

LONGWOOD AT OAKMONT HEALTHCARE CENTER

VERONA, PENNSYLVANIA



## TECHNICAL ASSIGNMENT I

# ASHRAE STANDARD 62.1 VENTILATION COMPLIANCE

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## EXECUTIVE SUMMARY

The Longwood at Oakmont Healthcare Center is roughly 45,000 square feet and is located a short distance outside of Pittsburgh in Verona, Pennsylvania. The building is a senior care facility and consists of a variety of spaces including a number of resident rooms, offices, dining areas, public gathering areas, and multi-purpose spaces. All of these zones are provided with ventilation are by one Desert Aire energy recovery unit which handles over 13,000 cfm of outside air. The individual spaces or combination of small spaces are then conditioned by their own Trane or Florida Heat Pump water source heat pump.

The Healthcare Center was analyzed using ASHRAE 2007 Standard 62.1 Section 6 – Ventilation Rate Procedure. This standard sets up a minimum requirement of outside air to be provided to the building. It is based off of the size, occupancy, and function of the space. The standard is established in order to ensure an adequate indoor air environment and minimize the risk of poor health effects.

In the examination of the Longwood at Oakmont Healthcare Center it was determined that the design of the building was in full compliance of Section 6. The amount of outdoor air provided throughout the building exceeded the minimum requirements by 60%.

The facility was also analyzed in regards to ASHRAE Standard 62.1 Section 5. This section institutes standards for mechanical systems and equipment to again ensure a safe and healthy indoor environment. The Healthcare Center was in compliance with essentially all of the requirements of this section.

The following report contains all assumptions, calculations, results, and conclusions made regarding the design of the Longwood at Oakmont Healthcare Center.

# ASSUMPTIONS

## SPACE CHARACTERISTICS/REQUIREMENTS

A few of the spaces within the building had to be assumed as related or like spaces in order to get a close approximation of the characteristics, in reference to ASHRAE 62.1 Table 6-1. The following are a list of these assumptions:

- Family rooms were treated as lobbies or public gathering spaces
- Living rooms were treated as lobbies or public gathering spaces
- Charting rooms were treated as office spaces
- Med rooms were treated as office spaces
- Cart corals were treated as storage spaces
- Work rooms were treated as office spaces
- Waitress stations were treated as coffee stations
- AL pre-dining room was treated as a lobby space
- Resident rooms were treated as healthcare patient rooms

## AIR DISTRIBUTION EFFECTIVENESS ( $E_z$ )

The zone air distribution effectiveness was determined per ASHRAE Standard 62.1 Table 6-2. The effectiveness value resulted in 1 in all cases due to one of the following air distribution configurations:

- Ceiling supply of cool air
- Ceiling supply of warm air and floor return
- Ceiling supply of warm air less than 15°F above space temperature and ceiling return provided that the 150 fpm supply air jet reaches to within 4.5 ft of the floor level

## DIVERSITY FACTOR (D)

The diversity factor was set at the design conditions of the project which in this case was equal to one.

## SPACES NOT INCLUDED

There were a few spaces within the building that were not considered while performing calculations because they were not treated by the air handling unit. These spaces include mechanical rooms, stair towers, and elevator shafts.

## SUPPLY AIR RATES

Supply air rates for each space are taken from the design when calculating primary outdoor air fraction.

## OCCUPANCY

The occupancy of each space was taken from the design calculations with the exception of resident laundry rooms. In this case an occupancy density was assigned.

## EXHAUST AIR

Spaces that were purely exhausted were treated as requiring zero outside air. Most of these spaces will receive a combination of ventilation and make up air due to the negative pressure of the space in comparison to those around them. The negative pressure of the spaces will also limit the amount of contaminated air from leaking into adjacent spaces. Such spaces include, but are not limited to: toilets, janitor's closets, soiled/clean utility rooms, storage rooms, and electrical rooms.

## ETS AREAS

Smoking is prohibited within this building; therefore section 5.18 of the standard is not an issue.

## INTAKE LOUVER

The intake louver is located two floors above ground level on a vertical wall. It is located in a large grassy courtyard area with no concern of vehicular traffic.

## AIR CLASSES

There is no need to evaluate the percentage of mixed class air due to the use of an energy recovery unit with a wheel. The exhaust air is sent to the exterior environment.

## SYSTEMS AND EQUIPMENT COMPLIANCE WITH SECTION 5

### DUCT WORK

All duct work is constructed of sheet metal which eliminates the concerns of mold and erosion. Exhaust air ducts are also negatively pressurized to eliminate the chance of unwanted air leakage. Also all ducts not run through treated spaces are insulated to avoid the chance of condensation.

### OUTDOOR AIR INTAKES

Intake louvers were selected to meet rain entrainment requirements. Bird screens are also specified to be installed during construction. Also the intake louver of the energy recovery unit can be accessed through the second floor mechanical room for inspection and maintenance.

Below is a table illustrating the compliance with ASHRAE Table 5-1:

OBJECT	MINIMUM DISTANCE (ft)	DESIGNED DISTANCE (ft)	SAFE
Significantly contaminated exhaust	15	25	Yes
Noxious or dangerous exhaust	30	NA	Yes
Vents, chimneys, and flues from combustion appliances and equipment	15	16	Yes
Garage entry, automobile loading area, or drive-in queue	15	NA	Yes
Truck loading area or dock, bus parking/idling area	25	NA	Yes
Driveway, street, or parking place	5	NA	Yes
Thoroughfare with high traffic	25	NA	Yes
Roof, landscaped grade, or other surface directly below intake	1	NA	Yes
Garbage storage/pick-up area, dumpsters	15	NA	Yes
Cooling tower intake or basin	15	15	Yes
Cooling tower exhaust	25	15	No

The cooling tower is located in a rooftop mechanical well with the outside air louver on the opposite side of the well wall. Although the crow's flight distance is roughly 15 feet the actual path the air would need to travel is greater than that. It seems as though this would be an acceptable location for the cooling tower.

## OPERATION AND MAINTENANCE

Ample room was left unoccupied within the second floor mechanical room to allow for full inspection and maintenance of the energy recovery unit's wheel, filters, and fan. The individual water source heat pumps located throughout the spaces of the building are also accompanied with access panels when located in enclosed niches or are accessible when located in mechanical closets. All equipment located in the attic is also accessible via catwalks throughout the space.

## CONTAMINATED AIR

All equipment such as laundry dryers and combustion boilers are exhausted directly to the outside environment to eliminate mixing of contaminants. Also spaces such as kitchens and trash rooms, which contains the kitchen's grease trap, are also exhausted directly to the exterior for the same purpose. The energy recovery unit is also fitted with a filter with a MERV rating greater than 6 to eliminate outside air contaminants and particulates.

## BUILDING ENVELOPE

The construction of the building is specified to incorporate weather barriers, vapor barriers, and air leakage blockades (caulk, weather-stripping, etc) in accordance with section 5.15.1.

## VENTILATION RATE PROCEDURE ANALYSIS COMPLIANCE WITH SECTION 6

For the evaluation of the ventilation rate procedure of the Longwood at Oakmont Healthcare Center the entire building was taken into consideration. This was simply due to the fact that a single energy recovery unit was used to handle the building's entire ventilation load.

The results that were gathered and calculated have shown that the building was designed in accordance with ASHRAE 62.1 Section 6 requirements. The following table illustrates the aforementioned data:

Space Name	$V_{ou}$ (cfm)	$V_{pz}$ (cfm)	$Z_p$ (max)	$E_v$	$V_{ot}$ (cfm)
Calculated Totals	6733	58073	0.34	0.8	8416
Designed Totals		58073			13200

There is a significant difference between the ASHRAE required outside air quantity and the designed outside air quantity. This could be looked at in two different lights.

On one side, this could be looked at as over engineering. If the designed value of outside air were to be closer to the minimum amount of outside air required by ASHRAE standards a smaller and subsequently less expensive energy recovery unit could be used. This would pose a great asset to the owner of the building.

On the other hand, an increased amount of ventilation air within a building has some great benefits. The building could have been designed this way to improve the indoor air quality for improved occupant comfort, well-being and productivity. By adding an additional 5000 cfm of outside air the ventilation system is in compliance with LEED Indoor Environmental Quality Credit 2. Although this building was not being considered for LEED certification it seems as though it was the engineer's intent to practice sustainable methods.

A fully encompassed analysis of the building's compliance with the ventilation rate procedure is located in the appendix of this report.



## PROCEDURE

### Step One: Uncorrected Outdoor Air Intake ( $V_{ou}$ )

$$V_{ou} = (R_p * P_z) + (R_a * A_z) = [\text{cfm}]$$

Where:  $R_p$  – People outdoor air rate [cfm/person] – per Table 6-1

$P_z$  – People in zone [person] – design conditions

$R_a$  – Area outdoor air rate [cfm/person] – per Table 6-1

$A_z$  – Area of zone [sf] – design conditions

### Step Two: Zone Primary Outdoor Air Fraction ( $Z_p$ )

$$Z_p = V_{ou} / V_{pz}$$

Where:  $V_{pz}$  – Zone primary airflow [cfm] – design conditions

### Step Three: Outdoor Air Intake Flow ( $V_{ot}$ )

$$V_{ot} = V_{ou} / E_v = [\text{cfm}]$$

Where:  $E_v$  – System ventilation efficiency – per Table 6-3 and max  $Z_p$  value of system

## REFERENCES

“ANSI/ASHRAE Standard 62.1-2007 – Ventilation for Acceptable Indoor Air Quality.” ASHRAE, Inc. Atlanta, GA. 2007.

“Additions and Renovations to Health Center for Presbyterian Seniorcare – Longwood at Oakmont.” Plans and schedules. Reese, Lower, Patrick, and Scott, Ltd. September 2007.

“LEED-NC: Green Building Rating System for New Construction and Major Renovations – Version 2.2.” U.S. Green Building Council. October 2005.

# APPENDIX

Space Name	Occ. Density (#/1000ft <sup>2</sup> )	A <sub>z</sub> (ft <sup>2</sup> )	R <sub>a</sub> (cfm/ft <sup>2</sup> )	P <sub>z</sub> (person)	R <sub>p</sub> (cfm/person)	V <sub>ou</sub> (cfm)	V <sub>pz</sub> (cfm)	Z <sub>p</sub>	E <sub>v</sub>	V <sub>ot</sub> (cfm)
<b>DEMENTIA</b>										
DEM. MED ROOM		128	0.06	1	5	13	200	0.07	0.8	16
DEM. FAMILY ROOM		415	0.06	5	5	50	400	0.13	0.8	63
DEM. CHARTING		142	0.06	4	5	29	200	0.15	0.8	36
DEM. GREAT ROOM		391	0.06	3	5	39	500	0.08	0.8	49
DEM. DINING ROOM/ COUNTRY KITCHEN		978	0.18	8	7.5	237	1500	0.16	0.8	296
DEM. CARE BASE		240	0.06	2	5	25	200	0.13	0.8	31
DEM. STAFF HALLWAY		65	0.06	0	0	4	50	0.08	0.8	5
DEM. CLEAN UTILITY		116	0	0	0	0	175	0.00	0.8	0
DEM. STAFF TOILET		58	0	0	0	0	0	0.00	0.8	0
DEM. RESIDENT TOILET		58	0	0	0	0	0	0.00	0.8	0
DEM. CORRIDOR		1180	0.06	0	0	71	750	0.09	0.8	89
NEW DEMENTIA PRIVATE ROOM 101		310	0	3	25	75	280	0.27	0.8	94
NEW DEMENTIA PRIVATE ROOM 102		310	0	3	25	75	280	0.27	0.8	94
NEW DEMENTIA PRIVATE ROOM 103		310	0	3	25	75	280	0.27	0.8	94
NEW DEMENTIA PRIVATE ROOM 104		310	0	3	25	75	280	0.27	0.8	94
NEW DEMENTIA PRIVATE ROOM 114		310	0	3	25	75	280	0.27	0.8	94
NEW DEMENTIA PRIVATE ROOM 115		310	0	3	25	75	280	0.27	0.8	94
NEW DEMENTIA PRIVATE ROOM 116		310	0	3	25	75	280	0.27	0.8	94
NEW DEMENTIA PRIVATE ROOM 124		310	0	3	25	75	280	0.27	0.8	94
NEW DEMENTIA PRIVATE ROOM 125		310	0	3	25	75	280	0.27	0.8	94
NEW DEMENTIA PRIVATE ROOM 126		310	0	3	25	75	280	0.27	0.8	94
NEW DEMENTIA PRIVATE ROOM 127		310	0	3	25	75	280	0.27	0.8	94
NEW DEMENTIA PRIVATE ROOM 128		310	0	3	25	75	280	0.27	0.8	94
NEW DEMENTIA PRIVATE ROOM 130		310	0	3	25	75	280	0.27	0.8	94
NEW DEMENTIA PRIVATE ROOM 131		310	0	3	25	75	280	0.27	0.8	94
NEW DEMENTIA PRIVATE ROOM 132		310	0	3	25	75	280	0.27	0.8	94
NEW DEMENTIA PRIVATE ROOM 133		310	0	3	25	75	280	0.27	0.8	94
<b>TOTALS</b>						<b>1668</b>	<b>8455</b>			<b>2085</b>

Space Name	Occ. Density (#/1000 ft <sup>2</sup> )	A <sub>z</sub> (ft <sup>2</sup> )	R <sub>a</sub> (cfm/sq ft)	P <sub>z</sub> (person)	R <sub>p</sub> (cfm/person)	V <sub>ou</sub> (cfm)	V <sub>pz</sub> (cfm)	Z <sub>p</sub>	E <sub>v</sub>	V <sub>ot</sub> (cfm)
<b>HC FIRST FLOOR</b>										
HC CONFERENCE ROOM		238	0.06	10	5	65	630	0.10	0.8	81
HC ACTIVITIES OFFICE		143	0.06	2	5	19	330	0.06	0.8	24
HC MULT-PURPOSE		998	0.06	12	5	120	750	0.16	0.8	150
HC STORAGE		94	0.12	0.00	0	12	100	0.12	0.8	15
HC RESIDENT TOILET		60	0	0	0	0	50	0.00	0.8	0
HC VISITOR TOILET		60	0	0	0	0	50	0.00	0.8	0
HC CORR / ENT HALL/ ELEV		1260	0.06	0	0	76	950	0.08	0.8	95
HC RESIDENT LAUNDRY	10	90	0.12	1	5	16	280	0.06	0.8	20
HC STAFF TOILET		78	0	0	0	0	50	0.00	0.8	0
HC FAMILY ROOM		257	0.06	4	5	36	280	0.13	0.8	45
HC CLEAN UTILITY		100	0.12	0	0	12	50	0.24	0.8	15
HC EQUIPMENT ROOM		165	0.06	0	0	10	480	0.02	0.8	13
HC CORR		785	0.06	0	0	48	430	0.11	0.8	60
HC CARE BASE		599	0.06	5	5	61	660	0.09	0.8	76
HC DINING ROOM		800	0.18	10	7.5	219	1120	0.20	0.8	274
HC COUNTRY KITCHEN		204	0	0	0	0	400	0.00	0.8	0
HC LIVING RM / ACT AREA		670	0.06	10	5	91	525	0.17	0.8	114
HC CHARTING		125	0.06	4	5	28	130	0.22	0.8	35
HC ELEC		47	0.06	0	0	3	0	0.00	0.8	4
HC MED ROOM		77	0.06	2	5	15	220	0.07	0.8	19
HC SOILED UTILITY		109	0	0	0	0	280	0.00	0.8	0
HC RESIDENT TOILET		63	0	0	0	0	50	0.00	0.8	0
HC RESIDENT SPA		250	0.48	0	0	120	350	0.34	0.8	150
HC CART CORRAL		70	0.12	0	0	9	0	0.00	0.8	11
HC JC		40	0	0	0	0	0	0.00	0.8	0
HC RESIDENT ROOM TYPE A 101		456	0	3	25	75	560	0.13	0.8	94
HC RESIDENT ROOM TYPE B 134		491	0	3	25	75	760	0.10	0.8	94
HC RESIDENT ROOM TYPE C 136		250	0	2	25	50	560	0.09	0.8	63
HC RESIDENT ROOM TYPE C 135		250	0	2	25	50	560	0.09	0.8	63
HC RESIDENT ROOM TYPE C 114		250	0	2	25	50	560	0.09	0.8	63
HC RESIDENT ROOM TYPE C 113		250	0	2	25	50	560	0.09	0.8	63
HC RESIDENT ROOM TYPE C 102		250	0	2	25	50	560	0.09	0.8	63
HC RESIDENT ROOM TYPE C 103		250	0	2	25	50	560	0.09	0.8	63
HC RESIDENT ROOM TYPE C 116		250	0	2	25	50	960	0.05	0.8	63
HC RESIDENT ROOM TYPE C 117		250	0	2	25	50	960	0.05	0.8	63
HC RESIDENT ROOM TYPE C 118		250	0	2	25	50	960	0.05	0.8	63
HC RESIDENT ROOM TYPE C 119		250	0	2	25	50	960	0.05	0.8	63
HC RESIDENT ROOM TYPE C 124		250	0	2	25	50	960	0.05	0.8	63
HC RESIDENT ROOM TYPE C 125		250	0	2	25	50	960	0.05	0.8	63
<b>TOTALS</b>						<b>1710</b>	<b>18605</b>			<b>2138</b>

Space Name	Occ. Density (#/1000 ft <sup>2</sup> )	A <sub>z</sub> (ft <sup>2</sup> )	R <sub>a</sub> (cfm/sq ft)	P <sub>z</sub> (person)	R <sub>p</sub> (cfm/person)	V <sub>ou</sub> (cfm)	V <sub>pz</sub> (cfm)	Z <sub>p</sub>	E <sub>v</sub>	V <sub>ot</sub> (cfm)
<b>HC SECOND FLOOR</b>										
HC VISITOR TOILET		60	0	0	0	0	50	0.00	0.8	0
HC CORR / ENT HALL/ ELEV		1069	0.06	0	0	65	950	0.07	0.8	81
HC RESIDENT LAUNDRY	10	90	0.12	1	5	16	280	0.06	0.8	20
HC STAFF TOILET		78	0	0	0	0	50	0.00	0.8	0
HC FAMILY ROOM		257	0.06	4	5	36	280	0.13	0.8	45
HC CLEAN UTILITY		100	0.12	0	0	12	50	0.24	0.8	15
HC EQUIPMENT ROOM		165	0.06	0	0	10	480	0.02	0.8	13
HC CORR		785	0.06	0	0	48	430	0.11	0.8	60
HC CARE BASE		599	0.06	5	5	61	660	0.09	0.8	76
HC DINING ROOM		800	0.18	10	7.5	219	1120	0.20	0.8	274
HC COUNTRY KITCHEN		204	0	0	0	0	400	0.00	0.8	0
HC LIVING RM / ACT AREA		670	0.06	10	5	91	525	0.17	0.8	114
HC CHARTING		125	0.06	4	5	28	130	0.22	0.8	35
HC ELEC		47	0.06	0	0	3	0	0.00	0.8	4
HC MED ROOM		77	0.06	2	5	15	220	0.07	0.8	19
HC SOILED UTILITY		109	0	0	0	0	280	0.00	0.8	0
HC RESIDENT TOILET		63	0	0	0	0	50	0.00	0.8	0
HC RESIDENT SPA		250	0.48	0	0	120	350	0.34	0.8	150
HC CART CORRAL		70	0.12	0	0	9	0	0.00	0.8	11
HC JC		40	0	0	0	0	0	0.00	0.8	0
HC RESIDENT ROOM TYPE A 201		456	0	3	25	75	560	0.13	0.8	94
HC RESIDENT ROOM TYPE B 234		491	0	3	25	75	760	0.10	0.8	94
HC RESIDENT ROOM TYPE C 236		250	0	2	25	50	560	0.09	0.8	63
HC RESIDENT ROOM TYPE C 235		250	0	2	25	50	560	0.09	0.8	63
HC RESIDENT ROOM TYPE C 214		250	0	2	25	50	560	0.09	0.8	63
HC RESIDENT ROOM TYPE C 213		250	0	2	25	50	560	0.09	0.8	63
HC RESIDENT ROOM TYPE C 202		250	0	2	25	50	560	0.09	0.8	63
HC RESIDENT ROOM TYPE C 203		250	0	2	25	50	560	0.09	0.8	63
HC RESIDENT ROOM TYPE C 216		250	0	2	25	50	960	0.05	0.8	63
HC RESIDENT ROOM TYPE C 217		250	0	2	25	50	960	0.05	0.8	63
HC RESIDENT ROOM TYPE C 218		250	0	2	25	50	960	0.05	0.8	63
HC RESIDENT ROOM TYPE C 219		250	0	2	25	50	960	0.05	0.8	63
HC RESIDENT ROOM TYPE C 224		250	0	2	25	50	960	0.05	0.8	63
HC RESIDENT ROOM TYPE C 225		250	0	2	25	50	960	0.05	0.8	63
<b>TOTALS</b>						<b>1483</b>	<b>16745</b>			<b>1854</b>

Space Name	Occ. Density (#/1000 ft <sup>2</sup> )	A <sub>z</sub> (ft <sup>2</sup> )	R <sub>a</sub> (cfm/sq ft)	P <sub>z</sub> (person)	R <sub>p</sub> (cfm/person)	V <sub>ou</sub> (cfm)	V <sub>pz</sub> (cfm)	Z <sub>p</sub>	E <sub>v</sub>	V <sub>ot</sub> (cfm)
<b>REHAB AREA</b>										
REHAB RESIDENT ROOM TYPE E 130		298	0.00	3	25	75	590	0.13	0.8	94
REHAB RESIDENT ROOM TYPE E 139		298	0.00	3	25	75	590	0.13	0.8	94
REHAB RESIDENT ROOM TYPE F 131		186	0.00	2	25	50	220	0.23	0.8	63
REHAB RESIDENT ROOM TYPE F 138		186	0.00	2	25	50	220	0.23	0.8	63
REHAB RESIDENT ROOM TYPE D 140		186	0.00	2	25	50	220	0.23	0.8	63
REHAB RESIDENT ROOM TYPE D 141		186	0.00	2	25	50	220	0.23	0.8	63
REHAB RESIDENT ROOM TYPE D 142		186	0.00	2	25	50	220	0.23	0.8	63
REHAB RESIDENT ROOM TYPE D 127		186	0.00	2	25	50	220	0.23	0.8	63
REHAB RESIDENT ROOM TYPE D 128		186	0.00	2	25	50	221	0.23	0.8	63
REHAB RESIDENT ROOM TYPE D 129		186	0.00	2	25	50	222	0.23	0.8	63
RESIDENT SPA B156/HALL B157		261	0.48	0	0	126	375	0.34	0.8	158
SHOWER B157A		43	0.00	0	0	0	0	0.00	0.8	0
MED RECORDS B160		81	0.06	2	5	15	160	0.09	0.8	19
CORRIDOR B158		200	0.06	0	0	12	160	0.08	0.8	15
VISITOR TOILET B160		63	0.00	0	0	0	0	0.00	0.8	0
JC B163		46	0.00	0	0	0	0	0.00	0.8	0
TRAINING TOILET B155		57	0.00	0	0	0	0	0.00	0.8	0
CART CORAL B153/HALL B154		104	0.12	0	0	13	100	0.13	0.8	16
RESIDENT LAUNDRY B152	10	53	0.12	1	5	12	0	0.00	0.8	15
LIVING ROOM B150		458	0.06	5	5	53	380	0.14	0.8	66
KITCHEN EQUIPMENT B149		119	0.06	0	0	8	480	0.02	0.8	10
DINING ROOM B147/COUNTRY KITCHEN B148		730	0.18	6	7.5	177	1415	0.13	0.8	221
CHARTING B146		136	0.06	4	5	29	280	0.10	0.8	36
LIVING ROOM B145		557	0.06	10	5	84	860	0.10	0.8	105
LOBBY B149/CARE BASE B144		338	0.06	4	5	41	380	0.11	0.8	51
RESIDENT TOILET B125		71	0.00	0	0	0	50	0.00	0.8	0
SOCIAL WORKER B126		124	0.06	2	5	18	180	0.10	0.8	23
STAFF TOILET B124		71	0.00	0	0	0	50	0.00	0.8	0
MED ROM B123		81	0.06	2	5	15	280	0.05	0.8	19
LOBBY B121/COFFEE SHOP B122		732	0.06	9	5	89	820	0.11	0.8	111
BEAUTY SHOP B115		264	0.12	4	20	112	380	0.29	0.8	140
RECEPTION B120		76	0.06	2	5	15	175	0.09	0.8	19
SC ADMIN B116		120	0.06	2	5	18	130	0.14	0.8	23
WORK ROOM B117		170	0.06	2	5	21	175	0.12	0.8	26
DON B119		119	0.06	2	5	18	140	0.13	0.8	23
ADON/RNAC B118		90	0.06	2	5	16	140	0.11	0.8	20
CORRIDOR B171		455	0.06	0	0	28	190	0.15	0.8	35
AL KITCHEN B176		650	0.00	0	0	0	1400	0.00	0.8	0
TRASH B178		109	0.00	0	0	0	100	0.00	0.8	0
WAITRESS STATION B174		111	0.06	2	5	17	0	0.00	0.8	21

Space Name	Occ. Density (#/1000 ft <sup>2</sup> )	A <sub>z</sub> (ft <sup>2</sup> )	R <sub>a</sub> (cfm/sq ft)	P <sub>z</sub> (person)	R <sub>p</sub> (cfm/person)	V <sub>ou</sub> (cfm)	V <sub>pz</sub> (cfm)	Z <sub>p</sub>	E <sub>v</sub>	V <sub>ot</sub> (cfm)
<b>REHAB AREA (cont.)</b>										
VISITOR TOILET B168		64	0.00	0	0	0	0	0.00	0.8	0
RESIDENT TOILET B167		62	0.00	0	0	0	0	0.00	0.8	0
AL PREDINING ROOM B166		279	0.06	6	5	47	160	0.29	0.8	59
CORRIDOR B164/165		700	0.06	0	0	42	380	0.11	0.8	53
SOILED UTILITY B132		100	0.00	0	0	0	280	0.00	0.8	0
CLEAN UTILITY B136		120	0.00	0	0	0	175	0.00	0.8	0
J.C. B133		32	0.00	0	0	0	0	0.00	0.8	0
OXY B134		32	0.00	0	0	0	50	0.00	0.8	0
CART CORRAL B137		64	0.12	0	0	8	0	0.00	0.8	10
CORRIDOR B135		695	0.06	0	0	42	300	0.14	0.8	53
<b>TOTALS</b>						<b>1626</b>	<b>13088</b>			<b>2033</b>