6.0 Breadth Work

Redesigning the building mechanical systems of the HBCCH will directly affect many of the building's other systems. As a result, these systems must be reevaluated to ensure their overall operation. At the same time, intentionally changing another building system could be a method of increasing the performance of the building mechanical systems. After considering both of these scenarios, a summary of the assumed breadth work required was formed.

Lighting/Electrical

The electrical service of the HBCCH will need to be changed once the new mechanical system has been designed. The loads from the new equipment will have to incorporated into the current electrical design. As a result, feeders, panel boards, and over current protection will be resized. The electrical service will also have to be altered if any changes are made to the building's lighting systems.

The lighting system of the HBCCH will be analyzed only in areas with extremely high lighting power densities. These areas will be located with the help of the ASHRAE 90.1 analysis carried out in Mechanical Technical Report #2. Alternative lighting layouts and design concepts will be evaluated for these areas. Lowering the lighting power densities would also lower the lighting load seen by the HBCCH's cooling systems.

Construction Management

The scope of this breadth study is limited to the guest room towers of the HBCCH. A short interval production schedule (SIPS) will be created for the construction of the guest room towers. This portion of the HBCCH is well-suited for a SIPS since the layout of each floor is extremely repetitive. If created well, the SIPS should minimize both construction time and cost for the guest room towers. While this breadth study has no immediate impact on the performance of mechanical system, cost savings could be used to purchase required mechanical equipment.

Structural

The structural system of the HBCCH will be studied only at locations where new building mechanical equipment would need to be placed. This new equipment would increase the structural load on the building's framing members and slabs, possibly requiring the resizing of these structural elements.

7.0 Project Methods

The initial focus of the spring semester will be the selection of the chillers for redesign. Load calculations from Trane TRACE will be used to aide in equipment selection. Once selected, the equipment chosen will be put back into TRACE in order to calculate energy consumption and operating costs.