Executive Summary

The University of Maryland, Baltimore (UMB) is located in downtown Baltimore. They have recently finished construction on a New Administration Building. This building is the subject of the following thesis report. This 6 story, 107,000 SF Administration Building contains the University's executive offices and conference rooms. Construction started in March of 2007 and was completed by October of 2008. The total project cost is $27,500,000. Barton Malow Company (referred to as BMC) was awarded the Design/Build contract with a Guaranteed Maximum Price.

The following thesis will provide background information on the University of Maryland, Baltimore as well as the constructed New Administration Building. Also included are three analyses that have been completed over the last semester. The theme found throughout is implementation of energy conservation in buildings.

The first analysis topic deals with the rise in energy cost and the counter actions that colleges and universities are taking. College campuses are in a unique situation since conservation efforts must consider the entire campus instead of a single building. Three colleges were selected for study including, The University of Maryland, Baltimore, Pennsylvania State University and the Los Angeles Community College District. Although each school has its own strategic plan to conserve energy campus wide, many of the initial steps and strategies are similar. The conclusion will discuss which techniques are vital to universities looking to develop their own energy conservation plan.

The next analysis investigates the efficiency of the current building envelope and possible improvements that could result in energy savings. Preventing the inside, conditioned air from escaping through the envelope of the building can save significant costs on one's energy bill. This analysis will also look into the possibility of removing the finned tube heating units, found within the perimeter spaces, and effects this will have on the energy consumption of the building. Extensive thermal calculations have been performed to help compare the effects the proposed alternatives will have on the energy consumption of the Administration Building. Ultimately energy performance, in depth cost analyses and owner preference will if these alternatives will be implemented.

The last analysis examines the possible implementation of photovoltaic panels (PV) on the site of the UMB New Administration building. PV panels are a great way to harness the sun and convert its energy into electricity. Being located in the city poses unique challenges compared to surrounding areas. Careful planning and research has been done to determine products that work best for this location and calculations determined the optimum size, configuration, angle, and orientation. Cost and schedule impacts are analyzed to determine if photovoltaic panels are a practical application for this situation.