Caitlin Ferrell Structural Option Dr. Boothby, AE Faculty Consultant

Erie Convention Center and Sheraton Hotel Erie, Pennsylvania

Technical Report #1: Structural Concepts/ Structural Existing Conditions Report
Submittal Date: 5 October 2005

Executive Summary

The Erie Convention Center and Sheraton Hotel sits on the waterfront of the Presque Isle Bay on West Dobbins Landing, in Erie, Pennsylvania. This site provides a great opportunity to enjoy all that the bay and the surrounding area has to offer, as well as a place for conferences and receptions. The proposed hotel is an eleven story, 132,000 sq.ft., steel structure with an attached parking garage and a pedestrian walkway from the fifth floor to the Bayfront Convention Center.

This report is a full description of the structural system and calculations of all of the loads that affect the design of the structure, including gravity, wind, and seismic loads. A complete list of codes used to obtain these values is also given. In addition, spot checks for gravity and lateral members are completed and compared with the sizes provided by the engineers. Typical frames and bays are drawn with given sizes for ease in understanding the explanation of framing members.

Through my analysis and calculations, I found that the Erie Convention Center and Sheraton Hotel is a steel structure with pre-cast concrete plank floors designed using IBC 2003. Cross and knee braced frames are used in the North/South direction, and moment frames in the East/West direction, both for resistance to lateral loads. The foundation consists of caissons drilled approximately twenty feet into the ground to ensure that they are enclosed in at least three feet of bedrock. Grade beams span each of these caissons, and are poured monolithically with column piers. Through my own beam and column design, I found similar beam sizes to those designed by the engineer. Any discrepancies can possibly be accounted for by the difference in the ASD and the LRFD method of solving, as well as the fact that I took a simplified approach to design, not taking into account all of the surrounding factors.