REEXAMINATION OF MONONOBE-OKABE THEORY OF GRAVITY RETAINING WALLS USING CENTRIFUGE MODEL TESTS[i)]

Closure by SHINYA NAKAMURA[ii)]

The writer would like to acknowledge the thoughtful discussions on this technical paper. This paper is primarily aimed at examining hypothetical conditions of Mononobe-Okabe theory in actual seismic state.

The discusser pointed out that the Mononobe-Okabe theory is a useful tool if an opportune value of kh is assumed for the analysis. A finding in this paper is that the earth pressure is nearly equal to the initial value prior to shaking when the inertia force is maximum. So the active earth pressure at static condition could be used for the seismic earth pressure. If the earth pressure is set to the actual one, the seismic coefficient to calculate the inertia force acting on the retaining wall, the height to apply the earth pressure, the passive earth pressure resistance in the embedment, the frictional coefficient between the retaining wall and soil, etc. should be set to actual seismic conditions. If not, the design procedure will lose safety.

The writer studied the seismic behavior of gravity retaining wall (Nakamura, 2005). The acceleration and displacement of a retaining wall and its backfill as well as the earth pressure acting on the wall were measured simultaneously together with the displacement of the wall and its backfill, using a high-precision high-speed camera. Data analysis showed that the present design method is able to be rationalized by calculating the seismic earth pressure by the active earth pressure of static state, setting the seismic coefficient to be 0.4, acting the thrust force at 40% of the wall height, etc.

References

16) Nakamura, S. (2005): Clarification of seismic behavior of gravity retaining wall by using centrifugal model tests and a proposal for rationalization of the seismic coefficient method, *Proc. JSCE*, (785/3–70), March, 107–122 (in Japanese).

i) Vol. 46, No. 2, April 2006, pp. 135–146. (Previous discussion by V. R. Greco, Vol. 47, No. 5, October 2007, pp. 999–1001).
ii) Director, Kurobe River Office, Ministry of Land, Infrastructure and Transport, Japan.