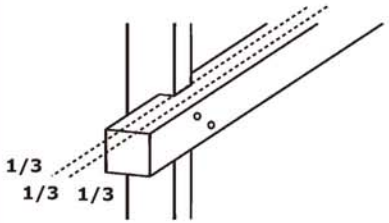
Use strong joints

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.

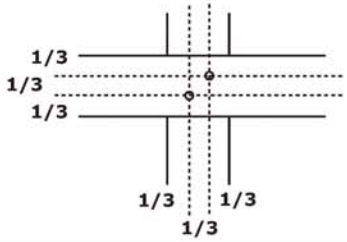
A Extend timber past joints to stop nails splitting the timber



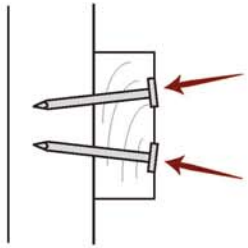
B Don't cut away too much of the main posts or beams



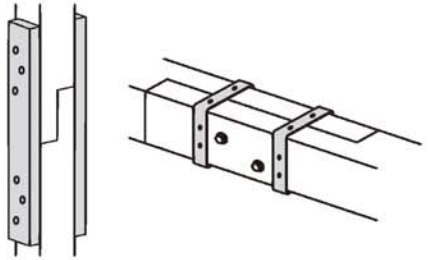
C Offset nails to prevent timber splitting



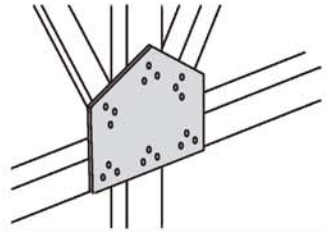
D Nailing at an angle will make the joint harder to pull apart



E Fishplate/strap vertical and horizontal joints to increase strength



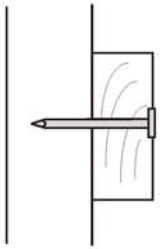
F Use gusset plates to strengthen joints



WHAT CAN I USE TO STRENGTHEN JOINTS?

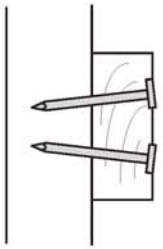
Too Weak ✗

Single nail

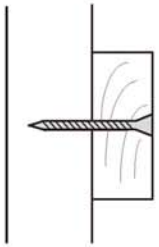


Strong ✓

Nails

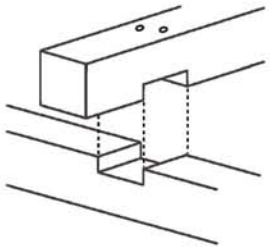


Screw

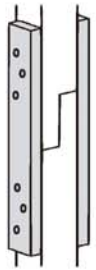


Stronger ✓

Interlock joint and nail

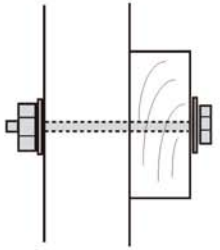


Fishplate or cleats



Strongest ✓✓

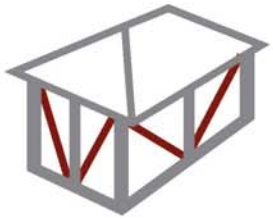
Bolt



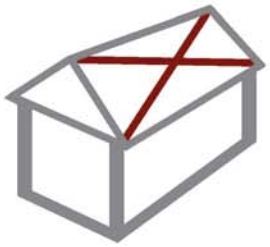
Brace against the storm

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.

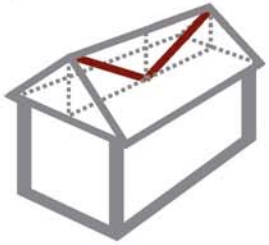
A Brace each wall



B Brace below the roof



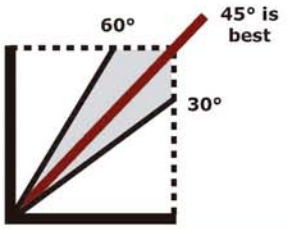
C Brace between roof trusses or rafters



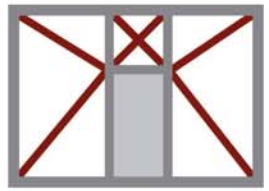
D When on stilts, brace between the posts

E Full bracing both ways from strong point to strong point!

F Brace at 45°. No less than 30° and more than 60°

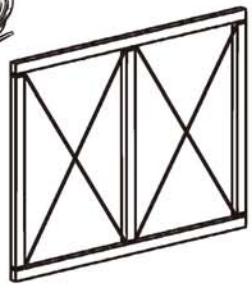


G Brace around doors and windows - strong point to strong point!

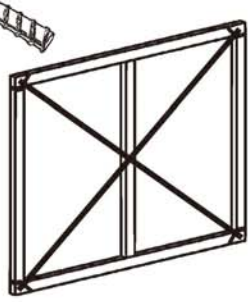


WHAT CAN I USE TO BRACE MY HOUSE?

Tie thick galvanized steel wire

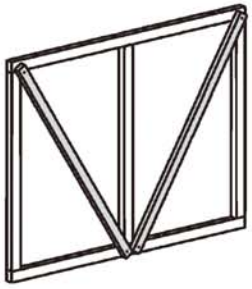


Tie old rebar

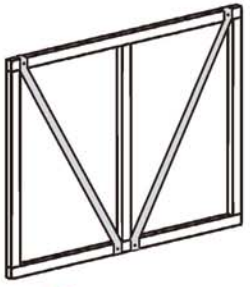


Strong ✓

Nail timber

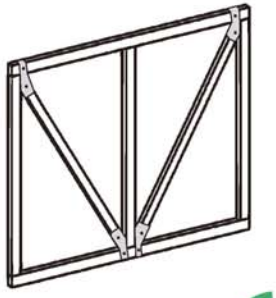


Nail galvanized steel straps

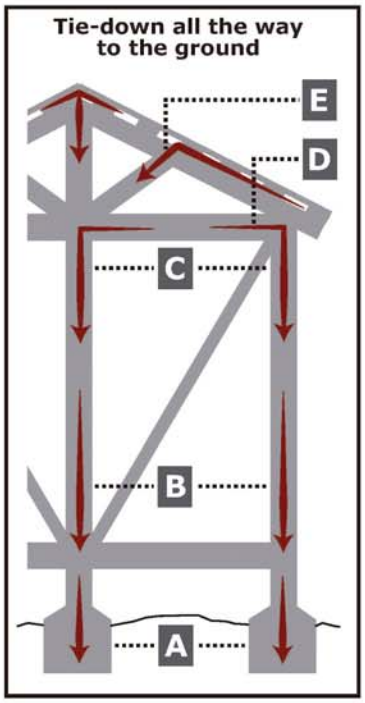


Stronger ✓

Nail timber and galvanized steel straps

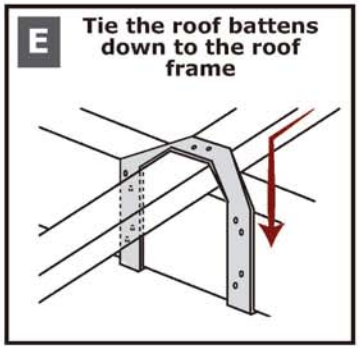


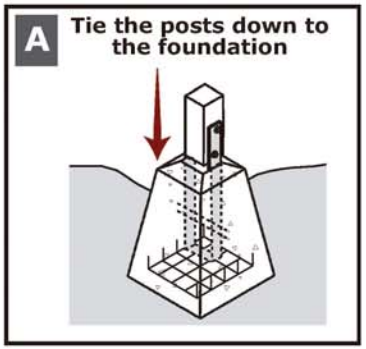
Strongest ✓✓

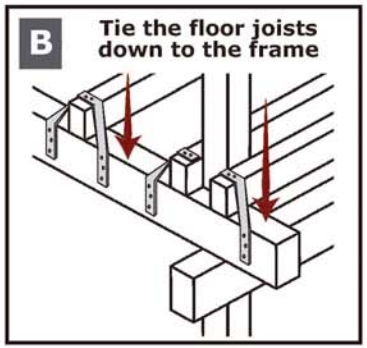


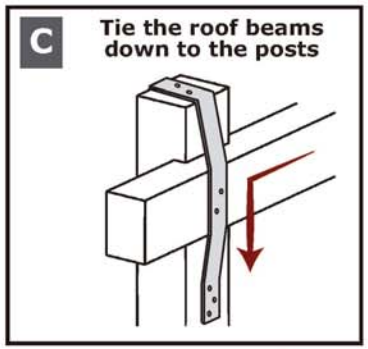
Tie-down from bottom up

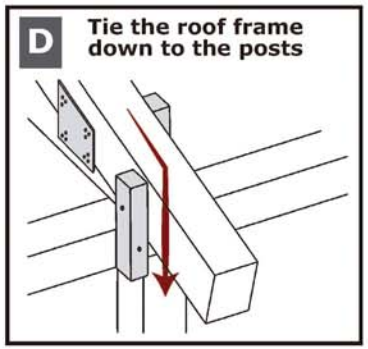
In a typhoon your house can be sucked apart or blown away by the wind. Tie every part of your building right through to the ground. Start thinking about this from the bottom up.





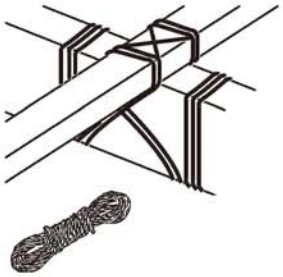




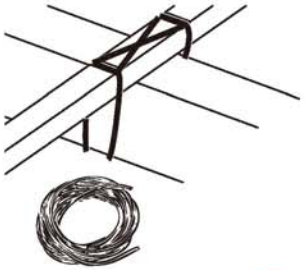


WHAT CAN I USE TO TIE-DOWN MY HOUSE?

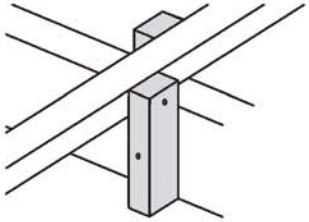
Rope or nylon fishing wire



Thick galvanized wire (multiple layers)

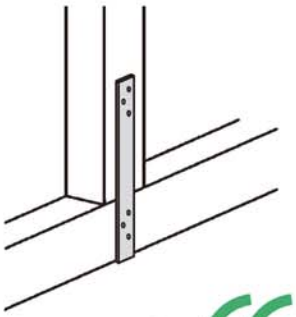


Timber cleats



Strong ✓

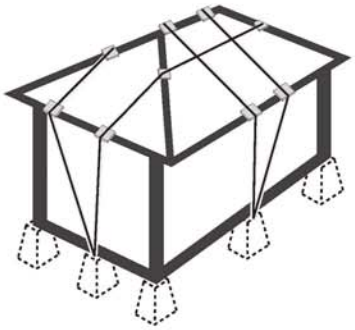
Galvanized metal strap



Strongest ✓✓

STRONG WINDS COMING?

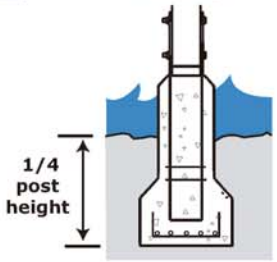
Tie-down when strong winds come



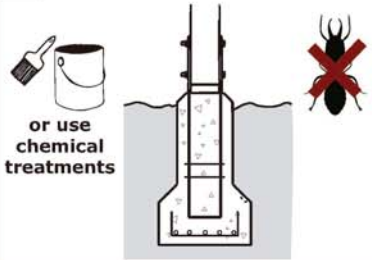
Build on strong foundations

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.

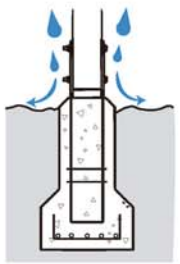
A Stops the building flooding



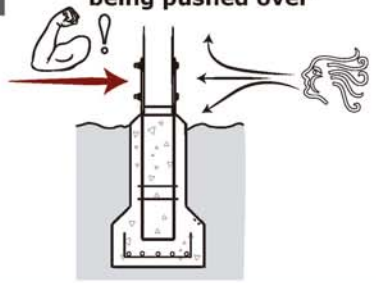
B Protects the building from pests - like termites



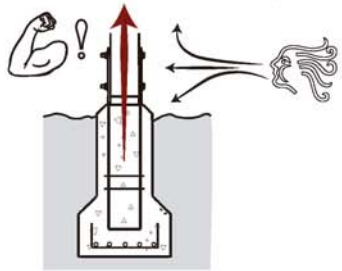
C Keeps the timber away from water so it does not rot



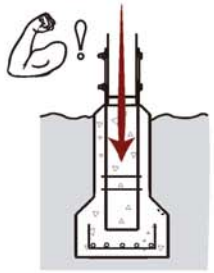
D Stops the building from being pushed over



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

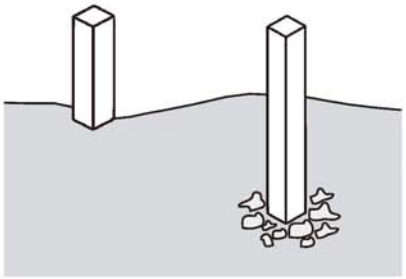


F Stops the building sinking into the ground



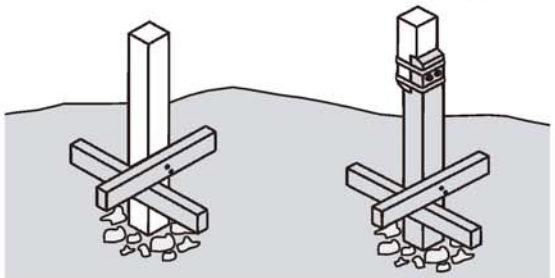
WHAT CAN I USE AS A FOUNDATION FOR MY HOUSE?

Above ground timber post | Below ground timber post



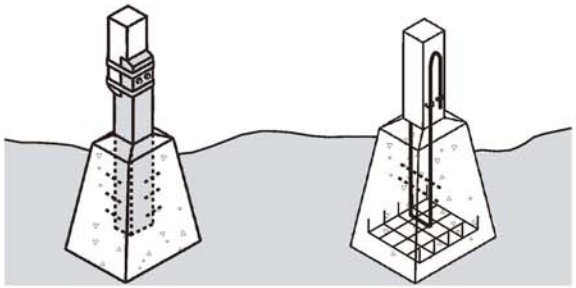
Too Weak ✗

Anchors increase foundation strength | Treated hardwood post below ground protects from rotting



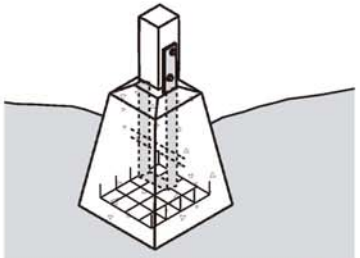
Strong ✓

Hardwood post set into concrete foundation | Rebar set into concrete foundation



Stronger ✓

Steel strap bolted to post with gap to avoid rotting



Strongest ✓✓

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?

-Hurricane?
-Earthquake?
-Landslide?
-Volcano?
-Floods?

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

CONSTRUCTION KEY POINTS

- Pitch Roofs: 2-pitched roof: min. 30°- 45°, 1-pitched roof: 12°-14°.
- Recommended extension of eaves/ overhang: min: 150mm – max: 300mm
- 225mm overlap between sheets longitudinally.
- 150mm overlap between sheets laterally.
- Timbers connecting the rafters: Use Collar ties, Gussets and Metal Straps to secure the ridge
- Rafter connecting the wall plates: straps and timber connector
- Wall plates: should be securely held down (no just nail)
- Roof Connections for Concrete Walls: Use a plate + Bolt or Galvanized metal strap embedded at least 200mm into concrete belt beam
- Purlins to rafters: Purlins minimum 50mm width to prevent splitting when nailed
- Spacing of Laths / Gauge sheeting: #26(2' nails- 2'6" Screws) - #24(2' Nails-3' Screws)
- Porches shouldn't be structurally attached