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July 7, 2017

Charter Township of Springfield
12000 Davisburg Road
Davisburg, Michigan 48350

Attn: Mr. Collin Walls, Supervisor

Re: Pebble Creek Court
Drainage Review
Section 14, Springfield Township

HRC Job No. 20170509.02

Dear Mr. Walls:

In accordance with your request, our office conducted a site inspection and review of documents pertaining to the recent storm sewer installation from the rear yard of Unit 67 between Units 54 and 68, and then along Pebble Creek Court toward the existing 24" diameter outlet pipe between Units 70 and 71. As noted on the drawings and as field confirmed, the storm sewer terminates in front of Unit 69. Our comments are as follows:

1. There are some apparent construction related issues with the portion of the 12" diameter storm sewer installed along the south right-of-way of Pebble Creek Court. The recent pipe installation runs parallel to the existing ditch line which includes 12" diameter culvert crossings of the driveways for Units 54, 69 and 70. Based on the recent ponding in front of these homes and existing condition of the roadside ditch and downstream culverts, it appears that the immediate issue is the capacity of the roadside ditch and drive culverts to pass the flow to the outlet storm sewer. Exacerbating the problem is the rock lined ditch in front of Unit 70 between the drive culvert and 24" diameter outlet pipe. The attached Photo #1 shows the outlet end of the new 12" diameter pipe extending along the Pebble Creek Court right of way. As evidenced from the photo, there is the lack of a defined roadside ditch adjacent to the new pipe installation. There is minimal if any cover over the new pipe (ref. Photo #2). Photo #3 shows the aforementioned rock lined ditch in front of the 24" diameter outlet. Photo #4 shows the drive culvert for Unit 70. Photo #5 shows the culvert under the drive for Unit 71. Based on visual observations, there are a number of issues associated with the roadside ditch and driveway culverts. The ditch is not well defined. The drive culverts are partially obstructed either by lawn or rocks as noted above. In addition to the new drainage area behind Unit 67, there is offsite drainage from an 18" diameter culvert at the intersection of Pebble Creek Drive and Pebble Creek Court. Photo #6 shows the east end of the 18" diameter culvert crossing of Pebble Creek Drive. The original subdivision plans show acreage to the south including Boulder Court draining via the 18" diameter cross culvert down Pebble Creek Court. Factoring in this upstream tributary area, it does not appear the existing roadside ditch is capable of handling the new storm sewer discharge from the rear of Unit 67. Also, the flow down Pebble Creek Court to the outlet culvert is impeded with the placement of the rocks in the ditch line as noted above. All of these factors help explain the current issues prohibiting proper conveyance of storm water flows down the Pebble Creek Court south ditch line.
2. The Project Engineer who prepared the storm sewer plan has provided storm sewer sizing calculations to confirm the capacity of the outlet 24" diameter pipe to accommodate the increased flows from the new storm sewer. From the submitted documentation, the 24" diameter pipe should have capacity to handle the flows. However, as indicated above, there are issues with conveyance of the increased

flows down the existing ditch line to the outlet pipe.

3. From the available development plans, the outlet 24" diameter pipe connects to a downstream storm sewer on Creekwood Trail which is 27" diameter and fairly deep. While drainage calculations are not available for the overall development, the downstream storm system should have been sized to accommodate all tributary flows.

SUMMARY & RECOMMENDATIONS

It appears that the drainage problem on Pebble Creek Court is localized. The 24" diameter outlet culvert should be adequately sized to accommodate the increased drainage area. However, there are a number of improvements which should be made in our opinion to better ensure proper storm water conveyance down the Pebble Creek Court ditch line. We offer the following course of action as a potential solution:

- 1) Remove recently installed storm sewer along Pebble Creek Court ditch line.
- 2) Remove all 12" diameter drive culverts.
- 3) Extend manhole MH-1 to center of ditch. Lower structure rim to match ditch bottom and replace solid cover with open grate.
- 4) Deepen MH-1 and install new 18" diameter HDPE pipe from MH-1 down ditch line and across drive to Unit 70. Maximize cover over pipe to extent possible.
- 5) Install inlet structures at all deflections in pipe direction and at upstream side of driveways as necessary to capture ditch drainage.
- 6) Install minor drainage swale in ditch line so as to direct runoff to new inlet structures. New pipe to function primarily as ditch enclosure to accommodate upstream flows.
- 7) Remove majority of rocks in ditch line in front of Unit 70 to minimize any impediment to storm water conveyance.

Please feel free to call with any questions or comments.

Very truly yours,

HUBBELL, ROTH & CLARK, INC.



Randal L. Ford, P.E.
Senior Associate

RLF

pc: HRC; N. Faight, Files

Photo #2



Photo #1



Photo #4



Photo #3

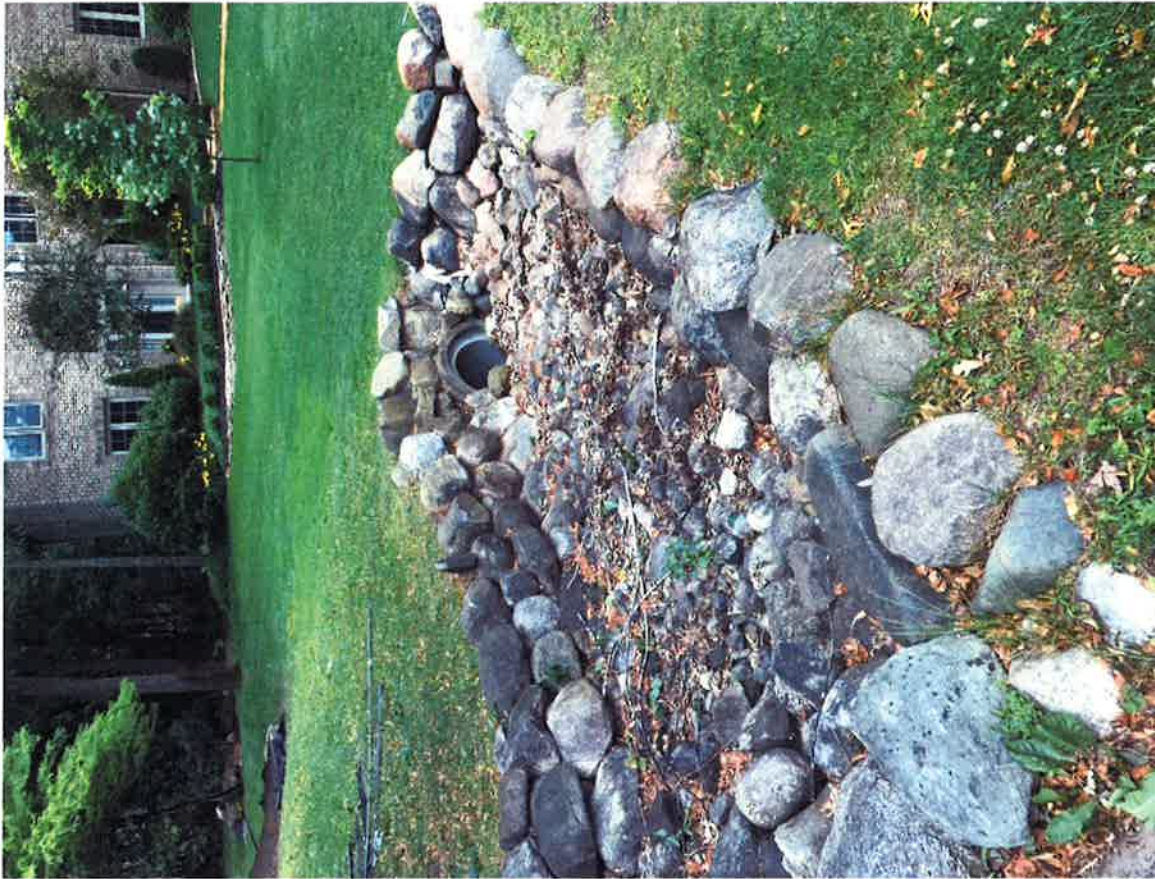


Photo #6



Photo #5

