

Christopher McCune
Structural Option
Eight Tower Bridge
Faculty Advisor: Dr. Hanagan
November 21st, 2005



Structural Technical Report #3

Lateral System Analysis

Executive Summary

This report is an in depth analysis of the lateral load resisting system of Eight Tower Bridge. The first section of the report is a brief introduction and overview of the building superstructure. The next section is an in-depth look at the lateral system of Eight Tower Bridge. This section includes a detailed description of the type of system used, typical framing members, and some of the benefits of the system. The report goes on to review the seismic and wind analysis conducted for Technical Assignment 1, “Structural Concepts/Existing Conditions Report”. This section describes changes that were made to the original analysis, as well as compares the two separate loading cases. Methods used to conduct both of the analysis are again derived from ASCE7-02. The final section includes a discussion of the lateral load distribution within Eight Tower Bridge, and also describes the analysis of the system conducted in the structural modeling program, ETABS. The computer model was used to analyze the structural behavior of the building under wind and seismic loads. The computer model was helpful in obtaining shear, moment, and drift data for Eight Tower Bridge, as well as being able to view any deformed shapes through animation of the model.

The wind and seismic load analysis from Technical Assignment 1 were reviewed and error corrected in order to provide a more accurate results. The wind analysis was conducted again through ASCE7-02, Chapter 6, Method 2. A change in C_p factors resulted in a more accurate wind analysis in regards to the long and short sides of the building, as the short side was determined to have stronger wind forces. The seismic analysis was reviewed and a more accurate assumption of the total building weight was determined, as well as the removal of live loads from the seismic calculations. The removal of the live loads was accidentally overlooked in the first technical report.

Finally, an 3D frame model of Eight Tower Bridge was constructed in the computer modeling software package, ETABS. Both seismic and wind load cases were analyzed through this program. The lateral load resisting system was checked for strength as well as drift. The model was constructed using the structural documents provided from Skidmore, Owings and Merrill, LLP. Certain assumptions were in creation of the model to focus on key members of the lateral system.