

8. Aged Deterioration of Natural Rubber Bearing

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The natural rubber bearings of the Office Building, which was constructed using the seismic isolation method, have been monitored over a period of 20 years to investigate their aging. The long term observation showed the following results.

The vertical displacement of the natural rubbers depended on the temperature conditions of the seismic isolation layers. The rubbers have repetitively expanded and contracted, but the creep values have always been within the range considered during designing.

Changes in vertical and horizontal stiffness by aging were investigated using laminated rubber specimens exposed to the same conditions. The changes in both vertical and horizontal stiffness were small, showing that the changes by aging of the laminated rubber were within the range assumed for designing.

Materials tests were conducted using one of the laminated rubber specimens. Both the tensile test, which was conducted by excising a rubber piece from the specimen, and the shear test, for which a piece was excised from the adhesive joint of rubber and steel plate, showed that the aging of the laminated rubber material used was within the range considered during designing.

Key words : natural rubber bearing, aged deterioration, creep, stiffness, material test