



Wildfires have increasingly brought devastation to both Northern and Southern California, and it is unlikely that these are isolated events. The **Federal Emergency Management Administration (FEMA)** allows public entities to reimburse for duct and HVAC cleaning to help mitigate the adverse health effects of soot, ash, and debris left by such events. According to ASHRAE Guideline 44 Polycyclic Aromatic Hydrocarbons “PAHs and other contaminants, such as heavy metals, can bind to indoor air particulate matter, and studies have shown that they persist in dust after the outdoor smoke has cleared”.

As the experts in HVAC installation, maintenance, and repair, the Western States Council of SMART would like to offer the following suggestions and best practices on HVAC system and duct cleaning. It is our hope that these suggestions will help school leaders and advocates make informed decisions for asset management, to wisely spend FEMA or public dollars, and mitigate the risk to students and staff from contaminants, such as fine particulate matter (PM 2.5), left over from wildfires in the vicinity of schools.

#### **Western States Council Suggested Actions After Wildfires:**

- Perform [Ventilation Verification](#) (Physical Testing of HVAC Systems) – Particularly concentrating on validation of outdoor air (OA) after an event like this. Often the first line of defense is to close off OA – a certified technician should at a minimum reset the OA dampers and verify that minimum airflow is maintained in all modes of operation. Along with OA, any rooms that are designed to have positive or negative airflow design for health or safety concerns should be verified by airflow and pressure readings.
- According to ASHRAE Guideline 44 (Section 6.5), along with duct cleaning, the air handling systems and/or downstream components (VAV’s, reheat coils, etc.) should be cleaned (internally) as well, since that is where the dirty air that makes it through the filter can be trapped in the coil(s) and other internal components. This should also be done on any exhaust fans, kitchen hood fans, etc., not just supply-side fans.
- Supply, return and exhaust grills and the ceiling spaces near them should also be cleaned thoroughly to avoid cross contamination.
- Sensors and thermostats should be cleaned per manufacturers’ suggestions by skilled and trained workers to ensure that fine particulates are not affecting the ability of the sensor to accurately measure temperature, pressure, humidity, etc.
- Verify air filtration fit, function, and performance. Per ASHRAE Guideline 44 (Section 6.5) “*Dirty filters should be changed to avoid circulation of odors that may remain from the smoke*”. When filtration is being replaced, inspections should be made to determine if there are physical indications of filtration being bypassed – if noted, a skilled, trained, and certified workforce should make corrections and/or alterations to reduce or eliminate any bypassing. Final cleaning of any soot or other residue should only then be done per the established protocols of health officials.
- Inspect outdoor air intakes and exhaust openings, bird screens, louvers, dampers, and other attached components and ducting for physical condition and buildup of dirt and debris.
- Verify operation and condition of air-cleaning devices and ultraviolet devices. Improperly functioning air cleaning devices, in many cases, can generate ozone or other toxic gases that can create a dangerous indoor environment.



- Inspect and clean the floor, ceiling, and other surfaces in mechanical rooms that house HVAC equipment and any surface of plenum systems to avoid contaminating systems or ductwork.

### Increase your IAQ IQ:

How much outside air should a classroom have?

A study conducted in 2019 showed that 85% of HVAC systems in California classrooms did **not** provide adequate ventilation. In California, the minimum amount of OA is determined by calculating the Cubic Foot per Minute (CFM) of OA per person and by CFM per square foot of floor area. After calculations are completed, the stricter requirement (higher CFM) is followed, and the HVAC system is adjusted to constantly deliver that amount of OA to the classroom. Below is an example of this calculation:

Standard	Method	15 People	25 People	32 People
California T24 (2022) Occupancy	15 CFM/person	225 CFM	<b>375 CFM</b>	<b>480 CFM</b>
California T24 (2022) Floor Area	0.38 CFM/ft <sup>2</sup>	<b>342 CFM</b>	342 CFM	342 CFM

For an overview of how proper ventilation and filtration impacts students and staff in classrooms, please watch these videos from the UC Davis Western Cooling Efficiency Center:

[The Importance of Filtration in Schools](#)

[Importance of Ventilation in Schools](#)

For more information or to help find a qualified contractor to perform this or other HVAC work, please contact the [Western States Council of SMART](#).

### Citations and Additional References:

ASHRAE Guideline 44-2024, Protecting Building Occupants From Smoke During Wildfire and Prescribed Burn Events, (2024). ASHRAE.

ASHRAE Guideline 42-2023, Enhanced Indoor Air Quality in Commercial and Institutional Buildings, (2023). ASHRAE.

Ruch, C., & Pistochini, T. (2021). *Proposed Ventilation and Energy Efficiency Verification/Repair Program for School Reopening* (Vol. 4). UC Davis Energy and Efficiency Institute. <https://ucdavis.app.box.com/v/ProposedVentilationProgram>