BREADTH TOPIC #2

ELECTRICAL DISTRIBUTION ANALYSIS FOR THE RETAIL STORE AND TICKET BUILDING

The electrical system design for *Penn State Ballpark* was documented rather quickly and sent out for bid without complete design documents. When the electrical package was awarded to the responsible low bidder, a new set of electrical construction documents was released. Not only did this require the electrical contractor to submit appropriate pricing for the changes, but the construction manager also had to make the necessary planning changes for the revised electrical work. Because the electrical package was assembled quickly, there is one item that I have found to give the owner, The Pennsylvania State University, a more worthwhile facility.

As depicted below, the retail store and ticket building is separate from the rest of the structure and will be used during non-operating game times.

Ballpark rendering with the area highlighted which will be analyzed.

Within the 2000 square foot structure, there is a ticket booth area, a retail store, an office, a small mechanical room, and a storage area. The spaces contain standard electrical equipment devices including light fixtures, wall receptacles, and data outlets. All of the electrical wiring for this area is designed to be run overhead through the canopy structure and into the building. Because there is no underground raceway conduits designed for this area, there is an added labor cost for running all wires through the canopy along with extra material cost for running the wires to the required panel board. Furthermore, by not

designing an electrical panel within the building, electrical maintenance could become an issue. If an electrical problem arises, the maintenance crew must find an electrical panel that is not near the retail store and ticket building.

Because of the issues named above, I have decided to design an electrical panel located within the building. The current panel which is not located within the building is 300A, 3 phase, 4 wire panel at 208V/120V for panel while the lighting is on a 225A, 3 phase, 4 wire panel at 480V/277V. In order to design a new panel, I will determine all of the connected loads with the appropriate electrical design factors for lighting, receptacles, and mechanical equipment. I will also provide underground raceways to the help minimize the wires that travel through the canopy area. Lastly, I understand before beginning the electrical calculations that two electrical panels will be required and a step-down transformer will be needed for the electrical receptacles and track lighting in the area. Furthermore, I will provide a cost-benefit analysis between the designed system and the proposed re-design to help determine the value of using an alternative system.