

RETROFIT Improvements

Making
Homes
Safer in
Disasters

Bracing & Attachment of Deck, Porch, Balcony & Stairs

Retrofit Opportunity

- Existing decks and balconies can be reinforced at anytime. Inspection and repair (as needed) should be a regular and on-going maintenance activity

Purpose

- To prevent deck failure

Benefits

- Ensures safety of occupants
- Increases structural integrity

Hazards

Wind



Rain



Flood



Seismic



Fire



Snow



Summary

Balconies are platforms enclosed by a wall or railing that project from the wall of a home. Decks, porches, stairway landings, and steps are also included in this category. Some balconies are cantilevered whereas others are attached to the rim joists or wall studs. Correct anchorage at the house wall is the first point for balcony inspection and repair. This is because during storms these projections create a "sail" to catch the full force of wind uplift.

The balcony creates greater loads on the wall, and therefore requires load path restraint of the deck. The American Wood Council's Deck Construction Guide (see Resources) gives guidance on ledger board connection details. IBHS' Fortified Engineering Guide (see Resources) covers wind uplift and seismic tie downs.

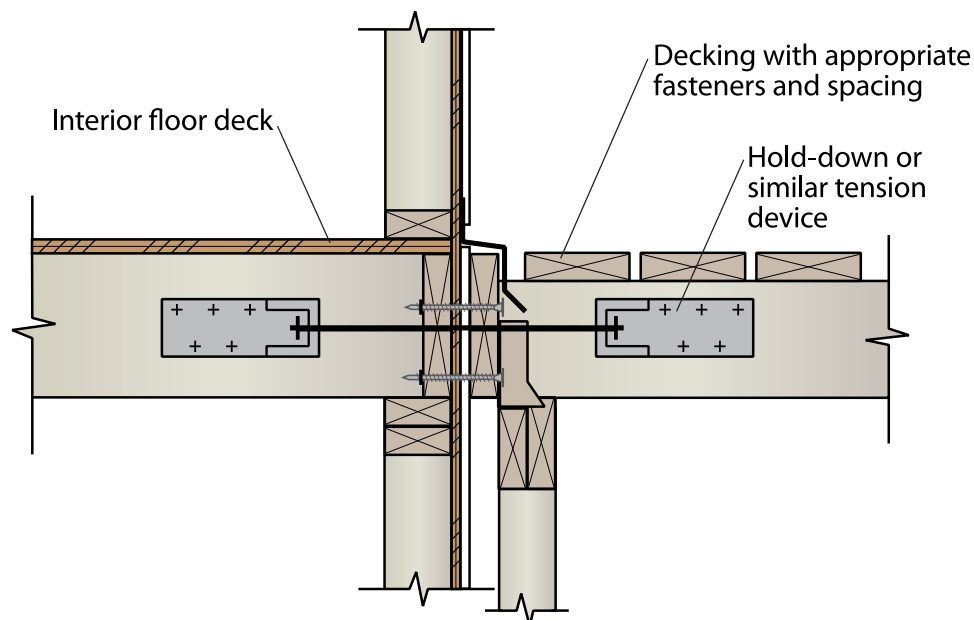
Providing a separate vertical support of the deck alongside the exterior house wall is the safest retrofit. This means installing posts and beams parallel and close to the exterior wall of the house so that the deck is self-supporting. Otherwise, check ledger attachment to ensure that it complies with current codes and verify or install flashing at ledger and tie down hardware as accessible. Similarly, inspect ledger at stair stringer.

Inspect all beam-to-post and joist-to-beam connections and repair as required. Replace rusted fasteners and add additional fasteners to comply with new construction details. Remember to inspect these connections at porch roofs, as well.

The cost of this retrofit will vary with size and age of balcony, deck, or stairway. Seasoned "Do-It-Yourselfers" can tackle this maintenance effort. Otherwise, consult a licensed contractor about this and other safety retrofits that are practical for your home.

Illustration

Retrofit



Potential Damage



Photo: www.fema.gov

Key Steps

- Installing load path tie down hardware and additional fasteners on an exposed deck can be a “Do-It-Yourself” project.
- Periodically inspect all deck, rail, column, roof, and wood stairway connections.
- Replace rusted fasteners.
- Install additional fasteners as needed to comply with recommended spacing patterns.
- Confirm fasteners are appropriate for decking material (i.e., approved for use with pressure treated lumber, composite decking, etc.)
- Install load path tie down hardware. Use calculation checklists and manufacturer’s load charts to select the right hardware or consult a professional building designer.
- Your contractor may have additional ideas on how to improve the safety of your home.
- For more details about this retrofit improvement, please refer to the list of Resources in the section below.

Resources

American Wood Council, *Prescriptive Residential Wood Deck Construction Guide*

<http://www.awc.org/Publications/DCA/DCA6/DCA6-09.pdf>

FEMA, *Homebuilders’ Guide to Earthquake-Resistant Design and Construction*

<http://www.fema.gov/library/viewRecord.do?id=2103>

Florida Division of Emergency Disaster, *Porch Post/Column Uplift Worksheet*

http://www.floridadisaster.org/hrg/content/porches/column_uplift_worksheet.asp

Florida Division of Emergency Disaster, *Porches & Attached Structures*

http://www.floridadisaster.org/hrg/content/porches/porches_index.asp

Insurance Institute for Business & Home Safety, *Fortified for Existing Homes™: Engineering Guide*

http://www.disastersafety.org/content/data/file/IBHS_FOR-engineering-guide.pdf

International Association of Certified Home Inspectors, *Inspecting a Deck, Illustrated*

<http://www.nachi.org/deck-inspections.htm>

