Project Information

Site:

The West Wing Addition sits on what was once a portion of the parking lot for the existing hospital. The hospital site itself is cut into a gently sloping hillside sloping from back to front of the building. Because the new addition had taken some of the valuable parking away from the hospital, a new section was placed to the immediate left of the new addition. Also there was some parking restored to the front of the new addition. The site itself contains minimal landscaping because of the need for more and more additions on this site.

Size:

120,000 sq. ft. addition with an additional 50,000 sq. ft. of alterations to four existing hospital floors. The West Wing addition has a total of 6 floors, with floors one through five above ground and a ground floor below finish grade. There is also a penthouse on the roof which contains some of the additions mechanical and electrical core components.

Primary Project Team:

Owner:	DuBois Regional Medical Center www.drmc.org
Architect:	KTH Architects, Inc. John P. Adams, AIA www.ktharch.com
General Contractor/CM:	Turner Construction Company John DeMarco, Superintendent www.turnerconstruction.com
Civil/Structural Engineer:	Lee-Simpson & Associates Scott Kunselman, P.E. www.leesimpson.com
Electrical Engineer:	Hornfeck Engineering Richard W. Petrie, P.E. www.hornfeck.com
Mechanical Engineer:	Dodson Engineering Jeff Carney, P.E.

Dates of Construction: September 1, 2002 to June 1, 2005

Project Delivery Method: CM @ Risk

Architecture:

The new West Wing addition contains a wide array of new departments with state-of-the-art-equipment. As you enter the addition on the first floor you are invited into the hospital with a three story high lobby in which the front façade is a huge glass curtain wall. Also on the first floor is a gift shop in the lobby and a new Ultrasound and Nuclear Medicine Department. The second floor along with parts of all other floors contains storage and office space. The third floor consist of two C-section delivery rooms, a 18 bed Natal Intensive Care Unit (NICU), 10 LDRP (Labor, Deliver, Recovery, and Post Pardon) rooms, 8 private care rooms, a nursery and a new pharmacy. The fourth floor has four technologically advanced operating rooms with sterilizing and wash stations near by. The best scenery in the hospital can be found at the Physical Therapy Department on the fifth floor which has two of its four high walls encased with a glass curtain wall looking over the hills of DuBois. Also on the fifth floor are three cardiac cath labs and an 8 bed nurse's station for cardiac rehabilitation. As you can see this hospital addition is almost a whole hospital in and of itself.

Major National Model Codes:

The applicable codes used is this particular project were the Guidelines For Design and Construction of Hospitals and Health Care Facilities 2001 Edition NFPA 101 Life Safety Code, and the 1985 Edition: Chapter 12 "New Health Care Occupancies" Construction Type II (2,2,2).

Zoning: Commercial

Building Envelope:

The outside façade of the building consists mostly of a brick and limestone cavity wall with aluminum window frames. In the front of the building the façade changes to a glazing curtain wall design with three different types of glass (gray reflective vision glass, gray reflective opaque glass and clear reflective opaque glass) and metal framing. The penthouse exterior façade is made up of an E.I.F.S. (Exterior Insulation and Finish System) type paneling. The roof is an EPDM membrane.

Electrical System:

The Electric Utility supplies the DuBois Hospital with a main feed voltage of 34.4 KV at the utility pole. After the utility pole, there is a 3750 KVA step-down transformer that changes the voltage from 34.4 KV to 4.16 KV which supplies the existing exterior substation. The substation then provides feeder circuits to other sections of the hospital. From the West Wings Switchgear in the substation the voltage is then stepped-down again using a 2500 KVA transformer from 4.16 KV to a 480/277V Wye 3 Phase 4 Wire configuration which is the normal distribution for the buildings branch circuits. From the West Wing Main Distribution Switchboard in the first floor energy plant the power is ran to the two Normal Distribution Panels

in the Penthouse and on the Ground Floor. The voltage is again stepped-down using a couple of 300 KVA transformers to provide power to normal, critical and life safety branch circuits throughout the addition at 208/120V Wye 3 Phase 4 Wire.

Because this is a hospital and power is critical, there are three 1,000 KW existing emergency generators located in the energy plant that serves an emergency paralleling gear. The West Wing is then served from a feeder from the gear to the two emergency distribution panels in the basement and penthouse. From these Emergency distribution panels only the Critical, Life Safety and Equipment branch circuits are supplied energy to keep the most important systems operating. Not all panels are supplied with emergency power though; the normal distribution panels are interrupted from the power supply and shut down upon utility power loss.

Lighting System:

Linear fluorescent 120 V area lights were the most common type utilized in the design of this addition. Typically electronic ballasts were also used in the different spaces of the building. CFL downlights and cove lighting was for the most part used in lighting the corridors of this building. Some incandescent lighting was used in critical care areas where color rendering of skin was important to recognize tone colors. The hospital addition also used photocells in the lobby and canopy to perform some daylight control by dimming to save energy during the day.

Mechanical System:

It was decided to make use of a hot water/forced air heating system in the addition. Another form of heating in the addition is the use of radiant panels along the exterior walls. The cooling load is supplied by a 500 ton chiller in the energy plant. The distribution system for the hospital addition contains over 200 VAV distribution boxes.

Structural System:

The west wing addition uses a steel structural system. A composite steel decking system is used on all floors above grade. The ground floor is a reinforced slab on grade. Reinforced concrete block walls are used at all areas below grade.

Fire Protection System:

The fire detection and alarm system that was utilized in this building is a rather complex one. The system utilizes the following equipment:

- NAC Power Extender Panel
- Smoke Sensors
- Duct Smoke Sensors
- Remote Test Station
- Door Holders
- Visual Only Units
- Manual Pull Stations
- Heat Sensors
- Remote Relay
- Individual Addressable Module
- Audio/Visual Units
- Remote Annunciation Panel

The fire suppression system receives the water supply for the standpipes from the existing standpipes and fire lines in the existing hospital. Sprinkler systems were hydraulically calculated and designed for Light Hazard, except in Mechanical Equipment Rooms, Storage Rooms, and similar type rooms, which were designed for Ordinary Hazard. Sprinklers used were concealed pendant type "Quick Response" sprinkler heads.

The fire proofing system uses a two hour rating for columns, floor decks and beams. The roof deck only requires a one hour fire rating. Along with these ratings a one or two hour rating is given for the through penetrations in the floors, roofs, walls and partitions, smoke barriers, construction enclosures and compartmentalized areas. For the floor and head of wall joints a one or two hour fire rating is also given. Lastly a one to two hour fire rating is given to joints between perimeter edges of fire-resistance-rated floor assemblies and back of non-fire-resistance-rated, exterior, glazed aluminum curtain walls.

Transportation:

The West Wing Addition of DRMC uses four electric traction elevators for pedestrian transportation from floor to floor. Three of the elevators stop on floors one through five and the other stops from ground floor to the fifth floor. The elevators that stop on only five floors are rated for 4000 pounds and rise at 350 fpm. The elevator that raises a total of six floors is rated for 5000 pounds and also rises at 350fpm.

Telecommunications:

In this state-of-the-art hospital there are Telephone and Data outlets in almost every room. There is also an intercom system that is integrated throughout the hospitals communication systems. An interesting system that was used in this building is a clock system that is controlled from a single module. This system can also keep track of elapsed American time. Lastly, there is a fairly complex nurse call system that is coordinated throughout spaces in the addition.

Special Systems:

One of the special systems that the hospital uses is a medical gas system. This system distributes nitrous oxide, oxygen, medical air and a vacuum to certain areas in the building such as operating rooms. A smoke evacuation system exists in the front atrium area which very quickly makes the space safe for egress if a fire breaks out. The hospital also utilizes a Translogic Tube System that transports vials of blood and other substances to different portions of the hospital.