



**Advisor: Dr. Mistrick**

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## **Executive Summary**

This proposal for the spring semester of 2006 includes and defines work that will be completed for the redesign of various systems in the Grand Oaks Assisted Living Facility. The Lighting Depth work will include a complete redesign of all light systems, layouts, and equipment. Four spaces will be studied, evaluated, and redesigned. These include the Lobby, Living Room/Library, Dining Room, and the Building Entry with exterior walkway lighting. The methods, criteria, and other factors that influence the design are described in this Proposal as well as in the Schematic Design Proposal that was presented to a panel of Lighting Designers at Lutron.

The Electrical Depth work will study the cost of extending a single feeder from the existing electrical room in the main building to the new addition. A section will be added to the existing switch gear, and from there, overcurrent protection will be sized according to the NEC design guidelines. In addition, the electrical depth will look at upsized the emergency power generation system so that the elevators, in case of emergency, can remain operational. The over all intent of the electrical redesign/study is to see if there is a cost savings when extending only one feeder instead of 4, and at what cost the emergency power be upgraded.

The Mechanical Breadth work will include a study of ground source heat pumps as an air distribution system for the residents' rooms. Currently, the residents' rooms make use of fan coil units that receive cold water from a roof top chiller, and hot water from steam power hot water heaters. The purpose of this breadth work is to look at the potential energy savings that the ground source heat pump could provide. In addition, if the new mechanical redesign saves energy, could it possibly decrease the size of the feeder that will be extended from the existing building to the addition.

The Construction Management breadth will evaluate the cost of the various systems that are to be redesigned and perform a payback period if there is significant energy savings. The cost analysis for the lighting depth work will look at fixture selection, controls, and time of installation compared to that of what is currently installed. Electrical Cost analysis will look the current design compared to the proposed redesign from the stand point of construction cost, and material cost. The Mechanical cost analysis will look at the cost of the existing fan coil units initial cost compared to the proposed ground source heat pump system. If there is a significant energy savings and payback period will be established to justify the initial cost of the system