Executive Summary

The Memorial Reception Building was first built in the early 20th century. The most recent renovation was completed in the spring of 2006. The buildings architecture is based off of Roman and Greek architecture giving the building an old but unique feel. This building is considered to be a historical building which creates new requirements to be followed. The main restriction that was followed for this lighting design was to place fixtures out of site of the visitors as much as possible. In the event of being unable to discreetly hide the fixtures, it is suggested to pick out fixtures that match the buildings time period and architecture as close as possible.

The lighting design consists of four spaces; the tomb guards work area, the reception room, the crypt chapel, and finally the amphitheater which currently has no light fixtures since the building and the cemetery grounds are only open between dawn and dusk. These lighting concepts keep the historical aspect in mind while creating a design that introduces points of interest and flow through each space. The light fixtures were either hidden in the architecture or chosen to help demonstrate it. By adding and subtracting loads to the building, the lighting electrical coordination was completed to ensure correct sizing for circuit breakers, wires, and transformers.

To ensure the protective device units will behave correctly in the event of a short circuiting or over loading, a typical line from a branch circuit back to the switch gear was chosen to analyze. This analysis proves the electrical system will work correctly in the event of short circuiting. Next, since all the emergency lighting, security cameras, and fire protection was being fed by battery packs during the event of a power outage, an emergency system was design with a new emergency panel board and generator. After the design was completed, it is noted that since this building is so small, battery packs would indeed be the most cost efficient method. To save energy, new power saving and environmentally friendly transformers were investigated to cut back on annual utility costs. By using these new energy efficient transformers, the owner saves almost $5,000 in annual operating costs and saves 50,000kWh per year.

By adding a cove bump up into the plenum space in the work area of the tomb guard quarters, the diffusers and return grill needed to be moved to a lower part of the dropdown ceiling. To get the correct air distribution for the space, new diffusers were chosen based on throw, CFM rating, and NC value. Also, because of a new dead load being added to the ceiling and less room allotted in the plenum space, the mechanical duct work layout as well as the drop down ceiling layout needed to be redesigned. Structurally, the new ceiling can hold the dead load of the cove and the new duct layout decrease pressure drop into the adjacent kitchen resulting in having to add a damper in the duct.

The lighting design requires many different coordination issues to be solved. All these issues including structural/architectural, mechanical, and electrical are solved through investigation and calculation. The design ends up being a well rounded engineering solution for all the coordination issues that are frequently found in construction today.