

RENOVATION ASSESSMENT

**Quinsigamond Community College
100 Front Street
Worcester, MA**



Prepared by:
Massachusetts Department of Public Health
Bureau for Environmental Health
Indoor Air Quality Program
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Background/Introduction

At the request of Lisa Verrochi, Project Manager, Division of Capital Assets Management, the Massachusetts Department of Public Health (MDPH), Bureau of Environmental Health's (BEH) Indoor Air Quality (IAQ) Program conducted an assessment of the Quinsigamond Community College (QCC), City Square facility at 100 Front Street in Worcester, Massachusetts on October 20, 2011. Occupant concerns regarding impacts to indoor air from construction activities in adjacent spaces and rodent (mouse and squirrel) issues prompted the assessment. The assessment was conducted by Michael Feeney, Director of BEH's IAQ Program and Ruth Alfasso, Environmental Engineer/Inspector in BEH's IAQ Program. BEH/IAQ staff were accompanied by Ms. Verrochi and Ms. Marilyn Cleary, Director of Operations, QCC.

The building is a high-rise that was part of the original Worcester Galleria Mall complex. At the time of the assessment, the mall and parking garage sections of the complex were being demolished. The QCC occupies converted retail space that opens into the mall complex. Two sides of the area occupied by QCC face the interior corridors of the remaining portion of the mall which has another tenant and several empty storefronts. The QCC space is on the second floor which is connected to the first floor by an escalator and to the garage by a covered walkway.

Methods

A visual assessment of the methods used to separate the renovation/demolition zones from occupied areas was conducted. An examination of building conditions due to reported rodent infestation was also conducted.

Results

The QCC has a staff of approximately 5. No indoor air testing was conducted at the time of the visit because the facility was closed and no demolition activity in the building was observed.

Discussion

Renovation Assessment

As part of the assessment, BEH staff examined the containment measures put in place to protect the occupied areas of the building from demolition and construction activities. At the time of the visit, a fully closed interior wall had been erected at the end of the hallway adjacent to QCC space. According to the property representative, this wall is backed by a new exterior wall which will be finished, making that end of the hallway the new exterior wall of the high-rise. A utility corridor surrounds the two sides of the QCC space that buffer the area from construction impacts. Ductwork in the ceiling in the hallway and utility corridor appeared to be intact. So long as the walls and ceilings of these areas are free of breaches or openings, direct impact from dusts or fumes from demolition and construction activities should be minimal.

Rodent Assessment

QCC staff were concerned about the presence of both squirrels and mice in the space. According to Ms. Cleary, squirrels entering the suspended ceiling above QCC had been a chronic problem. Trapping of squirrels was ongoing and reportedly several squirrels had been removed several weeks prior to the DPH visit. BEH staff examined the roof of the building for potential entry points for rodents/pests and identified several vents that, if not equipped with appropriate

bird screens, could allow squirrels into ductwork and from there, to become trapped in the ceiling plenum (Picture 1).

BEH staff also examined each room for evidence of rodents as well as potential entry points for rodents/pests. QCC staff reported frequent mouse sightings, including mice disrupting classroom activities, especially over the several days prior to the BEH visit. Droppings and chewed paper were found in several desk drawers (Picture 2).

To penetrate a building, rodents require a minimal breach of ¼ inch in the exterior wall/building envelop (MDFA, 1996). A large rodent access point exists in the main entrance to QCC space between the floor and bottom portion of the main entrance glass doors (Picture 3). Metal plates appear to be retrofitted to the bottom of each door (Picture 4). The purpose of the plates appeared to be preventing individuals from reaching under the door to open its lock, not to prevent rodent access. Other doors in the floor of empty retail space are configured in a similar pattern.

Reportedly, the rodent problem in the QCC has resulted from mice displaced from demolished areas of the mall as well as a change of operation of a food concession business on the lower level of the building below the QCC space.

A significant number of rodent attractors and harborages exist in the QCC space. Paper items and clutter, open containers of food (Picture 5), and empty food containers are attractive to rodents. Chemical bait traps were found in several of the occupied areas (Picture 6). Although bait traps are designed to kill rodents, the bait is attractive and can increase rodent traffic when they are placed in occupied areas.

Rodent infestation can result in IAQ related symptoms due to materials found in their wastes. Mouse urine contains a protein that is a known sensitizer (US EPA, 1992). A three-step approach is necessary to eliminate rodent infestation:

1. cleaning of waste products from the interior of the building;
2. reduction/elimination of pathways/food sources that are attracting rodents; and
3. removal of the rodents.

To eliminate exposure to allergens, rodents must be removed from the building. Please note that removal, even after cleaning, may not provide immediate relief since allergens can persist in the building's interior for several months after rodents are eliminated (Burge, 1995).

Other Concerns

Additional concerns were expressed regarding operational issues with the heating, ventilation and air conditioning (HVAC) system. Over the summer, occupants reported that there was no direct control of the HVAC system for several months, which led to wide swings in temperature. Facility staff reported that a control line was severed, requiring manual operation by the building owners to turn the HVAC system on and off manually. More recently, a steam leak in the physical plant penthouse led to steam and hot air being released into the QCC space. At the time of the BEH visit, these conditions had reportedly been repaired and the system appeared to be operating normally; temperatures in the facility were comfortable

Conclusions/Recommendations

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

1. Examine the vents/openings identified on and adjacent to the building roof to see if appropriate bird screens are present and if not, install appropriate screening.
2. Seal any other openings from the outside to the inside or from utility spaces to occupied spaces, such as utility openings and around sprinkler heads, with appropriate fire-rated foam sealant. Ensure all ceiling tiles are in place and intact.
3. Seal the gap noted at the bottom of the glass front doors (Picture 3) with metal stripping edged with a flexible door sweep or similar containment. Ensure tightness by monitoring for light penetration and drafts.
4. Once the openings have been sealed, have the facility professionally cleaned, including steam cleaning/drying of carpets and cleaning of all surfaces. Reduction of clutter and stored paper beforehand will allow for more thorough cleaning and reduce the harborage opportunities for rodents afterwards. Maintain regular cleaning of carpeting and surfaces.
5. Move bait traps out of the QCC space to the utility corridors and other unoccupied areas.
6. Institute policies to prevent storage and consumption of food in offices and classroom areas. If possible, set aside a single uncarpeted area for use as a break room and ensure that this area is cleaned daily.
7. Ensure that HVAC filters for QCC space are changed frequently to reduce any impact of construction dusts on indoor spaces.
8. Consider setting up a system to improve coordination between building occupants and facilities/operations staff on issues relating to HVAC operation, construction and pest management. Ensure that building occupants are informed before major uses of volatile chemicals (e.g., asphalt, paint) in areas adjacent to the QCC facility and adjust air intake rates as needed.

9. Consider having BEH staff perform a general IAQ assessment/testing when the facility has been reoccupied.

References

Burge, H.A. 1995. Bioaerosols. Lewis Publishing Company, Boca Raton, FL.

MDFA. 1996. Integrated Pest Management Kit for Building Managers. Massachusetts Department of Food and Agriculture, Pesticide Bureau, Boston, MA.

MDFA. 1996. Integrated Pest Management Kit for Building Managers. Massachusetts Department of Food and Agriculture, Pesticide Bureau, Boston, MA.

US EPA. 1992. Indoor Biological Pollutants. US Environmental Protection Agency, Environmental Criteria and Assessment Office, Office of Health and Environmental Assessment, Research Triangle Park, NC. EPA 600/8-91/202 January 1992.

Picture 1



Pressure equalization vents (oval) and other potential penetrations (arrows)

Picture 2



Chewed paper in desk drawer

Picture 3



Gap under glass front doorway

Picture 4



Spaces/metal plates at bottom of doors

Picture 5



Open container of food in classroom

Picture 6



Bait trap between filing cabinets