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Inspection Report Letter with Requirements and Recommendations

August 11, 2009

Ms. Susan Bowyer
Cumberland Hills HOA President
2145 Cumberland Road
Rochester Hills, MI 48307-3706

Re: Detention Basin Maintenance Inspection Follow–Up

Dear Ms. Bowyer:

On April 9, 2009, the City of Rochester Hills' Engineering Division completed an inspection of the three detention basins under your subdivision's ownership. This inspection focused on key structural components, sediment, capacity, and maintenance practices.

The inspection found that the following items could be improved or maintained now to prevent possible future failures. This is a summary of all inspection reports, broken down by basin. Please reference the attached digital pictures for a visual of each issue.

Highsplint Basin

- Cattails completely covering basin bottom.

Cattails are a common invasive and nuisance aquatic species. Each year the current growth dies back and some of the plant material falls. The following spring new growth pushes up through the old growth, and then the old growth falls down. Over time, the basin will slowly fill with this biomass combined with other debris. This cycle takes away required storage volume, clogs inlets, outlets, and flow channels, eventually requiring pond dredging and removal of the cattails. Dredging is expensive in and of itself, and then there is the additional cost of removing and disposing of all the material that was dredged.

At this time the City will not require the removal of the cattails, because the basin appeared to be functioning properly. However, if in the coming years a failure occurs because of the cattail growth, the City would require their removal. This would most likely entail dredging and result in a greater expense. For this reason I strongly encourage preventative maintenance in

the near future. Consultation with a specialist, such as an aquatic biologist is also recommended, to determine how to properly remove the cattails and the different options available to meeting this goal, while also meeting the HOA's financial status.

- There are stands of young trees around the inlet pipe on the southwest corner of the basin, and a more mature tree just outside of the inlet.

This is a situation similar to that of the cattails. As they grow, the stand of young trees around the inlet will most likely affect the structural integrity, and potentially block the flow through the inlet pipe. The larger tree just outside the inlet will cause obstruction of flow, along with scour and erosion, resulting in a greater cost for their removal in the future. For these reasons, I recommend the removal of these trees now to alleviate the potential for greater costs in the future.

- There are barren areas around the basin side slopes.

The turf grass on the pond side slopes prevents erosion of the banks and filters sediment before it reaches the basin bottom and outlet. The barren or eroded areas should be repaired to minimize sediment entering the pond.

Kentucky Basin

- Cattails impeding flow at inlet (southwest corner of basin) and through low flow channel.

The cattails must be removed, at least around the inlet and through the low flow channel to allow unrestricted flow of stormwater into and out of the basin. The previous recommendation for complete removal of cattails holds here too.

Keep in mind that cattail stems grow interconnected horizontally underground, and roots grow from the stems. So if you remove one area and leave the rest, it will quickly grow back. This is the main reason cattails are so invasive.

- There was erosion around the outlet pipe from the overflow structure.

The erosion around the pipe needs to be further investigated to pinpoint the cause of erosion. It appears the pipe may be separated, but there were large pieces of broken concrete around the pipe making it difficult to clearly see the problem. At the very least I would need to know the cause of the erosion, and then we can work from that point to determine the proper repair.

Norton Basin

- Cattails dense throughout basin bottom.
- Stands of trees growing within basin.

Both of these comments should be addressed as discussed above (i.e. allowing flow through basin and recommendation to remove young trees now).

- Replace bar grate from inlet pipe at northwest corner of basin.

The existing bar grate had apparently fallen out and was at the toe of the end section. We pulled it out and put it on dry ground next to the inlets' end section. The replacing of the bar grate, either with the existing or new, is required.

- The pipe southwest out of overflow structure has erosion that exposed the pipe.

This should be addressed similarly to the Kentucky Basin "pipe erosion" issue.

In addition to the City's inspection of your detention basins, I have been talking via telephone with Mr. Martin Berthiaume regarding the other portions of the stormwater system and how we can help Cumberland Hills HOA in determining the type of maintenance programs to set up.

I have attached a GIS map showing which portions of the stormwater system (i.e. storm lines, sump lines, drainage structures, etc.) are under the HOA, the City, or other entity's ownership.

Please note there are approximately 25,396 lineal feet of Association storm sewer in Cumberland Hills Subdivision, and approximately 14, 795 feet of 8" plastic sump collection system pipe. The design life for adequately maintained concrete storm sewer is 40-60 years; and for the plastic sump collection system is 20-30 years. Cumberland Hills' storm sewer was constructed in 1978, and is about 30 years old. Mr. Barthume is perceptive in planning to budget for maintenance, repair, or replacement of portions of the storm drainage system.

I would recommend that you obtain three or more quotes from contractors that specialize in sewer cleaning to evaluate the condition of your storm sewer system, and to discuss options to budget for maintenance, repair, or replacement. Depending on the resources the Association has available, you may need the services of a Professional Engineer to inspect and prepare contract documents for bidding the repairs, and provide oversight of the contractor. This would be more costly, but better protects the HOA. I have attached a list of such contractors and engineers, and an approximate cost to perform the different maintenance tasks to help assist you in determining your next steps.

I believe you picked up from City Hall a copy of "*Maintaining Your Detention Pond, a Guidebook for Private Owners in Southeast Michigan*". This resource lists common maintenance items for your basins and storm sewer system related to the basins. Other maintenance items for the storm sewer system beyond the limits of the basins are:

Storm Sewer Pipe:

1. Repair joint failures (often they may reflect to surface as "sink holes").
2. Inspect and remove accumulated sediment that impacts design flow rates.
3. Inspect and remove obstructions (often tree roots) in the pipe that impact design flows.

Storm Catch basin, Inlets, and Manholes:

1. Inspect for separated frame and cover for structure and repair if damaged.
2. Inspect for leaks into the structure (often this will be evident by sink holes next to structure).
3. Inspect and remove accumulated sediment and debris from Catch Basin sump once 1/3 full of debris.

Sump Collection System:

1. The sump collection system in Cumberland Hills is 8" plastic drain tile. The rear yard drain tile is perforated and in pea stone. The City has seen numerous failures of the tile of similar age due to tree and brush roots, landscape damage, and calcification. In most cases the tile is only about three feet deep, and could be repaired by hand digging. It is likely if they start to cause problems in one location you will see it in others.

The above items and recommendations are not intended to be all inclusive; but are some common problems. There are many variables to consider when determining how to handle each stormwater system. To say what needs to be done for any particular system is not possible without proper evaluation first.

At this point, we would like to work with you to complete the above requirements within a reasonable time frame, instead of requiring a date for items to be completed, as the Agreement for Subdivision Open Space Plan stipulates. If you have any questions or comments concerning the required or recommended items, please feel free to contact me at (248) 656–4640.

Sincerely,

Keith Depp

Keith Depp
Stormwater Engineer. Engineering Division

KPD/jfd

Attachments: Digital Pictures
GIS Map (Cumberland Hills Subdivision storm system ownership)
Suggested Cost Estimating Information

c: Roger Moore, P.S., Stormwater Manager
Martin Berthiaume
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