Memorandum

Date: December 9, 2016

To: Darlington Neighborhood Residents
From: City of Ann Arbor; OHM Advisors

Re: Darlington Neighborhood November 30, 2016 Public Meeting Summary and Recommendations

Introduction

On Wednesday, November 30th 2016, the City of Ann Arbor and its technical consultant, OHM Advisors, held a public meeting with the residents of the Darlington subdivision to present sanitary sewer system evaluation findings and to discuss possible options moving forward.

In 2013 and 2014, the City of Ann Arbor conducted a Sanitary Sewer Wet Weather Evaluation (SSWWE) project to evaluate the overall capacity of the sanitary sewer system. This citywide evaluation found five areas with potential capacity issues during wet weather events, including the Darlington/Pittsfield Valley area. These five areas are now being analyzed in depth as a part of the 2016-2017 Sanitary Sewer Improvements Preliminary Engineering (SSIPE) project.

Field Investigation

Initial computer modeling during the SSWWE project revealed that some sanitary sewer pipes in the Darlington area are receiving more flow than they can handle during wet weather events. Based on these model results, the project team initiated a field investigation to discover the source of the excess flows.

The field investigation crew performed flow-monitoring, closed circuit televising of the pipes, manhole inspections, and smoke testing to identify sources of inflow (direct connections) and infiltration (groundwater entering sanitary sewers through defective pipe joints and broken pipes) into the sanitary sewer pipes.

The results of the field investigation indicated that most of the excess flow is coming from connected footing drains. A footing drain, also known as a foundation drain, is a drain pipe system beneath a structure that drains ground water away from the structure. The field investigation crew also discovered a number of serious defects in the pipes that need to be fixed.

Modeling Results

The computer model was updated to reflect the findings from the fieldwork to determine the sanitary sewer pipe capacity, and the results of the model are shown in the figure on Page 3.

The red pipes in the Southeast corner of the neighborhood (Norwood and Parkwood area) receive more flow than they can handle during a wet weather event. The model indicates that about 3800 feet of pipe is overloaded. These findings echo the results from the resident survey for this neighborhood and correspond to the locations with high densities of pipe defects.

Alternatives

There are two options to address this issue. The summary on page 4 outlines the two options, their costs, and their pros and cons:

Option A is to install relief sewers in the area with overloaded (red) pipes. This option would require replacing the current sanitary sewer pipes with larger diameter pipes to increase the flow capacity.

Option B is to disconnect footing drains in about 20% of the homes in Darlington. This critical mass of disconnections is needed upstream of the overloaded pipes to reduce the flow. The homeowner would arrange a time for a contractor to disconnect the footing drain from the sanitary sewer system and install a sump pump in the basement to redirect the flow to an approved storm water discharge location.

Two alternate options were considered as well, but are not practical solutions:

The first alternate option is to install storage tanks to temporarily hold excess flow during wet weather events until the flow in the sanitary sewer system decreases. Storing the excess flow would require finding nearby land to install these storage tanks and also installing new pipe to route the excess flows to the tanks.

There are two reasons this option is not practical; first, finding enough open space to store these tanks would be difficult, and second the total length of new pipe that would have to be installed would likely be the same length or more than the relief sewer installed under Option A.

The second alternate option is to reroute some of the flow from the red pipes to pipes with higher capacity (shown as blue pipes.) However, the same issue exists, in that the amount of new pipe installed to reroute the flows would be the same length or more than the Option A relief sewer. Also, the rerouting would require new pipe to be installed across residents' yards as there is no street path that would allow easy access for rerouting. Thus, these alternate options were not explored further.

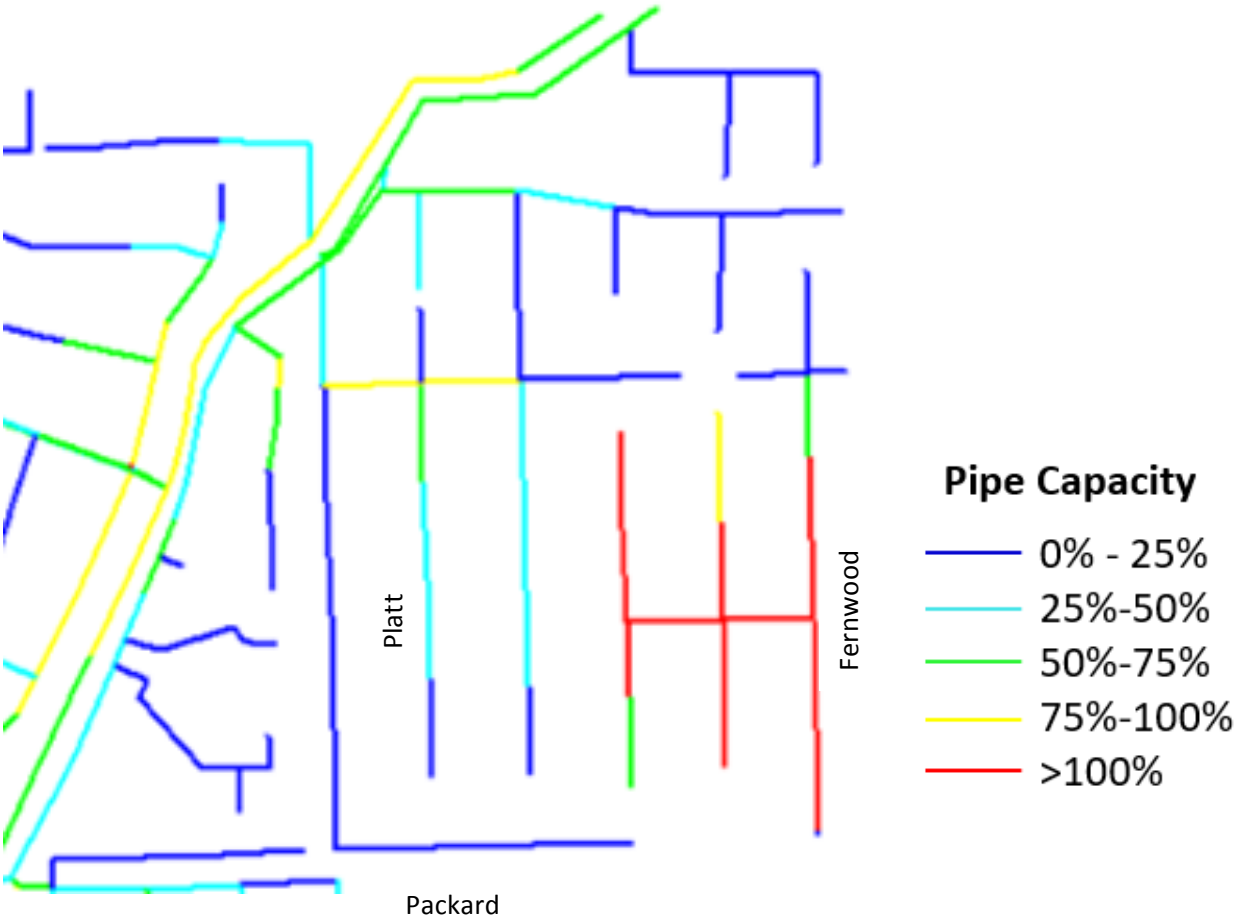
Recommendations

During the public meeting on November 30th, participants discussed the findings in detail and the residents were encouraged to comment and voice their opinions on the options and provide additional pros and cons from their perspective. **Based on the pros, cons, and costs of the options, we recommend Option A to install relief sewers in the area.** Approximately 1400 feet of relief sewers are needed to address the overloaded pipes. It is important to note that not all of the red pipes in this area will be replaced. Strategically replacing the main line pipes will resolve the overload issue in the other pipes. In addition to installing relief sewers, the remaining serious pipe defects should be repaired.

Even if Option B, disconnecting footing drains, were selected, the serious pipe defects would still need to be repaired which could potentially warrant some construction.

Lastly, all residents are encouraged to voluntarily participate in the City's Developer Offset Mitigation (DOM) program to have their footing drains disconnected. Disconnecting footing drains reduces the amount of clean water transported through the sanitary sewer system and unnecessarily treated at the wastewater treatment plant, making this a best practice and a sustainable solution. The developer covers the costs for these disconnections.

Model Map



Summary of Options

Option A - Relief Sewers

Replace old pipes with larger pipes to improve capacity

- Project Cost = **$700,000**
  - An alternate construction technique may be able to reduce the cost
- Engineers' Pros:
  - Less expensive than Option B
  - Responsibility to complete the work falls on the City, not residents
  - Construction will take place in street right of way
- Residents' Pros:
  - Opportunity to repair/replace the road and storm sewer and water main pipes that are in poor condition – curb to curb project
- Engineers' Cons:
  - Construction noise
  - Construction may temporarily limit neighborhood street access
- Residents' Cons:
  - Temporary sewer service shutdown (hours) is possible
  - Increased construction time/disturbance if the storm sewer and water main pipes are being repaired or replaced also
  - Reconnecting service leads could become a problem if the leads are in poor condition

Option B - Disconnect Footing Drains

- Project Cost = **$804,000**
- Engineers' Pros:
  - Removes I/I flow at the source, permanently reducing the volume of water that has to be transported and treated
  - Construction takes place at the residents' convenience by contractors
- Engineers' Cons:
  - More expensive for the City than Option A
  - Construction will take place on residents' properties
- Residents' Cons:
  - Radon could be a concern and would be the homeowner's responsibility to address
  - Sanitary sewer pipes remain in poor condition in certain areas and serious defects would still have to be repaired

Additional Comments at the Darlington Neighborhood Public Meeting

- A resident noted sewer gas smell coming out of two catch basins at Norwood and Elmwood intersection and one catch basin at Norwood and Maplewood intersection.
- Project costs do not reflect lifecycle cost of transporting and treating the flow.