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STRUCTURAL OPTION

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SENIOR THESIS PROPOSAL

EXECUTIVE SUMMARY

Memorial Sloan-Kettering Cancer Center is an 85,000 square foot, four-story healthcare facility located in Somerset County, New Jersey. Currently under construction, when MSK opens its doors in the summer of 2006, it will serve as one of the premiere cancer treatment centers in the nation. A combination of steel, concrete, and masonry, MSK is designed to hold a plethora of examination rooms, offices, laboratories, and various types of cancer treatment bays. Furthermore, an 88,000 square foot addition is currently in its design phase which will double the building's size.

Memorial Sloan Kettering's infrastructure is made up of braced steel framing supported by a concrete foundation. The floor systems consist of one-way slab on the first floor and slab on composite metal deck for the remaining four stories. MSK is laterally supported by four identical systems composed of diagonal bracing and shear walls. The building envelope is made up of brick and glass, and is attached directly to the steel framing by seat angles.

The focus of this thesis project will be to investigate the structural design of both the current four-story building and the Outpatient Addition. Right now, the site plan calls for the addition to be erected on the north side of MSK, extending its signature curved façade an additional 120 feet. This thesis will instead construct that addition vertically onto MSK and redesign the structural system to support the gravity and lateral loads experienced from this new building plan. To help analyze the loading on MSK, a model will be created in the ETABS computer program. This program will also assist in calculating the building's total drift, displacement, base shear, and overturning moments. The lateral loads will be developed using ASCE 7-02, as shown in Technical Report 3.

Two breadth studies will also be performed in the areas of construction management and MEP design. The first will be a detailed cost analysis and time schedule of the Outpatient Addition compared to that of the original four floors of MSK. The second will focus on a redesign of the building's mechanical system. Currently, MEP equipment is located in both the basement and on the roof of Memorial Sloan Kettering. This equipment will be moved and resized in order to accommodate MSK both during and after the addition's construction. This project will be completed in incremental steps and presented at the end of the semester.