



**Boston Municipal Court
Charlestown, MA**

**HVAC SYSTEM
EVALUATIONS
COVID-19**

Office of Court Management

November 1, 2021

Tighe&Bond

Existing Conditions & Site Observations

Tighe & Bond visited the Charlestown Municipal Courthouse on August 18th, 2021. While on site we toured the facility to determine if the spaces generally matched usages noted on the architectural plans. This building does not have a mechanical ventilation or cooling system, therefore Tighe & Bond did not perform analysis of ventilation for this building. The purpose of the ventilation calculations is to evaluate whether the existing ventilation system is providing enough outside air to the building as required by mechanical code. Without a ventilation system to analyze, there is no value in performing the calculations. Our analysis in this report is based solely on information gathered during our site visit.

Site Visit Attendees:

- *Office of Court Management:*
 - William Highgas Courthouse Facilities Staff
- *Tighe & Bond*
 - Ryan Ablondi, PE, Senior Mechanical Engineer
 - Matt Mancini, Staff Mechanical Engineer

1.1 Existing Ventilation System

The Charleston Municipal Courthouse was constructed in 1915 and is approximately 25,000 square feet in size. There are no mechanical systems providing ventilation air to the building. The only means of ventilation for this building are the operable windows for the perimeter rooms. For the courtroom, and the open office area on the second floor, it should be noted that the operable window area exceeds 4% of the floor area which meets the code requirements for natural ventilation. Cooling is provided by window AC units for perimeter rooms with windows, interior spaces have no cooling.

Local air filtration is being provided by portable HEPA filters. While on site, Tighe & Bond noted that there are several HEPA filters located in densely occupied spaces throughout the building. The filters have been located near the center of each of these rooms for optimal filtration.

From our site visit, Tighe & Bond found that there is only one exhaust fan in the first floor men's room. There are no exhaust fans in serving any of the other restrooms or the lockup area. The lockup area, and some of the restrooms are located on the perimeter of the building where there are operable windows to provide natural ventilation. There are also internal restrooms without an exhaust fan, mechanical ventilation, or operable windows that are not receiving ventilation air and are not being exhausted per the International Mechanical Code requirements.

There is a 1.3 million BTU/hr, gas fired boiler in the basement mechanical room which provides steam to perimeter radiators to heat the building. There is also an abandoned boiler in the basement mechanical room, next to the operating boiler. Tighe & Bond does not have any information on the exact age of the operating boiler but it appears to be in fair condition.

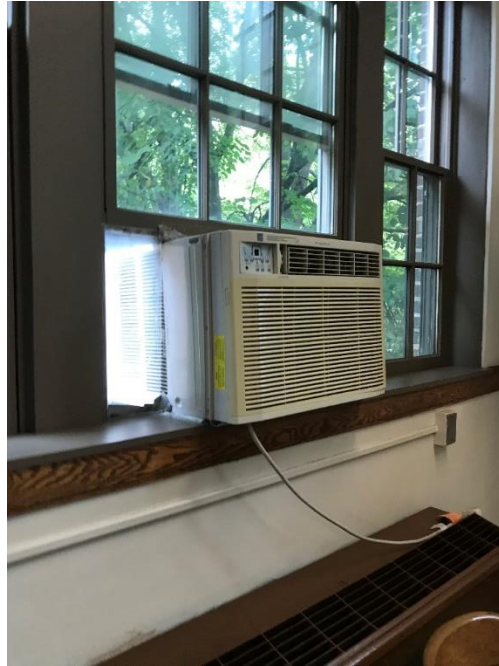


Photo 1 – Typical Window With AC Unit



Photo 2 – Portable HEPA Filter

1.2 Existing Control System

The building does not have any air handling equipment and therefore does not have a control system. All heating and cooling equipment is locally controlled by wall thermostats.

Section 2

Recommendations

Below is a list of recommendations for the Charlestown Municipal Courthouse. Please refer to the "Overview of Recommendations" report for further explanation and requirements of the stated recommendations.

Building areas without adequate ventilation and filtration significantly increase the risk of spreading viruses like Coronavirus (SARS-CoV-2), especially areas with high occupant density and where people occupy the same space for relatively long periods of time. Consider significantly reducing occupancy or relocating occupants to other areas with adequate ventilation.

2.1 Additional Filtration and Air Cleaning

We recommend the installation of the following air cleaning devices:

RFC-1: *Install portable HEPA filters.*

If the Courthouse is to operate at a high capacity (i.e. 50% occupancy or greater), we recommend installing portable HEPA filters in high traffic areas, such as entrance lobbies. The noise levels will vary depending on the manufacturer. Refer to the "Overview of Recommendations" document for further guidance on installing portable HEPA filters.

During our site visit, Tighe & Bond observed that portable HEPA filters have already been provided in some high traffic areas. We saw HEPA filters located in the District Court Room, Detention Office, Public Second Floor Lobby, Clerks Office, and Judges Lobby.

Due to the lack of ventilation in select densely occupied spaces, we recommend the use of portable HEPA filters or similar air purification approaches if these areas are to be occupied in the near term, until adequate ventilation is added to these areas. The court should confirm that a HEPA filter has been provided for each of the rooms listed below. If no HEPA filter is currently located in these rooms then one should be added. While all spaces benefit from additional air filtration, this measure is likely not necessary for single occupant offices.

- Admin Office
- Clerical Office
- First Floor Lobby
- First Floor Kitchen
- Detention Area
- Employee Kitchen
- Male Probation Office

2.2 Humidity Control

Installing portable humidifiers can help maintain the relative humidity levels recommended by ASHRAE. The feasibility of adding active humidification is determined by the building envelope. Buildings that were not designed to operate with active humidification can potentially be damaged due to a lack of a vapor barrier, adequate insulation, and air tightness.

Portable humidifiers are easier to install and require less maintenance, but still have the potential to damage the building envelope.

While active humidification is not recommended as a whole building solution due to high installation costs, operational costs, potential to damage the building envelope and adversely affect poor IAQ, it may be warranted as a temporary solution in some areas.

2.3 Other Recommendations

2.3.1 Mechanical Ventilation Feasibility Study

Most of the Courthouse is not mechanically ventilated. Operable windows do exist, and natural ventilation is acceptable per code, however in reality, windows are typically not opened during cold or hot outdoor air temperatures. We recommend a study of the Courthouse to determine how feasible it is to install mechanical ventilation in all occupied spaces.

2.3.2 Install Holding Cell and Toilet Exhaust Fans

We recommend installing exhaust fans for the holding cells and toilet rooms. These rooms are currently not being exhausted and therefore are not up to the mechanical code. Exhaust airflow creates a current and draws outside air into the space, in this case through open windows. Without proper ventilation through exhaust airflow, the risk of viruses spreading through the air in these rooms is higher. Lack of ventilation in toilet rooms also leads to poor breathing air quality for the occupants and odors.

2.3.3 Capital Planning for Replacement of the Steam Boiler

The existing gas fired steam boiler located in the basement of the courthouse is the only source of heat for the building. Tighe & Bond does not have any documentation indicating the age of the boiler but it appears to be in fair condition. Because this boiler is the only source of heat for the building and a single point of failure, we recommend developing a capital plan to install a new boiler to replace the abandoned boiler in the near future.

2.4 Charlestown Municipal Courthouse Recommendations Checklist

Recommended Immediate Actions

1. Confirm all densely occupied areas have portable HEPA filters

Recommended Actions

2. Mechanical Ventilation Feasibility Study
3. Install Holding Cell and Toilet Exhaust Fans

Optional Actions

4. Capital Planning for Replacement of the Steam Boiler

Disclaimer

Tighe and Bond cannot in any way guarantee the effectiveness of the proposed recommendations to reduce the presence or transmission of viral infection. Our scope of work is intended to inform the Office of Court Management on recommendations for best practices based on the guidelines published by ASHRAE and the CDC. Please note that these recommendations are measures that may help reduce the risk of airborne exposure to COVID-19 but cannot eliminate the exposure or the threat of the virus. Implementing the proposed recommendations will not guarantee the safety of building occupants. Tighe & Bond will not be held responsible should building occupants contract the virus. The Office of Court Management should refer to other guidelines, published by the CDC and other governing entities, such as social distancing, wearing face masks, cleaning and disinfecting surfaces, etc. to help reduce the risk of exposure of COVID-19 to building occupants.