**INDOOR AIR QUALITY ASSESSMENT**

**Franklin County District Attorney’s Office**

**56 Bank Row**

 **Greenfield, MA**



Prepared by:

Massachusetts Department of Public Health

Bureau of Environmental Health

Indoor Air Quality Program

March 2019

# Background

|  |  |
| --- | --- |
| Building: | Franklin County District Attorney’s Office (DA’s office) |
| Address: | 56 Bank Row, Greenfield, MA,  |
| DCAMM Project Manager: | Jaime Merrill Blood, Senior Project Manager, Division of Capital Asset Management and Maintenance (DCAMM) |
| Reason for Request: | Post-occupancy assessment |
| Date of Assessment: | July 27, 2018 |
| Massachusetts Department of Public Health/Bureau of Environmental Health (MDPH/BEH) Staff Conducting Assessment: | Mike Feeney, Director, Indoor Air Quality (IAQ) Program |
| Building Description: | This office is in a three-story building originally constructed as a feed store in the 1800s. The building has a brick exterior.  |
| Windows: | Windows are not openable. |

# Methods

Please refer to the IAQ Manual for methods, sampling procedures, and interpretation of results (MDPH, 2015).

# Results

The following is a summary of indoor air testing results (Table 1).

* ***Carbon dioxide levels*** were below the MDPH guideline of 800 parts per million (ppm) in all areas assessed.
* ***Temperature*** was within the MDPH recommended range of 70°F to 78°F in all areas.
* ***Relative humidity*** was within the MDPH recommended range of 40% to 60% in all areas.
* ***Carbon monoxide*** levels were 2- 3 ppm in all indoor areas assessed, which was the same or lower than the outdoor measurement of 3 ppm.
* ***Fine particulate matter (PM2.5)*** concentrations measured were below the National Ambient Air Quality Standard (NAAQS) level of 35 micrograms per cubic meter (μg/m3) in all occupied areas. Outdoor levels were higher than the NAAQS level.

# Discussion

## Ventilation

A heating, ventilating, and air conditioning (HVAC) system has several functions. First it provides heating and, if equipped, cooling. Second, it is a source of fresh air. Finally, an HVAC system will dilute and remove normally occurring indoor environmental pollutants by not only introducing fresh air, but by filtering the airstream and ejecting stale air to the outdoors via exhaust ventilation. Even if an HVAC system is operating as designed, point sources of respiratory irritation may exist and cause symptoms in sensitive individuals.

The HVAC system in this space consists of air handling units (AHUs) on the roof that draw in fresh air. Supply air is ducted to ceiling-mounted supply diffusers throughout the space. Return air is brought back to the AHUs through return vents.

To maximize air exchange, the MDPH recommends that both supply and exhaust ventilation operate continuously during periods of occupancy. In order to have proper ventilation with a mechanical supply and exhaust system, the systems must be balanced to provide an adequate amount of fresh air to the interior of a room while removing stale air from the room. It is recommended that HVAC systems be re-balanced every five years to ensure adequate air systems function (SMACNA, 1994). The HVAC system balancing was completed prior to this assessment.

## Microbial/Moisture Concerns

No water-damaged building materials or leaks were found during the assessment. Plants were observed in several offices (Table 1). Plants need to be well maintained and placed on non-porous surfaces to avoid becoming a source of odors or microbial growth.

# Conclusions/Recommendations

Based on the observations made during the visit, the following is recommended:

1. Operate the HVAC system to provide for continuous fresh air ventilation during occupied hours. Inspect all thermostats to ensure that they are set for “fan on” instead of the “auto” setting.
2. Ensure plants are kept in good condition and not placed on porous materials.
3. Regularly vacuum carpeting with a HEPA-filtered vacuum cleaner. Ensure that there is periodic access to the file room for cleaning. Clean carpeting at least once per year according to IICRC recommendations (IICRC 2012).
4. Continue to change filters for HVAC equipment 2-4 times a year. Continue to use pleated filters of MERV 8 (or higher), which are adequate in filtering out pollen and mold spores (ASHRAE, 2012). If outdoor conditions warrant, replace filters more frequently.
5. Consider adopting a balancing schedule of every 5 years for all mechanical ventilation systems, as recommended by ventilation industrial standards (SMACNA, 1994).
6. Refer to resource manuals and other related IAQ documents for further building-wide evaluations and advice on maintaining public buildings. Copies of these materials are located on the MDPH’s website: <http://mass.gov/dph/iaq>.

# References

ASHRAE. 2012. American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE) Standard 52.2-2012 -- Method of Testing General Ventilation Air-Cleaning Devices for Removal Efficiency by Particle Size (ANSI Approved).

IICRC. 2012. Institute of Inspection Cleaning and Restoration Certification. Institute of Inspection, Cleaning and Restoration Certification. Carpet Cleaning: FAQ. Retrieved from <https://www.iicrc.org/general/custom.asp?page=SANSIIICRCS100>.

MDPH. 2015. Massachusetts Department of Public Health. “Indoor Air Quality Manual: Chapters I-III”. Available at: <http://www.mass.gov/eohhs/gov/departments/dph/programs/environmental-health/exposure-topics/iaq/iaq-manual/>.

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

| **Location** | **Carbon****Dioxide****(ppm)** | **Carbon Monoxide****(ppm)** | **Temp****(°F)** | **Relative****Humidity****(%)** | **PM2.5****(µg/m3)** | **Occupants****in Room** | **Windows****Openable** | **Ventilation** | **Remarks** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Supply** | **Exhaust** |
| Background (Outdoors) | 404 | 3 | 86 | 72 | 47 |  |  |  |  |  |
| Front desk | 656 | 3 | 78 | 43 | 24 | 2 | N | Y | Y |  |
| Detectives | 598 | 2 | 74 | 50 | 30 | 0 | N | Y | Y |  |
| 101 | 557 | 2 | 75 | 48 | 26 | 0 | N | Y | Y |  |
| 102 | 557 | 2 | 75 | 49 | 26 | 1 | N | Y | Y |  |
| 103 | 633 | 2 | 75 | 48 | 27 | 1 | N | Y | Y |  |
| 104 | 581 | 2 | 74 | 51 | 26 | 1 | N | Y | Y |  |
| 105 | 579 | 2 | 74 | 51 | 25 | 0 | N | Y | Y |  |
| 108 | 529 | 2 | 74 | 49 | 31 | 0 | N | Y | Y |  |
| 114 | 485 | 2 | 74 | 48 | 30 | 0 | N | Y | Y |  |
| 115 | 482 | 2 | 74 | 49 | 29 | 0 | N | Y | Y |  |
| 116 | 511 | 2 | 74 | 50 | 28 | 0 | N | Y | Y |  |
| 117 | 527 | 2 | 74 | 50 | 27 | 0 | N | Y | Y |  |
| 118 | 513 | 2 | 74 | 49 | 27 | 0 | N | Y | Y |  |
| 201 | 452 | 2 | 76 | 45 | 33 | 0 |  |  |  |  |
| 202 | 478 | 2 | 74 | 49 | 25 | 0 | N | Y | Y |  |
| 203 | 503 | 2 | 74 | 46 | 24 | 1 | N | Y | Y |  |
| 204 | 502 | 3 | 75 | 46 | 28 | 0 | N | Y | Y |  |
| 205 | 449 | 3 | 75 | 46 | 27 | 0 | N | Y | Y |  |
| 206 | 445 | 3 | 75 | 46 | 29 | 0 | N | Y | Y |  |
| 208 | 447 | 3 | 75 | 46 | 28 | 0 | N | Y | Y |  |
| 211 | 445 | 2 | 75 | 47 | 28 | 0 | N | Y | Y |  |
| 212 | 461 | 3 | 75 | 47 | 24 | 0 | N | Y | Y |  |
| 213 | 434 | 2 | 75 | 46 | 22 | 0 | N | Y | Y |  |
| 214 | 435 | 2 | 75 | 46 | 24 | 0 | N | Y | Y |  |
| 215 | 455 | 2 | 75 | 47 | 28 | 0 | N | Y | Y | 1 water-damaged ceiling tile |
| 216 | 440 | 2 | 75 | 47 | 27 | 1 | N | Y | Y |  |
| 217 | 427 | 2 | 75 | 47 | 31 | 0 | N | Y | Y |  |
| 223 | 459 | 2 | 75 | 47 | 28 | 0 | N | Y | Y |  |
| 300 | 456 | 3 | 75 | 47 | 24 | 0 | N | Y | Y |  |
| 301 | 436 | 3 | 76 | 45 | 21 | 0 |  |  |  |  |
| 302 | 453 | 2 | 73 | 49 | 24 | 0 | N | Y | Y |  |
| 303 | 456 | 2 | 74 | 48 | 24 | 0 | N | Y | Y | Photocopier |
| 304 | 573 | 2 | 74 | 49 | 7 | 1 | N | Y | Y |  |
| 305 | 555 | 3 | 74 | 48 | 30 | 0 | N | Y | Y |  |
| 306 | 468 | 2 | 73 | 49 | 25 | 0 | N | Y | Y | Photocopier |
| 307 | 485 | 2 | 73 | 49 | 23 | 1 | N | Y | Y | Plants |
| 308 | 489 | 2 | 73 | 49 | 25 | 0 | N | Y | Y | Plants |
| 313 | 464 | 2 | 73 | 49 | 24 | 0 | N | Y | Y |  |
| 314 | 494 | 2 | 74 | 49 | 26 | 1 | N | Y | Y |  |
| 315 | 451 | 2 | 73 | 50 | 22 | 0 | N | Y | Y |  |
| 316 | 439 | 3 | 73 | 50 | 22 | 0 | N | Y | Y |  |