

Project:	<b>8939 Cardiff Road, Chesterfield, Virginia</b>	Permit Number:	<b>N/A</b>
Client:	<b>Michael Lind</b>	Inspected by:	<b>Charles R. Field, P.E.</b>
Date:	<b>July 13, 2025</b>	Time:	<b>10:00 am</b>
Weather:	<b>Sunny</b>	Temperature Range:	<b>80's</b>

**Services Provided – Check all that apply**

- Site Reconnaissance
- Earth Work - Cut to Fill, Compaction
- Foundations
- Structural – Commercial
- Structural – Residential
- Fine Grading/Pavement Section
- Utilities & Trenching
- Other - Listed Below

*Primary Contractor Responsible for Work*

Contractor: \_\_\_\_\_

Superintendent: \_\_\_\_\_

Other Responsible Parties On-Site: Chris DeTreville

**General:** The structure is located at 8939 Cardiff Road, in the Bexley subdivision of Chesterfield County, Virginia, is a two story, detached, single family home. The house was built in 1987, using construction methods typical of the time. The 3,180 square foot home faces south on a 0.81-acre lot.



**General Description of Activities and Test Results:**

**Observations**

*Any directional references are given from the perspective of an observer standing outside facing the front elevation of the residence. The front elevation faces roughly south.*

Exterior inspection of the home finds that the house has a working gutter system installed. Downspouts discharge at the base of the home's foundation. The homeowner states that gutters were only recently added to the home and that they were not permitted when the home was originally constructed.

Before the gutters were installed, water fell from the roof and landed on a concrete apron. The aprons are still in place. They are uneven, tilted, and cracked in places.

One downspout, on the right side of the home, near the garage has been piped out to the driveway with the use of a downspout extension.

An HVAC condensate line is seen discharging at the base of the foundation in the rear of the home.

Inspection in the garage of the home finds that the concrete floor is cracked and broken in places. The cracks are mostly located in the rear of the concrete slab, from the halfway point to the rear wall. The slab on the rear wall has sank approximately 4". Horizontal and vertical cracks in the CMU blocks are seen inside the garage.

Cracks are seen on the exterior of the garage. Stairstep cracks in the brick sheathing are seen behind the garage.

Inspection under the home in the crawl space found damp/wet conditions. Efflorescence stains are seen in places. No vapor barrier is present.

## **Conclusions**

*The house is safe and not in danger of structural failure, at this time.*

The home has suffered from a lack of gutters and poor drainage for an extended period of time.

When the house was originally constructed, HOA guidelines would not permit the installation of gutters on some of the homes in the neighborhood. Apparently they were thought to be unattractive, so a system was designed using a concrete apron that would serve to catch the water as it fell to the earth. Originally this apron was likely angled to move water away from the foundation. But over time these aprons settled, cracked, broke, and became uneven. Water was no longer moving away from the foundation, instead it was allowed to pond and pool around the home.

Compounding the problem is water that also arrives from the nearby asphalt driveway, which is sloped toward the rear yard. Visible water stains and moss growth on the asphalt show that water impacts the garage from the driveway.

So, as all this water arrived at the garage, it simply had nowhere to go. The accumulated runoff flowed under the slab to the left rear corner of the garage. As the water traveled under the slab it slowly took the earth under the concrete with it, leaving voids. Eventually not enough soil remained to properly support the concrete slab. When the earth was no longer supporting the slab, it cracked and sunk. The foundation under the left rear corner of the garage sank as the supporting soil became saturated.

It's also possible that during the original construction of the garage the concrete slab was not properly installed. Quite often this area is back filled with soil excavated from other areas during construction. This soil should have been properly compacted. Stone should have been added, and the stone should have been compacted in layers as well. But it appears that this probably didn't happen, or if it did, it wasn't done to code requirements.

The cracks in the interior and exterior of the garage formed from both settlement of the foundation and from the stresses exerted on the blocks when the slab began to sink.

The efflorescence stains in the crawl space are proof that water has traveled under the home. Efflorescence is a crystalline deposit of salts that can form when water is present in or on brick, concrete, stone, or stucco. It has a white or greyish tint and consists of salt deposits left behind when water evaporates. The presence of efflorescence on masonry components is a sure sign that water is present.

The HVAC condensate line that is seen discharging at the foundation is not helping the situation. An HVAC condensate line can discharge a surprising amount of water. During hot, humid days as much as

60 gallons of water can be generated per line. And this water comes out drip by drip, which is the perfect way to fully saturate the earth over time.

The home has no vapor barrier installed. A vapor barrier is an important component in building construction. Its purpose is to help prevent water vapor from reaching a home's crawlspace and walls, where it can condense and cause the wooden structural members of the home such as floor joists, girders, and sill plates to rot or grow mold. Effective vapor barriers run up the sides of the CMU foundation, and all seams are properly taped.

### **Recommendations**

To correct the garage floor, have a contractor cut and remove the rear half of the garage slab. Regrade the area and add copious amounts of clean #57 stone. Compact the area in layers. Repour the concrete slab back to its original position.

Remove the old garage concrete apron that is encouraging water to flow toward the foundation and repour to channel the runoff from the driveway to the backyard.

Install Schedule 40 PVC piping to route the discharge from the downspout adjacent to the garage to the backyard or, alternatively, direct it into the driveway apron channel. Do not use black plastic corrugated drainpipe. Do not use thin wall drainpipe. Do not use any perforated product. Use only Schedule 40 PVC plumbing pipe.

Once the drainage system is in place and the earth around the home has fully dried, (which could take a year or more) have a licensed masonry contractor repair any cracks in the homes foundation, or brick sheathed exterior.

Consider installing a vapor barrier, or having the entire crawlspace encapsulated. Of the two, Obsidian recommends complete encapsulation.

*Our report was based on information available at us at the time. Should additional information become available, we reserve the right to determine the impact, if any, the new information may have on our opinions, and conclusions, and to revise our opinions and conclusions if necessary and warranted.*

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Downspouts discharge at the base of the homes foundation. Wet conditions encourages moss to flourish around the home.



The original concrete apron was designed to move water away from the foundation. It is now cracked and broken.



The large amount of moss confirms that water is constantly present.



Cracks in the brick sheathing behind the garage.



Stair step settlement cracks.



Water ponded here for many years before gutters were added. This downspout has been piped away from the foundation, to the front of the garage.



Water flows down the asphalt driveway and arrives at the garage.



The HVAC condensate line is discharging too close to the homes foundation.



Conditions under the home are damp and wet in places. Efflorescence stains are prevalent.



The garage slab has cracked in several places.



Cracks in the CMU wall in the garage.



The concrete slab has sunk approximately 4 inches.



Horizontal and stair step cracks in the garage.



Have a contractor remove this portion of the concrete slab. Remove loose material and disturbed soil. Add #57 stone in layers. Thoroughly compact the stone between layers. Pour the new concrete slab.