Proposed Best Practice

Commercial Building Seismic Retrofit
Eureka Professional Building
Eureka CA

Description
The 6–story Eureka Professional Building was seismically retrofitted to attract the State of California as a tenant, and to protect the assets of its small business owners.

Problem:
The Eureka Professional Building is a 50,000 square foot 6–story unreinforced masonry (URM) and non-ductile concrete building located in Eureka, California. This building was recently acquired by a small business to lease as an office building, possibly to the State of California. Eureka is located in a very high seismic region with soft soil. The building had been retrofitted with steel angle braces in the 70’s. However, the as-built condition of the building may be susceptible to major damage and possible collapse in a major seismic event. The new owners recognized the risk to their investment, and were unable to obtain State tenants due to the poor anticipated seismic performance of their building. California leased buildings must meet certain FEMA requirements.

Solution
The following seismic upgrades were implemented to meet the State’s requirements for seismic safety and reduce the risk of death and injuries during a seismic event.

• Providing out of plane connections of the unreinforced masonry walls to the floor and roof framing to prevent loss of support.
• Reinforcing roof parapets to prevent a falling hazard.
• Installing new plywood sheathing at each floor level and roof to provide resistance to seismic forces.

The existing steel braces were replaced with new steel diagonal members which utilize “friction dampers” employ a combination of brass and steel plates to absorb seismic energy and to protect the brittle exterior walls of the building.

Resources
The cost of the project is expected to be over $40 /sq including architectural, mechanical, and electrical components. The cost of seismic upgrade to meet FEMA requirements is estimated at less than $7/sq. Funding was provided as a part of the tenant improvement project. The seismic upgrades were implemented during the renovation work thereby achieving considerable cost savings. In addition to reducing risks to life safety, the seismic upgrade was economically justified as a capital expenditure because the owners were able to obtain state tenants, as well as providing long term protection of assets.

Adaptability/Sustainability
The steps taken by this small business can easily be followed by many other businesses that require asset protection and preservation of revenue stream. The benefits are significant long-term financial gains through possible reduced property insurance premiums and a solid tenants base, while reducing the life safety risks which could occur in a major earthquake.