Breadth Proposals

Structural Breadth

The changing the building mechanical system will have an impact on the design of the structural system, particularly the roof structure. A reduction in the number of rooftop mounted air handling units will change the design of the structural system and construction cost savings are possible. The centralized chiller-heater and associated air handling units would be indoors on the cellar level to accomplish this. However, a cooling tower will be needed to cool the condenser water from the absorption chiller. The location of the tower is to be determined but would most likely be on the roof structure. The structural plans that are too be analyzed were provided by KTA Group.

Sustainability Breadth

The addition of a cooling tower brings with it the need for additional domestic water supply for operation. A rainwater harvesting system installed on the roof would reduce the use of potable domestic water used in cooling. The Northern Virginia area is rated at 40-50 inches of rainfall per year, where 20 inches per year is noted as the minimum practical amount to consider such a system. The roof structure is large in comparison to the square footage of the building due to it only being four stories in height. This leaves approximately 38,000 square feet of roof space to harvest rainwater. A treatment system for the captured water will have to be addressed before the water can be used in the cooling tower to prevent unnecessary damage. A storage system would also have to be designed for the water to be used in all conditions. The system would be relatively inexpensive to install and maintain when compared to the benefits received.