

Best Basement Water Management Practices

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When a home owner is faced with a leaking basement there is a way to correct the problem and a way to manage the problem. There are many companies in the basement water proofing business who do not actually waterproof your basement; they create a water management system. Waterproofing is done from the exterior of the home by digging down to the footer and re water proofing the foundation walls. The footer drains can also be redone or unclogged at this time cost effectively. No one can waterproof a basement from the inside however they can manage the water and keep the basement dry for many years to come. A typical single block in a foundation wall is a 6 sided object. Four sides are joined to other block which still leaves two. Most people only think about the one they can see from inside and forget the outside one with the dirt against it and where water begins coming in. This is why waterproofing can only be done from the outside; an attempt from the inside can only keep at most one side dry and water is still getting in from the exterior side. The best way to keep water out of your basement is from the outside. However, this is out of many homeowners budget and may not even be possible. Water can be controlled from the inside of the basement well enough to create a dry comfortable living environment.

The best way to control water from the inside involves three parts. The first part is a drainage plane. The drainage plane separates the wet foundation wall from the rest of the basement. A drainage plane is should be created by a dimple board product. This is a heavy duty plastic product that resembles bubble wrap. Bubble wrap has two sides with air in-between,

while dimple board has one side with dimples that lets a layer of air in-between it and the other side which would be the foundation wall. Drylock and other painted, brushed, or sprayed on products used on the inside create a drainage plan in the wrong place. The drainage plan is created between the inner and outer face of the block with no place to go. The other problem with these products is they are not flexible enough, once they basement walls move slightly they crack and let water back in the basement. One way to see if basement walls are still moving is to patch all the cracks with hydraulic cement. Hydraulic cement is more water resistant than regular mortar and can dry underwater. Check your patch a year later, if your patch has cracked there is a good chance products like drylock will crack and not do any good. Another product that has been used as a drainage plan is FRP which is a sheet vinyl product. This product should not be used for this application and was never made to be used for this application. Dimple board comes in rolls, lengths may vary but an average roll is fifty feet. FRP comes in four foot sheets which means every four feet there is a seam for water to get it. Another problem is the product is flat and does not let air circulate behind it. This keeps the masonry wall wet at all times which can speed up deterioration. The second part of the water management system is perforated drainage piping. The dimple board when installed will extend down under the concrete slab where the piping is installed and will collect the water. Perforated piping has holes in it to allow the water in and travel to the third part of the system, collection and discharge. The pipes will run slightly down hill to a sump pit where the water is collected. Once the water reaches a certain high the pump will turn on and discharge the water outside the home. Preferably into a storm drain. Some do it yourselves will try making a sump pit with a 5 gallon bucket which is too small and makes the pump run to often killing the pump prematurely. This water management system will also solve any water coming up through cracks in the floor from hydrostatic pressure. Water will

always take the path of least resistance. If the proper gravel was installed under the slab when the home was built the water will find its way to the drainage piping before being pushed through cracks in the floor.

Another problem this system can solve is high levels of radon. Radon is a colorless odorless gas which cannot be detected by human senses. It is suggested to test for radon every couple of years which is fairly inexpensive and simple. You can pick up a test at the home depot, follow the sampling instructions, and send it to the lab for testing. After a week or two you will have the results. Radon is measured in picocuries per liter in the U.S., anything over 4 picocuries per liter is harmful. Radon is a cancer causing radioactive gas. Radon is the number one cause of lung cancer in non smokers. Over 20,000 people die a year from lung cancer caused by radon in the U.S. Everyone knows smoking is bad for them but not everyone is educated on radon. When buying a new house there is no reason not to have a radon test done. If your basement test high for radon and has water problems they can be solved together. The sump pit in your water management system will be sealed with a lid. There will be a hole drilled in the lid for an inline fan and exhaust piping. The radon gas will enter the perforated pipe along with the water. Since the pipe is on a slight pitch it will never fill entirely with water leaving enough air space for the radon to be sucked back to the sump pit and exhausted outside. Radon gas is not harmful once outside and mixed with fresh air which reduces its concentration to a safe level. Another level homeowners want to keep in check in their basement is the humidity level. All home owners should buy a dehumidifier for their basement. This will keep the humidity at a reasonable level between 30% and 60%. Anything over 60% greatly increases chances for mold growth.

Once the water is managed effectively the basement can be finished. Since basements are below grade there is always a chance for flooding. Whether it is from living in a low flood prone

area or from a pipe bursting, your basement will always run a high risk of water damage. Walls should be built around the perimeter of the basement. Furring strips are unacceptable since they will put many holes in the drainage plane and let the water on the finished side of the basement which can rot the furring strips. Base plates of walls should not come in contact the concrete floor unless using a pressure treated plate. Sill seal can be used for metal bottom track and for non treated wooden base plates. Blue wood is also a good idea in basements since it is mold, rot, and insect resistant. If sticking to a tight budget this should be the last upgrade to consider, many others are more important. A simple way to help keep a standard wooden wall dry is to build it one inch from the drainage plane. Batt insulation should never be used in a basement except to insulate or sound proof a ceiling. More acceptable products are spray foam or ridged foam insulation. Rigid foam should be installed before the walls with glue to minimize the punctures in the drainage plane. Once the wall is built there is no way for it to fall off. The seams of ridged foam should be taped. If using spray foam the one inch gap will be filled and not let energy transfer through the studs. When using spray foam it is important to use closed cell. It is more dense and will not soak up water like open cell. Closed cell also has a higher R value which means less energy loss. If neither of these acceptable insulations fit in your budget no insulation is better than batt insulation. Once batt insulation is wet the drywall must be torn down and batts removed since they take too long to dry on their own and mold will have started growing. Standard drywall should never be used on basement walls. It is acceptable on the ceiling however one must provide access to all shut off valves and junction boxes. 5/8" drywall will help prevent the spread of fire from the basement to the floors above. It is a great idea to protect engineered floor joist with drywall since they burn and loss structural integrity much quicker than a standard wooden joist. Homes built with unprotected engineer I joist have a greatly

reduced escape time and make it dangerous for fire fighters to enter. Drop ceilings are popular for giving easy access mechanical systems in the ceiling. Water and mold resistant drywall should be used on the basement walls such as dense armor paperless drywall. Lastly is the floor finishes. Never use solid wood flooring in a basement. Engineered wood floors can be used although still not recommended. When buying carpet for the basement it is very important not to use a standard carpet pad. Standard carpet padding will soak up water. Use a water resistant carpet pad since it can be dried out with the carpet once wet without having to replace. If you follow these steps to manage water in your basement it will stand the test of time and keep your basement finishes dry and mold free. Also if water were to enter your basement another way, via a plumbing issue perhaps, these finishes will dry without needing replaced or creating a health issue like mold. For any questions or to request an estimate please call above number.



Sealed sump pit where the larger pipe on the left draws out radon gas and the smaller one on the right is the water discharge.



Inline fan and piping for radon on exterior of house. In some cases the fan will be installed in the attic with the pipe venting through the roof for better aesthetics.