

1.0 **Executive Summary:**

The purpose of this report is to analyze the Montgomery County Conference Center and Hotel (MCCCH) in Rockville, MD, for its building and plant energy performance. In order to develop a model for this, MCCCH was first compared and evaluated in relation to the LEED Green Building Rating System for New Construction and Major Renovations. Other calculations and comparisons performed herein include a building energy usage and emissions analysis, building envelope and lighting compliance with ASHRAE Standard 90.1-1999, and a building lost rentable space/mechanical system first cost analysis.

The Montgomery County Conference Center and Hotel was not designed as a LEED green building and therefore, could never qualify as one. However, it was determined that the building does hold some attributes of LEED green design. The building's envelope was found to fully comply with ASHRAE Standard 90.1-1999 but, the lighting power densities throughout the building spaces did not comply with the standard. The building's lost rentable space due to mechanical equipment was about 4% of the building's total area while the mechanical system's first cost was approximately 10% of the building total cost.

Once MCCCH's energy usage characteristics were determined, building load calculations, energy analyses, and annual energy costs were calculated with the help of Carrier's Hourly Analysis Program (HAP). No simplified calculation was performed as computer generated simulations tend to have the greatest levels of accuracy. The building's required cooling capability was established and compared to the original design. It was found, in almost every case, that all of the building's original cooling design values were greater than the actual computer generated numbers. Finally, an energy analysis was run on the building simulation program. The total cost to operate the building for one year came out to be \$2.429/sq. ft. or, about \$424,151.



Architectural renderings compliments of RTKL Associates