

RETROFIT Improvements

Making Homes Safer & More Resilient in Disaster-Prone Areas

Wind Resistant Exterior Cladding



SCOPE

This guide provides homeowners with an overview of wind resistant cladding materials for existing homes in high-wind areas with a focus on vinyl siding, fiber cement lap siding, and soffits.

PURPOSE

Minimize the risk of wind damage and water intrusion during a hurricane or other severe windstorm.

BENEFITS

- Protects the integrity of the exterior wall and soffit assemblies.
- Protects the water-resistive barrier from becoming exposed and damaged.
- Protects against water intrusion and damage to the home.
- Saves costs to repair/replace.

RETROFIT OPPORTUNITY

During cladding replacement or during repair of loose or damaged cladding (e.g., before painting).

TIPS

- Inspect siding and soffits periodically and repair as required.
- It is recommended that cladding be professionally inspected and installed to ensure structural integrity.



FIGURE 1. Wind Damage on Siding.
Source: platinumexteriorsmd.com
(Storm damage in Carroll County)

HAZARD AND RISK

During a hurricane or other severe windstorm, exterior wall siding can be damaged or blown off the house, leaving the water-resistive barrier (WRB) as the only protection against rainwater. If the exposed WRB is then damaged or compromised, severe water damage to wall sheathing, wall cavity insulation, and interior wall finishes can result.

Roof overhang soffits and fascia are also vulnerable to wind damage. The loss of soffits can leave large openings susceptible to wind and water intrusion into the attic that can lead to extensive damage and even building failure. The loss of fascia can expose soffit panels to the wind and lead to their failure.

SOLUTION

Select wind resistant cladding products and ensure they are properly installed to reduce the risk of wind damage during a storm. Replacement of cladding is a prime opportunity to upgrade products to meet new building codes and decide if above-code best practices are the right choice for the project. If cladding is not being replaced, inspect and repair as required.

Code Considerations The International Residential Code (IRC) requires siding, soffits, backing materials, and their attachments to be capable of resisting wind-pressures. For some high-wind regions, the IRC requires wind design in accordance with other methods including the International Building Code (IBC). A building permit may be required for siding/soffit replacements on existing homes. Some jurisdictions may also require specific product approvals. Ask the local building department if your house is in a high-wind or hurricane-prone region or if local requirements exceed those of the national code.

The IRC specifies minimum cladding thickness and attachment requirements including fastener (nail) type, spacing, and penetration depth into structural members. Cladding products must also be installed in accordance with manufacturer's instructions. This is important because codes do not provide all the detailed information required for a durable installation. Assessments after hurricanes commonly find that failures are due to improper installation [1].

TERMINOLOGY

Cladding: Exterior materials that cover the surface of a building and are directly loaded by the wind, including exterior wall coverings.

Exterior Wall Covering: Materials applied to the exterior side of an exterior wall, including products such as vinyl siding, fiber cement siding, and wood siding, soffits, and fascia.

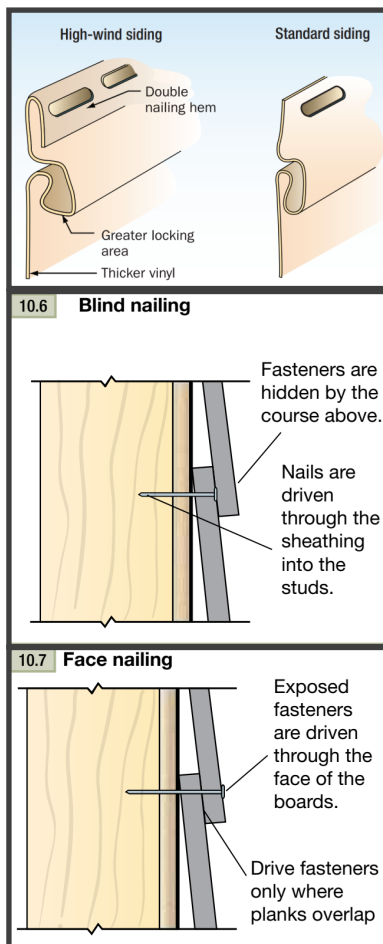
Water-Resistive Barrier (WRB): products such as house wrap and building paper that protect the wall assembly from water intrusion (e.g., wind-driven rain) that breaches the cladding system.

Soffit: material installed to enclose the underside of roof overhangs at eaves and gables.

Fascia: Horizontal board or other strip of material covering the projecting end of a roof eave.

COST

Installation costs can vary significantly depending on gable end wall and attic configurations and local labor rates. For a typical 2,500 sq. ft. home with two gable end walls, an estimated cost for professional installation ranges from approximately \$1,900 to \$3,000. The estimated cost of materials only ranges from \$400 to \$600.

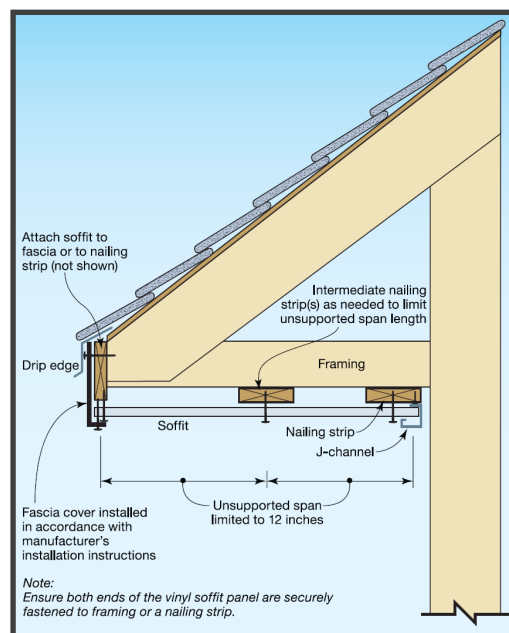


Soffits must be securely attached to framing. The fascia cover/cap also must be secured to framing to protect the soffit. Vented soffit products are available where required for vented attics. Per the IRC, vinyl soffit panels must be fastened at fascia and wall ends and to intermediate nailing strips as necessary to limit unsupported spans to no greater than 16 in. (FEMA recommends 12 in.; see image [4]). Select panels that have a test report (or product approval in Florida) indicating the soffit and installation instructions meet the required wind loads and, for vented soffits, are resistant to water intrusion. As a best practice, aluminum soffit panels should meet the same requirements. The IRC also has minimum requirements for wood structural panel soffits.

Best Practices. Inspect cladding to determine if products and installations meet current codes and manufacturer installation requirements.

Vinyl siding is a flexible product whose performance depends particularly on proper attachment of siding panels and accessories such as starter strips and channels at panel edges. Premium vinyl siding designed for high-wind applications is thicker than standard vinyl siding and has a reinforced nailing hem and greater locking area (see image [2]). Per the IRC, vinyl siding must be certified and labeled as conforming to ASTM D3679 requirements.

Fiber Cement Lap Siding is a rigid product with inherent wind resistance that still must be properly flashed, caulked, and attached. Blind (concealed) nailing is normally recommended, but face nailing may be required for high-wind applications (see image [3]). Per the IRC, fiber cement lap siding must comply with the requirements of ASTM C1186, Type A, minimum Grade II or ISO 8336, Category A, minimum Class 2. **Engineered Wood Lap Siding** has similar attributes and installation requirements.



REFERENCES AND ADDITIONAL RESOURCES

- [1] [Mitigation Assessment Team Report: Hurricane Irma in Florida](#) (FEMA P-2023)
- [2] [Home Builder's Guide to Coastal Construction, Technical Fact Sheet No. 5.3 Siding Installation in High-Wind Regions](#) (FEMA P-499)
- [3] [James Hardie Fiber Cement Siding Installation](#)
- [4] [FEMA Best Practices for Minimizing Wind and Water Infiltration Damage, Recovery Advisory 2](#) (FEMA RA-2)
- [5] [VSI Installation Manual](#) (Vinyl Siding Institute)
- [6] [LP SmartSide Engineered Wood Siding and Soffit Installation](#)

