

7 Breadth Topics

7.1 Architectural

An analysis on the solar shading will be done. The existing building contains a total of 37% glass areas as analyzed in Technical Report 2. This high percentage of glass leads to a high solar load on the building. An analysis will be performed to see the load reduction possibilities for external solar shading. An energy model will be performed using Trane Trace to evaluate the solar shading effect on internal load.

External aluminum solar shading was constructed on the North West corner of the building. To evaluate the architectural impact of solar shading on all four sides of the building, an architectural model will be constructed using Autodesk Revit and Adobe Photoshop. Different types of solar shadings will be modeled in Revit to determine which type is the most aesthetically pleasing. This will be also accomplished by researching different solar shading products in the market today such as aluminum shading and electronically controlled shading.

Fenestration Area			
Façade	Gross Wall (sf)	Glass (sf)	Fenestration %
East	6565	2542	38.7
South	10927	4082	37.4
West	4695	910	19.4
North	4274	2288	53.5
Total	26461	9822	37.1

Table-3 Fenestration Area

7.2 Electrical

The changing of the building mechanical system will have an impact on the design of the electrical system. Implementing the dedicated outdoor air system with chilled beam will possibly reduce the size of the chillers because less amount of air will be conditioned. However, by adding chilled beams into the system, more electricity will be needed to power the chilled beams. The other design alternative is to implement heat recovery systems to reduce the energy needed to condition the outside air. At the same time, energy is needed to power the heat recovery systems. Therefore, an electrical analysis will be done to determine the power distribution requirements for the facility as compared to the existing design with respect to energy consumption and additional cost.