EXECUTIVE SUMMARY

The IAC Headquarters is an 11-story office building that serves InterActiveCorp, an internet and media conglomerate. It is located on West 18th Street in the Chelsea neighborhood of Manhattan and is positioned along the Hudson River. At approximately 130,000 sq ft in size and 150 feet high, the IAC/InterActiveCorp Headquarters stands out along the New York City skyline because of its unique sculptural shape.

STRUCTURAL DEPTH

The current structural system of the IAC Headquarters is a two-way reinforced concrete flat-plate system with reinforced concrete shear walls. The proposed thesis will include a redesign of the entire floor system as post-tensioned, which will, in turn, result in changes to the shear wall core. There were a number of design concerns that dictated the decision to redesign using a post-tensioned system. For instance, the soil is very poor on the site, resulting in unforeseen costs and time spent during construction of the foundations. Additionally, the building undergoes substantial torsional motion. Through the redesign, these issues can hopefully be remedied. Because a post-tensioned system will require lower slab thicknesses, the weight of the building will decrease, resulting in fewer loads on the foundations. Another point of potential concern was to design a more efficient transfer slab at the sixth floor setback. Instead of the two-way flat-plate design, the uplift from the tendons in a post-tensioned system will reduce the likelihood of long-term creep, and lessen significant deflections or vibrations.

The post-tensioned system will be redesigned using RAM Concept, while ETABS will be used to model the lateral system. Investigations will be made to determine if changes to the shear walls or post-tensioning systems will help to alleviate the torsion acting on the building. Because torsion can cause large loads on the lateral system of the building, it would be advantageous to redesign the building so that it undergoes less torsional motion. Changes to the shear wall locations or sizes will be considered as a possible solution to alleviate torsion, as will designing the post-tensioned system to carry a portion of these loads. Additionally, the use of different concrete strengths throughout the building will be studied in both the shear walls and the columns. This could potentially lead to the optimization of the shear walls and could create uniformity in column sizes so that forms can be reused.

BREADTH STUDIES

Construction: To research effective ways of displaying information from a BIM model onto the construction documents so the building can be constructed correctly and easily.

The IAC Headquarters is an extremely unique, irregularly shaped building; therefore, it is especially important that it has very clear and concise construction documents. This building was actually designed using a BIM program called CATIA, which is a product of the Gehry Corporation. While the final three-dimensional model was provided to the contractor and subcontractors, it is equally important that they have an adequate set of two-dimensional construction documents. Every 'facet' of the edge of the slab was marked with hundreds of coordinates. Additionally, the sloped columns formed an elliptical shape in plan, so they were defined as the intersection of the major and minor elliptical axes. Further examination into these techniques and other possible ways of displaying three-dimension ideas within a two-dimensional format will be investigated.

Building Envelope: To develop a blast-resistant glass façade.

Frank Gehry, a world renowned architect, designed the InterActiveCorp/IAC Headquarters and, though it stands at only 150 feet tall, its sculptural quality makes it a high-profile building in the New York City skyline. This breadth topic will focus on utilizing skills learned in the AE542-Building Enclosures course to design a blast-resistant system for the IAC Headquarters' all-glass facade. This would include determining standoff distances and computing the thickness of the glass to resist blast. This is especially important in buildings with all glass in order to avoid the 'wet-blanket' effect.

In the event of a substantial change to the shear walls, an architectural breadth will be necessary to accommodate changes to the interior spaces.