INFRASTRUCTURE AUDIT OF BUILDINGS IN CAVITE STATE UNIVERSITY MAIN CAMPUS

Undergraduate Thesis
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ABSTRACT

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Over the past decades, the Philippines has been labeled as one of the disaster-prone countries in the world mainly because of its geographic and geologic location and physical characteristics. The country lies along several active fault lines. As of 2008, the Philippine Institute of Volcanology and Seismology (PHIVOLCS) listed 12 destructive earthquakes in the country. The recorded earthquakes had magnitudes ranging from 5.1 to 7.9.

Prolonging the life of important structures such as public school buildings due to earthquake hazards requires regular inspection, maintenance and possible retrofitting. Detailed inspection and retrofitting, however, is costly considering the limited budget. Public school buildings that need detailed inspection and possible retrofitting must be prioritized using a brief seismic diagnosis.

In this study, Cavite State University – Main Campus has been selected for vulnerability assessment of earthquake. A total of 60 buildings has been analyzed by the three methods of vulnerability assessment: (1) Rapid Visual Screening (RVS); (2) Rapid Condition Assessment Tool (RCAsT); and (3) Local Infrastructure Audit Form (LIAF).

This study was conducted to determine the over-all health condition of all buildings in Cavite State University – Main Campus. It specifically aimed to determine the types of structural defects present in each building; to identify all the buildings that

need further investigation; to determine the number of buildings that show high vulnerability to earthquake; to compare the three methods of vulnerability assessment; to produce maps showing the level of vulnerability of each building; and to provide a database management program that will store necessary information regarding the results of the inspection.

From the results of this study, it was found out that using the RVS Form, 18 out of 60 buildings (30.00%) are low vulnerable to earthquake. About 26.67% (16 buildings), 33.33% (20 buildings) and 10% (6 buildings) are moderately low, moderate and high vulnerable, respectively. On the other hand, different results were obtained using RCAsT. A share of 38.33% (23 buildings) dominated and is considered as low vulnerable to earthquake. In addition to this, 33.33% (20 buildings), 6.67% (4 buildings) and 3.33% (2 buildings) are moderately low, moderate and high vulnerable, correspondingly. The remaining 18.33% (11 buildings) were not inspected due to limited applicability of this tool. Moreover, after the evaluation using LIAF, about 43.33% (26 buildings) are low vulnerable to earthquake, 33.33% (20 buildings) are moderately low vulnerable and the remaining percentage were shared by buildings that are moderate and high vulnerable each having 11.67% (7 buildings). However, percentages obtained through LIAF are solely based on the authors' judgment and is purely subjective.

Based on the conducted vulnerability assessment, majority of the buildings are relatively safe from the adverse effects of earthquake. Nonetheless, a fraction of buildings still needs to be evaluated and undergo a more detailed inspection to check its structural integrity.

The final output of the vulnerability assessment is a map showing buildings with different categories of vulnerability as well as a database management program that will store the results of the inspection and will aid to efficient allocation of budget for possible detailed inspection and retrofitting works.

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