

TECHNICAL ASSIGNMENT I
VENTILATION REPORT
ASHRAE STD 62-2004 METHOD

$$T = 3 \cdot v / Vbz$$

$$Vbz = Rp \cdot Pz + Ra \cdot Az$$

$$Voz = Vbz / Ez$$

$$Ez$$

$$Zp = Voz / Vpz$$

PREPARED BY EVAN HUGHES
OCTOBER 5, 2005
FOR DR. JELENA SREBRIC

JOHNS HOPKINS HOSPITAL MEDICAL OFFICE BUILDING
BALTIMORE MARYLAND

TABLE OF CONTENTS

COMPARATIVE DISCUSSION OF VENTILATION PROCEDURES	3
EXECUTIVE SUMMARY	4
AHU ZONE DIAGRAM	5
ASSUMPTIONS	6
PROCEDURE	7-8
DATA SHEETS	9-23
SUMMARY OF RESULTS	24

COMPARATIVE DISCUSSION OF VENTILATION PROCEDURES

THERE ARE TWO POSSIBLE VENTILATION PROCEDURES FOR DETERMINING THE APPROPRIATE AMOUNT OF OUTDOOR AIR TO BE SUPPLIED TO BUILDING SPACES. THE TWO METHODS ARE THE VENTILATION RATE PROCEDURE, AND THE INDOOR AIR QUALITY PROCEDURE.

THE FIRST AND MOST WIDELY USED IS THE VENTILATION RATE PROCEDURE. IT ESSENTIALLY GUESSES AT THE SPACES OCCUPANT NUMBERS FOR APPLICATION OF ITS OCCUPANT BASED VENTILATION RATE. IT ALSO INCLUDES A SPACE-SPECIFIC VENTILATION RATE BASED ON THE SPACES FLOOR AREA. BOTH THE OCCUPANT AND FLOOR AREA VENTILATION RATES ARE PRESCRIBED FOR DIFFERENT CLASSES OF SPACES, RANGING FROM OFFICES, TO PHARMACIES, TO CLASSROOMS.

THIS METHOD IS A PREVENTATIVE METHOD, MEANT TO ALWAYS OVER VENTILATE A SPACE TO KEEP CONTAMINANT LEVELS BELOW PREDETERMINED UNHEALTHY LEVELS. THE VRP IS THE METHOD OF VENTILATION USED IN THE MEDICAL OFFICE BUILDING.

THE SECOND METHOD, THE INDOOR AIR QUALITY PROCEDURE, IS A MORE REACTIONARY METHOD OF MAINTAINING HEALTHY SPACE CONDITIONS. THE IAQP USES A SYSTEM OF SENSORS TO MONITOR THE INDOOR AIR CONTAMINANT LEVELS. OFTEN, CO₂ CONCENTRATIONS ARE USED AS INDICATORS OF MULTIPLE CONTAMINANT CONCENTRATIONS. UPON THE CONCENTRATIONS REACHING UNHEALTHY LEVELS, THE CONTROL SYSTEM MODULATES THE AMOUNT OF AIR THE SPACE RECEIVES UNTIL THE INDOOR CONTAMINANT LEVELS AGAIN DROP TO PRESCRIBED SAFE LEVELS. THIS METHOD REQUIRES LESS AIR THAN THE VRP BUT REQUIRES A MORE COMPLICATED CONTROL SYSTEM.

EXECUTIVE SUMMARY

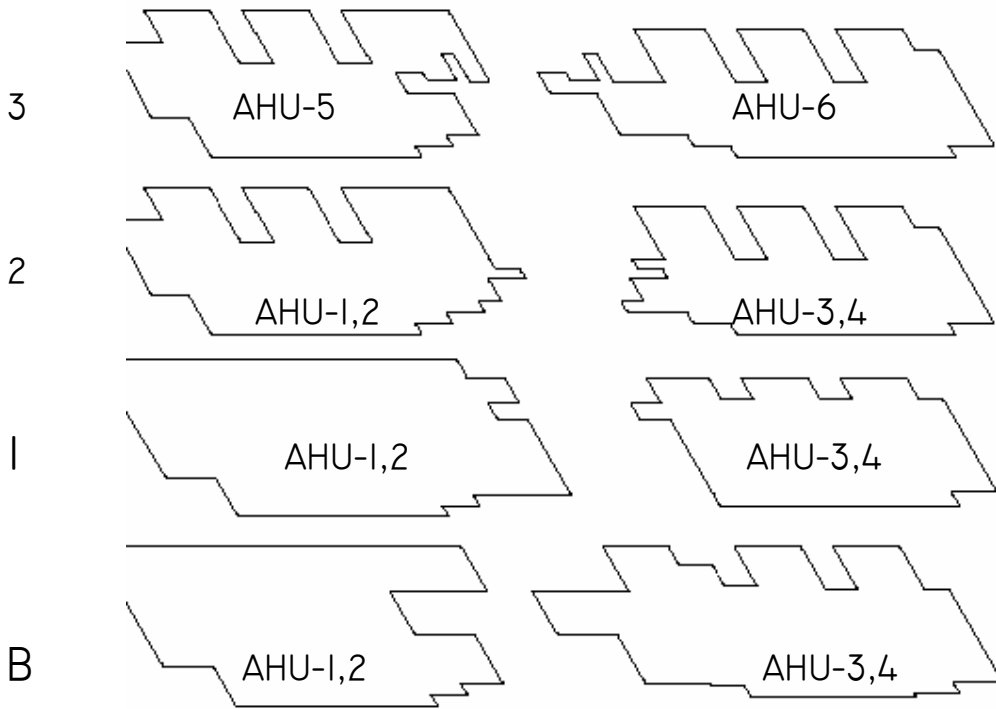
THE MOB IS AN 88,000 SQUARE FOOT BUILDING LOCATED IN BALTIMORE MARYLAND. IT CONSISTS OF FOUR FLOORS, BASEMENT, FIRST, SECOND AND THIRD. THE BUILDING IS SERVED BY SIX IDENTICAL PACKAGED ROOFTOP DX UNITS. EACH OF THE UNITS IS RATED AT 21,000CFM, WITH 10% OUTDOOR AIR.

FOUR OF THE AIR HANDLERS, AHU-1 THROUGH AHU-4 SERVE THE FLOORS, BASEMENT, FIRST, AND SECOND. THE THIRD FLOOR IS SERVED BY BOTH AHU-5 AND AHU-6.

THE TWO LOWER FLOORS, BASEMENT AND FIRST, ARE CONSTITUTED MAINLY OF MEDICAL EXAMINATION AND NON-INVASIVE PROCEDURE ROOMS SUCH AS RADIOLOGY, PHLEBOTOMY AND DIALYSIS. THE SECOND FLOOR IS MIXED USE, WITH SOME ROOMS BEING USED AS PATIENT EXAM ROOMS AND SOME ROOMS BEING OFFICE SPACES. AHU-1 AND AHU-2 ARE DUCTED TOGETHER TO FORM ONE SUPPLY AND RETURN RISER IN THE THIRD FLOOR PLENUM THAT SUPPLIES THE SOUTHERN ZONES THROUGH A MECHANICAL SHAFT ON THE SOUTHERN SIDE OF THE BUILDING. AHU-3 AND AHU-4 ARE DUCTED TOGETHER TO FORM ONE SUPPLY AND RETURN RISER IN THE THIRD FLOOR PLENUM THAT SUPPLIES THE NORTHERN ZONES THROUGH A MECHANICAL SHAFT ON THE NORTHERN SIDE OF THE BUILDING.

AFTER APPLICATION OF ASHRAE STD 62-2004, IT WAS FOUND THAT ALL AIR HANDLING UNITS COMPLY WITH VENTILATION MINIMUMS. ALL SYSTEM EV VALUES WERE FOUND TO BE .9 ACCORDING TO TABLE 6-3. THIS WAS DUE TO THE FACT THAT ALL ZONE MAXIMUM ZP VALUES WERE FOUND TO BE LESS THAN .25 AFTER APPLICATION OF A TIME BASED DIVERSITY FACTOR.

AHU ZONE DIAGRAM



ASSUMPTIONS

BECAUSE THE MOB IS A MEDICAL OFFICE BUILDING, IT CONTAINS MANY SPACES NOT USUALLY LISTED IN ASHRAE STD 62 TABLE 6-1. A LIST OF THE SPACE CATEGORIES CHOSEN FOR THE NON-DESCRIBED SPACES IS AS SUCH.

Category Approximated	MOB space name	occ rate/ 1000 sq ft	Rp (cfm/occ)	Ra (cfm/sq ft)
office	exam, treatment, radiology, infusion, dialysis, files copy, work	5	5	0.06
main entry lobby	lobby	7	7.5	0.06
corridor	vest			0.06
pharmacy	meds	10	5	0.18
reception	waiting	30	5	0.06
conference	consult	50	5	0.06
science laboratories	lab	10	5	0.18

ANOTHER ASSUMPTION WAS THAT SOME OF THE SPACES, NAMELY, CONFERENCE ROOMS AND WAITING ROOMS WOULD HAVE TIME BASED DIVERSITY FACTORS. THESE WERE BASED ON FORMULA (6-9A) SHOWN IN THE PROCEDURE SECTION.

THE ZP VALUES OF SOME SPACES WERE NEGLECTED BECAUSE THEY ARE NECESSARILY VERY HIGH. THESE SPACES ARE UNOCCUPIED MECHANICAL, ELECTRICAL AND PLUMBING SPACES THAT ARE SUPPLIED WITH VERY LOW AMOUNTS OF AIR. THE LOW AMOUNTS OF AIR CAUSE THE SPACES TO HAVE VERY HIGH ZP NUMBERS. HOWEVER THEY ARE NOT CRITICAL SPACES AND SO WERE EXCLUDED.

IN MOST CASES THE ZONES CONSIST OF ONE AHU ONLY. HOWEVER IN THE MOB, FOUR OF THE AHUS ARE DUCTED TOGETHER TO FORM TWO SETS OF TWO AIR HANDLERS. THEREFORE, THE AHU-1 AND AHU-2 WILL BE TREAETED AS ONE UNIT, AS WELL AS THE AHU-3 AND AHU-4.

PROCEDURE INCLUDING ALL FORMULAS USED IN DATA SHEETS

THE BASIC EQUATION USED IN THE VENTILATION RATE PROCEDURE OF ASHRAE STD 62-2004 IS THE **BREATHING ZONE OUTDOOR AIR EQUATION**. THIS EQUATION INCORPORATES THE PRINCIPLE VALUES OF THE VRP IN THEIR MOST BASIC FORM.

$$V_{bz} = R_p * P_z + R_a * A_z \quad (6-1)$$

R_p IS THE PEOPLE OUTDOOR AIR RATE, FROM TABLE 6-1

P_z IS THE ZONE POPULATION BASED ON FLOOR AREAS AND THE OCCUPANT DENSITY FROM TABLE 6-1, WHEN A SET NUMBER OF OCCUPANTS IS NOT KNOWN.

R_a IS THE AREA OUTDOOR AIR RATE, FROM TABLE 6-1

A_z IS THE ZONE FLOOR AREA

THE NEXT FORMULA APPLIED IS A MODIFIER FOR THE VALUE OF V_{BZ}. THE MODIFIER IS BASED ON THE EFFECTIVENESS OF THE TYPE OF DIFFUSER ON THE MIXING AND THEREFORE, VENTILATION OF A SPACE. THE RESULT IS THE **ZONE OUTDOOR AIRFLOW**.

$$V_{oz} = V_{bz} / E_z \quad (6-2)$$

E_z IS THE ZONE AIR DISTRIBUTION EFFECTIVENESS BASED ON THE DESCRIPTIONS OF THE DIFFUSERS LISTED IN TABLE 6-2.

IN THE MOB, THE E_z VALUE IS 1, THEREFORE V_{oz} = V_{BZ}

PRIMARY OUTDOOR AIR FRACTION, OR Z_p, IS A VALUE INDICATING THE PERCENTAGE OF OUTDOOR AIR NEEDED IN A SPACE AS COMPARED TO THE DESIGN VALUE.

$$Z_p = V_{oz} / V_{pz} \quad (6-5)$$

V_{pz}, FOR VAV SYSTEMS LIKE THE MOB, IS THE DESIGN VALUE OF AIRFLOW FOR THE SPACE.

SHORT-TERM CONDITION DIVERSITY FACTOR. THIS IS A TERM USED IN SPACES IN THE MOB SUCH AS CONFERENCE ROOMS AND WAITING ROOMS THAT WILL NOT BE FULLY OCCUPIED MUCH OF THE TIME. IT IS USED TO OBTAIN A MORE REALISTIC AVERAGE OCCUPANT NUMBER TO DECREASE PROBLEMATIC OVER VENTILATION.

$$T = 3 * \text{volume} / V_{bz} \quad (6-9a, \text{ for use with IP system})$$

UNCORRECTED OUTDOOR AIR INTAKE, IS THE SUM TOTAL AMOUNT OF OUTDOOR AIR NEEDED IN EACH ZONE, WITH SHORT TERM CONDITION DIVERSITY FACTOR APPLIED BUT WITHOUT THE SYSTEM VENTILATION EFFICIENCY APPLIED. IN THE CASE OF THE MOB:

$$V_{ou} = \text{SUM}(R_p * P_z (\text{including } T_{\text{diversity}}) + R_a * A_z) \quad (6-6)$$

SYSTEM VENTILATION EFFICIENCY, IS A MEASURE FROM TABLE 6-3 USING THE SPACE Z_P VALUES. THE PURPOSE OF \bar{E}_V IS TO DETERMINE WHAT ACTUAL AMOUNT OF OUTDOOR AIR MUST BE TAKEN IN TO MAINTAIN SPACE CONDITIONS IN HIGHER OUTDOOR AIR LOADED SPACES OF THE BUILDINGS ZONES.

$$E_z \quad (\text{from } Z_p \text{ and table 6-3})$$

OUTDOOR AIR INTAKE, IS THE FINAL NUMBER. IT'S THE TOTAL AIR THAT THE AHU'S INVOLVED IN A SINGLE ZONE NEED TO INTAKE IN ORDER TO SATISFY ALL INTERIOR SPACE VENTILATION NEEDS. THIS MUST BE LESS THAN THE DESIGN OUTDOOR AIR INTAKE.

$$V_{ot} = V_{ou}/E_v \quad (6-8)$$

BASEMENT LEVEL AHU1-2

AHU	space	description	area Az	occupant density	occ Pz	T 3v/Vbz	Rp	Rp*Pz	Ra	Ra*Az	Vbz	Vpz	Zp	Zp max
			(sq ft)	(per/sq ft)	(people)		(cfm/occ)	(cfm)	(cfm/sq ft)	(cfm)	(cfm)	(cfm)		
1-2	BR-B057	ELEC	246		0			0	0.12	30	30	150		
1-2	B060	STORAGE	180		0			0	0.12	22	22	200	0.108	
1-2	B062	EXAM	115	5	1		5	3	0.06	7	10	140	0.070	
1-2	B064	EXAM	115	5	1		5	3	0.06	7	10	140	0.070	
1-2	B066	TOILET	49		0			0		0	0			
1-2	B068	TOILET	49		0			0		0	0			
1-2	B070	OFFICE	120	5	1		5	3	0.06	7	10	140	0.073	
1-2	B072	OFFICE	120	5	1		5	3	0.06	7	10	140	0.073	
1-2	B074	WORK	110	5	1		5	3	0.06	7	9	160	0.058	
1-2	B076	CLEAN	80		0			0	0.12	10	10	55	0.175	0.175
1-2	B078	EXAM	120	5	1		5	3	0.06	7	10	120	0.085	
1-2	B080	EXAM	120	5	1		5	3	0.06	7	10	120	0.085	
1-2	B082	EXAM	120	5	1		5	3	0.06	7	10	120	0.085	
1-2	B084	VITALS	195		0		5	0	0.06	12	12	145	0.081	
1-2	MR-B055	PLUMBING	178.25		0			0	0.12	21	21	125		
1-2	B056	WORK	162	5	1		5	4	0.06	10	14	205	0.067	
1-2	B054	EXAM	125	5	1		5	3	0.06	8	11	125	0.085	
1-2	B052	EXAM	125	5	1		5	3	0.06	8	11	125	0.085	
1-2	B061	STORAGE	125		0			0	0.12	15	15	50		
1-2	B042	CLEAN	188		0			0	0.12	23	23	125		
1-2	B040	SOIL	105		0			0	0.12	13	13	140	0.090	
1-2	B035	EXAM	115	5	1		5	3	0.06	7	10	125	0.078	
1-2	B033	EXAM	115	5	1		5	3	0.06	7	10	125	0.078	
1-2	B031	WORK	161	5	1		5	4	0.06	10	14	205	0.067	
1-2	B034	EXAM	115	5	1		5	3	0.06	7	10	120	0.081	
1-2	B032	EXAM	115	5	1		5	3	0.06	7	10	120	0.081	
1-2	B030	EXAM	155.25	5	1		5	4	0.06	9	13	160	0.082	
1-2	MES AB	ELEC	69		0			0	0.12	8	8	150	0.055	
1-2	B051	EXAM	115	5	1		5	5	0.06	7	12	115	0.103	
1-2	B053	EXAM	115	5	1		5	5	0.06	7	12	115	0.103	
1-2	B027	EXAM	120	5	1		5	3	0.06	7	10	120	0.085	
1-2	B025	EXAM	120	5	1		5	3	0.06	7	10	120	0.085	
1-2	B023	EXAM	120	5	1		5	3	0.06	7	10	120	0.085	

3-2	B029	EXAMIT	1520	5	0		5	0	0.06	0	10	120	0.085		
3-2	B026	EXAMIT	48205	5	0		5	0	0.06	0	10	120	0.085		
3-2	B023	WORK	1520	5	0		5	0	0.06	0	10	135	0.076		
3-2	B022	WORKING	825	5	0		5	0	0.06	3	10	380	0.063		
3-2	B026	EXAMINATION	10225	5	0		755	0	0.06	6	10	180	0.067		
1-2	B009	WORKING	200	30	4	100	7	28	0.06	12	40	190	0.211	0.211	
3-4	B009	SECURITY	2458.7	10	25		755	184	0.06	148	332	2080	0.168		
3-4	B007A	WORK	120	5	1		5	3	0.12	14	17	195	0.166		
3-4	B007	NURSEIT	14725	5	1		5	4	0.06	8	13	200	0.066		
3-4	B009	CONSULT	145	5	0		5	3	0.06	2	3	105	0.082		
3-4	B007B	MENSULT	125	10	1		5	4	0.18	13	17	180	0.207	0.207	
3-4	B041	LABOR &	190	5	1		5	5	0.06	11	16	395	0.041		
3-2	B009	SASER OFC	1266.6	10	13		755	95	0.06	76	171	1880	0.086		
3-2	B004	DEGRIDORVIEW	13635	5	0			0	0.06	23	23	280	0.052		
3-2	B009,7	TRIDENT	19375	5	0		5	6	0.06	22	28	190	0.094	0.195	
3-2	B050	BARBIDOB	23095	5	0		5	6	0.06	20	28	105	0.160	0.160	
3-2	B053	SORVADONG	392	30	6		5	25	0.06	12	39	210	0.060	0.170	
3-2	B046	TRIDENT	12675	5	0		5	6	0.06	18	16	195	0.084		
SUM OF	B151	LOCKER	41.25		0			0	0.12	5	5	50	0.099		
AHU1-2	B149	PHLEB	132	5	1		5	3	0.06	8	11	130	0.086		
FOR	B147	PHLEB	132	5	1		5	3	0.06	8	11	130	0.086		
BASEMENT	B145	EXAM	132	5	1		5	3	0.06	8	11	130	0.086	0.211	
LEVEL	B143	EXAM	132	5	1		5	3	0.06	8	11	130	0.086		
3-4	B141	STOR	138		0			0	0.12	17	17	130	0.127	0.127	
3-4	B109	EXAM	131.25	5	1		5	3	0.06	8	11	125	0.089		
3-4	B107	EXAM	131.25	5	1		5	3	0.06	8	11	125	0.089		
BASEMENT	B105	INFUSION	131.25	5	1		5	3	0.06	8	11	125	0.089		
LEVEL	B110	INFUSION	686.25		8		5	40	0.06	41	81	1005	0.081		
AHU3-4	B111	INFUSION	120.75	5	1		5	3	0.06	7	10	125	0.082	Zp	
AHU	B106	EXAM	120.75	5	1		5	3	0.06	7	10	125	0.082	Zp max	
3-4	B108	WORK	120.75	5	1		5	3	0.06	7	10	165	0.062		
3-4	B113	UTILITY	(69ft)	(ft)	(people)		(cfm/occ)	(cfm)	(ft)	(cfm)	(cfm)	(cfm)	(cfm)	0.083	
3-4	B086	STORAGE	23205	50	8	87	5	40	0.02	14	54	320	0.120	0.155	
3-4	B088	RECORDS	51905		0		5	0	0.02	18	18	190	0.034		
3-4	B078	DIFFUSION	620	5	8		5	40	0.06	47	80	1035	0.080		
3-4	B075	TOILET	425	5	0		5	0	0.06	0	10	155	0.066		
3-4	B032	TOILET	435		0			0		0	0				
3-4	B010	TOILET	525		0			0		0	0				

3-4	B119	TOILET	52.5		0			0		0	0			
3-4	B132	PFT	300	5	2		5	8	0.06	18	26	375	0.068	
3-4	MES BB	ELEC	68		0			0	0.12	8	8	150	0.054	
3-4	B123	SOIL	32		0			0	0.12	4	4			
3-4	B30	JC	24.75		0			0		0	0			
3-4	B127	STAFF LOUNGE	313.5	30	4	66.65	7.5	30	0.18	56	86	350	0.247	0.247
3-4	B126A	OFFICE	100	5	1		5	3	0.06	6	9	125	0.068	
3-4	B126	OFFICE	150	5	1		5	4	0.06	9	13	210	0.061	
3-4	B124	OFFICE	100	5	1		5	3	0.06	6	9	135	0.063	
3-4	B122	DIALYSIS	125	5	1		5	3	0.06	8	11	155	0.069	
3-4	B120	DIALYSIS	125	5	1		5	3	0.06	8	11	240	0.044	
3-4	CB-2	CORRIDOR	236.5		0			0	0.06	14	14	105	0.135	
3-4	CB-9,7	CORRIDOR	514		0			0	0.06	31	31	155	0.199	0.199
3-4	CB-10	CORRIDOR	533.5		0			0	0.06	32	32	250	0.128	
3-4	CB-14	CORRIDOR	476.5		0			0	0.06	29	29	225	0.127	
3-4	CB-15	CORRIDOR	181.5		0			0	0.06	11	11	80	0.136	
3-4	CB-13	CORRIDOR	258.5		0			0	0.06	16	16	115	0.135	
3-4	CB-11	CORRIDOR	94		0			0	0.06	6	6	60	0.094	

SUM OF AHU3-4 FOR BASEMENT LEVEL

1242 11795

0.247

FIRST FLOOR LEVEL AHU1-2

AHU	space	description	area Az	occupant density	occ Pz	T 3v/Vbz	Rp	Rp*Pz	Ra	Ra*Az	Vbz	Vpz	Z	Zp max
			(sq ft)	(per/sq ft)	(people)		(cfm/occ)	(cfm)	(cfm/sq ft)	(cfm)	(cfm)	(cfm)		
1-2	1058	NURSE PRAC	170	5	1		5	4.25	0.06	10	14	420	0.034	
1-2	1057	EXAM	195.5	5	1		5	4.888	0.06	12	17	275	0.060	
1-2	1055	NURSE PRAC	195.5	5	1		5	4.888	0.06	12	17	340	0.049	
1-2	1053	EXAM	195.5	5	1		5	4.888	0.06	12	17	275	0.060	
1-2	1051	NURSE PRAC	195.5	5	1		5	4.888	0.06	12	17	295	0.056	
1-2	1056	SUB WAITING	51.75	30	2		5	7.763	0.06	3	11	80	0.136	
1-2	1060	EXAM	125	5	1		5	3.125	0.06	8	11	190	0.056	
1-2	1062	EXAM	120	5	1		5	3	0.06	7	10	190	0.054	
1-2	1064	EXAM	120	5	1		5	3	0.06	7	10	190	0.054	
1-2	1066	TOILET	45.5		0			0		0	0			
1-2	1068	TOILET	45.5		0			0		0	0			
1-2	1070	EXAM	120	5	1		5	3	0.06	7	10	195	0.052	
1-2	1072	EXAM	120	5	1		5	3	0.06	7	10	195	0.052	
1-2	1074	EXAM	115	5	1		5	2.875	0.06	7	10	195	0.050	
1-2	1076	EXAM	120	5	1		5	3	0.06	7	10	195	0.052	
1-2	1078	EXAM	120	5	1		5	3	0.06	7	10	195	0.052	
1-2	1080	EXAM	115	5	1		5	2.875	0.06	7	10	195	0.050	
1-2	1082	LAB	120	10	1		5	6	0.18	22	28	195	0.142	
1-2	1084	STOR	60		0			0	0.12	7	7	225	0.032	
1-2	1086	NURSE OFFICE	90	5	0		5	2.25	0.06	5	8	185	0.041	
1-2	1061	EXAM	126	5	1		5	3.15	0.06	8	11	150	0.071	
1-2	1054	EXAM	149.5	5	1		5	3.738	0.06	9	13	150	0.085	
1-2	1042	EXAM	138	5	1		5	3.45	0.06	8	12	150	0.078	
1-2	1040	EXAM	115	5	1		5	2.875	0.06	7	10	115	0.085	
1-2	1031	EXAM	120.8	5	1		5	3.019	0.06	7	10	115	0.089	
1-2	1035	SUB WAITING	174	30	5		5	26.1	0.06	10	37	250	0.146	
1-2	1035A	STOR	114		0			0	0.12	14	14	55	0.249	0.249
1-2	1063	EXAM	120	5	1		5	3	0.06	7	10	115	0.089	
1-2	1037	EXAM	126	5	1		5	3.15	0.06	8	11	115	0.093	
1-2	1041	CONSULT	210	50	11		5	52.5	0.06	13	65	490	0.133	
1-2	1019	WAITING	85.5	30	3		5	12.83	0.06	5	18	105	0.171	0.171
1-2	1019A	DENTAL	108	5	1		5	2.7	0.06	6	9	155	0.059	
1-2	1017	EXAM	117	5	1		5	2.925	0.06	7	10	190	0.052	

1-2	1015	EXAM	123.5	5	1		5	3.088	0.06	7	10	190	0.055	
1-2	1013	EXAM	130	5	1		5	3.25	0.06	8	11	190	0.058	
1-2	1011	ADOLESCENT	266.5	5	1		5	6.663	0.06	16	23	485	0.047	
1-2	1029	NURSE WORK/NUTR	286	5	1		5	7.15	0.06	17	24	350	0.069	
1-2	1034	HEARING/EYE	130	5	1		5	3.25	0.06	8	11	120	0.092	
1-2	1032	EXAM	123.5	5	1		5	3.088	0.06	7	10	120	0.087	
1-2	MES A1	ELEC	69		0			0	0.12	8	8	150	0.055	
1-2	1027	STOR	75		0			0	0.12	9	9	50	0.180	
1-2	1025	CLEAN	112.5		0			0	0.12	14	14	75	0.180	
1-2	1023	SOIL	81.25		0			0	0.12	10	10	110	0.089	
1-2	1028	EXAM	126	5	1		5	3.15	0.06	8	11	125	0.086	
1-2	1026	EXAM	115.5	5	1		5	2.888	0.06	7	10	110	0.089	
1-2	1024	EXAM	115.5	5	1		5	2.888	0.06	7	10	110	0.089	
1-2	1014	CHILD LIFE	115.5	5	1		5	2.888	0.06	7	10	110	0.089	
1-2	1075	PRECEPTOR	793.5	50	40		5	198.4	0.06	48	246	1000	0.246	0.246
1-2	1012	TOILET	361		0			0		0	0			
1-2	1010	TOILET	361		0			0		0	0			
1-2	1081	TOILET	48.75		0			0		0	0			
1-2	1083	TOILET	48.75		0			0		0	0			
1-2	CRI- 002	IT	91	5	0		5	2.275	0.06	5	8	200	0.039	
1-2	1009	SAFETY	133	5	1		5	3.325	0.06	8	11	95	0.119	
1-2	1091	WORK	124	50	4	88	5	20	0.06	7	27	135	0.203	0.203
1-2	1093	NURSE STATION	155	5	1		5	3.875	0.06	9	13	145	0.091	
1-2	1095	COPY	40	5	0		5	1	0.06	2	3	210	0.016	
1-2	1093A	MEDS	80	10	1		5	4	0.18	14	18	105	0.175	
1-2	1098	OFFICE	150	5	1		5	3.75	0.06	9	13	485	0.026	
1-2	1001	VEST	128.3		0			0	0.06	8	8	750	0.010	
1-2	1000	LOBBY	2711	10	27		5	135.5	0.06	163	298	3275	0.091	
1-2	C1-5	CORR	429		0			0	0.06	26	26	280	0.092	
1-2	C1-6	CORR	1054		0			0	0.06	63	63	515	0.123	
1-2	C1-3	CORR	277.8		0			0	0.06	17	17	105	0.159	0.159
1-2	C1-4	CORR	162.3		0			0	0.06	10	10	80	0.122	
1-2	C1-2	CORR	180		0			0	0.06	11	11	105	0.103	
1-2	C1-1	CORR	392		0			0	0.06	24	24	500	0.047	
1-2	C1-10	CORR	117.5		0			0	0.06	7	7	180	0.039	
1-2	A-1	STAIR										1000		

1-2	B-1	STAIR										700		
SUM OF AHU1-2 FOR FIRST FLOOR LEVEL											1428	18345	0.249	

FIRST FLOOR LEVEL AHU3-4

AHU	space	description	area Az	occupant density	occ Pz	T 3v/Vbz	Rp	Rp*Pz	Ra	Ra*Az	Vbz	Vpz	Z	Zp max
			(sq ft)	(per/sq ft)	(people)		(cfm/occ)	(cfm)	(cfm/sq ft)	(cfm)	(cfm)	(cfm)		
3-4	1097	CONSULT	135	5	1		5	3.375	0.06	8	11	105	0.109	
3-4	1100	OFFICE	106.3	5	1		5	2.656	0.06	6	9	175	0.052	
3-4	1102	CONFERENCE	381.3	50	19		5	95.31	0.06	23	118	765	0.154	
3-4	1114	CLINIC DIR.	125	5	1		5	3.125	0.06	8	11	240	0.044	
3-4	1116	PSYCH	125	5	1		5	3.125	0.06	8	11	165	0.064	
3-4	1118	LEGAL	125	5	1		5	3.125	0.06	8	11	175	0.061	
3-4	1161	EXAM	108	5	1		5	2.7	0.06	6	9	115	0.080	
3-4	1159	EXAM	120	5	1		5	3	0.06	7	10	115	0.089	
3-4	1157	EXAM	126	5	1		5	3.15	0.06	8	11	115	0.093	
3-4	1155	EXAM	162.5	5	1		5	4.063	0.06	10	14	200	0.069	
3-4	1153	EXAM	118.8	5	1		5	2.969	0.06	7	10	200	0.050	
3-4	1151	EXAM	118.8	5	1		5	2.969	0.06	7	10	190	0.053	
3-4	1149	EXAM	118.8	5	1		5	2.969	0.06	7	10	190	0.053	
3-4	1147	EXAM	118.8	5	1		5	2.969	0.06	7	10	190	0.053	
3-4	1145	EXAM	118.8	5	1		5	2.969	0.06	7	10	190	0.053	
3-4	1143	EXAM	118.8	5	1		5	2.969	0.06	7	10	190	0.053	
3-4	1141	EXAM	118.8	5	1		5	2.969	0.06	7	10	190	0.053	
3-4	1101	TREATMENT	172.5	5	1		5	4.313	0.06	10	15	180	0.081	
3-4	1158	STOR/SCALE	96		0			0	0.12	12	12	380	0.030	
3-4	1103	MED RECORDS	399		0			0	0.12	48	48	215	0.223	0.223
3-4	1148	EXAM	120.8	5	1		5	3.019	0.06	7	10	120	0.086	
3-4	1146	EXAM	120.8	5	1		5	3.019	0.06	7	10	120	0.086	
3-4	1133	EXAM	120.8	5	1		5	3.019	0.06	7	10	120	0.086	
3-4	1138	TOILET	52.5		0			0		0	0			
3-4	1136	TOILET	56		0			0		0	0			
3-4	1113	TOILET	52.5		0			0		0	0			
3-4	1115	TOILET	52.5		0			0		0	0			
3-4	1134	OFFICE	170.5	5	1		5	4.263	0.06	10	14	235	0.062	

3-4	1123	STOR	135		0			0	0.06	8	8	60	0.135	
3-4	1120	ADMIN. MGR.	93.75	5	0		5	2.344	0.06	6	8	220	0.036	
3-4	1122	OFFICE	93.75	5	0		5	2.344	0.06	6	8	105	0.076	
3-4	1124	OFFICE	118.8	5	1		5	2.969	0.06	7	10	120	0.084	
3-4	1126	OFFICE	125	5	1		5	3.125	0.06	8	11	120	0.089	
3-4	1128	OFFICE	175	5	1		5	4.375	0.06	11	15	260	0.057	
3-4	1129	STAFF LOUNGE	246.5	5	1		5	6.163	0.06	15	21	435	0.048	
3-4	1130	JC	18		0			0		0	0			
3-4	1150	WORK	148.5	50	7		5	37.13	0.06	9	46	230	0.200	0.200
3-4	C1-8	CORR	605		0			0	0.06	36	36	515	0.070	
3-4	C1-12	CORR	333.5		0			0	0.06	20	20	200	0.100	
3-4	C1-11	CORR	605.3		0			0	0.06	36	36	745	0.049	
3-4	C1-15	CORR	173.3		0			0	0.06	10	10	90	0.116	
3-4	C1-9	CORR	203.5		0			0	0.06	12	12	80	0.153	
3-4	C1-13	CORR	173.3		0			0	0.06	10	10	80	0.130	
3-4	C-1	STAIR										700		

SUM OF AHU3-4 FOR FIRST FLOOR LEVEL

657 8840 0.223

SECOND FLOOR LEVEL AHU1-2

AHU	space	description	area Az	occupant density	occ Pz	T 3v/Vbz	Rp	Rp*Pz	Ra	Ra*Az	Vbz	Vpz	Z	Zp max
			(sq ft)	(pers/sq ft)	(people)		(cfm/occ)	(cfm)	(cfm/sq ft)	(cfm)	(cfm)	(cfm)		
1-2	2055	OFFICE	175	5	1		5	4	0.06	11	15	430	0.035	
1-2	2053	OFFICE	115	5	1		5	3	0.06	7	10	225	0.043	
1-2	2051	OFFICE	110	5	1		5	3	0.06	7	9	315	0.030	
1-2	2056	OFFICE	168	5	1		5	4	0.06	10	14	245	0.058	
1-2	2063	OFFICE	114	5	1		5	3	0.06	7	10	210	0.046	
1-2	2061	OFFICE	114	5	1		5	3	0.06	7	10	90	0.108	
1-2	2062	OFFICE	114	5	1		5	3	0.06	7	10	135	0.072	
1-2	2060	OFFICE	114	5	1		5	3	0.06	7	10	135	0.072	
1-2	2065	OFFICE	128.25	5	1		5	3	0.06	8	11	275	0.040	
1-2	2064	OFFICE	128.25	5	1		5	3	0.06	8	11	250	0.044	
1-2	2054	RES. COORD	89.25	5	0		5	2	0.06	5	8	80	0.095	
1-2	2044	RES. COORD	94.5	5	0		5	2	0.06	6	8	80	0.100	
1-2	2033	RES. COORD	85	5	0		5	2	0.06	5	7	80	0.090	
1-2	2042	RES. COORD	90	5	0		5	2	0.06	5	8	80	0.096	
1-2	2032	RES. COORD	112.5	5	1		5	3	0.06	7	10	90	0.106	
1-2	2030	RES. COORD	112.5	5	1		5	3	0.06	7	10	90	0.106	
1-2	2067	RES. COORD	85	5	0		5	2	0.06	5	7	80	0.090	
1-2	2071	RES. COORD	85	5	0		5	2	0.06	5	7	80	0.090	
1-2	2075	OFFICE	114	5	1		5	3	0.06	7	10	210	0.046	
1-2	2073	OFFICE	114	5	1		5	3	0.06	7	10	90	0.108	
1-2	2074	OFFICE	114	5	1		5	3	0.06	7	10	135	0.072	
1-2	2072	OFFICE	114	5	1		5	3	0.06	7	10	135	0.072	
1-2	2077	OFFICE	128.25	5	1		5	3	0.06	8	11	275	0.040	
1-2	2076	OFFICE	128.25	5	1		5	3	0.06	8	11	250	0.044	
1-2	MES A2	ELEC	66		0			0	0.12	8	8	110	0.072	
1-2	2022	OFFICE 2	133	5	1		5	3	0.06	8	11	140	0.081	
1-2	2018	CONF	570	50	20	87	5	100	0.06	34	134	700	0.192	0.192
1-2	2026	OFFICE 2	137.5	5	1		5	3	0.06	8	12	115	0.102	
1-2	2023	OFFICE	105	5	1		5	3	0.06	6	9	230	0.039	
1-2	2021	OFFICE	105	5	1		5	3	0.06	6	9	230	0.039	
1-2	2019	OFFICE	147	5	1		5	4	0.06	9	12	270	0.046	
1-2	2017	OFFICE	105	5	1		5	3	0.06	6	9	230	0.039	
1-2	2015	OFFICE	120.75	5	1		5	3	0.06	7	10	215	0.048	

1-2	2125	OFFICE	104	5	1		5	3	0.06	6	9	90	0.098	
1-2	2127	OFFICE	137.5	5	1		5	3	0.06	8	12	255	0.046	
1-2	C2-2	CORR	101		0			0	0.06	6	6	50	0.121	
1-2	C2-6	CORR	145		0			0	0.06	9	9	50	0.174	
1-2	C2-7	CORR	625		0			0	0.06	38	38	505	0.074	
1-2	C2-4	CORR	137.25		0			0	0.06	8	8	200	0.041	
1-2	C2-5	CORR	104.5		0			0	0.06	6	6	50	0.125	
1-2	C2-8	CORR	132		0			0	0.06	8	8	60	0.132	0.132

SUM OF AHU1-2 FOR SECOND FLOOR LEVEL

543 7565 0.192

FIRST FLOOR LEVEL AHU3-4

AHU	space	description	area Az	occupant density	occ Pz	T 3v/Vbz	Rp	Rp*Pz	Ra	Ra*Az	Vbz	Vpz	Z	Zp max
			(sq ft)	(pers/sq ft)	(people)		(cfm/occ)	(cfm)	(cfm/sq ft)	(cfm)	(cfm)	(cfm)		
3-4	2041	FELLOWS	168	5	1		5	4	0.06	10	14	590	0.024	
3-4	2027	OFFICE	99.75	5	0		5	2	0.06	6	8	255	0.033	
3-4	2025	OFFICE	99.75	5	0		5	2	0.06	6	8	230	0.037	
3-4	2079	TOILET	201.5		0			0		0	0	295	0.000	
3-4	2013	TOILET	149.5		0			0		0	0	225	0.000	
3-4	2085	FELLOWS 4	198	5	1		5	5	0.06	12	17	495	0.034	
3-4	2083	FELLOWS 3	138	5	1		5	3	0.06	8	12	320	0.037	
3-4	2086	STOR	72		0			0	0.12	9	9	60	0.144	
3-4	2088	FELLOWS 8	372	5	2		5	9	0.06	22	32	745	0.042	
3-4	2082	STOR	93		0			0	0.12	11	11	50	0.223	
3-4	2002	EUDOWOOD CONF	839.5	50	29	87	5	145	0.06	50	195	860	0.227	0.227
3-4	2012	OFFICE	116	5	1		5	3	0.06	7	10	95	0.104	
3-4	2081	FILES	159.5		0			0	0.12	19	19	85	0.225	0.225
3-4	2011	KITCHEN LOUNGE	261	30	8		5	39	0.06	16	55	650	0.084	
3-4	2095	OFFICE	114	5	1		5	3	0.06	7	10	275	0.035	
3-4	2093	OFFICE	88	5	0		5	2	0.06	5	7	195	0.038	
3-4	2091	RESEARCH ASSIST 4	126.5	5	1		5	3	0.06	8	11	375	0.029	
3-4	2089	CONFERENCE	206.25	50	10		5	52	0.06	12	64	265	0.241	0.241
3-4	2057	OFFICE	246.5	5	1		5	6	0.06	15	21	430	0.049	

3-4	1094	OFFICE	137.75	5	1		5	3	0.06	8	12	250	0.047	
3-4	2096	FELLOWS 4	240	5	1		5	6	0.06	14	20	315	0.065	
3-4	2153	OFFICE	115.5	5	1		5	3	0.06	7	10	270	0.036	
3-4	2151	OFFICE	110.25	5	1		5	3	0.06	7	9	230	0.041	
3-4	2149	OFFICE	105	5	1		5	3	0.06	6	9	230	0.039	
3-4	2147	OFFICE	105	5	1		5	3	0.06	6	9	230	0.039	
3-4	2145	OFFICE	147	5	1		5	4	0.06	9	12	270	0.046	
3-4	2143	OFFICE	110.25	5	1		5	3	0.06	7	9	230	0.041	
3-4	2141	OFFICE	126	5	1		5	3	0.06	8	11	255	0.042	
3-4	2158	STAFF 4	271.25	5	1		5	7	0.06	16	23	325	0.071	
3-4	2158A	FILES/COPY	175	5	1		5	4	0.06	11	15	155	0.096	
3-4	2148	FELLOWS 3	175	5	1		5	4	0.06	11	15	140	0.106	
3-4	2109	OFFICE	131.75	5	1		5	3	0.06	8	11	115	0.097	
3-4	2146	OFFICE 2	131.75	5	1		5	3	0.06	8	11	115	0.097	
3-4	2144	OFFICE	126	5	1		5	3	0.06	8	11	140	0.077	
3-4	2134	TOILET	52		0			0		0	0			
3-4	2132	TOILET	48.75		0			0		0	0			
3-4	2030	TOILET	48.75		0			0		0	0			
3-4	2107	OFFICE	123.5	5	1		5	3	0.06	7	10	455	0.023	
3-4	2105	OFFICE	108	5	1		5	3	0.06	6	9	220	0.042	
3-4	2103	OFFICE	126	5	1		5	3	0.06	8	11	220	0.049	
3-4	2106	OFFICE	123.5	5	1		5	3	0.06	7	10	295	0.036	
3-4	2102	DATA COORD 4	240	5	1		5	6	0.06	14	20	355	0.057	
3-4	2115	OFFICE	123.5	5	1		5	3	0.06	7	10	275	0.038	
3-4	2114	OFFICE	123.5	5	1		5	3	0.06	7	10	250	0.042	
3-4	2113	OFFICE	108	5	1		5	3	0.06	6	9	220	0.042	
3-4	2111	OFFICE	126	5	1		5	3	0.06	8	11	220	0.049	
3-4	2112	OFFICE	132	5	1		5	3	0.06	8	11	105	0.107	
3-4	MES B2	ELEC	63.75		0			0	0.12	8	8	110	0.070	
3-4	2118	JC	38.25		0			0	0.12	5	5			
3-4	2120	PED. ADMIN.	264	5	1		5	7	0.06	16	22	525	0.043	
3-4	2122	FILES	72		0			0	0.12	9	9	50	0.173	0.173
3-4	2124	OFFICE	131.25	5	1		5	3	0.06	8	11	150	0.074	
3-4	2126	OFFICE	125	5	1		5	3	0.06	8	11	270	0.039	
3-4	C2-19	CORR	90		0			0	0.06	5	5	90	0.060	
3-4	C2-18	CORR	395		0			0	0.06	24	24	250	0.095	
3-4	C2-2	CORR	247		0			0	0.06	15	15	120	0.124	
3-4	C2-3	CORR	116.25		0			0	0.06	7	7	55	0.127	

3-4	C2-1/2010	CORR & LOUNGE	385.25	30	6	128	5	30	0.06	23	53	240	0.221	0.221
3-4	C2-9A	CORR	124.5		0			0	0.06	7	7	170	0.044	
3-4	2000	LOUNGE & LOBBY	742	10	7		5	37	0.06	45	82	890	0.092	
3-4	C2-11	CORR	647.5		0			0	0.06	39	39	480	0.081	
3-4	C2-12	CORR	125		0			0	0.06	8	8	85	0.088	
3-4	C2-13	CORR	112.5		0			0	0.06	7	7	50	0.135	
3-4	C2-14	CORR	112.5		0			0	0.06	7	7	60	0.113	
3-4	C2-15	CORR	37.5		0			0	0.06	2	2	50	0.045	
3-4	C2-16	CORR	162		0			0	0.06	10	10	50	0.194	0.194
3-4	C2-17	CORR	32.5		0			0	0.06	2	2	0		
3-4	C2-9B	CORR	132		0			0	0.06	8	8	55	0.144	
3-4	A-2	STAIR										1000		
SUM OF AHU3-4 FOR SECOND LEVEL											1144	17130	0.241	

THIRD FLOOR LEVEL AHU5

AHU	space	description	area Az	occupant density	occ Pz	T 3v/Vbz	Rp	Rp*Pz	Ra	Ra*Az	Vbz	Vpz	Z	Zp max
			(sq ft)	(pers/sq ft)	(people)		(cfm/occ)	(cfm)	(cfm/sq ft)	(cfm)	(cfm)	(cfm)		
5	3073	OFFICE	123.5	5	1		5	3	0.06	7	10	335	0.031	
5	3074	OFFICE	123.5	5	1		5	3	0.06	7	10	290	0.036	
5	3071	FELLOWS 4	228	5	1		5	6	0.06	14	19	575	0.034	
5	3072	NURSE	114	5	1		5	3	0.06	7	10	220	0.044	
5	3070	NURSE	114	5	1		5	3	0.06	7	10	220	0.044	
5	3088	OFFICE	144.5	5	1		5	4	0.06	9	12	355	0.035	
5	3086	FILES	280		0			0	0.12	34	34	470	0.071	
5	3084	STORAGE	75		0			0	0.12	9	9	50	0.180	0.180
5	3083	OFFICE	120	5	1		5	3	0.06	7	10	285	0.036	
5	3081	OFFICE	114	5	1		5	3	0.06	7	10	285	0.034	
5	CR3-082	IT	204	5	1		5	5	0.06	12	17	190	0.091	
5	3080	CONFERENCE	336	50	12	87	5	60	0.06	20	80	340	0.236	0.236
5	3011	KITCHEN LOUNGE	261	30	8		5	39	0.06	16	55	700	0.078	
5	3008	FELLOWS 5-6	177	5	1		5	4	0.06	11	15	355	0.042	
5	3006	OFFICE	120	5	1		5	3	0.06	7	10	420	0.024	
5	3004	OFFICE	100	5	1		5	3	0.06	6	9	180	0.047	
5	3157	FELLOWS	270	5	1		5	7	0.06	16	23	615	0.037	
5	3109	OFFICE	131.8	5	1		5	3	0.06	8	11	190	0.059	
5	3054	DIVISION DIR	180	5	1		5	5	0.06	11	15	500	0.031	
5	3061	FELLOWS 6	199.5	5	1		5	5	0.06	12	17	525	0.032	
5	3065	FACULTY	123.5	5	1		5	3	0.06	7	10	385	0.027	
5	3064	FACULTY	123.5	5	1		5	3	0.06	7	10	365	0.029	
5	3063	FACULTY	114	5	1		5	3	0.06	7	10	285	0.034	
5	3062	FACULTY	114	5	1		5	3	0.06	7	10	235	0.041	
5	3060	FACULTY	114	5	1		5	3	0.06	7	10	220	0.044	
5	3050	ADMIN SUPPORT	89.25	5	0		5	2	0.06	5	8	160	0.047	
5	3031	NURSE	89.25	5	0		5	2	0.06	5	8	160	0.047	
5	3041	FELLOWS	210	5	1		5	5	0.06	13	18	700	0.026	
5	3032	RN	106.3	5	1		5	3	0.06	6	9	175	0.052	
5	3030	RN	106.3	5	1		5	3	0.06	6	9	175	0.052	
5	3069	RESEARCH 2	170	5	1		5	4	0.06	10	14	265	0.055	

5	MES A3	ELEC	66		0			0	0.12	8	8	110	0.072	
5	3029	OFFICE	94.5	5	0		5	2	0.06	6	8	265	0.030	
5	3027	OFFICE	94.5	5	0		5	2	0.06	6	8	265	0.030	
5	3025	OFFICE	94.5	5	0		5	2	0.06	6	8	265	0.030	
5	3023	OFFICE	99.75	5	0		5	2	0.06	6	8	265	0.032	
5	3021	OFFICE	94.5	5	0		5	2	0.06	6	8	265	0.030	
5	3019	OFFICE	94.5	5	0		5	2	0.06	6	8	265	0.030	
5	3017	OFFICE	94.5	5	0		5	2	0.06	6	8	265	0.030	
5	3015	OFFICE	94.5	5	0		5	2	0.06	6	8	270	0.030	
5	3075	FILES/COPY	422.5	5	2		5	11	0.06	25	36	495	0.073	
5	3022	RESEARCH 2	150	5	1		5	4	0.06	9	13	210	0.061	
5	3077	RESEARCH 3	133	5	1		5	3	0.06	8	11	235	0.048	
5	3018	RESEARCH 4	133		0		5	0	0.06	8	8	235	0.034	
5	3155	OFFICE	105	5	1		5	3	0.06	6	9	265	0.034	
5	3153	OFFICE	105	5	1		5	3	0.06	6	9	265	0.034	
5	3151	OFFICE	105	5	1		5	3	0.06	6	9	265	0.034	
5	C3-6	CORRIDOR	145		0			0	0.06	9	9	90	0.097	
5	C3-7	CORRIDOR	510		0			0	0.06	31	31	570	0.054	
5	C3-4	CORRIDOR	124		0			0	0.06	7	7	260	0.029	
5	C3-5	CORRIDOR	85.5		0			0	0.06	5	5	185	0.028	
5	C3-8	CORRIDOR	132		0			0	0.06	8	8	105	0.075	
5	C3-3	CORRIDOR	124		0			0	0.06	7	7	85	0.088	
5	C3-2	CORRIDOR	347.5		0			0	0.06	21	21	305	0.068	
5	3009	LOUNGE	466.3	30	14		5	70	0.06	28	98	455	0.215	0.215
5	C3-11	CORRIDOR	125		0			0	0.06	8	8	115	0.065	
5	B-3	STAIR										1000		

SUM OF AHU5 FOR THIRD FLOOR LEVEL

863 17600 0.236

THIRD FLOOR LEVEL AHU6

6	3057	NURSE	89.25	5	0		5	2	0.06	5	8	160	0.047	
6	3053	OFFICE	110	5	1		5	3	0.06	7	9	285	0.033	
6	3051	DIVISION DIR	201.3	5	1		5	5	0.06	12	17	515	0.033	
6	3146	FILES	131.8		0			0	0.12	16	16	190	0.083	
6	3144	OFFICE	131.3	5	1		5	3	0.06	8	11	95	0.117	
6	3107	OFFICE	114	5	1		5	3	0.06	7	10	335	0.029	
6	3105	OFFICE	108	5	1		5	3	0.06	6	9	225	0.041	

6	3103	OFFICE	126	5	1		5	3	0.06	8	11	225	0.048	
6	3106	OFFICE	142.5	5	1		5	4	0.06	9	12	310	0.039	
6	3102	FELLOWS 8	240	5	1		5	6	0.06	14	20	590	0.035	
6	3091	CONFERENCE	218.8	50	11		5	55	0.06	13	68	340	0.199	0.199
6	3094	ACTG RESEARCH	142.5	5	1		5	4	0.06	9	12	365	0.033	
6	3096	CONFERENCE	240	50	12		5	60	0.06	14	74	580	0.128	
6	3097A	ADMIN.	97.75	5	0		5	2	0.06	6	8	120	0.069	
6	3150	ADMIN.	216.8	5	1		5	5	0.06	13	18	345	0.053	
6	3101	NURSE	131.8	5	1		5	3	0.06	8	11	190	0.059	
6	3148	KITCHEN	119	30	4		7.5	27	0.18	21	48	430	0.112	
6	3089	CONFERENCE	198	50	10		5	50	0.06	12	61	340	0.181	0.181
6	3095	OFFICE	123.5	5	1		5	3	0.06	7	10	355	0.030	
6	3093	DIVISION DIR	220	5	1		5	6	0.06	13	19	455	0.041	
6	3055	ADMIN SUPPORT	89.25	5	0		5	2	0.06	5	8	160	0.047	
6	3026	RESEARCH	137.5	5	1		5	3	0.06	8	12	210	0.056	
6	3079	TOILET	201.5		0			0		0	0			
6	3013	TOILET	149.5		0			0		0	0			
6	3000	LOBBY	525	10	5		5	26	0.06	32	58	530	0.109	
6	3149	OFFICE	105	5	1		5	3	0.06	6	9	265	0.034	
6	3147	OFFICE	99.75	5	0		5	2	0.06	6	8	265	0.032	
6	3145	OFFICE	99.75	5	0		5	2	0.06	6	8	265	0.032	
6	3143	OFFICE	105	5	1		5	3	0.06	6	9	265	0.034	
6	3141	OFFICE	99.75	5	0		5	2	0.06	6	8	265	0.032	
6	3115	OFFICE	123.5	5	1		5	3	0.06	7	10	355	0.030	
6	3113	OFFICE	108	5	1		5	3	0.06	6	9	225	0.041	
6	3111	OFFICE	126	5	1		5	3	0.06	8	11	225	0.048	
6	3114	OFFICE	162.5	5	1		5	4	0.06	10	14	290	0.048	
6	3120	ADMIN	364	5	2		5	9	0.06	22	31	810	0.038	
6	MES B3	ELEC	63.75		0			0	0.12	8	8	140	0.055	
6	3118	JC	38.25		0			0		0	0			
6	3134	TOILET	52		0			0		0	0			
6	3132	TOILET	52		0			0		0	0			
6	3130	TOILET	52		0			0		0	0			
6	3124	NURSE	144	5	1		5	4	0.06	9	12	325	0.038	
6	3125	CONFERENCE	534	50	15	87	5	75	0.06	32	107	440	0.243	0.243
6	C3-10	CORRIDOR	107.5		0			0	0.06	6	6	85	0.076	
6	C3-12	CORRIDOR	125		0			0	0.06	8	8	100	0.075	

6	C3-1	CORRIDOR	345		0			0	0.06	21	21	405	0.051	
6	C3-15	CORRIDOR	555		0			0	0.06	33	33	680	0.049	
6	C3-20/3097	TBN/CORR	207		0	5		0	0.06	12	12	255	0.049	
6	C3-19	CORRIDOR	370		0			0	0.06	22	22	390	0.057	
6	C3-18	CORRIDOR	80		0			0	0.06	5	5	0		
6	C3-17	CORRIDOR	124		0			0	0.06	7	7	140	0.053	
6	C3-14	CORRIDOR	137.5		0			0	0.06	8	8	105	0.079	
6	C3-16	CORRIDOR	37.5		0			0	0.06	2	2	0		
6	C3-13	CORRIDOR	137.5		0			0	0.06	8	8	105	0.079	
6	3009	LOUNGE	297.2	30	9	5	45	0.06	18	62	290	0.215	0.215	
6	A-3	STAIR										1000		
			0		0			0		0	0			

SUM OF AHU6 THIRD FLOOR
LEVEL

972 15040 0.243

SUMMARY OF RESULTS

THE FOLOWING TABLE SUMMARIZES THE IMPORTANT RESULTS OF THE DATA SECTION. IT IS DETERMINED THAT ALL AHUS MEET THE REQUIREMENTS OF ASHRAE STD 62-2004 FOR VENTILATION RATE PROCEDURE.

	AHU 1-2	AHU 3-4	AHU 5	AHU 6
SUM Vpz	33635	37765	17600	15040
Vpz*.1	3364	3777	1760	1504
SUM Vbz	2785	3043	863	972
Zp (max zone)	0.249	0.247	0.236	0.243
Ev	0.9	0.9	0.9	0.9
Vou	3095	3381	959	1081
compliance	YES	YES	YES	YES