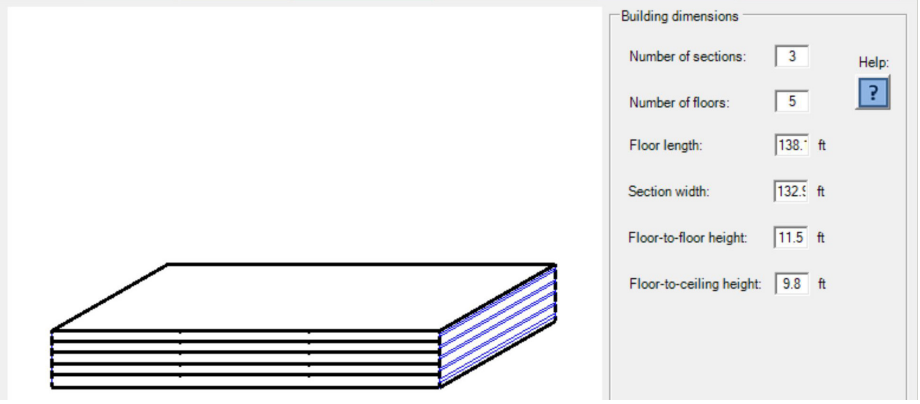
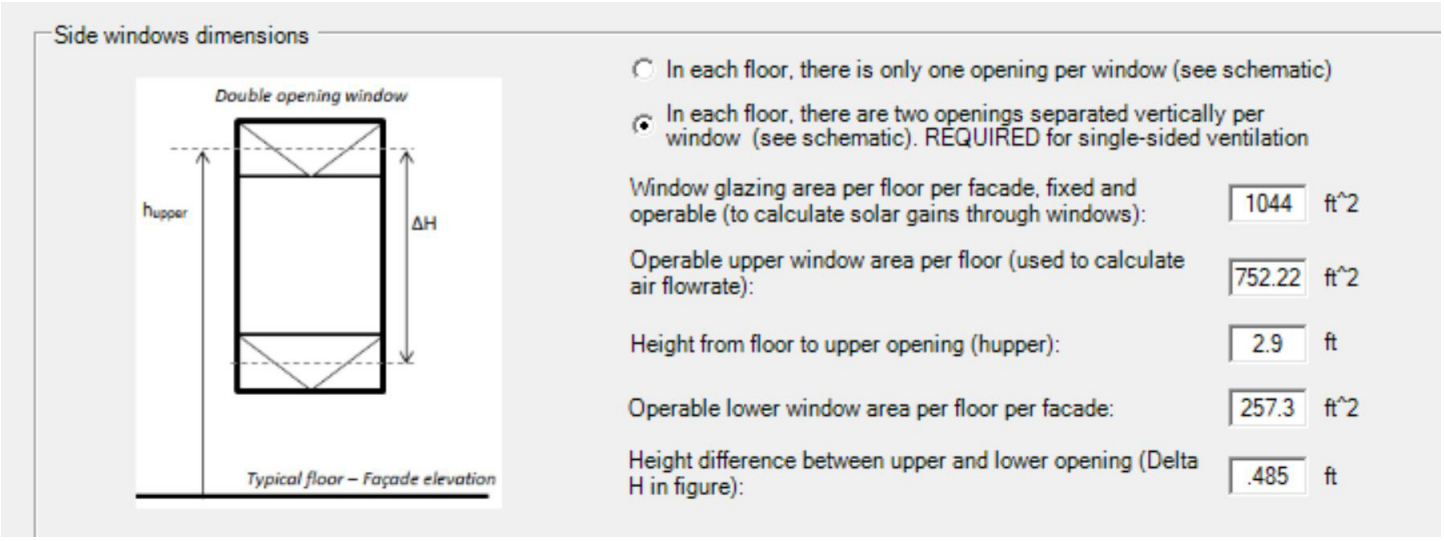
MEYERSON HALL - CURRENT STATE

JINAH OH

I ATTEMPTED TO CREATE A SIMILAR MODEL TO MEYERSON HALL AT IT'S CURRENT STATE. I MAINLY FOCUSED ON EMULATING THE WINDOWS AT MY LEVEL OF THE STUDIO (LEVEL TWO, WHERE THERE IS A LARGE FIXED WINDOW ABOVE SMALL OPERABLE WINDOWS). I WAS HOPING TO USE THIS MODEL AS A BASE LINE WHEN COMPARING IT TO MY TWO DESIGN PROOPSOALS FOR NATURAL VENTILATION.





SUMMER SOLTICE (June 21)

15 — 100% hot, 0% cold, 0% comfort of total number of occupied hours	14 — 100% hot, 0% cold, 0% comfort of total number of occupied hours	13 — 100% hot, 0% cold, 0% comfort of total number of occupied hours
12 — 100% hot, 0% cold, 0% comfort of total number of occupied hours	11 — 100% hot, 0% cold, 0% comfort of total number of occupied hours	10 — 100% hot, 0% cold, 0% comfort of total number of occupied hours
9 — 100% hot, 0% cold, 0% comfort of total number of occupied hours	8 — 100% hot, 0% cold, 0% comfort of total number of occupied hours	7 — 100% hot, 0% cold, 0% comfort of total number of occupied hours
6 — 100% hot, 0% cold, 0% comfort of total number of occupied hours	5 — 100% hot, 0% cold, 0% comfort of total number of occupied hours	4 — 100% hot, 0% cold, 0% comfort of total number of occupied hours
3 — 100% hot, 0% cold, 0% comfort of total number of occupied hours	2 — 100% hot, 0% cold, 0% comfort of total number of occupied hours	1 — 100% hot, 0% cold, 0% comfort of total number of occupied hours

ACCORDING TO THE COOLVENT ANALYSIS, THE MONTH OF JUNE PROVES TO BE 100% HOT IN ALL ZONES OF THE BUILDING, LEAVING 0% COMFORT OF TOTAL NUMBER OF OCCUPIED HOURS.

WINTER SOLSTICE

 15 85% hot 0% cold 15% comfort of total number of occupied hours	 14 100% hot 0% cold 0% comfort of total number of occupied hours	 13 100% hot 0% cold 0% comfort of total number of occupied hours
 12 100% hot 0% cold 0% comfort of total number of occupied hours	 11 100% hot 0% cold 0% comfort of total number of occupied hours	 10 100% hot 0% cold 0% comfort of total number of occupied hours
 9 100% hot 0% cold 0% comfort of total number of occupied hours	 8 100% hot 0% cold 0% comfort of total number of occupied hours	 7 100% hot 0% cold 0% comfort of total number of occupied hours
 6 100% hot 0% cold 0% comfort of total number of occupied hours	 5 100% hot 0% cold 0% comfort of total number of occupied hours	 4 100% hot 0% cold 0% comfort of total number of occupied hours
 3 100% hot 0% cold 0% comfort of total number of occupied hours	 2 100% hot 0% cold 0% comfort of total number of occupied hours	 1 100% hot 0% cold 0% comfort of total number of occupied hours

DURING DECEMEBER, THE MONTH OF THE WINTER SOLSTICE, ZONE 15 SHOWS 85% HOT LEVELS, WHICH ALLOWS FOR 15% COMFORT, ALL OTHER ZONES SHOW 100% HOT AND 0% COMFORT.

AUTUMNAL EQUINOX

 15 100% hot 0% cold 0% comfort of total number of occupied hours	 14 100% hot 0% cold 0% comfort of total number of occupied hours	 13 100% hot 0% cold 0% comfort of total number of occupied hours
 12 100% hot 0% cold 0% comfort of total number of occupied hours	 11 100% hot 0% cold 0% comfort of total number of occupied hours	 10 100% hot 0% cold 0% comfort of total number of occupied hours
 9 100% hot 0% cold 0% comfort of total number of occupied hours	 8 100% hot 0% cold 0% comfort of total number of occupied hours	 7 100% hot 0% cold 0% comfort of total number of occupied hours
 6 100% hot 0% cold 0% comfort of total number of occupied hours	 5 100% hot 0% cold 0% comfort of total number of occupied hours	 4 100% hot 0% cold 0% comfort of total number of occupied hours
 3 100% hot 0% cold 0% comfort of total number of occupied hours	 2 100% hot 0% cold 0% comfort of total number of occupied hours	 1 100% hot 0% cold 0% comfort of total number of occupied hours

DURING SEPTEMBER, THERE IS THE SAME CONDITIONS ACROSS THE ZONES, 100% HOT, 0% COLD, 0% COMFORT.

VERNAL EQUINOX

15 100% hot 0% cold 0% comfort of total number of occupied hours	14 100% hot 0% cold 0% comfort of total number of occupied hours	13 85% hot 0% cold 15% comfort of total number of occupied hours
12 100% hot 0% cold 0% comfort of total number of occupied hours	11 100% hot 0% cold 0% comfort of total number of occupied hours	10 98.3% hot 0% cold 1.7% comfort of total number of occupied hours
9 100% hot 0% cold 0% comfort of total number of occupied hours	8 100% hot 0% cold 0% comfort of total number of occupied hours	7 98.3% hot 0% cold 1.7% comfort of total number of occupied hours
6 100% hot 0% cold 0% comfort of total number of occupied hours	5 100% hot 0% cold 0% comfort of total number of occupied hours	4 98.3% hot 0% cold 1.7% comfort of total number of occupied hours
3 100% hot 0% cold 0% comfort of total number of occupied hours	2 100% hot 0% cold 0% comfort of total number of occupied hours	1 98.3% hot 0% cold 1.7% comfort of total number of occupied hours

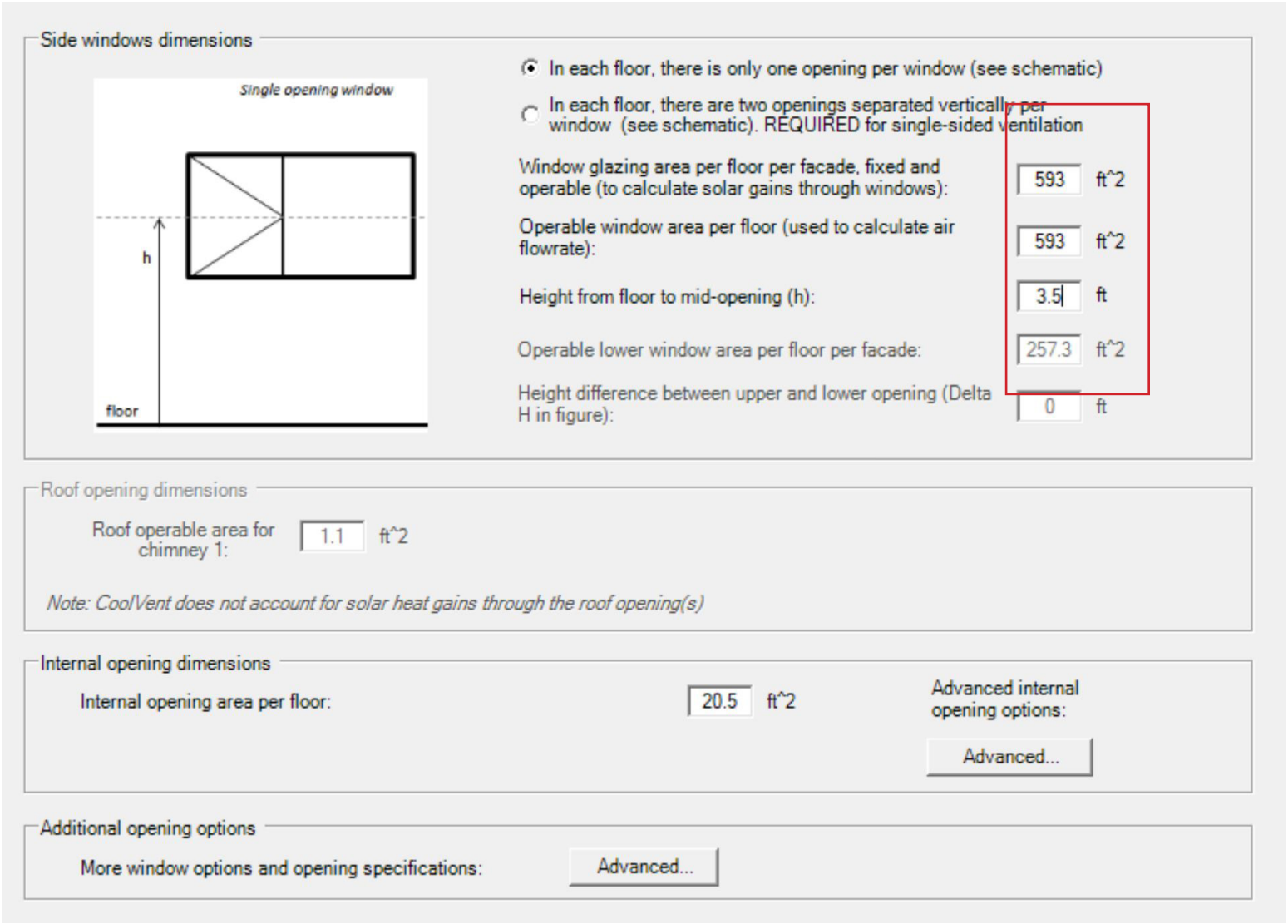
MARCH SHOWS SOME MILD DIFFERENCES--ZONE 13 HAS 85% HOT, 0% COLD, AND 15% COMFORT. ZONES 10, 7, 4, AND 1 ALL HAVE 98.3% HOT WHICH IS LOWER THAN THE OTHER ZONES, BUT ONLY RESULTS IN 1.7% COMFORT.

I TRIED MY BEST TO MATCH THE CONDITIONS OF MEYERSON WITHOUT GETTING INTO THE ADVANCED AND HYBRID VENTILATION SYSTEMS THAT COOLVENT OFFERS. I DID FIND IT CHALLENGING TO CHOOSE WINDOW CONDITIONS THAT WORKED FOR EVERY LEVEL OF MEYERSON ACROSS THE BOARD AS EACH LEVEL IS DIFFERENT AND VERY FEW ARE EVEN OPERABLE.

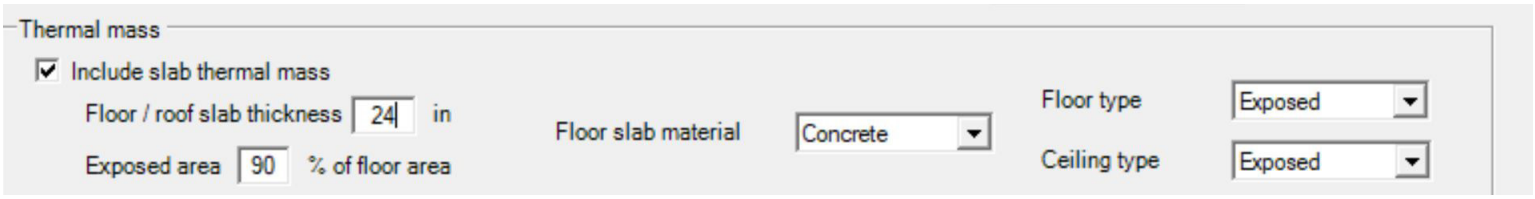
THE DIMENSIONS AND ASSUMPTIONS I MADE ARE SHOWN ON PAGE 1, ADDITIONAL ASSUMPTIONS I HAVE MADE WERE CHOOSING TRANSIENT (24 HOUR) AS A SIMULATION TYPE, CROSS VENTILATION AS THE MODEL, HEAT SOURCE LEVEL AS EDUCATION, AND OCCUPANCY SCHEDULE AS FROM 9 HRS TO 24 HOURS.

DESIGN PROPOSAL_01

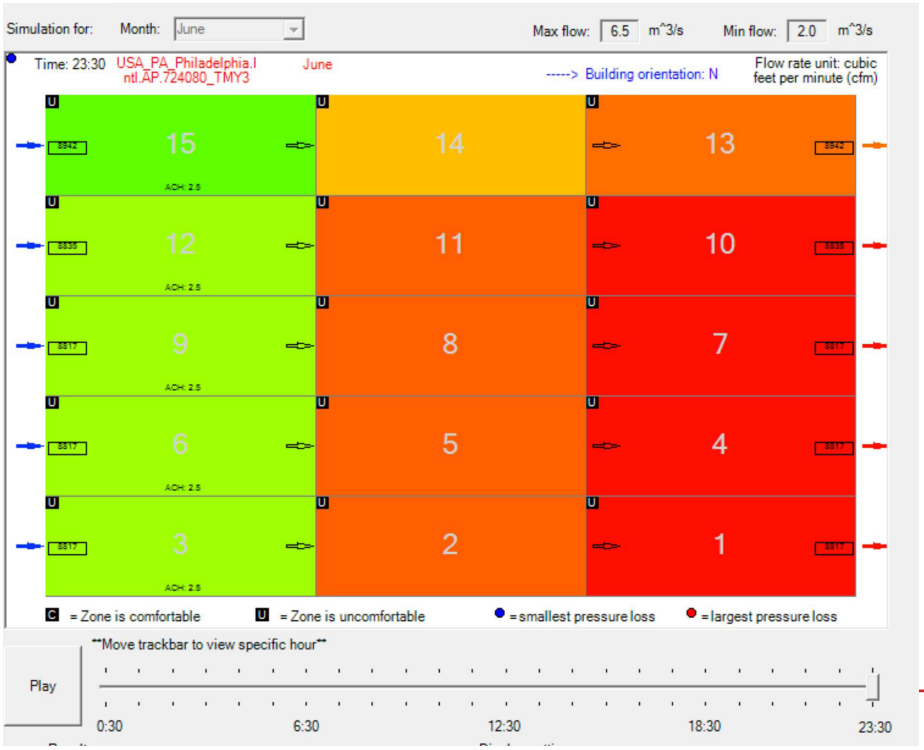
FOR THIS PROPOSAL, I KEPT ALL VALUES EXCEPT FOR THE WINDOW DIMENSIONS THE SAME, SO THAT I COULD HAVE SOME TYPE OF CONSISTANCY AND ELEMENTS THAT REMAINED AS "CONTROL" ELEMENTS. THE BUILDING TYPE REMAINED THE SAME AS "CROSS VENTILATION"



I LOWERED THE SQUARE FOOTAGE OF GLAZING PER FACADE, AS WELL AS MINIMIZED IT TO ONLY ONE OPENING PER WINDOW ON EACH FLOOR. THE PREVIOUS CONDITION OF MEYERSON PROVED TO BE TOO HOT IN MOST TIMES OF THE YEAR--WHICH LEAD ME TO BELIEVE THAT THERE WAS TOO MUCH GLAZING WHICH COULD CAUSE AN EXCESS OF HEAT DURING THE DAY.



AS THE ORIGINAL DESIGN OF MEYERSON HAD 14.4 INCH FLOOR SLABS, I INCREASED THE THICKNESS TO 24 INCHES IN HOPES THAT A LARGER THERMAL MASS COULD AID IN THE PASSIVE COOLING AND HEATING OF THE BUILDING.



SHOWN AT HOUR 23:30

SUMMER SOLTICE

15 — 100% hot, 0% cold, 0% comfort of total number of occupied hours	14 — 100% hot, 0% cold, 0% comfort of total number of occupied hours	13 — 100% hot, 0% cold, 0% comfort of total number of occupied hours
12 — 100% hot, 0% cold, 0% comfort of total number of occupied hours	11 — 100% hot, 0% cold, 0% comfort of total number of occupied hours	10 — 100% hot, 0% cold, 0% comfort of total number of occupied hours
9 — 100% hot, 0% cold, 0% comfort of total number of occupied hours	8 — 100% hot, 0% cold, 0% comfort of total number of occupied hours	7 — 100% hot, 0% cold, 0% comfort of total number of occupied hours
6 — 100% hot, 0% cold, 0% comfort of total number of occupied hours	5 — 100% hot, 0% cold, 0% comfort of total number of occupied hours	4 — 100% hot, 0% cold, 0% comfort of total number of occupied hours
3 — 100% hot, 0% cold, 0% comfort of total number of occupied hours	2 — 100% hot, 0% cold, 0% comfort of total number of occupied hours	1 — 100% hot, 0% cold, 0% comfort of total number of occupied hours

JUNE SHOWS NO IMPROVEMENTS IN ANY OF THE ZONES AFTER CHANGES TO THE WINDOWS.

WINTER SOLSTICE

	15	76.7% hot 0% cold 23.3% comfort of total number of occupied hours		14	100% hot 0% cold 0% comfort of total number of occupied hours		13	100% hot 0% cold 0% comfort of total number of occupied hours
	12	85% hot 0% cold 15% comfort of total number of occupied hours		11	100% hot 0% cold 0% comfort of total number of occupied hours		10	100% hot 0% cold 0% comfort of total number of occupied hours
	9	85% hot 0% cold 15% comfort of total number of occupied hours		8	100% hot 0% cold 0% comfort of total number of occupied hours		7	100% hot 0% cold 0% comfort of total number of occupied hours
	6	85% hot 0% cold 15% comfort of total number of occupied hours		5	100% hot 0% cold 0% comfort of total number of occupied hours		4	100% hot 0% cold 0% comfort of total number of occupied hours
	3	85% hot 0% cold 15% comfort of total number of occupied hours		2	100% hot 0% cold 0% comfort of total number of occupied hours		1	100% hot 0% cold 0% comfort of total number of occupied hours

RESULTS SHOW THAT COMFORT HAS INCREASED IN ZONES, 15, 12, 9, 6, AND 3, IN COMPARISON TO THE ORIGINAL SETTINGS OF MEYERSON. IT IS CLEAR THAT THE CHANGES TO THE WINDOWS MADE SOME IMPROVEMENTS IN TERMS OF %HOT AND % OF COMOFORT.

AUTUMNAL EQUINOX

	15	100% hot 0% cold 0% comfort of total number of occupied hours		14	100% hot 0% cold 0% comfort of total number of occupied hours		13	100% hot 0% cold 0% comfort of total number of occupied hours
	12	100% hot 0% cold 0% comfort of total number of occupied hours		11	100% hot 0% cold 0% comfort of total number of occupied hours		10	100% hot 0% cold 0% comfort of total number of occupied hours
	9	100% hot 0% cold 0% comfort of total number of occupied hours		8	100% hot 0% cold 0% comfort of total number of occupied hours		7	100% hot 0% cold 0% comfort of total number of occupied hours
	6	100% hot 0% cold 0% comfort of total number of occupied hours		5	100% hot 0% cold 0% comfort of total number of occupied hours		4	100% hot 0% cold 0% comfort of total number of occupied hours
	3	100% hot 0% cold 0% comfort of total number of occupied hours		2	100% hot 0% cold 0% comfort of total number of occupied hours		1	100% hot 0% cold 0% comfort of total number of occupied hours

SEPTEMBER SHOWS NO CHANGES

VERNAL EQUINOX

 15 100% hot 0% cold 0% comfort of total number of occupied hours	 14 100% hot 0% cold 0% comfort of total number of occupied hours	 13 80% hot 0% cold 20% comfort of total number of occupied hours
 12 100% hot 0% cold 0% comfort of total number of occupied hours	 11 100% hot 0% cold 0% comfort of total number of occupied hours	 10 83.3% hot 0% cold 16.7% comfort of total number of occupied hours
 9 100% hot 0% cold 0% comfort of total number of occupied hours	 8 100% hot 0% cold 0% comfort of total number of occupied hours	 7 83.3% hot 0% cold 16.7% comfort of total number of occupied hours
 6 100% hot 0% cold 0% comfort of total number of occupied hours	 5 100% hot 0% cold 0% comfort of total number of occupied hours	 4 83.3% hot 0% cold 16.7% comfort of total number of occupied hours
 3 100% hot 0% cold 0% comfort of total number of occupied hours	 2 100% hot 0% cold 0% comfort of total number of occupied hours	 1 85% hot 0% cold 15% comfort of total number of occupied hours

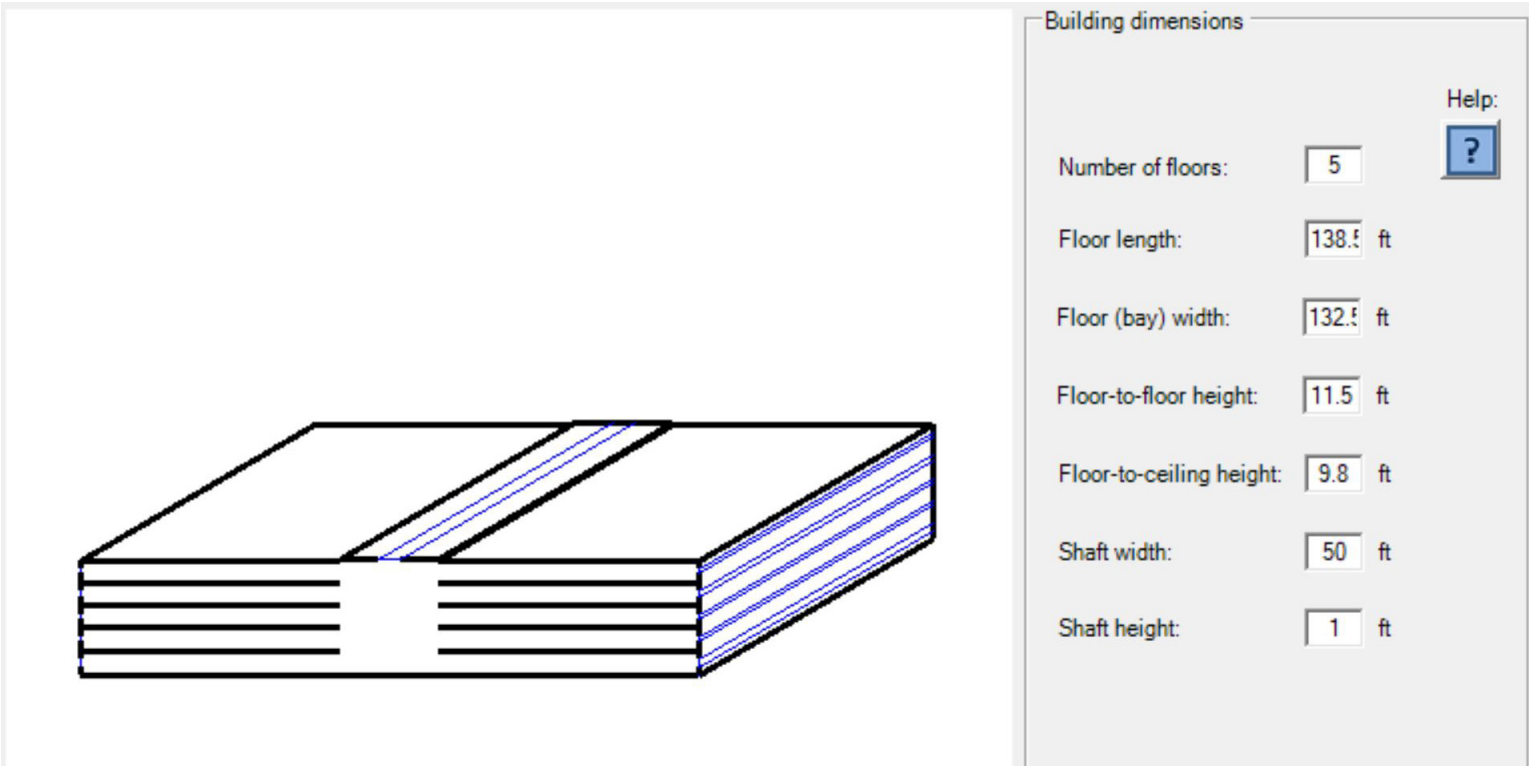
RESULTS SHOW AN IMPORVEMENT IN ZONE 13, 10, 7, 4, AND 1-- ORIGNALLY COMFORT WAS AT 1.7% BUT NOW HAS RAISED TO 16.7%. ZONE 13 EXPERIENCED A DECREASE IN HOT % AND THUS RAISED IN COMFORT BY 5%. ZONE 1 ROSE 13.3%.

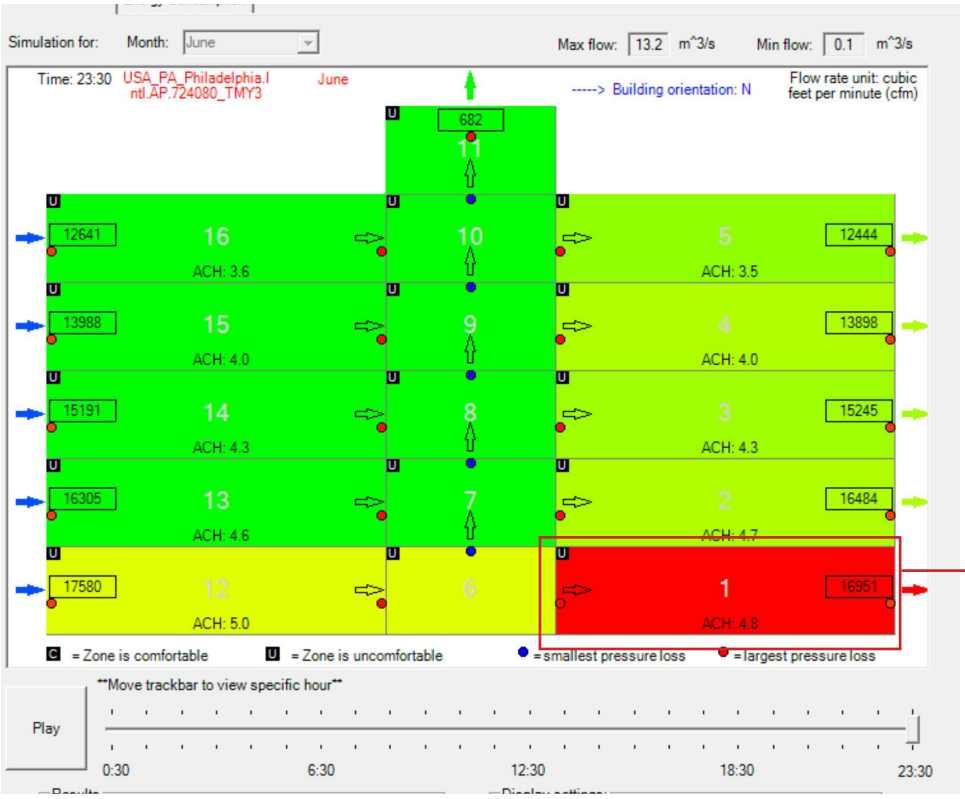
THE SIMPLE CHANGE IN GLAZING SQUARE FOOTAGE AND THICKENING OF THE FLOOR SLAB SEEMED TO ONLY MAKE A DIFFERENT IN DECEMBER AND MARCH.

DESIGN PROPOSAL_02

FOR THIS PROPOSAL, I WANTED TO CHANGE THE SORT OF BUILDING TYPOLOGY AND ADD AN ATRIUM IN ORDER TO IMPROVE THE NATURAL VENTILATION IN MEYERSON. I KEPT ALL THE WINDOW VALUES THE SAME IN ORDER TO BETTER SEE THE INFLUENCE OF THE ATRIUM SPACE.

I WAS CONCERNED WITH HAVING THE ATRIUM TO TALL AND CAUSING MORE PROBLEMS WITH AIR FLOW SO I TRIED TO MINIMIZE THE SHAFT HEIGHT TO JUST THE 5 FLOORS. COOLVENT HOWEVER, DOES NOT ALLOW YOU DO HAVE A SHAFT HEIGHT OF 0 SO CURRENTLY IT IS AT 1 FT.





AT 23:30 IN JUNE, ZONE 1 SEEMS TO HAVE THE HIGHEST HEAT. THIS IS CONSISTANT WITH THE PREVIOUS DESIGN. HOWEVER ALL OTHER ZONES SHOW SIGNS OF IMPROVEMENT OR COOLER VALUES.

SUMMER SOLTICE

			11				
	16	98.3% hot 0% cold 1.7% comfort of total number of occupied hours	10		5	98.3% hot 0% cold 1.7% comfort of total number of occupied hours
	15	98.3% hot 0% cold 1.7% comfort of total number of occupied hours	9		4	100% hot 0% cold 0% comfort of total number of occupied hours
	14	100% hot 0% cold 0% comfort of total number of occupied hours	8		3	100% hot 0% cold 0% comfort of total number of occupied hours
	13	100% hot 0% cold 0% comfort of total number of occupied hours	7		2	100% hot 0% cold 0% comfort of total number of occupied hours
	12	100% hot 0% cold 0% comfort of total number of occupied hours	6		1	100% hot 0% cold 0% comfort of total number of occupied hours

JUNE VALUES SHOW SLIGHT IMPROVEMENT IN ZONES 16, 15, AND 5, WITH COMFORT % AT 1.7% TO THE FORMER 0%. THE HOT% HAS DECREASED SLIGHTLY FROM THE ADDED ATRIUM.

WINTER SOLSTICE

			11				
	16	0% hot 100% cold 0% comfort of total number of occupied hours	10		5	0% hot 100% cold 0% comfort of total number of occupied hours
	15	0% hot 100% cold 0% comfort of total number of occupied hours	9		4	0% hot 100% cold 0% comfort of total number of occupied hours
	14	0% hot 100% cold 0% comfort of total number of occupied hours	8		3	0% hot 100% cold 0% comfort of total number of occupied hours
	13	0% hot 93.3% cold 6.7% comfort of total number of occupied hours	7		2	0% hot 100% cold 0% comfort of total number of occupied hours
	12	20% hot 11.7% cold 68.3% comfort of total number of occupied hours	6		1	0% hot 1.7% cold 98.3% comfort of total number of occupied hours

DECEMBER SHOWS WHAT APEARS TO BE ALMOST OPPOSITE VALUES OF DESIGN 1. DESIGN 1 HAD ISSUES OF HIGH % IN HOT VALUES LEADING TO 0% COMFORT. THE ADDITION OF THE ATRIUM HAS RELIEVED THE HEAT ISSUE BUT IS NOW SHOWING AS 100% COLD AND STILL, 0% COMFORT IN MANY ZONES (16, 15, 14, 5, 4, 3, 2). ZONE 12 SHOWS IMPROVEMENT OF 20% HOT AND 11.7% COLD, BRINGING THE PREVIOUSLY 0% COMOFORT TO 68.3%. THE BEST IMPROVEMENT LIES IN ZONE 1 WHERE THERE IS 0% HOT AND 1.7% COLD, LEADING TO 98.3 COMFORT.

AUTUMNAL EQUINOX

			11				
	16	98.3% hot 0% cold 1.7% comfort of total number of occupied hours	10		5	93.3% hot 0% cold 6.7% comfort of total number of occupied hours
	15	98.3% hot 0% cold 1.7% comfort of total number of occupied hours	9		4	95% hot 0% cold 5% comfort of total number of occupied hours
	14	98.3% hot 0% cold 1.7% comfort of total number of occupied hours	8		3	93.3% hot 0% cold 6.7% comfort of total number of occupied hours
	13	98.3% hot 0% cold 1.7% comfort of total number of occupied hours	7		2	93.3% hot 0% cold 6.7% comfort of total number of occupied hours
	12	100% hot 0% cold 0% comfort of total number of occupied hours	6		1	100% hot 0% cold 0% comfort of total number of occupied hours

SEPTEMBER SHOWS SMALL BUT CONSISTANT IMPROVEMENT ACROSS ALMOST ALL ZONES (NO IMPROVEMENT IN ZONE 12 AND 1). HOT % DROPPED FROM 100 TO 93.3%, ALLOWING 6.7% COMFORT IN ZONE 5 AND ZONE 3. ZONE 16, 15, 14, AND 13 HAVE ONLY 1.7% COMFORT.

VERNAL EQUINOX

			11				
	16	0% hot 100% cold 0% comfort of total number of occupied hours	10		5	0% hot 100% cold 0% comfort of total number of occupied hours
	15	0% hot 91.7% cold 8.3% comfort of total number of occupied hours	9		4	0% hot 100% cold 0% comfort of total number of occupied hours
	14	0% hot 88.3% cold 11.7% comfort of total number of occupied hours	8		3	0% hot 100% cold 0% comfort of total number of occupied hours
	13	0% hot 66.7% cold 33.3% comfort of total number of occupied hours	7		2	0% hot 85% cold 15% comfort of total number of occupied hours
	12	48.3% hot 1.7% cold 50% comfort of total number of occupied hours	6		1	15% hot 15% cold 70% comfort of total number of occupied hours

MARCH IS AN INTERESTING CHANGE AS SOME ZONES IMPROVED WHILE OTHERS WORSENED. ZONE 16, 5, 4, AND 3 ALL ARE THE SAME AS DESIGN OPTION 1. ZONE 15, 14, AND 13, ALL IMPROVED FROM THE PREVIOUS DESIGN ITERATION BY LOWERING THE COLD % AND THERABY INCREASING THE COMFORT PERCENTAGE. HOWEVER ZONES 12 AND 1 BOTH LOWERED IN COMFORT PERCENTAGE BECAUSE THE HEAT % OF BOTH ZONES INCREASED AFTER THE ADDITION OF AN ATRIUM SPACE.