

- Read the IAQ Backgrounder and the Background Information for this checklist.
- 2. Keep the
  Background
  Information and
  make a copy of
  this checklist for
  each ventilation
  unit in your school,
  as well as a
  copy for future
  reference.
- Complete the Checklist.
  - Check the "yes," "no," or "not applicable" box beside each item. (A "no" response requires further attention.)
  - Make comments in the "Notes" section as necessary.
- Return the checklist portion of this document to the IAQ Coordinator.

# **Ventilation Checklist**

Na	ame: Andrew lawson		
Sc	chool: Riverside Magnet School		
1	nit Ventilator/AHU No: DOAS-		- 0
	pom or Area: Date Completed: 12-20-2	4	
	gnature: Andrew Danzen		
21	gnature: Constant Constant		
1.	OUTDOOR AIR INTAKES		
la.		No	/N/A
1b.	example, a fire escape floor plan)		ш
	mode		
AC	TIVITY 1: OBSTRUCTIONS		
	Ensured that outdoor air intakes are clear of obstructions, debris, clogs,		
	or covers		
ld.	Installed corrective devices as necessary (e.g., if snowdrifts or leaves frequently block an intake)		
		8	_
	TIVITY 2: POLLUTANT SOURCES		
le.	Checked ground-level intakes for pollutant sources (dumpsters, loading docks, and bus-idling areas)	₩/	/ n
1f.	Checked rooftop intakes for pollutant sources (plumbing vents; kitchen,		_
	toilet, or laboratory exhaust fans; puddles; and mist from air-conditioning cooling towers)		
1g.	Resolved any problems with pollutant sources located near outdoor air	,	
	intakes (e.g., relocated dumpster or extended exhaust pipe)		
AC	TIVITY 3: AIRFLOW	,	
1h.	Obtained chemical smoke (or a small piece of tissue paper or light plastic).		
	Confirmed that outdoor air is entering the intake appropriately		
2.	SYSTEM CLEANLINESS		
AC	TIVITY 4: AIR FILTERS	,	
	Replaced filters per maintenance schedule		
2b.	Shut off ventilation system fans while replacing filters (prevents dirt from blowing downstream)	, _ □	
2c.	Vacuumed filter areas before installing new filters		ū
	Confirmed proper fit of filters to prevent air from bypassing (flowing	_	
2e	around) the air filter		
	commission proper misianation of fine is (correct direction for an now)	J	J

## 2. SYSTEM CLEANLINESS (continued)

# **ACTIVITY 5: DRAIN PANS** 2f. Ensured that drain pans slant toward the drain (to prevent water from 2g. Cleaned drain pans ..... 2h. Checked drain pans for mold and mildew ..... **ACTIVITY 6: COILS** 2i. Ensured that heating and cooling coils are clean ..... ACTIVITY 7: AIR-HANDLING UNITS, UNIT VENTILATORS 2j. Ensured that the interior of air-handling unit(s) or unit ventilator (air-mixing chamber and fan blades) is clean ...... 2k. Ensured that ducts are clean ..... **ACTIVITY 8: MECHANICAL ROOMS** 21. Checked mechanical room for unsanitary conditions, leaks, and spills ...... 2m. Ensured that mechanical rooms and air-mixing chambers are free of trash. chemical products, and supplies .... 3. CONTROLS FOR OUTDOOR AIR SUPPLY 3a. Ensured that air dampers are at least partially open (minimum position) ..... 3b. Ensured that minimum position provides adequate outdoor air for occupants ...... 🗹 🖸 **ACTIVITY 9: CONTROLS INFORMATION** 3c. Obtained and reviewed all design inside/outside temperature and humidity requirements, controls specifications, as-built mechanical drawings, and controls operations manuals (often uniquely designed)...... **ACTIVITY 10: CLOCKS, TIMERS, SWITCHES** 3d. Turned summer-winter switches to the correct position ...... 3e. Set time clocks appropriately..... 3f. Ensured that settings fit the actual schedule of building use (including night/weekend use) ACTIVITY 11: CONTROL COMPONENTS 3g. Ensured appropriate system pressure by testing line pressure at both the occupied (day) setting and the unoccupied (night) setting ...... 3h. Checked that the line dryer prevents moisture buildup..... 3i. Replaced control system filters at the compressor inlet based on the compressor manufacturer's recommendation (for example, when you blow down the tank)...... 3j. Set the line pressure at each thermostat and damper actuator at the proper level (no leakage or obstructions) ...... **ACTIVITY 12: OUTDOOR AIR DAMPERS** 3k. Ensured that the outdoor air damper is visible for inspection..... 31. Ensured that the recirculating relief and/or exhaust dampers are visible for inspection ...... 🗹 3m. Ensured that air temperature in the indoor area(s) served by each outdoor air damper is within the normal operating range.....



NOTE: It is necessary to ensure that the damper is operating properly and within the normal range to continue.



3.	CONTROLS FOR OUTDOOR AIR SUPPLY (continued)		
	of shutting off appropriate air handler	No.	N/A
30.	Checked that the outdoor air damper opens (at least partially with no delay) when the air handler is turned on	<b>/</b> _	
	If in heating mode, checked that the outdoor air damper goes to its minimum position (without completely closing) when the room thermostat is set to 85°F	٥	
-	If in cooling mode, checked that the outdoor air damper goes to its minimum position (without completely closing) when the room thermostat is set to 60°F and mixed air thermostat is set to 45°F	0	V
	<ul> <li>The damper actuator links to the damper shaft, and any linkage set screws or bolts are tight</li></ul>		
Pro	oceed to Activities 13–16 if the damper seems to be operating properly.		
	TIVITY 13: FREEZE STATS  Disconnected power to controls (for automatic reset only) to test continuity across terminals	<b>S</b>	<b>_</b>
3t.			<u> </u>
clos	TE: HVAC systems with water coils need protection from the cold. The freeze-sta se the outdoor air damper and disconnect the supply air when tripped. The typic ge is 35°F to 42°F.	at may	
AC	TIVITY 14: MIXED AIR THERMOSTATS		
	Ensured that the mixed air stat for heating mode is set no higher than 65°F		M
3w.	Ensured that the mixed air stat for cooling mode is set no lower than the room thermostat setting		
۸۵	TIVITY 15: ECONOMIZERS		
	Confirmed proper economizer settings based on design specifications or local practices		<b>Y</b>
NO	TE: The dry-bulb is typically set at 65°F or lower.		/
	Checked that sensor on the economizer is shielded from direct sunlight   Ensured that dampers operate properly (for outside air, return air,		ď
	exhaust/relief air, and recirculated air), per the design specifications		Y
NO	TF: Economizers use varying amounts of cool outdoor air to assist with the coo	lina	

NOTE: Economizers use varying amounts of cool outdoor air to assist with the cooling load of the room or rooms. There are two types of economizers, dry-bulb and enthalpy. Dry-bulb economizers vary the amount of outdoor air based on outdoor temperature, and enthalpy economizers vary the amount of outdoor air based on outdoor temperature and humidity level.

# 3. CONTROLS FOR OUTDOOR AIR SUPPLY (continued) **ACTIVITY 16: FANS** 3aa. Ensured that all fans (supply fans and associated return or relief fans) that move outside air indoors continuously operate during occupied Yes/No N/A hours (even when room thermostat is satisfied)..... NOTE: If fan shuts off when the thermostat is satisfied, adjust control cycle as necessary to ensure sufficient outdoor air supply. 4. AIR DISTRIBUTION **ACTIVITY 17: AIR DISTRIBUTION** 4a. Ensured that supply and return air pathways in the existing ventilation system. perform as required..... 4b. Ensured that passive gravity relief ventilation systems and transfer grilles between rooms and corridors are functioning..... NOTE: If ventilation system is closed or blocked to meet current fire codes, consult with a professional engineer for remedies. 4c. Made sure every occupied space has supply of outdoor air (mechanical system or operable windows) ...... 4d. Ensured that supply and return vents are open and unblocked ...... NOTE: If outlets have been blocked intentionally to correct drafts or discomfort, investigate and correct the cause of the discomfort and reopen the vents. 4e. Modified the HVAC system to supply outside air to areas without an outdoor air supply...... 4f. Modified existing HVAC systems to incorporate any room or zone layout and population changes ..... 4g. Moved all barriers (for example, room dividers, large free-standing blackboards or displays, bookshelves) that could block movement of air in the room, especially those blocking air vents 4h. Ensured that unit ventilators are quiet enough to accommodate classroom activities ....... 4i. Ensured that classrooms are free of uncomfortable drafts produced by air from supply terminals ..... **ACTIVITY 18: PRESSURIZATION IN BUILDINGS** NOTE: To prevent infiltration of outdoor pollutants, the ventilation system is designed to maintain positive pressurization in the building. Therefore, ensure that the system, including any exhaust fans, is operating on the "occupied" cycle when doing this activity. 4j. Ensured that air flows out of the building (using chemical smoke) through windows, doors, or other cracks and holes in exterior wall (for example, floor joints, pipe openings) 5. EXHAUST SYSTEMS **ACTIVITY 19: EXHAUST FAN OPERATION** 5a. Checked (using chemical smoke) that air flows into exhaust fan grille(s) .....

If fans are running but air is not flowing toward the exhaust intake, check for the following:

- Inoperable dampers
- · Obstructed, leaky, or disconnected ductwork
- · Undersized or improperly installed fan
- · Broken fan belt





ACTIVITY 20: EXHAUST AIRFLOW		
NOTE: Prevent migration of indoor contaminants from areas such as bathrooms, kitch and labs by keeping them under negative pressure (as compared to surrounding space		
5b. Checked (using chemical smoke) that air is drawn into the room from adjacent spaces	No	N/N
Stand outside the room with the door slightly open while checking airflow high and let the door opening (see "How to Measure Airflow").	ow in	
5c. Ensured that air is flowing toward the exhaust intake	<b>\d</b>	
ACTIVITY 21: EXHAUST DUCTWORK  5d. Checked that the exhaust ductwork downstream of the exhaust fan (which is under positive pressure) is sealed and in good condition	<b>S</b>	_
6. QUANTITY OF OUTDOOR AIR		
ACTIVITY 22: OUTDOOR AIR MEASUREMENTS AND CALCULATIONS		
NOTE: Refer to "How to Measure Airflow" for techniques.		
6a. Measured the quantity of outdoor air supplied (22a) to each ventilation unit	✓	• •
6b. Calculated the number of occupants served (22b) by the ventilation unit under consideration.		, 
6c. Divided outdoor air supply (22a) by the number of occupants (22b) to determine the existing quantity of outdoor air supply per person (22c) □	V	
ACTIVITY 23: ACCEPTABLE LEVELS OF OUTDOOR AIR QUANTITIES		
6d. Compared the existing outdoor air per person (22c) to the recommended levels in Table 1		
6e. Corrected problems with ventilation units that supplied inadequate quantities of outdoor air to ensure that outdoor air quantities (22c) meet the recommended levels in Table 1		

**NOTES** 

Activity 15 - Doas is 100% outside air. No economizers.

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   Backgrounder and
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   Information for
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  make a copy of
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  unit in your school,
  as well as a
  copy for future
  reference.
- 3. Complete the Checklist.
  - Check the "yes,"
     "no," or
     "not applicable"
     box beside each
     item. (A "no"
     response
     requires further
     attention.)
  - Make comments in the "Notes" section as necessary.
- 4. Return the checklist portion of this document to the IAQ Coordinator.

# **Ventilation Checklist**

N	ame: Andrew Dawson	
So	chool: Riverside Magnet School	
	nit Ventilator/AHU No: ERV-4	
	10 00 01	$\overline{}$
Si	gnature: Chrocen Lanson	
L		
1.	OUTDOOR AIR INTAKES	
	Marked locations of all outdoor air intakes on a small floor plan (for example, a fire escape floor plan)	N/A
1b.	Ensured that the ventilation system was on and operating in "occupied"	
	mode	
	CTIVITY 1: OBSTRUCTIONS	
1c.	Ensured that outdoor air intakes are clear of obstructions, debris, clogs,	
1d.	Installed corrective devices as necessary (e.g., if snowdrifts or leaves	, ,
	frequently block an intake)	) <u> </u>
<b>A</b> C	TIVITY 2: POLLUTANT SOURCES	
	Checked ground-level intakes for pollutant sources (dumpsters, loading	
1.0	docks, and bus-idling areas)	1 🗷
11.	Checked rooftop intakes for pollutant sources (plumbing vents; kitchen, toilet, or laboratory exhaust fans; puddles; and mist from	
	air-conditioning cooling towers)	ı 🗆
1g.	Resolved any problems with pollutant sources located near outdoor air intakes (e.g., relocated dumpster or extended exhaust pipe)	
	maries (e.g., relocated dumpster of extended extraust pipe)	
	TIVITY 3: AIRFLOW	
	Obtained chemical smoke (or a small piece of tissue paper or light plastic) Confirmed that outdoor air is entering the intake appropriately	
11.	Comminded that outdoor an is entering the make appropriately	
2.	SYSTEM CLEANLINESS	
AC	TIVITY 4: AIR FILTERS	
	Replaced filters per maintenance schedule	ı 🗆
2b.	Shut off ventilation system fans while replacing filters (prevents dirt from blowing downstream)	ם ו
2c.	Vacuumed filter areas before installing new filters	
	Confirmed proper fit of filters to prevent air from bypassing (flowing	
2e	around) the air filter	1 0
20.	Commission proper instantation of finets (contact direction for antitow)	

# 2. SYSTEM CLEANLINESS (continued) **ACTIVITY 5: DRAIN PANS** 2f. Ensured that drain pans slant toward the drain (to prevent water from accumulating) ..... 2g. Cleaned drain pans ..... 2h. Checked drain pans for mold and mildew ..... **ACTIVITY 6: COILS** 2i. Ensured that heating and cooling coils are clean **ACTIVITY 7: AIR-HANDLING UNITS, UNIT VENTILATORS** 2i. Ensured that the interior of air-handling unit(s) or unit ventilator 2k. Ensured that ducts are clean **ACTIVITY 8: MECHANICAL ROOMS** 21. Checked mechanical room for unsanitary conditions, leaks, and spills ....... 2m. Ensured that mechanical rooms and air-mixing chambers are free of trash, chemical products, and supplies ..... 3. CONTROLS FOR OUTDOOR AIR SUPPLY 3a. Ensured that air dampers are at least partially open (minimum position) ...... 3b. Ensured that minimum position provides adequate outdoor air for occupants ...... **ACTIVITY 9: CONTROLS INFORMATION** 3c. Obtained and reviewed all design inside/outside temperature and humidity requirements, controls specifications, as-built mechanical drawings, and controls operations manuals (often uniquely designed) **ACTIVITY 10: CLOCKS, TIMERS, SWITCHES** 3d. Turned summer-winter switches to the correct position ..... 3e. Set time clocks appropriately..... 3f. Ensured that settings fit the actual schedule of building use (including night/weekend use) **ACTIVITY 11: CONTROL COMPONENTS** 3g. Ensured appropriate system pressure by testing line pressure at both the occupied (day) setting and the unoccupied (night) setting ...... 3h. Checked that the line dryer prevents moisture buildup...... 3i. Replaced control system filters at the compressor inlet based on the compressor manufacturer's recommendation (for example, when you blow down the tank) ...... 3j. Set the line pressure at each thermostat and damper actuator at the proper level (no leakage or obstructions) ...... **ACTIVITY 12: OUTDOOR AIR DAMPERS** 3k. Ensured that the outdoor air damper is visible for inspection..... 31. Ensured that the recirculating relief and/or exhaust dampers are visible for inspection ..... 3m. Ensured that air temperature in the indoor area(s) served by each

NOTE: It is necessary to ensure that the damper is operating properly and within the normal range to continue.



3.	CONTROLS FOR OUTDOOR AIR SUPPLY (continued)			
3n.	Checked that the outdoor air damper fully closes within a few minutes of shutting off appropriate air handler		No	N/A. ☑
	Checked that the outdoor air damper opens (at least partially with no delay when the air handler is turned on	)		4
3p.	If in heating mode, checked that the outdoor air damper goes to its minimum position (without completely closing) when the room thermostat is set to 85°F	П	_	<b>\</b>
3q.	If in cooling mode, checked that the outdoor air damper goes to its minimu position (without completely closing) when the room thermostat is set	m	_	
3r.	to 60°F and mixed air thermostat is set to 45°F	🗅		<b>\</b>
	The damper actuator links to the damper shaft, and any linkage set screws or bolts are tight		۵	
	Moving parts are free of impediments (e.g., rust, corrosion)	. 🔾		M
	• Electrical wire or pneumatic tubing connects to the damper actuator			¥
	The outside air thermostat(s) is functioning properly (e.g., in the right location, calibrated correctly)		۵	
Pro	ceed to Activities 13–16 if the damper seems to be operating properly.			
AC'	TIVITY 13: FREEZE STATS			
3s.	Disconnected power to controls (for automatic reset only) to test continuity across terminals		П	
OR		. •	J	<u>u</u>
3t.	Confirmed (if applicable) that depressing the manual reset button (usually red) trips the freeze stat (clicking sound indicates freeze stat was tripped)	П		
3u.	Assessed the feasibility of replacing all manual reset freeze-stats with	. Ц	_	921 
	automatic reset freeze-stats	.□		W
clos	TE: HVAC systems with water coils need protection from the cold. The freeze e the outdoor air damper and disconnect the supply air when tripped. The ty ge is 35°F to 42°F.			
AC'	FIVITY 14: MIXED AIR THERMOSTATS			
3v.	Ensured that the mixed air stat for heating mode is set no higher than 65°F	П	П	<b>M</b>
3w.	Ensured that the mixed air stat for cooling mode is set no lower		u	
	than the room thermostat setting	. 🗖		<b>y</b>
AC'	ΓΙVITY 15: ECONOMIZERS			
3x.	Confirmed proper economizer settings based on design specifications or local practices	۵	⊌	٥
NO	TE: The dry-bulb is typically set at 65°F or lower.			,
-	Checked that sensor on the economizer is shielded from direct sunlight	.□		M
٥Z.	Ensured that dampers operate properly (for outside air, return air, exhaust/relief air, and recirculated air), per the design specifications	۵.		V
load Dry and	TE: Economizers use varying amounts of cool outdoor air to assist with the dof the room or rooms. There are two types of economizers, dry-bulb and en-bulb economizers vary the amount of outdoor air based on outdoor temper enthalpy economizers vary the amount of outdoor air based on outdoor tem humidity level.	thalp ature,	y.	

# 3. CONTROLS FOR OUTDOOR AIR SUPPLY (continued) **ACTIVITY 16: FANS** 3aa. Ensured that all fans (supply fans and associated return or relief fans) that move outside air indoors continuously operate during occupied Yes No N/A hours (even when room thermostat is satisfied)..... NOTE: If fan shuts off when the thermostat is satisfied, adjust control cycle as necessary to ensure sufficient outdoor air supply. 4. AIR DISTRIBUTION **ACTIVITY 17: AIR DISTRIBUTION** 4a. Ensured that supply and return air pathways in the existing ventilation system perform as required..... 4b. Ensured that passive gravity relief ventilation systems and transfer grilles between rooms and corridors are functioning...... NOTE: If ventilation system is closed or blocked to meet current fire codes, consult with a professional engineer for remedies. 4c. Made sure every occupied space has supply of outdoor air (mechanical system or operable windows) ..... 4d. Ensured that supply and return vents are open and unblocked ...... NOTE: If outlets have been blocked intentionally to correct drafts or discomfort, investigate and correct the cause of the discomfort and reopen the vents. 4e. Modified the HVAC system to supply outside air to areas without an outdoor air supply ...... 4f. Modified existing HVAC systems to incorporate any room or zone layout and population changes ..... 4g. Moved all barriers (for example, room dividers, large free-standing blackboards or displays, bookshelves) that could block movement of air in the room, especially those blocking air vents 4h. Ensured that unit ventilators are quiet enough to accommodate classroom activities ..... 💆 4i. Ensured that classrooms are free of uncomfortable drafts produced by air from supply terminals ..... ACTIVITY 18: PRESSURIZATION IN BUILDINGS NOTE: To prevent infiltration of outdoor pollutants, the ventilation system is designed to maintain positive pressurization in the building. Therefore, ensure that the system, including any exhaust fans, is operating on the "occupied" cycle when doing this activity. 4j. Ensured that air flows out of the building (using chemical smoke) through windows, doors, or other cracks and holes in exterior wall (for example, floor joints, pipe openings) 5. EXHAUST SYSTEMS **ACTIVITY 19: EXHAUST FAN OPERATION** 5a. Checked (using chemical smoke) that air flows into exhaust fan grille(s) ..... $\square$ If fans are running but air is not flowing toward the exhaust intake, check for the following:

Inoperable dampers

- · Obstructed, leaky, or disconnected ductwork
- · Undersized or improperly installed fan
- · Broken fan belt





### **ACTIVITY 20: EXHAUST AIRFLOW**

NOTE: Prevent migration of indoor contaminants from areas such as bathrooms, kitchens, and labs by keeping them under negative pressure (as compared to surrounding spaces). 5b. Checked (using chemical smoke) that air is drawn into the room from Yes No N/A adjacent spaces ...... Stand outside the room with the door slightly open while checking airflow high and low in the door opening (see "How to Measure Airflow"). 5c. Ensured that air is flowing toward the exhaust intake ...... **ACTIVITY 21: EXHAUST DUCTWORK** 5d. Checked that the exhaust ductwork downstream of the exhaust fan (which is under positive pressure) is sealed and in good condition....... 6. QUANTITY OF OUTDOOR AIR ACTIVITY 22: OUTDOOR AIR MEASUREMENTS AND CALCULATIONS NOTE: Refer to "How to Measure Airflow" for techniques. 6a. Measured the quantity of outdoor air supplied (22a) to each ventilation unit ....... 6b. Calculated the number of occupants served (22b) by the ventilation unit under consideration...... 6c. Divided outdoor air supply (22a) by the number of occupants (22b) to determine the existing quantity of outdoor air supply per person (22c)........ ACTIVITY 23: ACCEPTABLE LEVELS OF OUTDOOR AIR QUANTITIES 6d. Compared the existing outdoor air per person (22c) to the recommended levels in Table 1 ...... 6e. Corrected problems with ventilation units that supplied inadequate

NOTES Section 3 - No Dampers on ERVs and no freezestats.

quantities of outdoor air to ensure that outdoor air quantities (22c) meet the recommended levels in Table 1



- Read the IAQ
   Backgrounder and
   the Background
   Information for
   this checklist.
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  Background
  Information and
  make a copy of
  this checklist for
  each ventilation
  unit in your school,
  as well as a
  copy for future
  reference.
- 3. Complete the Checklist.
  - Check the "yes," "no," or "not applicable" box beside each item. (A "no" response requires further attention.)
  - Make comments in the "Notes" section as necessary.
- 4. Return the checklist portion of this document to the IAQ Coordinator.

# **Ventilation Checklist**

Andrew Dayson

M	anie. 7 Worless gottosoft	
	chool: Riverside Magnet School	
Uı	nit Ventilator/AHU No: ERV=3	_
Ro	pom or Area: Date Completed:	_
Si	gnature: Andrew Danson	
110000		
1.	OUTDOOR AIR INTAKES	
1a.	Marked locations of all outdoor air intakes on a small floor plan (for example, a fire escape floor plan)	<b>∕N/</b> A
1b.	Ensured that the ventilation system was on and operating in "occupied" mode	
AC	TIVITY 1: OBSTRUCTIONS	
1c.	Ensured that outdoor air intakes are clear of obstructions, debris, clogs, or covers	П
1d.	Installed corrective devices as necessary (e.g., if snowdrifts or leaves frequently block an intake)	
		_
	TIVITY 2: POLLUTANT SOURCES	
1e.	Checked ground-level intakes for pollutant sources (dumpsters, loading docks, and bus-idling areas)	Ø
1f.	Checked rooftop intakes for pollutant sources (plumbing vents; kitchen, toilet, or laboratory exhaust fans; puddles; and mist from air-conditioning cooling towers)	П
1g.	Resolved any problems with pollutant sources located near outdoor air	
	intakes (e.g., relocated dumpster or extended exhaust pipe)	
AC	TIVITY 3: AIRFLOW	
	Obtained chemical smoke (or a small piece of tissue paper or light plastic)	
1i.	Confirmed that outdoor air is entering the intake appropriately	
2.	SYSTEM CLEANLINESS	
AC	TIVITY 4: AIR FILTERS	
	Replaced filters per maintenance schedule	
2b.	Shut off ventilation system fans while replacing filters (prevents dirt from	П
2c	blowing downstream)	
	Confirmed proper fit of filters to prevent air from bypassing (flowing	
	around) the air filter	
2e.	Confirmed proper installation of filters (correct direction for airflow)	

# 2. SYSTEM CLEANLINESS (continued) **ACTIVITY 5: DRAIN PANS** 2f. Ensured that drain pans slant toward the drain (to prevent water from Yes No N/A accumulating) ...... 2g. Cleaned drain pans ..... 2h. Checked drain pans for mold and mildew ...... **ACTIVITY 6: COILS** 2i. Ensured that heating and cooling coils are clean ..... **ACTIVITY 7: AIR-HANDLING UNITS, UNIT VENTILATORS** 2j. Ensured that the interior of air-handling unit(s) or unit ventilator (air-mixing chamber and fan blades) is clean 2k. Ensured that ducts are clean ..... **ACTIVITY 8: MECHANICAL ROOMS** 21. Checked mechanical room for unsanitary conditions, leaks, and spills ....... 2m. Ensured that mechanical rooms and air-mixing chambers are free of trash. chemical products, and supplies ..... 3. CONTROLS FOR OUTDOOR AIR SUPPLY 3a. Ensured that air dampers are at least partially open (minimum position) ...... 3b. Ensured that minimum position provides adequate outdoor air for occupants $\square$ **ACTIVITY 9: CONTROLS INFORMATION** 3c. Obtained and reviewed all design inside/outside temperature and humidity requirements, controls specifications, as-built mechanical drawings, and controls operations manuals (often uniquely designed)...... **ACTIVITY 10: CLOCKS, TIMERS, SWITCHES** 3d. Turned summer-winter switches to the correct position ...... 3e. Set time clocks appropriately..... 3f. Ensured that settings fit the actual schedule of building use (including night/weekend use) ..... **ACTIVITY 11: CONTROL COMPONENTS** 3g. Ensured appropriate system pressure by testing line pressure at both the occupied (day) setting and the unoccupied (night) setting ..... 3h. Checked that the line dryer prevents moisture buildup...... 3i. Replaced control system filters at the compressor inlet based on the compressor manufacturer's recommendation (for example, when you blow down the tank)...... 3j. Set the line pressure at each thermostat and damper actuator at the proper level (no leakage or obstructions) ...... **ACTIVITY 12: OUTDOOR AIR DAMPERS** 3k. Ensured that the outdoor air damper is visible for inspection..... 31. Ensured that the recirculating relief and/or exhaust dampers are visible for inspection ..... 3m. Ensured that air temperature in the indoor area(s) served by each outdoor air damper is within the normal operating range .......





ა.	CONTROLS FOR OUTDOOR AIR SUPPLY (continued)			
3n.	Checked that the outdoor air damper fully closes within a few minutes of shutting off appropriate air handler		No	N/A.
	Checked that the outdoor air damper opens (at least partially with no delay when the air handler is turned on	)		4
3p.	If in heating mode, checked that the outdoor air damper goes to its minimum position (without completely closing) when the room thermostat is set to 85°F	🗅	0	⊻′
3q.	If in cooling mode, checked that the outdoor air damper goes to its minimu position (without completely closing) when the room thermostat is set to 60°F and mixed air thermostat is set to 45°F		_	<b>9</b>
3r.	If the outdoor air damper does not move, confirmed the following items:  • The damper actuator links to the damper shaft, and any linkage set			
	screws or bolts are tight	🗖		<b>E</b>
	Moving parts are free of impediments (e.g., rust, corrosion)			W
	<ul> <li>Electrical wire or pneumatic tubing connects to the damper actuator</li> <li>The outside air thermostat(s) is functioning properly (e.g., in the right</li> </ul>			
	location, calibrated correctly)	🗖		
	ceed to Activities 13–16 if the damper seems to be operating properly.			
	TIVITY 13: FREEZE STATS			
or.	Disconnected power to controls (for automatic reset only) to test continuity across terminals			
3t.				
Jt.	red) trips the freeze stat (clicking sound indicates freeze stat was tripped)	🗅	_	
3u.	Assessed the feasibility of replacing all manual reset freeze-stats with automatic reset freeze-stats		_	_
clos	TE: HVAC systems with water coils need protection from the cold. The freeze to the outdoor air damper and disconnect the supply air when tripped. The tyge is 35°F to 42°F.			
AC	TIVITY 14: MIXED AIR THERMOSTATS			
	Ensured that the mixed air stat for heating mode is set no higher than 65°F	. 🗆		8
3w.	Ensured that the mixed air stat for cooling mode is set no lower			/
	than the room thermostat setting	. 🗆		<b>\(\rightarrow\)</b>
AC'	TIVITY 15: ECONOMIZERS			
3x.	Confirmed proper economizer settings based on design specifications or local practices	. 🗅	<b>\(\sigma\)</b>	
NO:	TE: The dry-bulb is typically set at 65°F or lower.			_
3у.	Checked that sensor on the economizer is shielded from direct sunlight	. 🗖		M
3z.	Ensured that dampers operate properly (for outside air, return air, exhaust/relief air, and recirculated air), per the design specifications	. 🗅	0	<b>9</b>
load Dry and	TE: Economizers use varying amounts of cool outdoor air to assist with the dof the room or rooms. There are two types of economizers, dry-bulb and entuil be about the amount of outdoor air based on outdoor tempers and the amount of outdoor air based on outdoor tembers and the amount of outdoor air based on outdoor tembers burnidity level.	thalp ature,	y.	

3 of 5

# 3. CONTROLS FOR OUTDOOR AIR SUPPLY (continued) **ACTIVITY 16: FANS** 3aa. Ensured that all fans (supply fans and associated return or relief fans) that move outside air indoors continuously operate during occupied Yes/No N/A hours (even when room thermostat is satisfied) NOTE: If fan shuts off when the thermostat is satisfied, adjust control cycle as necessary to ensure sufficient outdoor air supply. 4. AIR DISTRIBUTION **ACTIVITY 17: AIR DISTRIBUTION** 4a. Ensured that supply and return air pathways in the existing ventilation system perform as required ...... 4b. Ensured that passive gravity relief ventilation systems and transfer grilles between rooms and corridors are functioning..... NOTE: If ventilation system is closed or blocked to meet current fire codes, consult with a professional engineer for remedies. 4c. Made sure every occupied space has supply of outdoor air (mechanical system or operable windows) ...... 4d. Ensured that supply and return vents are open and unblocked ...... NOTE: If outlets have been blocked intentionally to correct drafts or discomfort, investigate and correct the cause of the discomfort and reopen the vents. 4e. Modified the HVAC system to supply outside air to areas without an outdoor air supply ...... 4f. Modified existing HVAC systems to incorporate any room or zone layout and population changes ...... 4g. Moved all barriers (for example, room dividers, large free-standing blackboards or displays, bookshelves) that could block movement of air in the room, especially those blocking air vents 4h. Ensured that unit ventilators are quiet enough to accommodate classroom activities ..... 🗹 4i. Ensured that classrooms are free of uncomfortable drafts produced by air from supply terminals ...... **ACTIVITY 18: PRESSURIZATION IN BUILDINGS** NOTE: To prevent infiltration of outdoor pollutants, the ventilation system is designed to maintain positive pressurization in the building. Therefore, ensure that the system, including any exhaust fans, is operating on the "occupied" cycle when doing this activity. 4j. Ensured that air flows out of the building (using chemical smoke) through windows, doors, or other cracks and holes in exterior wall (for example, floor joints, pipe openings)..... 5. EXHAUST SYSTEMS **ACTIVITY 19: EXHAUST FAN OPERATION** 5a. Checked (using chemical smoke) that air flows into exhaust fan grille(s) ..... • If fans are running but air is not flowing toward the exhaust intake, check for the following:

· Inoperable dampers

Broken fan belt

Obstructed, leaky, or disconnected ductwork
Undersized or improperly installed fan

4 of 5



### **ACTIVITY 20: EXHAUST AIRFLOW**

NOTE: Prevent migration of indoor contaminants from areas such as bathrooms, kitchens, and labs by keeping them under negative pressure (as compared to surrounding spaces). Yes No N/A 5b. Checked (using chemical smoke) that air is drawn into the room from adjacent spaces...... Stand outside the room with the door slightly open while checking airflow high and low in the door opening (see "How to Measure Airflow"). 5c. Ensured that air is flowing toward the exhaust intake ...... **ACTIVITY 21: EXHAUST DUCTWORK** 5d. Checked that the exhaust ductwork downstream of the exhaust fan (which is under positive pressure) is sealed and in good condition....... 6. QUANTITY OF OUTDOOR AIR ACTIVITY 22: OUTDOOR AIR MEASUREMENTS AND CALCULATIONS NOTE: Refer to "How to Measure Airflow" for techniques. 6a. Measured the quantity of outdoor air supplied (22a) to each ventilation 6b. Calculated the number of occupants served (22b) by the ventilation unit under consideration...... 6c. Divided outdoor air supply (22a) by the number of occupants (22b) to determine the existing quantity of outdoor air supply per person (22c)........

ACTIVITY 23: ACCEPTABLE LEVELS OF OUTDOOR AIR QUANTITIES 6d. Compared the existing outdoor air per person (22c) to the recommended

quantities of outdoor air to ensure that outdoor air quantities (22c) meet the recommended levels in Table 1......

6e. Corrected problems with ventilation units that supplied inadequate

levels in Table 1

NOTES Section 3 - No Dampers on ERVs and no freezestats.

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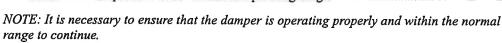


- 1. Read the IAQ
  Backgrounder and
  the Background
  Information for
  this checklist.
- 2. Keep the
  Background
  Information and
  make a copy of
  this checklist for
  each ventilation
  unit in your school,
  as well as a
  copy for future
  reference.
- 3. Complete the Checklist.
  - Check the "yes," "no," or "not applicable" box beside each item. (A "no" response requires further attention.)
  - Make comments in the "Notes" section as necessary.
- 4. Return the checklist portion of this document to the IAQ Coordinator.

# **Ventilation Checklist**

N:	ame: Andrew Dawson	
Sc	chool: Riverside Magnet School	
- 4	nit Ventilator/AHU No: ERV- 2	
1	10 00 01	7
Si	gnature: Undeen Hanson	
1	OUTDOOR AIR INTAKES	
1.		
1a.	Marked locations of all outdoor air intakes on a small floor plan (for example, a fire escape floor plan)	lo/N/
1b.	Ensured that the ventilation system was on and operating in "occupied"	osa L
	mode	
	CTIVITY 1: OBSTRUCTIONS	
Ic.	Ensured that outdoor air intakes are clear of obstructions, debris, clogs, or covers	n =
1d.	Installed corrective devices as necessary (e.g., if snowdrifts or leaves	<b>.</b> .
•	frequently block an intake)	
	CTIVITY 2: POLLUTANT SOURCES	
ıe.	Checked ground-level intakes for pollutant sources (dumpsters, loading docks, and bus-idling areas)	M
1f.	Checked rooftop intakes for pollutant sources (plumbing vents; kitchen,	
	toilet, or laboratory exhaust fans; puddles; and mist from	
×	air-conditioning cooling towers)	
۱g.	Resolved any problems with pollutant sources located near outdoor air intakes (e.g., relocated dumpster or extended exhaust pipe)	ח ח
	manies (o.g., retouted dutipater of extended exhaust pipe)	
AC	CTIVITY 3: AIRFLOW	
	Obtained chemical smoke (or a small piece of tissue paper or light plastic)	
li.	Confirmed that outdoor air is entering the intake appropriately	
2.	SYSTEM CLEANLINESS	
AC	TIVITY 4: AIR FILTERS	
	Replaced filters per maintenance schedule	0 0
	Shut off ventilation system fans while replacing filters (prevents dirt from	_
	blowing downstream)	0 0
	Vacuumed filter areas before installing new filters	0 0
∠a.	Confirmed proper fit of filters to prevent air from bypassing (flowing around) the air filter	n 0
2e.		

# 2. SYSTEM CLEANLINESS (continued) **ACTIVITY 5: DRAIN PANS** 2f. Ensured that drain pans slant toward the drain (to prevent water from Yes No N/A accumulating) ..... 2g. Cleaned drain pans ..... 2h. Checked drain pans for mold and mildew ..... **ACTIVITY 6: COILS** 2i. Ensured that heating and cooling coils are clean ...... **ACTIVITY 7: AIR-HANDLING UNITS, UNIT VENTILATORS** 2j. Ensured that the interior of air-handling unit(s) or unit ventilator (air-mixing chamber and fan blades) is clean 2k. Ensured that ducts are clean **ACTIVITY 8: MECHANICAL ROOMS** 21. Checked mechanical room for unsanitary conditions, leaks, and spills ....... 2m. Ensured that mechanical rooms and air-mixing chambers are free of trash, chemical products, and supplies 3. CONTROLS FOR OUTDOOR AIR SUPPLY 3a. Ensured that air dampers are at least partially open (minimum position) ...... 3b. Ensured that minimum position provides adequate outdoor air for occupants ..... **ACTIVITY 9: CONTROLS INFORMATION** 3c. Obtained and reviewed all design inside/outside temperature and humidity requirements, controls specifications, as-built mechanical drawings, and controls operations manuals (often uniquely designed) **ACTIVITY 10: CLOCKS, TIMERS, SWITCHES** 3d. Turned summer-winter switches to the correct position ...... 3e. Set time clocks appropriately ..... 3f. Ensured that settings fit the actual schedule of building use (including night/weekend use) **ACTIVITY 11: CONTROL COMPONENTS** 3g. Ensured appropriate system pressure by testing line pressure at both the occupied (day) setting and the unoccupied (night) setting ..... 3h. Checked that the line dryer prevents moisture buildup...... 3i. Replaced control system filters at the compressor inlet based on the compressor manufacturer's recommendation (for example, when you blow down the tank)...... 3j. Set the line pressure at each thermostat and damper actuator at the proper level (no leakage or obstructions) **ACTIVITY 12: OUTDOOR AIR DAMPERS** 3k. Ensured that the outdoor air damper is visible for inspection..... 31. Ensured that the recirculating relief and/or exhaust dampers are visible for inspection ..... 3m. Ensured that air temperature in the indoor area(s) served by each outdoor air damper is within the normal operating range







3.	CONTROLS FOR OUTDOOR AIR SUPPLY (continued)			
3n.	Checked that the outdoor air damper fully closes within a few minutes of shutting off appropriate air handler		No	N/A.
30.	Checked that the outdoor air damper opens (at least partially with no delay) when the air handler is turned on	)		
	If in heating mode, checked that the outdoor air damper goes to its minimum position (without completely closing) when the room thermostat is set to 85°F		a	<b>\</b>
_	If in cooling mode, checked that the outdoor air damper goes to its minimu position (without completely closing) when the room thermostat is set to 60°F and mixed air thermostat is set to 45°F			9
3r.	If the outdoor air damper does not move, confirmed the following items:  • The damper actuator links to the damper shaft, and any linkage set	_	_	»/
	screws or bolts are tight	. <b>u</b>		M
	• Moving parts are free of impediments (e.g., rust, corrosion)			M
	<ul> <li>Electrical wire or pneumatic tubing connects to the damper actuator</li> <li>The outside air thermostat(s) is functioning properly (e.g., in the right location, calibrated correctly)</li> </ul>			M S
Proc	ceed to Activities 13–16 if the damper seems to be operating properly.	. С	J	<b>34</b>
	FIVITY 13: FREEZE STATS			
	Disconnected power to controls (for automatic reset only) to test continuity			
OR	across terminals			<b>Y</b>
	Confirmed (if applicable) that depressing the manual reset button (usually			
	red) trips the freeze stat (clicking sound indicates freeze stat was tripped)	. 🗖		
3u.	Assessed the feasibility of replacing all manual reset freeze-stats with automatic reset freeze-stats		_	
NOT	TE: HVAC systems with water coils need protection from the cold. The freeze	-stat	mav	
close	e the outdoor air damper and disconnect the supply air when tripped. The ty te is 35°F to 42°F.			
AC7	FIVITY 14: MIXED AIR THERMOSTATS			
	Ensured that the mixed air stat for heating mode is set no higher than 65°F	. 🗆		4
	Ensured that the mixed air stat for cooling mode is set no lower			/
	than the room thermostat setting			<b>T</b>
AC	FIVITY 15: ECONOMIZERS			
	Confirmed proper economizer settings based on design specifications or local practices		<b>9</b>	
NOT	TE: The dry-bulb is typically set at 65°F or lower.			
3у.	Checked that sensor on the economizer is shielded from direct sunlight	. 🗆		M
3z.	Ensured that dampers operate properly (for outside air, return air, exhaust/relief air, and recirculated air), per the design specifications	.0		4
load Dry- and	E: Economizers use varying amounts of cool outdoor air to assist with the coordinary of the room or rooms. There are two types of economizers, dry-bulb and en bulb economizers vary the amount of outdoor air based on outdoor temperountalpy economizers vary the amount of outdoor air based on outdoor temperountally level.	thalp <sub>.</sub> ature,	<i>y</i> .	

# 3. CONTROLS FOR OUTDOOR AIR SUPPLY (continued) **ACTIVITY 16: FANS** 3aa. Ensured that all fans (supply fans and associated return or relief fans) that move outside air indoors continuously operate during occupied Yes/No N/A hours (even when room thermostat is satisfied) NOTE: If fan shuts off when the thermostat is satisfied, adjust control cycle as necessary to ensure sufficient outdoor air supply. 4. AIR DISTRIBUTION **ACTIVITY 17: AIR DISTRIBUTION** 4a. Ensured that supply and return air pathways in the existing ventilation system perform as required.... 4b. Ensured that passive gravity relief ventilation systems and transfer grilles between rooms and corridors are functioning NOTE: If ventilation system is closed or blocked to meet current fire codes, consult with a professional engineer for remedies. 4c. Made sure every occupied space has supply of outdoor air (mechanical system or operable windows) ...... 4d. Ensured that supply and return vents are open and unblocked ...... NOTE: If outlets have been blocked intentionally to correct drafts or discomfort, investigate and correct the cause of the discomfort and reopen the vents. 4e. Modified the HVAC system to supply outside air to areas without an outdoor air supply ....... 4f. Modified existing HVAC systems to incorporate any room or zone layout and population changes 4g. Moved all barriers (for example, room dividers, large free-standing blackboards or displays, bookshelves) that could block movement of air in the room, especially those blocking air vents ..... 4h. Ensured that unit ventilators are quiet enough to accommodate classroom activities ...... 🗹 4i. Ensured that classrooms are free of uncomfortable drafts produced by air from supply terminals ...... **ACTIVITY 18: PRESSURIZATION IN BUILDINGS** NOTE: To prevent infiltration of outdoor pollutants, the ventilation system is designed to maintain positive pressurization in the building. Therefore, ensure that the system, including any exhaust fans, is operating on the "occupied" cycle when doing this activity. 4j. Ensured that air flows out of the building (using chemical smoke) through windows, doors, or other cracks and holes in exterior wall (for example, floor joints, pipe openings)...... 5. EXHAUST SYSTEMS **ACTIVITY 19: EXHAUST FAN OPERATION** 5a. Checked (using chemical smoke) that air flows into exhaust fan grille(s) ..... • If fans are running but air is not flowing toward the exhaust intake, check for the following:

Inoperable dampers

Broken fan belt

Obstructed, leaky, or disconnected ductworkUndersized or improperly installed fan

4 of 5



### **ACTIVITY 20: EXHAUST AIRFLOW**

NOTE: Prevent migration of indoor contaminants from areas such as bathrooms, kitchens, and labs by keeping them under negative pressure (as compared to surrounding spaces).

She Checked (value chemical smalls) that six is drawn into the grown from No. No. No. 10.

		•	,	
5b.	Checked (using chemical smoke) that air is drawn into the room from adjacent spaces		No W	,N/A □
	nd outside the room with the door slightly open while checking airflow high ar door opening (see "How to Measure Airflow").	nd l	ow in	!
5c.	Ensured that air is flowing toward the exhaust intake		¥	
	TIVITY 21: EXHAUST DUCTWORK  Checked that the exhaust ductwork downstream of the exhaust fan (which is under positive pressure) is sealed and in good condition	<b>-</b>	Ø	<b>,</b>
6.	QUANTITY OF OUTDOOR AIR			
AC	TIVITY 22: OUTDOOR AIR MEASUREMENTS AND CALCULATION	S		
NO	TE: Refer to "How to Measure Airflow" for techniques.			
6a.	Measured the quantity of outdoor air supplied (22a) to each ventilation unit	<b>_</b>		¥
	Calculated the number of occupants served (22b) by the ventilation unit under consideration	_		<b>'</b>
6c.	Divided outdoor air supply (22a) by the number of occupants (22b) to determine the existing quantity of outdoor air supply per person (22c)	<b>_</b>		Ø
AC	TIVITY 23: ACCEPTABLE LEVELS OF OUTDOOR AIR QUANTITIE	S		
	Compared the existing outdoor air per person (22c) to the recommended levels in Table 1	<b>_</b>		<u> </u>
6e.	Corrected problems with ventilation units that supplied inadequate quantities of outdoor air to ensure that outdoor air quantities (22c) meet the recommended levels in Table 1	ב		<u> </u>

NOTES Section 3 - No Dampers on ERVs and no freezestats.

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- Read the IAQ
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- 2. Keep the
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  as well as a
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- Complete the Checklist.
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  - Make comments in the "Notes" section as necessary.
- Return the checklist portion of this document to the IAQ Coordinator.

# **Ventilation Checklist**

	ame: Mnotrew Dawson		
Sc	hool: Riverside Magnet School		,
Ur	nit Ventilator/AHU No: ERV-1		_
	pom or Area: Date Completed: 12-20-2	4	
C:	gnature: Andrew Danson	3	
Sig	gnature.		
1.	OUTDOOR AIR INTAKES		
1a.	Marked locations of all outdoor air intakes on a small floor plan (for Yes	No/	N/A
16	example, a fire escape floor plan)  Ensured that the ventilation system was on and operating in "occupied"	M	
10.	mode		
AĊ	TIVITY 1: OBSTRUCTIONS	er:	
1c.	Ensured that outdoor air intakes are clear of obstructions, debris, clogs, or covers		۵
1d.	Installed corrective devices as necessary (e.g., if snowdrifts or leaves frequently block an intake)	□	۵
AC	TIVITY 2: POLLUTANT SOURCES		
le.	Checked ground-level intakes for pollutant sources (dumpsters, loading docks, and bus-idling areas)		4
1f.	Checked rooftop intakes for pollutant sources (plumbing vents; kitchen, toilet, or laboratory exhaust fans; puddles; and mist from		
1~	air-conditioning cooling towers)	_ <b>_</b> _	
ıg.	intakes (e.g., relocated dumpster or extended exhaust pipe)		
AC	TIVITY 3: AIRFLOW	-	
	Obtained chemical smoke (or a small piece of tissue paper or light plastic)		
li.	Confirmed that outdoor air is entering the intake appropriately		
2.	SYSTEM CLEANLINESS		
	TIVITY 4: AIR FILTERS	-	
	Replaced filters per maintenance schedule		
۷υ.	blowing downstream)		
	Vacuumed filter areas before installing new filters		
2d.	Confirmed proper fit of filters to prevent air from bypassing (flowing around) the air filter	'n	
2e.	Confirmed proper installation of filters (correct direction for airflow)	<u> </u>	٥

# 2. SYSTEM CLEANLINESS (continued) **ACTIVITY 5: DRAIN PANS** 2f. Ensured that drain pans slant toward the drain (to prevent water from Yes No N/A accumulating) ..... 2g. Cleaned drain pans ...... 2h. Checked drain pans for mold and mildew ...... **ACTIVITY 6: COILS** 2i. Ensured that heating and cooling coils are clean ...... **ACTIVITY 7: AIR-HANDLING UNITS, UNIT VENTILATORS** 2i. Ensured that the interior of air-handling unit(s) or unit ventilator (air-mixing chamber and fan blades) is clean 2k. Ensured that ducts are clean ..... **ACTIVITY 8: MECHANICAL ROOMS** 21. Checked mechanical room for unsanitary conditions, leaks, and spills ...... 2m. Ensured that mechanical rooms and air-mixing chambers are free of trash. chemical products, and supplies ..... 3. CONTROLS FOR OUTDOOR AIR SUPPLY 3a. Ensured that air dampers are at least partially open (minimum position) ...... 3b. Ensured that minimum position provides adequate outdoor air for occupants ..... **ACTIVITY 9: CONTROLS INFORMATION** 3c. Obtained and reviewed all design inside/outside temperature and humidity requirements, controls specifications, as-built mechanical drawings, and controls operations manuals (often uniquely designed) **ACTIVITY 10: CLOCKS, TIMERS, SWITCHES** 3d. Turned summer-winter switches to the correct position ...... 3e. Set time clocks appropriately..... 3f. Ensured that settings fit the actual schedule of building use (including night/weekend use) ..... **ACTIVITY 11: CONTROL COMPONENTS** 3g. Ensured appropriate system pressure by testing line pressure at both the occupied (day) setting and the unoccupied (night) setting ...... 3h. Checked that the line dryer prevents moisture buildup...... 3i. Replaced control system filters at the compressor inlet based on the compressor manufacturer's recommendation (for example, when you blow down the tank)..... 3j. Set the line pressure at each thermostat and damper actuator at the proper level (no leakage or obstructions) **ACTIVITY 12: OUTDOOR AIR DAMPERS** 3k. Ensured that the outdoor air damper is visible for inspection..... 31. Ensured that the recirculating relief and/or exhaust dampers are visible for inspection ....

NOTE: It is necessary to ensure that the damper is operating properly and within the normal range to continue.

outdoor air damper is within the normal operating range.....

3m. Ensured that air temperature in the indoor area(s) served by each



3.	CONTROLS FOR OUTDOOR AIR SUPPLY (continued)			
3n.	Checked that the outdoor air damper fully closes within a few minutes of shutting off appropriate air handler		No □	N/A
30.	Checked that the outdoor air damper opens (at least partially with no delay when the air handler is turned on			<b>Y</b>
•	If in heating mode, checked that the outdoor air damper goes to its minimum position (without completely closing) when the room thermostat is set to 85°F			<b>Y</b>
	If in cooling mode, checked that the outdoor air damper goes to its minimu position (without completely closing) when the room thermostat is set to 60°F and mixed air thermostat is set to 45°F.		۵	<b>\( \)</b>
3r.	<ul> <li>If the outdoor air damper does not move, confirmed the following items:</li> <li>The damper actuator links to the damper shaft, and any linkage set screws or bolts are tight</li></ul>			
Pro	ceed to Activities 13–16 if the damper seems to be operating properly.			
3s. OR	TIVITY 13: FREEZE STATS  Disconnected power to controls (for automatic reset only) to test continuity across terminals		0	⊌′
3t. 3u.	Confirmed (if applicable) that depressing the manual reset button (usually red) trips the freeze stat (clicking sound indicates freeze stat was tripped)  Assessed the feasibility of replacing all manual reset freeze-stats with			
	automatic reset freeze-stats			¥
clos	TE: HVAC systems with water coils need protection from the cold. The freeze the outdoor air damper and disconnect the supply air when tripped. The t ge is 35°F to 42°F.			
	FIVITY 14: MIXED AIR THERMOSTATS			
	Ensured that the mixed air stat for heating mode is set no higher than 65°F			4
3w.	Ensured that the mixed air stat for cooling mode is set no lower than the room thermostat setting			<b>y</b>
	Confirmed proper economizer settings based on design specifications or local practices	🗆	<b>\( </b>	<b>,</b>
NO	TE: The dry-bulb is typically set at $65^{\circ}F$ or lower.			
3у.	Checked that sensor on the economizer is shielded from direct sunlight	🗆		¥
5Z.	Ensured that dampers operate properly (for outside air, return air, exhaust/relief air, and recirculated air), per the design specifications	🗖		4
NO	TE: Economizers use varying amounts of cool outdoor air to assist with the	cooli	ng	

NOTE: Economizers use varying amounts of cool outdoor air to assist with the cooling load of the room or rooms. There are two types of economizers, dry-bulb and enthalpy. Dry-bulb economizers vary the amount of outdoor air based on outdoor temperature, and enthalpy economizers vary the amount of outdoor air based on outdoor temperature and humidity level.

# 3. CONTROLS FOR OUTDOOR AIR SUPPLY (continued)

### **ACTIVITY 16: FANS**

NOTE: If fan shuts off when the thermostat is satisfied, adjust control cycle as necessary to ensure sufficient outdoor air supply.

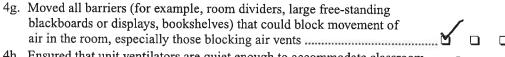
### 4. AIR DISTRIBUTION

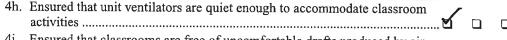
### **ACTIVITY 17: AIR DISTRIBUTION**

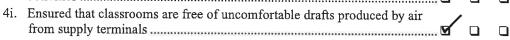
4a.	Ensured that supply and return air pathways in the existing ventilation system perform as required		
4b.	Ensured that passive gravity relief ventilation systems and transfer grilles between rooms and corridors are functioning		<b>Y</b>
NOT prof	TE: If ventilation system is closed or blocked to meet current fire codes, consult wi fessional engineer for remedies.	ith a	
	Made sure every occupied space has supply of outdoor air (mechanical system or operable windows)		

NOTE: If outlets have been blocked intentionally to correct drafts or discomfort, investigate and correct the cause of the discomfort and reopen the vents.

4e.	Modified the HVAC system to supply outside air to areas without an outdoor	/	
	air supply	$oldsymbol{\nabla}$	
4f.	Modified existing HVAC systems to incorporate any room or zone layout	/	
	and population changes	$\mathbf{Y}$	







### **ACTIVITY 18: PRESSURIZATION IN BUILDINGS**

NOTE: To prevent infiltration of outdoor pollutants, the ventilation system is designed to maintain positive pressurization in the building. Therefore, ensure that the system, including any exhaust fans, is operating on the "occupied" cycle when doing this activity.

4j. Ensured that air flows out of the building (using chemical smoke) through windows, doors, or other cracks and holes in exterior wall (for example, floor joints, pipe openings)

### 5. EXHAUST SYSTEMS

### **ACTIVITY 19: EXHAUST FAN OPERATION**

5a. Checked (using chemical smoke) that air flows into exhaust fan grille(s) .....

If fans are running but air is not flowing toward the exhaust intake, check for the following:

- Inoperable dampers
- Obstructed, leaky, or disconnected ductwork
- Undersized or improperly installed fan
- · Broken fan belt





### **ACTIVITY 20: EXHAUST AIRFLOW**

NOTE: Prevent migration of indoor contaminants from areas such as bathrooms, kitchens, and labs by keeping them under negative pressure (as compared to surrounding spaces). 5b. Checked (using chemical smoke) that air is drawn into the room from Yes No N/A adjacent spaces ...... Stand outside the room with the door slightly open while checking airflow high and low in the door opening (see "How to Measure Airflow"). 5c. Ensured that air is flowing toward the exhaust intake \_\_\_\_\_\_ **ACTIVITY 21: EXHAUST DUCTWORK** 5d. Checked that the exhaust ductwork downstream of the exhaust fan (which is 6. QUANTITY OF OUTDOOR AIR ACTIVITY 22: OUTDOOR AIR MEASUREMENTS AND CALCULATIONS NOTE: Refer to "How to Measure Airflow" for techniques. 6a. Measured the quantity of outdoor air supplied (22a) to each ventilation 6b. Calculated the number of occupants served (22b) by the ventilation unit under consideration...... 6c. Divided outdoor air supply (22a) by the number of occupants (22b) to determine the existing quantity of outdoor air supply per person (22c) ....... **ACTIVITY 23: ACCEPTABLE LEVELS OF OUTDOOR AIR QUANTITIES** 6d. Compared the existing outdoor air per person (22c) to the recommended levels in Table 1 6e. Corrected problems with ventilation units that supplied inadequate quantities of outdoor air to ensure that outdoor air quantities (22c) meet the recommended levels in Table 1 

NOTES Section 3 - No Dampers on ERVs and no freeze stats



- 1. Read the IAQ

  Backgrounder and the Background Information for this checklist.
- 2. Keep the
  Background
  Information and
  make a copy of
  this checklist for
  each ventilation
  unit in your school,
  as well as a
  copy for future
  reference.
- 3. Complete the Checklist.
  - Check the "yes,"
     "no," or
     "not applicable"
     box beside each
     item. (A "no"
     response
     requires further
     attention.)
  - Make comments in the "Notes" section as necessary.
- 4. Return the checklist portion of this document to the IAQ Coordinator.

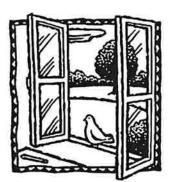
# **Ventilation Checklist**

Andrew Dayson

1	ane. Another Dawson		_	-
Sc	hool: Riverside Magnet School			_
Ur	nit Ventilator/AHU No: AHU-1			
Ro	oom or Area: Date Completed: 12-20-2	4		
Si	gnature: andrew Danson			
				_1
1.	OUTDOOR AIR INTAKES			
1a.			No	M/A
1h	example, a fire escape floor plan)		Œ	u
10.	mode	4		
AC	TIVITY 1: OBSTRUCTIONS			
1c.	Ensured that outdoor air intakes are clear of obstructions, debris, clogs,	/	•	
	or covers	A		
Id.	Installed corrective devices as necessary (e.g., if snowdrifts or leaves frequently block an intake)	√		۵
AC	TIVITY 2: POLLUTANT SOURCES			
1e.	Checked ground-level intakes for pollutant sources (dumpsters, loading docks, and bus-idling areas)	3	⊌	<b>,</b> _
1f.	Checked rooftop intakes for pollutant sources (plumbing vents; kitchen,		•	
	toilet, or laboratory exhaust fans; puddles; and mist from air-conditioning cooling towers)	1		
1g.	Resolved any problems with pollutant sources located near outdoor air	/	•	
	intakes (e.g., relocated dumpster or extended exhaust pipe)	g		
	TIVITY 3: AIRFLOW	/	•	
1h.	Obtained chemical smoke (or a small piece of tissue paper or light plastic)	٥/	<u> </u>	
11.	Confirmed that outdoor air is entering the intake appropriately	7	u	u
2.	SYSTEM CLEANLINESS			
	TIVITY 4: AIR FILTERS		•	
	Replaced filters per maintenance schedule	ৰ্থ	۵	
Zb.	Shut off ventilation system fans while replacing filters (prevents dirt from blowing downstream)	/	· 🗀	
2c.	Vacuumed filter areas before installing new filters	1	0	ā
	Confirmed proper fit of filters to prevent air from bypassing (flowing	/		_
20	around) the air filter	A .	. <b>.</b>	
20.	Commission of their (correct direction for annow)		J	u

## 2. SYSTEM CLEANLINESS (continued)

# **ACTIVITY 5: DRAIN PANS** 2f. Ensured that drain pans slant toward the drain (to prevent water from Yes/No N/A accumulating) ..... 2g. Cleaned drain pans ..... 2h. Checked drain pans for mold and mildew ...... **ACTIVITY 6: COILS** 2i. Ensured that heating and cooling coils are clean ..... ACTIVITY 7: AIR-HANDLING UNITS, UNIT VENTILATORS 2j. Ensured that the interior of air-handling unit(s) or unit ventilator (air-mixing chamber and fan blades) is clean ...... 2k. Ensured that ducts are clean ..... **ACTIVITY 8: MECHANICAL ROOMS** 21. Checked mechanical room for unsanitary conditions, leaks, and spills ....... 2m. Ensured that mechanical rooms and air-mixing chambers are free of trash, chemical products, and supplies 3. CONTROLS FOR OUTDOOR AIR SUPPLY 3a. Ensured that air dampers are at least partially open (minimum position) ...... 3b. Ensured that minimum position provides adequate outdoor air for occupants \_\_\_\_\_\_ 🗹 🗅 **ACTIVITY 9: CONTROLS INFORMATION** 3c. Obtained and reviewed all design inside/outside temperature and humidity requirements, controls specifications, as-built mechanical drawings, and controls operations manuals (often uniquely designed)...... **ACTIVITY 10: CLOCKS, TIMERS, SWITCHES** 3d. Turned summer-winter switches to the correct position ...... 3e. Set time clocks appropriately...... 3f. Ensured that settings fit the actual schedule of building use (including night/weekend use) **ACTIVITY 11: CONTROL COMPONENTS** 3g. Ensured appropriate system pressure by testing line pressure at both the occupied (day) setting and the unoccupied (night) setting ..... 3h. Checked that the line dryer prevents moisture buildup...... 3i. Replaced control system filters at the compressor inlet based on the compressor manufacturer's recommendation (for example, when you blow down the tank) ..... 3j. Set the line pressure at each thermostat and damper actuator at the proper level (no leakage or obstructions) **ACTIVITY 12: OUTDOOR AIR DAMPERS** 3k. Ensured that the outdoor air damper is visible for inspection..... 31. Ensured that the recirculating relief and/or exhaust dampers are visible for inspection ..... 3m. Ensured that air temperature in the indoor area(s) served by each outdoor air damper is within the normal operating range





3.	CONTROLS FOR OUTDOOR AIR SUPPLY (continued)			
3n.	Checked that the outdoor air damper fully closes within a few minutes of shutting off appropriate air handler	es/	No	N/A
3о.	Checked that the outdoor air damper opens (at least partially with no delay) when the air handler is turned on	<b>_</b>	0	٥
	If in heating mode, checked that the outdoor air damper goes to its minimum position (without completely closing) when the room thermostat is set to 85°F		۵	V
_	If in cooling mode, checked that the outdoor air damper goes to its minimum position (without completely closing) when the room thermostat is set to 60°F and mixed air thermostat is set to 45°F			<b>d</b>
31.	<ul> <li>If the outdoor air damper does not move, confirmed the following items:</li> <li>The damper actuator links to the damper shaft, and any linkage set screws or bolts are tight</li></ul>	A A	٥٥٥	0000
Pro	ceed to Activities 13–16 if the damper seems to be operating properly.			
	TIVITY 13: FREEZE STATS  Disconnected power to controls (for automatic reset only) to test continuity across terminals	ב	⊌∕	, 
	Confirmed (if applicable) that depressing the manual reset button (usually red) trips the freeze stat (clicking sound indicates freeze stat was tripped)	<u> </u>	_ <b>_</b>	, _
clos	TE: HVAC systems with water coils need protection from the cold. The freeze-se the outdoor air damper and disconnect the supply air when tripped. The typinge is $35^{\circ}F$ to $42^{\circ}F$ .			
AC'	TIVITY 14: MIXED AIR THERMOSTATS			
3v.	Ensured that the mixed air stat for heating mode is set no higher than 65°F	_	a	M
3w.	Ensured that the mixed air stat for cooling mode is set no lower than the room thermostat setting	ב		V
AC'	TIVITY 15: ECONOMIZERS			
	Confirmed proper economizer settings based on design specifications or local practices	ב	<b>d</b>	<b>-</b>
NO2	TE: The dry-bulb is typically set at 65°F or lower.	/		
3y. 3z.	Checked that sensor on the economizer is shielded from direct sunlight 5 Ensured that dampers operate properly (for outside air, return air, exhaust/relief air, and recirculated air), per the design specifications			<u> </u>
load Dry and	TE: Economizers use varying amounts of cool outdoor air to assist with the cold of the room or rooms. There are two types of economizers, dry-bulb and enthe-bulb economizers vary the amount of outdoor air based on outdoor temperate enthalpy economizers vary the amount of outdoor air based on outdoor temperate humidity level.	ooling alpy ure,	g :	

# 3. CONTROLS FOR OUTDOOR AIR SUPPLY (continued) **ACTIVITY 16: FANS** 3aa. Ensured that all fans (supply fans and associated return or relief fans) that move outside air indoors continuously operate during occupied No N/A hours (even when room thermostat is satisfied)..... NOTE: If fan shuts off when the thermostat is satisfied, adjust control cycle as necessary to ensure sufficient outdoor air supply. 4. AIR DISTRIBUTION **ACTIVITY 17: AIR DISTRIBUTION** 4a. Ensured that supply and return air pathways in the existing ventilation system perform as required...... 4b. Ensured that passive gravity relief ventilation systems and transfer grilles between rooms and corridors are functioning ...... NOTE: If ventilation system is closed or blocked to meet current fire codes, consult with a professional engineer for remedies. 4c. Made sure every occupied space has supply of outdoor air (mechanical system or operable windows) ...... 🗹 4d. Ensured that supply and return vents are open and unblocked ..... NOTE: If outlets have been blocked intentionally to correct drafts or discomfort, investigate and correct the cause of the discomfort and reopen the vents. 4e. Modified the HVAC system to supply outside air to areas without an outdoor air supply ....... 4f. Modified existing HVAC systems to incorporate any room or zone layout and population changes ...... 4g. Moved all barriers (for example, room dividers, large free-standing blackboards or displays, bookshelves) that could block movement of air in the room, especially those blocking air vents ..... 4h. Ensured that unit ventilators are quiet enough to accommodate classroom activities ..... 4i. Ensured that classrooms are free of uncomfortable drafts produced by air from supply terminals ...... ACTIVITY 18: PRESSURIZATION IN BUILDINGS NOTE: To prevent infiltration of outdoor pollutants, the ventilation system is designed to maintain positive pressurization in the building. Therefore, ensure that the system, including any exhaust fans, is operating on the "occupied" cycle when doing this activity. 4j. Ensured that air flows out of the building (using chemical smoke) through windows, doors, or other cracks and holes in exterior wall (for example, floor joints, pipe openings) 5. EXHAUST SYSTEMS **ACTIVITY 19: EXHAUST FAN OPERATION** 5a. Checked (using chemical smoke) that air flows into exhaust fan grille(s) ..... $\square$ If fans are running but air is not flowing toward the exhaust intake, check for the following: • Inoperable dampers · Obstructed, leaky, or disconnected ductwork · Undersized or improperly installed fan

· Broken fan belt



## **ACTIVITY 20: EXHAUST AIRFLOW**

NOTE: Prevent migration of indoor contaminants from areas such as bathrooms, kitchens, and labs by keeping them under negative pressure (as compared to surrounding spaces).

ши	i tuos by keeping them under negative pressure (as compared to surrounding spa	cesj.	
5b.	Checked (using chemical smoke) that air is drawn into the room from adjacent spaces		Ń/A □
the	nd outside the room with the door slightly open while checking airflow high and door opening (see "How to Measure Airflow").		,
5c.	Ensured that air is flowing toward the exhaust intake	M	
AC	TIVITY 21: EXHAUST DUCTWORK		
5d.	Checked that the exhaust ductwork downstream of the exhaust fan (which is under positive pressure) is sealed and in good condition	, <b>\</b>	ٔ
6.	QUANTITY OF OUTDOOR AIR		
AC	TIVITY 22: OUTDOOR AIR MEASUREMENTS AND CALCULATIONS		
NO	TE: Refer to "How to Measure Airflow" for techniques.		
6a.	Measured the quantity of outdoor air supplied (22a) to each ventilation unit	۵	M
6b.	Calculated the number of occupants served (22b) by the ventilation unit under consideration	۵	
6c.	Divided outdoor air supply (22a) by the number of occupants (22b) to determine the existing quantity of outdoor air supply per person (22c)	_	
AC	TIVITY 23: ACCEPTABLE LEVELS OF OUTDOOR AIR QUANTITIES		
6d.	Compared the existing outdoor air per person (22c) to the recommended levels in Table 1	۵	۵
6e.	Corrected problems with ventilation units that supplied inadequate quantities of outdoor air to ensure that outdoor air quantities (22c) meet	_	_
	the recommended levels in Table 1		1.1

**NOTES** 

	8				
		E		W	



- Read the IAQ
   Backgrounder and the Background Information for this checklist.
- 2. Keep the
  Background
  Information and
  make a copy of
  this checklist for
  each ventilation
  unit in your school,
  as well as a
  copy for future
  reference.
- Complete the Checklist.
  - Check the "yes,"
     "no," or
     "not applicable"
     box beside each
     item. (A "no"
     response
     requires further
     attention.)
  - Make comments in the "Notes" section as necessary.
- Return the checklist portion of this document to the IAQ Coordinator.

# **Ventilation Checklist**

Na	ame: Andrew Dawson		_,
Sc	hool: Riverside Magnet School		
	nit Ventilator/AHU No: AHU-Q		
1	pom or Area: Date Completed: 12-20-24		
			- 1
Sig	gnature: Landelin Vanden		-
		-	
1.	OUTDOOR AIR INTAKES		
1a.	Marked locations of all outdoor air intakes on a small floor plan (for example, a fire escape floor plan)	No/	N/A
1b.	Ensured that the ventilation system was on and operating in "occupied" mode		
AC	TIVITY 1: OBSTRUCTIONS		
1c.	Ensured that outdoor air intakes are clear of obstructions, debris, clogs,	_	
1.d	or covers		
14.	frequently block an intake)		
۸۵	TIVITY 2: POLLUTANT SOURCES		
	Checked ground-level intakes for pollutant sources (dumpsters, loading		ı
	docks, and bus-idling areas)	A	
1f.	Checked rooftop intakes for pollutant sources (plumbing vents; kitchen, toilet, or laboratory exhaust fans; puddles; and mist from	_	
	air-conditioning cooling towers)		
1g.	Resolved any problems with pollutant sources located near outdoor air	<b>,</b>	
	intakes (e.g., relocated dumpster or extended exhaust pipe)	_	_
	TIVITY 3: AIRFLOW	/	
lh.	Obtained chemical smoke (or a small piece of tissue paper or light plastic)		
11.	Confirmed that outdoor air is entering the intake appropriately	u	
2.	SYSTEM CLEANLINESS		
AC	TIVITY 4: AIR FILTERS	•	
	Replaced filters per maintenance schedule		
2b.	Shut off ventilation system fans while replacing filters (prevents dirt from blowing downstream)	, ,	
	Vacuumed filter areas before installing new filters		
2d.	Confirmed proper fit of filters to prevent air from bypassing (flowing	<b>/</b>	
2e.	around) the air filter		
	Last or manner of transfer (agreed agreement or grange) unum	_	_

# 2. SYSTEM CLEANLINESS (continued)

AC	TIVITY 5: DRAIN PANS			
		Yes	No	N/A
2g.	Cleaned drain pans			
2h.	Checked drain pans for mold and mildew	<b>a</b>	ū	ū
AC	TIVITY 6: COILS	_		
2i.	Ensured that heating and cooling coils are clean	M		
AC	TIVITY 7: AIR-HANDLING UNITS, UNIT VENTILATORS			
2j.	Ensured that the interior of air-handling unit(s) or unit ventilator (air-mixing chamber and fan blades) is clean	<b>\</b>		. 🗆
2k.	Ensured that ducts are clean	ā	<u> </u>	
AC	TIVITY 8: MECHANICAL ROOMS	/		
	Checked mechanical room for unsanitary conditions, leaks, and spills	<b>d</b>		
2m.	Ensured that mechanical rooms and air-mixing chambers are free of trash, chemical products, and supplies	v/		۵
3.	CONTROLS FOR OUTDOOR AIR SUPPLY	,		
3a.	Ensured that air dampers are at least partially open (minimum position)	প্র		
3b.	Ensured that minimum position provides adequate outdoor air for occupants	∀′		
AC	TIVITY 9: CONTROLS INFORMATION			
3c.	Obtained and reviewed all design inside/outside temperature and humidity requirements, controls specifications, as-built mechanical drawings, and controls operations manuals (often uniquely designed)		⊌	
AC	TIVITY 10: CLOCKS, TIMERS, SWITCHES			
	Turned summer-winter switches to the correct position			V
	Set time clocks appropriately			
3f.	Ensured that settings fit the actual schedule of building use (including night/weekend use)	<b>y</b>		
AC	TIVITY 11: CONTROL COMPONENTS			
	Ensured appropriate system pressure by testing line pressure at both the occupied (day) setting and the unoccupied (night) setting	П		<b>~</b>
3h.	Checked that the line dryer prevents moisture buildup			Ğ∕
3i.	Replaced control system filters at the compressor inlet based on the compressor manufacturer's recommendation (for example, when you			_
3j.	blow down the tank)	ч		A
٠,٠	level (no leakage or obstructions)			Y
AC'	TIVITY 12: OUTDOOR AIR DAMPERS	_		
3k.	Ensured that the outdoor air damper is visible for inspection	$\mathbf{M}$		
31.	Ensured that the recirculating relief and/or exhaust dampers are visible for inspection	/		
3m.	Ensured that air temperature in the indoor area(s) served by each	/	_	_
	outdoor air damper is within the normal operating range	M		



NOTE: It is necessary to ensure that the damper is operating properly and within the normal range to continue.



ა.	CONTROLS FOR OUTDOOR AIR SUPPLY (continued)		
	of shutting off appropriate air handler	s/No	N/A
	Checked that the outdoor air damper opens (at least partially with no delay) when the air handler is turned on	<b>/</b>	a
3p.	If in heating mode, checked that the outdoor air damper goes to its minimum position (without completely closing) when the room thermostat is set to 85°F	1 0	<b>\( </b>
3q.	If in cooling mode, checked that the outdoor air damper goes to its minimum position (without completely closing) when the room thermostat is set to 60°F and mixed air thermostat is set to 45°F	1 🗆	<b>Y</b>
3r.	<ul> <li>If the outdoor air damper does not move, confirmed the following items:</li> <li>The damper actuator links to the damper shaft, and any linkage set screws or bolts are tight</li></ul>	000	
Pro	ceed to Activities 13–16 if the damper seems to be operating properly.		
AC	TIVITY 13: FREEZE STATS		
3s. OR	Disconnected power to controls (for automatic reset only) to test continuity across terminals	ı 🗹	<b>'</b>
3t.	Confirmed (if applicable) that depressing the manual reset button (usually red) trips the freeze stat (clicking sound indicates freeze stat was tripped)		
3u.	Assessed the feasibility of replacing all manual reset freeze-stats with automatic reset freeze-stats		, _ _
clos	TE: HVAC systems with water coils need protection from the cold. The freeze-st se the outdoor air damper and disconnect the supply air when tripped. The typic ge is 35°F to 42°F.		
AC	TIVITY 14: MIXED AIR THERMOSTATS		
3v.	Ensured that the mixed air stat for heating mode is set no higher than 65°F		V
3w.	Ensured that the mixed air stat for cooling mode is set no lower than the room thermostat setting		<u>~</u>
AC	TIVITY 15: ECONOMIZERS		
	Confirmed proper economizer settings based on design specifications or local practices		
NO	TE: The dry-bulb is typically set at 65°F or lower.	/	
	Checked that sensor on the economizer is shielded from direct sunlight	/	
load Dry and	TE: Economizers use varying amounts of cool outdoor air to assist with the cood of the room or rooms. There are two types of economizers, dry-bulb and enthate-bulb economizers vary the amount of outdoor air based on outdoor temperature that the conomizers vary the amount of outdoor air based on outdoor temperature that the conomizers wary the amount of outdoor air based on outdoor temperature that the conomizers wary the amount of outdoor air based on outdoor temperature.	oling ulpy. ire,	

# 3. CONTROLS FOR OUTDOOR AIR SUPPLY (continued) **ACTIVITY 16: FANS** 3aa. Ensured that all fans (supply fans and associated return or relief fans) that move outside air indoors continuously operate during occupied No N/A hours (even when room thermostat is satisfied)...... NOTE: If fan shuts off when the thermostat is satisfied, adjust control cycle as necessary to ensure sufficient outdoor air supply. 4. AIR DISTRIBUTION **ACTIVITY 17: AIR DISTRIBUTION** 4a. Ensured that supply and return air pathways in the existing ventilation system perform as required..... 4b. Ensured that passive gravity relief ventilation systems and transfer grilles between rooms and corridors are functioning..... NOTE: If ventilation system is closed or blocked to meet current fire codes, consult with a professional engineer for remedies. 4c. Made sure every occupied space has supply of outdoor air (mechanical system or operable windows) ..... 4d. Ensured that supply and return vents are open and unblocked ..... NOTE: If outlets have been blocked intentionally to correct drafts or discomfort, investigate and correct the cause of the discomfort and reopen the vents. 4e. Modified the HVAC system to supply outside air to areas without an outdoor air supply ...... 4f. Modified existing HVAC systems to incorporate any room or zone layout and population changes ..... 4g. Moved all barriers (for example, room dividers, large free-standing blackboards or displays, bookshelves) that could block movement of air in the room, especially those blocking air vents ..... 4h. Ensured that unit ventilators are quiet enough to accommodate classroom activities ..... 4i. Ensured that classrooms are free of uncomfortable drafts produced by air from supply terminals ..... **ACTIVITY 18: PRESSURIZATION IN BUILDINGS** NOTE: To prevent infiltration of outdoor pollutants, the ventilation system is designed to maintain positive pressurization in the building. Therefore, ensure that the system, including any exhaust fans, is operating on the "occupied" cycle when doing this activity. 4j. Ensured that air flows out of the building (using chemical smoke) through windows, doors, or other cracks and holes in exterior wall (for example. floor joints, pipe openings)...... 5. EXHAUST SYSTEMS **ACTIVITY 19: EXHAUST FAN OPERATION** 5a. Checked (using chemical smoke) that air flows into exhaust fan grille(s) ..... $\square$

If fans are running but air is not flowing toward the exhaust intake, check for the following:

- Inoperable dampers
- · Obstructed, leaky, or disconnected ductwork
- · Undersized or improperly installed fan
- · Broken fan belt





### **ACTIVITY 20: EXHAUST AIRFLOW**

and labs by keeping them under negative pressure (as compared to surro	unding spa	ces).
5b. Checked (using chemical smoke) that air is drawn into the room from adjacent spaces	n Yes	No N/A
Stand outside the room with the door slightly open while checking airflov	v high and	low in
the door opening (see "How to Measure Airflow").		,

NOTE: Prevent migration of indoor contaminants from areas such as bathrooms, kitchens,

Checked that the exhaust ductwork downstream of the exhaust fan (which is				
under positive pressure) is sealed and in good condition	Y			

### 6. QUANTITY OF OUTDOOR AIR

**ACTIVITY 21: EXHAUST DUCTWORK** 

### **ACTIVITY 22: OUTDOOR AIR MEASUREMENTS AND CALCULATIONS**

NOTE: Refer to "How to Measure Airflow" for techniques.

6a.	Measured the quantity of outdoor air supplied (22a) to each ventilation	
	unit	
6b.	Calculated the number of occupants served (22b) by the ventilation unit	
	under consideration	

6c. Divided outdoor air supply (22a) by the number of occupants (22b) to determine the existing quantity of outdoor air supply per person (22c).......□ □

### **ACTIVITY 23: ACCEPTABLE LEVELS OF OUTDOOR AIR QUANTITIES**

- 6d. Compared the existing outdoor air per person (22c) to the recommended levels in Table 1......
- 6e. Corrected problems with ventilation units that supplied inadequate quantities of outdoor air to ensure that outdoor air quantities (22c) meet the recommended levels in Table 1

**NOTES** 

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14				