

Table of Contents

Section	Page
Executive Summary	2
Background	3
Site and Architecture	3
Introduction to Lighting	4
Registration Area	5
Main Lobby	15
<i>Daylight Study</i>	26
Introduction to Electrical	33
Electrical Depth	34
<i>Alternate 1</i>	35
<i>Alternate 2</i>	44
Construction Management Breadth	55
Mechanical Breadth	60
Conclusions	64
References	65
Acknowledgements	66
Appendix	

Executive Summary

The Holy Cross Hospital North Addition presents an interesting and unique mixture of spaces when discussing a typical hospital. Included among the usual exam rooms, nurses stations, and operating rooms are an assortment of unique spaces such as the conference center, concourse, lobby and surrounding spaces. In my lighting depth, my design focuses on two spaces: the out-patient registration area and the main entrance lobby. The following report includes an in-depth discussion of design concepts and criteria, equipment selections and characteristics, reflected ceiling plans, power densities, system performances, and conclusions on the designs' effectiveness. My goal for each space was to design a lighting system that both accentuated the architecture and functioned efficiently while remaining a minimal intrusion to the space. A portion of the main lobby space was also analyzed for the feasibility of implementing a dimming control system to utilize the available daylight within the space.

For the electrical depth, I proposed and investigated the feasibility of two separate alternatives. Alternative 1 discusses the feasibility of replacing the transformers feeding the 208Y/120V panels with a single transformer stepping down to a 208Y/120V distribution panel. Alternative 2 discusses the feasibility of reconfiguring the entire emergency generator system by including the normal power branch under an additional automatic transfer switch and supplying it with power from an isolated generator sized to feed only the North Addition portion of the hospital.

The Construction Management breadth analyzes the changes proposed in Alternate 2 and discusses the impact it will have on the cost, scheduling, and concerns that might arise in the construction phase of the project. The Mechanical breadth analyzes the impact Alternate 1 imposes upon the existing mechanical system. It discusses the redistribution of the sensible loads associated with the transformer changes and resizes the VAV boxes and associated ductwork.

Background

The Holy Cross Hospital – North Addition project is a 4-story, 80,000 square feet addition with 44,000 square feet of renovation work. Holy Cross Hospital is located north of Washington, D.C. adjacent to the Capitol Beltway. The addition consists of a main concourse, new main lobby, a gift shop, and a conference center wing on the 1st floor; a new obstetrician exam wing on the 2nd floor; a new gynecological exam wing on the 3rd floor; and unoccupied space on the 4th floor for future expansion. The new addition not only houses patient exam rooms, but is the main entrance to the hospital and is a major source of circulation on the 1st floor while connecting the North Addition with the new Emergency Department addition via the concourse.



Figure 1: Architects Rendering of North Addition

Site and Architecture

The North Addition to Holy Cross Hospital is part of a larger 260,000 square foot additions and alterations to the facility. The additions include the North Addition, Emergency Department addition, and a new Physician's Office Building (POB). Also included in the overall package is extensive renovation work in the ICU, NICU, Labor and Delivery, Ambulatory Services, MRI, Operating Room departments. In total, the hospital will be spending roughly \$69 million expanding and improving the facility. Included in these renovations are some major infrastructure improvements. A new emergency generator plant will include two new 500-ton centrifugal chillers and a dual cell cooling tower, three new 750 KW generators and 5000 amp paralleling switchgear, and an additional 3000 KVA substation to support the additions.



Figure 2: Architects Rendering of Emergency Department/POB Addition