

Daniel Alexander | CM | Dr. Messner



Thesis Final Report

Doctors Community Hospital | Lanham, MD

April 7, 2009



PROJECT TEAM

- OWNER: DOCTORS COMMUNITY HOSPITAL
- CM: GILBANE BUILDING COMPANY
- ARCHITECT: CR GOODMAN ASSOCIATES
- STRUCTURAL: MINCIN-PATEL-MILANO
- MECH & ELECTRICAL: LEACH WALLACE ASSOCIATES

STRUCTURE

- STEEL COLUMNS AND BEAMS BUILT UP ON EXISTING STEEL CONSTRUCTION
- CONCRETE FOOTERS WITH GRADE BEAMS (~50% EXISTING, 50% NEW)
- LIGHTWEIGHT CONCRETE ON METAL DECK TO FORM COMPOSITE SLAB
- NON-LOAD BEARING BRICK ON METAL STUD FACADE

MECHANICAL

- ROOF MOUNTED MECHANICAL PLANT
- 90,000 CFM AIR HANDLER FEEDING VAV BOXES
- 425 TON CHILLER
- DRAW THROUGH 425 TON COOLING TOWER
- (3) 2,678 MBH DUEL FUEL BOILERS
- MEDICAL GAS AND VACUUM TUBES FEED EACH PATIENT ROOM

PROJECT OVERVIEW

- FUNCTION: MEDICAL HOSPITAL
- SIZE: 270,000 SF EXPANSION
- COST: \$42 MILLION
- DELIVERY: DESIGN-BID-BUILD WITH A GMP FROM A CM@RISK
- OCCUPANT: DOCTORS COMMUNITY HOSPITAL
- DATES: NOV '07- MARCH '10

ELECTRICAL/LIGHTING

- 1,200 AMP SWITCHGEAR
- (2) 2,500 AMP SWITCHBOARDS
- 1,250 KVA EMERGENCY GENERATOR FED BY 5,000 GAL FUEL TANK
- POWER FED VERTICALLY THROUGH STACKED ELECTRICAL ROOMS WITH MULTIPLE TRANSFORMERS IN EACH
- LIGHTING TYPICALLY CONSISTS OF RECESSED 2X4 FLUORESCENT LIGHTS

SPECIAL CONSIDERATIONS

- CONSTRUCTION IS OCCURRING DIRECTLY ABOVE AND ADJACENT TO AN OPERATIONAL HOSPITAL. OUTAGES MUST BE COORDIANATED WITH OWNER, AND SPECIAL DUST AND DEBRIS CONTROL IS NEEDED IN RENOVATION PORTIONS

ARCHITECTURE

- PATIENT ROOMS ARRANGED ON THE OUTSIDE WITH SUPPORT AREAS IN THE CENTER
- BRICK FACADE WITH SPLIT-FACE CMU BANDING AND CAST STONE WINDOW LINTELS
- ROOF: BUILT UP STYRENE-BITUMEN-STYRENE SYSTEM ON 3" POLYSTYRENE FOAM

DANIEL ALEXANDER | CONSTRUCTION MANGEMENT

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EXECUTIVE SUMMARY

This document is a comprehensive technical analysis of the construction of the Doctors Community Hospital (DCH) expansion currently underway in Lanham, MD. An overview of the project, including a look at the project team, the client, the current design and construction methods was performed. Other important information such as site plans, current schedules, and project costs were also outlined.

Three areas of analysis were performed and address different aspects of the construction industry. Value engineering, schedule reduction, constructability, and a critical industry issue were four items addressed in these analyses.

The first analysis focused on a critical industry issue: BIM Implementation. BIM is growing in popularity and has much of the industry interested in its capabilities. This analysis focused specifically on 3D MEP coordination and a generalized process for performing this task. The goal was to generate a process that could tie into ongoing research at Penn State with the Computer Integrated Construction group. A process map based on input from several experience industry members was developed. The application of this process to the DCH project was also analyzed and a plan for implementation was created.

Analysis Two focuses on using a precast façade in place of the current system, hand laid brick façade. Positive gains in the schedule, decreasing it 6 weeks, were realized by using the new system. Structural calculations were performed to ensure that the heavier system was still able to be supported without a redesign of the steel superstructure. Mechanical calculations showed that there was improved energy efficiency which translated into operations savings of roughly \$2,700 per year. Initial costs were significantly higher, and as such, this alternative system was deemed unfeasible.

The final analysis looked at the current site logistics, specifically the site congestion, and how it affected the constructability of the project. Interviews with subcontractors were performed to assess the effects of the congested site on their respective trades. This information was synthesized and an overall cost and schedule impact was generated based on their input. Property adjacent to the site that DCH contemplated purchasing was looked at from a cost/benefit standpoint based on this new information. Had the owner moved to purchase the land 2-3 years ago at the original offer price of \$500,000, it would have been a good investment. The current asking price of \$2 million is too high for it to be a viable move at this time.