Executive Summary

The William W. Wilkins Professional Building is a six story, 112,000 sq. ft. medical office building located in Columbus, Ohio. Costing approximately $7.4 Million, it is essentially an addition to the Grant Riverside hospital across the street. These buildings are connected by a pedestrian bridge from the third floor. Enclosed by brick veneer, precast concrete and spandrel glass panels the exterior is non-load bearing.

The Wilkins building is founded on caissons drilled 25', on average, to bear on soil with an allowable bearing stress of 16,000psf. On each caisson is a pier supporting grade beams. The slab on grade is 4" concrete reinforced with 6x6-W1.4xW1.4 welded wire fabric (WWF) over 6" porous fill. Floors 2-6 consist of a 3 ½" concrete slab on 2" 18ga composite steel deck welded to the support steel. These slabs are reinforced with 6x6-W2.1xW2.1 WWF. Floor framing generally consists of a W16x31 beam connected compositely to the floor slab. Beams frame into a W24x55 girder. Columns are ASTM 992 Grade 50 rolled W12 steel shapes.

Lateral bracing is provided in the form of five braced frames. Two frames spanning North-South are located near the elevator shafts. Frames spanning East-West are split with one by the elevator shafts, one on the exterior South-East bay and one on the exterior North-East bay. The concentric framing members are steel tubes.

The floor system in the Wilkins building is typical of medical office buildings. However, the use of braced frames in two exterior bays reduces the available façade area for windows. Thus, two alternative designs will be considered. The first alternative to be investigated is concrete skip-joists with moment frames. Concretes properties make moment frames a natural occurrence. This will eliminate the braced framing creating a larger area for natural day lighting. The second alternative to be considered is a steel moment frame. This will also eliminate the exterior braced frames.

After an initial inspection, the best solution will be chosen for a more in depth design. Both strength and serviceability issues will be considered in the design process. To determine which is the more economical system, the proposed system or the existing system, a cost analysis will be executed.

Two breadth topics will also be considered. The first topic will look at integrating a photovoltaic (PV) skin façade with the buildings energy system. The analysis on the PV façade will include a calculation of energy savings, investigation into the

integration of the energy obtained from the PVs to the buildings main energy system, and a look at the distribution of the energy.

During Technical Assignment #2, a one-way concrete slab and beam system was considered. It has since been noted this is not the best use of a one-way system, skip-joists are. Thus, the second breadth topic will be a cost and schedule comparison between both of these one-way systems to determine why skip-joists are used concrete beams.