SITE-SPECIFIC RESPONSE SPECTRA: 2ND DISTRICT OF CAGAYAN DE ORO CITY, PHILIPPINES

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Abstract - An earthquake is an inevitable event that caused damaged to lives and properties, inflicting fear and apprehension if it is still safe to live in our homes and work in building offices. Building codes were updated advertently to address the catastrophic effect of earthquakes. In the Philippines, the National Structural Code of the Philippines (NSCP 2015) was the recognized National Building Code adopting the 1997 Uniform Building Code (UBC-1997). The NSCP Code used the 10% probability of exceedance in a 50-year period with a return period of 475 years. In this study, site-specific response spectra were developed with the same probability of exceedance in the 50-year period in the 2nd District of Cagayan de Oro City, Philippines using the Probabilistic Seismic Hazard Analysis (PSHA). PSHA was conducted assimilating local soil conditions to account for linear and nonlinear factors of soil response, utilizing available soil reports in the study area. Further, historical earthquake catalogues are gathered from the United States Geological Survey (USGS) and the Department of Science and Technology-Philippine Institute of Volcanology and Seismology (DOST-PHIVOLCS). Finally, site-specific response spectra were developed using a 300-km radius, showing conservative results compared to the current NSCP Code.

Keywords: Earthquake, Local Site Condition, Probabilistic Seismic Hazard Analysis, Shear-wave Velocity, Ground Motion Prediction Equation.