

## **Section 1 - EXECUTIVE SUMMARY**

The First Albany Building is located in downtown Albany, NY. It is a 12 story, 180,000 square feet structure designed for mixed-use office space and condominiums. The building's footprint is approximately 115' x 137'.

The foundation is a concrete slab on grade over a network of reinforced concrete grade-beams and pile caps. The first floor is at grade and the building has no basement. H-piles were driven to practical refusal to fully support the building. Gravity loads are resisted by a reinforced concrete slab supported by a grid of simply supported steel beams and girders. Partial composite beam and composite deck design was incorporated in to the building. The main lateral force resisting system is comprised of steel braced frames. There are five braced frames, two in the East – West direction and three in the North – South Direction, all located in the core of the building. The braced frames each act as a vertical, cantilevered truss.

A proposed alternative system will be studied in depth consisting of a full composite beam/composite deck design to resist gravity loads and special reinforced concrete shear walls to resist lateral loads (replacing braced frames). The core of the building will be altered slightly to reduce natural eccentricities created by lateral loads and eliminated the need for transfer girders at the perimeter. Upstate New York is a region of low seismic activity, for which The First Albany Building performs adequately. However, if the owner decided to build a nearly identical building in Charleston, South Carolina, significant modifications would be needed. A new building site will be chosen there. A light weight structural system with a higher response modification factor would be ideal to minimize base shears.

Along with a study of this alternative system, two breadth studies shall be done in the construction management and mechanical options. The breadth in construction management will be an investigation of the scheduling and cost impact of switching to a full composite action beam with reinforced shear wall design. Changes in the geographic location will also be considered (weather, seasonal changes, local labor and material costs). The Mechanical breadth work study will in Energy Conservation and Energy Cost Considerations. Time of day usage (energy storage methods), energy recovery (heat recovery), and alternate energy sources will be explored to see where savings can be made. Other areas to check are for in-efficiencies of mechanical equipment and building envelope parameters for a location in a warmer climate.