

# Executive Summary

The Dulles Town Center Building One project is located in Dulles, Virginia; five minutes north of Dulles International Airport and 25 miles outside of Washington, D.C. It consists of seven stories of office space above grade and one story below grade that includes rentable space, storage, mechanical rooms, a loading area, a trash room, building service offices, and a workout space. The building is approximately 202,000 square feet and reaches a total height of 118 feet above grade. The building has an open floor plan and an average floor-to-floor height of 12'-6" making it ideal for office space. A typical bay is 20 feet by 40 feet, and the gravity system consists of a post-tension concrete beam and non-post-tension one-way slab system with typical 24" x 24" columns.

This proposed thesis will not only include the investigation of a composite steel framing system, but also how the current design loads will effect a steel moment frame resisting system. The effects caused by the proposed structural system on the current foundation system due to reduced building weight, overturning moment and uplift are also discussed. Two breadths will be explored, as well, in this proposed thesis. They are a construction management study and a vibration and noise transmission study.

As with any building project, time and cost are very important. The construction management study will analyze the effects of a steel system on the cost and schedule of the project and compare it to that from the existing concrete system. It is already known that Northern Virginia and the Washington, D.C., area are known for their preference in using concrete as a building material due to its lower cost and availability, so an increase in cost is expected.

With the floor system changing from a post-tension beam one-way slab system to a composite steel system vibrations from the mechanical equipment in the penthouse may cause noise issues to those people working on the seventh floor. The second breadth of the proposed thesis will be to analyze effects due to the new steel system on vibration and noise control between the penthouse and seventh floor.