

## 9. Evaluation of the Dynamic Characteristics of the Base-isolation System on the Actual Building

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A free-vibration experiment and a static loading experiment were conducted on a 30-year-old base-isolated building in order to evaluate and compare the measured horizontal stiffness of the base-isolation systems obtained from the two experiments. As a result, the horizontal stiffness results obtained from the free vibration experiment showed good agreement with the secant stiffness results obtained from the static loading experiment. This confirms the validity of evaluating the dynamic response of a building seismically isolated by means of natural rubber bearings and steel bar dampers in terms of mechanical properties observed in a static loading test.

This study also evaluated the effects of cyclic deformation and temperature changes on the horizontal stiffness of laminated natural rubber bearings. The experimental results showed little effect of cyclic deformation on stiffness. The tendency of the horizontal stiffness of the natural rubber bearings to decrease as temperature rises shows fair agreement with the tendency of rubber material test results.

These results confirm the validity of the initial design condition and indicate that the seismically isolated structure is sufficiently safe and durable.

**Key words:** natural rubber bearing, steel bar damper, horizontal stiffness, cyclic deformation, temperature change