1 Exterior of Opus House at dusk. **2** Completed reception area. **3** Closeup of a viscous damper inside the office.

OPUS HOUSE

Opus International Consultants for SSF One Limited

Project Location: Christchurch

Opus House is a new five storey office building constructed on a brownfield site overlooking Hagley Park at 12 Moorhouse Avenue in Christchurch. The building is a showcase for the building owner and Opus who, together have brought next level technology and design excellence to create a landmark resilient building. The structural system is a steel moment frame with supplementary fluid viscous dampers. This is the first new building in New Zealand to incorporate this technology which, in concert with integration of the structural and geotechnical engineering, and innovative construction techniques, has enabled this very high performing and highly resilient building to be constructed to a commercial office budget.

The building incorporates the Seismic Monitoring Asset Reporting Tool (SMART) developed by Opus which combines complex structural engineering analysis and assessment with active measurement during earthquake shaking to provide immediate performance assessment. All this is condensed into two home pages which display building occupancy status and a graphic of the earthquake trace.

The viscous dampers can only dissipate energy when the building is moving during earthquake shaking, and therefore understanding the behaviour of the building and demonstrating performance of the system is complex due to the velocity relationship of the dampers. Displacement based design and non-linear time history analysis were used to validate performance. In order to encourage uptake of this structural system three publications have been produced, one of which demonstrates that this system compares favourably to the performance and cost of a Buckling Restrained Brace (BRB) system.

The approach to low damage design is holistic, for example joints are installed at stairwells to prevent damage to linings required for fire ratings that would affect ongoing building occupancy. The SMART system combines both complex structural engineering and instrumentation data into a simply understood display and status. The result is an affordable, highly resilient building and when coupled with the SMART, this infrastructure contributes to a step change in community resilience.

Judging & Copyright Statement

This project is an entrant in the 2016 INNOVATE NZ Awards of Excellence competition. The winners will be celebrated at our Awards Gala Dinner on Saturday, 12th August 2017 in Taupo.

For more media information and high resolution images, please contact Holly Morchat Stanko
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