

## Executive Summary

This report is the building and plant analysis of the Margaret M. Alkek Building for Biomedical Research in Houston, TX. The report looks at the building's compliance with Standard 90: Sections 5 & 9, which deal with the building envelope and lighting densities, and rates the building according to the LEED rating system. This report also discusses lost rentable space and mechanical system first cost. A majority of the report consist of design load and energy analysis of the building using the Hourly Analysis Program put out by Carrier.

The research tower was not designed with the LEED rating system in mind and as such did very poorly when rated by the system. When applying Standard 90: sections 5 & 9 to the building it is found that none of the envelope complies other than the roof. Also the lighting densities does not work when you do the building area method, however some spaces do comply when you use the space by space method. The building loses 15% of its rentable space to mechanical systems however this high percentage is due to an entire floor being dedicated to mechanical systems as requested by the owner. An estimate shows the buildings mechanical systems coming to a first cost of a little over \$21 million.

The final part of the report deals with simulations using Carrier's Hourly Analysis Program (HAP). This simulation was used as a basis for comparison for the design load calculated by the MEP engineers. Also this HAP simulation produced an estimate of how much energy the building would consume annually. This allowed for the buildings emissions to be studied.