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The Anne & Michael Armstrong Medical Education Building
Thesis Proposal: Executive Summary and Breadth Topics

Contents

Executive Summary

This thesis proposal will examine various systems associated with the Anne and Michael Armstrong Medical Education Building. Specifically, the lighting and electrical systems will be analyzed to determine the level of coordination of the systems into the building. In particular, four spaces will be considered which are the exterior space and façade, the first floor auditorium, the full height central atrium and the fourth floor anatomy laboratory.

The first in depth analysis will be the lighting systems in the building. Each of the four main spaces will be redesigned to provide an aesthetically stimulating atmosphere while also meeting the IESNA and ASHRAE 90.1 standards. Daylighting and sustainable practices will also be implemented in order to efficiently harness the considerable amount of daylight permeating into the building as well as minimize the harmful effects of building on the environment.

The electrical systems in the Armstrong building will also be evaluated in depth. It will include a protection device coordination analysis, a feeder redesign from copper to aluminum, a branch circuit redistribution of the four main spaces in the building and a redesign using photovoltaic arrays.

The breadth topics covered will be a sustainability study, an architecture study and an acoustics study. The sustainability and architectural studies will examine the implementation of different techniques to further control the fluctuating levels of natural light that enter the building throughout the day. The sustainability breadth will focus on the methods to achieve better control of daylight and the effects it has on energy savings, material savings and costs. The architectural breadth will study the impacts of these new sustainable practices on the building. The acoustical breadth will examine the acoustical reverberation times in the four main spaces in the building being analyzed and how the architecture effects the acoustics.

LEED/Sustainable Breadth

The Armstrong building is not currently a LEED design and is not attempting to reach LEED certification. A large factor in the decision not to attempt LEED certification was the large glass curtain wall on the southern façade of the building. During heavy midday daylight levels, electrochromic glass will tint to restrict light and ultraviolet light from entering the building. This will help to control the lighting levels as well as the heat buildup in the spaces.The implementation of proper material selection to control the daylight and mechanical loads associated with this prominent architectural feature along with materials and systems integrated throughout the rest of the building can achieve points to reach certification. With controllable lighting, air quality, mechanical loads, materials renewable energy sources and other components, the building will be able to apply sustainable practices to reach LEED certification.

Architecture Breadth

The redesign of the glass materials to use an adjustable electrochromic glass window will alter the exterior view of the skin of the building in particular the southern façade. During heavy midday daylight levels, the electrochromic glass will get darker and the rest of the time the windows will be transparent. The acoustics of the building will also affect the architecture of the spaces. This component along with the other sustainable materials on the exterior and interior to improve the sustainability and the lighting of the building will combine to help reshape the interior and exterior of the building and increase the functionality of the building as a whole.

Acoustical Breadth

The atrium and the auditorium are the two largest spaces in the building and therefore will hold the largest amount of people causing the largest amount of noise in the building. It will be very important to the practical use of these two spaces to maximize the sound absorption in the spaces to optimize the use of the spaces. This acoustical component will be a major factor in the design and aesthetics of the space.

Time Schedule

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Task	Week 1 1/14-1/20	Week 2 1/21-1/27	Week 3 1/28-2/3	Week 4 2/4-2/10	Week 5 2/11-2/17	Week 6 2/18-2/24	Week 7 2/25-3/2	Week 8 3/3-3/9	Week 9 3/10-3/16	Week 10 3/17-3/23	Week 11 3/24-3/30	Week 12 3/31-4/6	Week 13 4/7-4/13	Week 14 4/14-4/20	Week 15 4/21-4/27
Construct 3D models in AutoCAD	■								SPRING						
Finish 3D models in AutoCAD	■	■							BREAK						
Fixture Selection - ies files, cut sheets, ballast information				■					!						
Import 3D models into AGI32 - material designation and calculations		■	■												
Finalize Fixture Layout - Recalculate Lighting Loads					■										
Resize feeders, panelboards, protection devices. Collect manufacturers information						■									
Finalize Fixture Schedule and Complete Power and Lighting Plans							■	■							
Perform Over Current and Short Current Analysis								■							
Design PV Array System										■					
Begin LEED Breadth											■				
Begin Acoustical Breadth											■				
Assess implementation and cost benefits of LEE D and Acoustical Breadth												■			
Finish LEED and Acoustical Breadth and start Architectural Breadth													■		
Begin Report														■	
Finalize report and prepare Presentation															■
Finalize Presentation															■