MASSACHUSETTS DEPARTMENT OF PUBLIC HEALTH
BUREAU OF CLIMATE AND ENVIRONMENTAL HEALTH | INDOOR AIR QUALITY
OUTREACH AND EDUCATION UNIT

QUICK REFERENCE: WATER DAMAGE RESPONSE IN BUILDINGS

Water leaks and floods within a building can result in short- and long-term damage if actions are not taken quickly. The severity of the damage mounts the longer water sits and building components and contents stay wet.

Before remediation, identify the source of the water. Water sources are classified as:

- Category 1: Clean water from sanitary sources that does not contain significant microbial contaminants. It includes precipitation penetrating through roof, walls, windows, and doors; leaks from HVAC systems or heating systems free of antifreeze; and leaks from steam pipes, water heaters, or plumbing.
- Category 2: Known typically as gray water, these water sources contain chemical and/or biological contamination that may cause illness. Sources include dishwasher or washing machine overflow, sump pump failures, and toilet overflow with urine but no fecal matter.
- Category 3: Black water sources contain pathogens and are highly contaminated. Ingestion can result in severe illness or death. Examples of these sources include sewage, toilet backflow with fecal matter, rising flood water from rivers and streams, surface water flowing into buildings, and water from heating systems containing antifreeze.

This guidance describes best practices for handling building materials damaged by Category 1 or so-called 'clean water'.

If black water is the source of the flooding, or for larger flooding events, take additional precautions:

- Contact a professional flooding cleanup/restoration contractor as soon as possible for guidance.
    - If the extent of the damage requires remediation by a professional cleanup contractor, arrange for remediation to occur quickly to prevent further damage.

Take the following steps to assess Category 1 water damage and reduce occupant exposure:

- Identify and reduce or eliminate the source of water. This may include shutting off plumbing, redirecting water, or collecting infiltration with tarps or buckets.
- If water is still coming into the building (or may return), remove as much material from the location/path as possible, particularly porous items and electronics. Pick up items from floors in the flooded area.
- Examine wet materials promptly. Do not store wet items where they can moisten other items (e.g., carpet, cloth partitions/walls). Relocate items that can be dried and discard items that cannot be dried.
- To the extent possible, move staff, clients, and visitors away from the impacted area. Use

alternative workspaces. Use barriers (e.g., plastic/tape) and signs to prevent access to wet areas and areas under remediation. For significant flooding, operations may have to be moved to a different site or be temporarily suspended.

Once you take these initial steps, remove flood-damaged building materials that cannot be dried and cleaned:

- Dry building materials as soon as possible using large fans, dehumidifiers, and heat. For fans to operate properly and for materials to dry, airflow is necessary:
    - Remove furniture in wet areas, especially away from walls and off carpets. Movers may be needed to relocate heavy items such as file cabinets.
    - Remove items such as area rugs and carpet protectors.
    - Remove plastic coving from the base of moistened walls. Coving on wet walls will peel away easily.
    - Remove items such as picture frames that may prevent walls from drying.
    - Remove and discard wet ceiling tiles. Replace ceiling tiles only after water infiltration has stopped and the area is dry. Examine the ceiling above to see if porous or electrical items may be water-damaged.
- The US EPA and the American Conference of Governmental Industrial Hygienists (ACGIH) recommend that porous materials be dried with fans and heating within 24 to 48 hours of becoming wet (US EPA, 2008; ACGIH, 1989). If porous materials are not dried within this period, mold growth may occur. Once mold has colonized porous materials, remove and discard the materials:
- Cut out and discard the wallboard that has not been sufficiently dried within 48 hours.
    - Remove and discard wallboard showing signs of mold growth, including at least one foot of additional wallboard beyond the saturation point.
    - Examine the wall cavity for additional damage, such as wet insulation. Remove any water from the wall cavity, discard wet insulation, and allow the wall cavity to dry before reconstructing the wall.
- Remove and discard carpeting that has not been sufficiently dried or that shows signs of mold growth. Consider installing carpet squares as new carpet; they are easier to replace.
- Discard and replace porous furniture (e.g., upholstered items) not sufficiently dried or that show signs of microbial growth.
- Remove water-damaged/mold-colonized building materials in a manner consistent with
- recommendations found in “Mold Remediation in Schools and Commercial Buildings” published by the US Environmental Protection Agency (US EPA, 2008).
- If asbestos-containing materials are present (e.g., pipe wrap, floor tile, interlocking ceiling tiles), perform work in accordance with applicable laws and work practices. For more information consult the Massachusetts Department of Labor Standards Asbestos Program at https://www.mass.gov/asbestos-safety-program.
- Clean non-porous items (e.g., metal, solid wood, plastic) that were in contact with water before being returned to service.
- Consult with professional restoration specialists for water-damaged items of significant value (e.g., historic documents).

Mitigate the impact of future water-damage issues in the building by:

- Storing items on shelves or in cabinets, particularly in below-grade areas. Keep valuable items/files away from windows and doors. Reduce clutter.
- Examining periodically the building envelope and surroundings for damage. Look for poorly sealed windows and doors, damaged siding and roofing, and drainage issues (e.g., gutters/downspouts) that may lead to water damage during severe weather.
- Ensuring HVAC and plumbing systems are in good repair.

- Developing a system for employees to report water infiltration or damage promptly to building management/maintenance.
- Perform building walk-throughs following severe weather (e.g., heavy rain, extreme cold) to check for and fix leaks promptly. If possible, also perform these checks during weekends of heavy precipitation to address problems that may arise when the building is unoccupied.

References

1. American Conference of Governmental Industrial Hygienists (ACGIH). 1989. Guidelines for the Assessment of Bioaerosols in the Indoor Environment. Cincinnati, OH.
2. Institute of Inspection Cleaning and Restoration Certification (IICRC). 2012. Storm Damage Restoration Recommendations. https://iicrc.org/flood-resources/
3. US EPA. 2008. "Mold Remediation in Schools and Commercial Buildings". EPA 402-K-01-001. United States Environmental Protection Agency, Office of Air and Radiation, Indoor Environments Division, Washington, DC. September 2008. http://www.epa.gov/mold/mold-remediation-schools-and-commercial-buildings-guide.

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