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L/E  
Dr. Mistrick  
Holy Cross Hospital – North Addition  
Silver Spring, MD  
9/9/05

## Building Statistics

**Building name:**

Holy Cross Hospital – North Addition

**Location:**

1500 Forest Glen Rd.  
Silver Spring, MD 20910

**Building Owner:**

Holy Cross Hospital

**Occupancy Type:**

Institutional

**Size:**

75,000 square feet new work  
44,000 square feet renovation work  
15,000 square feet fit-out work

**Number of stories:**

4 + basement

**Primary Project Team:**

Owner – Holy Cross Hospital <<http://www.holycrosshealth.org/>>  
Architect – Smithgroup <<http://www.smithgroup.com/>>  
MEP Consultant – Leach Wallace Associates <<http://www.leachwallace.com/>>  
Structural Engineer – McMullen & Associates <<http://www.jjma.com/>>  
Civil Engineer – Dewberry & Davis <<http://www.dewberry.com/>>  
Construction Manager – Bovis Lend Lease <<http://www.bovislendlease.com/>>

**Dates of Construction:**

April 2004 – July 2005

**Project Cost:**

Total Construction Cost - \$21.9 million  
MEP System Cost – \$7.8 million  
Structural Cost - \$3.1 million

**Project Delivery Method:**

Design-bid-build

**Architectural Features:**

They added new concourse and conference center on 1<sup>st</sup> floor, new obstetrician exam rooms on 2<sup>nd</sup> floor, new gynecological exam rooms on 3<sup>rd</sup> floor, and a fit-out on the 4<sup>th</sup> floor. Also, part of the existing hospital on the 1<sup>st</sup> floor was renovated into a new outpatient center.

**National Code followed:**

IBC 2003



**Zoning:**

There are no specific zoning concerns on this project

**Historical Requirements:**

There are no specific historical requirements concerning this project other than it has to tie into the existing hospital.

**Building envelope:**

- glass façade on concourse/atrium
- tower is steel construction with cavity walls
- cavity walls are efis
- roof is flat steel decking

**Construction:**

The contract was quite unique for this project. Since Bovis and many of the subcontractors were already working on the new Emergency Department renovation, the hospital decided to treat the North Addition like a giant change order. However, it was also treated as a design-bid-build, only the bidding was done by a single contractor. Also, the landscaping of the exterior and ground work was contracted out as a separate package.

**Electrical:**

Due to the importance of uninterrupted power to numerous components of a hospital's electrical systems, extra care was taken when designing the North Addition. In addition to normal power being run through the new wing, 3 emergency power systems (life safety, critical, equipment) were added to match the electrical system in the current hospital and to ensure all necessary equipment is running in case of an emergency. To support the added capacity to the current emergency power system in the hospital, a new generator plant will include 750 KW generators and a 5000 amp paralleling switchgear. A new 3000 KVA substation was added as well to support the additions to the hospital. Most lighting was 277V since the majority of the existing hospital was already 277V.

**Mechanical:**

The North Addition is fed by two new air handling units and one existing. One of the new AHU's is an interior custom modular design that serves all critical (patient) areas. The second new AHU serves the lobby and office spaces. The distribution system is a VAV system with variable frequency drives. The system utilizes medium pressure ductwork feeding VAV boxes with reheat coils. A new hot water heating plant was installed on the 2<sup>nd</sup> floor penthouse. It included the installation of two new steam to hot water converters with variable flow capabilities. In addition, new chilled water mains were ran from the central plant to the 2<sup>nd</sup> floor penthouse. The multi-level atrium/concourse was fitted out with a state-of-the-art smoke control system for fire protection.

**Structural:**

The addition will consist of concrete slab on grade supported by a steel skeleton system on concrete footers. The footers are a minimum of 2.5' below grade. The concourse roof typically consists of a W10x30 beam at a 28' span supported by a W18x76 girder at a 26' span supported by "W" columns. The tower section is typically a 5 ½" concrete slab on 2" deep steel decking. The decking is supported by W18x55 beams at a 29' span on W18x71 girders at a 21' span supported by "W" columns. The roof consists of a 1 ½" galvanized 18 gage roof decking. All decking is welded to structural steel for lateral stability.

**Fire Protection:**

The North Addition renovation is designed to the 2000 NFPA Life Safety Code. The ground and first floor sprinkler systems were reconfigured and tied into existing 4" sprinkler pipe main. The tower portion of the renovation had a new 4" standpipe installed with each floor of the tower having a dedicated zone valve. A dry pipe was installed for the canopy protection. Current fire department connections were relocated to accommodate the addition.

**Transportation:**

There are two elevators and one set of emergency stairs installed in the new addition. The elevators and set of stairs are located in the main tower and can be accessed by all four floors. Access to the elevator banks are straight off the main lobby and off of each floor's lobby. They are fed by a dedicated 480V 3-phase, 3-wire 225A panel with its own automatic transfer switch being fed by emergency mechanical branch power. The elevators are cable driven and equipment for the elevator bank is located on the roof of the new tower. In addition, the elevators are tied into the hospital security system and can be controlled remotely in case of an emergency.

**Telecommunications:**

In any hospital, security and communications are of utmost concern. Data as well as voice systems are imperative to maintaining proper operation of a hospital. Depending on the particular function of the space, most rooms have data lines feeding medical equipment which needs to send and receive information from central computers. Nurses and doctors can monitor vital signs and ensure patient health through these integrated data lines throughout the patient care areas.

For the new natal care ward, a state-of-the-art Infant Abduction Alarm System was installed. This system is very similar to a patient wandering system which attaches a band to the infant's leg that will set off alarms in the corridors and exit stairwells that alert nurses that a baby has left the ward unauthorized. This system is also ran to the main security system with the capability of locking all exit paths and halting elevator operation until the infant is accounted for.

Since this is an addition to the hospital, all the above systems had to be integrated into the current security and communication systems already present in the existing hospital. This further challenged the design and installation of the systems and called for extra care in ensuring system reliability after the new addition was completed.