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Ginger Scoggins
2023-2024 ASHRAE President

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March 15, 2024

Mr. Nathan J. Deahl
Inspector General
Office of the Inspector General
U.S. Government Publishing Office
732 North Capitol Street, NW
Washington, DC 20401

Re: Report No. 24-02, "Indoor Air Quality Inspection," February 14, 2024

Dear Inspector General Deahl:

Thank you for the opportunity to review and comment on Inspection Report Number 24-02, "Indoor Air Quality Inspection," dated February 14, 2024. We appreciate the opportunity since the report references ASHRAE.

ASHRAE, founded in 1894, is a technical society advancing human well-being through sustainable technology for the built environment. The Society and its more than 53,000 individual members – comprising engineers, academics and other professionals in the buildings industry – focus on building systems, energy efficiency, indoor air quality, refrigeration and sustainability within the industry. ASHRAE also develops standards in its fields of expertise to guide industry in delivery of goods and services to the public. ASHRAE has some 87 active standards and guideline project committees, including ANSI/ASHRAE Standard 62.1, *Ventilation and Acceptable Indoor Air Quality*, which is the recognized standard for ventilation system design and maintenance.

The attached comments come from two bodies within ASHRAE with different focus areas:

- Standing Standard Project Committee (SSPC) 62.1, the body that develops ASHRAE Standard 62.1, provides comments focused on Standard 62.1.
- Environmental Health Committee, a standing committee of ASHRAE's Technology Council, provides comments focused on broader environmental health aspects.

Please do not hesitate to contact ASHRAE if you have questions or need additional information by emailing GovAffairs@ashrae.org. Thank you again for the attention you devoted to this inspection, analysis, and report, and for providing ASHRAE with the opportunity to review the report and submit comments.

Sincerely,

A handwritten signature in black ink, appearing to read 'Ginger Scoggins', with a stylized, cursive script.

Ginger Scoggins
2023-2024 ASHRAE President

Enclosures: ASHRAE SSPC62.1 Comments
ASHRAE EHC Comments

Comments from Member of Standing Standard Project Committee 62.1 – March 2024

Members of SSPC 62.1, the cognizant committee responsible for ASHRAE Standard 62.1 *Ventilation and Acceptable Indoor Air Quality*, have reviewed Inspection Report 24-02: Indoor Air Quality Inspection, dated February 14, 2024. We offer the following comments and recommendations with respect to the report:

- 1) Observation 1 on Page V incorrectly states that the standard is 80% satisfaction, but the standard is 80% not expressing dissatisfaction. The difference is subtle, but important, as neutral responses are considered to be affirming of the air quality. Furthermore, the specific complaints summarized in Figure 2 on page 5 include items unrelated to air quality, such as temperature, maintenance, and duct cleanliness, suggesting that the survey needs to be clearer in specifying that they are to only consider their perception of the air quality.
- 2) The test methods in the report do not comply with the requirements in Section 7.3. Although the standard does not specify that these methods be followed for assessment of buildings not seeking to provide compliance with the indoor air quality method of the standard they are customarily followed by professionals assessing indoor air quality issues. In particular, membership mentioned the accuracy of the sensors used and the quantity of points sampled as being insufficient for them to draw meaningful conclusions from the data presented. This comment is relevant to Finding 2, specifically the commentary starting on Page 24 and Recommendation 6 on Page 26 of the report, also mentioned on Page 30 and Page 5 of Appendix E.
- 3) With respect to Figure 8, the assessment of outdoor air contaminants does not identify sources of outdoor air contamination, which is required by section 4.3 of the standard. Related to this item, Section 6.1.4.4 requires documentation by the design team of assumptions where outdoor contaminants are known to exceed acceptable limits.
- 4) Consideration 1 on page 18 of the report should reference Section 6.3.4 allowing the use of the ventilation rate procedure and indoor air quality procedure for different ventilation zones served by the same system.
- 5) Consideration 2 on page 19 of the report should add recommendations for owner responsibilities and reference the following sections:
 - a. Section 6.2.1.1.2 requiring the establishment of unusual contaminant sources by an Environmental Health & Safety Professional responsible to the owner.
 - b. Section 8.3 requiring operation of systems in compliance with the design documents.

Thank you for your interest in ASHRAE's standards.

Sincerely,

Brendon J. Burley
Chair SSPC 62.1

Review Comments - GPO OIG Inspection Report No. 24-02 Indoor Air Quality
Comments Provided by ASHRAE Environmental Health Committee (Chair, Dr. William Bahnfleth)
March 13, 2024

Page	Para	Comment
		Overall, it seems like they have good plans in place for the issues they have identified.
		Agree with using MERV13 filters, as long as system can handle the change.
v		ASHRAE Standard 62.1 is updated on a three year cycle. The report should identify which version of the standard was used for compliance evaluation. 62.1-2022 + any approved addenda is the most recent version.
1	Bullet 2	The report refers to "fresh" air here and in other places. Fresh air is not a term used in ASHRAE Standard 62.1, which simply refers to "outdoor air," which may have varying levels of contaminant.
7	5	If the childcare facility can't get the outdoor air to enter even with fans being run due to lack of return air vents (I assume the issue is over pressurization), perhaps a solution while waiting for a new system would be to open windows just enough to let air exit.
7	5	Page numbers listed as PDF page number, not document page number. Regarding "Even when fresh air was provided, the space lacked ventilation due to the absence of return vents" cannot be adequately verified without duct schematics, pressure measurements, and measurement of outdoor air decay rates inside occupied spaces. Opening windows may not be prudent given unknown outdoor pollutants (if this is in the D.C. area, that could be traffic emissions). Pressurizing occupied zones is not inherently a negative as it also reduces infiltration of outdoor pollutants and of air from adjacent classrooms that carry pollutants, airborne viruses, etc.
7	5	The statement "The lack of ventilation meant that the occupants of the Child Care Center were not provided fresh air when the outside air temperature was below 40°F" means that the control algorithm shut off the outdoor air intake below 40F for temperature concerns? Could this be addressed by adjusting the control algorithm to minimize freeze but also maintain ASHRAE 62.1 outdoor air rates, particularly to a vulnerable population like children?
9	1	TVOC is often blamed for poor air quality. That may or may not be true. TVOC is not a credible measure of gas phase contaminant loads in air.
11	2	Good that testing done for more than a single season. However, the "spot readings" were taken at a single point in time. What else was recorded at that time - indoor conditions, outdoor conditions, occupant activities, system status? Without these supporting measurements, it will be difficult to assess what the overall IAQ is particularly when occupants are present more than a single point in time and are exposed to what's in the air for several hours a day. What are the specifications of the monitor used - it is not feasible that a commercially available product will be able to measure formaldehyde (for example) at a point in time that is accurate. I could not easily google the specs for the Bosean T-Z01Pro.
12	1	Good to recognize that TVOC is a qualitative measurement provides no indication of what VOCs are in the air. Because I cannot access the specs of the Bosean T-Z01Pro, I cannot identify how TVOC is calculated. It should be noted that there is no standard method in calculating what TVOC is so every company will do it differently. There is no supporting measurements to correlate TVOC with system operation, indoor/outdoor conditions, occupant activity, etc. at the points where the measurements taken. Phase I is 20-30% OA but what is the OA at the measurement location? What are the local occupant activities at the time?
12	footnote	GPO has operation criteria of %OA based on outdoor temperature, what does this translate to in cfm/person for the various Phases? Is this air handling system a DOAS?
12		TVOC will also include safe/acceptable VOCs, so may overstate the issue. But agree that checking with device is a good way to do a first pass.
13	1	There is no effective means of filtering formaldehyde.
14	1	ASHRAE 62.1 has requirements for distance of air intakes from pollutant sources.
14		Reference to ASHRAE Standard 62.1 (1973). When first published, there was no distinction between residential and non-residential buildings, so there was only a single standard, 62. The title in 1973 was "Standards for Natural and Mechanical Ventilation." This reference should be corrected. It would be preferable to give the bibliographic information for 62.1-2022 only. That is the current version of the standard.
15	1	This is an unsubstantiated statement: "TVOC is often to blame for poor indoor air quality" since TVOC does not take into account particles and other non-gaseous pollutants that can equally, if not more, contribute to poor IAQ. Susceptibility of occupants also must be taken into account.
15	1	"TVOC is the summation of all volatile organic compounds found in a given volume of air" is not a substantiated statement per above - there is no standard way to calculate TVOC so it is not a quantitative metric, it is only qualitative. Staying below the WHO guideline can be a positive thing; however, the instrument might won't be capturing pollutants it's not measuring, and those pollutants could be causing occupant complaints.

17	1	Good finding - "This data strongly suggests GPO is the source of the formaldehyde and can control the formaldehyde levels in the indoor air by adjusting the amount of outdoor air used." They can offer better control by removing sources of formaldehyde. Similar comment for TVOC.
17		Building codes generally adopt ventilation rates from ASHRAE Standard 62.1, but that is not necessarily noted in the code.
18		Only one compliance method for Standard 62.1 needs to be used and a system that complies with one one may not comply with others. If GPO has mechanical ventilation, evaluation using Standard 62.1 prescriptive values seems most appropriate.
21		Evidence on the value of duct cleaning, or how often it should be done is mixed. See, for example, Zuraimi, M.S., 2010. Is ventilation duct cleaning useful? A review of the scientific evidence. Indoor Air, 20(6), pp.445-457. ASHRAE Standard 62.1 does not currently include any requirements for periodic duct cleaning. It is not clear whether HUD standards for floors and windowsills are relevant. However, there is no harm (other than potential temporary elevation of airborne dust levels during and after cleaning) and potentially some benefits from periodically cleaning ducts.
27		If the dust is visible, it is likely fairly big particles. This makes sense if it is chunks breaking off of the deposited material. In affected areas, use of low MERV/low pressure drop media pieces over the inlet vent could be a stop-gap measure to reduce exposure and not influence airflow much.
31	4	"Prior to this cleaning, the agency will conduct IAQ tests, and then retest after the duct cleaning", meaning using the same handheld device and the lead tests?
33	1	Will the contractor be sampling air over time with more sophisticated instruments? Will documentation on indoor conditions, outdoor conditions, occupant activities, system status be recorded?