

RETROFIT Improvements

Bracing of Roof Projections

Making
Homes
Safer in
Disasters

Retrofit Opportunity

- Dormers and skylight shafts that penetrate unfinished attics can be braced anytime from the attic
- The framing of dormers and skylights in finished spaces are best inspected and shored up from the outside when siding or roofing is being replaced

Purpose

- To prevent roof projections (e.g., skylights, dormers, etc.) from outward thrust during a storm event
- To prevent failure of roof projections in an earthquake

Benefits

- Ensures safety of occupants
- Ensures safety of contents
- Creates a more durable structure

Hazards

Wind



Rain



Flood



Seismic



Fire



Snow



Summary

Most often skylights, dormer windows, and other roof openings are added to roofs, so they should be inspected and braced as required. For earthquake loading, this includes checking the opening size against permitted maximum sizes allowed in the codes in seismic zones and removing the skylight or dormer if it exceeds code limits. The framing around the opening—whether skylight or dormer—should be constructed for gravity load requirements such as doubled rafters and headers.

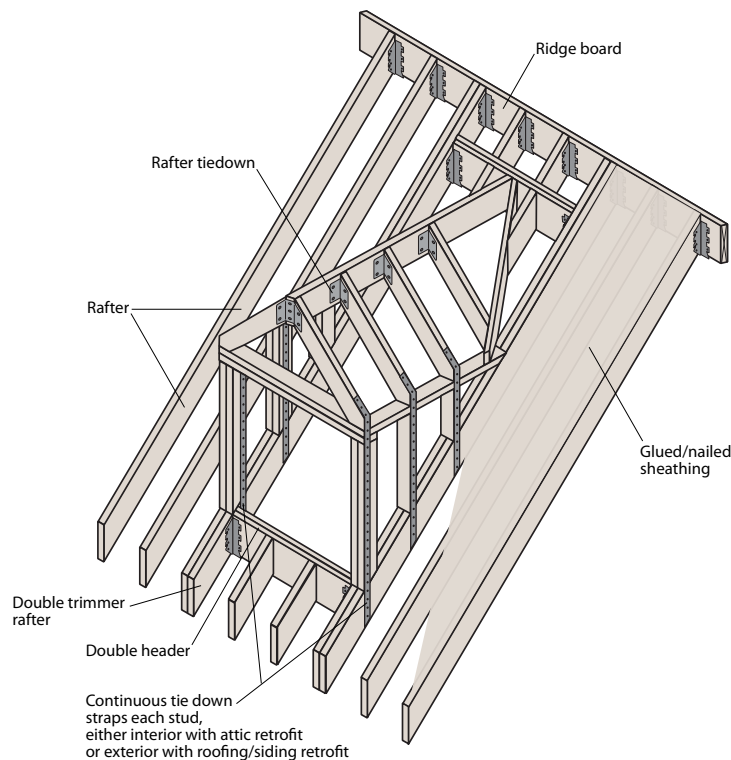
The connections between additions and the existing house should be tied together very well. The level of interconnection should be the same as it would be if they had been built at the same time, or as closely to that as can be achieved.

For wind loads, using tighter nailing patterns and adhesive to secure the roof sheathing around the window opening is an effective way to combat roof uplift. However, the seismic solution is different because gluing the sheathing would not allow some of the desirable deformation in the roof plane. Also, load path strapping should be installed where accessible for all structures penetrating the roof.

Cost will vary, depending on size and scope of roof repair. Consult with your contractor about this and other safety features that fit into your remodeling project.

Illustration

Retrofit



Potential Damage



Photo: www.fema.gov

Key Steps

- When replacing the roof shingles, remove roof sheathing at roof opening.
- Inspect framing.
- Install load path hardware.
- Reinstall sheathing using correct nailing pattern and adhesive if the retrofit is for strength against wind uplift.
- 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, *Details for Conventional Wood Frame Construction*
<http://www.awc.org/pdf/wcd1-300.pdf>

Coastal Contractor Online, *Using Adhesives to Beef Up Houses*
<http://www.coastalcontractor.net/article/282.html>

FEMA, *Homebuilders' Guide to Earthquake-Resistant Design and Construction*
<http://www.fema.gov/library/viewRecord.do?id=2103>

Insurance Institute for Business & Home Safety, *Anchoring Gable End Outlookers*
<http://www.disastersafety.org/project?projectId=4036>

