

Executive Summary

The New Acute Care Hospital and Skilled Nursing Facility is a proposed addition to the Chinese Hospital in San Francisco, CA. This report involves an investigation into the implementation of Fluid Viscous Damper technology in the special steel moment frames of the hospital as a means of resisting the large seismic loads present in the region.

The design involved the redesign the lateral system using a response modification factor of 8 and to meet drift requirements for static loading conditions. Next, the amount of damping required by each frame to resist yielding in a major seismic event was determined using a nonlinear analysis. This total amount of damping was then used to determine the number and capacity of FVDs needed.

Fluid Viscous Dampers were found to be an effective means of reducing the formation of plastic hinges developed in the structure during a Maximum Considered Earthquake as defined by the geotechnical engineers on the project. The design involved (28) 55 kip damping devices located on diagonal braces throughout the moment frames of the structure. 8 devices were used on frames A and E, while 6 devices were used on frames 1 and 7.

Included in the report is an investigation into the architectural impact of the inclusion of the damper system. It was found that while the dampers could be incorporated into the system without major problems, the architectural restrictions of the project prevent a completely smooth implementation.

In addition, the total cost of the damper system was also determined. The device cost, including installation, was found to be approximately \$115,900. This increase in cost was accompanied by a savings of \$19,805.05 due to reductions in the steel moment frames. The net increase in cost was found to be \$96,095.