14. Study on the Improvement of the Friction Pendulum System (FPS)

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The friction pendulum system (FPS) is the base isolation system for the building applications, which has a bearing, restoring, and damping mechanism. Because the natural period is determined only by the spherical surface, it would be possible to extend the period irrespective of the weight of the building. This system isn't used widely in the actual circumstances from the following reason, the rotation of the building in the earthquake which results from the unbalanced load and the unbalanced friction coefficient condition, the amplification of the higher order vibration, and the performance which is inferior to the rubber-metal laminated bearing.

We proposed FPS that an elasticity element (rubber material) is included into the movable body. The result of the element examination of the actual opportunity model and the vibration test of the reduction model demonstrated the improved FPS good performance, and an earthquake response in the unbalanced load condition and the unbalanced friction coefficient condition. In addition, the earthquake response analysis results also demonstrated the validity of the simulation model.

Key words : isolation, friction pendulum system, elasticity element, element examination, vibration test