Minimum Standards Checklist for use by Builders

a. Foundation:

1. Solid cement/concrete pillars, minimum 9” x 9” in cross section, firmly embedded 18 inches in ground with ½” rebar extending 12 inches above foundation.

OR

2. Wooden pillars (6" x 6" minimum or 8" diameter) of treated lumber, sunk at least 4 feet into the ground

Note: the height of foundation pillars should be controlled to prevent possible buckling or overturning. A maximum of 2’ between the ground and the underside of the building is recommended.

b. Walls:

1. Wall plate/sill attached to cement foundation/pillars by bolted rebar
2. Wall plate/sill attached to wooden pillars by straps and nails
3. Floor joists toe-nailed to wall plate
4. Wall uprights (studs) located at 2'-0" centres or 16” centres for increased rigidity.
5. Double studs around doors and windows and cross braces at corners

c. Roof:

1. Hip or gable shaped roofs with minimum 30 degree slopes
2. Overhang of approximately 8" or less horizontal, or maximum 18” when enclosed
3. Ventilation installed in gable ends
4. Rafters attached to wall plate with twisted metal straps
5. Rafters located at 2'-0" centers maximum
6. Every second set of rafters connected by collars or ties beneath the ridge board
7. Cross laths (purlins) located at 2'-0" centres
8. Galvanized sheets of no thinner than 26 gauge should be used (24 gauge is the recommended thickness.)
9. Galvanized sheets should overlap to at least one complete corrugation but preferably two complete corrugations
10. Galvanized sheeting should overlap at least 10" when they are joined lengthwise.
11. Galvanized sheets should be nailed at the top of every corrugation at eaves and the ridge board and every second corrugation on lath/purlins. Nailing should be done through the crown of the corrugation and a wooden fillet to the purlin/lath.
12. Ridge is capped and nailed at every corrugation.
13. Dome head galvanized nails or washered bolts used for roofing.
14. Porch/veranda roof is separate from house roof and can break away.

d. Windows/Doors:

1. Shutters made and attached for rapid closing OR Shutters pre-made and stored to be nailed in place before storm strikes
2. Family trained to keep all entrances closed throughout storm period and/or open entrance on opposite sides of house to neutralize air pressure.

Summary

Building meets all minimum hurricane resistance standards of the Safer Housing Programme:

_____ _____

(Inspector's Signature) (Date)

Building fails to meet minimum hurricane resistance standards of the Safer Housing Programme. The following items must be completed in order to qualify for final loan disbursement.

1) _____

2) _____

3) _____

4) _____

5) etc _____

_____ _____

(Inspector's Signature) (Date)

Easy Guide Checklist

Hurricane-resistant Home Improvement Checklist
for use by HRHIP Building Officer

Lower Income Families in the Caribbean

Premises

1) The families owning these properties have a modest income, desire to do home improvements and will need to be guided as to the value and importance of including hurricane resistance measures in their home improvement plans.
2) Any hurricane resistance measures included will need to be folded into the larger home improvements the family desires.
3) Families may have to do both their home improvement and hurricane resistance retrofitting in progressive stages, for they may not have enough funds to complete the entire project at one time.

Priorities

When a complete retrofitting project cannot be financed all at one time, then retrofitting measures should be undertaken in the following order of priority:

1. Strengthening and tying down the roof as much as possible, since heavy rains and damaging winds are perennial occurrences in the Caribbean. If the roof fails, whether in hurricane or regular storms, all the other home improvements will be damaged and possibly wasted.
   - replace any rotten roofing sheets and/or rafters
   - add extra nails with dome heads in corrugated sheeting
   - box eaves and/or cut off overhang in excess of 8 inches
   - insert extra lath/purlins and nail sheeting to the laths
   - strap roof rafters to wall plate and ridge beam using metal connectors
   - place collar ties on every second set of rafters
2. Establishing a firm footing/foundation and tying the house to this solid foundation. If a house shifts off of its footing during a storm there will be great water leakage and damage to other home improvements.
   - embed into the ground four or more concrete/wood pillars to strengthen footing
   - bolt/strap floor sill to new and existing footing/foundations
3. Strengthening the walls at the corners, around doors and windows and where they are attached to floor sill and wall plate.
   - strap wall studs to floor sill and wall plate using metal connectors
   - double studs around doors and windows and add cross braces in corners
   - add extra studs if currently installed further than 20 inches apart
4. Providing protection/shutters to doors and windows to withstand winds
   - teach family members how to completely close and/or leave open opposite entrances to neutralize air pressure in hurricane force winds.
   - construct pre-fit shutters that can be installed or nailed on when needed
5. Implement the remainder of the items on the minimum standard checklist and/or additional amounts of each of the above (i.e. six footing pillars instead of four, more metal straps, additional studs etc.)

All of the above skills can be taught to any family member who has a working knowledge of a hammer, saw, measuring tape and nails. Therefore, a family with severely limited resources can save costs by doing much of the work themselves under the watchful eye of a technical supervisor.

Each of these steps can be done progressively as and when the family has the funds to buy the necessary supplies. A family may choose to repair and strengthen the roof in the first year, and then construct a new kitchen (with some hurricane resistance included) in the second year. In subsequent years they can do the footings and strengthen the walls. Each step will make the house stronger and more hurricane resistant. The risk with this progressive approach, however, is that a strong hurricane will hit midway in the project and destroy the repairs made before the entire house is fully strengthened.