Tanaka Award: Achievement Category

Study on Seismic Design, Seismic Retrofit and Strengthening by New Material (FRP) for Concrete Bridges

Kyuichi Maruyama
Professor Emeritus, Nagaoka University of Technology

As a professor at Nagaoka University of Technology, Dr. Kyuichi Maruyama has for many years been involved in research on structural concrete. One of his leading research contributions in this field is pioneering work on the seismic design of concrete bridges and the application of a new material (FRP) for seismic retrofitting of existing bridges. He has published numerous papers on these subjects and played a leadership role on research committees and others. Through this work he has significantly contributed to the standardization and practical adoption of this technology.

In his research work, Dr. Maruyama has carried out methodical experiments on the loading capacity of RC column members under large-deformation cyclic loading. These efforts have contributed to the development of seismic design codes and seismic retrofitting methods. He played a central role in the establishment of the Standard Specifications for Concrete Structures [Seismic Design] in 1996 and a revision of the Standard Specifications for Concrete Structures [Seismic Performance Verification] in 2002. His work has contributed to the progress of seismic technology in Japan for structures such as bridge piers.

In relation to the application of FRP to concrete structures, he has studied the loading capacity of concrete members using FRP rods instead of steel rebars, the use of FRP for the external strengthening cables of precast members, the retrofitting of bridge piers by jacketing with new materials such as carbon fiber sheet, and the seismic retrofitting of bridges by FRP rope binding. He has presented his work at domestic and international conferences many times, and has summarized the findings as chief editor of the JSCE design recommendations.

Dr. Maruyama’s achievements in bridge technology and his contributions to its progress are significant and he is recognized as being a worthy recipient of the JSCE Tanaka Award.