

Executive Summary

1100 Broadway is a 20-story office building located in the Bay Area of Oakland, California. It contains 310,000 square feet of office space and 10,000 square feet of retail space at the ground level. The project is currently in the design development phase and construction is scheduled to begin in June of 2010. The gravity system is composite metal deck supported by composite steel beams and the lateral system is composed of steel moment and concentric braced frames.

A depth study will be performed that focuses on the structural system of 1100 Broadway. The current composite floor system is 30.25" in depth and supporting composite member sizes are controlled by deflections. The impact of a one-way mild steel reinforced concrete slab with post-tensioned concrete beams is proposed for study in place of the current composite metal deck and supporting composite steel beam gravity system. Advantages of the proposed system include better economy, reduced floor depth, and reduced deflections. The change of system will in turn require a change of lateral systems. Concrete shear walls will be chosen and designed for the new lateral system.

The proposed system will be designed using a combination of computer modeling programs and hand calculations to supplement and check the models. Software to be utilized includes RAM Concrete, RAM Concept, and RAM Frame. This portion of the study is an extension of AE 597A, Building Modeling, and is intended to fill the MAE requirement.

In addition to a depth study focusing on the structural system, two breadth topics outside the field of structures will be proposed for study. The breadth studies will focus on the green roof on the Key System portion of the building. An architectural breadth will be performed to research the sustainable benefits of installing a green roof on a building and also to provide a landscape design for the green roof. Additionally, a building enclosure breadth will be performed to research the thermal and waterproofing issues associated with the green roof and the integration of the system with the building. Drawing details of the building envelope/waterproofing aspect of the green roof design will be provided.