

Our main goal is to keep the water from getting in the garage/house. And for the past 4 years we have developed a plan that we know works. The house has remained dry for almost all rain/storm situations—if it did get wet it was due to a power outage.

Here's the thing—this is a really complicated issue with many unusual factors:

- There is a high volume of water coming down the driveway from the street.  
As stated in the Feasibility Report on Mailand-McKnight Road Gully Erosion prepared by Barr Engineering for Ramsey-Washington Metro Watershed District (RWMWD): *"Three drainage areas drain into Mailand gully...water enters the channel in two ways: (1) overland (from adjacent land and from McKnight Road overflows that proceed down a driveway at 461 McKnight)..."* (pg 2) and *"Although less land than planned drains in the wetland, the available storage and/or discharge capacity is still inadequate to prevent the wetland from overtopping, even during relatively small rainfalls. All water that overtops the wetland basin flows over McKnight Road, down the driveway at 461 McKnight Road and into the channel."* (pg 2-3)
- The water must be kept away from the house—for the usual reason of keeping water out of the house, but even this is more complicated—due to the sewer situation.
- The house lost it's septic system (due to the water runoff issue) and now is connected to the storm sewer system that ends 1.5 lots away. The water must be pumped uphill to get to this system.
- If there is a big storm where there is a power outage—and a big storm like that generally comes with a lot of rain—that pump does not work. (it is not possible to put a backup power source on).
- The holding tank for this pump has a limited volume—about 6' tall and about 4' across (we know because my husband has already had to crawl down inside-yuk—to re-connect hoses that weren't connected properly by the installers).
- [A drain tile system had to be installed in the house at some point to handle the water that already drains by the foundation. This water goes to a sump pump – which can have a backup power source—that also goes into the septic system holding tank until it is pumped out to the city sewer system. *this then is sent out to the backyard - which adds to the backyard problem*]
- At this point if there is a power outage the residents cannot run water down drains, flush a toilet, run the dishwasher, etc.—due to the limited volume in the septic pumping tank.
- Therefore the chance of the house flooding during a big storm that has a power outage is compounded (much more than a "normal" house) if we cannot control the flow of the runoff coming down the driveway and around the house. *Because water is coming from 2 sources. Can come in*
- With a malleable surface we can go out and make a bigger swale or berm to stop the water from coming into the garage/house (which happened this last storm). We also have a small dip that lets water pool in front and percolate down—to help control the volume of water.

**There are three ways the current driveway works for us:**

1. It is porous—especially where it pools.
2. We can create a swale/berm.
3. It is malleable—so we can change the swale/berm/trough as needed. And we do.

I don't think there is a surface out there that can do all three.

Tom Beach could not guarantee that an asphalt driveway with a swale would keep the water away. To me he said "I think it would work". When I asked if he could say with 100% assurance he said no. On the issue of a porous pavement—a porous driveway would be a huge cost—even if we could find some one in the area that did residential porous driveways, which we can't. It also isn't really feasible.

From the MN DOT research paper Porous Asphalt Pavement Performance in Cold Regions (April 2012) the functional life expectancy is 5 to 8 years. The performance is negatively impacted from clogging and winter maintenance is problematic. It also states that areas next to this surface can't have loose soil, sand, etc because runoff could clog the pavement—if these conditions exist they need to be separated. (and isn't that the problem?) Even if these conditions didn't exist the surfaces need to be maintained by vacuum sweeping them once or twice a year to keep them from becoming clogged. (per Brian at Bituminous Roadways—the only people I found that actually make the product, and the watershed district). I have a call into Jill Thomas, president of the MN Asphalt & Pavement Association, for more info on maintenance—but she's on vacation. *she called not a good candidate see EPA table*  
And this still doesn't address the issue that we change the swale/berm as needed—which wouldn't be possible with a static structure. He stated that crushed aggregate has a low volume of percolation. However, he didn't state that that is when it becomes compacted. We regrade to maintain the percolation qualities.

We have stabilized the area around the house now—so we had someone coming out to jack up the <sup>garage</sup> driveway apron and the sidewalks around the house and steps—which sank due to the water problem (that got put on hold until we know what's going on). We were also going to regrade and add some more rock to increase the volume. We could certainly add pea gravel, which is dustless...

**If the larger water problem can be solved (i.e. the runoff coming down the driveway) we would be happy to pave the driveway in asphalt. Until that time we are asking to be able to keep the driveway we have.**

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Carl Anderson  
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*The only thing  
I mentioned the Tom Beach really said about the  
big water issue is that it would be expensive.*

*Solve - Mitigate the problem*

*French Drain near*

*raise the end of the drive way - french drain -*

*direct water to dry well in backyard.*