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Structural Option  
Eight Tower Bridge  
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## Senior Thesis Proposal

### Executive Summary

Eight Tower Bridge is a 16 story steel high-rise office tower located outside of Philadelphia in Conshohocken, Pennsylvania. Completed in April of 2002, Eight Tower Bridge sits on the shore of the Schuylkill River, next to the Fayette Street Bridge, leading to both interstates I-476 and I-76. The building was designed by Skidmore, Owings and Merrill, and is owned by a partnership of Oliver Tyrone Pulver Corporation and Brandywine Reality Trust.

The building is the latest of the Tower Bridge projects to be constructed in the Conshohocken area. As such, the architect has incorporated the signature precast concrete and green-tinted glass façade of the other Tower Bridge buildings into this project. This façade is supported by a steel superstructure resting on pile caps covering groups of auger cast concrete piles. Additional foundation elements include a 4'3" thick MAT slab and concrete grade beams. The W-shape columns and floor beams support a composite concrete slab cast on metal deck. These members help support a rooftop mechanical penthouse that sits atop the 16<sup>th</sup> floor. The lateral force resisting system is a combination of moment resisting frames and a series of braced frames located at the building core.

The focus of this thesis design project will be the lateral system. The goal of the project is to perform an in-depth analysis of the current system to develop a better understanding on how the lateral forces are distributed throughout the superstructure of Eight Tower Bridge. With this knowledge, alternate lateral systems will be developed and compared to the existing lateral system. The alternate systems will first be compared with respect to their structural performance, and then evaluated on a cost and constructability scale to determine if there is a more economical lateral system that maintains structural adequacy. A 3D model of the entire structure will be developed through ETABS, and costs compared through R.S. Means.

Two breadth topics will also be studied during this report. The first will be a construction schedule comparison based on the alternate lateral system found to be most viable. The second topic will be an analysis of the rooftop mechanical penthouse, more specifically the noise and vibration effects associated with rooftop HVAC equipment.