Executive Summary

The purpose of this senior thesis is to study The Salamander Resort and Spa, which is located in Middleburg, Va. This report contains a project overview and three analyses focusing on schedule deceleration, guest lodge lighting redesign, and water management. The analyses are focused on reducing the upfront and running costs of the resort through the use of lower energy use and alternate scheduling.

The first analysis deals with the voluntary schedule deceleration per owner's request. The initial design and schedule called for completion in March 2011, but was delayed 12 months to March 2012. In the revised schedule, most activities were not delayed, rather their durations were extended over a longer period of time. The main exception to this schedule was the interior work. From January 2009 to November 2009, all interior work in the lodge was stopped. I analyzed a halt in construction activities for a period of ten months. This will alleviate the general conditions costs for that time period while still allowing the project to finish by March 2012. The general conditions savings totaled $252,345. The main component of the savings came from the project team salaries and temporary power, lighting, and heating.

The second analysis deals with the redesign of the guest lodge lighting system. A large amount of energy is wasted every year when occupants leave lights on when they are not in the room. The resort has 168 rooms and this leads to a significant energy waste. I analyzed a system that will replace all halogen lamps with LED's and install a control system that will turn off the guest room's lights when no one is present. The total energy cost per year with the LED's is $5,151 versus $60,584 with halogens. Taking initial investment, replacement cost, and yearly energy cost into consideration, the payback period for the proposed system is 2.37 years. Approximately $100,000 will be saved in energy and maintenance costs annually for the following 15 years.

The final analysis investigates the buildings water management, more specifically, the irrigation system. A wide range of plants are used in the surrounding landscaping, many of which are not native to Virginia. Native plants are accustomed to the climate and conditions of the location and are hardier and more likely to survive harsh conditions than that of non-native and exotic plants. By replacing the current pond pump irrigation water source with rain water collection tanks, the system improves sustainability. The additional cost of the proposed system is $18,350.