CAHI™ CONNECTICUT ASSOCIATION OF HOME INSPECTORS, INC.

MONTHLY

News and Views from the Connecticut Association of Home Inspectors, Inc. July 2008

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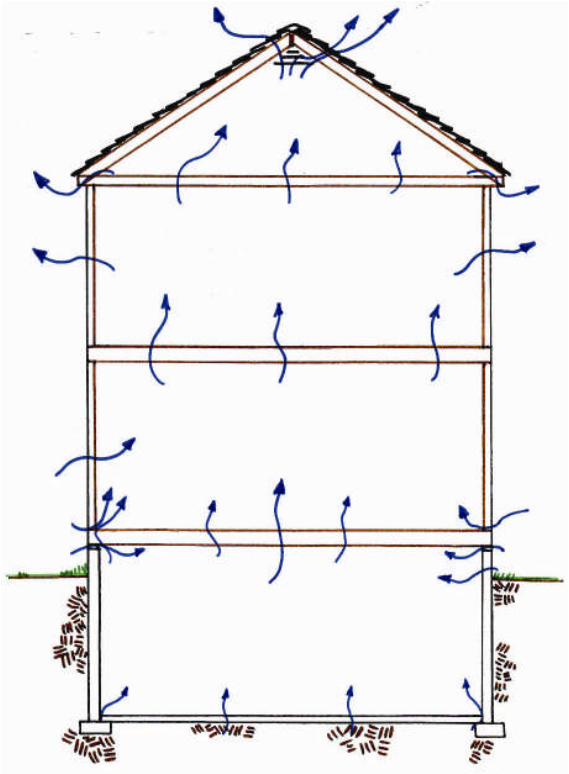
Your Basement is Valuable Space

Your basement is useful space, easy to heat and cool, and easy to finish. And a home buyer will expect your basement to be dry. Since you can spend a lot of money and not get the result you wanted, this is an important subject. And if it's worth owning a home with a wet basement at all, it is certainly worth fixing...

You Breathe Basement Air – Like it or Not

As warm air rises in a home it leaks out of the upper levels. New air must enter to replace the air that escaped. In fact, in a tight home about half of the air in the home escapes each hour out of the upper levels. This creates a suction at the lower levels of the home to draw in replacement air. In older, leaky homes the air exchange rate can be as high as two air exchanges per hour.

What this "stack effect" does is create an airflow in your home from bottom to top. So air from the basement is drawn upwards into the first floor, and then to the second floor.



Of course it dilutes with other air in your home, but building scientists say that up to 50% of the air you breathe on the first floor is air that came from the basement. If you have hot air heating with ductwork, the air mixes even more thoroughly throughout the

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Meeting Dates

Jul 23 ***On Location in Seymour*** **- Larry Janesky, Basement Systems, Inc.**

August ***Vacation Month*** **No Meeting Scheduled**

Sep 24 **TBA**

Holiday Inn
201 Washington Ave
North Haven
(203) 239-6700

President's Corner

Bernie Caliendo

First of all I would like to wish everyone a happy belated July 4th and hope you all have a wonderful summer. Whether the price of gas allows you to travel or not, make sure you take time to spend with your family. It just seems like the months are flying by. In recent weeks it appears that some homes are selling and the inspection business has picked up. However, not as much as usual this time of year or has been in the last four or five years. Even though the foreclosure market appears to be taking off, due to the fact that these sales are usually "as is" ,for some reason the buyers and investors are reluctant to have a home inspection performed on the property.

Recently, in the Hartford Courant real estate section under "House Calls", there was an article entitled "Good Inspection Lead to Good Decisions". In this real estate market the time for quick and cheap inspections have gone by the wayside. Savy buyers and investors are looking for bargains especially as it appears to be a buyers' market. However, they are also looking for a thorough and quality inspection performed by a competent knowledgeable licensed inspector. These buyers need and want to know up front whether the property is a good investment or a potential money pit that they must walk away from. And it all boils down to not making that decision for them but providing them with a thorough report so they can make that decision.

Dealing with some CAHI business, we would like to thank all those members who have renewed their membership for the coming year on time. For those of you who have not yet done so or have misplaced your application for renewal, please go to our website, www.ctinspect.com. Renew online or download the application and send it in with your payment promptly.

We would like to take this time to thank Director Peter Sampiere Jr. for giving his time in helping out the organization. Unfortunately the demands of serving as a fireman (of which we greatly thank and admire him) have prevented him from spending the time he had hoped to dedicate while serving on the board. Peter decided to step down from the board to open up a directorship so someone new could step forward and serve. He has stated he would like to offer his time off the board, when available, to help out. Thanks Peter! There will be another opening on the board come September. We are presently looking and hoping a member in good standing will come forward to serve. Contact any director or myself for further consideration.

Have a great summer.

Bernie

PS: Thanks to all the members who attended our June meeting. You know who you are and what you did. It really meant a lot to me.

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house.

Therefore, whatever is in your basement air is in your house and affecting you, whether you spend much time in the basement or not. If there is high humidity downstairs, there is higher humidity upstairs than there would be otherwise. If there is mold in the basement, there are mold spores upstairs. If there are damp odors downstairs – you get the idea.

STACK EFFECT

Dust Mites – #1 Indoor Allergen

Dust Mites are parasites that live in your carpeting, bedding and furniture. They are tiny – you can't see them. Their droppings are even smaller, and float in the air. These droppings are the number one thing people with asthma and allergies react to indoors.

What you need to know about dust mites is that they don't drink water, but instead absorb water out of the air. When the relative humidity is more than 50%, dust mites thrive. When the relative humidity goes down below 50%, they dry up and die (however, they leave their larvae behind to hatch when it gets damp again). Of course when they die, they stop pooping. So the best way to combat dust mites is to dry up your wet basement and then keep the relative humidity down below 50%.

Who wants to buy a home with a wet basement?

Nobody! It's difficult enough to find a buyer who wants your house, and heart-breaking when they walk away after looking at the basement.

These days in most states there are disclosure forms which ask the seller a whole range of questions about their knowledge of defects with the property. One of the questions asks if you ever had any water in the basement. In addition, most buyers hire home inspectors these days to inspect the property for defects. Home inspectors have a keen eye for water problems because that's what they are hired for.

There is simply no hiding your wet basement when you sell your home. And if you do disclose your leaky basement, either nobody will buy, or they will make a low offer. In fact, buyers will discount the price of a home by 10% or more because of a wet basement.

Moral of the Story – Fixing your wet basement is a lot cheaper than not fixing your wet basement!

Why Basements Leak

When builders build homes, they have a lot of things to put in the house and pay for. Given the choice of spending money on beautiful things like great cabinets and bathroom fixtures, or on things that protect the house and make it last longer that a buyer won't see – he goes for the beauty. Why? It's what people see and want.
There are two things that keep a basement from leaking:

1. A coating on the basement walls

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2. A proper drain around the bottom of the foundation – called a "footing drain"

Wall coatings can be inexpensive black tar coatings called "dampproofing". Dampproofing costs builders about 20 cents per square foot, or around $200 a home. Dampproofing doesn't bridge wall cracks, doesn't stop water completely, and doesn't last forever. Until about 1985, nearly all new homes were dampproofed. Even today, 85% of homes still only get their foundation walls dampproofed.

A big step up from dampproofing is "Waterproof" coatings. These will cost a builder from 60 cents per square foot to $1.25 per square foot, or $1000 or more per home. It often includes some kind of drainage board or protection board, such as foam, over them. Waterproofing will bridge most small wall cracks, and will last a lot longer than dampproofing.

Footing drains are plastic pipes with holes or slots laid around the outside of the footing or at the bottom of the walls. A bed of crushed stone is installed around them and the soil around the outside of your home is pushed back over the drains. There are many things that can go wrong with a footing drain – especially since unskilled labor is often used to install them.

Footing Drain Failure

Footing drain failure is the most common cause of wet basements. When this happens – the soil around the outside of the foundation can't drain and it becomes saturated. The weight of the water in the soil creates hydrostatic pressure, and pushes the water into the basement through:

- The joint between the footing and the wall - most common
- Through wall cracks and pipe penetrations - very common
- Through porous block walls - very common if you have block walls.
- Under the footing - pretty rare

Dirt Around the Foundation Settles

When the loose soil is pushed back against a new foundation, it will settle – especially in the first few years. This doesn't help a wet basement situation, and dirt should be added so water does not flow towards the foundation. Unlike dirt, mulch is porous and water easily passes through it, so mulch doesn't count.

Hydrostatic Pressure

Hydrostatic Pressure is pressure from a body of water at rest. The weight of the water itself is what causes the pressure. The higher the water is in a vertical column, the more the pressure. So if the void space in the soil outside of your foundation is filled with water (temporarily during a rain) it will cause hydrostatic pressure to push the water into your basement. The higher the soil is filled, the more the pressure.

It's Simple

Your basement is a hole in the ground lined with an imperfect concrete structure – a porous material with cracks, holes, and joints in it. That's why basements leak.

What Can (or should) Be Done Outside

One way to fix a wet basement is to dig up the earth outside around your foundation and waterproof the walls and install a new footing drain. This is almost never a good option. Why?

First of all you'll be replacing the same system that failed you – and how long will it last this time?

The big problem is the excavation itself. You have to dig down to the bottom of the footing, about 8 feet deep. Picture standing in a trench, looking up at where the grass used to be. An 8-foot deep trench has to be at least 8 feet wide at the top (12 feet if you ask OSHA). Everything in this area has to be removed and replaced, including porches, driveways, sidewalks, landscaping, air conditioning units, decks, steps, and so on. Then after the work is done, the dirt that was excavated – which is now fluffed up and loose on your lawn, is put back in the trench. It will take years for this dirt to settle, and as it does, new dirt has to be added against the foundation to keep the slope away from the house. Then you can put your driveway, sidewalks, decks, porches, and landscaping back. This is reason enough not to consider doing the job outside.

Grading

If the soil around your foundation is pitched towards the foundation, it's a good idea to add dirt so that the soil slopes away. Be sure not to use sand or mulch, because water flows right down through these materials whether

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they are pitched or not. It's best to use clay or other dense dirt.
Be sure that you keep the dirt at least four inches down from the siding though. If the siding is close or touching the soil, it will rot and you'll have another problem. Termites could also create a highway into your home undetected.

Gutters

Keep your gutters clean. There are a variety of gutter screening and cover materials that work well to keep them clean.

Downspouts

One way is to bury pipes underground to the edge of the yard to take the roof water away. However, you need pitch on your yard to do it. And remember all the leaves and pine needles and acorns and twigs that wind up in your gutter will be going into those underground pipes and cause them to clog. If you do bury pipes underground I recommend you use as few elbows as possible and put as much pitch on the pipe as possible.

There are a few other options that work very well. An underground extension called LawnScape Outlet enables downspout water to escape with virtually no pitch. It's also extremely popular for discharge lines on sump pumps! Another product called RainChute is recessed into the ground just an inch or so and takes the water up to 7 feet away. Usually this is all you need to make a big difference. The advantage of RainChute is that it is not above ground to cause tripping or mowing problems and be unsightly, yet it is not underground either so it's not expensive and won't clog.

For areas that are landscaped and don't need mowing, a simple extension called RainChute EZ will do the trick.

Inside is the Answer!

So if digging it up outside is not the answer, what is? Digging it up on the inside! Jackhammering to be more specific. By installing a drainage system around the inside of the basement along the wall, you can capture water at the most common point of entry – the floor/wall joint. You can also capture water from the walls and prevent the center of the floor from leaking by intercepting the water at the perimeter of the floor before it gets to the center.

The advantages of an interior drainage system include:

1. Accessibility to do the job.
2. More affordable than an outside system.
3. Installs in a day or two.
4. Easily serviceable year round.
5. It works.

Even in basements that are already finished, it's still much easier to waterproof from the inside than the outside. Most full-time basement waterproofing companies offer interior drainage systems – between which there are big differences in systems. Some are old-fashioned and generic, and others are modern and specially designed for the job.

In the 1950's and before, clay pipe sections about 18 inches long were used for underground and under floor drains. There were no holes in the pipe, but instead the sections were laid with a 1/4-inch space between them to let in water. Since the pipe sections were made from clay tile material – like a chimney flue pipe or a brick– they called it drain "tile." This term is still used today to refer to a pipe with holes or slots in it that is buried for drainage, even though the industry switched to plastic

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pipe long ago. These generic, round, perforated drainpipes can be used for field drainage, exterior footing drains, road drainage, and just about anything.

Clay or plastic, the pipe was usually laid alongside the footing in new construction applications, and many contractors do the same for retrofitting an existing home.

However, this placement of the pipe isn't necessarily the best. Existing drains alongside the footing have failed – usually by clogging with dirt. Slowly, different methods began to develop in the 60's, and afterwards. A WaterGuard system is a specially-designed piping system engineered specifically to be a very efficient, long-lasting interior perimeter basement waterproofing system. The big difference is that the WaterGuard sits on top of the footing, instead of alongside the footing. This is important because the wet dirt (commonly referred to as Mud) can't get into the drain because the drain does not sit in the mud.

Requirements of a good interior drainage system:

- Designed not to clog - sits on top of the footing
- Has a built in 3/8-inch gap between the floor and the wall to drain wall leaks
- Does not rely on filter fabric
- Has a big drain outlet to the sump
- Will not cause structural damage to the foundation

WaterGuard meets all these requirements. With a sub-floor system such as WaterGuard, an experienced installer can make various modifications to account for unusual foundation situations.

The Floor/Wall Joint

One important key to a waterproofing system is that it must have an opening to accept water from the walls. Wall leaks now or in the future include leaks from wall cracks, pipe penetrations, flooding window wells, condensation, and other miscellaneous sources. Of course we want to fix all of the leaks we see with the original installation, but we should also address new leaks that may come up in the future. A gap at the edge of the floor will catch any leaks, prevent the floor from getting wet, and prevent damage to anything that is on the floor.

This gap is sometimes called a "french drain," although those that know a little commonly use this term to mean different things. The gap along the wall can be made by sticking a piece of wood between the floor and wall, concreting up to it, and pulling it out. This makes a big ugly gap that can fill up with debris from the floor.

A better way is to have spacers along the backside of a flange that sticks up above the floor. 3/8 inch is the optimum size for this gap. You want it to function and look nice and neat – as if it's supposed to be there.

Monolithic Foundations – Require Special Care

A monolithic basement foundation is a two-piece foundation instead of a three piece one. The footing and floor are poured together in one shot, and then the walls are built on top of the floor. In other words, the floor is poured with thick edges to it and those thick edges are the footing.

In this case, it is not recommended to jackhammer the perimeter of the basement floor to install a sub floor perimeter drain system. It will take forever and be very dusty as well.

Instead, you should install an above-the-floor system

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called DryTrak, which does not require jackhammering the floor. DryTrak is a heavy vinyl baseboard system, which is permanently epoxied to the surface of the floor to channel water from the floor/wall joint and walls to the sump. It is a perfect solution for monolithic foundations.

Beware of Filter Fabrics

Inside or outside, systems that use filter fabrics clog, slowing the flow rate down considerably. Think about the word "filter." What filter doesn't clog? And when it does how are you going to replace a filter under your basement floor?

Radon Gas

Radon is a naturally occurring radioactive gas that comes from radium deposits in the earth's crust. If present in the soil under your home, it can get sucked into your house via the basement or crawl space. Don't panic. It's fairly common and easy to get rid of.

Some people that know a little think that basement waterproofing and radon reduction systems are incompatible. While it's true that gaps, cracks, and holes in the basement floor and walls need to be sealed as part of the strategy to get rid of radon, this can be done without compromising the waterproofing system.

Sump Pumps are Better Than Ever

Now that you've channeled all groundwater that used to leak in from around the perimeter of your basement, you need to direct it to one spot and have some way of getting it out of your basement. You can either have a pipe that water flows through by gravity (downhill) to daylight, or use a sump pump to pump it up and out.

Gravity drains require that you have a substantial slope on your property so you can dig a trench from underneath your foundation to daylight while having the pipe pitch 1/8" per foot (one foot of pitch for every 100 feet you go out away from the house). Most homes don't have that kind of pitch on their property. And to get a trench that deep and go that far can be a big mess and cause substantial disturbance to other things outside your home. And remember your neighbors probably won't talk to you at this year's block party if you discharge it directly onto their property.

If gravity drains are easy to do on your property, it's not a bad option. But you must keep them from getting clogged, frozen or having the end covered over with ice or leaves and debris. I would recommend that a sump pump with an alarm be installed inside as a back up, so in case anything ever goes wrong with your gravity drain you can just plug the pump in.

For 99.9% of us, a sump pump is our best option. Despite any stories you have heard over the years about folks getting flooded because their sump pump was on the blink again, today's sump equipment is better than ever and very reliable – that is unless you cheap out and just buy a basic pump-in-a-hole. Then you'll be telling a tale of woe about your pump failing causing your basement to flood one day.

The Sump Liner

You don't want your pump to clog up in a muddy hole in the floor. And you don't want it in a 5-gallon bucket that doesn't hold a lot of water and will cause the pump to "short cycle" (go on and off very quickly). Instead, you should have a sturdy liner or housing for your sump pump with holes in it to accept water directly from the ground as well as a larger inlet hole to allow your perimeter drainage system to empty into it. There should be about 100 3/8-inch holes in it. The liner should be about 2 feet deep and about 18 inches wide, and should have a rim that accepts a sealed cover.

Airtight Sump Lid

The sump should have an airtight lid on it to prevent water from evaporating out of the sump hole into your basement, to stop stuff from falling in that can clog the pump or switch, and to quiet the system. Depending on the cover, it can also make the installation look good too. Instead of a necessary evil in your home, you have a thought-fully engineered system.

Importance of a Back-up Pumping System

It is important to note that there are many kinds of "back-up" systems provided. I just saw one with a contractor price of $79, which he would put together with a $50 car battery and sell for $400 to $800. When it comes to back-up equipment, the variance of quality is a chasm. The low-end equipment most often will not work when you need it. And the folks like you who buy back-up pumping equipment really need and want the

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protection.

To give you an example, nearly all suppliers of back-up equipment do not supply batteries. Batteries are heavy and expensive and difficult to ship. Instead, they leave it to the contractor to go to the automotive store and buy a car battery. Car batteries are not made for this application. Their ampere-hour capacity diminishes quickly after a year in this application and will not get the "gallonage" out of your basement when you need it to.

Other suppliers provide expensive back-up pumping systems with batteries that need maintenance every 6 months. If you don't remember, you are out-of-luck. Sealed, maintenance-free batteries are the only sensible option.

Float switches are extremely important too. The best pump in the world needs to have a switch to tell it when to go on and off. Many primary and back-up pump systems come with a tethered float switch – a "ball-on-a-wire" design. These have to swing up and down to operate and commonly get hung up – and cause a flood.

No pump or back-up pump is perfect. But so many are really pitiful protection.

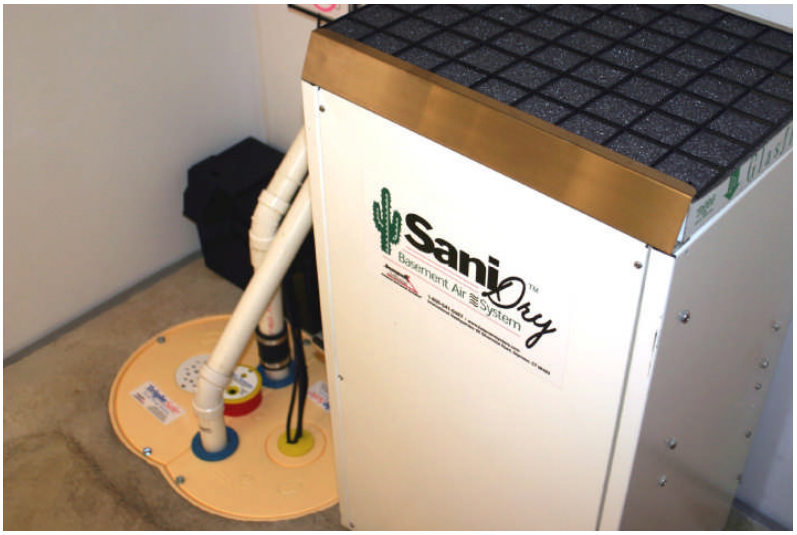
Mastering Humidity

Whenever the outside air is warmer than the inside air, and especially when it's humid outside air, we are likely to have a condensation problem in our subterranean levels. This is because the Relative Humidity of air goes up 2.2% for each one-degree you cool it. Our basements are always cool because they are below ground. And we know that a house is like a chimney – air flows upwards, allowing air to escape the upper levels, with new air being sucked in at the lower levels.

So when it's hot and humid in the summer, rain or not, our basement may be the wettest it has been all year!

This is called condensation.

In order to eliminate condensation you need to either heat the basement (ridiculous in summer), or take water out of it (easy to do). Correction. I should say take water out of it efficiently and effectively (not so easy unless you have the right equipment to do it with). A dehumidifier is the plain answer.



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Keep Basement Windows Closed!

There is no reason to open a basement window for any type of climate control. When the air outside is cooler than inside you loose heat. When it's warmer outside you bring in moisture. Keep basement windows closed.

What Makes a Basement Smell Like One?
Answer = Mold.

Mold needs organic material to grow (which you have), and high relative humidity – over 60 to 70%. It doesn't have to be wet for mold to grow, just humid. In fact, mold won't grow underwater.

There are a lot of mold experts. But one that tells you to eliminate the mold without eliminating the water and humidity is not helping you.

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The Licensing Board meetings are held at 9:30 am, Department of Consumer Protection, Room 117, 165 Capitol Avenue, Hartford.

The public is always welcome.