

HVAC Maintenance

The best way to ensure routine maintenance occurs for all HVAC units is to have SOP's and a maintenance logbook for the HVAC systems. Often, due to lack of repair or maintenance, HVAC systems, if not the cause, exacerbate indoor air quality problems. The following list contains items that can be included in a maintenance program to reduce this risk. This list does not include maintenance of the mechanical components such as motors. Those items should be addressed following manufacturer's recommendations.

IAC 33-4-5 requires schools to establish and maintain a written procedure for routine maintenance of HVAC systems.

1. Unit Ventilators – routine maintenance should include the following
 - a. Clean intake and exhaust vents
 - b. Clean drip pan and condensate drain line
 - c. Clean coils
 - d. Clean all accessible areas of interior of unit
 - e. Ensure fresh air damper linkage is functioning
 - f. Clean air intake on exterior of building
 - g. If intake on ground level, check for pooling water along building.
 - h. Change filter (we suggest at minimum use a good quality pleated filter)
 - i. Noise level should not be disruptive to students and teacher
 - j. With fresh air damper at lowest setting, supply sufficient outside air to maintain a maximum of 700 ppm carbon dioxide over the outdoor measurement (ASHRAE recommends 15 CFM outside air/person for classrooms)
 - k. All cleaning residue that causes irritation or respiratory distress should be flushed from system prior to students returning to classroom

2. Central systems- routine maintenance should include the following
 - a. Clean intake and exhaust vents in rooms
 - b. Examine ductwork behind supply and return vents for accumulated dust and or mold
 - c. Clean coils.
 - d. Clean drip pan and condensate drain line
 - e. Ensure dampers are functioning properly

- f. On automatic systems, with damper set at lowest setting, ensure minimum outside air to maintain maximum of 700 ppm carbon dioxide over the outside measurement (ASHRAE recommends 15 CFM outside air/person for classrooms).
 - g. Check that fresh air intake is not blocked and no standing water or mold near intake. Do not allow birds to roost or nest on vents
 - h. Ensure individual thermostats are working
 - i. Ensure individual room dampers are functioning properly
 - j. Clean or replace filters (use good grade of filter)
 - k. Systems should have been balanced to ensure minimum movement of odors from one area to another and minimum fresh air requirement is met for all rooms
 - l. Examine outside air intakes for cleanliness and ensure no standing water near the intake
 - m. All cleaning residue that causes irritation or respiratory distress should be flushed from system prior to students returning to classroom
 - n. Check integrity of ductwork
3. All systems
- a. Check to see area in front of air intakes is unobstructed (keep shrubs a minimum of 3 feet from air intakes)
 - b. Check to ensure there is no standing water near air intakes
 - c. Use air filters that have an acceptable minimum efficiency rating.
 - d. Locate waste containers (both indoor and outdoor) away from any air intakes or air return vents
 - e. On new construction or renovations, air intakes and exhausts should be located so as to minimize the possibility of re-entrainment of exhaust gasses, car exhausts, or other outdoor pollutants

Resources:

- EPA's Creating Health Indoor Air Quality in Schools
<https://www.epa.gov/iaq-schools>
- EPA's "Design Tools for Schools" Heating Ventilation and Air Conditioning Systems
<https://www.epa.gov/iaq-schools/heating-ventilation-and-air-conditioning-systems-part-indoor-air-quality-design-tools>
- Minnesota Dept. of Health "Indoor Air Quality (IAQ) in Schools"
<https://www.health.state.mn.us/communities/environment/air/schools/index.html>

The following page is an example maintenance chart produced by the Minnesota Department of Health and amended by the Indiana State Department of Health
Attachment 4: Example Preventive Maintenance Schedule

Edit according to operational needs of each school building.

	Every 3 Months	Every 6 Months	Annually	Every 2 Years	As Needed
HVAC System					
Filters Replaced/Fitted Properly	x				x
Fan / Air Flow Direction	x				
Belt Tension			x		
Drain Pans Empty/Clean	x				
Drain Condensate lines cleaned	x				
Overall Cleanliness of Ducts and Unit			x		
15-20 percent of Air Delivered is Fresh				x	
Calibration of System				x	
Thermostats Functional	x				
CLEANING SCHEDULE					
Cleaning of Heating Coils			x		
Cleaning of Cooling Coils		x			
Cleaning of Drainage Areas		x			
Cleaning of Ductwork					x
AIR INTAKE					
Avoid Obstructions	x				
Air Flows into duct	x				
No Pollutant Sources Nearby (garbage, idling vehicles, exhaust)	x				
Dampers Operational	x				
Motors Operational	x				
LOCAL EXHAUST SYSTEMS					
Proper Exhaust Volume			x		
Air Direction Correct			x		
Fan Functional			x		
Outdoor Vent Checked / Cleaned			x		
OTHER					
Sewage Traps Filled with Water Weekly	x				
Hazardous Chemicals Storage		x			
Walk-off Mat Cleanliness	x				
Carpet Cleanliness	x				
Leaks, Stains, Moisture Inspection	x				
Clean All Classroom Tables, Diffusers, Shelves	x				x
Deep Clean Carpets, Strip and Wax Floors		x			x

410 IAC 33-4-5(C) For new construction, or renovation of the HVAC system, all air supplies and air returns shall be ducted. Open return plenums above the ceiling are not allowed.

Rule Interpretation:

Renovations:

March 5, 2013 - For the purpose of this rule, replacement with "like kind" is considered a repair even if the new units are of different size and designed to supply a different quantity of air. March 5, 2013 – For the purpose of this rule, relocation of existing structures is considered a repair.

March 5, 2013 – Replacement of the central air handler, even if it is a different design, is a repair when all work is in the mechanical room.

New Construction:

March 5, 2013 – New construction of a new building or wing. Individual classrooms may be added on, and tap into existing HVAC systems that were already sized to accommodate additional rooms. If the HVAC has to be upgraded to accommodate the additional rooms this may have to be reviewed on an individual basis.