Air Handling Checklist

Excerpted from Tools for Schools Indoor Air Quality (IAQ) Action Kit, Health Canada.

Date: __________________ Room/area: __________________________ School ________________________________
Name: __________________________________ Signature: ____________________________________________

To be completed by:
• School maintenance/facilities staff
• Contract service providers

Read the entire Air Handling Checklist section in Health Canada’s Tools for schools Action kit, including the sections: How to Measure Airflow - Reference Information and Interpreting Indoor CO2 Concentration Measurements, pages 7-3 to 7-15.

Y = statement is correct,  N = statement is incorrect,  N/A = not applicable

Outdoor Air Intakes

Perform these activities for all outdoor air intakes while outside the building, and mark the results on the Air Handling Log for each unit.

Activities:

Y  N  N/A

1. Ensure that the outdoor air intakes are unobstructed.

__  __  __  From outside the school building, checked the intakes for obstructions, such as debris, clogged screens, damage, or makeshift covers (e.g. boards or plastic).
__  __  __  Removed any obstructions.
__  __  __  Installed corrective devices if snowdrifts or leaves often block an intake.

Comments___________________________________________________________________________________

2. Ensure that outdoor air intakes are clear of nearby pollutant sources.

__  __  __  At ground level, looked for dumpsters, loading docks, parking lots, and areas where cars or busses idle.
__  __  __  At roof level, looked for plumbing vents, exhaust outlets (such as kitchen, toilet, or laboratory exhaust fans), puddles on the roof, and mist from air-conditioning cooling towers.
__  __  __  Birds and other pests do not roost or inhabit the areas around the air intakes.
__  __  __  Resolved problems due to pollutants near intakes:
__  __  __  Removed sources, where possible (e.g., move a dumpster to another location).
__  __  __  Separated the source from the intake (e.g., add another pipe section to raise a nearby exhaust outlet above the intake).
__  __  __  Changed operating procedures (e.g., turn off vehicles instead of idling them at loading docks and bus stands).
__  __  __  Outdoor smoking areas are not near an intake.

Comments___________________________________________________________________________________

3. Confirm that outdoor air is entering the system intake (visual indication)

__  __  __  Used chemical smoke (or a small piece of tissue or light plastic) to test whether air is flowing into the intake grille
__  __  __  Confirmed the operation and positions of intake dampers during all operating cycles.

Comments___________________________________________________________________________________
System Cleanliness

Y N N/A
___ ___ ___ Read warnings on page 7-6 of IAQ Tools for Schools Kit.

Perform activities 4-12 as a set on each ventilation unit while in the room and the unit is open.

4. Inspect air filters on ventilation equipment.
___ ___ ___ Reviewed ventilation system filter components and specifications to ensure that the proper filters are being used.
___ ___ ___ Installed new filters as needed. Shut off ventilation system fans when replacing filters so that dirt will not blow downstream. Vacuumed the filter area before installing the new filter.
___ ___ ___ Confirmed that filters fit properly in their tracks, with no air leaks around the air filter.
___ ___ ___ Confirmed that filters are installed in the proper direction for airflow.

5. Ensure that condensate (condensed water, frost, or “fog”) drain pans are clean and drain properly.
___ ___ ___ Drain pans slant toward the drain so they do not collect and hold water.
___ ___ ___ Checked for traps and drains within the plenums and ducts. Ensured that they are flushed and filled with clean water on a regular basis.

6. Ensure that heating and cooling coils are clean.
___ ___ ___ Heating and cooling coils are clean.

7. Ensure that air handling units (air mixing chambers, coils, and fan blades) and duct interiors are clean.
___ ___ ___ Visually inspected the interior and exterior of all system components.
___ ___ ___ Noted that crawlspaces, tunnels and other areas may be used as ducts, or may be in contact with the ventilation airstream. I understand the system layout and inspected all areas.
___ ___ ___ Properly decommissioned and removed any unused system components.

8. Ensure that mechanical rooms are free of trash and chemicals
___ ___ ___ Checked mechanical rooms for unsanitary conditions, leaks, or spills.
___ ___ ___ Mechanical rooms and air mixing chambers are not used to store trash or chemical products or supplies.

Comments_____________________________________________________________________________________

System Controls

___ ___ ___ Air dampers are always at least partially open (minimum position) during occupied hours.
___ ___ ___ The minimum position provides an adequate amount of outdoor air for the occupants.

9. Gather controls information
___ ___ ___ Gathered and read any controls specifications, as-built mechanical drawings, and controls operations manuals (checked with the maintenance supervisor).
___ ___ ___ Contacted the system installer or HVAC maintenance contractor to obtain controls information that is missing.

10. Check clocks, timers, and seasonal switches
___ ___ ___ Summer-winter switches are in the right position.
___ ___ ___ Time clocks read the correct time.
___ ___ ___ Time clock settings fit the actual schedule of building use (night/weekend set-back and set-up).

11. Check pneumatic control system components
___ ___ ___ Tested the line pressure at both the occupied (day) setting and the unoccupied (night) setting to determine whether the overall system pressure is appropriate.
___ ___ ___ The line dryer is preventing moisture build-up.
___ ___ ___ Checked the control system filters. The filter at the compressor inlet is changed periodically in keeping with the compressor manufacturer’s recommendations (e.g., when you blow down the tank).
Y  N  N/A
— — — The line pressure at each thermostat and damper actuator is at the proper level (no leakage or obstructions).
— — — Repaired or replaced defective components.

12. Check outdoor air damper operation
The air temperature in the indoor area(s) served by an outdoor air damper must be within the normal operating range. Ensure that the outdoor air damper is visible for your inspection.

— — — Turned off the air handler connected to the outdoor air damper and confirmed that the damper fully closes within a few minutes.
— — — Turned on the air handler and confirmed that the outdoor air damper opens (at least partially) with little or no delay.
— — — Set the room thermostat at least 5degreesC above and then below the current room temperature. Observed the damper for movement (damper should go to its design set-point position).
— — — Confirmed that the damper actuator is linked to the damper shaft and that any linkage set screws and bolts are tight.
— — — Confirmed that rust or corrosion is not preventing free movement.
— — — Confirmed that either electrical wires or pneumatic tubing is connected to the damper actuator.
— — — Reset thermostats to appropriate temperatures.

Proceed to Activities 13-16 if the damper seems to operate properly.

NOTE: The minimum damper setting may need to be adjusted using a nut or a knob, to create a larger damper opening.

Perform activities 13-16 as required in specific situations:

13. Confirm freeze-stat condition
HVAC systems with water coils need protection from freezing. The freeze stat may close the outdoor air damper and disconnect the supply air when tripped. (The typical trip range is 2 to 5 degrees C).

— — — If the freeze-stat has a manual reset button (usually red), depress the button. If a click is heard, the freeze-stat was probably tripped. Consider replacing manual reset freeze-stats with automatic freeze-stat resets.
— — — If the freeze-stat has an automatic reset, disconnect power to the controls and test for continuity across the terminals.

14. Check mixed air thermostat.
— — — The mixed air stat for heating mode is set no higher than 18degreesC (typically 13 to 18C).
— — — The mixed air stat for cooling mode is set no lower than the room thermostat setting.

15. Check air economizer setting
— — — Confirmed proper settings based on design specifications or local practices (dry-bulb setting is typically 18degrees C or lower).
— — — The sensor is shielded from direct sunlight.

16. Confirm that fans operate continuously during occupied periods
— — — If the fan shuts off when the thermostat is satisfied, changed the control cycle to prevent under-ventilation.
— — — Noted any complaints of drafts or cold temperatures.

Comments

Air Distribution
Perform activities 17-21 as required in specific situations:

17. Check air distribution. Verify that the air pathways in the original ventilation system design continue to function:

☐ Check to see whether operable windows have been replaced by windows that can’t be opened.
☐ Check to see whether passive gravity relief ventilation systems and transfer grilles between rooms and corridors are functioning. If they are closed off or blocked to meet modern fire codes, consult with a professional engineer for remedies. (Consult with fire department)

Comments
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Every occupied space has a supply of outdoor air (mechanical system or operable windows). If the building relies on passive ventilation, ensured occupants are aware of how ventilation can be provided.

| _ | _ | __ |

Supplies and returns are open and unblocked. If outlets have been blocked intentionally to correct drafts or discomfort, investigated, corrected, and re-opened the vents.

| _ | _ | __ |

In areas with no source of outside air, modified the HVAC system to correct the problem.

| _ | _ | __ |

Checked for barriers, such as room dividers, large freestanding blackboards or displays, or bookshelves that could block the movement of air in the room, especially obstacles that block air vents.

18. **Check air flow direction - building pressure**

First confirm that the system is operating on the occupied cycle and that outdoor wind is less than 10km per hour.

| _ | _ | __ |

Used chemical smoke to determine whether air flows out of the building through leaks in nearby windows, doors, or other cracks and holes in exterior walls (pressurized interior).

| _ | _ | __ |

Used chemical smoke to determine whether air flows out of the building through below-grade cracks and holes such as floor joints or pipe openings (pressurized interior).

**Comments**

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### Exhaust Systems

19. **Confirm that exhaust fans are operating**

| _ | _ | __ |

Used chemical smoke to confirm that air is flowing into exhaust grilles.

20. **Verify that local exhaust fans remove enough air to eliminate odours and chemical fumes.**

| _ | _ | __ |

If the fan is intended to exhaust the entire room, stood outside the room with the door slightly open and used chemical smoke to confirm that air is being drawn into the room from locations both high and low in the door opening.

| _ | _ | __ |

If the fan is running but air isn’t flowing toward the exhaust intake (or not enough air to do the job) checked for the following possibilities:

- □ The backdraft damper at the exhaust outlet does not open;
- □ obstructions in the ductwork;
- □ leaky or disconnected ductwork;
- □ broken fan belt;
- □ motor running backwards; or
- □ design problems (e.g. undersized fan).

21. **If the exhaust fan is located close to the contaminant source, rather than on the roof, and exhaust air is ducted through the building under positive pressure**

| _ | _ | __ |

Confirmed that the exhaust ductwork is sealed and in good condition. Made any repairs permanent and took other measures that help ensure there will be adequate outdoor air in the future.

**Comments**

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Perform activities 22-24 as described in the Tools for Schools Kit pages 7-11 to 7-14 on all units when airflow measurement equipment is available.

See separate log sheet