

Guest Editorial

Immediately after the 1995 Hyogoken-Nanbu Earthquake, which caused massive collapse of concrete structures, some tentative guidelines for retrofit of concrete structures damaged by the earthquake were notified and practical retrofitting works had been done based mainly on these guidelines before the revision of the current seismic design codes. After the revision of these codes, which reflect the results of the analyses on structural damages and collapse mechanism, retrofit design of existing concrete structures, whether damaged or not, has been done based on, in principle, the revised codes. Details of the revision are somewhat different according to the type of structure such as road and highway structures, railway structures and building structures. However, the basic points of the revision are almost the same, that is, (1) consideration of two levels of design ground motion according to the seismic performance level required for a structure, (2) confirmation of sufficient ductility and shear capacity, and (3) consideration of the seismic performance of a whole structural system. Under this background, this special edition is issued being focused mainly on the retrofit of existing concrete structural based on the revised seismic design concept.

In case of retrofit of existing concrete structures, the conditions of the construction site are different from those of newly constructed structures, and therefore, new materials, systems and techniques are proposed and adopted. As for reinforced concrete columns, steel plate jacketing and reinforced concrete jacketing are popular. After the earthquake, however, continuous fiber sheet wrapping or jacketing, especially using carbon fiber

sheet, became to be adopted because of its high strength, high durability and lightweight. Some design recommendations for the use of continuous fiber sheet for retrofit of existing concrete structures are already proposed. New systems such as seismic dampers and seismic isolators are also adopted both in highway structures and building structures.

In this special edition, the strategies and methods for retrofit of existing concrete structures adopted in highway bridges, railway viaducts and buildings are described. New materials and systems adopted in the practical retrofitting works are also introduced. In addition, a brief review of the revised seismic design concept adopted by each organization is included. If the information, herewith, on the seismic retrofit of concrete structures would be of interest to readers, it would be of great pleasure to the guest editors.

Toyaki Miyagawa
*Kyoto University,
Department of Civil Engineering,
Yoshida-Honmachi, Sakyo-ku,
Kyoto 606-8501,
Japan*

Susumu Inoue
*Osaka Institute of Technology,
Department of Civil Engineering,
5-16-1 Omiya, Asahi-ku,
Osaka 535-8585,
Japan*