# Background

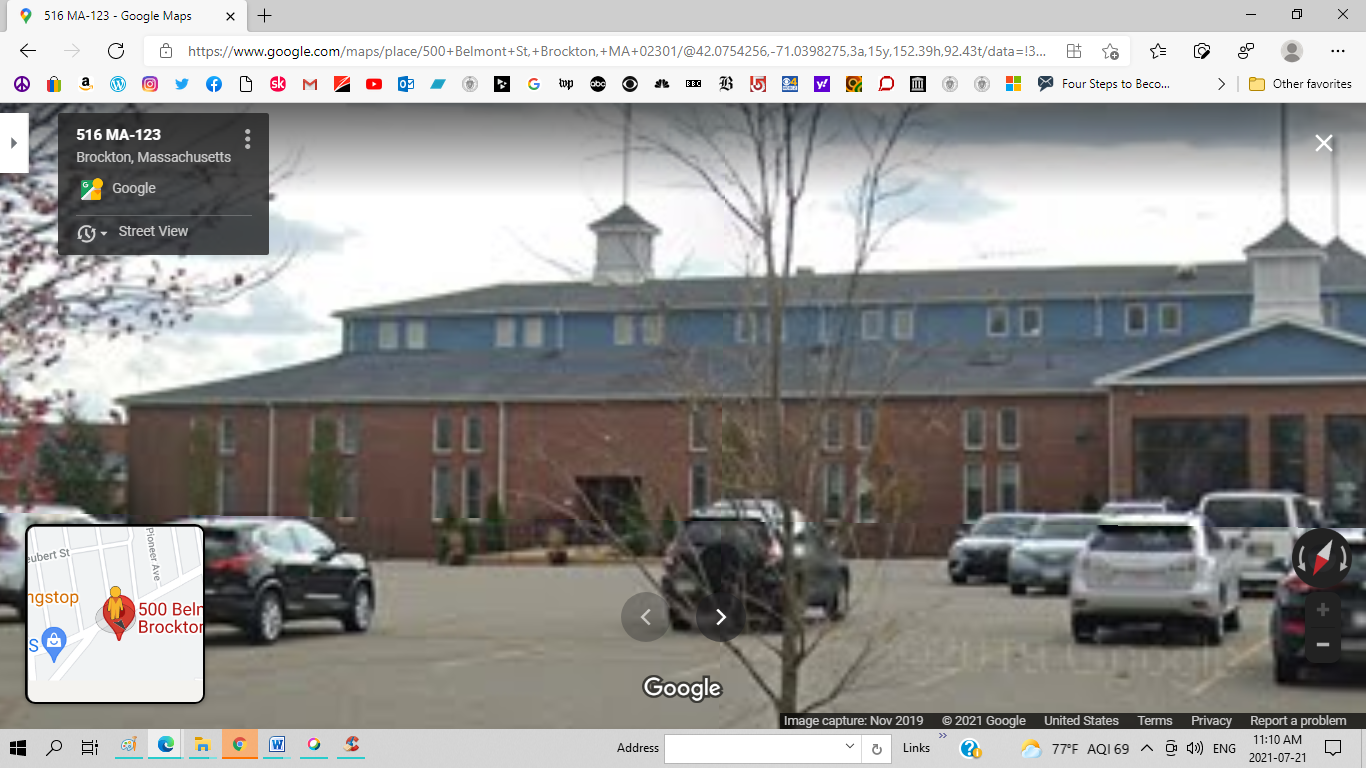
**INDOOR AIR QUALITY**

**PRE-OCCUPANCY ASSESSMENT**

**Massachusetts State Auditor’s Office**

**500 Belmont Street**

**Brockton, MA**



Prepared by:

Massachusetts Department of Public Health

Bureau of Environmental Health

Indoor Air Quality Program

July 2021

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| --- | --- |
| Building: | Massachusetts State Auditor’s Office (MSAO) |
| Address: | 500 Belmont Street, Brockton, MA |
| Division of Capital Asset Management and Maintenance (DCAMM) Project Manager: | Paul Burke, Project Manager, Division of Capital Asset Management and Maintenance (DCAMM) |
| Date of Pre-Occupancy Assessment: | June 29, 2021 |
| Massachusetts Department of Public Health/Bureau of Environmental Health (MDPH/BEH) Staff Conducting Assessment: | Michael Feeney, Director, Indoor Air Quality (IAQ) Program |
| Building/Ventilation:  The newly renovated MSAO is located on the upper floor of a two-story building. The space contains offices, workstations, conference rooms and auxiliary spaces. The MSAO space has been renovated, including a few new heating, ventilation, and air conditioning (HVAC) units. Ventilation system balancing occurred prior to the assessment. New carpeting and furnishings have been installed in the space. Previous Relevant Environmental History: No current/active Massachusetts Contingency Plan projects for this building or property were found in the Massachusetts Department of Environmental Protection database. | |

# Methods

Air tests for carbon monoxide, temperature and relative humidity were taken with the TSI, Q-Trak, IAQ Monitor 7565. Air tests for airborne particle matter with a diameter less than 2.5 micrometers were taken with the TSI, DUSTTRAK II Aerosol Monitor Model 8532. Screening for volatile organic compounds (VOCs) was conducted using a MiniRAE Lite Photo Ionization Detector. BEH/IAQ staff also performed a visual inspection of building materials for water damage and/or microbial growth and examined the space for the presence of odors or other environmental concerns.

## Air Testing Results

| **Media sampled** | | **MDPH Guideline/**  **Comparison Value** | | **Measured Range** | | | **Comments** | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Outdoors/**  **Background** | | **Indoors** |
| Carbon Dioxide (CO2) | | < 800 parts per million (ppm) is preferred | | 384 | | 559-612 | HVAC system on, office space unoccupied apart from a few contractors on site | |
| Carbon Monoxide (CO) | | Non-detectable (ND) or equal to or below background level measured | | ND | | ND |  | |
| Temperature | | 70 to 78ºF | | 93 | | 71-73 |  | |
| Relative Humidity (RH) | | 40% to 60% | | 54 | | 57-60 |  | |
| Particulate Matter 2.5 (PM2.5) | | US EPA National Ambient Air Quality Standards (NAAQS) 35 μg/m3 or less | | 22 | | 6-7 |  | |
| Total Volatile Organic Compounds (TVOCs) | | Equal to or below background level measured | | ND | | ND |  | |
| ppm = parts per million | µg/m3 = microgram per cubic meter | | ND = non-detectable | |  | | |

# Discussion/Visual Observations

At the time of the assessment, some finishing work remained to be performed, including unboxing of some furnishings. No water-damaged materials or musty odors were noted during the assessment. One room has shelving installed for record storage (rm 116). It is recommended that a passive vent be installed in the ceiling. In addition, it is not recommended to store any materials that are capable of supporting mold growth in the direct flow of ceiling–mounted fresh air diffusers. Such materials may become moistened during extended periods of hot, humid weather (>70%), which can lead to mold growth.

# Recommendations

In view of the findings at the time of assessment, the following recommendations are made:

1. Ensure the HVAC system is set to provide *continuous* filtration and ventilation during occupied hours.
2. Use filters with a Minimum Efficiency Reporting Value (MERV) 8 or better in HVAC units and ensure they are changed 2-4 times per year, or per the manufacturer’s instructions. Note that facility staff reported that MERV 11 filters are used and changed quarterly.
3. Have the HVAC balanced every five years (SMACNA, 1994).
4. Please note, it is recommended that areas where cooking occurs have a dedicated exhaust system to vent odors outdoors. If such a system is not present, cooking odors in the kitchen area can be captured by the general HVAC system and distributed to other areas of the building.
5. Install a ceiling vent in Room 116. Do not store records in the airstream of the HVAC system.
6. Upon completion of renovations, perform a final/thorough cleaning of the office space including wet wiping of all surfaces and use of a high efficiency particulate arrestance (HEPA) vacuuming of all carpeting prior to occupancy.
7. If desired, once the space has been occupied for a minimum of three weeks, contact the BEH/IAQ Program to conduct a follow-up assessment of the space.

# References

SMACNA. 1994. HVAC Systems Commissioning Manual. 1st ed. Sheet Metal and Air Conditioning Contractors’ National Association, Inc., Chantilly, VA.