

Finished basement best practices – Mold & Moisture

This guide is moisture/mold focused and does not consider other potential basement issues: radon, accessibility, local codes/ordinances, fire safety, combustible gases, monsters, cellar ghosts, etc. Please seek the advice of qualified professionals.

Basements are common in the Northeast and Midwest of the US in residential housing. Many basements are subject to occasional and/or chronic moisture and water intrusion. Typically, basements are constructed with a poured slab floor, foundation walls of cement block, poured concrete panels or historically fieldstone and rock. All of these rock/concrete materials are non-organic and do not support mold growth (The dust/debris that builds up on these surfaces over time DOES support mold growth). The basement ceiling is the underside of the floor above and is typically built from wood joists and wood subfloor. These wood materials are vulnerable to water damage and mold. When basements are “finished”, more mold and moisture vulnerable materials are added to the space. Even when mold is not visible on the room-side, there may be un-seen growth on the backside of drywall.

Mold spores are everywhere, but they need a source of water or moisture to grow. Water and moisture issues in basements are not just limited to flooding and active leaks. Many times, issues are created by vapor transmission (water vapor penetrating concrete/block to enter the basement) and humidity. In the very few basements where flooding, humidity and vapor transmission are not issues, there are always potential plumbing leaks to

consider. Is that tub drain going to last forever? Is that the cheap PEX pipe the plumber used?



Figure 1-heavy mold basement drywall

Some historically dry basements are later affected by moisture/flooding due to changes in the neighboring environment and adjacent properties outside of your control. (construction, grading, paving, vegetation removal). You can't choose your neighbors and sometimes they don't know that the changes they're making are affecting you. Your basement could be dry for 30 years and some yahoo developer builds a long driveway a quarter mile away and now you have an indoor swimming pool....whoops. Have fun proving that in court.

- **Is my basement a good candidate for creating a finished space?**
 - Is there a history of flooding during rain? Not a good candidate.
 - Is there evidence of efflorescence (white, powdery salt deposits) along many of the block foundation walls? Not a good candidate.
 - Is humidity during spring and summer months regularly at 60%RH or higher? (un-managed by a mechanical dehumidifier). Not a good candidate.
 - Is your house built into the side of a mountain? How about next to a lake? Is your foundation old, gnarly and full of holes? Probably not going to be ideal.
- **Best practices for water/moisture mitigation**

- **Exterior water** – Stop water from getting in. Next time you get a heavy rain, go outside for a walk around your house. Bring an umbrella. Look for overflowing gutters, puddling around the foundation, underground drains that back up.
 - **Grading.** Slope soil around the house away from the foundation. Goal for a drop of 6" in 10 feet. Look for and get rid of depressions/puddles.
 - **Gutters/Downspouts.** Clean and maintain – clogged, leaky or undersized gutters allow rain water to collect around foundation. Extend downspouts minimum 5' away from foundation. Maybe you need to upgrade the 5" wide gutters to 6" wide for greater capture and capacity?
 - **Exterior foundation.** Seal cracks and gaps. If you've got a big bag of money, excavate around the foundation and install waterproof membrane and/or exterior French drain.
- **Interior water/moisture** – mitigate the water/moisture after it gets in
 - **Interior French drain + sump pump.** Installed around the perimeter, it captures water that penetrates the foundation and collects for sump pump to remove.
 - **Mechanical Dehumidification.** Can be as simple as 1 standalone dehumidifier or maybe multiple units or a full basement dehu system, depending on size and how the space is broken up. Goal for 50% RH throughout the entire space. (including crawlspaces and all rooms/closets) all year round. *Those basement vent systems (Wave, humidex) rarely work. Don't bother*
 - **Seal/Coat block.** Only really effective in holding back milder vapor transmission. If the block is wet and/or there is heavy efflorescence, the coating will fail (even if the label says encouraging things like "extreme!" or "holds back lots of static pressure". Expect to need to clean and re-coat every few years.
- **Best practices for refinishing**
 - **Don't refinish.** Do you really need that finished space? Sure, it would be cool to have a nice family hangout spot or a place for the kids to play. But, you know what else is cool? Not having a moldy basement and expensive remediation. Take that refinishing money and get a camper or put in a patio. Just a thought.
 - **I'm going to do it anyway.** Ok, but leave enough space between your finished walls and exterior foundation walls for access, dehumidification and periodic repair/inspection. Yes, it takes away from your total usable space but saves you a lot of long-term regret. No matter how much you've prepared, it's going to get wet eventually (plumbing leak, power outage, 500-year storm...water always finds a way). So plan for easy ways to maintain and repair.
 - **For your consideration, the Minimalist Finished space.**
 - Don't close the ceiling. Maybe paint it black. Install dimmable LED lights.
 - Stucco the walls. Give it that Tuscan village or modern man-cave look. (DIY or Mason)
 - Do a poured epoxy floor or get the existing concrete polished. (Painter or flooring contractor) Put down some cool area rugs. If they get wet, you can roll them up and take them outside to clean & dry.
 - Doesn't look like your creepy Uncle's paneled basement from 1971.
 - **Traditional finishing with a better budget**
 - Did you get that interior French drain installed? Do it before your frame and close up the walls.
 - Your basement is dry now, but you don't know if it occasionally gets wet? Ok, maybe wait a year and see what happens before you commit.
 - Get all that plumbing looked at while it's open and easily repaired/upgraded.

- Framing: Galvanized steel studs for framing instead of 2x4s. No rot, no mold. If they get wet, worst that happens is you have some rust. (Remember to leave some room between framing and block foundation – you will need/want access eventually and you might need to have a dehumidifier back there!)
 - Insulation. If you must insulate – use rigid foam board, not batt insulation with paper facing. Insulate the finished wall, not the foundation.
 - Finished walls: PVC, FRP, Cement or fiberglass wall panels. Again, no rot or mold. No drywall, no wood, no hardboard, no MDF. There are some really great looking PVC panels out there so design is not limited.
 - Ceiling: Exposed ceiling still an option here. Clean it up, paint it a dark color. Drop ceiling is second best, use PVC or fiberglass tiles. Inorganic, so resistant to drips, leaks and humidity. Aluminum is a good choice as well, not as good a sound insulator but it looks cool. If you insist on drywall, go with mold/moisture resistant. Cut in a few access panels around upper floor kitchen/bath drains and junctions.
 - Flooring: (Forget carpet, just don't do it). Consider the poured epoxy, polished concrete, etc. Tile is good, if the grout is sealed. LVP or LVT (vinyl) flooring are good choices, but make sure the subfloor installed is foam or PPE (nothing with organic material)
 - Area rugs. Warms it up. Can be easily taken out for cleaning/drying as needed.
 - Trim/molding – PVC is ideal. Lots of designs. No wood.
- **Cheap traditional (or to try and rehab an existing finished basement installation.)**
- Still consider metal studs instead of wood. Depending on pricing, might be cheaper or the same price.
 - If you insist on drywall, Mold/moisture resistant drywall (green at least, purple is better). If you have a huge pile of regular drywall already and insist on using it, paint both sides before hanging. Helps resist humidity.
 - Cut your drywall up from the floor 2-3 inches. Keeps it from sucking in moisture through the floor or from minor flooding. Cover the gap with higher base trim (PVC ideally)
 - Ceiling tiles – if you've got that drop ceiling, consider replacing those nasty, old tiles with newer moisture resistant ceiling tiles. They even have waterproof ones. Too expensive? Clean and paint your old tiles to maintain and the paint will give them a bit of moisture resistance. Paint both sides.
 - Finished walls tight up against the foundation walls and all the moisture is trapped back there? Up the mechanical dehumidification and install some return air filter grilles into walls to allow



Figure 2-mold under basement carpet

air flow. Just cut holes in the drywall and put these over. Doesn't look out of place and allows drier air in and moist air to escape. Not ideal, but it helps.

- Furniture and fixtures and decorations.
 - Non-porous and non-organic materials are best. Wood can absorb moisture. Big, ole fluffy couches collect mold spores, humidity and moisture. Wicker is not great for moisture/mold resistance and looks like the set of The Golden Girls. Try one of those imitation leather couches.
 - Don't put cheap chipboard and MDF cabinets against the walls full of stuff. Any humidity that makes it through the wall is going to suck right into them and make a mold community.
 - Putting in a bar? Ok, but wet bars are wet. Kegerators leak. Drunks spill stuff. Be aware of condensation and clean it regularly/often. Consider stainless for the bar, maybe granite or something else moisture/mold resistant than wood?
 - Work out room and exercise equipment? (Your dedication to your health is inspiring, you should start an Instagram or something). I know it's not Planet Fitness and technically nobody is making you wipe it down when you're done – but do it anyway. That Peloton is covered with sweat and skin cells. Mold loves that.
 - Basement fridge or freezer? Wipe it down, keep it clean and let it breathe. That compressor kicks out a lot of heat and if you stick it in a tight hole against a cold wall, condensation may follow.
- Maintenance
 - Dust is a great food for mold. It's mostly made up of dander – dead skin cells. Organic and delicious if you're mold. Vacuum often. HEPA vac is best.
 - Check your dehumidifiers 2x year. Clean the filters. Confirm operation and that they're actually dehumidifying the air. Get some inexpensive thermometers with humidity to check. If you went with the Home Depot residential dehu, expect to replace it about every 5 years.
 - Clean. Yes, do your regular cleaning, but at least 2x year, do a full, crazy clean. Vacuum the ceilings, walls and under all furniture. Move stuff around so you can find where the kids spilled something and never told you. Flip the couch, clean the underside.
 - Got a pool table? Good for you. Now clean it regularly. Vacuum underneath and try to blow dust out of the holes and inaccessible tubes. Good luck.
 - Inspect. Get into those unfinished and interstitial spaces if you can. Bring a flashlight. Look for water or mold staining. Seeing cave crickets? They love moist places. Why is there a moist place in your basement?? Do you want mold?

Can you finish your basement and make additional living space for you and your family? Sure, you can do it. Just make sure you're not creating a mold habitat at the same time. However, if you do end up with mold – give us a call!

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