

Mechanical Systems Existing Conditions Evaluation Report

Monday, November 21, 2005

Executive Summary

This report develops a detailed evaluation of the existing mechanical systems and equipment for the Hilton Hotel at BWI Airport. All the major components and equipment used in the system design are explained and examined. In order to accurately accomplish this, the design objectives and requirements for the project are identified first.

The design of a building is influenced by a variety of factors. In this case, for the BWI Hilton, some of these factors included the energy sources and rates of electricity and natural gas, mechanical equipment first costs, and the solar orientation of the building on the site plan.

Also included with this report are the design ventilation requirements from ASHRAE Standard 62.1-2004 for the air handling units and rooftop units. The design heating and cooling loads for the major equipment are calculated using Carrier's Hourly Analysis Program. HAP is used to estimate the annual energy consumption for the BWI Hilton, as well.

Schematic drawings are developed for the hot water and condenser water systems with the corresponding mechanical equipment. The major equipment schedules are listed with information taken from the design documents for the BWI Hilton.

To gain an understanding of how the mechanical systems of the BWI Hilton actually function, the sequences of operation for the air handling units, rooftop units, variable air volume system, hot water system, and condenser water system are studied. Finally, an evaluation of the existing mechanical systems is performed with a critique of the variable air volume air handling units on the two main floors of the hotel, the water source heat pumps in all the guest rooms, and the rooftop units serving the guest room tower and main floors.