

# Homeowner's Handbook to Prepare for Natural Hazards

## Shelter-In-Place Instructions and Table

These instructions and the Shelter-In-Place Table contain general guidance on what makes a house strong. Seek the advice of a licensed structural engineer to precisely determine the strength of your house and learn about the simple measures to retrofit.

During a hurricane your family needs a safe place. One option is the shelters that the counties will officially open. Since space in public shelters is limited, a better option is to shelter in **a house (yours, friends, or relatives) if it is: (i) outside a high risk flood zone and no risk of flooding, (ii) outside a storm surge zone, and (iii) wind-resistant.**

### 1) **Flooding - Do not shelter in place if the house is in a high-risk flood zone or has a risk of flooding.**

Go to <http://gis.hawaiiinfip.org/FHAT/> - Type in the address or tax map key number. If the house is in a VE, A, AH, AO, AE, or AEF zone, and a hurricane threatens, do not shelter in place. Even if the house is outside a high-risk flood zone, it may have a history of flooding. Do not shelter in place if the house is at any risk of flooding during a hurricane.

2) **Storm Surge** - Hurricane storm surge evacuation maps are being created (not to be confused with tsunami evacuation maps). When the maps arrive (check with your local emergency management or civil defense agency), evacuate if the house is in a hurricane storm surge zone and a hurricane threatens. Listen to TV and radio.

3) **Wind** - Use the Shelter-In-Place Table to guide your decision. The stronger the wind, the stronger the house needs to be. Use the following as a guide:

- **Condition** - A house in good condition is free from termite damage, wood rot, and corrosion of fasteners. Maintain your house to make it stronger.
- **Hurricane Clips** - Generally, houses built after 1988 on O'ahu, after 1990 on Maui and Kaua'i; and after 1994 on Hawai'i Island have hurricane clips which tie the roof to the wall and prevent it from blowing off.
- **Load Path** - Generally, houses built after 1993 on Kaua'i, after 1994 on Hawai'i Island, and after 1995 on Maui and O'ahu have a continuous load path (tie roof to wall to foundation).
- **Windows Roof Garage & Doors** - Other ways to strengthen a house are to protect windows from flying debris (masking tape will not work), fortify the roof after its useful life, and brace garages and doors.
- **Retrofitting** - If a house does not have the above items, they can be added as a retrofit. See Part 4 of the handbook. This is encouraged as it will strengthen the house significantly and reduce the risk to the homeowner.

To use the Shelter-In-Place Table, determine if the house is single-wall, double-wall (framed by 2" x 4" studs with drywall on the inside and siding on the outside), or has a concrete-wall. Concrete is strongest, then double-wall, then single-wall. Once you find the applicable row, move to the right to determine the current house situation – Condition? Hurricane Clips? Load Path? Window Protection? When sheltering in place, always stay in the lowest floor and in the center of the house away from all windows. If you cannot find a suitable house to shelter in (yours, friends or relatives), consider a high-rise concrete structure or a public shelter as a last resort.

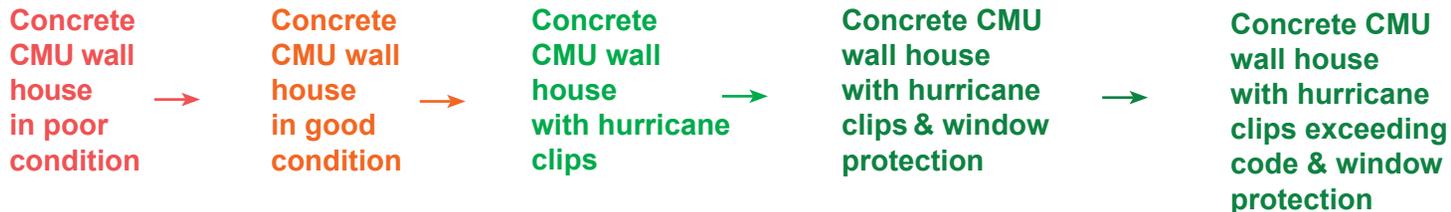
# ABILITY TO SHELTER IN PLACE DURING A HURRICANE

PLEASE READ INSTRUCTIONS BEFORE USING THIS TABLE

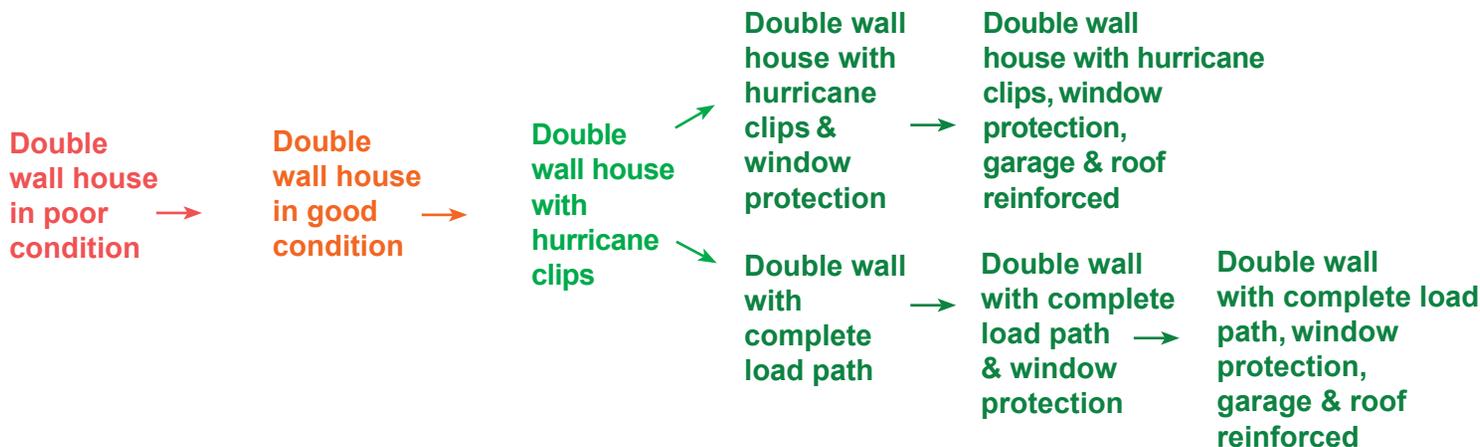
FEMA or  
Hawai'i  
Residential  
Safe Room

## Safe room

### Concrete or CMU wall house



### Double wall house



### Single wall house



## Suggested Action



**Unsafe**

Evacuate! Do Not Shelter in place

**Marginal**

Shelter in place up to a Tropical Storm

**Good**

Shelter in place up to Category 1 hurricane

**Better**

Shelter in place up to Category 2 hurricane

**Best**

Shelter in place up to Category 3 hurricane