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Book review

RESPONSE CONTROL AND SEISMIC ISOLATION OF BUILDINGS

M. Higashino and S. Okamoto (eds). Taylor & Francis, 2006. ISBN 978 0 415 36623 6, £95, 416 pp.

Earthquakes apply significant additional lateral loading onto structures. The traditional approach used by structural engineers to design for this is to provide additional material (concrete/steel) to improve the strength of a building. Unfortunately, this often worsens matters, by stiffening buildings and attracting even greater structural loads.

Seismic isolation alters this approach, by allowing the building to move with the earthquake, thus reducing the inertial loads and concentrating imposed displacements in an engineered device. The process for assessing this is often non-linear and, as such, difficult to assess. Similarly, design of structures using 'response control' (typically either passive damping or active control systems) presents its own problems, not typically dealt with by common practice.

In order to bring this technology more into mainstream seismic design, practitioners of the art have developed methods of assessing the behaviour of isolators and 'response controllers' in a manner which is consistent with common design practice (i.e. design codes). Each of the major seismic design communities has found a different way of doing this over the last 30 years or so. This book brings together much of this knowledge in one place.

The first two chapters look at the different technologies available and provide a brief explanation of how they work. There is not a lot of detail here and it would have been useful if further references to other publications could have been included.

The next chapter compares the results of a comparison of different seismic isolation codes around the world: Japan, China, USA, Italy and Taiwan. The limitations of code use for each country are compared, as well as the differing methods of assessing seismic hazard. The net result is a broad spectrum of methods for the different countries. This is a reflection of the general seismic code provisions, as well as the specific ones for isolation.

The chapter 'Observed response of seismically isolated buildings' is interesting—for a relatively new technology, real response data are a valuable validation.

The bulk of the book consists of 'World reports': separate articles from China, Italy, Japan, Korea, New Zealand, Taiwan and the USA. These cover a variety of matters: current practice, a history of the development in each country, design examples, and so on. Following on from this are 60 pages of data sheets for different buildings. The Japanese section is perhaps the most comprehensive, covering a variety of technologies and applications.

This certainly is not a book for beginners to the subject, but perhaps those with a little knowledge of existing design techniques can learn a lot. There is a lot of information here, although many contributing authors say the same thing in a slightly different way.

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