Research about verification technique of earthquake resistance capacity (1)

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The purpose of this research is to clarify the performance required for a structure, and organize earthquake resistant design standard system that flexibly corresponds to the adoption of new technique by adopting reliability design method as a method for checking the performance. Earthquake resistant performance requirement that was required depending on degree of importance of a structure, and limit state of a structure required for achieving it, were clarified from the perspective of safety, combination usability, and repairability. Original proposal of performance checking type earthquake resistant design standard was then created based on specifications for highway bridges vs. earthquake resistant design. Furthermore, reliability assessment method of a structure was suggested with consideration to variability characteristics of earthquake motion probability as well as phase characteristic of ground motion waveform, in addition to consideration to variability characteristics of material intensity, deformation performance assessment formula, and member intensity assessment formula with RC bridge pier as a target. Reliability assessment was also conducted with RC bridge pier as a target based on this technique, and trial calculation of partial safety factor that was needed for ensuring predetermined reliability was also conducted. Performance checking type earthquake resistant design standard was reflected on specifications for highway bridges that were revised in March 2002.

Keywords: performance requirement, performance checking type design method, reliability design method, partial safety factor method