Executive Summary

The University of Maryland College Park Dorm Building 7 (Building 7) is the final stage of the south campus master plan at the University of Maryland. Building 7 is an eight story residential dorm in the shape of an unsymmetrical-U that compliments the adjacent two existing dorm buildings in architectural styles with its shape and material usage. This eight story-133,000 square feet residential building, houses 370 bedrooms, study lounges, seminar spaces and resident life offices. The layout of each floor is such that all of the rooms have an exterior view of the surrounding campus with a central corridor running the length of the building. The roof level houses the mechanical equipment along with the elevator and stair towers. Building 7 is also in the process of achieving a LEED Gold rating.

This report includes a seismic analysis of the Building 7 which the location was moved to San Diego, California which has a high seismic activity. San Diego was chosen based on its seismic activity and also because the San Diego Region has a University, The University of California at San Diego, since this building is a dorm this location makes it a good choice if USD would ever want a new dorm.

Building 7 was redesigned from the original Hambro Composite Joists and bearing walls with light gage shear walls to a more standard and reliable structural steel system. Structural steel was chosen for back in Technical Report 2 it was determined to be the most efficient for the cost. A new bay layout and also the locations of the new Special Concentric braced Frame had to be determined. A double loaded corridor was determined to be the best bay layout and the redesign was able to reduce the number of lateral frames as compared to the original (16 before to 10 at the end). Lateral connections were looked and were designed to meet the seismic requirements.

The AISC Steel Construction Manual, 13th Edition and Steel Seismic Design Manual were used as a basis for all of the structural steel designs. A Ram Structural Model was created to help with the analysis and the design of both the gravity and the lateral systems. Preliminary hand calculations and spot checks were performed to verify the computers results to ensure the design was valid. ASCE 7-05 was used to determine the required seismic loads and conditions along with all the other loading and general requirements. Advanced computer modeling along with connections were looked at for the MAE requirement.

Two breadth studies were conducted; the first was a green roof study. A green roof was designed to bring and add to the Green Standard and make the building more efficient. A water collection was also designed for both locations so that the roof runoff can be used to help reduce the water consumed by the sanitary system. The second breadth study was an acoustic study to see the impacts of changing the structural system to steel. It was determined that the new system is acceptable and recommendations were made to make the space more efficient at reducing sound leaks throughout.