CENTER FOR ENVIRONMENTAL HEALTH
Emergency Response/Indoor Air Quality Program

Guidance Concerning Remediation and Prevention of Mold Growth and Water Damage in Public Schools/Buildings to Maintain Air Quality

November 2006

Mold growth inside buildings can lead to adverse health symptoms in building occupants. Preventing or minimizing exposure to mold and its contaminants is essential to reduce indoor air-related symptoms in building occupants. If water damage or mold growth does occur, the removal of mold-contaminated materials and remediation of the moisture source is critical. The following guidelines are provided to reduce or minimize exposure to mold in buildings.

Building materials can become mold colonized as a result of chronic exposure to moisture. Measures to repair sources of water release or penetration into a building must be taken to prevent future damage to building components and materials.

Prolonged hot humid weather can also create conditions that can allow for mold to colonize building materials. For strategies to prevent or limit mold growth in hot, humid weather, please consult the DPH document **"Preventing Mold Growth in Massachusetts Schools,"** which can be downloaded at the Health Topic Index - Indoor Air Quality Emergency Response/Indoor Air Quality Unit at http://www.mass.gov/dph/topics/iaq.htm

Removal of Mold Growth

Mold Growth Inside Buildings

Mold growth in or on building components or materials stored within a building is considered a public health nuisance subject to enforcement action or removal by the Board of Health pursuant to M.G.L. c. 111, sec. 122.

Removal of Mold Contaminated Materials

Mold contaminated materials should be removed in a manner to prevent cross contamination of clean areas of a building in order to minimize exposure to building occupants. Such removal should be done in a manner consistent with the most current guidelines established by the US Environmental Protection Agency document entitled "Mold Remediation in Schools and Commercial Buildings." This document can be downloaded at: http://www.epa.gov/iaq/molds/mold_remediation.html.

Prevention of Mold Growth

Below Grade Space in Public Buildings

The conversion of below grade space in public buildings should not be done if that space is subject to chronic dampness. Existing below grade space should be inspected at least twice a year for evidence of water penetration or water damage of building materials after significant precipitation events. The results of inspections should be recorded in a log book. Information or evidence of mold/water damage in rooms and building components should be noted. Also porous materials listed in Table 1 (attached) from the most current guidelines established by the US Environmental Protection Agency document entitled “Mold Remediation in Schools and Commercial Buildings" should not be used in below grade space in public buildings if that space is subject to chronic dampness due to water leaks or condensation accumulation.

General Building Condition

The foundation, floors, walls, doors, windows, ceilings, roof, staircases, porches, chimneys, gutters/downspouts and other structural elements of public building should be evaluated to ensure that the building is in good repair and weathertight against wind, rain and snow.

Holes, cracks, loose plaster, or other defects that may render the area subject to water penetration or damage should be repaired to the extent practicable.

The following are recommendations to maintain windows and doors weathertight to prevent water penetration into the building interior.

1. Windows:

    a. all panes of glass should be in place, unbroken and properly caulked
    b. windows should open and close fully without excessive effort
    c. exterior cracks between the prime window frame and the exterior wall should be caulked
    d. at least one of the following should be present with respect to storm windows or the window sash:
        i. a storm window is affixed to the prime window frame, with caulking installed so as to fill exterior cracks between the storm window frame and the prime window frame
        ii. weather-stripping is applied such that the space between the window sash and the prime window frame is no larger than 1/16 inch at every point on the perimeter of the sash, in the case of double hung windows and 1/32 inch in the case of casement windows
        iii. the window sash is sufficiently well-fitted such that, without weather-stripping, the space between the window sash and the prime window frame is no larger than 1/16 inch at any point on the perimeter of the sash in the case of double hung windows and 1/32 inch in the case of casement windows.

2. Exterior doors:

    a. all panes of glass are in place, unbroken and properly caulked
    b. doors open and close fully without excessive effort
    c. exterior cracks between the prime door frame and the exterior wall are caulked
    d. at least one of the following conditions is met:
        i. a storm door is affixed to the prime door frame, with caulking installed so as to fill exterior cracks between the storm door frame and the prime door frame
        ii. weather-stripping is applied such that the space between the door and the prime door frame is no larger than 1/16 inch at any point on the perimeter of the door
        iii. the door is sufficiently well-fitted such that, without weather-stripping, the space between the door and the prime door frame is no larger than 1/16 inch at any point on the sides of the door or 1/8 inch at any point on the top or bottom of the door.

Maintaining the Plumbing, Heating, Ventilating and Air-conditioning (HVAC) Systems Elements

The owner/operator shall maintain the plumbing, waste disposal and heating system pipes and equipment attached thereto in good repair and free of water damage. Any leaks from these systems should be repaired in a timely way to prevent mold growth in building components.

Exhaust ventilation systems that have the purpose of removing water vapor from the interior of a building, including but not limited to restroom vents, shower vents, locker room vents, kitchen vents, and indoor pool vents, shall be maintained in good repair and operated continuously as long as a water vapor source exists in the area vented. All such exhaust vents must be vented to the outdoors and not be connected to the general ventilation system. Such vents must not direct air into the building wall cavity and ceiling plenums.

Inspection upon Request

The Massachusetts Department of Public Health, Center for Environmental Health, Emergency Response/Indoor Air Quality Program, is available to inspect a public building upon receipt of a written request for inspection from and in cooperation with the appropriate government agency.

Questions

If you have any questions concerning these guidelines, please contact:

Massachusetts Department of Public Health
Center for Environmental Health
Emergency Response/Indoor Air Quality Program
250 Washington Street, 7th Floor
Boston, MA 02108
Phone: (617) 624-5757, Fax: (617) 624-5777.

Table 1
U.S. Environmental Protection Agency
"Mold Remediation in Schools and Commercial Buildings" Investigating, Evaluating, and Remediating Moisture and Mold Problems

Water Damage - Cleanup and Mold Prevention

Table 1 presents strategies to respond to water damage within 24-48 hours. These guidelines are designed to help avoid the need for remediation of mold growth by taking quick action before growth starts. If mold growth is found on the materials listed in **Table 1**. Depending on the size of the area involved and resources available, professional assistance may be needed to dry an area quickly and thoroughly.

Table 1: Water Damage - Cleanup and Mold Prevention	
Guidelines for Response to Clean Water Damage within 24-48 Hours to Prevent Mold Growth*	
Water-Damaged Material†	**Actions**
Books and papers	• For non-valuable items, discard books and papers. • Photocopy valuable/important items, discard originals. • Freeze (in frost-free freezer or meat locker) or freeze-dry.
Carpet and backing - dry within 24-48 hours§	• Remove water with water extraction vacuum. • Reduce ambient humidity levels with dehumidifier. • Accelerate drying process with fans.
Ceiling tiles	• Discard and replace.
Cellulose insulation	• Discard and replace.
Concrete or cinder block surfaces	• Remove water with water extraction vacuum. • Accelerate drying process with dehumidifiers, fans, and/or heaters.
Fiberglass insulation	• Discard and replace.
Hard surface, porous flooring§ (Linoleum, ceramic tile, vinyl)	• Vacuum or damp wipe with water and mild detergent and allow to dry; scrub if necessary. • Check to make sure underflooring is dry; dry underflooring if necessary.
Non-porous, hard surfaces (Plastics, metals)	• Vacuum or damp wipe with water and mild detergent and allow to dry; scrub if necessary.
Upholstered furniture	• Remove water with water extraction vacuum. • Accelerate drying process with dehumidifiers, fans, and/or heaters.

Table 1: Water Damage - Cleanup and Mold Prevention	
	• May be difficult to completely dry within 48 hours. If the piece is valuable, you may wish to consult a restoration/water damage professional who specializes in furniture.
Wallboard (Drywall and gypsum board)	• May be dried in place if there is no obvious swelling and the seams are intact. If not, remove, discard, and replace. • Ventilate the wall cavity, if possible.
Window drapes	• Follow laundering or cleaning instructions recommended by the manufacturer.
Wood surfaces	• Remove moisture immediately and use dehumidifiers, gentle heat, and fans for drying. (Use caution when applying heat to hardwood floors.) • Treated or finished wood surfaces may be cleaned with mild detergent and clean water and allowed to dry. • Wet paneling should be pried away from wall for drying.

* Even if materials are dried within 48 hours, mold growth may have occurred. Items may be tested by professionals if there is doubt. Note that mold growth will not always occur after 48 hours; this is only a guideline.

These guidelines are for damage caused by clean water. If you know or suspect that the water source is contaminated with sewage, or chemical or biological pollutants, then Personal Protective Equipment and containment are required by OSHA. An experienced professional should be consulted if you and/or your remediators do not have expertise remediating in contaminated water situations. Do not use fans before determining that the water is clean or sanitary.

† If a particular item(s) has high monetary or sentimental value, you may wish to consult a restoration/water damage specialist.

§ The subfloor under the carpet or other flooring material must also be cleaned and dried. See the appropriate section of this table for recommended actions depending on the composition of the subfloor.