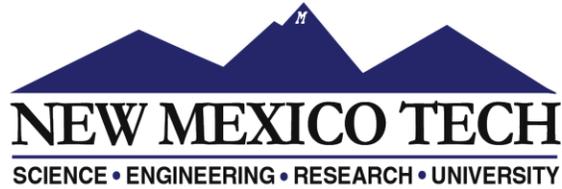


Evaluating the Seismic Preparedness of New Mexico



Abstract

The State of New Mexico does not currently have a comprehensive database of facilities such as fire stations, Emergency Operations Centers, hospitals, and other structures aiding in the recovery process following an earthquake or other natural disaster. Therefore, as a first step to ensure emergency preparedness of the state, this project aims to perform a seismic assessment of essential facilities in New Mexico. The research team initially considered facilities located in the Belen to Taos corridor, an area considered vulnerable to seismic incidents, as shown in Figure 1. The Federal Emergency Management Agency's (FEMA) Rapid Visual Screening (RVS) Method was used as the primary method to assess the seismic vulnerability of essential structures. This study represents the first phase of a multiphase earthquake assessment. In this phase, structures thought to be seismically hazardous are identified and prioritized. In following phases, the identified structures are assessed by a structural specialist to determine if they are, in fact, seismically hazardous.

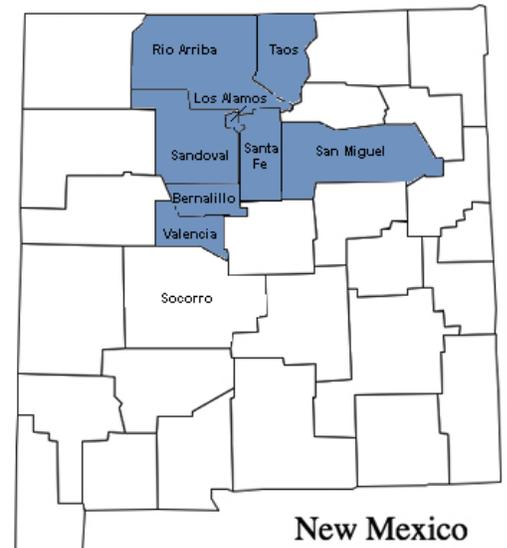


Figure 1: Buildings in eight counties in the state of New Mexico were assessed using the RVS method

Methodology

The study conducted followed the guidelines defined in the FEMA 154 - Rapid Visual Screening of Buildings for Potential Seismic Hazards handbook. Many of the safety concerns addressed in the second edition of the FEMA154 Publication have been adopted from the International Building Code (2009) for seismic hazards. In the RVS method, structures are assessed based on five categories: soil conditions, construction type, anticipated ground shaking, year of design, and building geometry. Each building receives a structural (S) score determined by these five parameters. The S score represents the probability of a building collapse during a seismic event. Final Structural scores range between 0 to 7, with higher S scores corresponding to better performance. FEMA 154 defines 2.0 as an acceptable cutoff point, which indicates a 1 in 100 chance that a building will sustain damage. S scores below 2.0 indicate that the building requires additional attention from a structural specialist.

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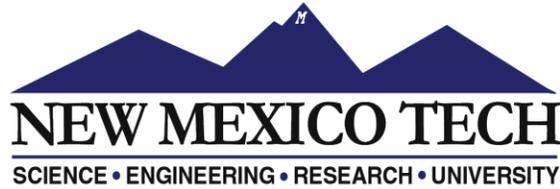
Funding

Funding for this project was provided by the U.S. Department of Homeland Security (DHS) Federal Management Agency (FEMA) 2010 Earthquake State Assistance Grant through the New Mexico Department of Homeland Security and Emergency Management.

Acknowledgements

We would like to extend special thanks to those that provided assistance with various aspects of the project: Ms. Susan Walker, Ms. Sophia Beym, Ms. Wendy Blackwell, Dr. Bruce Harrison, Dr. Mehrdad Razavi, Dr. Dave Love, Ms. Mary Annette-Boulden, Ms. Roxann Moore, and Mr. Dennis English.

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Results

The RVS survey was conducted on 78 different structures. The proportions of facilities considered are broken down by type and county in table 1. Due to the remoteness of certain structures, the New Mexico Research Team was only able to conduct a complete RVS analysis on 72 of the structures. The RVS analysis identified 58 of the 72 structures as requiring additional attention. Table 2 lists the number of passing and failing structures by county.

Table 1: Proportion of Facilities assessed by County and Type

County	Fire Station	Hospital	Police Station	Schools	EOC	Other	Total
Bernalillo	13	5	4	0	0	0	22 (28.2%)
Los Alamos	4	1	1	1	0	0	7 (9.0%)
Rio Arriba	1	1	1	1	0	0	4 (5.1%)
Sandoval	4	0	3	0	0	0	7 (9.0%)
Santa Fe	6	2	1	0	0	1	10 (12.8%)
San Miguel	2	2	1	0	1	10	16 (20.5%)
Taos	3	1	1	0	0	0	5 (6.4%)
Valencia	3	0	3	1	0	0	7 (9.0%)
Total	36 (46.2%)	12 (15.4%)	15 (19.2%)	3 (3.8%)	1 (1.3%)	11 (14.1%)	78 (100%)

Table 2: Number of Passing and Failing Structures

County	Number of Passing Structures	Number of Structures Requiring Additional Attention
Bernalillo	3	17
Los Alamos	0	7
Rio Arriba	1	2
Sandoval	1	5
Santa Fe	1	9
San Miguel	5	11
Taos	1	4
Valencia	2	3

Conclusions

All counties have a significant amount of structures that require additional attention. Therefore, it should be assumed that New Mexico is not seismically prepared. It is highly advisable to consider implementing this second phase of analysis, in which a structural specialist can determine if the identified structures are, in fact, hazardous.

Additional Information

Please note that the information in this brochure provides only a general overview of the results determined by the New Mexico Tech research team. It is strongly recommended to read the Final Report for the project “Evaluating the Seismic Preparedness of New Mexico” for an accurate demonstration of the methodology, considerations, and conclusions that went into this study.

A Request for Assistance

The RVS model provides results that are well-suited to identifying and prioritizing seismically hazardous structures, but the model is currently incomplete. The model needs to be enhanced with accurate data relating to the design year and construction type of each structure. When this data is attained, the RVS model will provide results that are more accurate and more suited to evaluating New Mexico’s seismic preparedness. Any lack of accuracy in the model may lead to an improperly assessed building and may put lives at risk during an earthquake. Any help that can be provided in attaining this data would be greatly appreciated.

Future Work

The highest priority for future work is to update the existing RVS models with accurate design year and construction type data. After the models are updated, additional structures should be added to the study. There are still many essential facilities that have not been included in the study but may prove to be seismically hazardous. Finally, a structural specialist can be contracted to investigate the structures that the RVS analysis identified as being hazardous.