

Cathedral Place

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Executive Summary

The Thesis Proposal developed here will introduce the specific investigations into Cathedral Place for the depth and breadth elements of the AE Senior Thesis in the second semester. Analyses of particular problems related to lighting design, electrical distribution, mechanical systems and/or integration, and cost-management will be completed and solutions proposed in an attempt to identify alternatives to the current design. The Proposal consists of four parts: a Lighting Depth, an Electrical Depth, Mechanical and Construction Management Breadths, and the Project Schedule for the coming semester. The specifics are listed below.

The Lighting Depth will redesign five areas of the building relative to those specified in Technical Assignment #3 (see the link on the following pages). This redesign will focus on developing an image for the building, and redefining the building as a hallmark in the downtown area as opposed to another building with simple exterior illumination. As well, the lighting design will take into consideration the daylighting availability in an attempt to reduce the power density and meet the requirements set forth in ASHRAE 90.1 while meeting the lighting design goals found in the IESNA Handbook. Of particular note in the redesign is the use of atypical light distribution systems to achieve certain effects such as a wave pattern in the entrance lobby.

The Electrical Depth seeks to analyze the building from a standpoint that precedes construction – development of a system with the assumption that the building has a single owner/operator taking all profits garnered and paying all bills resultant from the construction and operation of the building until its end use. The redesign will use a single distribution system for the whole building and attempt to minimize materials, labor, and price fluctuations from the utility company. Resizing of the whole system and its individual components, as well as analysis of tenant power requirements and current load requirements will be integral to the redesign.

The Mechanical and Construction Management Breadths are, for the most part, an extension of the two depth work proposals and their relationship with the cost of the building and the impact the new systems will have on the mechanical system. Of particular concern is the use of daylighting in the electrical and lighting designs and its use or impact on the thermal loads of the building. Breadth work focused on the mechanical system will analyze its design and the use of this system, while the construction management breadth will analyze the building and systems as a whole and project their costs into the future to attain a payback period and/or analysis of profitability by changing over the system.

All of these analyses will be challenging and quite specific to the building. Utilizing all of the knowledge as an Architectural Engineer and not just the proficiencies in a Lighting or Electrical capacity will provide an accurate and interesting look at the building's system alternatives and the real-world impact of aesthetic value, functional simplification, and development marketability from both the engineering and owner/developer standpoints.