

Numerical Simulation on Collapse Behaviors of CTV Building Caused by the 2011 New Zealand Earthquake

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In this study, we investigated the behaviors of the Canterbury Television (CTV) building which totally collapsed, with only the north-core wall remained standing, during the New Zealand earthquake that occurred on February 22, 2011. A seismic collapse analysis code for RC framed buildings developed using the ASI-Gauss technique [1] is used to simulate the collapse phenomenon. A finite element model of the CTV building is constructed based upon the actual structural drawing of the building. The result of a static pushover analysis showed its unbalanced strengths toward the EW and NS directions due to its biased distribution of anti-seismic walls. Furthermore, the result of a dynamic collapse analysis showed a collapse behavior of the same feature with the investigation report, with a twist motion clearly observed around the elevator shaft connected at the north part of the building.

Keywords : CTV Building, 2011 New Zealand Earthquake, ASI-Gauss Technique, Collapse Analysis

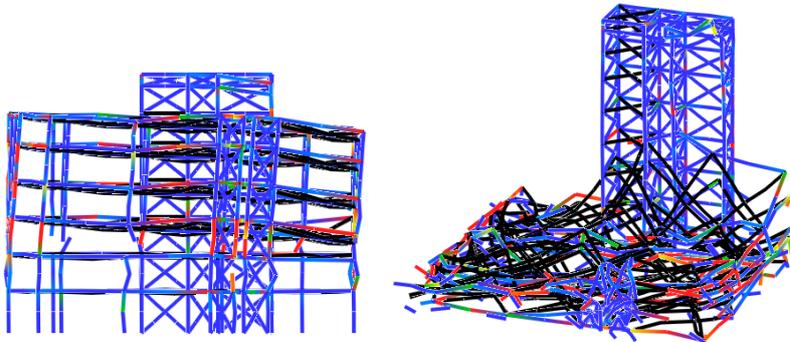


Fig.1 Collapse analysis of the CTV building



Fig.2 Remains of the building after the earthquake [2]

Reference

- [1] D. Isobe, W.S. Han and T. Miyamura: Verification and Validation of a Seismic Response Analysis Code for Framed Structures using the ASI-Gauss Technique, *Earthquake Engineering and Structural Dynamics*, Vol.42, No.12, (2013), pp.1767-1784.
- [2] C. Hyland and A. Smith: *CTV Building Collapse Investigation*, Department of Building and Housing, New Zealand, 2012.