Executive Summary:

This report is slated to assess the current structural system of the Crocker West Building and attempt to document any and all necessary information relating to this thesis study of an alternative lateral framing system and its implications on other systems and overall program layout. The goal of this report is to conduct an in depth study and redesign of the main force resisting system in the building with the addition of 3-stories while trying to avoid severe ramifications to the existing structural integrity or program layout, yet introducing a new style of architecture to the surrounding area.

The Crocker West Building will be used as a highly classified research facility, specializing in the development and testing of underwater weapons for the U.S. Department of Defense. Located in State College, Pa, the structure will be a 3-story low-rise building with areas classified as office, light industrial, and warehouse totaling nearly 120,000 square feet. The first floor of the CWB will consist mainly of 'closed' lab area, along with technician offices, locker rooms and special test areas. The second floor will include office space, another lab area, computer lab, student room and a room designated to SCIF (Sensitive Compartmented Information Facility), while the third floor will be devoted mostly to office space. The existing building will be constructed of Architectural Precast Concrete (APC) systems, including: columns, beams, walls, and floor & roof diaphragms. Lateral loads applied to the structure will be collectively distributed throughout the building to specially designed APC shear walls.

The depth study of this report focuses on the proposed alternate framing system, evaluated and designed using conventional composite steel framing methods while utilizing concentrically braced frames (CBF) for the main lateral resisting system. These designs shall adhere to the provisions of ASCE 7-05, the 13th edition AISC Steel Construction Manual, and any other applicable design codes and standards. Two breadth topics are also examined with respect to a new lateral system. An architectural breadth that addresses conflict between CBF locations and programmatic space was conducted with an additional 3-D BIM that was created to visually display the additional three stories. Relative cost and schedule effects due to the additional levels and construction time of the proposed building were also observed. Culmination of this report shows that the proposed system can be considered a feasible alternative for the Crocker West Building.

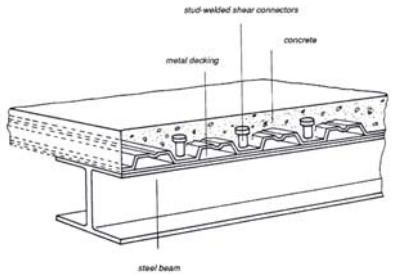

Figure 1: Composite Steel Beam Perspective