

S05: JAE Special Session

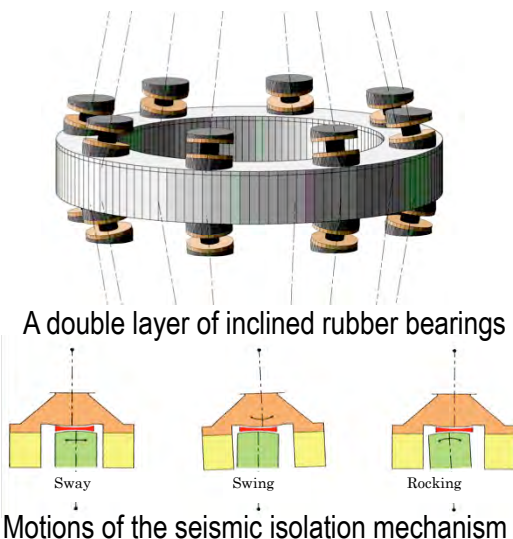
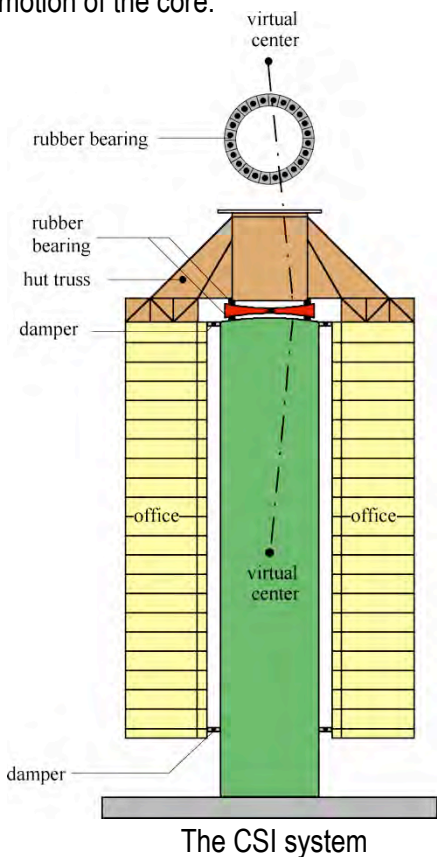
S05-01:  
Spectacular Projects of  
Base-Isolated Buildings

# DEVELOPMENT OF THE CORE-SUSPENDED ISOLATION SYSTEM

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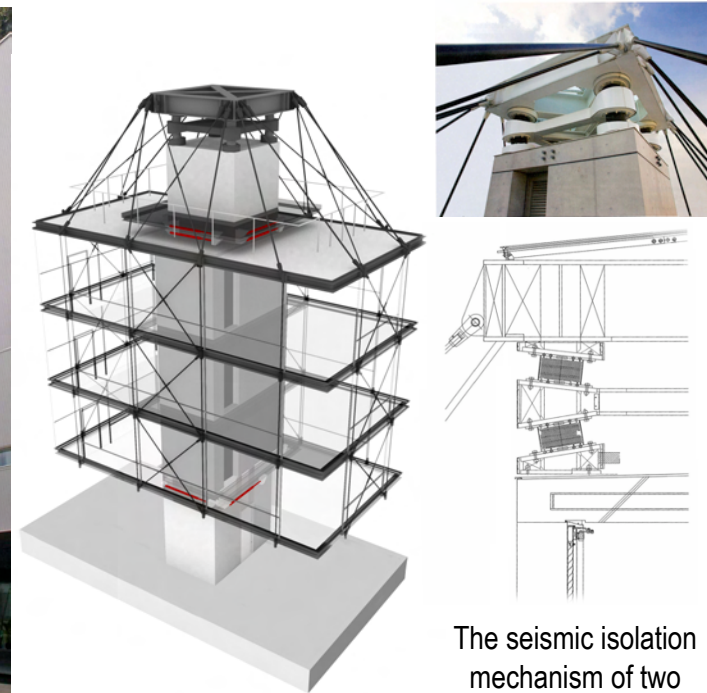
A new type of seismic isolation system – called the core-suspended isolation system (CSI) – has been recently developed and implementation completed in the first building in Tokyo, Japan. The core-suspended isolation system consists of a reinforced concrete core on top of which a seismic isolation mechanism composed of a double layer of inclined rubber bearings is installed to create a pendulum isolation mechanism. An office or residential structure is then suspended from a hat-truss constructed on the seismic isolation mechanism, isolating it from the motion of the core.



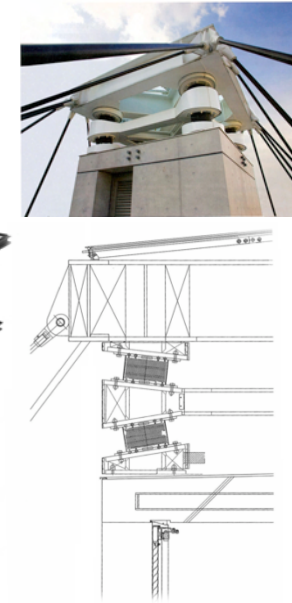
Shaking table tests



Appearance and perspective drawing of building utilizing the CSI system



Overview of building utilizing the CSI system



The seismic isolation mechanism of two layers each of four inclined rubber bearings

Site	Institute of Technology, Shimizu Corporation, Koto-ku, Tokyo, Japan
Floor space	total area:213.65 m <sup>2</sup> , 1st floor:9.05 m <sup>2</sup> , 2nd-4th floor:66.15 m <sup>2</sup> , penthouse:6.15 m <sup>2</sup>
Height	total height:18.75 m, 1st story:4.15 m, 2nd-4th story: 3.0 m
Core shaft	reinforced concrete wall 200 mm thick, 40 cm clearance joint
Office structure	total weight of suspended structure: 180 ton, steel rod column 42 mm diameter
Rubber bearings	diameter: 300 mm, inner steel shims: 1.2 mm × 45, rubber layers: 2.1mm × 46, S1 = 35.7, S2 = 3.11, G = 0.294 MPa
Tilt angles	lower layer: 9.9 degrees (R <sub>1</sub> = 9.5 m), upper layer: 6.6 degrees (R <sub>2</sub> = 14.25 m)