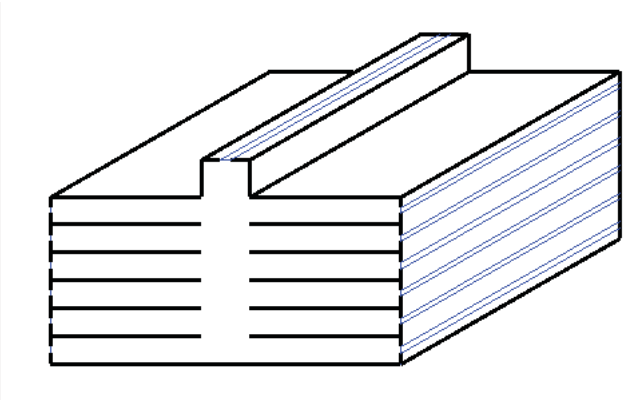
Ellison Turpin
Assignment 08 - Meyerson Hall Ventilation

ARCH 631
Environmental Systems I

Design 1:
Central Atrium

Use of a Central Atrium running through Meyerson Hall allowed the building to be naturally ventilated in the Summer and early Fall months. The building was 100% comfortable during the Fall months using operable windows and night flushing. During the summer months, the mornings and evenings were comfortable, while the peak afternoon hours were too hot to use natural ventilation.



Building dimensions

Number of floors:	6	
Floor length:	105	ft
Floor (bay) width:	62.7	ft
Floor-to-floor height:	11.5	ft
Floor-to-ceiling height:	9.8	ft
Shaft width:	20	ft
Shaft height:	15	ft

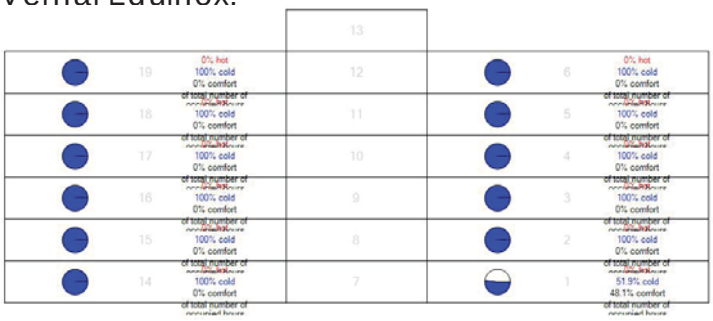
Scenario summary

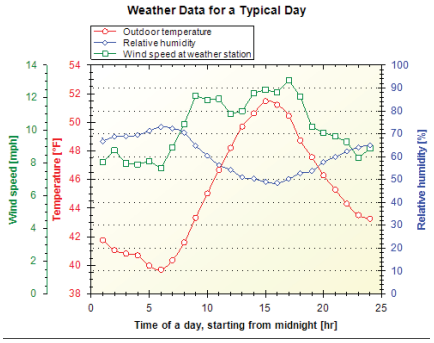
Simulation type: transient

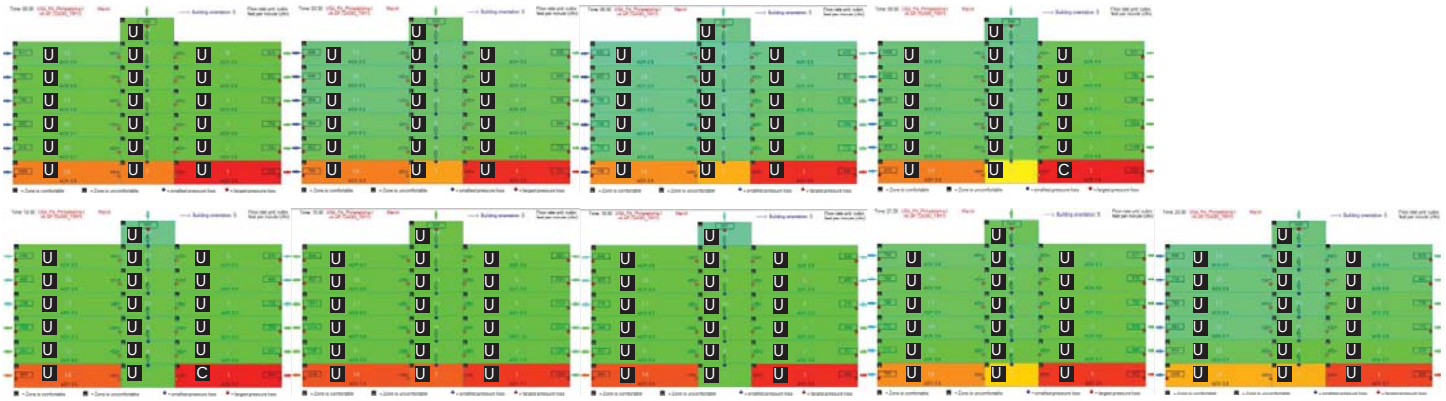
Building type: central atrium

Building footprint:	15120.0	ft^2
Occupied area per floor:	13020.0	ft^2
Glazing-to-wall ratio per floor:	6.2	%
Opening-to-wall ratio per floor:	1.8	%
Ratio of roof opening to roof area:	0.5	%

Vernal Equinox:







***I had some difficulty with CoolVent giving me weird results with the “Thermal Comfort Analysis” simply saying everything was 100% comfortable when the animation showed otherwise. ***

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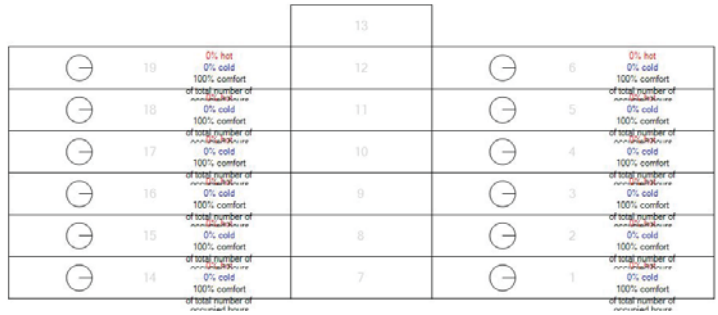
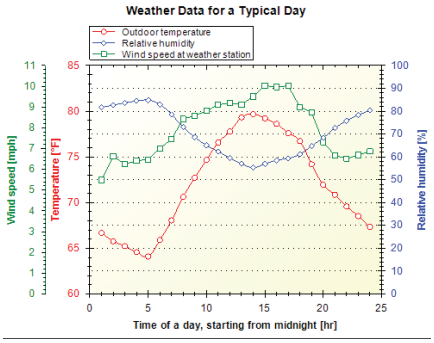
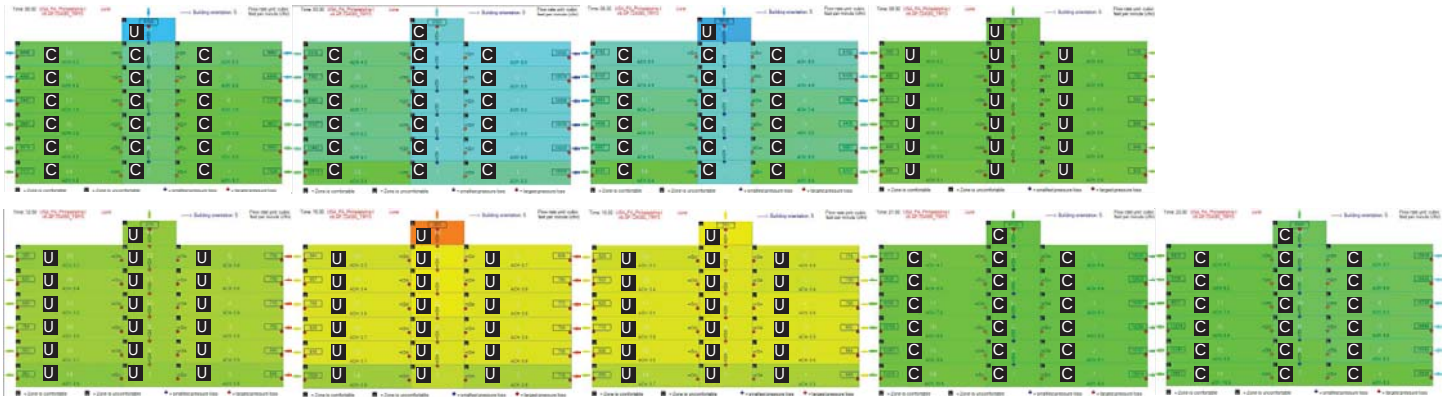
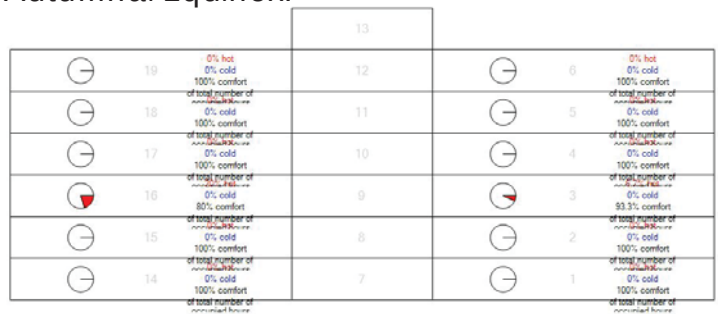
Summer Solstice:

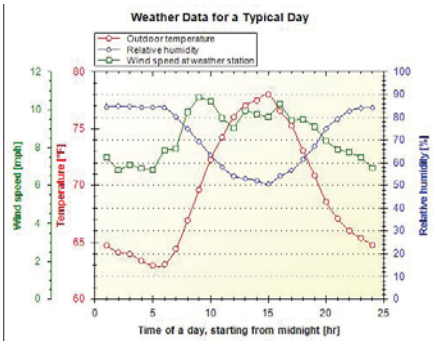


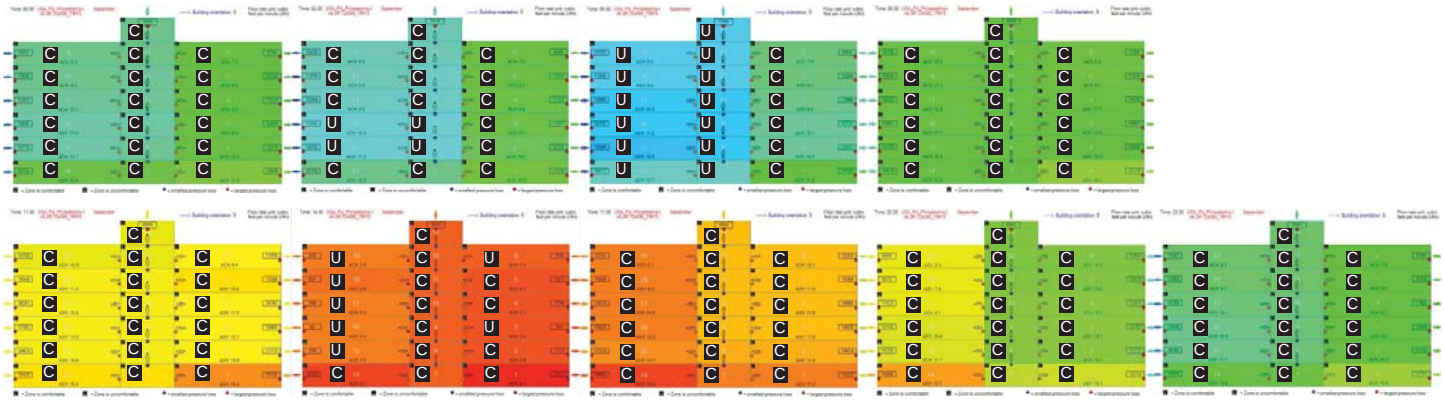




Autumnal Equinox:







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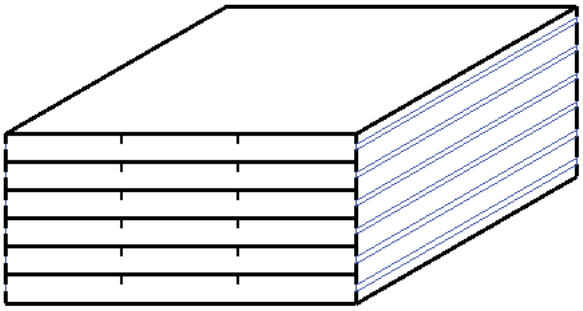
Design 2:
Cross Ventilation

Use of Cross Ventilation helps to make the space comfortable in the mornings and afternoons, but during the Summer and Fall the heat of the afternoon makes the space too hot. Dividing the volume in to 3 typically meant the that inner mixing chamber trended comfortable.



Building dimensions

Number of sections:	3	
Number of floors:	6	
Floor length:	105	ft
Section width:	48	ft
Floor-to-floor height:	11.6	ft
Floor-to-ceiling height:	9.7	ft

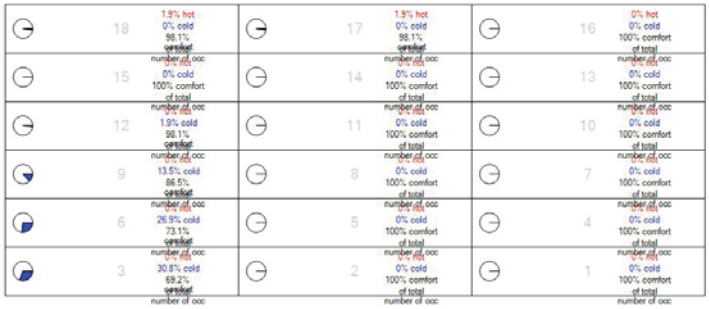
Scenario summary

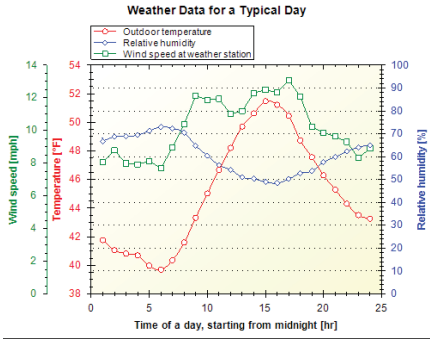
Simulation type: transient

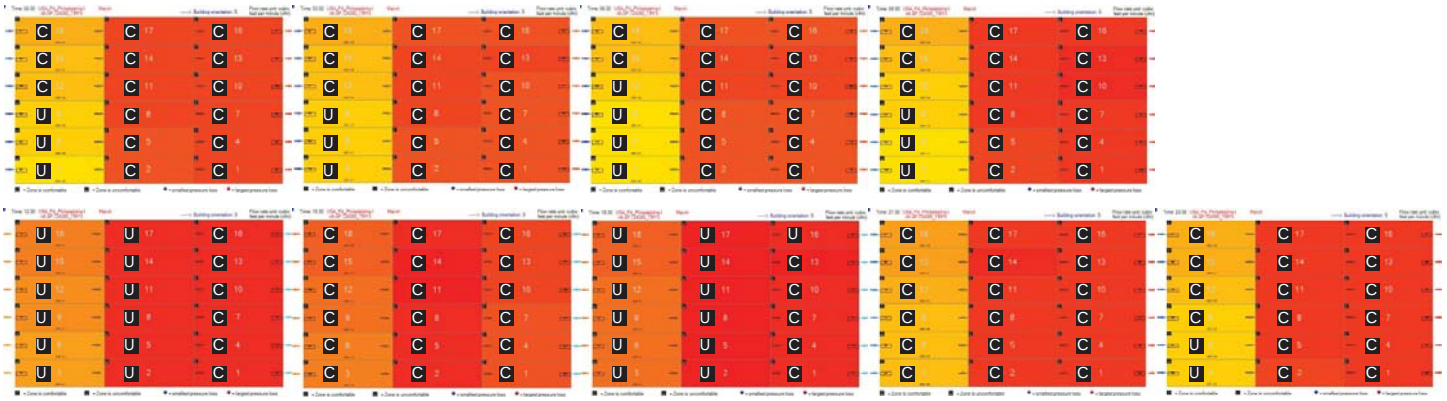
Building type: cross ventilation

Building footprint:	15120.0	ft^2
Occupied area per floor:	15120.0	ft^2
Glazing-to-wall ratio per floor:	6.2	%
Opening-to-wall ratio per floor:	1.8	%
Ratio of roof opening to roof area:	0.0	%

Vernal Equinox:







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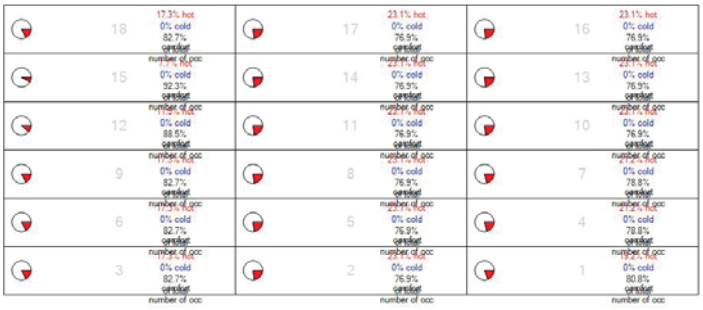
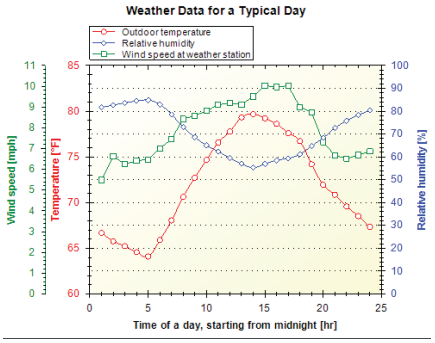
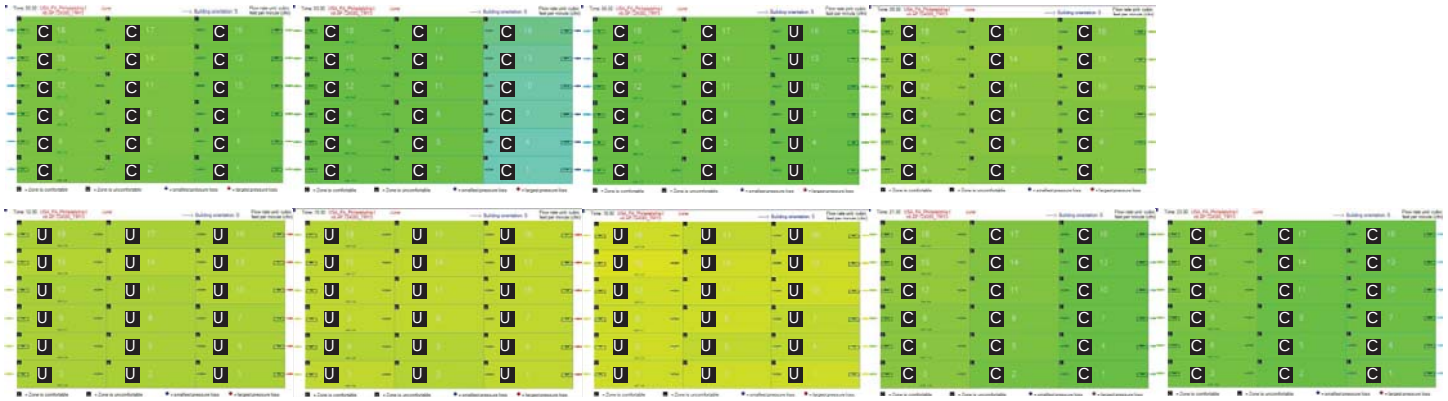
Summer Solstice:







Autumnal Equinox: