

Executive Summary:

Building A and B are both being constructed at the existing National Naval Medical Center located in Bethesda, Maryland. Building A will be housing areas for services such as the Cancer Treatment Center, Children's Health Area, Medical Staff Offices, and Examination Rooms. Building B is the smaller of the two buildings and is the location for the ambulatory receiving center, operating rooms, and houses all of the patient bedrooms.

The mechanical system that was designed for both of these buildings uses a constant volume supply of 100% outdoor air. This is supplied to remote CAV boxes located throughout both buildings which provide occupant control. In order to offset some of the energy costs associated with a dedicated outdoor air system (DOAS), total energy wheels and heat recovery chillers were installed on this project. The chilled water plant for both of the buildings is electric based, while steam from the campus steam plant is routed through heat exchangers for both heating hot water and domestic hot water needs.

The total mechanical cost of the system for both design and construction is \$109,500,000. If this cost is broken out on a per square foot basis it yields \$182.84/sf. The total mechanical portion of the contract represents roughly 17% of the total contract which is within the typical 15%-20% of the construction budget that mechanical systems usually cost.

Both new buildings will be applying for a Silver Rating from the Leadership in Energy and Environmental Design (LEED) which is a subsidiary of the United States Green Building Council (USGBC). A LEED analysis was performed using the version three rating scale which is the most current rating system available. When going through this analysis, only the areas in Energy and Atmosphere along with Indoor Environmental Quality were considered due to the mechanical systems direct correlation with these categories. This analysis showed that the design team was focused on delivering a high quality system while making significant strides at reducing energy consumption and improving the indoor environment.

An overall system evaluation was performed and provides critiques of the design system in the areas of construction cost, maintainability, operating cost, and mechanical space requirements. It was concluded that the engineers design was appropriately selected for this project type. Though areas of improvement potentially may not yield large savings in energy or construction costs, there are still design changes that will be investigated during later reports and presentations.