Kate Feato
Lighting/Electrical Option
Woolly Mammoth Theatre
Washington, DC

Thesis Proposal

Executive Summary

In the upcoming semester I will be performing an in-depth study of the Woolly Mammoth Theatre. In this study there will be two depths prepared; the redesign of the lighting and the electrical systems. Also there will be two breadths prepared to incorporate the redesign of other important building systems.

For my lighting and electrical depth, I chose to focus on the entrance canopy, lobby, theatre and office suite. The lighting in these spaces will be redesigned to make them come alive. An energy efficient solution will be a main consideration in all of the spaces. Following the new lighting design, the panelboards, circuiting, feeders and branch circuits will be redesigned.

For my first breadth, I will perform an acoustical analysis of the 6000 SF theatre space. The reverberation times will be found and the current acoustical solution will be analyzed. An alternate solution will be provided if necessary. The second breadth will be a cost and energy analysis of the new lighting design system. All equipment, labor and installation costs will be considered.

Depth 1: Lighting Design

The Woolly Mammoth Theatre Company's mission is to provide new, edgy and provocative productions for the community. The theatre that the company calls home must fit in with that mission. The architectural concept is a "transparent theatrical laboratory", conveyed by having all of the spaces normally hidden from view of patrons open to see. Glass walls are used in these spaces, including the rehearsal rooms, classrooms, and offices. The lighting design theme will parallel with the architectural concept, making the space come alive. I will be redesigning the lighting for four spaces in the Woolly Mammoth Theatre; the entrance canopy, lobby, theatre, and the office suite.

The entrance canopy is the only exterior space of the theatre. This canopy must be eye-catching and peek the interest of those passing by. The space will "pop out" during to day and evening hours. The canopy should be dynamic with many flexible elements such as color and texture.

The next space to be discussed is the most important space of the four. The lobby is the first interior space patrons will see. The space will mainly be used as a waiting area before and after productions. The space must be inviting and exhilarating for its occupants. Color will be used throughout the lobby to make the space come alive, because the finishes in the space are primarily white and unfinished concrete. Sparkle will be provided to highlight some of the architectural features. The lighting will be rhythmic to help promote movement and flow throughout the space.

The third space to be redesigned is the theatre. The space has a courtyard configuration to connect the audience with the actors, and therefore must stay intimate. The house lighting will be on as patrons wait for the show to begin, and as they leave. It should prepare them for the production. The housing lighting should not compete with the show at all, and so it will be more subdued than the previous spaces discussed. To make the space come alive, sparkle will be added by highlighting the theatre equipment such as catwalks and theatrical fixtures.

The office suite is the final space to be redesigned. It is the only private space of the four chosen. Therefore the design goals will be considerably different. The space will almost be treated as a residential environment, rather than a commercial one. It should be an energetic space to promote production. The suite being a small area should feel spacious to the workers. The lighting should be flexible to meet the desires and needs of each individual person.

My schematic design proposal was presented at Lutron. Comments were made by designers in the industry to help make the design work in these four spaces. These comments will be considered strongly when beginning my depth to redesign the lighting for the Woolly Mammoth Theatre.

When redesigning the four chosen spaces, I plan to find the most efficient solutions for each space. The type of source will be considered strongly when thinking about energy usage and lamp life. A daylighting study in AGI will be done in the office suite. From this daylighting study a control system will be designed for the space. AGI will also be used when designing the other spaces to do electrical lighting calculations.

Depth 2: Electrical Design

The electrical system for the Woolly Mammoth Theatre will be redesigned to incorporate the new lighting design in the chosen spaces. The appropriate panelboards will be resized, circuiting will be rewired, and feeders/branch circuits will be redesigned.

The control systems for the spaces will be considered. The current lobby control system using wall box dimmers will be redesigned to a more sophisticated dimming system. The office suite will have a control system to incorporate daylight harvesting.

The next step in the electrical depth will be to perform a comparison of using Copper wire or Aluminum wire. Copper and Aluminum both have their advantages and disadvantages. These will be thoroughly researched and discussed. Aluminum wire is greater in size than Copper wire, so there may be safety concerns in redesigning with it. The cost of Copper is very expensive and Aluminum wiring may be a more cost efficient solution for the theatre.

Lastly an analysis of self ballasted compact fluorescents will be prepared. Their advantages and disadvantages will be thoroughly researched including cost, lamp life, and heat dissipation. Then a comparison between the self ballasted compact fluorescents and remote ballasted compact fluorescents will be performed. The cost of lamp, ballast and example fixtures will be taken into account.

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Breadth 1: Acoustical Analysis

The theatre space in the Woolly Mammoth Theatre is the most important space to the theatre company. This space is where the productions are performed. The acoustical quality of the environment must be top quality. An analysis will be carried out on reverberation times in the space. Currently there are metal acoustical baffle panels along the balcony level back wall. This solution will be analyzed and alternate solutions may be provided if necessary.

Breadth 2: Cost and Energy Analysis

Using the new lighting and electrical designs, a cost analysis will be performed. The cost of all equipment, labor and installation will be taken into account. This total new cost will be compared to the current solution cost for the lighting and electrical systems. Next an energy analysis will be carried out. The new lighting solution will be broken down to its energy usage, and compared to the current system. The payback period of the new system will be determined. Then a complete analysis of the two systems will be shown. This will show if the redesign is beneficial to the client.