

EERI VERT Chiapas Earthquake

Performance of Retrofitted Buildings

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Retrofitted Buildings

- 10-story Office building located in Downtown Mexico City
http://www.iitk.ac.in/nicee/wcee/article/11_20.PDF
- 3-4 story low rise school buildings in Santa Maria District of Mexico City, used post-tensioned bracing systems for retrofit.
<http://earthquakespectra.org/doi/pdf/10.1193/1.1585915>



Continued: Retrofitted Buildings

- 9 story apartment building in Mexico City (Built in late 60s and it was first retrofitted after the 1979 Petatlan Earthquake. The damage was due to pounding and steel brace was added. It also survived 1985 Mexico City EQ with minor structural damage. Due to chronic pounding issues, the author of the paper is proposing energy dissipating “U” element to existing steel brace) [Link to the paper](#)

Overview of topic and how it affected various regions

- Key facilities affected: Some schools and hospitals may have been retrofitted. Unfortunately, no data was found online and further research is needed for more information.
- Many historic buildings in the rural towns closer to the epicenter have not been retrofitted and have collapsed.
- Retrofitted buildings would most likely be located in major cities such as Mexico City. Although the epicenter was closer to Oaxaca State and Chiapas State, neither of the states seems to have any major buildings that went through a rehabilitation and seismic retrofit.

Questions that a reconnaissance team could look into

- How well did the retrofitted buildings perform?
- Was the ground motion close to the ground motion these retrofitted buildings were designed for?
- Was there any mandatory retrofit ordinances? (See next slides)

Mandatory Rehabilitation in 1987 Mexico City Building Code

- “It was established as mandatory to owners, director responsible for work (DRWs) and Co-Responsibles (CRs) on structural safety, to inform Mexico City authorities on structural damage attributed to earthquake, wind, explosion, overloads, and differential settlements, to decide what to do.”
- If damage was deemed serious, rehabilitation was mandatory. DRWs are responsible for the construction quality.

2004 Mexico City Building Code Regarding Rehabilitation/Retrofit

- “The MCBC states that for buildings constructed prior to 1900 and that have suffered no damage or tilting, assessment on their structural safety is not need. All damaged buildings should be reported if their rehabilitation is needed, it should provide at least, similar safety levels as those established for new construction in the code.”[Article Link](#)

Mexican society on Structural Engineering (SMIE)

- SMIE is developing new guidelines for the rehabilitation of existing houses in rural areas. [Article Link](#)

Links to media articles discussing the topic

Provided in previous slides.