

Building Statistics #1

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Calvert Memorial Hospital Prince Frederick, MD



General Project Data:

- **Building Name:** Calvert Memorial Hospital
- **Location and Site:** Calvert Memorial Hospital is located on 100 Hospital Road in Prince Frederick Maryland, 20678.
- **Building Occupant Name:** The building will be occupied by any and all Calvert Memorial Hospital Staff including, doctors, surgeons, specialists, nurses, etc. Also occupying the building will be patients, administrative officials, security services people, maintenance people, and hospital visitors.
- **Occupancy or Function Types(Type of building):** Hospital
- **Size:** 185,000 square feet
- **Number of Stories above grade / Total Levels:** Calvert Memorial Hospital is designed with a total of six floors. The first level is the ground floor which contains the kitchen, cafeteria, and other support type areas. The actual first floor level is comprised of the emergency department, operating rooms, radiology department, laboratory, and administration area. The majority of patient care areas is consolidated in the second, third, fourth, and fifth floor patient tower.
- **Primary Project Team:**
 - **Contractor or CM:** Whiting / Turner <http://www.whiting-turner.com/>
 - **Architect:** Wilmot Sanz <http://www.wilmot.com/home.html>
 - **Engineer:** Leach Wallace Associates, Inc. <http://www.leachwallace.com>
 - **Owner:** Jim Xinis (Calvert Memorial Hospital President)
<http://www.calverthospital.com/>
- **Dates of Construction:** The Original Building was constructed in 1978 and consisted of the basement, first, second, and third floors. Then in 1982, the Patient Tower Addition began construction. The most recent renovation was the Surgery/PACU Addition which began production in 1999. I will be focusing my thesis on the Surgery/PACU Addition from 1999.
- **Actual Cost Information:** The cost of the building renovation is comprised of removal work, new work, AHU additions and removals, mechanical equipment and electrical equipment. Considering all of these items, the total cost of the renovation is \$13,042,766.00.
- **Project Delivery Method:** Design - Build

Architecture:

- **Architecture (Design and Functional Components):** Calvert Memorial Hospital represents a more modern type of architecture. The floor plan of the building introduces uniquely angled walls to ensure the building's massive size, yet keeping it from looking intimidating. The architect also implements different levels to account for the building's large size. White brick is used for the exterior walls which give off a soft feeling of comfort. The darkly tinted windows create a great contrast between the white brick. This really emphasizes the hospital's dominating lines. The whole site is beautifully designed, and is very welcoming to common visitors.

- **Major National Model Code/s:** The National Modeling Code for Calvert Memorial Hospital is based on BOCA standards. Load information was obtained from various sources such as ASHRAE, The National Electric Code, NFPA, and current data compiled from other area hospitals.
 - **Zoning and Historical:** Calvert Memorial Hospital is located in Prince Frederick, Maryland and follows the Calvert County Zoning Ordinance. Historically, Calvert County was considered primarily as a “bedroom community.” Ever since the first Calvert County Comprehensive Plan was adopted in 1966, one of the County’s primary goals has been the preservation of its rural character. Although the need for developing high technology, heritage, recreation, ecotourism, retirement, leisure, farming, and aquaculture Calvert County puts an emphasis on preserving prime farmland, contiguous forests, historic resources, and sensitive areas.
 - **Building Envelope:** The Hospital is uniquely shaped with a modern/contemporary floor plan. The facade is constructed of white brick with occasional square, darkly tinted windows.
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Building Statistics #2

Building Systems I:

- **Electrical:** Calvert Memorial Hospital has a 480Y/277 volt 3 phase, 4 wire configuration that currently receives secondary power service from Southern Maryland Electric Company (SEMCO). The power is delivered underground, serving two pad-mounted transformers, each rated at 1500 KVA. Each transformer serves as an independent switchboard (SWBD A and SWBD B) which are each rated for 3000 amps at 480Y/277 volts. The switchboards utilize a three main breaker configuration with the largest breaker being 2000 amps. Dry-type transformers are located in electrical rooms to step down the voltage from 480 volt power to handle 120 volt loads.
 - **Lighting:** The building is served by numerous different lighting configurations which are either mounted in a ceiling grid or installed in the drywall ceiling. Most of the spaces contain 2”x4” recessed fluorescent troffers with 32 Watt T-8 lights and 2”x2” recessed indirect/direct fixtures. A fair amount of 6/7” downlights are used to light the spaces as well. Different rooms requiring more light such as operating rooms or emergency rooms contain multi-function patient overbed fixtures which are recessed, semi-specular parabolic louvers with clear lenses in the exam section.
 - **Mechanical:** The hospital contains fourteen air handling units ranging from 4,000 CFM to 16,000 CFM. One-third of the hospital is served by water source heat pumps; while the other two thirds of the hospital are served by either a 100% outdoor air or variable-air-volume with hot water reheat system. The hospital chilled water plant consists of two 260 ton and one 110 ton chillers. There is also a 50 ton air-cooled glycol chiller used for secondary “sub-cooling” for the operating rooms. The facility also has four cooling towers with capacities of 370 tons, 260 tons, 378 tons, and one tower with unknown capacity. The boiler plant contains two 5021 MBH hot water boilers which are gas-fired. Steam generators are provided in the second floor mechanical penthouse to serve the humidifiers on three of the air handling units serving the Surgery/PACU Addition.
 - **Structural:** The basement level is partially below grade and has a load-bearing concrete foundation wall. This slab-on-grade wall configuration is supported by steel reinforcements. The first, second, third, fourth, and fifth floors all maintain a concrete beam and steel joist system. The floors are a concrete slab on metal decking structural arrangement. The roof of the hospital contains B.U. roofing, rigid insulation, metal decking, and spray insulation. The structure is designed for a one floor vertical expansion.
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Building Systems II:

- **Fire Protection:** The recently installed Edwards System Technologies (EST) fire alarm replaces the building's original zonal, Pyrotronics fire alarm system. This system is controlled by automated sensors or may be activated manually by building occupants. The building also has a wet pipe sprinkler system which serves the entire interior of the hospital.
- **Transportation:** There are six floors to Calvert Memorial. The basement and first floors consume many of the occupants and are relatively busy throughout the course of a day. In order to create a useful and beneficial traffic pattern, the building offers numerous entrances/exits to the exterior. For example, the first floor of the hospital has two larger entrances including the main entrance and the emergency entrance. There are also some less-pronounced entrances including ones near the cafeteria and the hospital concourse area. Upon entering the hospital, there are large waiting areas and spacious hallways to accommodate the people traveling through the hospital and the equipment that may need to be transported to the different areas of the hospital such as patient gurneys, wheelchairs, or hospital equipment. There are four elevators located in the middle of the hospital and provide vertical transportation to the 2nd-5th patient tower floors. These elevators also provide access to the basement level. The hospital has numerous stairwells that are equally dispersed throughout the hospital.
- **Telecommunications:** The hospital has telephone outlets in just about every space of the hospital. Television cables are placed in many of these areas as well such as patient rooms, waiting, rooms, and lounges. Nurse call boxes are also located in many of the patient rooms and many of the other workspaces.
- **Special Systems:** Heat pumps provide service to portions of the basement, first, second, third, and entire fourth and fifth floors. Both concealed ceiling mounted units and exterior wall units are utilized in the building. These heat pumps either collect (heating mode) or reject (cooling mode) heat from the central condenser water loop. Unfortunately, these heat pumps create a violation of the ASHRAE Standard 62-2001 with indoor air quality requirements. Heat pumps are not to be located in the patient rooms due to molds and bacteria that may grow in the condensate drip pans inside of the pumps. It is planned that these heat pumps are to be removed and replaced with an overhead all-air system. This replacement will not only minimize the amount of equipment to be maintained but will also provide a more flexible system for future modifications.
- **Renderings:**



Hospital Front Entrance



Emergency Entrance



Entrance/Exit from Cafeteria



First Floor Roof



View from Hospital Concourse



Helicopter Landing Pad