

Executive Summary

Overlook Towers is a nine story office building situated right outside of Washington D.C. Overlook Towers is a three building complex, two nine story office buildings and a five story parking deck. For the purposes of this report, only one of the office buildings will be researched. 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. The office building has a footprint of 24,000 square feet and stands 140' tall. Each floor provides 21,000 square feet of useable office space.



First, I propose for the structural system change from a steel building to a precast concrete building. Several construction management issues will be addressed to help decide a good structural design. The floor-to-floor heights will remain the same. The column grid will also remain the same, using a bay size of 30' x 46'. The system will utilize precast concrete so that construction time and money can be saved. Pre-stressed double-T planks will be used as the flooring system, spanning in the 46' direction. Supporting the planks will be pre-stressed inverted-T beams. The beams will then frame into a steel column system, very similar to the existing. The lateral system will also remain relatively unchanged due to its effectiveness in the building design.

A cost analysis and proposed construction schedule has also been developed. The proposed structural system has an estimated cost of & 3.5 million, while the existing steel system came in at just above \$ 4 million. Construction time has also been estimated to end about a week earlier. Considering the savings alone and a faster erection time, the new design for overlook towers' structural system seems to be a feasible alternative to the existing system.

An acoustic evaluation has also been performed on the office space of the building. A mechanical room on each floor poses a potentially high background noise. Also a floor-to-floor sound transmission loss calculation and it was found that the existing construction will be adequate for unwanted noise to travel between offices. In many open plan office buildings, other factors such as speech privacy also become an issue. Some minor changes to the space can isolate some of the speech to a smaller area. A more absorptive ceiling tile can be used to better reduce sound reflection or the ceiling can be broken up with headers to isolate speech to a smaller area. There are also a number of other ways to improve on speech privacy. One drawback is that if a design is chosen for one plan, it may not work with another. Tenants can move in and out and it is likely for each tenant to have different requirements for the space. Careful consideration must be made to keep the versatility of the office space.