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Earthquake Safer Housings and Buildings: Strength Evaluation of Existing Structures

Mulyo Harris Pradono^{1*}

¹BPPT, Jakarta, Indonesia

Important thing in seismic resistant structures is evaluating the seismic strength of existing structures. For important and expensive structures, structural health monitoring is applied by putting sensors capable of detecting any changes in the structures. Any changing in stiffness, mass, and damping of the structures is considered as symptoms. Fortunately, important structures are built with very strict supervising method so that the detail of the building is recorded in the as-built drawing.

For most developing countries, usually the drawing itself is not well kept. Even if it is kept in a safe place, the drawing and the actual building are usually not the same. Steel reinforcement inside the concrete makes it the source of in-appropriateness because it is hidden in the concrete. Building a structure that really follows the detailed engineering drawing is not usually the case for budget structures. For the sake of practicality, material availability, and rising cost, structures are usually built different from what it was stated in the engineering drawing.

Learning from that, it is important to apply a method that is capable of diagnosing the health of a structure. Methods for evaluating the strength of structure usually consist of two steps. First step is for obtaining data and second step is for making a numerical model based on the obtained data.

In this paper, experiences in carrying out strength evaluations of existing structures for seismic safety are shown and important findings are highlighted.

Keywords: existing structures, seismic resistant, strength evaluation, seismic code, structural analysis