

# *Hurricanes Irma and Maria in Puerto Rico Mitigation Assessment Team Report 50% Draft, Recovery Advisories, and Code Update Tasks*



IX Reunión Cumbre Consejo de Cambio Climático PR

June 8, 2018

DR-4336 (Irma) and DR-4339 (Maria)

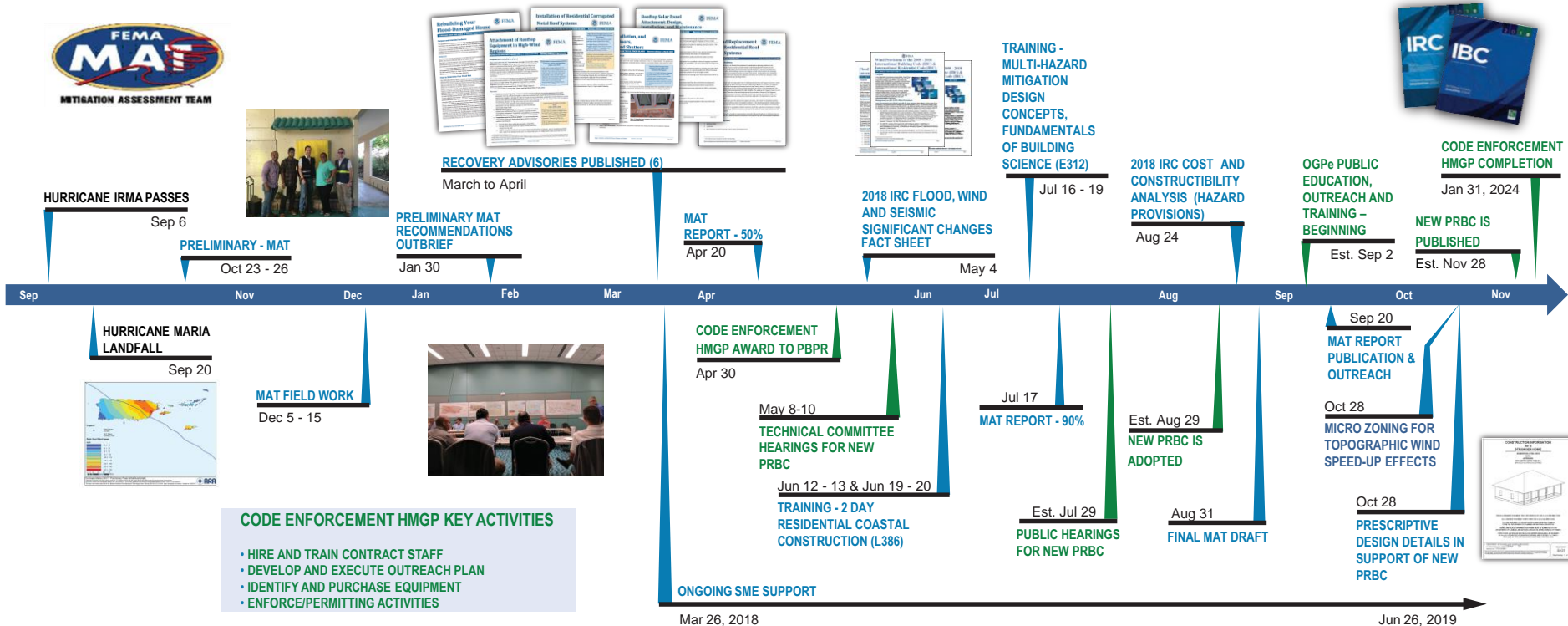


**FEMA**

**Building Science Branch**

# MAT Timeline for PR – Added Elements

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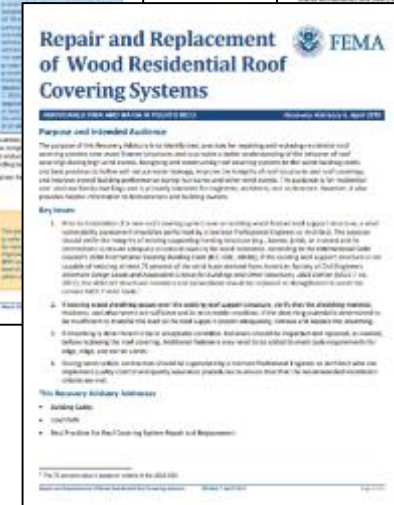


- Products include MAT Report, Recovery Advisories, Fact Sheets, Training and Analysis
- Actionable recommendations for a more resilient Puerto Rico
- Periodic briefings and requests for comments to key stakeholders throughout the process
- MAT Report Publication & Outreach on September 20<sup>th</sup>
- Integrated with ongoing HMGP Post-Disaster Code Adoption and Enforcement Mission
- New design wind maps based on Puerto Rico topography
- Residential Prescriptive Design Plans based on PR Building Code update (2018 I-Codes) to help address informal construction

# Puerto Rico Recovery Advisories

## Hurricanes Irma and Maria in Puerto Rico Mitigation Assessment Team Report

- **RA-1** Rooftop Equipment Maintenance and Attachment in High-Wind Regions
- **RA-2** Siting, Design, and Construction in Coastal Flood Zones
- **RA-3** Safe Rooms and Storm Shelters for Life Safety Protection from Hurricanes
- **RA-4** Best Practices for Minimizing Flood Damage to Existing Structures
- **RA-5** Protecting Window and Openings in Buildings
- **RA-6** Repair and Replacement of Wood Residential Roof Covering Systems



# Key Recommendations of the PR MAT

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- Adopt the latest building code from ICC and update regularly.
- Publish prescriptive residential designs.
- Require construction documents to list critical parameters and load path connections
- Perform vulnerability assessments for public buildings and critical facilities
- Require design professionals and contractors to be licensed and registered.
- Develop hazard-resistant design guidance for alternative energy systems.
- Improve/construct life-safety hurricane shelter facilities (P-361/ICC 500).

# Collaborative MAT Effort

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FEMA



NIST  
National Institute of  
Standards and Technology  
U.S. Department of Commerce



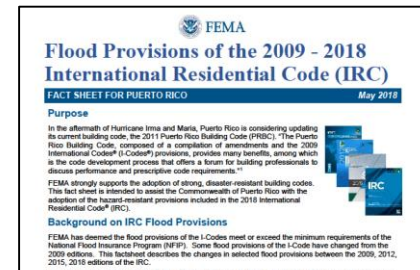
- Collaborative effort with local, regional and national stakeholders

# Support for Building Code Update to 2018 I-Codes

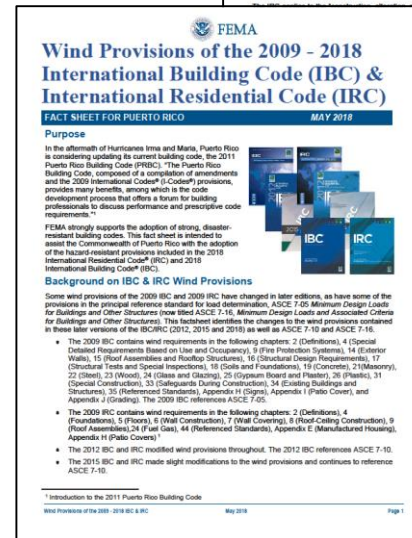
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## Puerto Rico Fact Sheets – Changes in the Hazard Provisions

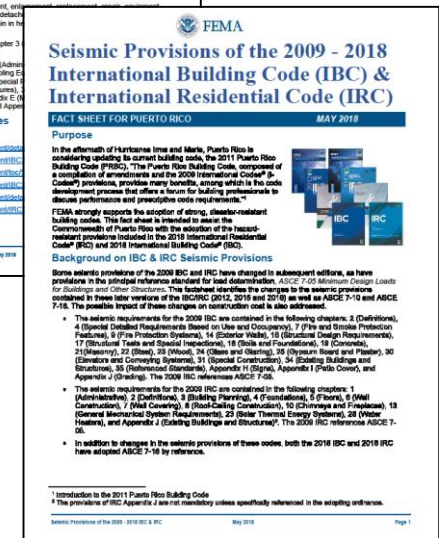
- Flood Provisions of the IBC & IRC (2009-2018)**



- Wind Provisions of the IBC & IRC (2009-2018)**



- Seismic Provisions of the IBC & IRC (2009-2018)**



# Support for Building Code Update to 2018 I-Codes Code Amendment Proposals

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## Submitted 6 code change proposals:

- PRBC update based on the latest I-Codes and consensus standards during 3-year cycle.
- Corrosion protection requirement for entire Territory.
- (2) Proposals requiring SFHA documentation in replicable building code review as outlined in Appendix N.
- 423.3 for storm shelters in critical facilities
- 423.4 for Group E Occupancies.

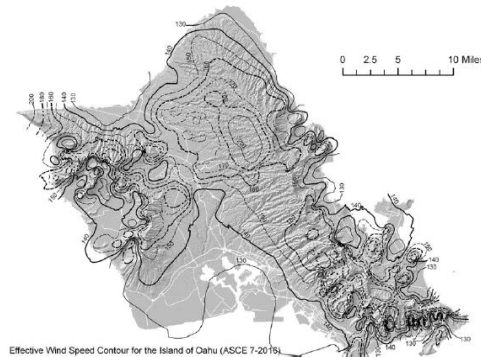
## Additional code change proposals being monitored:

- Design roof coverings to withstand wind loads of 150 MPH
- Design roof decks and roof coverings using a wind speed of 155 PMH
- Preserve the wind pressures in the 2011 PRBC
- Recommend maintaining the wind provisions in the 2018 IBC/IRC and compliance with ASCE 7-16.



## Microzoning - Topographic Considerations

- Develop new design guidance for wind speed-up in Puerto Rico
  - Determine new wind speeds to incorporate effects of wind speed up
  - Based on 2018 I-Codes including ASCE 7-16
  - Simplifies procedure for Design Professionals and Building Code Officials



Ex: Microzoning for Hawaiian Islands  
(ASCE 7-16)

## Cost and Constructability Analysis

- Compare 2011 PRBC and flood, wind and seismic provisions in the 2018 IRC with known local amendments
- Document differences and potential increased costs
- Support from Institute for Business & Home Safety (IBHS)

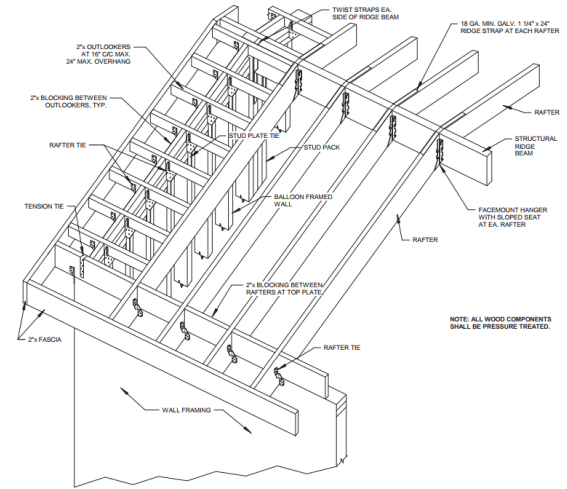




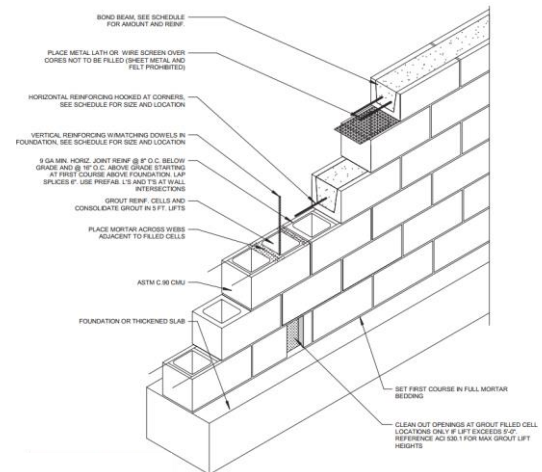
# Prescriptive Design Guide for Residential Structures as Permitted by the PR Building Code

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- Workgroup
  - Up to 6 local design and construction stakeholders
  - Local officials, engineers, architects, design professionals, home builders, and members of regulatory bodies
- 7 prescriptive residential design sheets using 2018 I-Codes
  - 4 for each of the 3 home geometries identified:
    - 1-story house
    - 2-story house
    - Elevated house



Gable End Framing Detail



Typical Masonry Wall Construction

# Key Dates – PR MAT Report & Training

Hurricanes Irma and Maria in Puerto Rico Mitigation Assessment Team Report

Deliverable	Due Date
50% Draft of MAT report to FEMA for comments	April 20, 2018
90% draft MAT report to FEMA for comments	July 17, 2018
Final MAT report review	August 31, 2018
Final English GPO document published	September 20, 2018
Final Spanish GPO document published	October, 2018

## Building Science Training Courses

### Coastal Construction Manual (FEMA P-55)

- 2-Day Course
- June 12 – 13
- June 19 - 20

### Homeowner's Guide to Retrofitting (FEMA P-312)

- 4-Day Course
- July 16 – 19

