

Breadth Topics

In order to create a smooth flowing presentation, only breadth topics that would flow well with the overall project were considered. Two topics stood out from the rest: daylighting and acoustics.

Daylighting

Daylighting was the original breadth topic considered. Several different aspects would be considered in a daylight study. Currently the building has daylight harvesting sensors and programmed dimmers in order to minimize the electric light usage. However, the quality and quantity of available daylight is questionable. From studies in AE 565 (daylighting) the use of daylight in a space is very specific. There must be a minimum level at the task plane, there cannot be direct sunlight in the space, too much daylight could also have an impact on the HVAC equipment. Modeling the building and running daylight simulation would be an appropriate breadth topic. This would provide the necessary information regarding whether there is enough available daylight given the site location and building orientation to justify the additional expenses of daylight sensors and dimming systems. Possible redesigns might include modifying the existing system by rewiring luminaires, removing some sensors in locations where dimming is not an option, incorporating shades/louvers, or even changing the glazing type/layout to increase the efficiency/quality of daylight entering the space. Two references, one regarding daylight quality and lighting techniques and the other discussing the effect daylight has on HVAC systems are included in the references.

Acoustics

Acoustics are an important part of any design, especially in a school. For a second breadth topic an evaluation of the individual classrooms and labs from an acoustical perspective would be appropriate. This would include evaluating the reverberation times, checking the NC ratings for the HVAC equipment, and checking the transmission loss through the walls to adjacent spaces. Possible redesigns could include changing the materials in the rooms, changing the room layout, or changing the wall constructions.

MAE/BAE Qualification

In order to qualify for the integrated program the proposal must include design objects learned in master level classes. In the proposal two such design objectives have been included: daylighting and thermal storage.