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June 3, 2011

City of Grosse Pointe Farms
90 Kerby Road
Grosse Pointe Farms, Michigan 48236

Attn: Mr. Shane Reeside, City Manager

Re: Major Rainfall Event – May 25, 2011

HRC Job No. 20110291.02

Gentlemen:

In accordance with your request, we have assembled and reviewed the rainfall records, basement flooding call in reports and street flooding episode reports for the rainfall event on May 25, 2011. The following is a very preliminary effort to identify the cause or causes of the flooding issues experienced on May 25th.

Our comments herein are made in a general fashion. Individual homes could experience flooding from a number of sources including houselead problems not identified herein.

First, regarding the amount of rainfall. There are various hourly recording rainfall stations in close proximity to where the flooding occurred. The rainfall recording station at the Country Club of Detroit (CCD) on Country Club Drive in the City is the closest station to the flooding area. At the CCD site, the maximum hourly rainfall recorded was 2.70 inches and the total 18 hour rainfall was 4.20 inches. There was a variation in the amount of recorded rainfall between the nearby stations which is indicative of micro burst rainfall activity associated with this large rainstorm. As an example, the Grosse Pointe Farms (GPF) Water Plant at Kercheval and Moross recorded a total 24 hour rainfall of 3.3 inches. Utilizing Bulletin 71 from the Midwestern Climate Center which identifies the rainfall frequencies for the Midwestern United States (see copy-attached), this storm, when taken as an isolated one day event would be a 10 year storm for a 24 hour event using the Grosse Pointe Farms water plant data. The rainfall data from CCD reveals that for the 1 hour peak, this storm exceeded the 100 year storm (2.05 inches) and for the 18 hour total this storm also exceed the 100 year storm (4.10 inches).

According to records kept by the City, there has not been a storm event approaching this magnitude since 1946 (sixty-five years) and the rainfall here exceeded that storm and was a 100 year event.

In addition, prior to the rainfall event on May 25, 2011 records indicate that the ground was saturated due to multiple lesser intensity rainfall events in the days prior to the storm totaling over 3 inches. The saturated ground surface undoubtedly contributed to additional stormwater runoff reaching the sewer system which normally would be absorbed by lawns, landscape areas, or evaporated.

The total rainfall for the month of May 2011 in Grosse Pointe Farms was 7.90 inches. Normal average monthly rainfall for May is 3.05 inches.

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Based upon the intensity of this storm event, occurring on saturated ground, it is likely that the combined sewer system capacity was exceeded, resulting in street and basement flooding.

Based upon the City's call logs the basement flooding on May 25, 2011 appears to have been primarily located in the Inland Sewer District west of Ridge Road (which remains a combined sewer district) with the majority of the flooding being reported between Chalfonte and Mack from Moross north to the City limits and Madison to McKinley. (See attached map). Based upon discussions with the Kerby/Chalfonte Pumping Station personnel, they have indicated that the severity and magnitude of this rainfall event caused all 8 pumps to operate simultaneously, which is the first ever instance of this occurrence.

In addition, it is our understanding that in addition to the large volume of rainwater due to the intensity of the storm, there were several short duration power spikes from the Detroit Edison power grid experienced at the Kerby/Chalfonte station during the height of the event, which caused the pumps to switch over to standby power resulting in a short term decrease in pumping capacity while they came back on-line.

Summary

Based upon the information compiled to date, it would appear that the basement flooding issues experienced on May 25, 2011 were the result of a record storm event (exceeding 100 year) which the local combined sewers and Kerby/Chalfonte Sewage Pumping Station were unable to handle at the peak of the event.

If this was a chronic flooding problem for the Inland Sewer district, the City could examine several potential alternatives such as storm relief sewers or sewer separation in the Inland Sewer district to mitigate these impacts of an extreme event such as May 25, 2011. Keep in mind that there are costs associated with additional levels of protection for extreme storm events.

If you have any questions regarding this preliminary report, please do not hesitate to contact the undersigned. As requested, I will be at Monday night's council meeting to answer any of council's questions.

Very truly yours,

HUBBELL, ROTH & CLARK, INC.

Thomas E. Biehl, P.E.
Executive Vice President

TEB/nef

pc: Grosse Pointe Farms; Matthew Tepper, Terry Brennan, Scott Homminga
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