

Agenda Report

Subject: Sanitary Sewer Evaluation Survey

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Date: December 8, 2011

Background

In 2008, the Village experienced an intense rainstorm that led to widespread basement flooding, resulting in significant amounts of property damage. The Village began a process of studying various flooding areas to develop stormwater flood risk reductions. In July, 2011, the Village was struck by a massive flash flooding event, the result of 6.49 inches of rainfall in the span of 2½ hours. An estimated 1,100 homes suffered basement flooding, from a variety of causes, including sanitary sewer backups. Survey data from September, 2011, indicated that of the 1,060 respondents, 277 (or 27%) experienced sanitary sewer backup from the July 22-23 rainstorm. Accordingly, the community, Village Council, and staff have all concluded that in addition to the ongoing efforts to improve stormwater drainage, a program to identify and address causes of sanitary sewer backups should also be implemented.

While there are a variety of causes of sanitary sewer backups, the primary cause of wet-weather backups is stormwater entering the sanitary sewer system. In a separate-sewered community, like Winnetka, there are two sewer systems beneath the ground. The storm sewer collects rainwater from streets, yards, roofs, and other surfaces and directs it to discharge points in local waterways, such as Lake Michigan and the Skokie River. The sanitary sewer collects wastewater discharged from buildings and carries it, via intercepting sewers, to a treatment works on the north side of Chicago at Howard Street and McCormick Boulevard. The sanitary sewer system is designed and sized to carry relatively stable, comparatively low-volume flows, and not large volumes associated with rainstorms. When significant volumes of stormwater enter the sanitary sewer system, the pipes surcharge, causing water to backup into unprotected basements. This condition of stormwater entering a separate sanitary system is called Inflow/Infiltration, or I/I, and is a common problem in separate-sewered areas.

Approach

As a common issue, and one that has been dealt with by many areas, including Winnetka, there is a relatively standardized approach to addressing I/I concerns, called a Sanitary Sewer Evaluation Survey (SSES). An SSES is a systematic and data-based method of evaluating the condition and effectiveness of a sanitary sewer system. An SSES will typically begin with a review of existing data, including detailed sewer system construction, maintenance and performance information. The evaluation continues with a physical assessment of the sewer system, which would include flow monitoring to establish I/I conditions, and physical inspection of the system, to identify sources of I/I, and structural conditions of the infrastructure. In many cases, hydraulic modeling of some or all of the system is performed to identify hydraulic bottlenecks that may lead to surcharging. All of this data is then compiled and evaluated to determine the system-wide needs and to develop a recommended improvement program. A fairly detailed description of a typical SSES program can be found in **Attachment 1**.

Proposed Plan for Winnetka

Staff has met with three consulting engineering firms with significant experience and expertise in performing SSES work to discuss how the Village might proceed with an SSES program. Each of these firms outlined a program similar to what is contained in Attachment 1 as the most cost-effective means of evaluating the Village's sanitary sewer system. Each firm described an approach using flow monitoring and the detailed results of the September 2011 survey to tailor a priority listing showing the order in which Winnetka's 46 separate sewer basins should be evaluated in depth for sources of I/I. Once this priority listing is developed, reviewed by staff and the Council, and approved, a number of basins, based on priority, would be selected for detailed evaluation and development of improvement plans.

Each of the consultants was very pleased to have available both detailed GIS information and the detailed results of the September, 2011 survey. They all cautioned, however, that the survey results would only tell part of the I/I story, and that additional relevant data would need to be obtained from flow monitoring to accurately assess I/I conditions in each basin. Although each of the three firms suggested slightly different approaches, the suggested work would roughly correspond to Phase 1 and Phase 2-A of the typical SSES program shown in **Attachment 1**. A draft Request for Proposals (RFP) for providing an SSES for the Village is shown in **Attachment 2** for the Council's review.

Staff estimates that the fee for this initial study may be in the \$50,000 to \$75,000 range, however this is dependent on both the number of flow monitors needed to cover the system and the length of time the flow monitors are in the system. This in turn is completely dependent on the amount of precipitation received while the flow monitors are in place.

Timeline and Next Steps

A conceptual timeline has been prepared to illustrate a possible schedule for this work. This timeline is shown in **Attachment 3**. Staff proposes to issue the Request for Proposals, if authorized by the Village Council, by December 20, 2011, with responses being due by January 20, 2012. Staff proposes to bring an award recommendation to the Village Council at its February 7, 2012 meeting. This timeline would allow work to commence in March, 2012 with placement of flow monitors in time for the spring wet season. Completion of flow monitoring in May-June would allow data analysis and presentation of recommendations in August, 2012.

Recommendation:

Consider authorizing staff to solicit proposals from qualified engineering firms for conducting a Sanitary Sewer Evaluation Survey for the Village of Winnetka.

Attachments:

1. Sample SSES Program
2. Draft Request For Proposals
3. Draft Project Timeline