Pre-MAT Field Deployment: Puerto Rico Earthquake Sequence
January 17-19, 2020
Presidential Disaster Declaration  
Status as of March 3, 2020

Individual Assistance (IA)
• 25 municipalities approved for IA
• Over 32,000 applicants
• $22.3 million approved
• FEMA’s Transitional Sheltering Assistance is available and allows eligible survivors to shelter in a participating hotel, for a limited period of time, as a bridge to intermediate and long-term housing.

Public Assistance (PA)
• 14 municipalities approved for PA
• Does not yet include Permanent Repairs
• Only includes Debris Removal and Emergency Protective Measures (Categories A and B)
• Funding not available for a full MAT study.

~32 schools still remain closed
FEMA Mitigation Grant for Building Codes after 2017 Hurricanes in Puerto Rico

- Government received $79 million from FEMA’s Hazard Mitigation Grant Program to improve code enforcement
- The code enforcement and code update is part of the $3 billion in hazard mitigation grant funding made available to Puerto Rico during hurricane recovery
- 2018 Puerto Rico Building Codes based on the 2018 I-Codes, including reference to ASCE 7-16

FEMA/NEHRP Supported Projects/Training in Puerto Rico

- Past adoption of Hazard-resistant Building Codes
  - Initial adoption of 1997 UBC
  - Adoption of the 2009 I-Codes (with amendments) as the 2011 PRBC
- Technical trainings for designers and technical audiences include:
  - FEMA training on 2009 IBC and IRC as part of the adoption of 2011 PRBC.
  - A recent Seismic Building Code Symposium by SK Ghosh (Feb 21)
  - Other NETAP provided courses on topics like: ATC-20, ROVER, P-154, etc.
Areas of Focus for Field Work

Preliminary Assessments and Collection of Perishable Data

• Residential buildings
  • Performance of elevated single family homes

• Schools, hospitals and other critical facilities (police and fire)

• Previous mitigation grants for school seismic retrofits
  • 1989, 1996, 2004 School Retrofit (Seismic) for 109 schools

• Updated guidance on Post-disaster Building Safety Evaluations (FEMA P-2055, related to ATC-20 Post-EQ Building Safety Evaluations)
# Field Team Composition

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<thead>
<tr>
<th>Name</th>
<th>Title</th>
<th>Agency / Firm</th>
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![Map of Puerto Rico](image)
Building Safety Evaluations: Placarding, Cordonning and Barricading

Ponce
Single Family Residential: Elevated and at Grade
Single Family Residential: Elevated and at Grade
Public Buildings and Critical Facilities - Municipal Buildings
Public Buildings and Critical Facilities: Hospitals
Schools: Owned by Dept of Education, Managed Regionally

- Multi-story school in Guanica with lower 2 floors collapsed. Note public housing complex in background with minimal damage.
- Multi-story school in Yauco. No collapse, but exterior walls panels fell. Interior damage reported may trigger full seismic upgrades during repairs or total replacement.
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Teams Field Observations

- Island specific construction
- Large number of non-permitted structures (aka, “informal construction”)
- Lack of building official staff and resources
- Lack of contractor licensure requirements
- Existing (older) building stock remains vulnerable to seismic damage
- ATC 20-1 assessment resources extremely limited, people are not in buildings because they do not feel safe/have been told to stay away and the building could be occupied if assessed and tagged
- Seismic code requirements to prevent buildings from collapsing do not always mean a building maybe be simply repaired after an event
- Mitigation efforts must remain multi-hazard
If Funded, Further MAT Studies May Result In

- **Recovery Advisories and Fact Sheets** specific to Puerto Rico seismic hazards
- **MAT Technical Report** providing
  - Guidance for newest codes and standards
  - Mitigation guidance and best practices
- Code adoption and enforcement guidance and support, prescriptive designs
- **Disaster Risk Reduction Minimum Codes and Standards** policy implementation support
- Relevant, **customized training** and SME support
Questions?

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https://www.fema.gov/building-science