

## Lewis Hall Ventilation and Cooling

### Option A: (Full Mechanical Cooling )

All spaces in the building have mechanical cooling (ie. Air Conditioning)

Pros & Cons:

- Full Cooling requires a large, chiller which will replace the visible green roof
- Need to find sufficient operational efficiencies in other systems
- Comfort Level: Easier to control interior temperature on hot days
- Recommendation will be for fitting each operable window with a switch that will shut off the system zone when the window is open
- Costs approximately \$1,500 more annually than Option B for operations (i.e. utility bills).

### Option B (Assigned Mechanical Cooling & Mixed Mode Ventilation):

The classrooms on the 2nd & 3rd floors, and all of the 4th floor will be mechanically cooled; the remainder of the building will utilize fan-assisted natural ventilation.

Pros & Cons:

- Dedicated shafts per floor to draw air up and out of the building
- Chiller is substantially smaller, so a green roof can be accommodated
- Enclosed spaces will need a vent or jalousie window to allow air flow to the hallway
- Fan velocity will adjust based on the outside temperature, to help cool the building.
- On very hot days the increased inside temperature will peak in the late afternoon hours.
- Cost is approximately \$300,000 less than Option A in first cost (i.e. purchase & installation).
- Cost is ~\$500 more annually than Option A for maintenance, due to the mix of a natural ventilation system and partial mechanical cooling of other spaces (i.e. more time from service staff)

### Temperature data

The following information is based on occupants in Lewis Hall Monday thru Friday from 7:00 AM to 7:00 PM. This is also in direct correlation to the amount of equipment, people, and lighting in each of the iSchool's programmed spaces, and the heat being given off.

- 10 months of the year (September – June) there will be a total of approximately 60 hours (or 2%) of the occupied hours where the building will feel at or above 85°F. The remaining 98% of the time, the temperature should be an acceptable level of comfort.
- 2 months of the year (July—August)
  - 52 hours or 18% of the time the temp will be above 80°F
  - 80 hours or 28% of the time the temp will be above 77°F
  - Approx 2 hours per day above 77° probably 3:00-5:00 PM

Note: The difference between greenhouse gas emissions for Option A and B is approximately 30,000 lbs or 15 tons annually—roughly equal to what two average residences release each year associated with electricity use.