DaiyaGate Ikebukuro

Mid-story Isolation Building Straddling over Railroad Track

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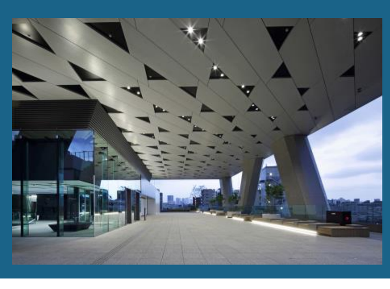


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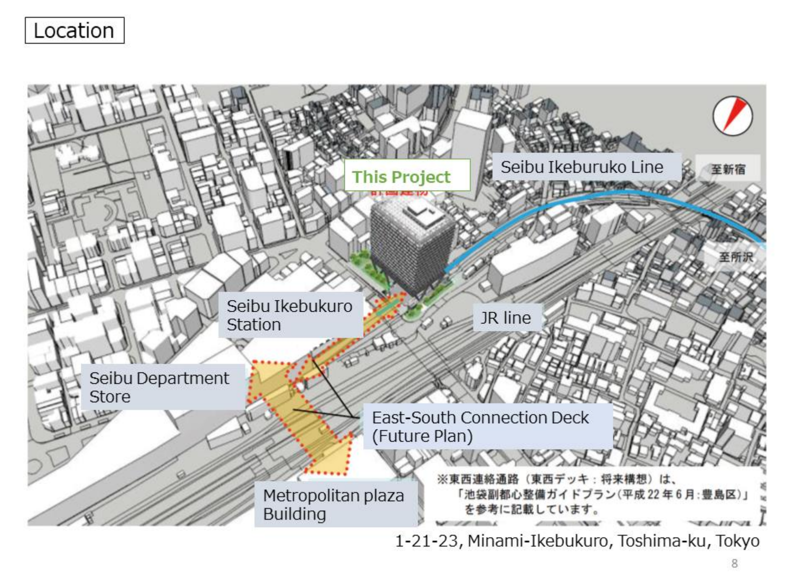
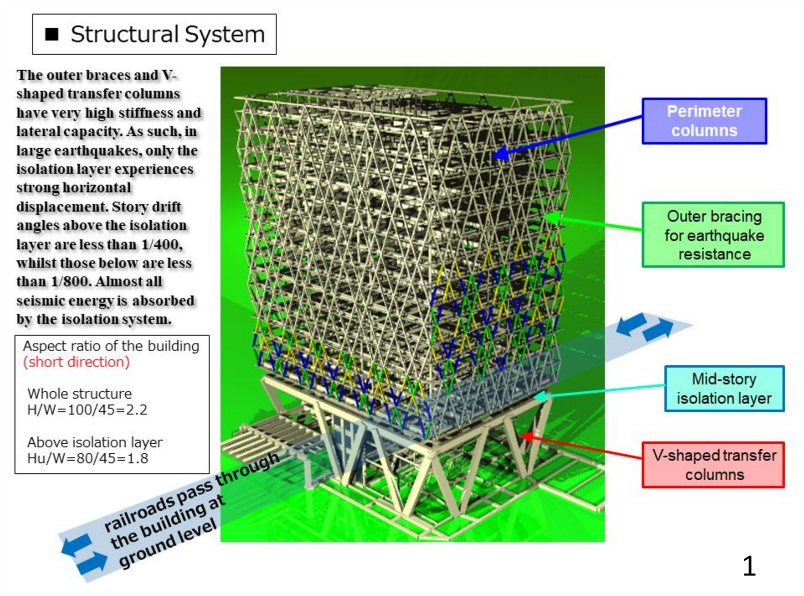
1 Architectural Scheme of the building project

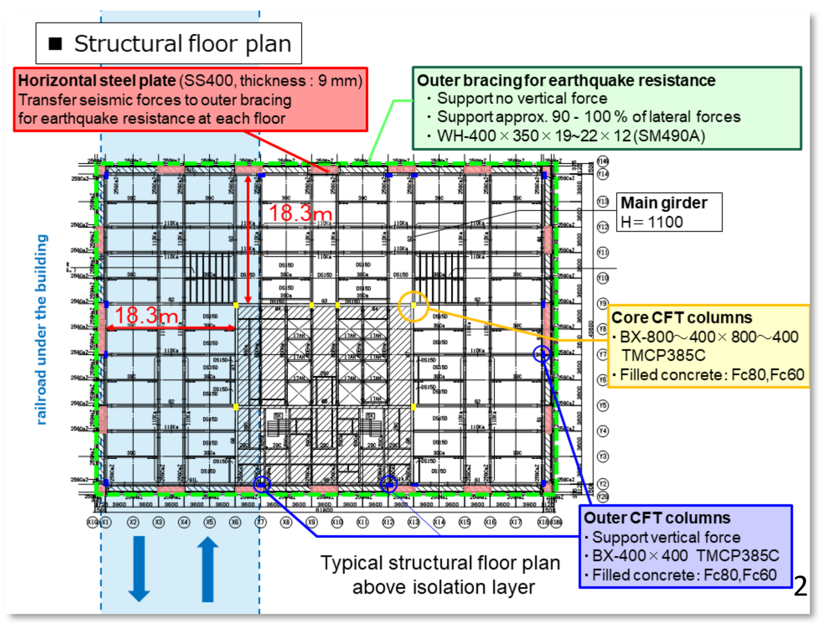


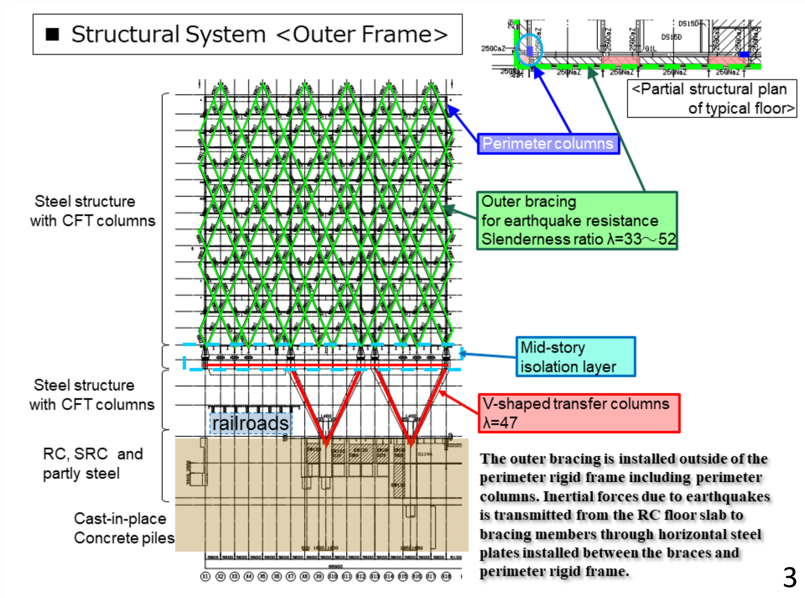
In recent years, Transit-Oriented Development (TOD) is garnering attention and popularity for urban development projects. In particular, the popularity of over-track buildings is beginning to increase. The building was built over railroad track adjacent to Ikebukuro station. Because the railroad is owned by Seibu group, the headquarter building was planned as built over the tracks due to the effective use for the airspaces.

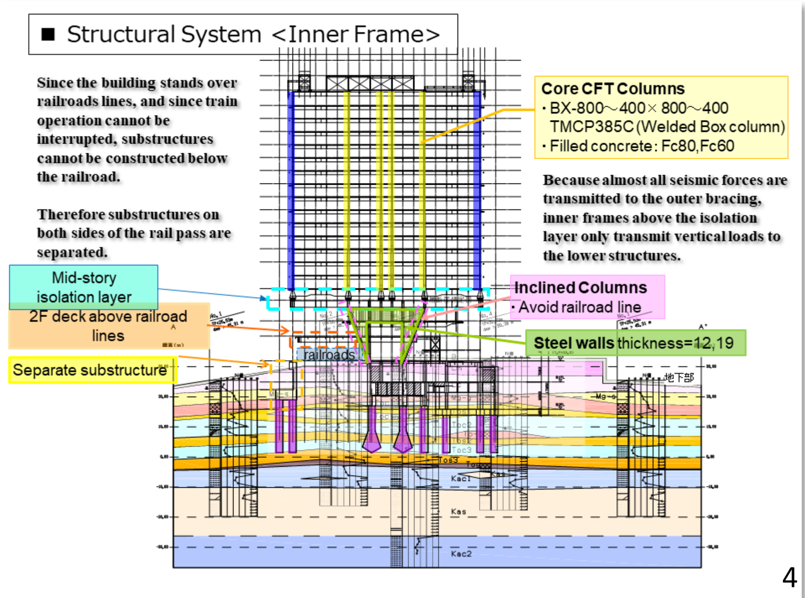
2 Implemented schemes for Innovative Use of SI Technologies due to the Achieved High Seismic Performance

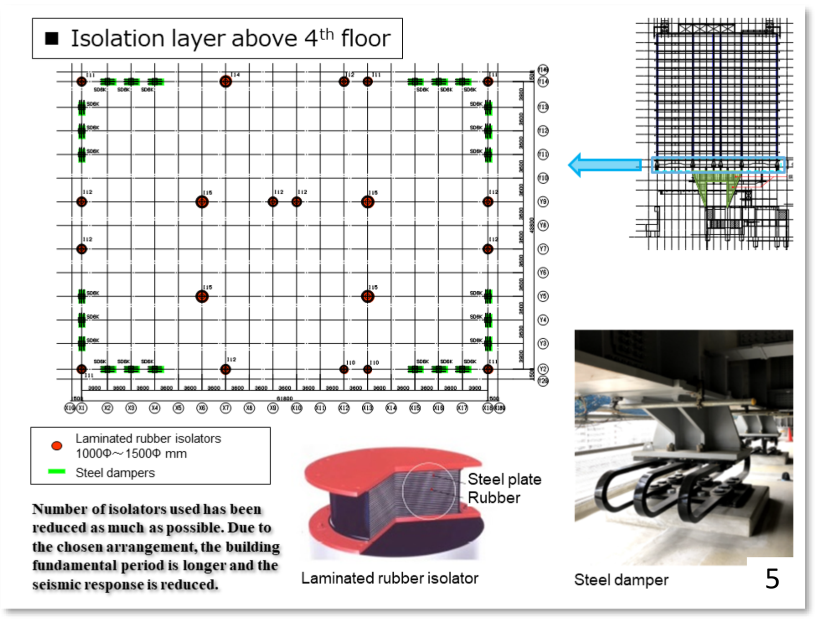
The building – being an over-track structure – is the first of its kind to employ mid-story isolation (an increasingly popular tall building solution in Japan). The decision to adopt this system was taken in order to reduce vibration effects due to train operation, and also to decouple the relative displacement between the lower stories and above office floors. The isolation system grants significant response reduction and absorbs almost all of the seismic energy, since the drift of the other layer is small. The building is designed to have sufficient toughness to mitigate train vibration effects, and sufficient redundancy in accidental scenarios where the trains derail and impact the structure.

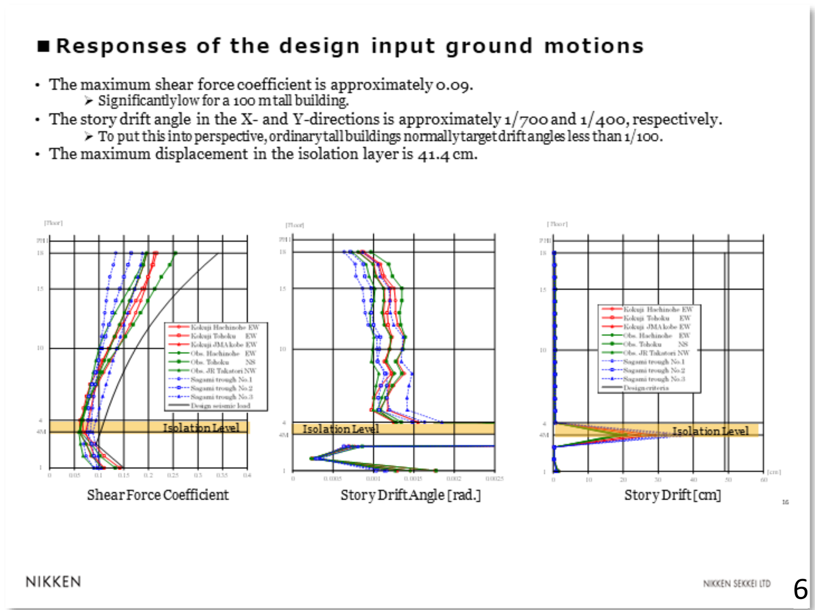


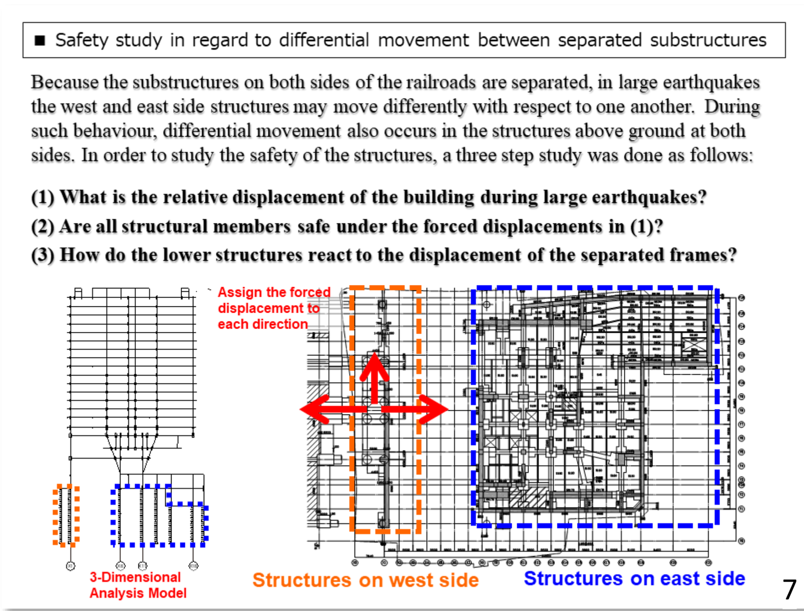


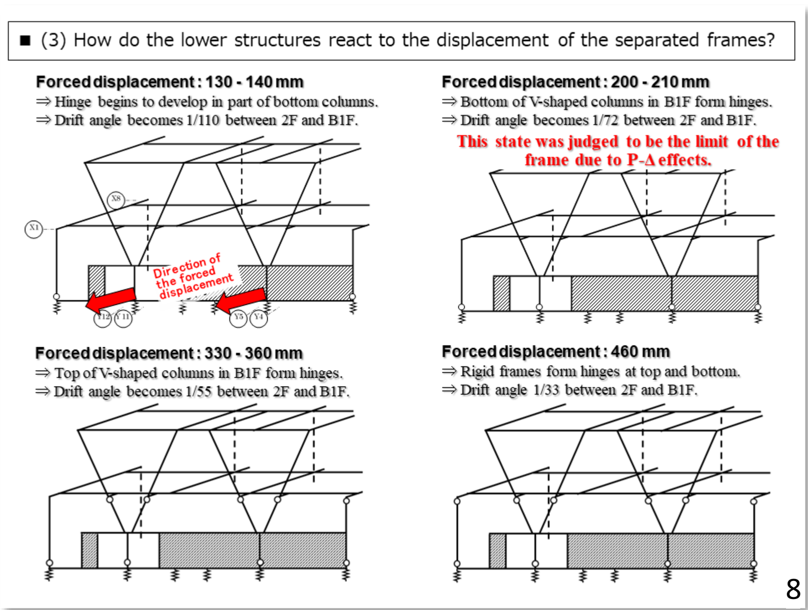












3 Structural Schemes Including Innovative Use of SI to Facilitate Architectural Form and Expression Exceeding Conventional Structural Design

The outer bracing (installed above the isolation layer) and V-shaped columns (below the isolation layer) compliment the building façade and aesthetic. These structural members are engaged during large earthquakes to reduce story drift, and are inspired by train schedule diagrams. Such structural arrangements represent symbolic and memorable meanings for the owners, Seibu Group··· and are all the more significant since the building will serve as their headquarters in close vicinity to the Seibu-Ikebukuro line. The bracings are considered from a multi viewpoint not only structural load transmission and full-scale loading test but also aesthetic of the part of the bolted joint , paintings for anti-rust, snow accumulaton and ponding of rainwater, etc.