

PRO Construction, Inc.
Responsibility: Project Managers/Assistant Project Managers,
All Field Management, Subcontractors

MOLD PREVENTION POLICY

Overview

Moisture control is the key to preventing mold growth. Materials that are dried within 24-48 hours will usually not experience mold growth. If materials become wet or mold growth is found, the Corporate Office should be contacted immediately.

Introduction to Molds

Molds are microscopic fungi that can easily grow and reproduce rapidly, producing spores and mycelia in the process. White molds will occur naturally at low levels everywhere on the planet, molds are undesirable when they grow where we don't want them - most importantly in our construction projects. This policy addresses mold growth that can happen as the result of moisture or water intrusion in our construction projects.

Mold can grow on virtually any organic substance, as long as moisture is present. There are molds that can grow on wood, paper, carpet, foods, and insulation. When excessive moisture accumulates in buildings or on building materials, mold growth will often occur, particularly if the moisture problem remains undiscovered or unaddressed. It is impossible to eliminate all mold and mold spores in the indoor environment, however; mold growth can be controlled indoors by controlling moisture indoors.

Molds reproduce by making very small spores that usually cannot be seen without magnification. Mold spores blow through the indoor and outdoor air continually. When mold spores land on a damp spot indoors, they may begin growing and digesting whatever they are growing on in order to survive. Molds gradually destroy the things they grow on.

Since mold requires water to grow, it is important to prevent moisture problems in buildings. Moisture problems can have many causes including leaks and condensation resulting from relative humidity greater than 60%. Building materials, such as drywall, may not allow moisture to escape easily. Moisture problems may include roof leaks, landscaping or gutters that direct water into or under the building, or unvented combustion appliances. Delayed maintenance or insufficient maintenance is also associated with moisture problems.

Moisture Control is the Key to Mold Control. If we keep things dry, molds do not grow.

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How to Avoid Mold During Construction

There are three primary ways to avoid mold during construction:

1) The best way to avoid mold during construction is to prevent materials that allow mold growth from getting wet. This can be done by insuring that mold-susceptible materials that are stored on site are kept dry and that mold-susceptible materials are not installed until the building is waterproofed and conditioned. For example, gypsum board should be stored in a dry condition and should not be installed unless water penetration has been stopped and the HVAC system is installed. This usually means that the roof and building enclosure, and HVAC system should be installed before the gypsum and/or wood products are installed when possible. Sometimes this is not practical and any exception to this should be approved by the Corporate Office. If an exception is approved, temporary dry in measures should be taken.

A detailed weather protection plan for all areas of exposure should be prepared, with a sufficient budget to implement the plan. There are options that can help mitigate the risk of mold if the Owner determines that the schedule cannot allow for the building to be completely enclosed and conditioned before any gypsum board is installed. For example, standard gypsum board can be replaced by moisture resistant board with an inorganic coated glass fiber mat. An example of this is Ultimate DensArmor™ Plus Interior Guard which is not the same as green board or Densglas™ The glass fiber mat is more costly both in material and installation cost initially but may be cost effective in the end. Another option is to incorporate dehumidifiers into the permanent HVAC system or temporary dehumidifiers during construction. Another possibility is to ask the Owner to conduct a "peer review" on the mechanical design including a dew point analysis on the walls to see where moisture will accumulate. All of these options should be presented in writing to the Owner for review and consideration. A response should be requested from the Owner on these options.

2) Another way to avoid mold during construction is to manage water after it enters the building. A Water intrusion Event occurs whenever water infiltrates any structure or materials related to a project that may be conducive to mold. Once drywall, wood and insulation are present, all water intrusion events should be reported. However, if water entered the building and the only material erected was steel then a water intrusion event would not need to be reported. Assign for each project a person from the site management team to be responsible for routine inspections and promptly reporting potential incidents of water intrusion and mold growth.
Responding to a water intrusion event within 24-48 hours can Prevent mold growth.

3) The third way to avoid mold during construction is to insure that all materials delivered to the site do not have any visible mold growth or dampness. For especially sensitive materials like wood, moisture content can be measured. The portion of materials that have mold growth or dampness should be rejected and sent back to the vendor. To best avoid any water damage, the transportation of materials to the construction site shall be determined in advance and the reception, intermediate storage and protection of the materials should be thoroughly reviewed and planned.

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What you should do when water enters the building

Upon any water intrusion event where there are materials susceptible to mold, you should immediately do the following:

- Stop the water intrusion
- Notify Corporate office immediately.
- Identify the source of the water
- immediately remove excess water
- Use fans and dehumidifiers, if appropriate, to accelerate drying (never use fans if visible mold is present)
- Expose areas where water is trapped
- Take photographs throughout the process
- Verify complete removal of moisture.
- Check area for mold growth periodically for at least 4 days after it completely dries.
- Prevent further water intrusion events

All of the above items should be done and checked off when there is a water intrusion event.

Action Plan Upon Discovering Mold

Immediately upon discovery of a mold condition, stop the water source and then contact the Corporate office (even if they were previously notified for a water intrusion event). DO NOT COVER UP MOLD GROWTH.

You must contact the Corporate Office before you attempt to clean up the visible mold. Use the proper mold remediation guidelines for relatively simple cleaning of small quantities of mold. However, repairs for a substantial mold problem must be performed by professional abatement contractors and typically include sealed containment with negative pressurization and full body suits and respirators. This broad range of remediation possibilities makes it imperative that you contact the Corporate Office to ensure that you are taking safe and effective remediation measures.

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HOW TO HELP THE OWNER AVOID MOLD AFTER CONSTRUCTION IS COMPLETE

When PRO Construction, Inc. completes a typical building, the Owner has the responsibility for the building's maintenance, unless the contract documents require additional services. Many times mold problems arise from poor maintenance even if the building was "clean" at turnover. As noted above, mold needs moisture to grow and many items that occur during the operation of a building can create the proper circumstances for mold growth.

Although it is not our responsibility to perform maintenance, we should give our clients helpful information when we can. Some areas of concern during operation that relate to water intrusion and/or mold growth are as follows:

- HVAC should be operated so that the relative humidity stays below 60%. There may be short time cost savings in turning the HVAC system off at times or in certain parts of the building but if the building maintains too much moisture then mold will grow. Additionally, it is important to have the test and balance performed as soon as possible after completion.
- The building envelope should have regular inspections including checking the caulk joints and weeps to insure they are functioning properly.
- Exterior landscaping and grading should be maintained to slope away from the building. Bushes and trees near the building should be trimmed so that sunlight and ventilation can reach the building. Irrigation should be directed away from the building.
- Water used for cleaning (both interior and exterior) should not be allowed to seep into locations or materials that may be conducive for mold growth.
- Water that may enter the building either from overflow of toilets, inadequate drainage of condensate pans and lines, or other sources should be immediately cleaned up and dried.
- Owners should immediately dry out any wet materials in the building. if it can be dried within 48 hours, mold can almost always be avoided.
- If possible, sit with a representative of the Owner and discuss operation and maintenance issues. Maintenance is critical in order to prevent mold growth. These issues should be reviewed in a face-to-face meeting and documented. After the meeting, you should follow up with a letter.

PRO Construction, Inc.
MOLD PREVENTION/WATER INTRUSION PLAN

PRE-JOB TASKS

Project management and workers trained in importance and methods of preventing mold growth.

- Keep interior materials dry - prior to, during and after installation
- Do not install wet building materials
- Report any water damage, leaks or intrusion to project manager immediately
- Dry out any water damaged materials as soon as possible
- Build in strict accordance with designs and specifications
- Immediately alert architects to designs that may allow water intrusion or moisture accumulation
- Question "conceptual only," inadequate architectural detailing or outright improper building plans

During the design phase, carefully review the details with specific attention to ensuring an impermeable envelope.

Consult an envelope engineer on geometrically complex buildings and all design-build projects for a third party opinion on the water tightness of the envelop. A review of flashing details is especially important.

On a renovation or addition, carefully survey the existing building before construction begins. Look for discoloration in finished surfaces or a musty smell. It is possible that a pre-existing mold problem can become the contractor's problem once construction begins.

Develop the project schedule with envelope construction completion as a predecessor to installation of finishes. This maybe impossible on some projects; if so, have a detailed weather protection plan for all areas of exposure and establish a sufficient budget to implement the plan. Be prepared to discuss/defend effect on schedule and cost of the Water Intrusion Plan. Establish a partnering program with the owner and promote a peer review for the mechanical system and the building envelope designs.

Carefully document any recommended changes to the Architect of Record. On standard Owner-Architect-Contractor project delivery methods, the Architect's approval must be attained. In the event the recommendation is rejected, reiterate the recommendation in writing, copy the owner and file it.

Pre-qualify potential subcontractors and ensure that the subs have adequate experience in the specific application being bid.

Consult manufacturers of moisture critical products to confirm the product's application and recommend standards details, and provide preferred installers.

Delivery of interior materials (e.g. dry wall, paneling, ceiling tiles, framing lumber):

Schedule so materials will arrive after exterior of building has been sealed or ensures that temporary protection has been provided.

Provide for dry storage of materials — off ground away from moisture sources.

Minimize storage time.

Plastic sheeting or traps used to cover materials are secured loosely to allow air circulation.

Pre — arrange for drying equipment

Fans

Dehumidifiers

Wet — Dry vacuums

“Super Sucker” trucks

DURING CONSTRUCTION CHECKS

Preconstruction meetings on critical items

Exterior skin — curtain wall, etc.

Roofing

Mechanical system review

All materials inspected upon delivery for pre-existing mold contamination.

Interior materials installed in dry condition — per manufacturers' specifications.

All water services (including fire sprinklers) and waste lines checked for:

Proper installation

Connections properly made and checked for leakage

Water lines (particularly chilled water) properly insulated

Have multiple inspectors for filling or hydro test of sprinklers

All building penetrations properly installed and checked for leakage:

Doors Windows

Balconies and decks

Roof membranes — lapping at corners and joints

Ventilation/exhaust ducts

All tears, openings or punctures in vapor barriers have been repaired.

All flashing and caulking checked for proper lapping, application and installation.

All roof drains drain away from the foundation.

Roof drains properly supported and braced for large volume storms and check for blockage.

All moisture-generating equipment vented outdoors.

Surrounding ground sloped away from foundation.

Proper ventilation to attics, crawl spaces or other enclosed areas.

The site will be inspected each day to ensure that all doors and windows are closed when leaving the site or when weather threatens.

All building openings will be secured to prevent moisture entry during storms.

HVAC system

Ensure the correct filters are properly installed — ASHRAE Dust Spot.

Efficiency per specifications, no filters missing or misaligned.

Drip pan for cooling coils drains properly.

No insulation on interior of ventilation ducts — bare, galvanized sheet metal preferred.

All ducts joints sealed.

The system is cleaned and commissioned. Third party certification of HVAC (test and balance report). The American Society of Heating Refrigerating and Air Conditioning Engineers has published a good practice commissioning procedure (ASHRAE Guide# 1).

Documentation of critical installations, including photographs.

Use EIFS installers that follow performance standards, specification, and methods of application guidelines from the EIFS Industry Members Association. (www.eima.com)

Perform interim inspections; invited the Architect, Envelope Engineer, Mechanical Engineer, manufacturer's representatives to inspect for mold related issues.

POST - CONSTRUCTION CHECKS

Have manufacturers inspect installations for warranty purposes.

Facility owners briefed on the responsibilities to prevent mold growth (including the importance of the proper maintenance of the HVAC systems).

Fix leaky plumbing and leaks in the building envelope as soon as possible.

Watch for condensation and wet spots. Fix source(s) of moisture problem(s) as soon as possible.

Prevent moisture due to condensation by increasing surface temperature or reducing the moisture level in air (humidity). To increase surface temperature, insulate or increase air circulation. To reduce the moisture level in air, repair leaks, increase ventilation (if outside air is cold and dry), or dehumidify (if outdoor air is warm and humid).

Keep heating, ventilation and air conditioning (HVAC) drip pans clean, flowing properly and unobstructed.

Vent moisture-generating appliances, such as dryers, to the outside when possible.

Maintain low indoor humidity, below 60 percent relative humidity (RH) < ideally 30-50 percent, if possible.

Perform regular building/HVAC inspections and maintenance as scheduled.

Install and maintain proper air filters.

Clean and dry wet or damp spots within 48 hours.

Don't let foundations stay wet. Provide drainage and slope the ground away from the foundation.

Ensure new building penetrations are properly sealed.

Ensure landscape watering system does not spray building foundation.

Final visual inspection of:

- Pipe chases

- Utility tunnels

- Areas above drop ceilings that are exposed to water or waste lines or that are directly below roof