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DESIGNING MOTION RESILIENT BUILDING INTENDED FOR SEISMIC HAZARD

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ABSTRACT

Architects are the professionals who are involved in ensuring the safety of the people by designing or creating an infrastructure that can withstand seismic events like earthquakes. In the Philippines, earthquakes are prevalent because it is located in the Pacific Ring of Fire wherein geological activities are frequent. This research aims to design a prototype motion-resilient building intended for seismic hazards using technologies such as base isolation and tuned mass dampers. The development of motion-resilient buildings gives significance to the community because it provides innovation in the motion-resilient technology in the Philippines. This study focused on improving public safety in earthquake-prone areas, especially in the Balayan, Batangas. This research utilized the AutoCAD software in designing to create innovative engineering concepts structures capable of withstanding seismic hazards. The building uses steel rod, aluminum alloy, lead sheet, cement, lead-rubber bearing, and tuned mass damper in developing the motion-resilient technologies. The study evaluates the effectiveness of base

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isolation, tuned mass damper, and their combination through material selection, design conceptualization, and ground motion testing. The building was tested through ground motion simulation. Concluding based on the study of Mazzon et al. (2023), the findings of the research shows that 90% of shear motion can be reduced using base isolation technology, 50% can be reduced using tuned mass damper, and 95% of shear activity is reduced using the combination of the two technologies. The results show that the combination of based isolation and tuned mass damper are effective motion-resilient technologies as it can withstand seismic hazards. This study contributes to the innovation of motion-resilient building and provides valuable implications for future architects and researchers. Further recommendations were added to improve the overall study.