BSR/ASHRAE Addendum h
to ANSI/ASHRAE Standard 62.1-2022

Public Review Draft

Proposed Addendum h to Standard 62.1-2022, Ventilation and Acceptable Indoor Air Quality

Third Public Review (July 2025)
(Draft shows Proposed Independent Substantive Changes
to Previous Public Review Draft)

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FOREWORD

Section 8 of ASHRAE Standard 62.1 addresses Operations and Maintenance of Ventilation Systems and related components. Ventilation systems that are not operated per design or maintained in good working order are subject to degraded performance of maintaining acceptable IAQ and potentially impacting energy use.

ASHRAE/ACCA Standard 180 provides maintenance tasks for HVAC systems. Table 8-1 has previously duplicated or modified maintenance tasks from this standard. A second public review of this proposed addendum set to eliminate the majority of this table and referred to Standard 180 for maintenance. Based on public comments received, a new review of this section and table was initiated. It was decided that a new table, separate from Standard 180, that is based on the requirements of 62.1, could provide facility users with a list of inspection tasks that are important to maintaining acceptable IAQ.

It is important to emphasize that this new table is based on inspection and not maintenance. The results of the inspection task may have an impact on the preventive maintenance plan, or could elevate the need for service, or professional support. The goal is to be IAQ focused and to identify issues that may otherwise go undetected and to keep the ventilation system performing as intended.

[Note to Reviewers: This public review draft makes proposed independent substantive changes to the previous public review draft. These changes are indicated in the text by underlining (for additions) and ~~strikethrough~~ (for deletions) except where the reviewer instructions specifically describe some other means of showing the changes. Only these changes to the current standard are open for review and comment at this time. Additional material is provided for context only and is not open for comment except as it relates to the proposed changes.]

Addendum h to 62.1-2022

Modify Section 8

8. OPERATIONS AND MAINTENANCE

8.1 General

8.1.1 Application. The requirements of this section apply to buildings and their ventilation systems and their components after placed into service.

8.1.2 Building Alterations or Change of Use. Where buildings are altered or where changes in building use, occupant category, significant change in occupant density, or other changes inconsistent with system design assumptions are made, the ventilation system design, operation, and maintenance shall be reevaluated and the O&M manual updated as necessary.

8.2 O&M Manual. An O&M manual, either written or electronic, shall be developed and maintained on site or in a centrally accessible location for the working life of the applicable ventilation system equipment or components. This manual shall be updated as necessary. The manual shall include the O&M procedures, ventilation system operating schedules and any changes made thereto, final design

drawings, maintenance schedules based on manufacturer's instructions, and the inspection and maintenance requirements and frequencies provided in Table 8-1 and in ANSI/ASHRAE/ACCA Standard 180.

Informative Note: ANSI/ASHRAE/ACCA Standard 180, Standard Practice for Inspection and Maintenance of Commercial Building HVAC Systems, provide requirements for the development of a comprehensive maintenance plan for commercial HVAC systems.

8.3 Ventilation System Operation. Mechanical and natural ventilation systems shall be operated in a manner consistent with the O&M manual. Systems shall be operated such that spaces are ventilated in accordance with Section 6 during periods of expected occupancy.

8.4 Ventilation System Maintenance. The building ventilation system components shall be maintained in accordance with the O&M manual.

8.5 Ventilation System Inspection, Verification, Validation. The building ventilation system and components shall be inspected and verified to continue to meet requirements as designed in accordance with this standard. The inspection and verification shall be performed per minimum frequencies provided in Table 8-1.

Informative Note: Tasks may need to be increased in frequency when operating in a mode that is beyond normal operation. Tasks may result in changes to the O&M manual or identification of ventilation system deficiencies that require corrective action. Failure to perform tasks, make repairs, or correct deficiencies may result in less than acceptable IAQ.

Table 8-1 Minimum Inspection, Verification, and Validation (See Table 8-1 Notes) Activity and Frequency for Ventilation Systems and Associated Components

Task #	Relative Section	Inspection, Verification, Validation Task	Frequency
1a	4.1 6.1.4	Verify that the building is located in an area not designated as a nonattainment area. If the area has been designated as a nonattainment area, prepare and implement a plan to comply with the requirements of ~~Address per~~ Section 6.1.4.	Annually
2a	5.1.2	Inspect piping and ductwork insulation system in accessible areas for integrity and signs of moisture or biological growth and repair as needed.	Annually
3a	5.4.1	Verify that no modifications to the HVAC system or the facility have been made that impact separation distances. If deficiencies are identified, document the deficiencies and undertake and document corrective actions. ~~Deficiencies require corrective action~~.	Annually
4a	5.4.3 5.4.4 5.4.5	Inspect outdoor air intakes and exhaust openings, bird screens, louvers, dampers, and other attached components and ducting for rain intrusion, snow entrainment, pest intrusion, and physical condition. • Indication of biological growth • Indication of corrosion • Buildup of dirt and debris • Indication or presence of birds, insects, or other animals • Integrity Clean and repair as needed; determine root cause and corrective actions.	Semi-annually
5a	5.5 5.9	Verify air filtration fit, function, and performance: • Verify efficiency and particulate matter rating meets or exceeds ~~is at least~~ minimum requirements.	Quarterly, or at scheduled replacement if sooner

		• Verify filters are correct thickness, fit, and size for housing assembly. • Verify seal integrity so that airflow cannot bypass the filter(s). • Verify filter scheduled replacement frequency per the O&M manual. • ~~Confirm that pressure drop readings do not~~Replace filters that exceed the maximum pressure drop of the filter ~~or the maximum allowable for the fan based on the static pressure calculations~~ per the O&M manual. • Verify electronic air cleaning devices are operating in accordance with manufacturer's instructions. Repair, replace, or clean filters or assembly components as ~~necessary to for intended operation~~ needed.	
6a	5.7.1 5.7.2 5.7.3 5.7.4 7.2.3	Inspect drain pans, seals, traps, pumping systems, drains and drain piping within air handling equipment, ducting, and plenums. • Verify drain pan is ~~sized and~~ positioned under water producing devices. *Informative Note:* The operator may check sizing per Sections 5.7.4 and 7.2.3. • Verify drain pan slope is in direction of drain outlet. • Inspect for biological growth, corrosion, or other debris that would prevent intended drain operation. • Verify water drains freely out of pan and through attached drain piping. • Verify traps, seals, and priming devices are wet and operational. • Verify pumps are operational. • Inspect for signs of overflow or water carryover. • Validate shut off devices or alarms function as intended. Clean and repair as needed; determine root cause and make corrective actions.	Semi- annually
7a	5.8	Inspect humidifiers and dehumidifiers • Verify drain components function as intended. • Verify water feed components function as intended. • Inspect for biological growth, corrosion, or other debris on units or associated ducting as an indication of improper operation. • Verify humidity, dew point, or other moisture measurements are within designed ranges and associated sensors are functional ~~function as intended~~. • Verify operation ~~on~~ of desiccant dehumidifiers per manufacturer's instructions Clean and repair as needed; determine root cause and make corrective actions.	Semi- annually
7b	5.8	• Validate that humidity, dew point, and ~~or~~ other sensors that measure moisture ~~measurements associated sensors~~ are calibrated and function as intended.	Every 3 years
8a	5.9.1 5.9.2	Verify operation and condition of electrical air-cleaning devices and ultraviolet devices • Verify operation of air cleaning devices per manufacturer's instructions. • Inspect for indication of lamp malfunction or ineffectiveness and determine root cause and corrective action. • Clean lamps in accordance with manufacturer's instructions. • Replace lamps per manufacturer's schedule or upon lamp failure.	Quarterly
9a	5.10.1.1 5.19.1 5.19.2 5.19.3	Verify that space and access is provided and is maintained unobstructed for: • All areas necessary for air balancing, verification, and measurement of ventilation by Section 7.2.2. • All other areas that require routine maintenance and inspection by Section 8.2 • All components and equipment that require verification by Section 8.5	Semi- annually

		• All sensors, instruments, and ventilation system components, controls, and equipment • All access doors and panels. o Verify access doors and panels are functional and correctly seal when not open for testing, inspection, or maintenance. Clean, repair, and provide access as needed.	
10a	5.10.2 5.11.1	Inspect floor, ceiling, or mechanical room plenum systems and ductwork. • Verify that there is no biological growth, corrosion, or indication of insects or other animals. • Verify chemicals, cleaning products or equipment, or other materials are not kept in air handling spaces or plenums. Clean and remove foreign objects; determine root cause and make corrective actions.	Annually
11a	5.10.3 7.2.2	Perform ~~TAB~~ air balance verification. • <u>If occupancy or space utilization has changed, determine if airflow rates meet this standard</u> o Review design documents, most-recent TAB report, and current requirements. ▪ Determine if <u>reported</u> airflows meet design intent. ~~o If occupancy or space utilization has changed determine if airflow rates meet this standard~~ • <u>When airflow is displayed:</u> o Verify outdoor airflows meet design requirements of this standard. o In spaces that require exhaust by Table 6-2, verify exhaust airflow is greater than supply airflow<u>.</u> • Verify dynamic reset and outdoor airflow per Section 14 of this table. Verify CO2 sensor calibration <u>date</u> and CO2 DCV setup. • <u>When the time elapsed since the previous CO2 sensor calibration date is beyond manufacturer's calibration frequency, then have sensor calibrated.</u> • Determine space type and design occupancy and verify maximum CO2 limit is correctly set. • Verify when the space is unoccupied that ventilation for the building component ventilation rate is provided or <u>the space is</u> in occupancy standby.	Annually
11b	5.10.3 5.18 6.2.5 6.2.6 6.2.6.1.3 6.2.5 6.2.6 7.2.2	Perform TAB air balance validation • Measure outdoor airflows of all units and adjust as necessary. o Spot check space level airflows at outlets<u>/ and</u> inlets at a minimum of 20% of all zones. o Rebalance as necessary ~~any discrepancies found~~ to ~~verify~~ <u>achieve</u> compliance with the design intent and this standard. o ~~Rebalance all zone and space level airflows if~~ <u>If</u> ~~determined that~~ occupancy or space utilization has changed~~,~~ and airflows no longer meets design intent or this standard<u>, rebalance all zone and space level airflows</u>. • Rebalance exhaust airflows to maintain supply and exhaust relationship and pressurization requirements. • <u>Validate CO2 sensor calibration date and CO2 DCV setup.</u> o <u>When CO2 sensor calibration date is beyond manufacturer's calibration frequency</u>, ~~Validate CO2 sensor~~ calibrat<u>e</u>~~ion~~ in accordance with manufacturer's instruction. • Validate, maintain, and calibrate ventilation sensors. o Calibrate static and differential pressure transducers used <u>to</u> control fan pressure, room pressure, VAV boxes, airflow, and filters. o Validate airflow rates of airflow sensors. <u>Clean and calibrate airflow sensors per manufacturer's instructions.</u>	Every 3 years

		~~• Clean airflow measuring stations per manufacturer's instructions.~~ ~~• Calibrate airflow measuring stations per manufacturer's instructions.~~	
12a	5.12	Verify cooling systems maintain indoor conditions below humidity limits as referenced in Section 5.12. ~~Determine root cause and m~~Make corrective actions.	Annually
13a	5.13 5.17 6.5.1.2	Verify directional airflow and building pressurization. • ~~Verify that air is transferred only from a lower class air to a higher class air or within the same classification~~ • Verify that zones are pressurized positively or negatively per design and that flow moves toward the exhaust. • Verify operation of any pressure indication or measurement sensors. • ~~Validate through measurement that controls for ventilation and controls for exhaust track to maintain building at minimum neutral to positive pressure under all dynamic conditions~~	Annually
14a	5.18 6.2.5 6.2.6	Verify ventilation system~~,~~ with variable load ~~and~~ or dynamic reset controls. • Inspect and test damper assemblies and ~~(~~adjust and repair as needed.~~)~~ o Verify seals are intact, linkages and dampers operate smoothly, dampers operate full range, actuator~~s~~ clamps are tight on shaft, dampers close tight, actuators modulate as intended and fail-safe on power loss. • Inspect fan assemblies. ~~(~~Clean, lubricate, adjust, and repair as needed.~~)~~ o Belt tension and wear, sheave alignment, bearing operation. o Fan balance, tightness, and cleanliness o Electrical connections, motor controllers, variable frequency drives, and other speed modulating devices • For ventilation zones with airflow sensors, verify that zone level controls ~~maintain no less than ventilation rates (*Vbz*) under all load and dynamic~~ reset to changing conditions. o Verify that zone air ventilation rates are maintained during supply fan turndown and other reduced load conditions. o Verify that demand control ventilation zones respond to changes in occupancy.~~Verify ventilation system and control provide no less than the minimum ventilation rates for the current occupancy.~~ • Verify that occupancy controls shut off the zone ventilation when the space is either unoccupied or in occupied standby.	Every 2 years
15a	5.20	Verify legionella plan is implemented and maintained.	Annually
16a	6.3.1 6.3.3.2 7.3	For systems designed per the Indoor Air Quality Procedure (IAQP), verify if changes to occupancy, changes to space utilization, new procedures, new components, refurbishments, or renovations have been made. If so, see section 16b. ~~Verify design compounds, Particulate Matter (PM), and occupant satisfaction.~~ ~~• Conduct subjective evaluation of occupants per section 7.3.2~~ ~~o Address concerns of occupants~~ ~~• Review design documents and any available test results per section 7.3.3:~~ ~~o Identify design compounds (DCs) and PM design intent, review post occupancy testing.~~ ~~o If occupancy or space utilization has changed determine if the initial tested DCs and DLs are still applicable to the space.~~ *Informative Note:* • New procedures or components in the space such as new furniture, printers, computers, cleaning chemicals, or other additions could increase the compounds listed in Table 6-5.	Every 2 years

		• Refurbishment of carpets, paint, tiles, windows, or other additions could increase the compounds listed in Table 6-5.	
16b	6.3.1 6.3.3.2 7.3	For systems designed per the Indoor Air Quality Procedure (IAQP), validate concentrations of DCs and PM2.5 remain less than the design limits (DLs) per Section ~~7.~~6.3.1. ~~o If occupancy or space utilization has changed identify new DCs.~~ • Perform objective evaluation per Section 7.3.1 to verify DLs continue to be met. o If any limit is exceeded, perform root cause analysis to determine if flow rates need adjustment or air cleaning equipment needs repair or replacement. • Conduct subjective evaluation of occupants per Section 7.3.2. o Address concerns of occupants.	~~Every 3 years~~ As Required
17a	6.4.3	Verify natural ventilation controls and accessibility. • Verify that occupant operated natural ventilation openings are functional and accessible. • Verify control sequences and instrumentation that automate natural ventilation openings operate during occupied periods. Validate openings cannot be closed except during unoccupied periods or when mechanical ventilation system is active. • Verify controls and sequences for mechanical ventilation operate when conditions for natural ventilation are inadequate.	Annually
18a	6.5	Verify exhaust ventilation. • When following the Prescriptive Compliance Path (6.5.1), review design documents and most-recent TAB report exhaust flow rates. o Determine if exhaust airflow rates are per Table 6-2 and 6-3. o If occupancy or space utilization has changed, identify new exhaust rates. • When following the Performance Compliance Path (6.5.2), review design documents to determine that expected contaminants and mixtures of concern have not changed. ~~o~~ Verify that exhaust monitoring and control system are detecting and maintaining concentrations below limits. For systems equipped with airflow sensors ~~and~~ verify design airflow rates are maintained.~~maintaining design airflow rates.~~ o If occupancy or space utilization has changed identify new contaminants or mixtures of concern, concentration limits, and exhaust flow rates. • If concentration levels, airflow rates, or pressurization requirements are not being maintained per design, perform the necessary actions described in Section 11b of this table.	Annually

Table 8-1 Notes:

1. "a" type tasks are intended as verifications see Note 2; "b" type tasks are intended as validations, see Note 3
2. ~~As used in this table, "~~Verify~~" is intended to~~ shall mean checking a condition through means such as visual inspection, review of documentation, reading gauges, using telltales, viewing local displays, or analyzing live or trend data in a Building Automation System (BAS). These tasks are intended to be accomplished without special tools~~,~~ or specialized instrumentation, ~~or~~ and by persons ~~needing~~ without specialized training, knowledge, certifications, or licenses.
3. ~~As used in this table, "~~Validate~~" is intended to~~ shall mean taking action ~~to perform a function~~ that requires specific tools, calibrated instrumentation, adjustments, changes in operation, and by persons needing specialized training, knowledge, certifications, or licenses.

4. If the desired results of a task cannot be verified, as described in Note 2, then the task shall be validated as described in Note 3, regardless of listed minimum frequency.

Add the following reference to Section 9.

ANSI/ASHRAE/ACCA Standard 180 (2018) Standard Practice For Inspection And Maintenance Of Commercial Building HVAC Systems
Tables 5.1 – 5.25