



Mold Growth: Prevention and Remediation

Prevention

Water damage from accidental or recurring water intrusion can result in major losses to school districts. Such losses can affect structures and personal property. If water losses are not responded to promptly and appropriately, they can manifest into a much larger problem—mold.

Remediation and public relations cost involving mold can make the cost for a water loss clean up appear minor.

Mold spores are literally present in all indoor and outdoor environments, and it will grow and multiply whenever conditions are right. Oxygen, moisture, and a food source are all mold spores need to proliferate in a building. Food sources are abundant—commonly used building materials and furnishing are excellent food for mold growth. Dust on surfaces can provide additional nutrients.

Therefore, moisture control is the only variable that can be eliminated or managed at a level to prevent mold growth. It is critical to control and remediate water intrusion within the first 48 hours after an occurrence to eliminate the possibility for mold to begin to proliferate.

Cal/OSHA recently acknowledged the significance of mold issues by adopting a new section that specifically addresses the water/mold connection. The new section includes the following, “When exterior water intrusion, leakage from interior water sources, or other uncontrolled accumulation of water occurs, the intrusion, leakage or accumulation shall be corrected because of the potential for these conditions to cause the growth of mold.”

The language focuses on what the Cal/OSHA Standards Board says is the “source of the most problematic mold growth—the uncontrolled presence of water in the workplace.”

Accidental or recurring water intrusion can be in liquid, vapor, or aerosol form and can originate from either the interior or exterior of the structure. It is not necessary to have a physical water leak to have a moisture problem; high humidity and water condensation also present a concern.

Understanding the potential sources for water intrusion can help in developing strategies to control and eliminate problems.

The following are sources of indoor moisture that could present a problem.

- Broken or leaky water supply lines.
- Leaky drains under sinks.
- Backed-up sewer lines.
- Steam or water leaks in chiller/boiler cooling and heating systems.
- Broken or plugged air conditioning condensation drain lines.
- Inoperative sump pumps in basements.
- High humidity levels from the lack of fresh air intake.
- Lack of proper attic ventilation.
- Steam from cooking and shower areas that lack proper ventilation.
- Houseplants—watering can generate large and consistent amounts of moisture.
- Carpet cleaning—water left behind from steam cleaning carpets can pose a problem if not properly dried or furnishings are placed over carpet that is damp trapping the moisture in the carpet.
- Lack of sufficient sub-floor venting.

Sources of exterior moisture can also pose a problem. The following items summarize exterior sources of moisture that can contribute to or cause mold proliferation.

- Floods from rain or broken exterior water supply lines.
- Out-of-adjustment or broken irrigation systems that allow water to contact the building while operating.
- Improper drainage around the structures allowing water to collect against or under the structure.

- Roof leaks/plugged roof drains.
- Leaks around doors and windows.
- Leaks through exterior walls and under wall sill plates that are not properly sealed.

Establishing a regular schedule for inspecting school facilities for the areas of concerns listed above can reduce the chance your district will have an indoor environmental mold problem. Listed below are the steps to follow with regard to a clean water intrusion.

Sewer or septic water contains bacteria, viruses, and parasites that are hazardous to humans, therefore, such episodes should always be handled by a qualified professional.

- Respond promptly and take the appropriate actions to ensure the building and contents can be adequately dried within 24 to 48 hours after the initial water intrusion; this will reduce the chance of mold growth.
- Stopping the source of the moisture is a priority. Obvious leaks may be easy to locate but others may take some effort to determine the exact cause.
- Remove excess water with mops or wet vacuums (or call a professional water remediation company).
- Remove wet items to a dry well ventilated area to expedite drying.
- Remove area rugs and dry thoroughly .
- Vacuum all affected carpet areas using the appropriate equipment until the area is dry.
- Carpet installed over a wood sub-floor may need to be removed to allow the moisture to be adequately removed from the wood. It is much easier to replace carpet than a wood sub-floor (contact SISC II before making this decision).

- Open all closets and cabinet doors to allow circulation within the areas to facilitate drying. If cabinets are installed on top of the carpet, the cabinets may need to be removed or vented to allow drying.
- Remove all furnishings from the room and do not replace any items until the room is completely dry. This includes bookcases and cabinets.
- Run portable fans to provide continuous air circulation until the room is adequately dried.
- Run dehumidifiers continuously until an acceptable level of dryness has been achieved.
- **Do not** use portable fans if mold has started to grow. Fans can spread the mold spores thereby increasing mold growth.
- **Do not** use the HVAC system if flooding has occurred in any of the ducts. All ducts need to be properly dried and checked for mold growth before operating the system to ensure mold spores are not spread by operation of the system.
- **Do not** turn up the heat in the room or use portable heaters in confined areas; high temperatures increase the rate of mold growth by providing a humid environment.
- If water has soaked inside the wall cavity or attic space, request professional assistance

Remediation

When planning a mold remediation project, consider the building occupants. Have there been complaints about musty or moldy odors or have any health concerns been reported? If so, notify SISC before proceeding with the remediation project. The highest priority must be to protect the health of the building occupants and the workers conducting the remediation.

There are a few issues to consider before conducting a mold remediation project. First, the water or moisture problem must be corrected or the problem may reoccur. Next, it is important to assess the size of the mold-contaminated area.

Existing guidelines utilize the surface area affected by mold growth to establish the type of personal protective equipment and containment. Containment is a barrier constructed of polyethylene sheeting surrounding the contaminated area and maintained under negative pressure during the remediation process. Negative pressure is provided by the use of a high-efficiency particulate air (HEPA) filtered fan unit (for very small containment areas a HEPA filtered vacuum may be used).

Mold contamination that is greater than 10 square feet requires the use of containment and should be addressed by a professional remediation contractor. The following guidelines are consistent with the United States Environmental Protection Agency (EPA) Mold Remediation in Schools and Commercial Buildings Guidelines. Mold contamination that encompasses less than 10 square feet does not require containment and can be handled as a standard custodial task or maintenance operation as long as the employee(s) performing the clean up is wearing the appropriate personal protective equipment. Listed below are the minimum requirements.

- Half-face respirator with N-95 filters
- Gloves
- Goggles

It is important when conducting mold remediation projects that they are conducted after hours or when the building occupants are not present. Mold spores can be released when mold contaminated materials are disturbed. The following information is the EPA's methods for cleaning practices.

- **Method 1: Wet vacuum** affected areas to remove moisture. 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 carpet and some upholstered furniture.
- **Method 2: Damp-wipe** surfaces with plain water or with water and detergent solution (except for wood: use a wood floor cleaner), scrub as needed
- **Method 3: Vacuum with a 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** water-damaged materials and seal in plastic bags while inside containment, if containment is present. Dispose as normal waste. HEPA vacuum area after it is dried.

The following is a list of materials that have been affected by mold growth caused by clean water and the cleaning methods that should be used.

Type of Material	Cleaning Method
Books and papers	#3
Carpet and backing	#1, #3
Concrete or cinder block	#1, #3
Hard surface, porous flooring	#1, #2, #3
Non porous hard surfaces	#1, #2, #3
Upholstered furniture & drapes	#1, #3
Wallboard (drywall & gypsum)	#3
Wood surfaces	#1, #2, #3
Ceiling tiles & panels	#4

Materials that do not appear to be responding appropriately to cleaning should be discarded.