

Technical study of essential conditions for the structure of tsunami evacuation buildings

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1. Background to the study

The Great East Japan Earthquake of March 2011 caused tsunami to destroy or damage many buildings and took many valuable human lives, and in particular, we were reminded of the importance of ensuring structural capacity guaranteeing safety from tsunami for tsunami evacuation buildings and others where people temporarily seek refuge from tsunami.

In response, the Housing Bureau and the National Institute for Land and Infrastructure Management of the Ministry of Land, Infrastructure, Transport and Tourism performed an emergency study based on a field survey of design methods to provide buildings with structural capacity sufficient to withstand tsunami, and knowledge related to the rationalization of the existing tsunami evacuation building design method ¹⁾ was compiled through discussions by the Committee on Building Structure Standards formed at the National Institute for Land and Infrastructure Management. Based on this, the requirement for hydrostatic pressure uniformly 3 times the inundation depth stipulated by the existing tsunami load setting, could be relaxed to hydrostatic pressure 2 times or 1.5 times the inundation depth considering location conditions, and provisions for a study of overturning by buoyancy, consideration of scouring in the design, and consideration of the impact of floating debris in the design were clearly stipulated. The results of the study were standardized as the notification, Enactment of a Construction Method Safe from a Hypothetical Tsunami when Setting Tsunami Inundation Hypothesis (MLIT Notification No. 1318 of 2011)) based on technical guidance released by the

Housing Bureau (Supplementary Knowledge Concerning Design Methods for Buildings with Structural Capacity Ensuring Safety From Tsunami (Kokujushi No. 2570 of November 17, 2011²⁾) and the Law Concerning the Establishment of Tsunami Protection Districts.

2. Future actions

The Explanation of Essential Structural Conditions for Tsunami Evacuation Buildings, which presents cases of the design of tsunami evacuation buildings based on the explanation of design methods etc. for tsunami evacuation buildings and the said design method, are prepared and lecture meetings are being held in seven places nationwide from February 2012. We pray that the results of the study will contribute to the establishment of future tsunami disaster protection districts.

[Reference]

- 1) Cabinet office web site, disaster prevention information page: Guideline to Tsunami Evacuation Buildings Etc., June 2005.
http://www.bousai.go.jp/oshirase/h17/tsunami_hinan.html
- 2) Ministry of Land, Infrastructure, Transport and Tourism web site, Press Releases: Supplementary Knowledge Concerning Design Methods for Buildings with Structural Capacity Ensuring Safety from Tsunami, November 2011.
http://www.mlit.go.jp/report/press/house05_hh_000274.html