

Thesis Proposal

Voorhees Replacement Facility | Voorhees, NJ

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Executive Summary

The following proposal is an outline that will guide my research for the spring of 2010. It identifies my 4 major areas of construction management analysis and provides research steps that will be taken to complete each analysis.

The first analysis is sustainability in healthcare projects and will determine what aspects of sustainability and LEED design are most important to Virtua Health in a healthcare building. Then using the information obtained from the owner I will determine the current LEED points the building is achieving and evaluate where points can be earned that meet the owners values.

The second analysis is the redesign of patient room lighting. Currently the patient rooms are design using fluorescent lighting but with owners continuously looking for energy saving ideas I will determine if using LED lighting is more efficient and cost effective then the fluorescent lighting in place. Also I will research the effect of lighting on patient's recovery and overall health and determine if the switch from LED to fluorescent lighting will have a positive or negative effect on patients.

The third analysis involves creating a short interval production schedule for the rough-in and fit-out of the bed tower and comparing it to the current schedule in place.

My two breadth analysis's come from analysis 2: patient room lighting. The first breadth analysis will determine if switching from LED lighting to fluorescent lighting in the patient rooms will reduce the HVAC load and my second breadth analysis is the lighting design of the room.



Analysis 1: Sustainability

Problem

Although the Voorhees Replacement Hospital does incorporate some green design it is not attempting to achieve a sustainable rating of any kind. In a continuously growing green market is there a way to push the hospitals design to incorporate more sustainable ideas and possibly achieve a LEED rating?

Goal

To determine what aspects of sustainability and LEED design is most important to Virtua Health (owner), and determine the LEED points already associated with the current design and the cost to obtain a LEED rating based on the owners preferences.

Research Steps

Step 1: Research LEED certification and the points needed to achieve LEED certification.

Step 2: Construct interviews with the owner (Virtua Health) to determine what aspects of sustainability and LEED are most important to them.

Step 3: Analyze the Voorhees Replacement Hospital for LEED points already included in design.

Step 4: Determine the cost to implement LEED points not already included in current design that are important to Virtua Health.

Step 5: Analyze present costs and lifecycle costs of implementing new LEED ideas into the building and ensure that each idea is able to be constructed.

Expected Outcome

I expect that there will already be a lot of LEED ideas that are included in the current design. I also expect that Virtua Health will inform me that the aspects of sustainability and LEED that are most important to them are ones that reduce their energy consumption and life-cycle costs.



Analysis 2: Patient Room Lighting

Problem

The patient rooms are currently designed around the use of fluorescent lighting. As energy issues grow and owners continuously look for energy savings in their buildings I will investigate the use of LED lighting in the patient rooms. I will also ask if a patient feels more comfortable under the use of LED lighting than fluorescent.

Goal

To redesign the current patient rooms to include more efficient and cost effective lighting and determine if the use of LED lighting will increase the patient's happiness and make them feel more comfortable in the hospital.

Research Steps

Step 1: Determine the requirements for lighting in hospital patient rooms.

Step 2: Redesign the patient room lighting plan using LED lighting to meet lighting requirements.

Step 3: Conduct an initial cost analysis of the LED lighting verse the fluorescent lighting followed by a life cycle cost analysis.

Step 4: Research by articles and talking to healthcare professionals the effect of lighting on patients.

Step 5: Determine if patients would be affected positively with the use of LED's verse fluorescent lighting.

Expected Outcome

I expect that the LED lighting will provide a better cost model then the fluorescent lighting and will ultimately provide more cost savings although the initial investment may be more expensive. I also expect that LED lighting will provide a more comfortable experience for hospital patients.



Analysis 3: Bed Tower Short Interval Production Schedule

Problem

The rough-in and fit-out of the bed tower is along the critical path of the project and is the last major portion of construction before substantial completion. Is there a way to manage the rough-in and fit-out of the bed tower to reduce the schedule time without causing clutter of subcontractors?

Goal

To investigate if using a short interval production schedule for the bed tower rough-in and fit-out will effectively reduce the original schedule of the bed tower.

Research Steps

Step 1: Evaluate the current schedule and determine the scheduled time for each floor.

Step 2: Determine the sequence in which rough-in and fit-out needs to be completed.

Step 3: Speak with subcontractors to determine the amount of work that can be put in place over a period of time for a particular activity.

Step 4: Determine zones on each floor for the schedule.

Step 5: Create the short interval production schedule.

Step 6: Compare the short interval production schedule to the original schedule.

Expected Outcome

After completing the short interval production schedule I believe that the schedule will be able to be reduced which in turn would allow the building be substantially complete earlier than originally planned.



Breadth Analysis's

Mechanical Breadth – Analysis 2: Patient Room Lighting

This analysis will include a mechanical breadth analysis. The breadth analysis will be determining the current HVAC loads in the patient room before and after the lighting change to see if there could be a reduction in equipment or duct size resulting in a cost reduction.

Lighting/Electrical Breadth – Analysis 2: Patient Room Lighting

This analysis will include a lighting breadth analysis. The breadth analysis will be the redesign of a patient room from fluorescent lighting to LED lighting.

Weight Matrix

Description	Research	Value Engineering	Const. Rev.	Sched. Red.	Total
Sustainability	15%	10%	10%		35%
Patient Room Lighting	5%	30%			35%
Bed Tower Short Interval Production Schedule				30%	30%
Total	20%	40%	10%	30%	100%