

## Proposal Breadth Topics

Along with the redesign of mechanical systems in the building, many other building systems are affected by the change. The proposal breadth topics will investigate the structural and architectural systems that will be affected by the mechanical design. Below are the proposed areas of breadth topics and a description of how each will be approached.

### Structural Proposal

By changing the 100% OA AHU and providing a heat recovery wheel, many mechanical equipments will be changed and even be removed from the schedule. Due to this alteration, the total weight of the penthouse will be changed and will perhaps reduce the amount of steel needed for support.

This will be accomplished with hand calculations and also the help of RAM, structural engineering software that will model the building's structural system with the given structural plans provided by Cannon Design.

### Architectural Proposal

The HSS River Building façade contains over 60% of glass as analyzed in *Technical Assignment 2 – Building and Plant Energy Analysis Report*. This high percentage of glass will increase solar heat gain and heat loss during the summer and winter times respectively. A breadth analysis will determine whether or not the aid of solar shades or a façade with a different material will reduce internal loads, reducing the amount of energy needed to condition the building.

This will be accomplished by researching different solar shade products available on the market today and also by researching other materials that will decrease the heat transfer of the glass. This modeling will be performed on Trane Trace, a building energy modeling software that will calculate the new facades impact on internal loads. Also, Adobe Photoshop and Autodesk Revit will help provide renderings and models of the new façade appearance.

Finally, these two breadth proposals will be analyzed with their associated costs and it will be determined whether or not significant savings will occur or if the additional cost is worth the alterations.