This demonstration is based off the 2009 report by structural engineers Dr. Ian Robertson and Gary Chock. You may be able to do the work yourself but first consult with a licensed structural engineer. The work can reduce earthquake and hurricane damage.
Single-wall houses on post and pier foundations are easily damaged from earthquakes and hurricanes. The post sits on a termite pan, with no connections and are held by friction.
The retrofit design depends on what seismic zone the house is in. Even for the most active area, the south part of Hawaiʻi, the retrofits can provide earthquake and hurricane protection. For these areas shear walls may be needed also.

Proximity to the coastline is also a factor.
Other factors to consider besides the seismic zone are number of stories, post spacing, post height, and the ratio of the tallest post with the shortest. Refer to the 2009 Report and 2018 Assessment for proper spacing to retrofit the post.
New Simpson Products Make for Easier Installation

- Shorter Holdown – HDU2
- Knee Brace Stabilizer
- Timber HEX Screw
- Titen Heavy Duty Concrete Anchor Screw
Use the holdown most appropriate given the post height.
Procedures

Remove decorative fencing with multi-tool using flat wood blade, hammer and small nail-trim remover.
Install Simpson Strong Tie AC4 connector to inside post and beam. The AC4 is for 4” x 4” post. AC6 is for larger posts.

Use 3.5 inch 16d nails and a palm nailer. A hammer can be used but it is tiring and time consuming.
Knee brace stabilizer (Simpson KBS1Z) installed for all knee braces.
Trace outline of holdown on termite pan.

Cut termite pan with snips.

Fold down or hammer down termite pan against tofu block. Do for inside and outside.
Attach 2” x 4” between post and edge of tofu block.

Attach Simpson HDU2 holdown to 2” x 4” and concrete foundation.
Repeat process for outside of post with 2” x 4”

Attach HTT5 holdown to 2” x 4” and concrete foundation.
Drill hole with rotary hammer, clean hole of dust with air spray and brush. Then fill with epoxy. If epoxy used – drill hole is 1/8” larger than anchor bolt. Set anchor bolt and holdown.
The Titen concrete anchor screw eliminates the need to epoxy. Drill hole with **rotary hammer** - same size as anchor screw (e.g., 5/8” hole for 5/8” anchor). Drill anchor screw with **impact driver**. Treat for corrosion with zinc rich galvanizing spray, primer for galvanized metal and enamel paint.
For short posts, complete for all exterior posts and double the corners. Refer to the 2009 report and 2018 assessment for post retrofit spacing.
Single-Wall House with Load Path!!

HPT hurricane clip on each rafter. See Part 4.1.1 of the Homeowner's Handbook on procedures.

This single wall house on O‘ahu now has a continuous load path.

Depending on the carrier, there are potential discounts on hurricane insurance for the different retrofits based on the stronger house and the reduced risk of property damage. This will vary with each company.

Hurricane Clips – 10%

Foundation Upgrades – 10-12%

Upgrades are cumulative, so total discount for this house is up to 22%.

One quote for this house went from $1,184 to $932 per year for hurricane insurance.