

The logo for IEA, INC. features a large, thin-lined circle. A thick, dark grey horizontal bar is positioned across the middle of the circle. The text "IEA, INC." is written vertically in a dark grey, sans-serif font along the left side of this bar.

IEA, INC.

2022 - 2023 IAQ Walkthrough



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Saint Paul Public Schools Highland Park Middle School

Walkthrough Date:
Friday, January 6, 2023

Project Description

IEA conducted an Indoor Air Quality (IAQ) walkthrough at Highland Park Middle School by IEA representative, Sashya Wandmaker. This walkthrough was conducted with the intent of gathering basic air quality and visual observations which will assist the District in making informed and proactive decisions to improve and maintain acceptable air quality in the building. This walkthrough is based upon the Environmental Protection Agency's (EPA's) Tools for Schools IAQ guidelines.

Some observations gathered during the walkthrough may identify issues which may require additional testing, evaluation or further investigation.

The findings, conclusions and recommendations presented herein are believed to be accurate and representative of the building on the date and time of the walkthrough.

GENERAL COMMENTS

The analysis and opinions expressed in this report are based upon data obtained from Saint Paul Public Schools at the indicated locations. This report does not reflect variations in conditions that may occur across the site, property, or facility. Actual conditions may vary and may not become evident without further assessment.

The report is prepared for the exclusive use of our client for specific application to the project discussed and has been prepared in accordance with generally accepted indoor air quality practices. Other than as provided in the preceding sentence, no warranties are extended or made.

Building Information

General information regarding the building was collected during the walkthrough. The information gathered during this process is a vital component, as it is helpful in determining how these items may play a role in possible IAQ related issues.

Below is a summary of the information gathered during the walkthrough:

- The building has three (3) floors.
- The building has not had recent construction.
- There are operable windows in the exterior rooms within the building.
- The building was originally constructed in 1957.
- The building does utilize walk-off mats.
- There are below grade floors.
- There are tunnels under portions of the building.

Observations Summary and Air Quality Measurements

Room / Location	Number of Occupants	Odor Present	Observations	Dust Accumulation	CO ₂ (ppm)	CO (ppm)	RH (%)	Temp (°F)
OUTDOORS					422	0.8	26.5	38.7
1000 MAIN OFFICE	4	No		Yes Air Return	524	0.1	15.1	70.9
1002	0	No	• Stained Ceiling Tiles	No	528	0.0	14.6	71.7
1004	1	No	• Stained Ceiling Tiles	No	560	0.2	14.4	69.3
1008	1	No	• Stained Ceiling Tiles	No	560	0.0	14.1	72.1
1013	2	No		No	547	0.0	13.8	72.7
1012	1	No	• Stained Ceiling Tiles	No	528	0.1	13.7	72.1
MAIN OFFICE STAFF WORKROOM	1	No		No	548	0.1	14.2	72.7
1009	0	No	• Stained Ceiling Tiles	No	514	0.0	13.2	73.4
1007	1	No	• Plants	No	570	0.2	13.3	72.9
1015	2	No		No	621	0.2	14.9	71.0
1006	1	No		No	543	0.1	13.5	70.0
EAST GYM	23	No		Yes Air Supply	566	0.1	13.7	68.1
1208	24	No		No	712	0.1	12.5	67.8
1214	17	No		No	642	0.2	13.6	68.5
1215	28	No		No	846	0.0	17.8	68.9
1310	0	No	• Plants	No	571	0.1	13.9	70.6
1312	5	No	• Stained Ceiling Tiles • Plants	No	638	0.0	14.4	72.4
1311	26	No		No	816	0.2	16.3	72.9
1316	19	No		No	745	0.1	14.8	72.1

Room / Location	Number of Occupants	Odor Present	Observations	Dust Accumulation	CO ₂ (ppm)	CO (ppm)	RH (%)	Temp (°F)
1314	28	No	<ul style="list-style-type: none"> Stained Ceiling Tiles Plants 	No	815	0.1	15.8	73.3
1320	25	No	<ul style="list-style-type: none"> Stained Ceiling Tiles 	No	708	0.0	15.5	73.2
1415	22	Yes Fragrance	<ul style="list-style-type: none"> Plants Taxidermy 	No	1,480	0.1	20.6	73.4
1416	23	No	<ul style="list-style-type: none"> Stained Ceiling Tiles 	No	1,512	0.2	21.6	72.9
1413	2	No		No	738	0.1	13.4	76.6
1313	11	No		No	752	0.2	13.0	75.0
1315	1	No		No	569	0.2	13.1	74.4
1317	2	No		No	638	0.1	14.3	72.3
1317A	0	No		No	619	0.3	16.4	72.6
1321	0	No		No	468	0.1	9.8	70.1
1319	3	No		No	650	0.2	12.5	69.5
1111	0	No	<ul style="list-style-type: none"> Stained Ceiling Tiles 	No	913	0.0	17.5	83.2
1319B	0	No		No	521	0.1	14.9	66.6
MEDIA CENTER	1	No	<ul style="list-style-type: none"> Stained Ceiling Tiles 	No	529	0.0	14.2	67.9
1410 OFFICE	0	No	<ul style="list-style-type: none"> Plants 	No	567	0.0	17.0	69.3
1409	1	No	<ul style="list-style-type: none"> Plants 	No	570	0.3	15.0	69.8
1408	1	No		No	536	0.0	15.3	70.3
1309	0	Yes Fragrance	<ul style="list-style-type: none"> Stained Ceiling Tiles 	No	719	0.1	15.7	69.1
1307	20	No		No	840	0.1	16.1	71.4
1308	21	No		No	950	0.1	16.4	72.0
1305	26	No		No	820	0.1	16.1	71.8
1305A	0	No		No	792	0.1	16.2	72.0
1306	22	No		No	963	0.1	17.5	71.1
1304	21	No		Yes Air Return	900	0.1	18.1	71.1
1302	28	No		No	871	0.0	16.2	74.0
1301	27	No		No	881	0.1	13.0	74.6

Room / Location	Number of Occupants	Odor Present	Observations	Dust Accumulation	CO ₂ (ppm)	CO (ppm)	RH (%)	Temp (°F)
1325	8	No		No	595	0.1	8.9	71.8
1323	23	No		Yes Ceiling Tiles Around Air Supply	790	0.0	18.6	71.6
1406	0	No		Yes Air Supply	555	0.1	13.2	71.4
1405	2	No	<ul style="list-style-type: none"> Bubbling/Peeling Paint: Large sections of bubbling and peeling paint on both walls by window. See Appendix A. 	No	674	0.0	15.1	72.5
1403	22	No	<ul style="list-style-type: none"> Bubbling/Peeling Paint: NW corner; See Appendix A Plants 	No	1,398	0.1	14.1	72.5
1401	25	No		No	1,070	0.1	19.7	72.6
1409	21	No	<ul style="list-style-type: none"> Bubbling/Peeling Paint: See Appendix A 	No	1,062	0.1	19.5	72.0
1010	0	No	<ul style="list-style-type: none"> Plants 	No	520	0.1	11.5	73.6
1005	2	No	<ul style="list-style-type: none"> Plants 	No	628	0.1	11.6	73.6
1003	2	No		No	565	0.1	12.1	73.4
0106 LOWER GYM	12	No	<ul style="list-style-type: none"> Stained Ceiling Tiles 	No	678	0.1	15.3	71.5
0105	0	No		No	727	0.0	17.0	71.0
0108	1	No		No	659	0.1	15.6	70.9
0109 ENGINEERS OFFICE	0	No		Yes Horizontal Surfaces	556	0.0	17.9	68.8
2417	1	No	<ul style="list-style-type: none"> Bubbling/Peeling Paint: NW corner; See Appendix A 	No	1,810	0.1	23.7	72.8
2415	19	No	<ul style="list-style-type: none"> Stained Ceiling Tiles 	No	984	0.0	17.9	73.7
2410	5	No	<ul style="list-style-type: none"> Bubbling/Peeling Paint: See Appendix A Stained Ceiling Tiles Plants 	No	997	0.1	17.6	74.3

Room / Location	Number of Occupants	Odor Present	Observations	Dust Accumulation	CO ₂ (ppm)	CO (ppm)	RH (%)	Temp (°F)
2413	23	No	<ul style="list-style-type: none"> Bubbling/Peeling Paint: NE and Nw corners; See Appendix A Condensation: On windowsills. 	No	2,809	0.2	31.2	73.7
2411	15	No	<ul style="list-style-type: none"> Bubbling/Peeling Paint: See Appendix A Moisture Impacted Materials: Counter raising and cracking; See Appendix A 	No	1,103	0.0	20.0	71.6
2407	19	No	<ul style="list-style-type: none"> Live Animals 	No	1,070	0.0	18.8	71.8
2403	22	No	<ul style="list-style-type: none"> Bubbling/Peeling Paint: See Appendix A 	No	1,282	0.0	20.1	72.4
2406	0	No	<ul style="list-style-type: none"> Bubbling/Peeling Paint: See Appendix A 	No	935	0.0	17.8	72.0
2401	28	No		No	1,282	0.0	21.0	71.7
3401	23	No		No	1,186	0.0	23.2	72.8
3403	24	No	<ul style="list-style-type: none"> Moisture Impacted Materials: NE corner windowsill; See Appendix A Plants 	No	1,080	0.0	15.7	73.0
3406	1	No		No	783	0.2	16.5	71.8
3405	21	Yes Fragrance	<ul style="list-style-type: none"> Bubbling/Peeling Paint: Nw corner; See Appendix A 	No	1,575	0.0	24.4	71.4
3407	21	No	<ul style="list-style-type: none"> Bubbling/Peeling Paint: See Appendix A 	No	996	0.0	16.5	71.2
3411	17	No	<ul style="list-style-type: none"> Bubbling/Peeling Paint: Both sides of middle pillar by window; See Appendix A 	No	1,047	0.1	20.2	71.9
3413	22	No		No	1,112	0.0	19.2	71.1
3415	23	No		No	880	0.1	13.0	71.8
3417	25	No		No	1,290	0.0	17.2	71.8
3410	2	No	<ul style="list-style-type: none"> Bubbling/Peeling Paint: Small bubbles and cracking; See Appendix A 	No	735	0.0	15.5	72.2
AUDITORIUM	32	No	<ul style="list-style-type: none"> Moisture Impacted Materials: There are 2 water spots and an area with a lot of cracking. See Appendix A. 	No	543	0.2	11.9	71.0

Room / Location	Number of Occupants	Odor Present	Observations	Dust Accumulation	CO ₂ (ppm)	CO (ppm)	RH (%)	Temp (°F)
CAFETERIA	85	No	<ul style="list-style-type: none"> Moisture Impacted Materials: Ceiling tiles falling. Stained Ceiling Tiles: Very large stains with paint flaking from the edges Suspect Microbial Growth: Along the east wall of the cafeteria Plants 	No	1,075	0.1	25.2	70.9
KITCHEN OFFICE	2	No		No	1,046	0.0	20.7	76.5
1112 CAFETERIA	8	No	<ul style="list-style-type: none"> Stained Ceiling Tiles Suspect Microbial Growth: Suspect growth where missing tiles were. See Appendix A. 	No	1,055	0.0	25.4	73.2
1104 KITCHEN	6	No		No	1,115	0.0	19.4	75.6
2405	24	No		No	1,708	0.1	22.4	72.4

Summary of Concerns & Recommendations

See below for IEA's list of concern areas and recommendations:

Indoor Air Quality Parameters/Guidelines

IEA recorded area(s) with carbon dioxide measurements above 1,200 ppm in the room(s) listed below. IEA considers carbon dioxide measurements above 1,200 ppm as an indication of a possible ventilation issue. The ventilation system(s) serving the location(s) with these levels should be evaluated.

- 1403
- 1415
- 1416
- 2401
- 2403
- 2405
- 2413
- 2417
- 3405
- 3417

IEA recorded area(s) with humidity levels outside the ASHRAE recommended range of 30 - 60%. Relative humidity levels identified in area(s) listed below were found to be outside these guidelines. Low humidity levels tend to dry mucous membranes which may result in increased susceptibility to irritation. Elevated humidity levels can lead to condensation and provide conditions conducive to fungal growth. Low relative humidity is common in buildings during the heating season. An evaluation of the ventilation system controls, performance, and operation is recommended.

- IEA identified eighty-three (83) rooms with relative humidity levels below 30%. However, this is common for non-humidified buildings during the heating season and is not considered an issue.

IEA recorded area(s) with temperatures outside the recommended range. During the heating season, ASHRAE recommends that temperatures be between 68°F and 75°F. Evaluation of temperature controls and/or ventilation system performance and operation is recommended.

- 1104 KITCHEN
- 1111
- 1208
- 1319B
- 1413
- KITCHEN OFFICE
- MEDIA CENTER

Odors

Odors were detected during the site visit in the building. If the source of the odor cannot be easily identified, IEA can provide further investigation or recommendations.

- 1309 *Fragrance*
- 1415 *Fragrance*
- 3405 *Fragrance*

Moisture-Impacted Building Material Concerns

Moisture-impacted building materials should be repaired or replaced when discoloration or water staining is observed. Moisture-impacted building materials can be a source for microbial growth. The source for the moisture infiltration should be investigated and repaired if not easily identified.

- 2411 *Counter raising and cracking*
- 3403 *NE corner windowsill*
- AUDITORIUM *There are 2 water spots and an area with a lot of cracking.*
- CAFETERIA *Ceiling tiles falling.*

Stained Ceiling Tiles

Stained ceiling tiles were found in the room(s) shown below. The impacted ceiling tiles should be removed and replaced, and the cause of the moisture repaired.

- 0106 LOWER GYM • 1312
- 1002 • 1314
- 1004 • 1320
- 1008 • 1416
- 1009 • 2410
- 1012 • 2415
- 1111 • CAFETERIA *Very large stains with paint flaking from the edges*
- 1112 CAFETERIA • MEDIA CENTER
- 1309

Suspect Microbial Growth Concerns

IEA observed building materials with possible microbial growth that should be removed and/or cleaned under controlled conditions, per the Minnesota Department of Health *Recommended Best Practices for Mold Remediation in Minnesota Schools* guidelines (<https://www.health.state.mn.us/communities/environment/air/docs/schools/remediation.pdf>) or following the Institute of Inspection, Cleaning and Restoration (IICRC) S520 Standard and Guide for Professional Mold Remediation to prevent possible contamination of adjacent locations and impact to building occupants. Further assessment or fungal sampling may be necessary to identify a scope of work for a professional mold remediation contractor.

- 1112 *Suspect growth where missing tiles*
- CAFETERIA *were.*
- CAFETERIA *Along the east wall of the cafeteria*

Bubbling/Peeling Paint Concerns

IEA observed bubbling/peeling paint in area(s) within the room(s) listed below. Bubbling/peeling paint can be caused by moisture issues. IEA recommends investigating the cause and repairing the paint. IEA recommends ensuring that the paint is not lead-based prior to disturbance.

- 1403 *NW corner*
- 1405 *Large sections of bubbling and peeling paint on both walls by window.*
- 1409
- 2403
- 2406
- 2410
- 2411
- 2413 *NE and NW corners*
- 2417 *NW corner*
- 3405 *Nw corner*
- 3407
- 3410 *Small bubbles and cracking*
- 3411 *Both sides of middle pillar by window*

Condensation Concerns

IEA located area(s) where condensation was forming. Condensation on interior sources can increase the humidity in the area and may become a source of microbial growth. Temperature differentials that cause condensation on surfaces may suggest a ventilation concern and should be evaluated. Window condensation and frost can also contribute to condensation during extreme cold outdoor temperatures.

- 2413 *On windowsills.*

Plants

Plants in an occupied location can be a source of allergens to sensitized individuals due to the pollen and soil mold. It is recommended that plants be removed from locations occupied by sensitized individuals. If plants are to remain in the area, IEA recommends that plants should not be placed near air unit ventilators or air supply diffusers. Additionally, plants should be watered from the bottom. These measures will help control pollen and mold spores from becoming airborne.

- 1005
- 1007
- 1010
- 1310
- 1312
- 1314
- 1403
- 1409
- 1410 OFFICE
- 1415
- 2410
- 3403
- CAFETERIA

Taxidermy

IEA observed area(s) with taxidermy mounts present. Individuals with allergies or asthma may be sensitive to dust, animal fur, or dander, and may have a reaction when exposed to these allergens. IEA recommends using an alternative to taxidermy mounts if allergen symptoms are found by occupants within the classroom.

- 1415

Live Animals / Aquariums

IEA observed live animal(s). Prior to having animals, the Building Principal should be consulted. Consult parents about potential allergies in a take-home note with students or during parent-teacher conferences. IEA recommends that the animal and cages/cases are regularly cleaned/maintained and stored away from air supply and return vents.

- 2407

Dust Accumulation

IEA observed dust accumulation in the following room(s) and recommend that the specified area is wiped clean using a damp rag.

- | | | | |
|-------------------------|----------------------------|------------|--|
| • 0109 ENGINEERS OFFICE | <i>Horizontal Surfaces</i> | • 1304 | <i>Air Return</i> |
| • 1000 MAIN OFFICE | <i>Air Return</i> | • 1323 | <i>Ceiling Tiles Around Air Supply</i> |
| | | • 1406 | <i>Air Supply</i> |
| | | • EAST GYM | <i>Air Supply</i> |

Appendix A

Photo Documentation



1405

Bubbling/Peeling Paint



1403

Bubbling/Peeling Paint



1409

Bubbling/Peeling Paint



2417

Bubbling/Peeling Paint



2410

Bubbling/Peeling Paint



2413

Bubbling/Peeling Paint



2411

Bubbling/Peeling Paint



2411

Bubbling/Peeling Paint



2411

Moisture Impacted Materials



2403

Bubbling/Peeling Paint



2406

Bubbling/Peeling Paint



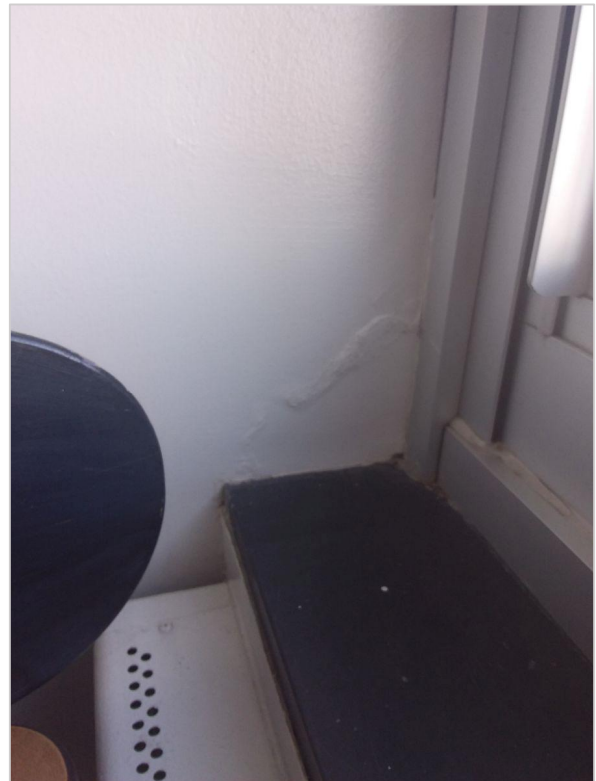
3403

Moisture Impacted Materials



3403

Moisture Impacted Materials



3405

Bubbling/Peeling Paint



3407

Bubbling/Peeling Paint



3411

Bubbling/Peeling Paint



3410
Bubbling/Peeling Paint



AUDITORIUM
Moisture Impacted Materials



1112 CAFETERIA
Suspect Microbial Growth