Special Committee on Countermeasure for Damage of Tarui Viaduct（2005.5～2006.3）
Special Committee on Research for Damage of Tarui Viaduct（2006.7～2008.3）

(1) Committee:

Chairman: Prof. Kyuichi MARUYAMA (Vice President of Nagaoka University of Technology), Secretary: Prof. Junichiro NIWA (Tokyo Institute of Technology), other 22 members.

(2) Objectives:

Tarui viaduct was completed in Suda-cho, Hashimoto City, Wakayama Prefecture in April 2002 by Kinki Regional Development Bureau of Ministry of Land, Infrastructure, Transport and Tourism. In October 2003, numerous cracks in the superstructure of the viaduct were found. When the further investigation for the entire superstructure was conducted, a large number of cracks in the top and bottom slabs and the webs of the PRC box girders were found out, and the unexpected deformation was generated in the superstructure. Since this bridge is a part of Hashimoto Road, of Kyoto-Nara-Wakayama Expressway, which was scheduled to be in service in the spring of 2006, the swift action was strongly required. For this reason, JSCE was commissioned to do the research on the cause of damage, the current load bearing capacity, strengthening and maintenance methods, etc. by Kinki Regional Development Bureau. In this commission, JSCE concrete committee established Special Committee on Countermeasure for Damage of Tarui Viaduct. The committee planed to complete the study report, conducting the investigation on the cause of damage from the academic viewpoint, the evaluation of the degree of soundness, and the consideration of the strengthening and maintenance methods.

(3) Activities:

(a) From May 2005 to March 2006

This committee was required to investigate the cause of damage of this viaduct, to evaluate the load bearing capacity, and to present the methods of strengthening and maintenance within a very short period. In addition, this result is likely to affect the society directly. For this reason, not only academic experts but also practical experts, such as the experts of design, construction, materials, and diagnosis, are called together from a broad range.

Considering the inherent characteristic of this viaduct, the design, construction, materials, etc. were comprehensively examined. It was also taken into account to develop the preventive method for the same type of the damage. In addition, paying attention for that this viaduct was not in service yet, the strengthening and maintenance methods and its effectiveness were examined. In September 2005, the committee issued the interim report, i.e., "it is able to fix the damage of this viaduct by the strengthening and maintenance". The interim report was compiled with the completion of the experimental data with time.

(b) From July 2006 to March 2007

After the interim report of March 2006, the continuous research was entrusted by Kinki

Regional Development Bureau of Ministry of Land, Infrastructure, Transport and Tourism and JSCE decided to undertake this offer. Since Kinki Regional Development Bureau agreed with the proposal by the committee, that is, to deal with the damage by the strengthening and maintenance, the JSCE committee established the subcommittees of “Strengthening", "Maintenance", and "Construction System" from July 2006. The purpose of each subcommittee was (1) to draw and examine the various problems on the strengthening, (2) to consider the monitoring method after the strengthening, and (3) to consider the construction system for the order, design, construction, and maintenance, respectively. The strengthening and the maintenance subcommittees proposed the detail method for the strengthening and the method of maintenance after the strengthening, respectively, in March 2007.

(c) From May 2007 to March 2008

After the proposal of the methods for the strengthening and maintenance in March 2007, the further continuous research was entrusted by Kinki Regional Development Bureau. In the third JSCE committee from May 2007, it was decided to consider the maintenance method after the strengthening and the construction system from the order to the maintenance.

The strengthening of Tarui viaduct was completed in August 2007 and the viaduct has been in service. The committee proposed the maintenance method and also the appropriate construction system from the order to the maintenance as well. The final report has been open on the concrete committee’s website from March 2008 and all of activities of the committee were finished.

The new committee for monitoring on Tarui viaduct was established within JSCE Organization for Promotion of Civil Engineering Technology (OPCET) in April 2008. In this new committee, the activity for the maintenance will be conducted for another 10 years.

Tarui viaduct

Crack repairs and strengthening by out-cables