

ALL OPTIONS

This active sample form has been modified for offline access. Modified fields and instructions are indicated in purple. Sample forms are for reference only.

Note: The content highlighted in yellow below is linked to IEQc1.3.

Select all that apply to the project building:

- ☒ The project building is mechanically ventilated, in part or in whole.
- ☐ The project building is naturally ventilated, in part or in whole.
- ☐ The project building is mechanically conditioned, in part or in whole.
- ☐ The project building is naturally conditioned, in part or in whole.

MECHANICAL VENTILATION

Performance period start:

Performance period end:

Select all that apply to the project space:

- ☒ **Case 1.** One or more AHUs are able to meet the ASHRAE Standard 62.1-2007 outdoor air requirement.
- ☐ **Case 2.** One or more AHUs are unable to meet the ASHRAE Standard 62.1-2007 outdoor air requirement.

Select these if the building is mechanically ventilated and all systems meet ASHRAE.



Choose either the form or the 62MZ to complete the ventilation rate procedure calculations

AHUs THAT MEET ASHRAE STANDARD 62.1-2007 OUTDOOR AIR REQUIREMENTS

The ASHRAE 62.1-2007 Ventilation Rate Procedure documentation for each air handling unit must be submitted using one of the documentation methods below. All documentation methods should account for the worst case ventilation conditions (generally heating mode), and should list all relevant variables used in the calculations (e.g. Ez, Ds, Ev, etc.). All AHUs must be included in one, not all, of the documents below.

Select one of the following:

- ☐ Complete the "VRP Compliance Calculator" found in Appendix 1 of this form.
- ☐ Download, complete, and upload ASHRAE calculator "62MZCalc".

If you're already familiar with the 62MZ calculator, this works great. If not, the USGBC form might be a little more straightforward

Include a narrative to demonstrate how systems were set to simulate worst-case conditions while outside air testing was performed

MEASUREMENT AND MAINTENANCE

For all variable air volume systems, describe how the VAV outside air flow was set up during the air flow measurements to operate at the worst-case condition expected during normal operations (i.e., fan speeds set at minimum normal operating level, OA dampers set at their minimum normal operating opening, etc.).

The worst-case scenario for the ventilation systems occurs during the heating season. In order to simulate this state, AHU's and VAV boxes were setup to operate in heating mode with a minimum outside air quantity while testing was conducted.

Required Signatory IEQp1.1. Facility Manager, Property Manager, or Building Engineer

All values of occupancy used to define minimum outside air flow requirements for this prerequisite are based on the maximum occupancy expected during normal facility operation (e.g., not design occupancy, minimum occupancy, or unusual or emergency conditions).



Include a narrative for the outside air testing methodology and the ventilation maintenance program

Describe the outside air flow measurement method or protocol used for each AHU, explaining the measurement device or system, its accuracy, and how the measurements were taken.

Outside air flow measurements were taken at each AHU room. When access was available, a Shortridge flow hood was used to take direct CFM readings. The accuracy of the flow hood is within +/- 1% . Rooms with limited access required the use of a Davis anemometer which has an accuracy of +/- 3%.

Describe the ventilation maintenance program, including a description of the periodic checks and scheduled maintenance performed, and whether the checks are manual, based on a building automation system, or both.

The ventilation system in the building consists of individual air handling units(AHU's), Outside air fans (OAF), Return air fans(RF) and Toilet exhaust fans(TEF). The building EMS records fan hours for the OAF's, RAF's and TEF's with scheduled maintenance performed every 1200 hours (approximately 3 times/year). Visual Inspections occur daily on these fans and monthly status logs are filed to ensure minimum OA requirements are documented. Specific PM procedures include checking fan filters, VFD, blade torque and angle, fan hub, motor mounts, and lubricate per manufacturers recommendation.

Include the PM documentation and...

Upload IEQp1-3. Provide documentation verifying an HVAC system maintenance program related to outdoor air introduction and exhaust was implemented for the project building during the performance period. If a building automation system is used for any ventilation components, include a periodic system status report taken during the performance period. For ventilation components handled manually, include the maintenance log written during the performance period.

Upload

Files:

Upload IEQp1-4. Upload a testing report for each type of exhaust system in the project building.

Upload

Files:



Don't forget about the exhaust testing reports!



APPENDIX

Select all that apply to the project building:

- ☒ Mechanical Ventilation Multiple Zone Unit
- ☐ Mechanical Ventilation Single Zone Unit
- ☐ Mechanical Ventilation 100% Outside Air
- ☐ Natural Ventilation

Select the appropriate system type. This is where the ventilation rate procedure calculations are run if you're not using the 62MZ calculator

Table IEQp1-A1. Mechanical Ventilation - Multiple Zone Unit

Add AHU

Delete AHU

System Name and Number: (AHU 1)									AHU - 7F West									
System Design Operating Condition									Peak heating mode ▼									
									IEQp1 Compliance							IEQc2 Compliance		
Zone	Occupancy Category	Rp (cfm /p)	Ra (cfm /sf)	Occupancy Density			Az (sf)	Vbz (cfm)	Ez	Voz (cfm)	Vdzd (cfm)	Ds (%)	Vpz (cfm)	Zp	Vbz (cfm)	Voz (cfm)	Zp	
				Default	# / 1000 sf	Pz												
1	Office space ▼	5	0.06	<input type="checkbox"/>	0	30	4,000	390	0.8 ▼	488	1,400	40	560	0.87	0	0	0	
2	Conference / meetin ▼	5	0.06	<input type="checkbox"/>		12	1,000	120	0.8 ▼	150	720	40	288	0.52	0	0	0	
3	Break rooms ▼	5	0.06	<input type="checkbox"/>		5	500	55	0.8 ▼	69	200	40	80	0.86	0	0	0	
System Population without diversity (Ps)									47							0		
Occupancy Diversity (D) (%)									100							0		
System Population with Diversity (Ps)									47							0		
Design System Primary supply Airflow (Vpsd) (cfm)									2,320							0		
Uncorrected Outdoor Air Intake (Vou) (cfm)									565							0		
System Ventilation Efficiency (Ev)									0.74							0		
Required Outdoor Intake Flow (Vot) (cfm)									765							0		
Project Design Outdoor Airflow (cfm)									805									

+

-

+

-

Enter zone level data for each building AHU



Table IEQp1-A1. Mechanical Ventilation - Multiple Zone Unit

Add AHU
Delete AHU

System Name and Number: (AHU 1)	AHU - 7F West	
System Design Operating Condition	Peak heating mode ▼	
	IEQp1 Compliance	IEQc2 Compliance

Heating mode is often the condition with the worst-case ventilation scenario

Zone	Occupancy Category	Rp (cfm /p)	Ra (cfm /sf)	Occupancy Density			Az (sf)
				Default	# / 1000 sf	Pz	
1	Office space ▼	5	0.06	<input type="checkbox"/>	0	30	4,000
2	Conference / meeting ▼	5	0.06	<input type="checkbox"/>		12	1,000
3	Break rooms ▼	5	0.06	<input type="checkbox"/>		5	500
System Population without diversity (Ps)							
Occupancy Diversity (D) (%)							
System Population with Diversity (Ps)							
Design System Primary supply Airflow (Vpsd) (cfm)							
Uncorrected Outdoor Air Intake (Vou) (cfm)							
System Ventilation Efficiency (Ev)							
Required Outdoor Intake Flow (Vot) (cfm)							
Project Design Outdoor Airflow (cfm)							

All zones have to be entered when using the form calculator. As an alternative, the 62MZ calculator only requires assessment of critical zones

Zone	Occupancy Category	Rp (cfm /p)	Ra (cfm /sf)	Occupancy Density			Az (sf)
				Default	# / 1000 sf	Pz	
1	Office space	5	0.06	<input type="checkbox"/>	0	30	4,000
2	Conference / meeting	5	0.06	<input type="checkbox"/>		12	1,000
3	Break rooms	5	0.06	<input type="checkbox"/>		5	500
System Population without diversity (Ps)							
Occupancy Diversity (D) (%)							
System Population with Diversity (Ps)							
Design System Primary supply Airflow (Vpsd) (cfm)							
Uncorrected Outdoor Air Intake (Vou) (cfm)							
System Ventilation Efficiency (Ev)							
Required Outdoor Intake Flow (Vot) (cfm)							
Project Design Outdoor Airflow (cfm)							

Do not use default occupancy values unless the zone is a vacant space. Rather, use actual occupancy under typical conditions.

Make sure that the total occupancy and area addressed by the ventilation calculations are consistent with the total occupancy and area across all credits

Default	# / 1000 sf	Occupancy Density		Az (sf)
		Pz		
<input type="checkbox"/>	0	30		4,000
<input type="checkbox"/>		12		1,000
<input type="checkbox"/>		5		500
Population without diversity (Ps)				
Occupancy Diversity (D) (%)				
Population with Diversity (Ps)				
Primary supply Airflow (Vpsd) (cfm)				
Outdoor Air Intake (Vou) (cfm)				
System Ventilation Efficiency (Ev)				
Outdoor Intake Flow (Vot) (cfm)				
Total Design Outdoor Airflow (cfm)				

Zone	Occupancy Category	Rp (cfm /p)	Ra (cfm /sf)	Occupancy Density			Az (sf)	Vbz (cfm)	Ez	Voz (cfm)	V (cfm)
				Default	# / 1000 sf	Pz					
1	Office space	5	0.06	<input type="checkbox"/>	0	30	4,000	390	0.8	488	
2	Conference / meeting	5	0.06	<input type="checkbox"/>		12	1,000	120	0.8	150	
3	Break rooms	5	0.06	<input type="checkbox"/>		5	500	55	0.8	69	

TABLE 6-2
Zone Air Distribution Effectiveness

Air Distribution Configuration	E_z
Ceiling supply of cool air	1.0
Ceiling supply of warm air and floor return	1.0
Ceiling supply of warm air 15°F (8°C) or more above space temperature and ceiling return.	0.8
Ceiling supply of warm air less than 15°F (8°C) above space temperature and ceiling return provided that the 150 fpm (0.8 m/s) supply air jet reaches to within 4.5 ft (1.4 m) of floor level. Note: For lower velocity supply air, $E_z = 0.8$.	1.0
Floor supply of cool air and ceiling return provided that the 150 fpm (0.8 m/s) supply jet reaches 4.5 ft (1.4 m) or more above the floor. Note: Most underfloor air distribution systems comply with this proviso.	1.0
Floor supply of cool air and ceiling return, provided low-velocity displacement ventilation achieves unidirectional flow and thermal stratification	1.2
Floor supply of warm air and floor return	1.0
Floor supply of warm air and ceiling return	0.7
Makeup supply drawn in on the opposite side of the room from the exhaust and/or return	0.8
Makeup supply drawn in near to the exhaust and/or return location	0.5

The value for E_z is often 0.8 in heating mode. This value is dependent on the way that ventilation is supplied to the occupied space (i.e. ceiling supply)

This value is the design total supply air (outside + re-circulated) to the zone.

AHU - 7F West									
Peak heating mode									
IEQp1 Compliance									IEC
ensity	Az (sf)	Vbz (cfm)	Ez	Voz (cfm)	Vdzd (cfm)	Ds (%)	Vpz (cfm)	Zp	Vbz (cfm)
Pz									
30	4,000	390	0.8▼	488	1,400	40	560	0.87	
12	1,000	120	0.8▼	150	720	40	288	0.52	
5	500	55	0.8▼	69	200	40	80	0.86	
diversity (Ps)								47	
diversity (D) (%)								100	

The value for Ds is the percent of supply air at the condition analyzed. This should be less than 100% for a VAV system.

AHU - 7F West									
Peak heating mode									
IEQp1 Compliance									IEC
ensity	Az (sf)	Vbz (cfm)	Ez	Voz (cfm)	Vdzd (cfm)	Ds (%)	Vpz (cfm)	Zp	Vbz (cfm)
Pz									
30	4,000	390	0.8▼	488	1,400	40	560	0.87	
12	1,000	120	0.8▼	150	720	40	288	0.52	
5	500	55	0.8▼	69	200	40	80	0.86	
diversity (Ps)								47	
diversity (D) (%)								100	

Number: (AHU 1)							AHU - 7F West						
Operating Condition							Peak heating mode						
							IEQp1 Compliance						
Occupancy Category	Rp (cfm /p)	Ra (cfm /sf)	Occupancy Density			Az (sf)	Vbz (cfm)	Ez	Voz (cfm)	Vdzd (cfm)	Ds (%)	Vpz (cfm)	Zp
			Default	# / 1000 sf	Pz								
Office	5	0.06	<input type="checkbox"/>	0	30	4,000	390	0.8	488	1,400	40	560	0.87
Meeting	5	0.06	<input type="checkbox"/>		12	1,000	120	0.8	150	720	40	288	0.52
Storage	5	0.06	<input type="checkbox"/>		5	500	55	0.8	69	200	40	80	0.86
System Population without diversity (Ps)							47						
Occupancy Diversity (D) (%)							100						
System Population with Diversity (Ps)							47						
Design System Primary supply Airflow (Vpsd) (cfm)							2,320						
Uncorrected Outdoor Air Intake (Vou) (cfm)							565						
System Ventilation Efficiency (Ev)							0.74						
Required Outdoor Intake Flow (Vot) (cfm)							765						
Project Design Outdoor Airflow (cfm)							805						

The values for Zp determine the system ventilation efficiency down here.



Table IEQp1-A1. Mechanical Ventilation - Multiple Zone Unit

Add AHU

Delete AHU

System Name and Number: (AHU 1)								AHU - 7F West									
System Design Operating Condition								Peak heating mode ▼									
								IEQp1 Compliance							IEQc2 Compliance		
Zone	Occupancy Category	Rp (cfm /p)	Ra (cfm /sf)	Occupancy Density			Az (sf)	Vbz (cfm)	Ez	Voz (cfm)	Vdzd (cfm)	Ds (%)	Vpz (cfm)	Zp	Vbz (cfm)	Voz (cfm)	Zp
				Default	# / 1000 sf	Pz											
1	Office space ▼	5	0.06	<input type="checkbox"/>	0	30	4,000	390	0.8 ▼	488	1,400	40	560	0.87	0	0	0
2	Conference / meetin ▼	5	0.06	<input type="checkbox"/>		12	1,000	120	0.8 ▼	150	720	40	288	0.52	0	0	0
3	Break rooms ▼	5	0.06	<input type="checkbox"/>		5	500	55	0.8 ▼	69	200	40	80	0.86	0	0	0
System Population without diversity (Ps)															47		
Occupancy Diversity (D) (%)															100		
System Population with Diversity (Ps)															47		
Design System Primary supply Airflow (Vpsd) (cfm)															2,320		
Uncorrected Outdoor Air Intake (Vou) (cfm)															565		
System Ventilation Efficiency (Ev)															0.74		
Required Outdoor Intake Flow (Vot) (cfm)															765		
Project Design Outdoor Airflow (cfm)															805		

+

-

+

-

For EBOM, this is the measured outside air, not the design outdoor airflow