7 Breadth Topics

7.1 Architectural

To reduce the external thermal load on the building, an architectural breath will be explored. The existing building contains a total of 37% glass area as analyzed in Technical Report 2. This high percentage of glass leads to a high solar load on the building. A study of the solar shading system will be done to determine whether or not the aid of solar shades will reduce external loads and reduce the amount of energy need to condition the building.

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

In addition, building envelope such as roof construction, wall material will be examined to optimize the envelope for lowering summer solar gains as well as reducing winter thermal losses.

7.2 Construction

Most heat recovery systems require the main supply and exhaust ducts to be adjacent to each other. Additional space is required for heat recovery device and pumps. Employing the Dedicated Outdoor Air System should reduce equipment and duct sizes. However, additional hot water and chilled water supply and return pipes are required for the chilled beam system. Impact of the redesign on the coordination of the system will be evaluated. An coordination study on the mechanical rooms and building coordination will be done to make sure the redesign system can fit inside the space.