

Preventing and Mitigating Mold and Mildew

The Schoolchildren's Health Act of 2006 amended G.S. 115C-12 to add a new subdivision (33), which addresses prevention and mitigation of mold and mildew in schools.

Mold (often used interchangeably with the word "mildew") is the common term for a variety of fungi which feed on organisms or dead organic matter. Molds produce tiny spores to reproduce, which spread through the air. Therefore, molds can be found almost anywhere; they can grow on virtually any substance. Mold needs both a food source and moisture to grow. By far the easiest to control within a building is moisture. *To keep mold and mildew from growing in a building, limit the moisture.* Moisture problems in school buildings can be caused by a variety of conditions, including roof and plumbing leaks, condensation, and excess humidity levels.

Follow good design practices to keep moisture out of the building.

- Design roofs for positive drainage; design flashing with appropriate height to prevent water intrusion over the top of flashing.
- Detail flashing appropriately at wall openings such as windows and doors; provide weep holes at adequate spacing.
- Do not rely on caulking alone to prevent water intrusion.
- Design cavity walls rather than composite walls; use "drainage" construction configurations rather than "barrier" types.
- Ensure that finish grade is 8" (6" min.) below finish floors.
- Base-of-wall flashing should weep to the exterior at least one brick course below finish floor level, and be integrated into the interior wythe several inches above finish floor.
- Carefully design any changes in floor levels, conditions where finish floor is below finish grade, retaining wall conditions, and other situations where waterproofing, foundation drains, and the like would be used.
- Detail vapor barriers with type and position, as appropriate to building function and geographic location.
- Reduce the potential for condensation on cold surfaces (i.e., windows, piping, exterior walls, roof, or floors) by adding insulation.
- Provide ventilation for space above uninsulated soffits.
- Outbuildings: provide good natural ventilation, high and low, and provide durable and easily cleanable finish materials.

Design and maintain HVAC equipment to control moisture accumulation.

- Maintain low indoor humidity – below 60% relative humidity (RH), ideally 30-50%.
- ASHRAE standards for ventilation rates can be reduced to 7.5 cfm per person in classrooms in N.C. Ventilation air is perhaps the largest moisture source in schools.
- Adequately vent showers and other moisture-generating sources to the outside. Use exhaust fans whenever cooking, dishwashing, and cleaning in food service areas. Vent moisture-generating appliances, such as dryers, to the outside.
- Keep HVAC drip pans clean, flowing properly, and unobstructed.
- Perform regular equipment inspections and maintenance as scheduled.

Follow good building maintenance practice to keep moisture out of the building.

- Maintain roofing and flashing, and repair leaks promptly, to prevent water intrusion into the building. Clean and repair gutters regularly.
- Insulate roof drain leaders, and other "cold" piping, to prevent condensation.
- Repair voids in caulking; cut-out and replace caulking as part of on-going maintenance.
- Ensure that weep holes are maintained clean and open.

- Do not allow water to accumulate against building walls. Ensure positive drainage away from building.
- Watch for and repair cracks and other breaks in the building envelope, which could allow moisture to enter.
- Clean and dry any damp or wet spots within 48 hours. Remove mold and mildew quickly, AND determine and correct the source of the problem (dampness).



An example of a hospitable environment for mold growth is on gypsum board and the back of vinyl wallcovering, especially on an exterior wall, and especially if migrating water vapor, or water leaking through the wall construction, provides the necessary moisture.

The food source here is the glue on the wall covering.

Source: Paul Ellringer, PE, CIH

Potential health effects and symptoms associated with mold exposures include allergic reactions, asthma, and other respiratory complaints. See the website for the Center for Disease Control and Prevention, at www.cdc.gov/

Mold Remediation.

Assess size of the moldy area. Consult a qualified professional if necessary or desired. Consider the possibility of hidden mold. Examine the underside of carpet or wall coverings, interior lining of ducts and air handling equipment, etc. Select cleanup method (see EPA publication listed below). Select containment equipment – protect building occupants. Keep building occupants informed of procedure and progress. Discard moldy porous items that cannot be cleaned.

Additional Resources.

For additional information from State Agencies, see...

<http://www.epi.state.nc.us/epi/air/schools.html>
<http://www.epi.state.nc.us/epi/pdf/LEAletter.pdf>

From the National Clearinghouse for Educational Facilities, you can download the publication “Mold in My School: What Do I Do?” at...

<http://www.edfacilities.org/pubs/mold.html>

You can also read the U.S. Environmental Protection Agency (EPA) guidelines, *Mold Remediation in Schools and Commercial Buildings*, at http://www.epa.gov/iaq/molds/mold_remediation.html . Also, see these Web sites for more indoor air quality tools for schools:

<http://www.epa.gov/iaq/schools/tfs/guidtoc.html>
<http://www.epa.gov/iaq/schools/tfs/guideh.html>
http://www.healthyschools.org/guides_materials.html

Many other sources of information, both from private industry and from governmental agencies, are available on the Web.