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IF THIS REPORT IS REQUESTED AS PART OF A REAL ESTATE TRANSACTION, ANY DISCUSSIONS OR DECISIONS SHOULD BE MADE WITH YOUR REALTOR OR LEGAL REPRESENTATIVE. IT IS NOT OUR INTENT OR RESPONSIBILITY TO NEGOTIATE FOR EITHER PARTY.

RE: REPAIR OR RESTORATION WORK RECOMMENDED ON THIS REPORT, THE USE OF LICENSED TRAINED AND QUALIFIED PROFESSIONALS IS ALWAYS ADVISED.

Observations during the visual moisture and mold investigation

On Wednesday, August 13, 2009, we were contracted to investigate concerns about mold and moisture, expressed by the prospective purchasers at:
2718 Guilford Ave., Baltimore, MD 21218

Interview:

We began our investigation by interviewing the prospective purchaser regarding any known building related symptoms or abnormal health concerns. He had some concern regarding predisposed allergies.

Scope:

We evaluated the exterior and grading around the outside of the home. We continued our investigation inside the home systematically examining the walls and personal belongings for evidence of visible mold growth.

Conclusions:

Before we began our investigation, a stale or musty odor could be noticed in the home upon entry.

We began our investigation in the basement where the smell of obvious mold growth was pungent and consistent. The odor associated with mold and mold growth is MVOC, microbial [volatile organic compounds](#), or let's call that a gas, which cannot be quantified with spore traps or surface samples.

There is active and dormant mold growth on most of the visible walls in the basement. We identified the mold, on-site, as the humidity-condensation type, Aspergillus. There are a number of factors with this type of mold growth, including high humidity and condensation from temperature differential. The humidity measurement taken during the investigation exceeded 85%. This level will easily allow for mold growth. Review some of the pictures below and the white mold, which may look like dust, can be seen growing on the wall surfaces. As a point of reference, 1 in.² of Aspergillus mold can produce one million spores.



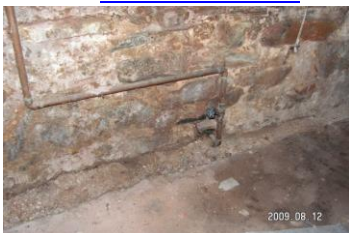
I could go on with the pictures, but I believe you get the point.

This same mold could be seen on the first floor joists.



This is a good time for a little building science background:

Buildings used to be constructed over cellars. Cellars were dank, dark places where coal was stored. People never intended to live in cellars. Now we have things called basements that have pool tables, media centers and play rooms. Cellars were easy to construct – rubble, stone, bricks and sometimes block. If they got wet or were damp so what? Basements are different. They are not easy to construct if we intend to live in them. They need to be dry, comfortable and keep contaminants out. Due primarily to the cost of homes, over the last 50 years, there has been a notable expansion of living space. The useful conditioned space of building enclosures is expanding to the outer edge of the building skin. Attics, crawlspaces, garages and basements are valuable real estate that are being used to live in or used for storage or places to locate mechanical systems. Basements are viewed by many as cheap space that can easily be incorporated into a home. Keeping basements dry, comfortable and contaminant free is proving to be anything but simple. Things are further complicated, in Maryland, due to the building code requirement that interior footer drains, (referred to as French drains), be installed under the basement floor, when 95% of the time they belong outside of the foundation perimeter. Please understand that interior drain tiles are designed to control sub-terrain occurring hydrostatic water pressure. (high water table). Over 90% of basement moisture issues begin with surface rain water, not ground water, yet the interior drain tile is designed for ground water control. Regarding this house on Guilford, this house was built before drain tiles were mandatory. This home has a [trench drain](#), along the front wall, that is commonly confused with a [French drain](#).



The trench drain, located along the front of his home, was placed there to contain surface water that intrudes from time to time, along the front wall.

The finished portion of the basement has had a retrofit French drain, or trench drain, or waterproofing system, installed which terminates in the sump pit.

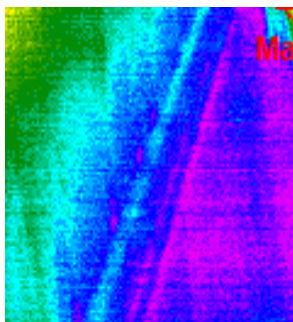


Unfortunately, this system is needed throughout the entire basement and especially along the front wall. The current system should be retrofit to include a full interior drain tile loop.

The finished basements building materials that are in contact with the concrete portion of this system are currently wet. When using a hand-held moisture meter, they registered full saturation.



When examined with a thermal imaging camera, the blue areas are indicative of condensation which will allow mold to grow on the interior surface and behind the walls.



The fundamentals of groundwater control date back to the time of the Romans: drain the site and drain the ground. Today that means collecting the runoff from roofs and building surfaces using gutters and draining the water away from foundation perimeters. Roof and façade water should not saturate the ground beside foundations. Grade should slope away from building perimeters and an impermeable layer should cover the ground adjacent to buildings. The way this is accomplished, in most states, is a free draining layer of backfill material or some other provision for drainage such as a drainage board or drainage mat should be used to direct penetrating groundwater downward to a perimeter drain. Of course the problem, in Maryland, is we do not have an exterior perimeter drain tile. The black stuff we watch builders spray on the exterior is *damp proofing* not waterproofing.

Capillary breaks, on footers, are not common. They were not needed when basement perimeter walls were un-insulated and unfinished on the interior, because these conditions permitted inward drying of the migrating moisture. For finished basements they are an important control mechanism. Without them, and we never see those in Maryland, moisture constantly migrates through the foundation, and then into the building materials. That's one reason your basement can smell like a basement (musty).

Unfortunately, when this basement was retro fit into living space, it was not retro-engineered to compensate for interior drying.

The structural elements of below grade walls are cold (concrete is in direct contact with the ground). The main problem with below grade walls comes during the summer when warm moist air comes in contact with basement cold surfaces that are below the dew point of the interior air. This situation is greatly exacerbated with the addition of air conditioning to a home that was not designed for air conditioning. The density of the cold air settles to the already cool floor and exacerbates dew point moisture. Currently this home does not have central air conditioning; however, the prospective purchaser was considering that addition.

Basement walls should be insulated with non-water sensitive insulation that prevents interior air from contacting cold basement surfaces – the stone structural elements and the rim joist framing.

All this being said, this basement is not designed for living space. While living space can be accommodated through a number of engineering techniques, a basement like this is best left to storage in airtight containers and large dehumidifiers to control the relative humidity.

The vegetation in the front of the house should be removed to allow for better grading along this front wall.



A layer of plastic should be put down to allow for a waterproof membrane against a home.



The downspout should be extended to keep rainwater away from the home.



Once again, if living space is desired in the basement then these additional engineering techniques should be accomplished to prevent vapor intrusion:

1. Improve the grading around the entire home and repair or install proper window well covers to prevent water intrusion and to assist with vapor intrusion.



2. Install at least one low temperature dehumidifiers, configured in a continuous operation mode to prevent the need for constant emptying of the condensation buckets. The relative humidity needs to be kept below 60%
3. Remove any building materials that touch the foundation walls since this is allowing moisture via capillary action.
4. Have a complete interior drain tile waterproofing system installed.
5. Have a qualified mason [repoint](http://video.about.com/homerepair/Tuck-pointing-basics.htm) the brick work along the front wall.
<http://video.about.com/homerepair/Tuck-pointing-basics.htm>
6. Consider a certified mold remediation contractor to clean or remove the building materials and to disinfect the floor joists.

Please feel free to call me with any questions about this report;

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