

ASK THE INSPECTOR COLUMN FOR JULY 20, 2016
HEADLINE: BLOCK BASEMENTS; WHY THEY FAIL

For some reason, we have had a run of block basements with either moisture issues or differential movement, settlement as it is sometimes referred too. The number one issue with a block basement is moisture; blocks are not waterproof...period. Water will penetrate any mortar crack, open seam or just about any opening for that matter and we all know that the blocks, themselves, are porous. A standard concrete block can absorb up to 4lbs of water and the cavities can hold up to a gallon of water.

I have seen cases where a contractor drilled a hole in the second course of blocks and the water actually flowed in. The CMHC guide to damp basements has a good list of reasons why basements leak. Ineffective or non-existent eavestrough and downspouts are at the top of the list. Lack of slope away from the building, poorly draining backfill around the basement, ineffective window well drains, defective or missing below grade drainage systems are the most common culprits for a wet basement.

A block basement with moisture issues is usually fairly easy to detect, provided its not covered in drywall or paneling. If you have an aggressive white chalking along the first or second row of blocks, you can bet you have a drainage issue. This chalking is called efflorescence and is not uncommon in a block foundation, especially an older one. Efflorescence, by itself, is not that harmful. What it means is that there is a salt content in the blocks and the external ground water seeping through deposits this as a white crystal like powder on your block wall. There are as many reactions from a wet basement as there are terms. Mold, mildew and that "damp smell" are all signs of a water issue. Mold or rot at the end of your floor joists or along the sill plate are also a sign. Most often this is due to the soil being too high around the foundation. The CMHC publication, "A Guide to Fixing your Damp Basement," is a good starter manual. This free publication is available at www03.cmhc-schl.gc.ca/catalogDetail.cfm. It is publication number 65886.

Excessive moisture in a block foundation can usually be fixed by excavation and installing any number of membranes around the basement. The other issue is foundation displacement and there are a number of conditions here. Some are caused by seasonal expansion and contraction of the soil around the basement, which puts pressure on the actual block foundation. During the freeze-thaw cycle this pressure builds up against the wall and often causes horizontal cracks along the mortar lines. This can and does lead to a bow in some block walls. I generally see this at or near the frost line, anywhere from the fourth to sixth row of blocks in a standard basement, which are commonly 11 rows high. Improperly back filled soil can also cause pressure, usually seen as a horizontal line at grade or one/two rows of blocks below grade. The next defect that I see too often is the lack of anchors in the sill plate, with the soil pressure actually pushing the wall vertically inward. While not as common, a shear crack at the base or second row

of blocks is usually caused by poorly drained soil that has moved these blocks inwards. These types of block failure are more common than many people think and usually mean major foundation restoration or replacement, if not caught in time.

Another common problem is step cracks that follow the mortar line. These can be the result of settling or a poorly installed footing base. This is reasonably common in many block basements and, if there is no continued movement, there are some reasonable repairs available for this type of crack. A wall with a bulge or a full bow can often be stabilized by means of buttress work or infilling the blocks with rebar and concrete slurry. I have seen a Kevlar wrap used on a bowed wall and I have also seen the installation of steel columns that were anchored to the pad and the floor joists. The benchmark I have seen used is that this generally works if the bow is under an inch. While the rebar and slurry does work, it has some drawbacks. Getting an even pour inside a block wall is difficult and air pockets are not uncommon. Feeding a 6-7 foot long piece of rebar inside a block wall is a daunting task; it takes patience and a skilled hand. Any block wall with more than a $\frac{3}{4}$ -1" of displacement should be excavated and brought back to plumb or replaced.

As noted, drainage and eavestrough discharge are the two major issues and I can't stress enough how important this is. Every time I get called to a basement problem for a home that is 25 plus years old, the downspout discharge is the elbow on the end and the wall has a major crack. I shake my head to think that less than twenty bucks of eavestrough extension could have saved what could quite easily be a five figure repair. If you have a block basement and see activity in your wall, don't delay getting a professional foundation company to look at it. Caught in the early stages you can save thousands of dollars. If your block basement is not yet failing, don't assume all is well until you do a thorough check for moisture issues. You'll be glad you did.

My final comment, if you suspect that you have an issue with water or settlement and want it looked at, find a reputable foundation contractor. This is an industry where permits are not usually required and there is an unusually high number of less than reputable foundation contractors. Do your homework here; you may be spending a substantial amount of money to correct the problem.

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