

Overview of FEMA P-804 (2023), *Wind Retrofit Guide for Residential Buildings in Hurricane-Prone Regions*

FEMA released the second edition of FEMA P-804 (2023), *Wind Retrofit Guide for Residential Buildings in Hurricane-Prone Regions*, to summarize the updated technical information needed for selecting and implementing cost-effective, FEMA-funded, wind retrofit projects for existing one- and two-family dwellings in hurricane-prone regions of the United States and its territories.

Purpose of FEMA P-804 (2023)

Every year, houses along the coast are subject to high winds that cause extensive damage and threaten the safety and security of coastal residents. Much of this wind-related damage can be reduced by improving the performance of the existing buildings through retrofits that strengthen the residential building's envelope and load path. Hurricane Ida demonstrated the damage a hurricane can inflict on the built environment when it made landfall as a major hurricane in Louisiana on August 29, 2021. Even though the storm was not a design-level event for wind loading on residential buildings, extensive damage was documented to the housing stock. In response to this storm, FEMA decided to update [FEMA P-804 \(2023\)](#), *Wind Retrofit Guide for Residential Buildings in Hurricane-Prone Regions* (Guide) (last published in 2010, see Figure 1), with lessons learned from the last decade of storm observations and advances in wind engineering to help property owners retrofit their houses and apply for FEMA funding to do so.

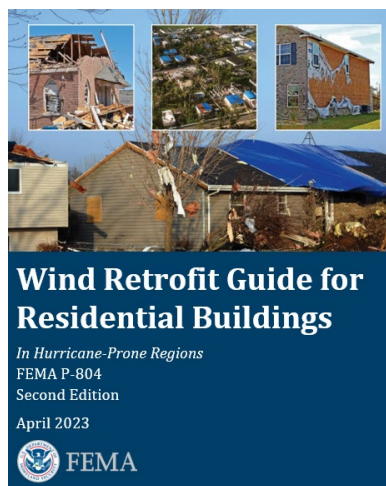


Figure 1. Cover of the 2023 edition of FEMA P-804



FEMA

Updated Content

FEMA P-804 (2023) summarizes the technical information needed for selecting and implementing cost-effective, FEMA-funded, wind retrofit projects for existing one- and two-family dwellings in hurricane-prone regions of the United States and its territories. Although the guidance in FEMA P-804 (2023) is for one- and two-family dwellings in hurricane-prone regions, much of the guidance may also be applied to non-coastal areas subject to high winds.

FEMA P-804 (2023) presents mitigation measures in “Mitigation Packages.” A Mitigation Package is a combined set of retrofit measures that must be implemented for a house to provide a defined level of protection. The Guide identifies three successive Mitigation Packages: Basic, Intermediate, and Advanced. Each Mitigation Package consists of several wind retrofit mitigation measures. The Mitigation Packages should be implemented cumulatively, beginning with the Basic Mitigation Package. This means that for a house to successfully meet the criteria of the Advanced Mitigation Package, it must also meet the criteria of the Basic and Intermediate Mitigation Packages.

BASIC MITIGATION PACKAGE RETROFITS:

Option 1 – Improvements without Roof Covering Replacement

- Sealing and strengthening the roof deck
- Improving the water intrusion resistance of attic vents

Option 2 – Improvements with Roof Covering Replacement

- Inspecting and improving attachment of the existing roof deck
- Sealing the roof deck
- Improving underlayment details at eaves (drip edge)
- Installing wind-resistant roof coverings
- Improving the water intrusion resistance of attic vents

INTERMEDIATE MITIGATION PACKAGE RETROFITS:

- Protecting windows and doors from windborne debris
- Garage doors rated for the design wind pressure and protecting garage doors with glazing from windborne debris
- Strengthening gable end walls
- Strengthening soffits
- Strengthening chimney attachment
- Strengthening connections of attached structures

ADVANCED MITIGATION PACKAGE RETROFITS:

- Wind pressure resistance for openings
- Exterior wall impact resistance
- Developing a continuous load path

Implementing the Mitigation Packages in this Guide on existing vulnerable houses in hurricane-prone regions of the United States and its territories will result in their improved performance during high-wind events. Figure 2 shows the benefit of a sealed roof deck that prevented wind-driven rain from entering the house during Hurricane Michael. In the 13 years between the first and second editions of FEMA P-804, FEMA's Building Science Disaster Support Program through its Mitigation Assessment Team (MAT) deployments has documented lessons learned and best practices that reduce future damage and impacts from a variety of natural hazard events. Many of the recommendations for one- and two-family dwellings in the hurricane-prone region have been incorporated into the update of FEMA P-804 (2023).



Figure 2: House with a sealed roof deck that successfully prevented the entry of wind-driven rain during Hurricane Michael after windborne debris punctured the metal roof covering.

FEMA MITIGATION ASSESSMENT TEAMS

FEMA carries out many actions in response to a natural disaster. When a Presidential Disaster Declaration is made and a state, tribe, or territory requests an investigation, FEMA may deploy a Mitigation Assessment Team (MAT) to the location impacted by the natural disaster. A MAT conducts performance assessments of buildings and related infrastructure to determine both the causes of damage and the performance of past mitigation efforts and projects. The MAT then recommends actions various stakeholders can take to mitigate damage from future natural hazard events. Furthermore, the recommendations resulting from the MAT's assessment help FEMA coordinate with agencies and organizations to assess the hazard-resistance provisions of building codes and standards. Long-term strategies can then be developed to help reduce future damage and impacts from a variety of natural hazard events and improve community resilience.

For more information on FEMA's Building Science Disaster Support (BSDS) Program and to access MAT publications, visit the [BSDS Program webpage](#).

One change in the 2023 edition of FEMA P-804 is that the Mitigation Packages now correspond closely to the Insurance Institute for Business & Home Safety’s (IBHS’s) *2020 FORTIFIED Home Standard FORTIFIED Home™* – Hurricane designations for existing homes (Figure 3). FEMA P-804 (2023) references the criteria for 2020 FORTIFIED Hurricane Home designations (also referred to as the “Basis of Requirements”) for existing homes with some exceptions, which are more conservative and designated as “FEMA Grant Requirements.” FEMA Grant Requirements must be implemented to receive FEMA funds for retrofit projects. While this publication outlines minimum technical and performance-based grant requirements related to residential wind retrofits, refer to the latest edition of FEMA’s *Hazard Mitigation Assistance Program and Policy Guide* (HMA Guide) for the most current FEMA policy on residential wind retrofit and HMA grants implementation requirements.

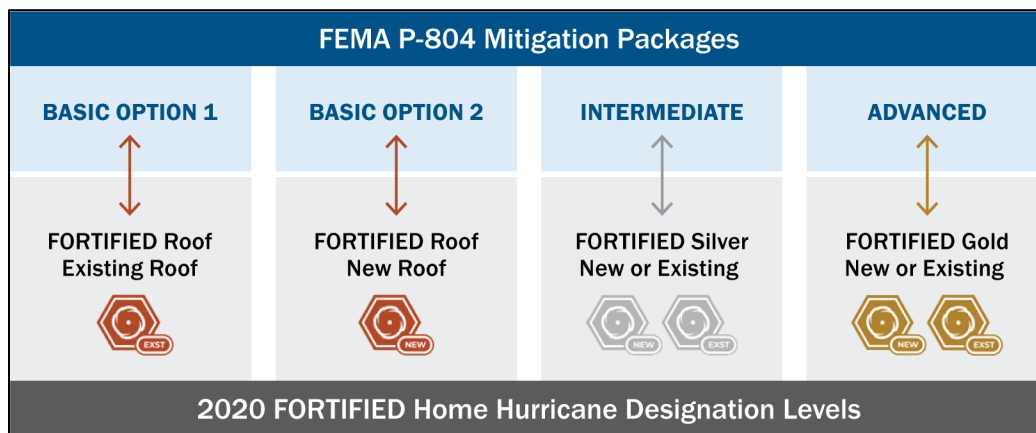


Figure 3: FEMA P-804 Mitigation Package requirements meet or exceed the criteria of the respective 2020 FORTIFIED Home Hurricane designations

FEMA P-804 (2023) references the most up-to-date codes and referenced standards at its time of publication in 2023, including:

- ASCE/SEI (American Association of Civil Engineers / Structural Engineering Institute) 7-22, *Minimum Design Loads and Associated Criteria for Buildings and Other Structures*
- The 2024 International Code Council (ICC) model building codes
- ICC 600-2020, *Standard for Residential Construction in High-Wind Regions*

Target Audience

FEMA P-804 (2023) is intended for multiple audiences, including homeowners, contractors, evaluators, and registered design professionals (RDPs). Homeowners should always be involved in the process of their wind retrofit project; they must understand the benefits and costs of each potential decision. Using this Guide, homeowners should work with an evaluator, contractor, and an RDP (if necessary) to determine which Mitigation Package of wind retrofit activities is most appropriate for their house.

Using FEMA P-804

FEMA recommends that users review FEMA P-804 (2023) in its entirety before pursuing the development of a wind retrofit mitigation project. The Guide consists of five chapters and four appendices:

- Chapter 1. **Introduction** provides an overview of the Guide, summarizing its purpose and contents.
- Chapter 2. **Identifying the Risks and Desired Level of Protection** describes wind hazards, how to identify wind risks for a particular site or area, and how the wind hazard is addressed through building codes and best practices.
- Chapter 3. **Evaluating Existing Houses** explains how to assess houses to determine their vulnerabilities and what types of mitigation measures would be most appropriate and feasible.
- Chapter 4. **Technical Design and Construction Methods** provides details on and specific measures for each of the three Mitigation Packages: Basic, Intermediate, and Advanced.
- Chapter 5. **Implementing Mitigation Projects** describes how to move a project forward, important issues and challenges that should be considered, and details about potential sources of assistance.
- Appendix A **FORTIFIED Home™ – Hurricane for Existing Houses** summarizes the Hurricane designations of the IBHS's *2020 FORTIFIED Home Standard* FORTIFIED Home program. Mitigation projects that meet the criteria for FEMA P-804 should also meet or exceed the criteria for the corresponding 2020 FORTIFIED Home Hurricane designation. However, additional eligibility or administrative documentation may be required to achieve a 2020 FORTIFIED Home Hurricane designation, which may qualify property owners for insurance benefits in participating states.
- Appendix B **Evaluation Guidance** provides guidance on conducting an evaluation of a house that is being considered for a wind retrofit project; this appendix supplements the information in Chapter 3.
- Appendix C **Using the FEMA BCA Toolkit Hurricane Wind Module for Determining Cost-Effectiveness of Retrofit Projects** contains information that can be used with the FEMA BCA Tool (Version 6.0) to model the post-mitigation cost-effectiveness of the projects detailed in Chapter 4. A BCA must be performed as part of a FEMA mitigation grant application.
- Appendix D **Acknowledgements** provides a list of those who helped with the review and direction of this Guide.

Contact Us

If you have any questions, please contact:

- FEMA Building Science at 866-927-2104 or at FEMA-BuildingScienceHelp@fema.dhs.gov

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FEMA Mission

Helping people before, during, and after disasters.