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GREENWORKS IAQ INSPECTION



Inspector

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TABLE OF CONTENTS

1: Inspection Details	5
2: Conducive Conditions	32
3: Recommendations	47
Standards of Practice	48

This inspection was conducted in accordance with state regulations as well as current industry guidelines and practices. This is not a certificate, assurance, warranty or guarantee of future conditions or performance, but is an inspection of the conditions present and detected on the date of this inspection.

Disclaimer: It is important to note that mold sampling results may yield inconclusive or misleading information. Caution must be used in relying on sampling results to render a conclusion. Concentrations of indoor environments can change dramatically based on a number of factors. Standards or Threshold Limit Values (TLVs) for airborne concentrations of mold, or mold spores, have not been set. Currently, there are no EPA regulations or standards for airborne mold contaminants.

NOTE: Pictures are a representative sample, and may not display every defect.

GreenWorks Inspections was contacted by the Client listed on the report to conduct a mold inspection which includes taking samples within the inspected property to confirm/deny the presence of fungal growth. The purpose of this inspection is to determine if there were any underlying mold and moisture intrusion conditions affecting interior air quality in the inspected property. This report is solely for the benefit of the Client. Any person or party designated by the Client to receive information in this report shall be subject to the TERMS AND CONDITIONS contained herein. Such designation shall be provided in writing to the inspector.

Molds are part of the natural environment and are simple, microscopic organisms whose purpose is to break down dead materials. Molds can be found on plants, dry leaves, and about every other organic material. Mold spores are lightweight and are spread by air currents. If spores land on a suitable surface, they will begin to grow. In order to thrive, mold requires four things to grow: water, organic materials, oxygen, and an optimum temperature. Mold growth is often seen as discoloration and can grow in several different colors. The most common are white, orange, pink, blue, green, black, or brown.

Health problems associated with high levels of airborne mold spores may include allergic reactions, asthma episodes, irritations of the eye, nose, and throat, sinus congestion, and other respiratory problems.

SUMMARY

- ⊖ 2.1.1 Conducive Conditions - Interior: Moisture Damage - Walls
- ⊖ 2.1.2 Conducive Conditions - Interior: Assumed Mold Growth
- ⊖ 2.1.3 Conducive Conditions - Interior: Dust/Debris On Registers
- ⊖ 2.1.4 Conducive Conditions - Interior: Oxidized stainless steel
- ⊖ 2.1.5 Conducive Conditions - Interior: Chlorine levels

1: INSPECTION DETAILS

Information

Foundation Type Slab	Occupancy Occupied (Viewing Restricted)	In Attendance Client
Structure Type Commercial Structure	Weather Conditions Clear	EMS Pump Environmental Monitoring Systems (EMS) pump with Integrated Flow Meter
Temp/Humidity Zenith Zenith Portable CO2 Detector with Temperature and Humidity	Allergenco Cassette Allergenco Cassettes	Sample 1: Temperature (°F) 78 Degrees Fahrenheit
Sample 1: Humidity (%) 54 %	Sample 1: Carbon Dioxide 444 ppm	Sample 1: Air Quality Index 9
Sample 1: PM 2.5 2.3 ug/m3	Sample 1: PM 10 3.5 ug/m3	Sample 1: Total Number Of Particles 354 per/L
Sample 1: HCHO .01 mg/m3	Sample 1: TVOC .04 mg/m3	Sample 2: Temperature (°F) 79 Degrees Fahrenheit
Sample 2: Humidity (%) 53 %	Sample 2: Carbon Dioxide 443 ppm	Sample 2: Air Quality Index 9
Sample 2: PM 2.5 2.3 ug/m3	Sample 2: PM 10 3.7 ug/m3	Sample 2: Total Number Of Particles 355 per/L
Sample 2: HCHO .01 mg/m3	Sample 2: TVOC .04 mg/m3	Sample 3: Temperature (°F) 79 Degrees Fahrenheit
Sample 3: Humidity (%) 55 %	Sample 3: Carbon Dioxide 444 ppm	Sample 3: Air Quality Index 8
Sample 3: PM 2.5 1.9 ug/m3	Sample 3: PM 10 2.9 ug/m3	Sample 3: Total Number Of Particles 296 per/L
Sample 3: HCHO .01 mg/m3	Sample 3: TVOC .04 mg/m3	Sample 4: Temperature (°F) 78 Degrees Fahrenheit
Sample 4: Humidity (%) 53 %	Sample 4: Carbon Dioxide 448 ppm	Sample 4: Air Quality Index 9
Sample 4: PM 2.5 2.1 ug/m3	Sample 4: PM 10 3.4 ug/m3	Sample 4: Total Number Of Particles 330 per/L

Sample 4: HCHO

.01 mg/m3

Sample 5: Humidity (%)

55 %

Sample 5: PM 2.5

2.2 ug/m3

Sample 5: HCHO

.01 mg/m3

Sample 6: Humidity (%)

53 %

Sample 6: PM 2.5

2.2 ug/m3

Sample 6: HCHO

.01 mg/m3

Sample 7: Humidity (%)

53 %

Sample 7: PM 2.5

2.7 ug/m3

Sample 7: HCHO

.02 mg/m3

Sample 8: Humidity (%)

52 %

Sample 8: PM 2.5

1.8 ug/m3

Sample 8: HCHO

.01 mg/m3

Sample 9: Humidity (%)

55 %

Sample 9: PM 2.5

2.3 ug/m3

Sample 9: HCHO

.01 mg/m3

Sample 10: Humidity (%)

52 %

Sample 10: PM 2.5

2.2 ug/m3

Sample 4: TVOC

.04 mg/m3

Sample 5: Carbon Dioxide

452 ppm

Sample 5: PM 10

3.5 ug/m3

Sample 5: TVOC

.04 mg/m3

Sample 6: Carbon Dioxide

442 ppm

Sample 6: PM 10

3.5 ug/m3

Sample 6: TVOC

.04 mg/m3

Sample 7: Carbon Dioxide

442 ppm

Sample 7: PM 10

4.3 ug/m3

Sample 7: TVOC

.04 mg/m3

Sample 8: Carbon Dioxide

439 ppm

Sample 8: PM 10

2.5 ug/m3

Sample 8: TVOC

.04 mg/m3

Sample 9: Carbon Dioxide

441 ppm

Sample 9: PM 10

3.7 ug/m3

Sample 9: TVOC

.04 mg/m3

Sample 10: Carbon Dioxide

442 ppm

Sample 10: PM 10

3.4 ug/m3

Sample 5: Temperature (°F)

79 Degrees Fahrenheit

Sample 5: Air Quality Index

9

Sample 5: Total Number Of Particles

343 per/L

Sample 6: Temperature (°F)

79 Degrees Fahrenheit

Sample 6: Air Quality Index

9

Sample 6: Total Number Of Particles

335 per/L

Sample 7: Temperature (°F)

80 Degrees Fahrenheit

Sample 7: Air Quality Index

11

Sample 7: Total Number Of Particles

419 per/L

Sample 8: Temperature (°F)

80 Degrees Fahrenheit

Sample 8: Air Quality Index

7

Sample 8: Total Number Of Particles

277 per/L

Sample 9: Temperature (°F)

79 Degrees Fahrenheit

Sample 9: Air Quality Index

9

Sample 9: Total Number Of Particles

352 per/L

Sample 10: Temperature (°F)

79 Degrees Fahrenheit

Sample 10: Air Quality Index

9

Sample 10: Total Number Of Particles

330 per/L

Sample 10: HCHO

.01 mg/m³

Sample 10: TVOC

.04 mg/m³

Sample 11: Temperature (°F)

76 Degrees Fahrenheit

Sample 11: Humidity (%)

48 %

Sample 11: Carbon Dioxide

431 ppm

Sample 11: Air Quality Index

17

Sample 11: PM 2.5

4.2 ug/m³

Sample 11: PM 10

6.5 ug/m³

Sample 11: Total Number Of Particles

638 per/L

Sample 11: HCHO

.01 mg/m³

Sample 11: TVOC

.04 mg/m³

General Information

Inspector is not responsible for or liable for the non-discovery of any, water problems, mold contamination, or any other problems that were not discovered due to inadequate sampling in specific areas where sampling was not requested and paid for or where not readily visible clues existed that would have warranted sampling in those areas. Your inspector is unlikely to sample for, or locate mold which may be hidden inside walls, behind wall paper, appliances, furniture or other inaccessible areas.

How to Stop Mold

- To stop mold growth, it is important to first stop water/moisture concerns. Mold spores will not grow if moisture is not present. Indoor mold can and should be prevented or controlled by controlling moisture.
- Look for evidence of water penetrating the structure by locating water stains or moist areas and remedy the water source.
- Look at the plumbing system for any leaks. Common leaks may be caused by a damaged toilet seal or from an original sink or bathtub drain.
- Check out the HVAC system condensation drain lines for any leaks or if they are properly insulated to prevent water dripping from the lines themselves.
- Remember to always vent your clothes dryer directly to the exterior. (If present within the structure)
- Clean out gutters regularly and roof should be monitored for areas of leaking.
- Install exhaust vent fans in recommended areas if the structure was not equipped with them originally. The exhaust vent fans should be vented directly to the exterior.

If mold growth is discovered GreenWorks recommends utilization of a mold remediation contractor to perform any selective demolition of wall materials or removal of visible molds.

Thank you for using GreenWorks Inspections to perform this testing for you.

Carbon Dioxide Levels

Carbon dioxide levels and potential health problems are indicated below:

- 250-350 ppm: background (normal) outdoor air level
- 350-1,000 ppm: typical level found in occupied spaces with good air exchange
- 1,000-2,000 ppm: level associated with complaints of drowsiness and poor air
- 2,000-5,000 ppm: level associated with headaches, sleepiness, and stagnant, stale, stuffy air; poor concentration, loss of attention, increased heart rate and slight nausea may also be present.
- >5,000 ppm: This indicates unusual air conditions where high levels of other gases also could be present. Toxicity or oxygen deprivation could occur. This is the permissible exposure limit for daily workplace exposures.
- >40,000 ppm: This level is immediately harmful due to oxygen deprivation

Carbon dioxide is what living organisms breathe out. Because carbon dioxide is a result of human metabolism, concentrations within a home are often used to indicate whether adequate fresh air is being supplied to the interior space.

To prevent or reduce high concentrations of carbon dioxide in a home, fresh air should be supplied to the area.

An improper heating, ventilation and air conditioning system (HVAC) can lead to high levels of carbon dioxide. Many HVAC systems are designed to circulate and bring in fresh air because many structures rely totally on the system to recirculate air and the windows are never opened to let in fresh air. If there is any concern about carbon dioxide within the structure, further evaluation by an HVAC technician is recommended.

Humidity Levels

Normal Humidity levels are between 30%- 50%

According to the EPA, high humidity levels, 60% and above, can lead to moisture problems. Condensation can be a sign of high humidity. When warm, humid air contacts a cold surface, condensation may form. Water activity has a profound effect on mold growth. Keeping the humidity level at the surface layer dry is key to prevention. A surface relative humidity of 65%-72% promotes the growth of dry tolerant or xenophobic molds like Aspergillus/Penicillium. One function of the building heating, ventilation, and air conditioning (HVAC) system is to remove moisture from the air before the air is distributed throughout the building. If the HVAC system is turned off during or shortly after major cleaning efforts that involve a lot of water, such as mopping and carpet shampooing or cleaning, the humidity may rise greatly, and moisture or mold problems may develop.

Air Quality Index

The below table outlines the concentrations and there level of health concerns for the air quality levels taken.

(AQI) Values	
When the AQI is in this range:	..air quality conditions are:
0 to 50	Good
51 to 100	Moderate
101 to 150	Unhealthy for Sensitive Groups
151 to 200	Unhealthy
201 to 300	Very Unhealthy

PM 2.5

Particles that are of the 2.5 micron size. Particles that are around this size, are particles that in high levels and with extended exposure can be unhealthy to people.
The below table shows concentrations and there health affects.

PM _{2.5} IAQI	24-hour average ($\mu\text{g}/\text{m}^3$)	Air quality ranges
0–50	0–35	I (optimal)
50–100	35–75	II (good)
100–150	75–115	III (light pollution)
150–200	115–150	IV (moderate pollution)
200–300	150–250	V (high pollution)
300–500	250–500	VI (severe pollution)

PM 10

Particles that are around 10 microns in size. Particle in this size range are particles that in high levels and with extended exposure can be unhealthy to people.

The below table has PM 10 concentrations and their health affects.

PM 10

0 - 54	Good
55 - 154	Moderate
155 - 254	Unhealthy for Sensitive Groups
255 - 354	Unhealthy
355 - 424	Very Unhealthy
> 424	Hazardous

TVOC

Total Volatile Organic Compounds. Volatile Organic Compounds (VOCs) are a combination of gases and odors emitted from many different toxins and chemicals found in everyday products.

VOCs can cause serious health effects in both the short and long term. Health effects vary from minor eye, nose and throat irritations all the way to liver and kidney damage or cancer, depending on the level of exposure.

TVOC Level mg/m3	Level of Concern
Less than 0.3 mg/m3	Low
0.3 to 0.5 mg/m3	Acceptable
0.5 to 1 mg/m3	Marginal
1 to 3 mg/m3	High

HCHO

This is formaldehyde. Formaldehyde is an important chemical used widely by industry to manufacture building materials and numerous household products. It is also a by-product of combustion and certain other natural processes. Thus, it may be present in substantial concentrations both indoors and outdoors.

Formaldehyde can cause irritation of the skin, eyes, nose and throat. High levels of exposure may cause some types of cancers.

	HCHO
0 - 0.1	Healthy
> 0.1	Unhealthy

Epithelial Cells and Fibers

The levels for epithelial cells and fibers in the exterior environment are typically low to zero. So on the report they may show up as elevated. The environmental specialist compares these numbers to a standard set for air quality to make their determination.

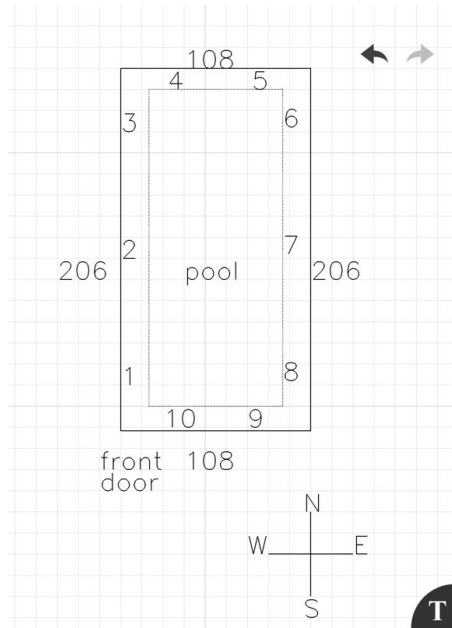
High levels of these two things are a sign of poor air quality.

Bug Parts

Concentrations of bug parts in the exterior environment is typically low to zero. The environmental specialist will compare the interior level observed to standards to determine the level of potential health effects. High levels in the indoor air is a sign of poor indoor air quality.

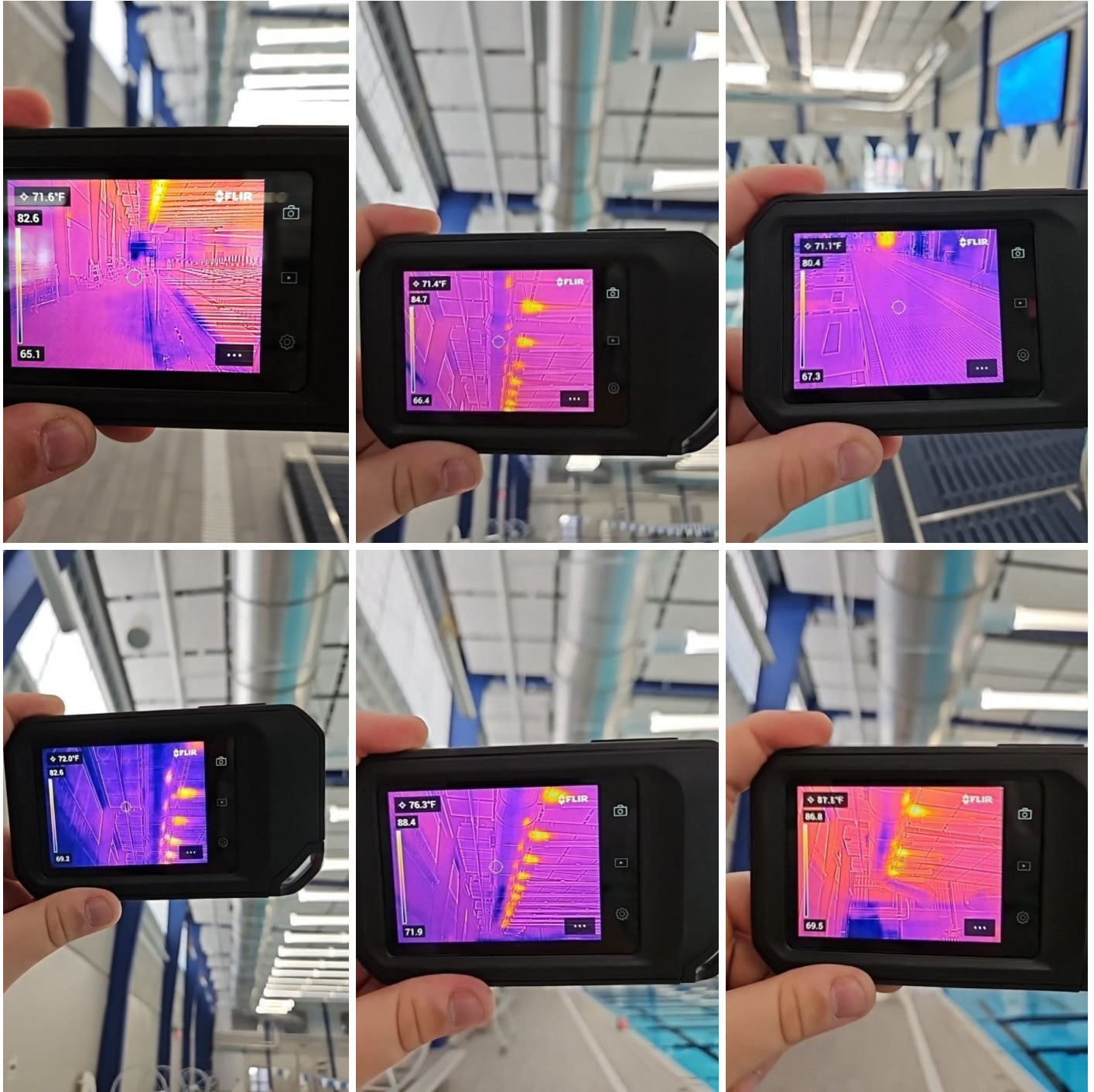
Structure Layout and Sample Location

Layout of inspected address is a general approximation of size and sample locations.

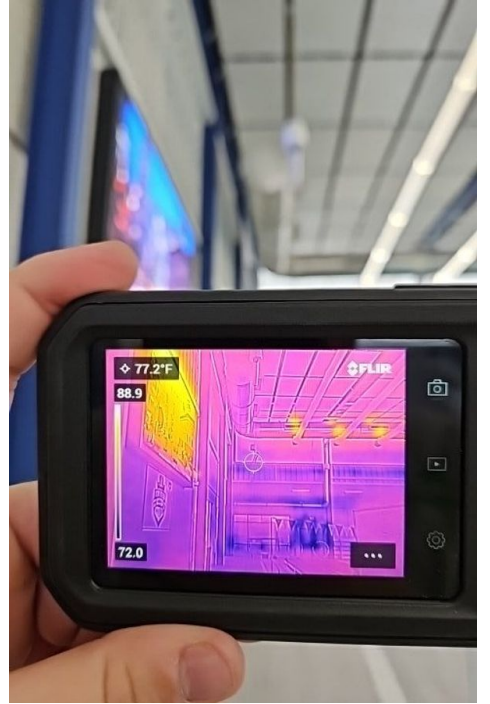
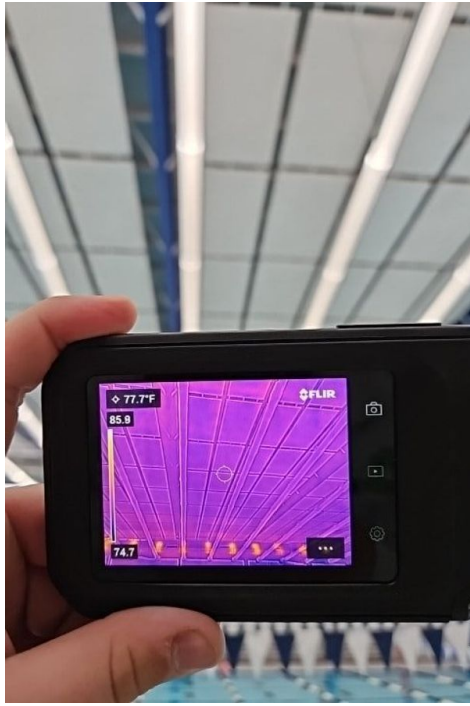


Infrared

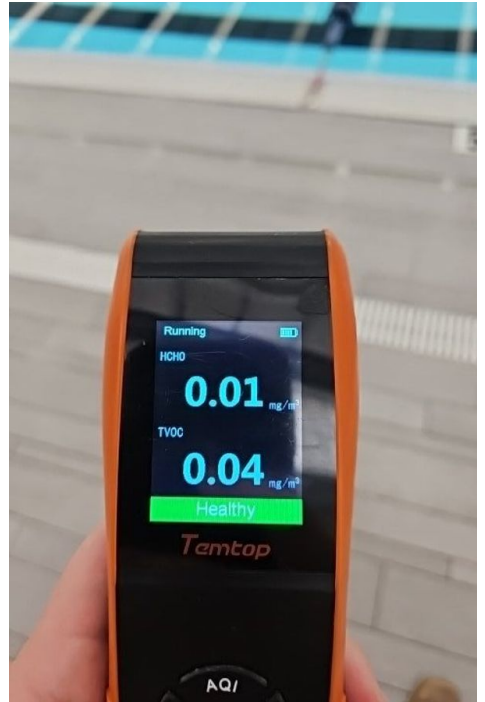
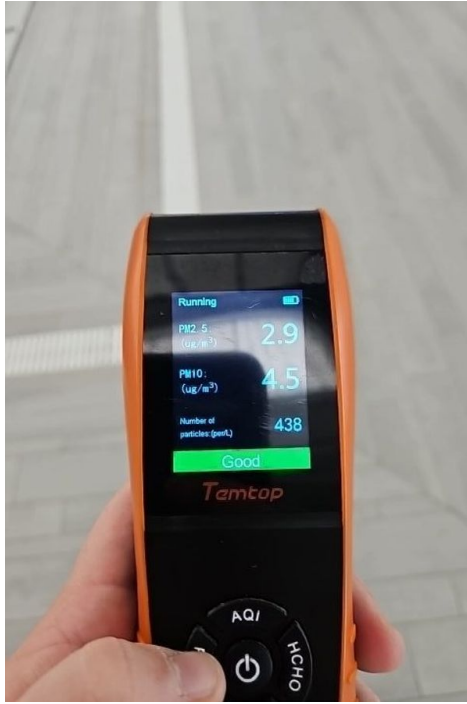
Flir Infrared Inspection Camera

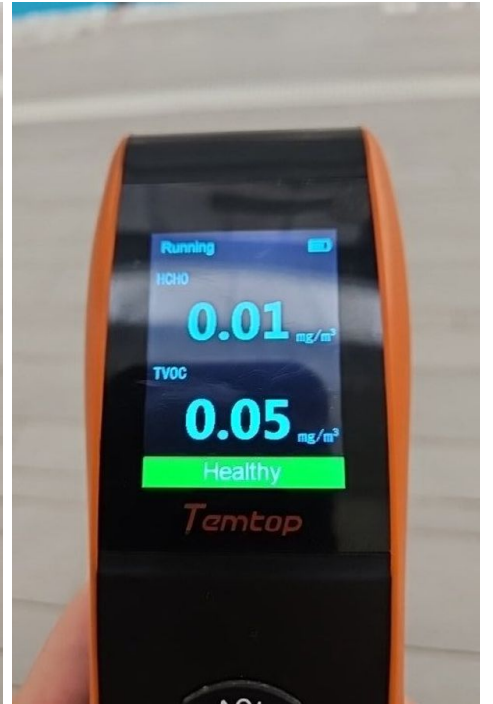
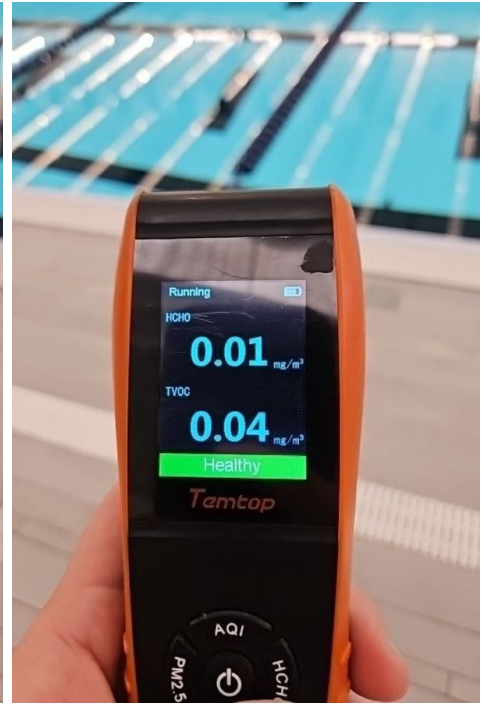


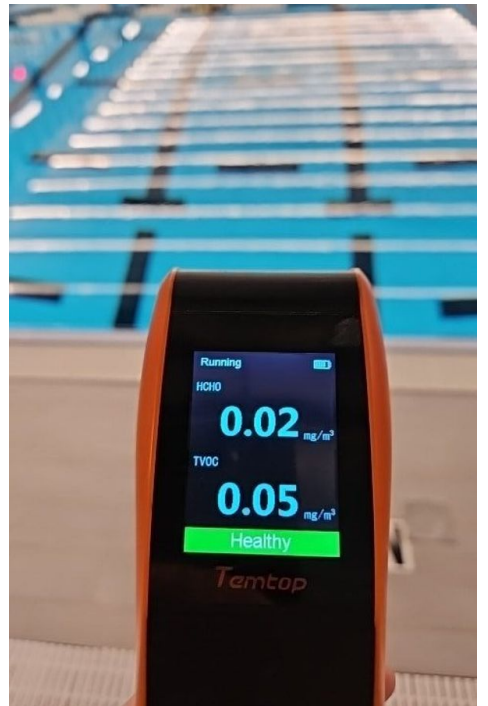
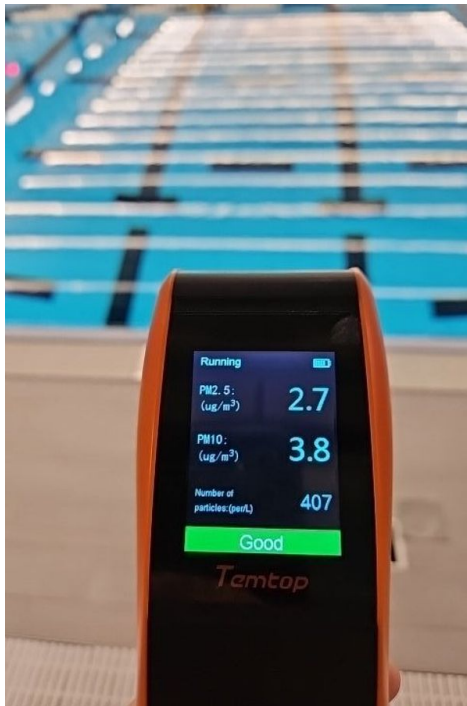
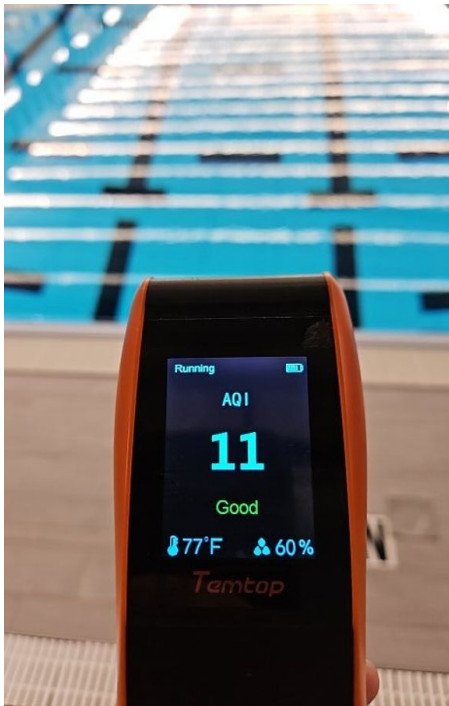
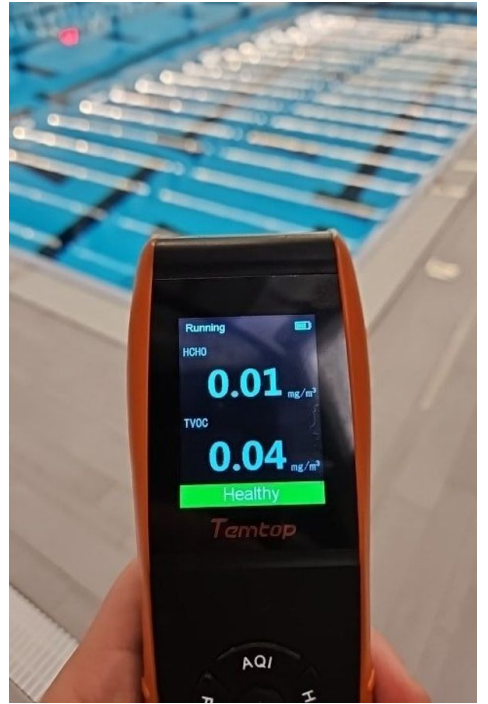
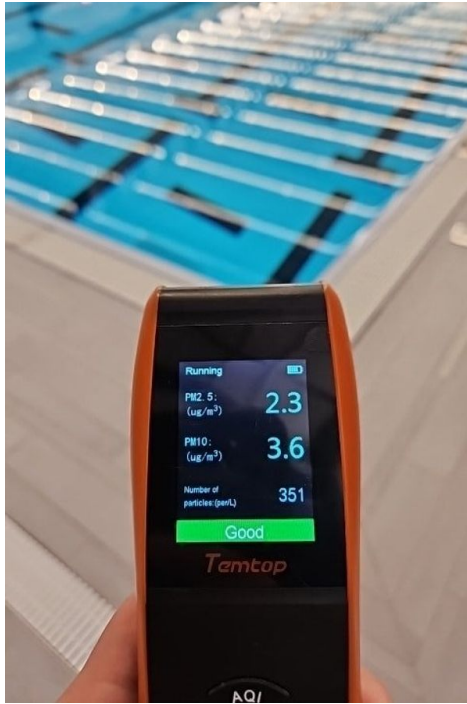


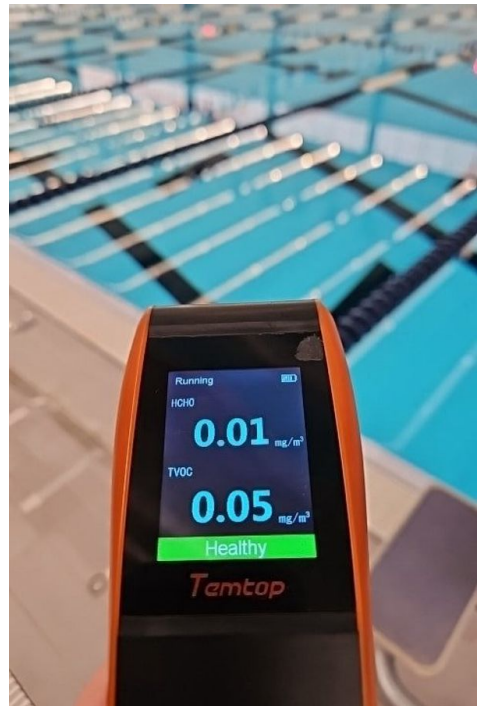
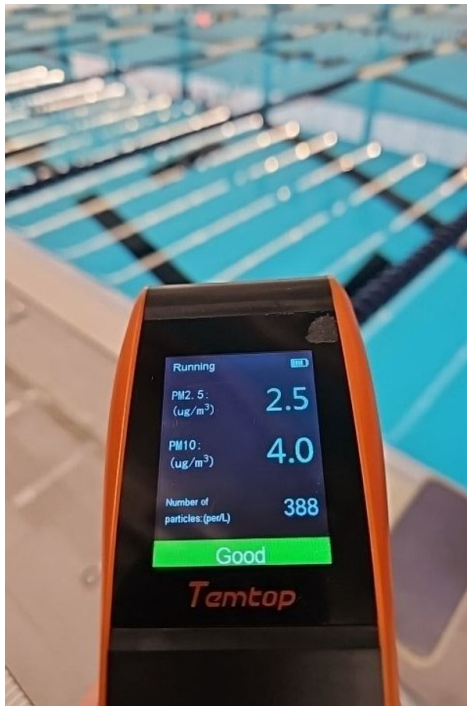
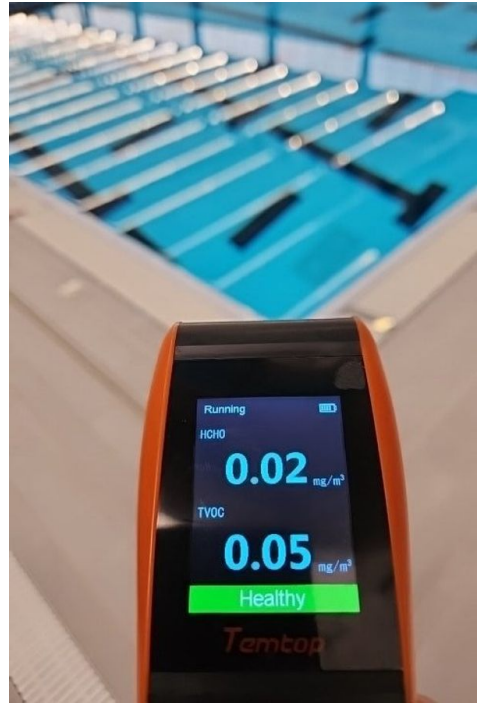
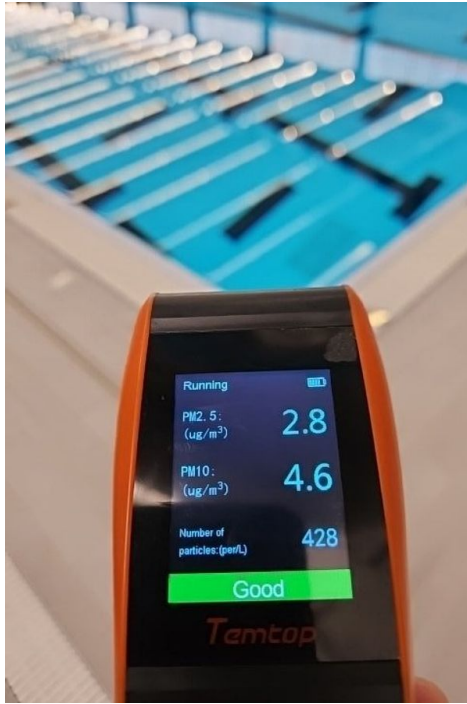
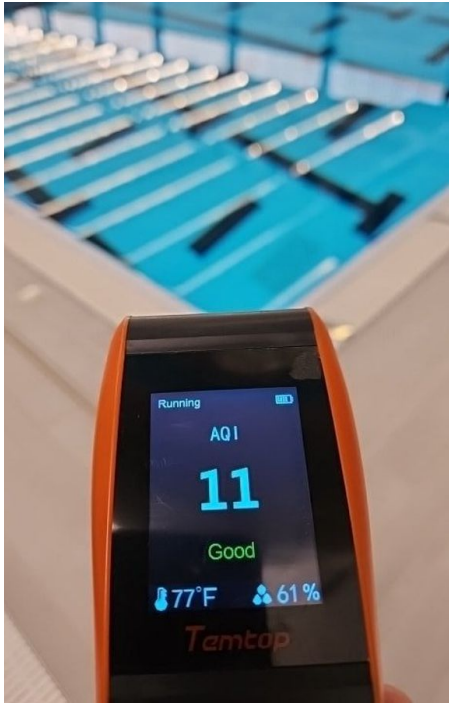


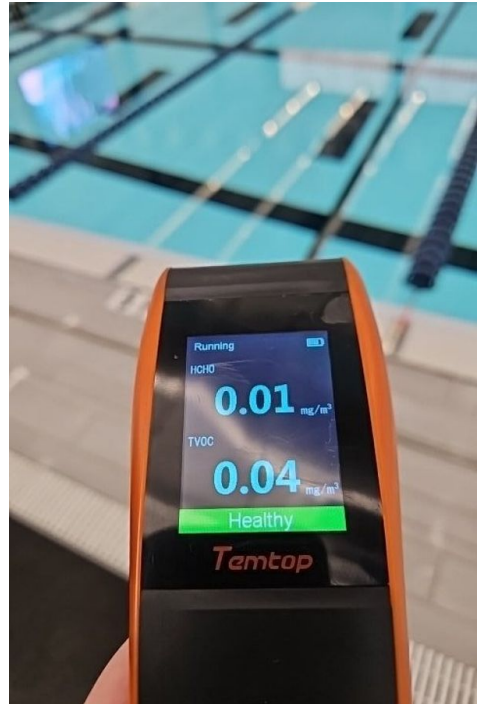
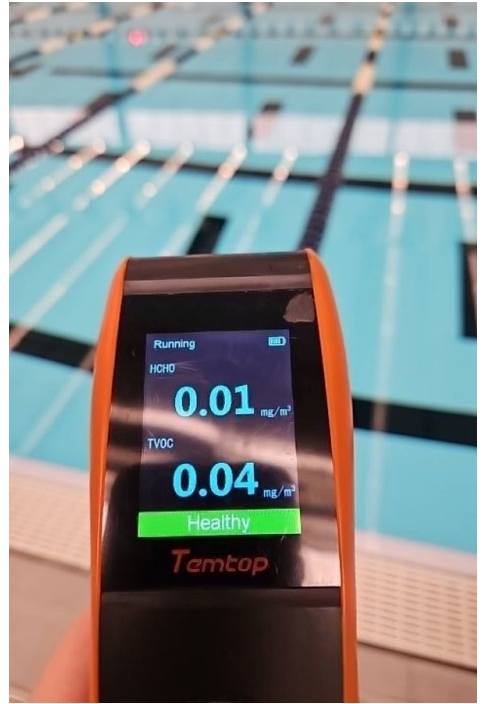
Temtop LKC-1000S+2nd Air Quality Monitor

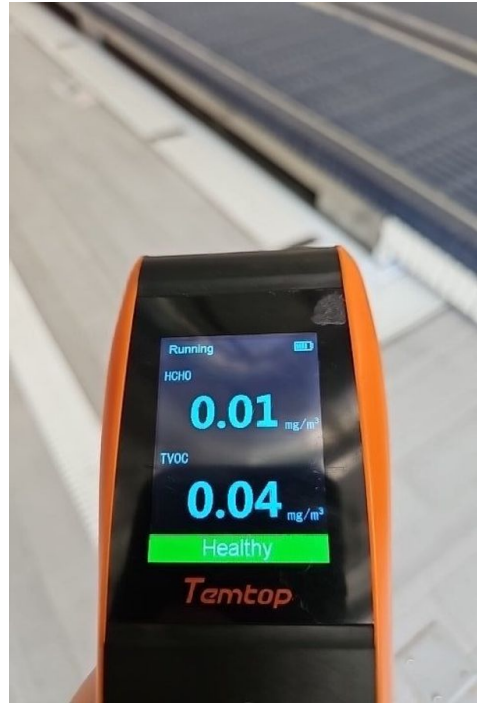
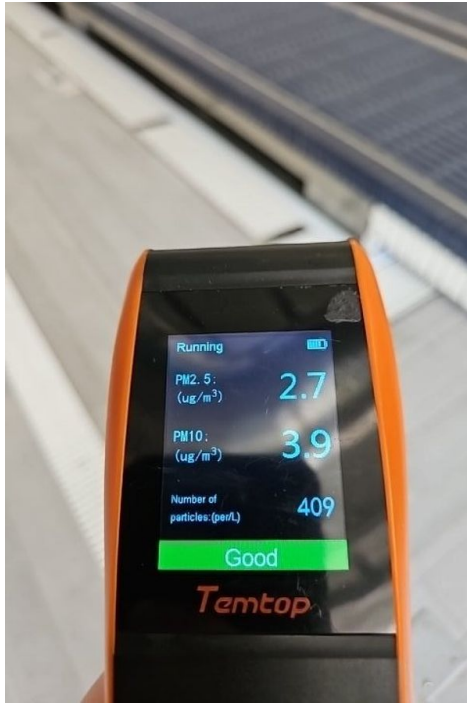






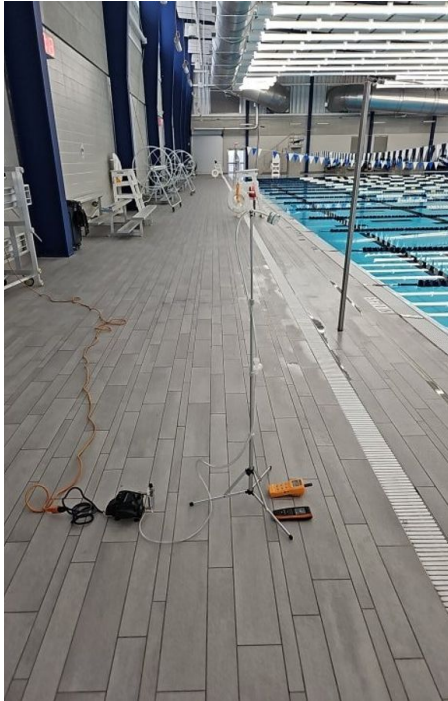






Sample 1: Location of Sample

1



Sample 1: Low Mold Levels Per Testing

The molds listed in the samples were equal to or lower than the outside comparison sample. Indicating no significant concern in this area at the time of inspection.

Sample 2: Location of Sample

2



Sample 2: Low Mold Levels Per Testing

The molds listed in the samples were equal to or lower than the outside comparison sample. Indicating no significant concern in this area at the time of inspection.

Sample 3: Location of Sample

3



Sample 3: Low Mold Levels Per Testing

The molds listed in the samples were equal to or lower than the outside comparison sample. Indicating no significant concern in this area at the time of inspection.

Sample 4: Location of Sample

4

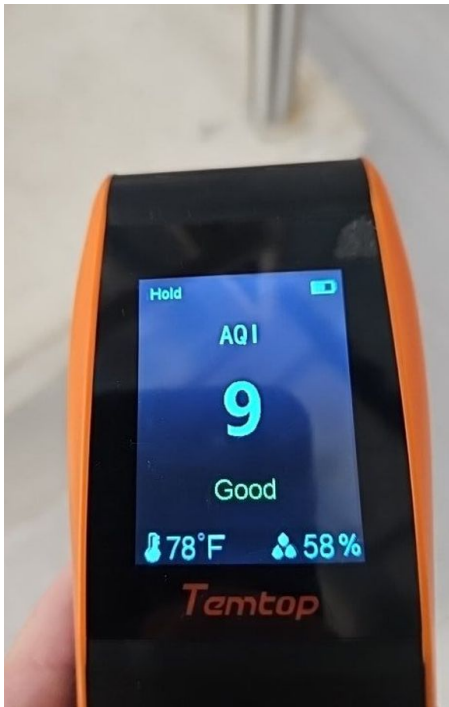


Sample 4: Low Mold Levels Per Testing

The molds listed in the samples were equal to or lower than the outside comparison sample. Indicating no significant concern in this area at the time of inspection.

Sample 5: Location of Sample

5

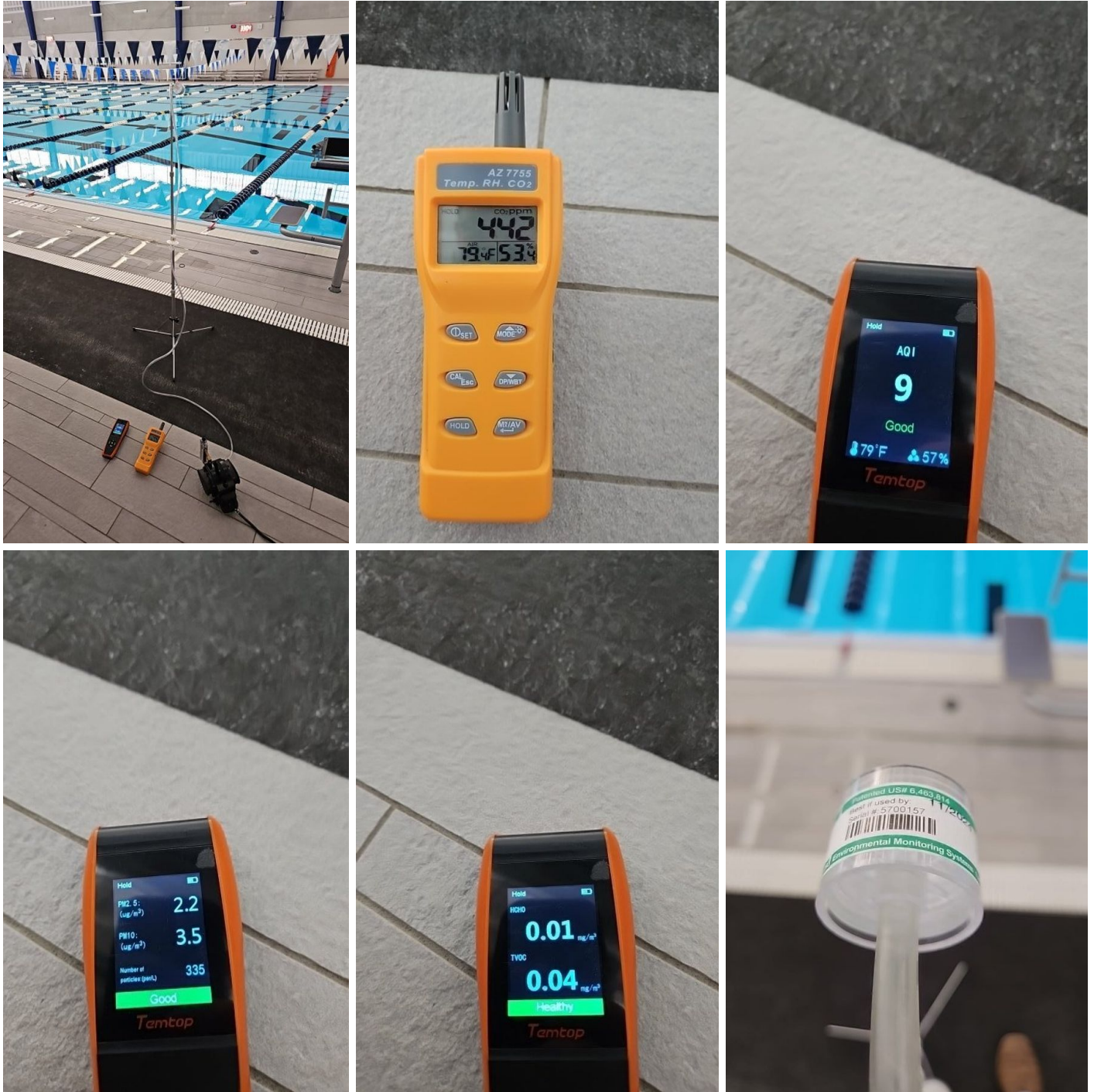


Sample 5: Low Mold Levels Per Testing

The molds listed in the samples were equal to or lower than the outside comparison sample. Indicating no significant concern in this area at the time of inspection.

Sample 6: Location of Sample

6



Sample 6: Low Mold Levels Per Testing

The molds listed in the samples were equal to or lower than the outside comparison sample. Indicating no significant concern in this area at the time of inspection.

Sample 7: Location of Sample

7

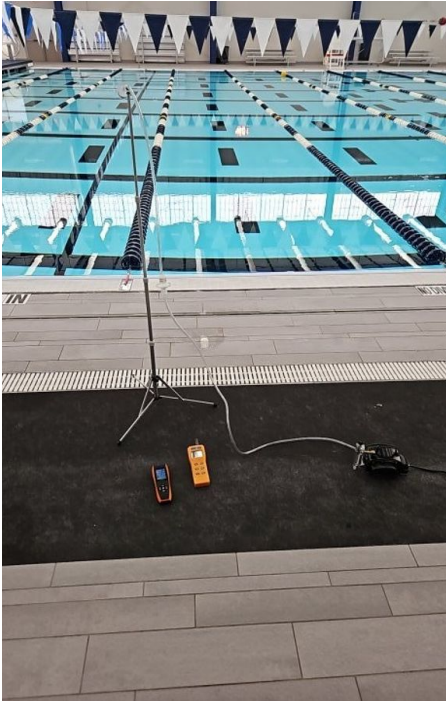


Sample 7: Low Mold Levels Per Testing

The molds listed in the samples were equal to or lower than the outside comparison sample. Indicating no significant concern in this area at the time of inspection.

Sample 8: Location of Sample

8

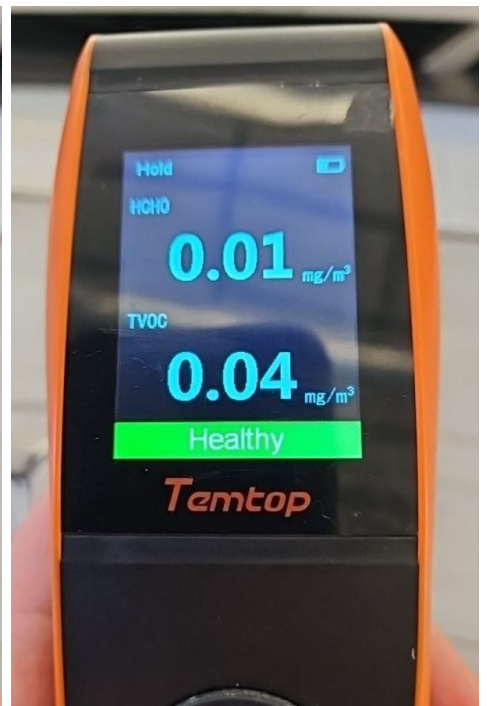
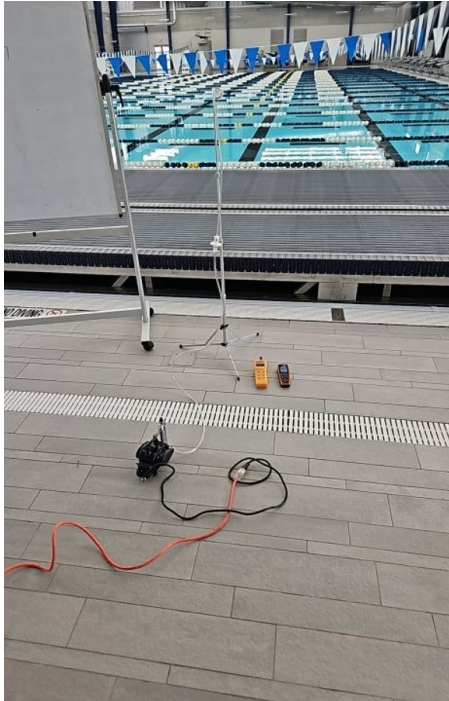


Sample 8: Low Mold Levels Per Testing

The molds listed in the samples were equal to or lower than the outside comparison sample. Indicating no significant concern in this area at the time of inspection.

Sample 9: Location of Sample

9

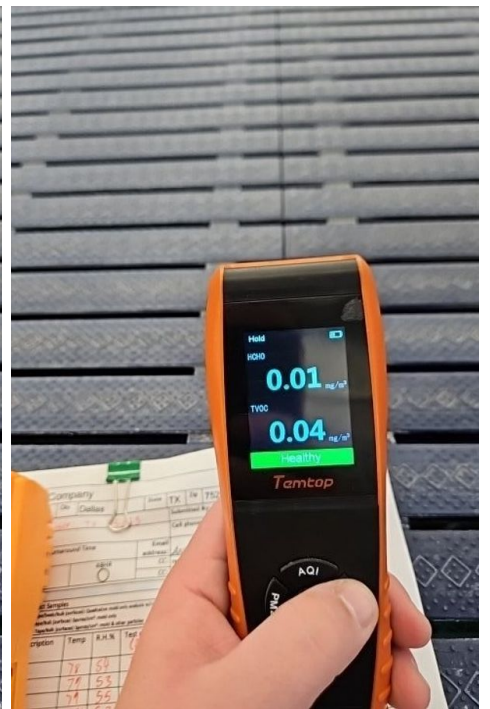
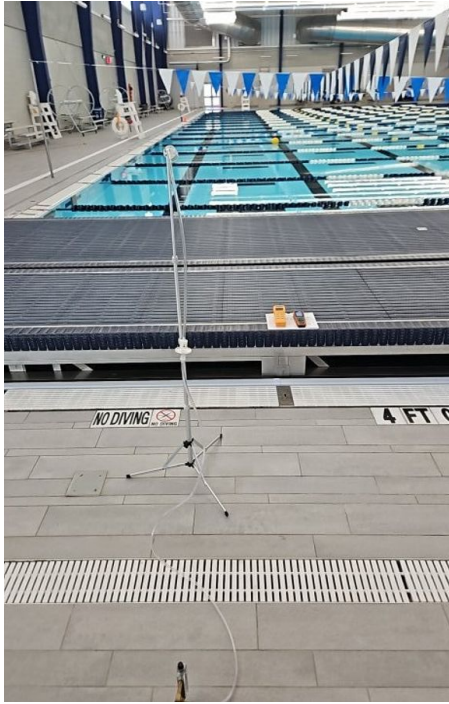


Sample 9: Low Mold Levels Per Testing

The molds listed in the samples were equal to or lower than the outside comparison sample. Indicating no significant concern in this area at the time of inspection.

Sample 10: Location of Sample

10



Sample 10: Low Mold Levels Per Testing

The molds listed in the samples were equal to or lower than the outside comparison sample. Indicating no significant concern in this area at the time of inspection.

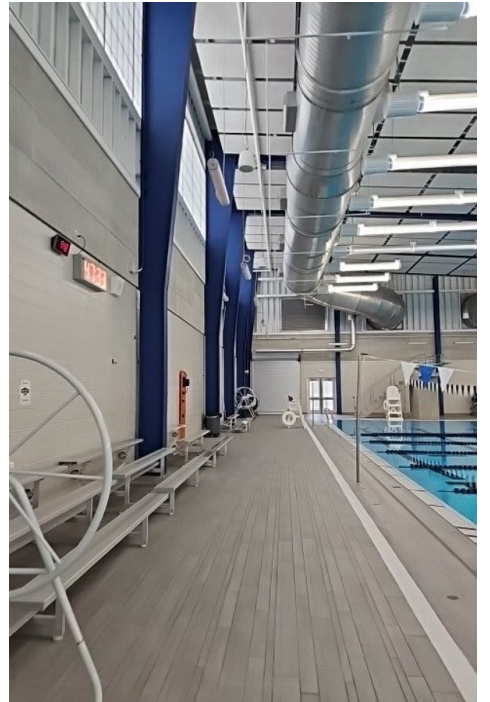
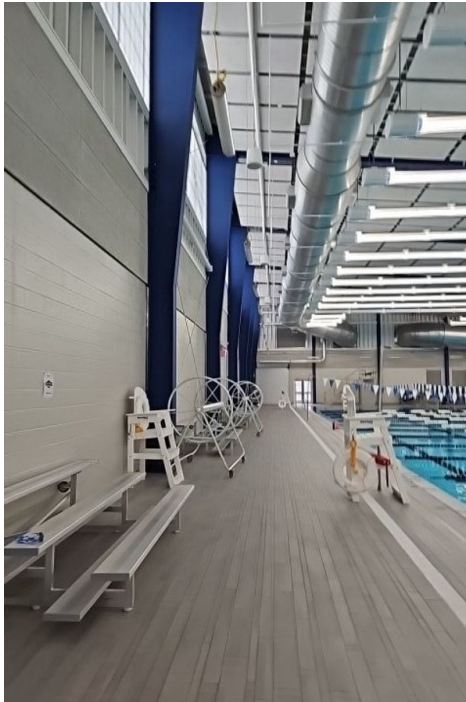
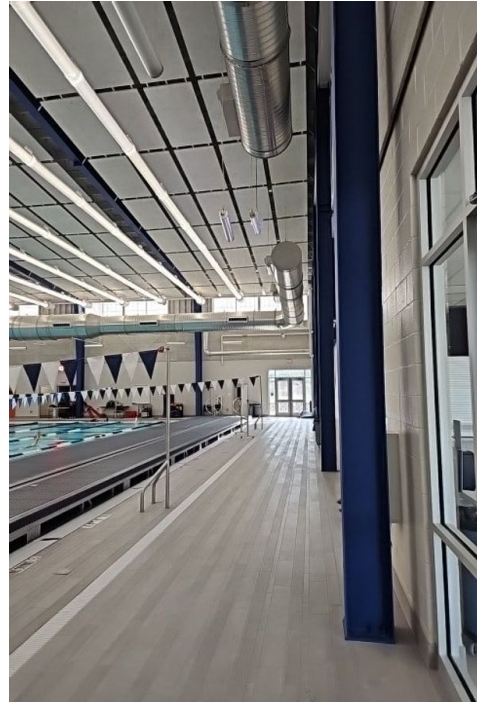
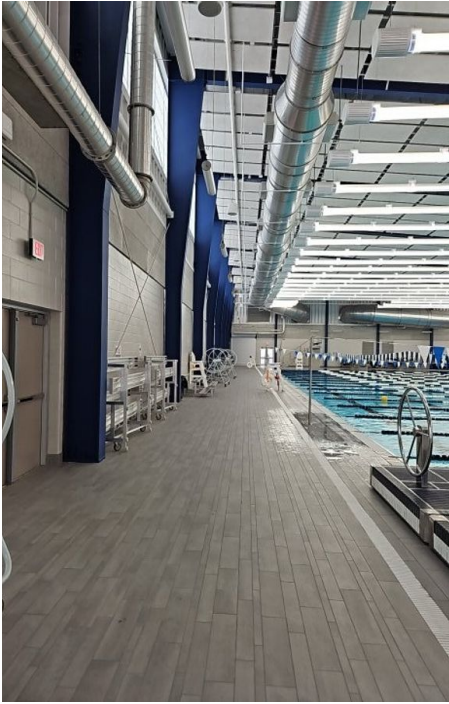
Sample 11: Location of Sample
Exterior (Comparison)

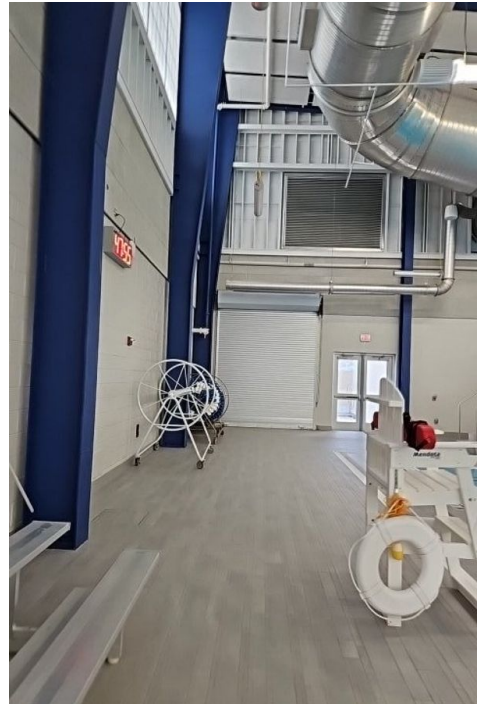
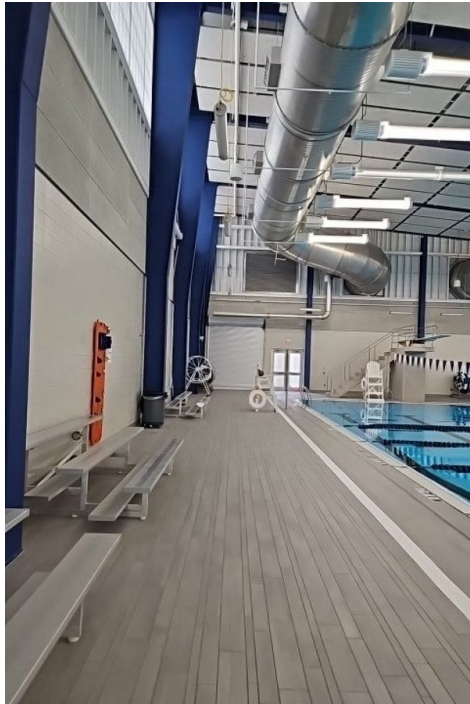
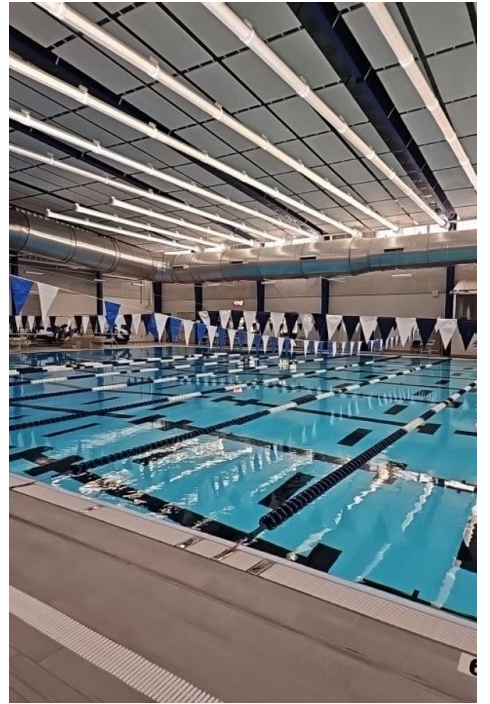


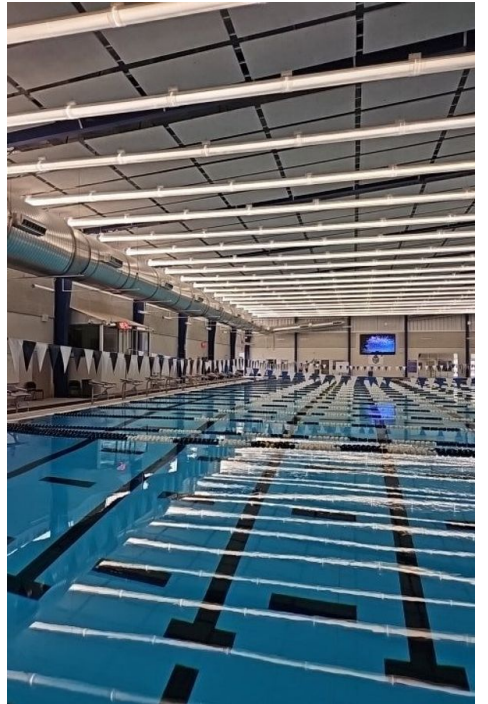
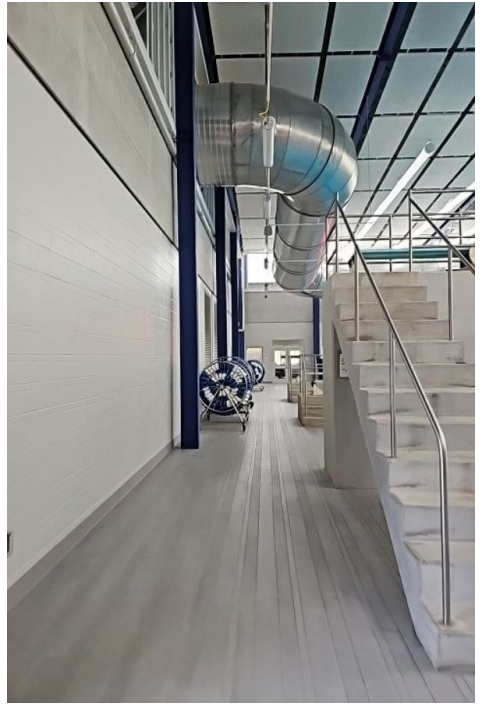
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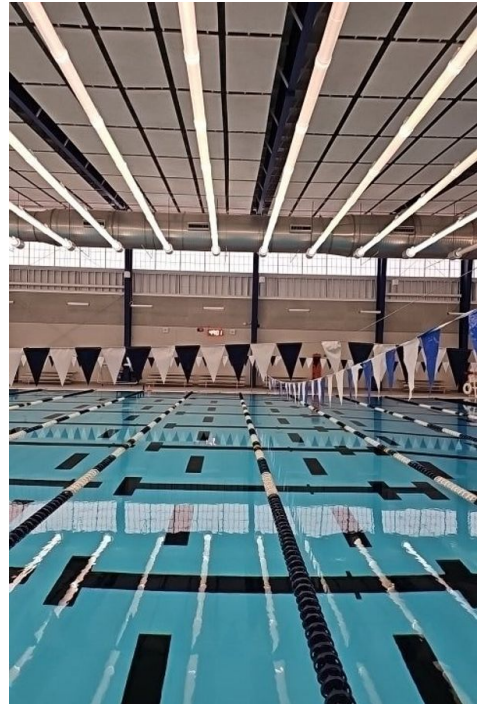
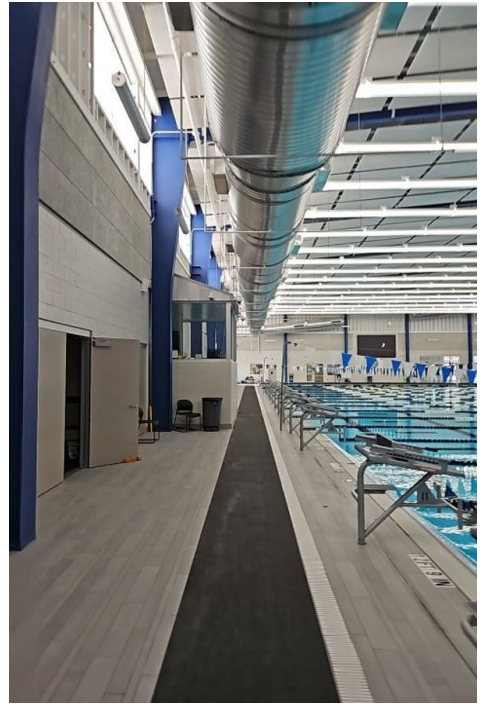
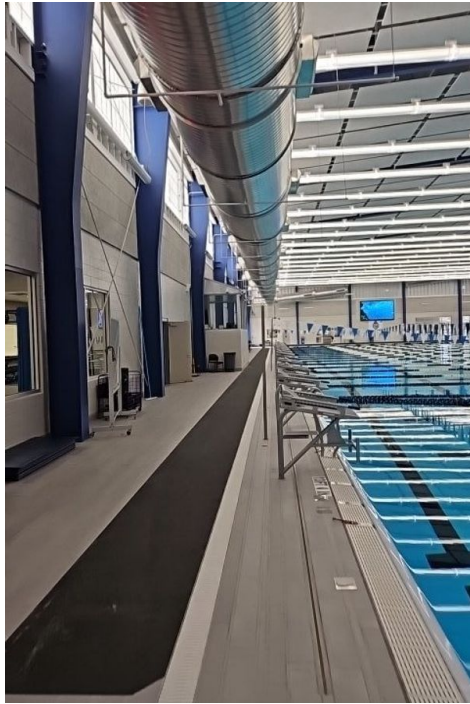
Information

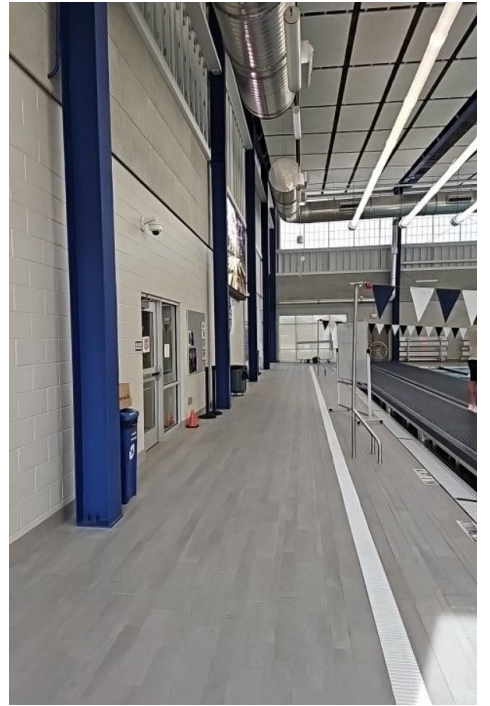
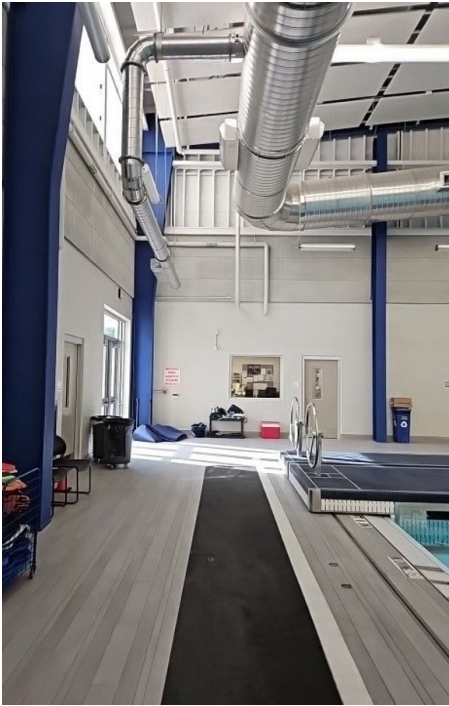
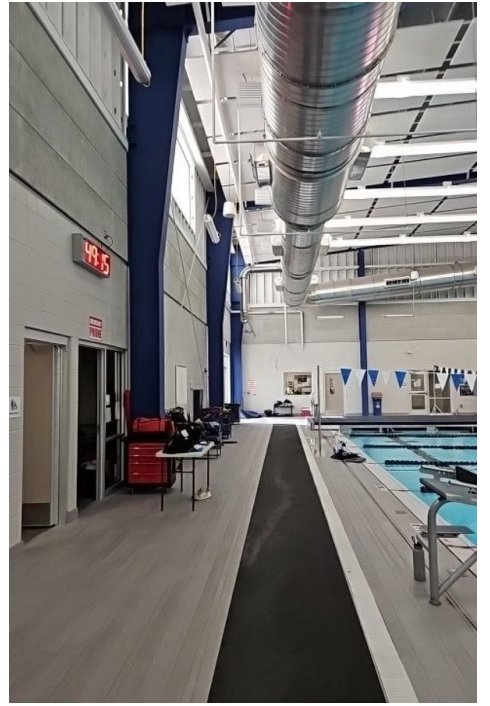
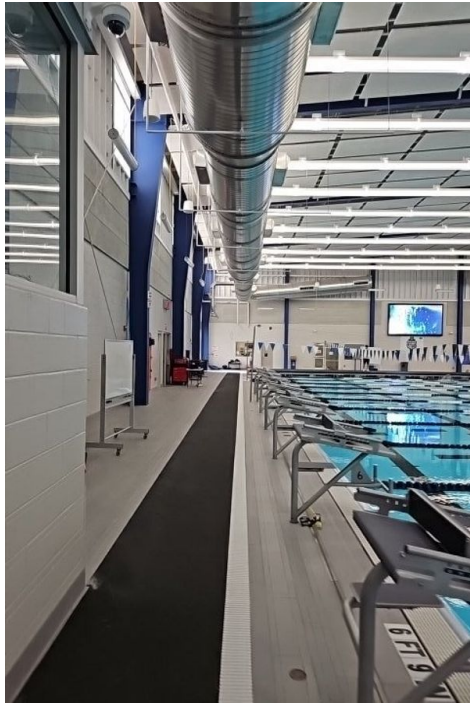
Interior: General Interior Photos

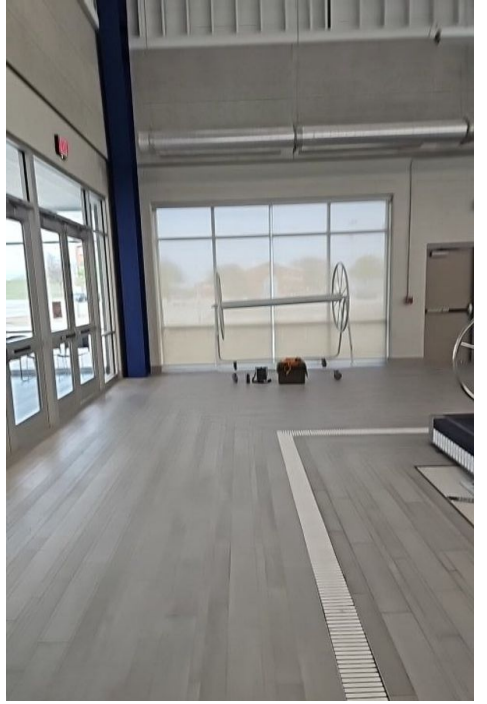
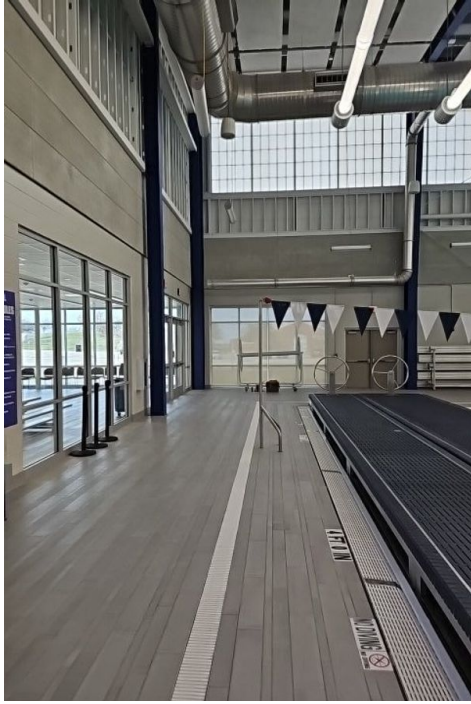




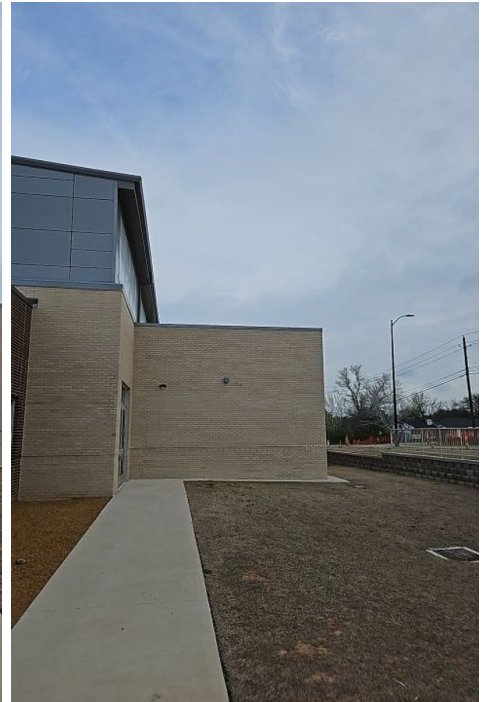
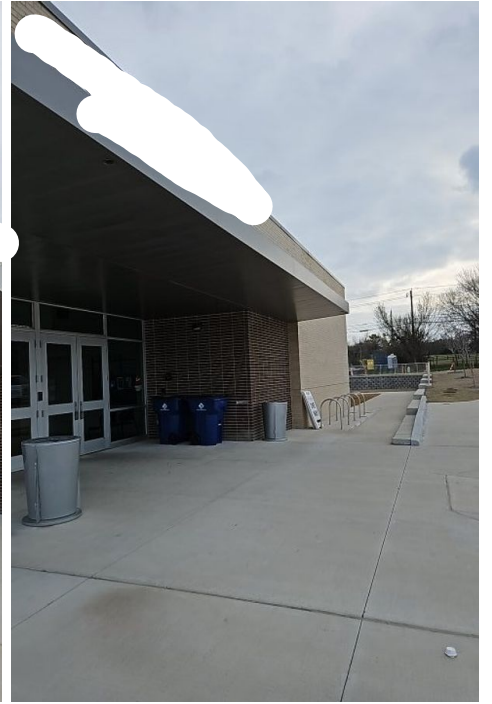


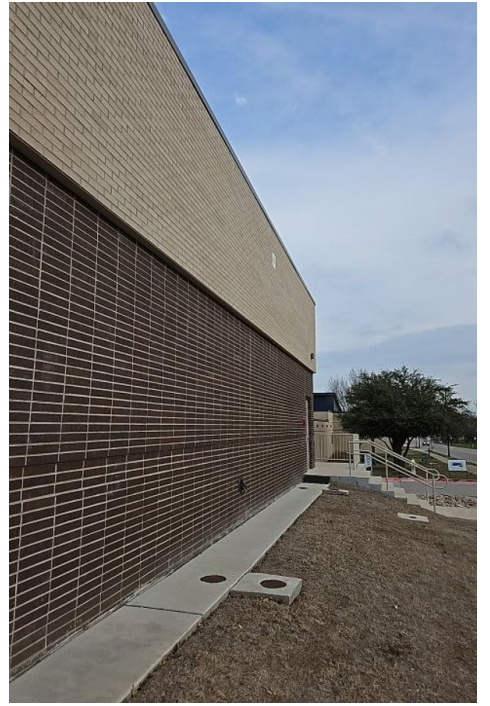


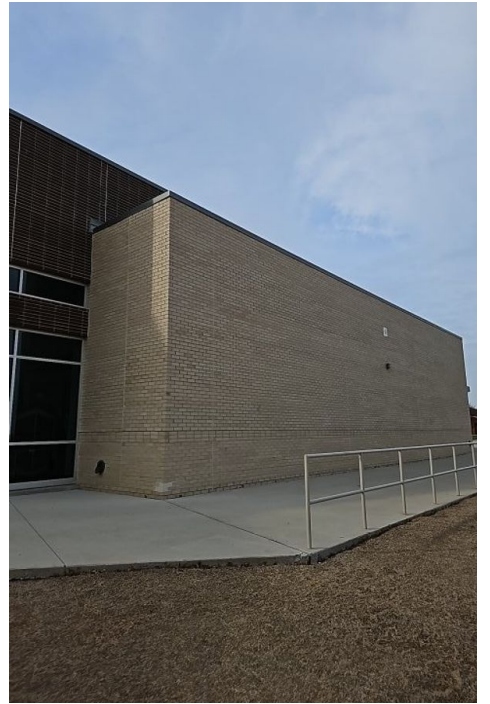




Exterior: Exterior Photos









Observations

2.1.1 Interior

MOISTURE DAMAGE - WALLS

Walls had areas of visible moisture damage. Recommend a qualified contractor evaluate & repair areas of moisture.

Recommendation

Contact a qualified flooring contractor



Left side of back wall above exit



Back left corner above garage door

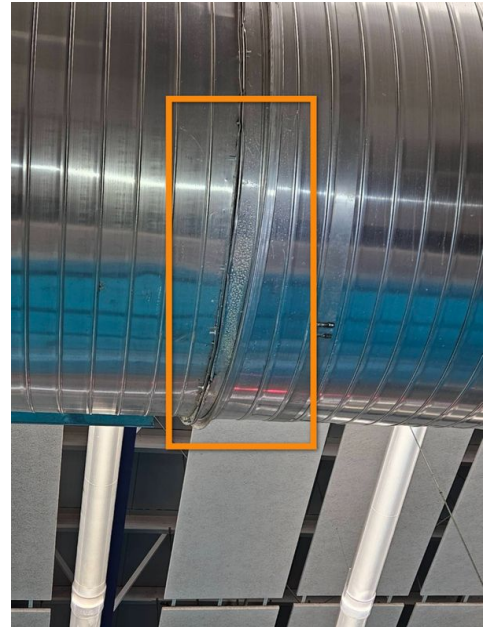
2.1.2 Interior

ASSUMED MOLD GROWTH

There were areas of assumed mold growth observed in the home at the time of inspection.

Recommendation

Contact a qualified mold inspection professional.



Duck work in the back right corner in front of the storage room

2.1.3 Interior

DUST/DEBRIS ON REGISTERS

An accumulation of dust/debris at one or more registers observed at the time of inspection. This build up of dust and debris could lead to inefficient hvac operation, poor indoor air quality and mold growth. Cleaning recommended.

Recommendation

Contact a qualified professional.



Back right register



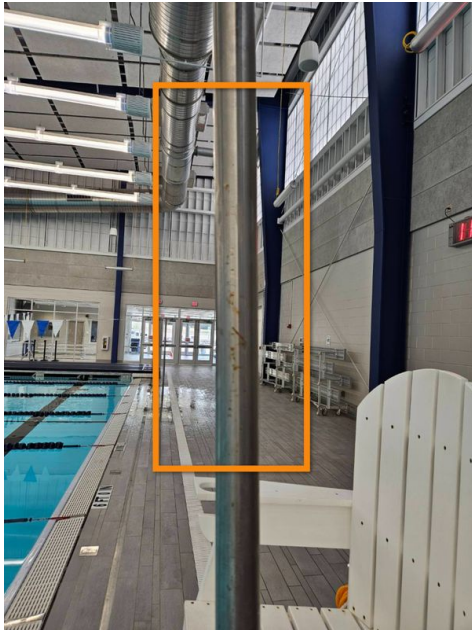
Back left register

2.1.4 Interior

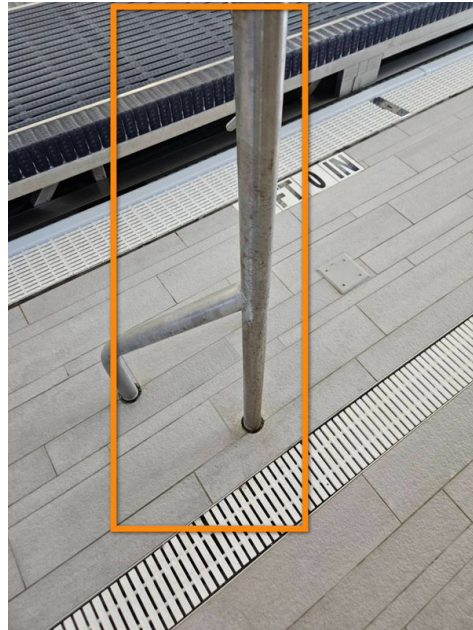
OXIDIZED STAINLESS STEEL

Recommendation

Contact a qualified professional.



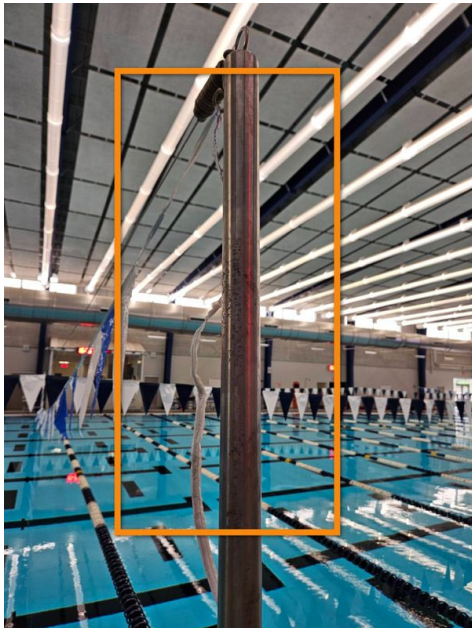
Flag pole



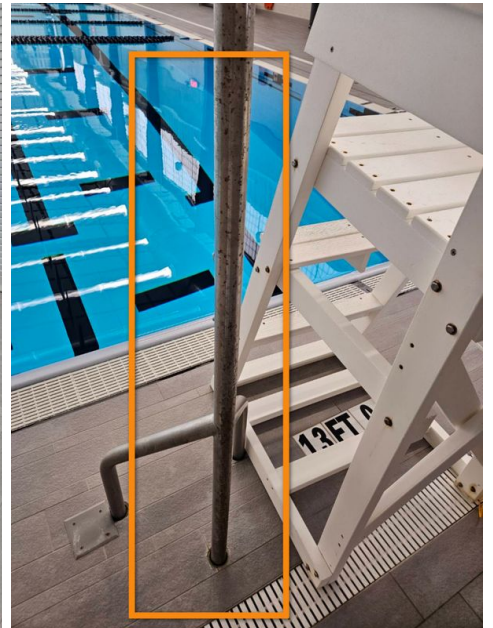
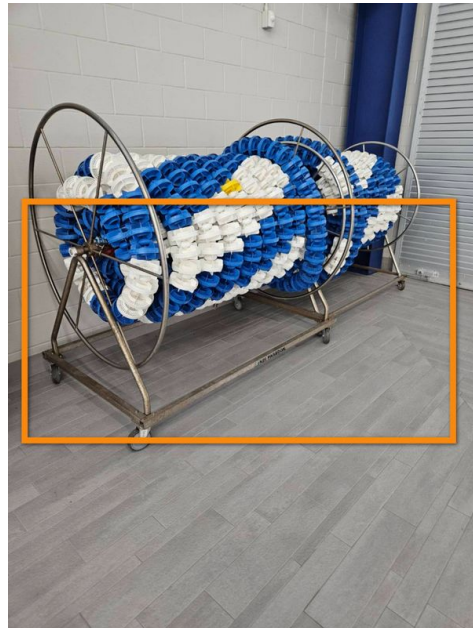
Flag pole



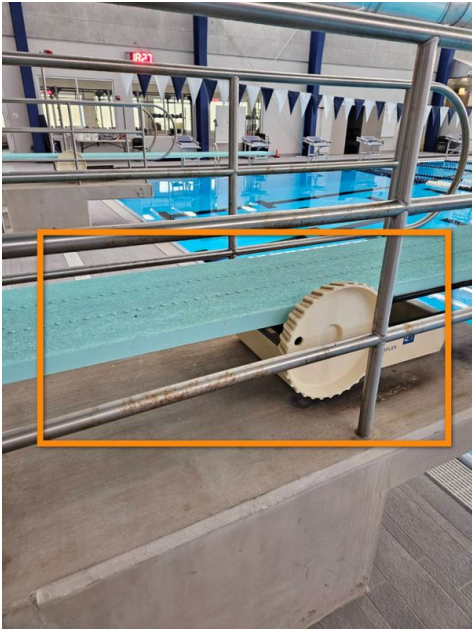
Flag pole



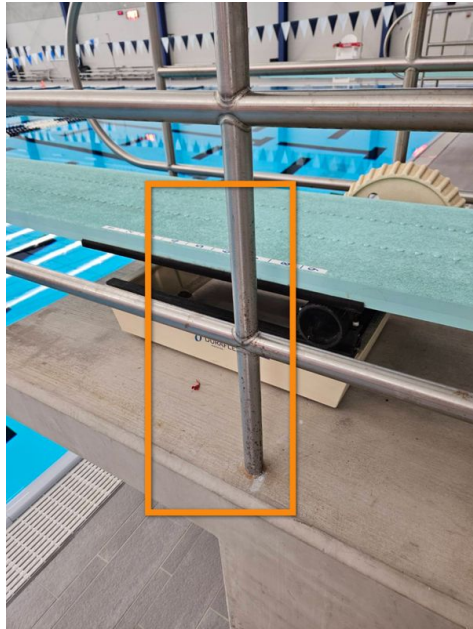
Flag pole



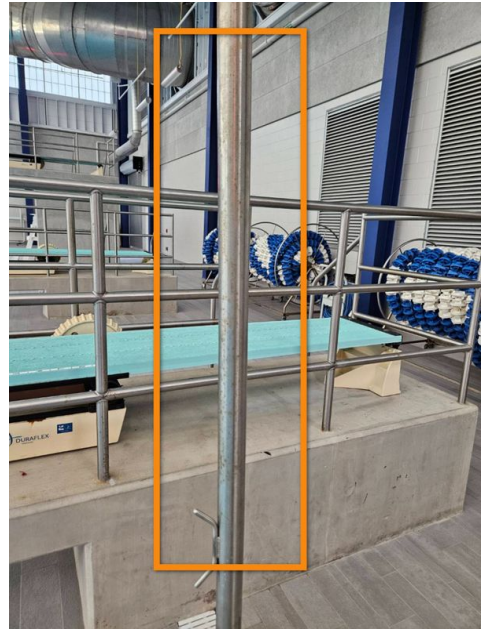
Flag pole



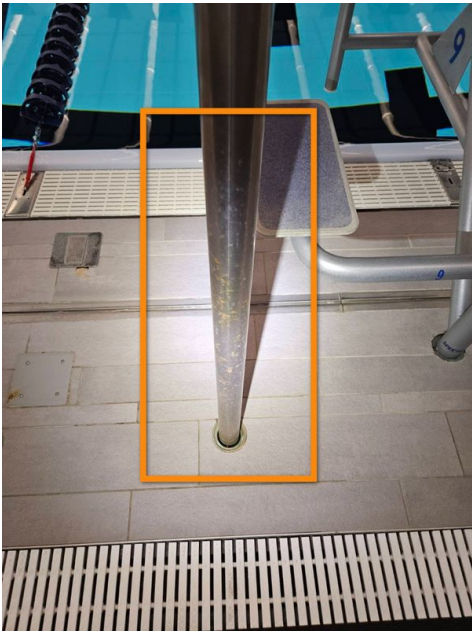
Left diving board



Right diving board



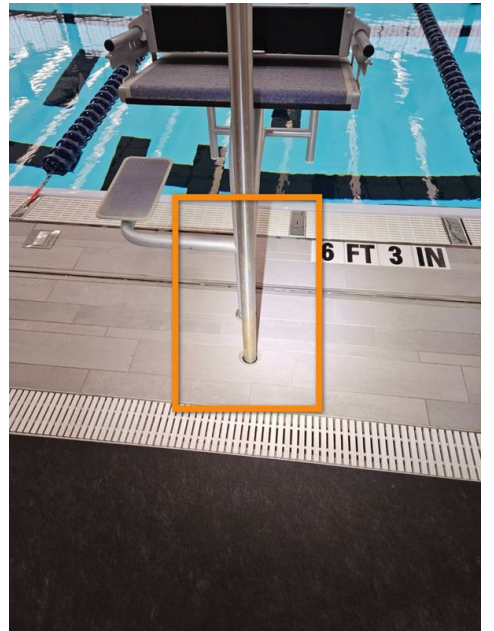
Flag pole



Flag pole



Kick plate on door to A123



Flag pole



Kick plate on door to men's locker room



Kick plate on door to A119



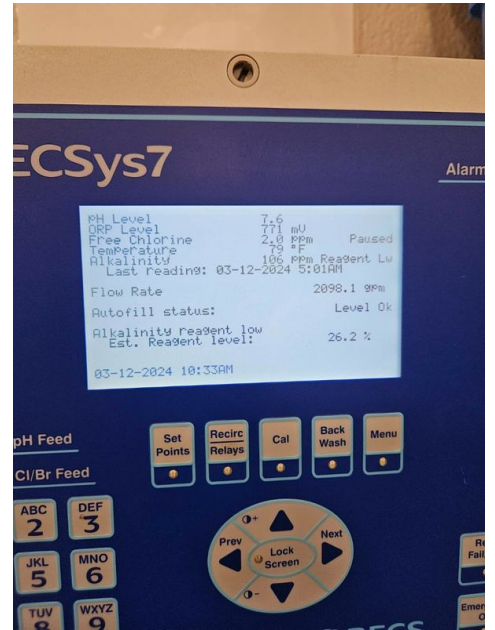
Door to weight room

2.1.5 Interior

CHLORINE LEVELS

Recommendation

Contact a qualified professional.



3: RECOMMENDATIONS

Information

Summary

This inspection was scheduled due to a company recommending the client to get an air quality inspection completed. The inspector conducted a visual inspection of the interior and exterior of the property and utilized an air quality monitor throughout the inspection to help determine where to collect air samples. During the inspection, no elevated readings were shown on the air quality device, an air quality solutions company is not necessary at this time. The inspector collected 10 air samples throughout the facility. Per the lab results, elevated levels of mold were not detected, a protocol is not required at this time.

No Concern

The molds listed in the samples were equal to, slightly elevated, or lower than the outside comparison sample. Indicating no significant concern in the samples areas at the time of inspection.

STANDARDS OF PRACTICE
