Guidelines for Assessment and Remediation of Fungal Contamination

CAMBRIDGE

real estate services

Introduction

Mold, also referred to as mildew or fungus, is found throughout the environment. Mold growth may be caused by a leaking roof, pipe leaks, sewage backups, floods, high humidity, heating, leaks in air conditioning and ventilation systems, construction design defects in the building envelope and water-damaged building materials.

In the residential environment, molds can be found growing in wallboards, carpets, ceiling tiles, books and papers, plywood, wooden studs, and wooden furnishings. As long as moisture is present, molds will grow; without moisture, molds cannot reproduce.

Many molds and mildews are quite common and have no adverse health effects. A few species of molds however, if present in a large enough quantity, may have the potential to cause adverse health effects in certain susceptible individuals.

The conditions necessary for mold growth to occur on surfaces are:

- Moisture
- Temperature range between 40-100 degrees Fahrenheit
- Mold spores
- Nutrient base – Something the organism can metabolize, such as cellulose in wood, paper and ceiling tiles, or dirt in carpets and hidden areas.

The purpose of these guidelines is to establish procedures for addressing mold or mildew reported or observed at a property. Some of the material in these guidelines is taken from the Environmental Protection Agency and the Center for Disease Control. Please read in full the procedures, forms and related documentation contained in these guidelines.

ADDRESSING MOLD RELATED ISSUES

Mold requires a water source and prefers a dark, stagnant environment. Therefore, should a resident notify you of water intrusion, remove the existing water as quickly as possible, schedule repairs, and supply the resident with a dehumidifier. The use of ceiling fans, if available, and lower air conditioning temperatures are also highly recommended. All molds, should they be left untreated and allowed to grow, may cause health concerns for individuals suffering from allergies to mold, have immune deficiencies or sinus conditions. Our goal is to remediate all issues involving mold, and therefore reduce the health concerns of our residents.

Use the following guidelines when addressing mold or mildew reported or observed at a property.

At the Office:

1. Fill out a Maintenance Request form and in doing so record the observations of the resident regarding the presence of conditions that may be favorable to mold growth, or whether the resident believes mold growth is present. If a health concern is reported, immediately contact your Property Supervisor and submit an Incident Report to the Central Office. If the resident has had the mold tested, send a copy of the test results to the Property Supervisor.
2. Treat the service request as a priority.
3. Begin to complete the Mold and Mildew Tracking Log to reflect the Maintenance Request. Maintain the Log in the management office.

At the Service Location:

1. Determine the nature and extent of conditions favorable for mold growth, or mold, if any. Determine the source of any water infiltration or excessive moisture, both interior and exterior.
2. If a source of water or excessive moisture is found, stop the leak or cause of excessive moisture and completely dry out all affected areas immediately, or within 24 hours of notification. Consult the procedures for drying out surfaces in the remediation section of these guidelines.
3. If no mold is found, send a Mold and Mildew Resident Follow-up Letter and indicate the results of the investigation.
4. If mold is found, consult the procedures for drying out surfaces in the remediation section of these guidelines.
5. Use the Maintenance Request form or the Mold and Mildew Resident Follow-up Letter to inform the resident of the corrective action completed and additional steps to be taken, if any.

Back at the Office:

1. Before determining that the remediation will require the use of outside professionals or that a unit be vacated, consult the appropriate Property Supervisor.
2. Complete the Mold and Mildew Tracking Log to reflect what action was taken.

Within 7 – 10 days:

1. Send a Mold and Mildew Follow-up Letter.
2. Log the follow-up action on the Mold and Mildew Tracking Log.

COMPLETE EVERY STEP OF THESE GUIDELINES WHEN POSSIBLE.

Inspecting and Remediating Mold or Mildew

Inspection Procedures

A visual inspection is the first step in identifying the extent of moisture damage, which may create conditions favorable for mold growth. To the maximum extent possible ceiling tiles, gypsum wallboard, cardboard, duct line, wood, carpet, paper, and other cellulose surfaces should be given careful attention during a visual inspection. Kitchens, bathrooms, windows and HVAC systems should be scrutinized for a possible mold and mildew problem. Ceiling tiles, gypsum wallboard, cardboard, duct liner, wood, carpet, paper, and other cellulose surfaces should be given careful attention during a visual inspection.

An earthy or musty odor may also indicate that mold is present. The use of a moisture meter, to measure the saturation in building materials, is useful in evaluating the extent of water damage and determining when the appropriate moisture level has been restored. Under further investigation, it may be necessary to look inside of wall cavities of filter areas to determine the extent of any water damage or mold growth.

Once mold growth is observed, the extent of any damaged area should be evaluated in order to determine appropriate remedial strategies based on EPA guidance.

Remediation Procedures

Once mold is identified, it is essential to identify and correct the underlying source of water intrusion. Otherwise, mold growth will recur. Generally speaking, if mold is either seen or smelled, it should be remediated. Thus, a visual inspection is the first step to assessing a mold service request. According to the EPA guidelines, it is not essential to identify the types of mold (i.e. test) to remediate the situation. Under certain circumstances, however, it may be important to have building materials/air tested to determine the type of mold present. Consult with the appropriate regional maintenance manager before proceeding with any testing.

If extensive (i.e., the total surface area of visible mold is greater than 100 square feet or the potential for increased resident or remediator exposure during remediation is estimated to be significant), it is important to consult the appropriate regional maintenance manager.

Sampling and Testing

Sampling and testing are to proceed only upon the approval of the appropriate Property Supervisor and regional maintenance manager.

Bulk Sampling

- Bulk or surface sampling involves taking a sample of material and performing laboratory analysis. Sampling and testing are not a prerequisite to remediation.
- Bulk or surface samples may need to be collected to identify the type of mold if occupants are experiencing symptoms which may be related to mold exposure or to identify the presence or absence of mold if a visual inspection is inconclusive (e.g., discoloration or staining).
- Bulk sampling is to proceed only upon the approval of the appropriate Property Supervisor.

Air Sampling

- Air sampling may be utilized if the presence of mold is suspected (e.g., musty odors) but cannot be identified through visual inspection.
- Any air sampling must also include an exterior air sample as a baseline sample for the ambient environmental level of mold.
- If air sampling is conducted, personnel conducting the sampling must be trained in proper air sampling methods.

General Clean up Procedures

In all situations, the underlying cause of water accumulation must be fixed or the problem may recur. A prompt response (within 24 to 48 hours) and thorough clean up, drying and/or removal of water damaged materials will prevent or limit mold growth.

The EPA has delineated three levels of remediation, based on the total area of material affected by visible mold growth. Consult Clean Up and Mold (Table 1) and the following procedures, which are applicable to the Level I and Level II remediation procedures described above:

- Wear rubber gloves or vinyl gloves when handling moldy materials.
- Wear appropriate clothing and shoes, including eye protection; during clean-up of the area.
- Turn off all HVAC equipment.
- Exercise caution around any electrical equipment or fixtures.
- Make sure the area is well ventilated at all times during the removal process. Do not fan an area where mold is present or suspected.
- Read and follow the instructions and safety data sheets (MSDS) of all chemicals used.
- Wipe all surfaces with a non-ammonia soap or detergent in hot water to remove all loose mold.
- Use a stiff brush or cleaning pad on all uneven surfaces with detergent.
- At completion, rinse all surfaces clean with water. Use a wet/dry vacuum if necessary.
- Spray or wipe to disinfect the area with a mildewcide or virucide.
- Never mix ammonia with bleach.
- Let dry overnight.
- Remove and discard all porous or cellulose materials (e.g., wallboard) that appear to have mold on them. Contaminated absorbent material should be sealed in plastic sheets. Tape the plastic sheets closed before removing from the area.
- HEPA vacuum clean the entire work area at completion. (HEPA vacuums are available at The Home Depot or similar hardware/home center type stores.)
- Wipe clean all surfaces in the work area at completion of the cleaning and removal process.
- Wash hands thoroughly and HEPA vacuum all clothes during any break and at completion of the clean-up project.

The following equipment is available at most supply stores, such as Home Depot, and is useful to have on site to deal with water intrusion and/or mold remediation:

- Moisture meter
- High efficiency particulate air (HEPA) filtered vacuum cleaner
- Disinfectant or bleach and standard cleaning detergent
- Wet vacuum
- Blowers (have on site or know where to rent)
- Dehumidifiers (have on site or know where to rent)
- Localized containment bag (2-glove bags)
- Disposable clothing (1 box)
- N-95 disposable respirators (5 pack)
- 6-mil disposable bags (1 box)
- 6-mil polyethylene sheeting (2 rolls)
- Yellow caution tape (3 rolls)
- Plastic spray cleaning bottles
- Disposable scrub brush, sponges and cloths

Clean up and Mold (Table 1) Water Damage

Clean up 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 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 under flooring is dry; dry under flooring if necessary.
Non-porous, hard surfaces (plastic, 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. • 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 specialized 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.
If mold growth has occurred or materials have been wet for more than 48 hours, consult Table 2 guidelines. 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, 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 be cleaned and dried. See the appropriate section of this table for recommended actions depending on the composition of the subfloor.

Clean Up and Mold (Table 2) Remediation Guidelines

Use professional judgment to determine prudent levels of Personal Protective Equipment and containment for each situation, particularly as the remediation site size increases and the potential for exposure and health effects rises. Assess the need for increased Personal Protective Equipment, if during the remediation; more extensive contamination is encountered than was expected. Consult Table 1 if materials have been wet for less than 48 hours, and mold growth is not apparent.

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 the Occupational Safety and Health Administration (OSHA) requires PPE and containment. An experienced professional should be consulted.

Select the method most appropriate to the situation. Since molds gradually destroy the things they grown on, if mold growth is not addressed promptly, some items may be damaged such that cleaning will not restore their original appearance. If mold growth is heavy and items are valuable or important, you may wish to consult a restoration/water damage/remediation expert. Please note that these are guidelines; other cleaning methods may be preferred by some professionals.

CLEAN UP METHODS

Method 1: Wet vacuum (in the case of porous materials, some mold spores/fragments will remain in the material but will not grow if the material is completely dried. Steam cleaning may be an alternative for carpets and some upholstered furniture.

Method 2: Damp wipe surfaces with plain water or with water and detergent solution (except wood-use wood floor cleaner); scrub as needed.

Method 3: High-efficiency particulate air (HEPA) vacuum after the material has been thoroughly dried. Dispose of the contents of the HEPA vacuum in well-sealed plastic bags.

Method 4: Discard – remove water-damaged materials and seal in plastic bags while inside of containment, if present. Dispose of as normal waste.

PERSONAL PROTECTIVE EQUPMENT (PPE)

Minimum: Gloves, N-95 respirator, goggles/eye protection

Limited: Gloves, N-95 respirator or half-face respirator with HEPA filter, disposable overalls, goggle/eye protection

Full: Gloves, disposable full body clothing, head gear, foot coverings, full-face respirator with HEPA filter

CONTAINMENT

Limited: Install polyethylene sheeting from ceiling to floor around affected area with a slit entry and covering flap; maintain area under negative pressure with HEPA filtered fan unit. Block supply and return air vents within containment area.

Full: Use two layers of fire-retardant polyethylene sheeting with a one-airlock chamber. Maintain area under negative pressure with HEPA filtered fan exhausted outside of building. Block supply and return air vents within containment area.

Table developed from literature and remediation documents including Bioaerosols: Assessment and Control (American Conference of Governmental Industrial Hygienist, 1999) and IICRC S500, Standard and Reference Guide for Professional Water Damage Restoration. (Institute of Inspections, Cleaning and Restoration, 1999); see Resources List for more information.

Material or Furnishing Affected	Clean Up Methods	Personal Protective Equipment (PPE)	Containment
SMALL – Total Surface Area Affected Less Than 10 sq. ft.			
Books and papers	3	Minimum N-95 respirator, gloves, and goggles	None Required
Carpet and backing	1, 3	Same as above	None
Concrete/cinder block	1, 3	Same as above	None
Hard surface, porous flooring (linoleum, ceramic tile, vinyl)	1, 2, 3	Same as above	None
Non-porous, hard surfaces (plastics, metals)	1, 2, 3	Same as above	None
Upholstered furniture & drapes	1, 3	Same as above	None
Wallboard (drywall and gypsum board)	3	Same as above	None
Wood surfaces	1, 2, 3	Same as above	None
MEDIUM – Total Surface Area Affected Between 10-100 sq. ft.			
Books and papers	3	Limited or Full – Use professional judgment, consider potential for remediator exposure and size of contaminated area.	Limited – Use professional judgment, consider potential for remediator/occupant exposure and size of contaminated area.
Carpet and backing	1, 3, 4	Same as above	Same as above
Concrete or cinder block	1, 3	Same as above	Same as above
Hard surface, porous flooring (linoleum, ceramic tile, vinyl)	1, 2, 3	Same as above	Same as above
Non-porous, hard surfaces (plastics, metals)	1, 2, 3	Same as above	Same as above
Upholstered furniture & drapes	1, 3, 4	Same as above	Same as above
Wallboard (drywall and gypsum board)	3, 4	Same as above	Same as above
Wood surfaces	1, 2, 3	Same as above	Same as above
Material or Furnishing Affected	Clean Up Methods	Personal Protective Equipment (PPE)	Containment

LARGE – Total Surface Area Affected Greater than 100 sq. ft. or Potential for Increased Occupant or Remediator Exposure During Remediation Estimated to be Significant			
Books and papers	3	Full Use professional judgment, consider potential for remediator exposure and size of contaminated area.	Full Use professional judgment, consider potential for remediator/occupant exposure and size of contaminated area
Carpet and backing	1, 3, 4	Same as above	None
Concrete/cinder block	1, 2, 3, 4	Same as above	None
Hard surface, porous flooring (linoleum, ceramic tile, vinyl)	1, 2, 3, 4	Same as above	None
Non-porous, hard surfaces (plastics, metals)	1, 2, 3	Same as above	None
Upholstered furniture & drapes	1, 3, 4	Same as above	None
Wallboard (drywall and gypsum board)	3, 4	Same as above	None
Wood surfaces	1, 2, 3	Same as above	None

Communicating Mold Issues to Residents

Residents may have questions or concerns regarding mold intrusion and remediation given the current media attention to this issue. In addition to the items below, should they wish to learn more about this subject, please refer them to the Environmental Protection Agency or Center for Disease Control websites.

1. A Mold and Mildew Addendum is to be signed by all new residents.

2. Keep residents informed with respect to repair and remediation issues.

3. If a condition is hazardous to a resident's health or if needed repairs pose a danger to residents, contact the appropriate Property Supervisor and Regional Maintenance Manager.

RESOURCES LIST

Center for Disease Control and Prevention (CDC)
(800) 311-3435 Information on health-related topics including asthma, molds in the environment, and occupational health.

CDC's National Center for Environmental Health (NCEH)
(888) 232-6789 "Questions and answers on Stachbotrys chartarum and other molds".

Occupational Safety & Health Administration (OSHA)
(800) 321-OSHA (800-321-6742)
www.osha.gov - Information on worker safety; includes topics such as respirator use and safety in the workplace.

MOLD & MILDEW TRACKING LOG

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Property Name_____

APT #	REPORTED BY	DATE	CONDITION REPORTED	ACTION TAKEN	FOLLOW UP DATE	FOLLOW UP ACTION	RESOLVED (YES/NO)