

Executive Summary

Overlook Towers is located south of Washington Dulles International Airport in Herndon, VA. The complex will have two nine story office buildings and two five story parking decks. This report will focus on one office building. Long interior spans are used to reduce the number of columns and make the office space more versatile for the tenants. The exterior walls are made of architectural precast concrete panels. Structural steel and a lightweight composite concrete deck make up the structural system.



First, I propose for the structural system change from a steel building to a concrete building. An analysis of two alternate structural systems will be performed. For each system, several construction management issues will be addressed and an alternate system will be chosen. The floor-to-floor heights will remain the same, however total floor depth may change. The column grid will also remain the same unless a better arrangement is found for each system.

The first system will be a cast-in-place concrete structure. Beams will be post-tensioned to allow for a more shallow system. With a span of 46', beam sizes were too large when considering a normal reinforced concrete system. As found in technical assignment 2, the overall floor depth will be smaller than the existing; however more work will be involved for the construction.

The second system to be considered will involve using pre-cast members. Hollow-core planks were not found to be a viable system, so only pre-stressed double-T planks can be used more efficiently. This system will have an advantage over the cast-in-place on site curing time will be much less.

A breadth analysis will be conducted for each system. Construction management issues will be addressed and the best system for the given conditions will be chosen. Approximate cost and construction schedule will be investigated in detail. Material cost, labor cost and erection time are to be included. Other issues relating to the mechanical, plumbing and electrical systems will be considered, but not in detail.