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To:	Public Works Committee
Through:	Carl S. Goldsmith, Director of Public Works
From:	David A. Dratnol, P.E., Village Engineer
Date:	August 8, 2013
Subject:	Gatz and NAS Watersheds Sewer Separation Analysis and Prioritization Plans

Currently the Village has some areas served by combined Sanitary and Storm sewers. The combined sewers transmit mixed storm and sanitary water to the Glenbard Waste Treatment Plant. During major storm events the sewers become full and overflow. This situation causes sewer back-ups for some residents and also some dirty water flooding at some manholes.

The Village hired Christopher B. Burke Engineering, Ltd. (CBBEL) to model our system and devise a separation plan. The project was broken up into two major drainage areas: the Gatz Pond Watershed and the NAS Watershed which drains the North Area Sewers. The sewers were designed for the 10 year storm event (a storm intensity having a 10% chance of happening in a given year). The cost estimates in this study do not include the infrastructure such as pavement and curb.

For the Gatz Pond watershed to be fully separated it will be necessary to install a 108 inch diameter storm sewer interceptor to outfall at the East Branch of the DuPage River. The most likely path would be in the Prairie Path right-of-way. In conjunction with the interceptor, a 400 cfs pump station would be required in the area of North Broadway and Fairfield Avenue. These would be in addition to installing separate storm and sanitary sewers on the local streets. To begin achieving separation at a feasible cost an interim plan was devised which will provide the separation in stages. The two initial projects, the pump station and forcemain ($1.2 M), and the Gatz Pond outfall ($1.1 M) are in the Capital Improvement Plan (CIP) for FY 15-16 and FY 16-17 respectively. According to the study these two projects will separate the stormwater from Gatz Pond and Kenilworth Pond as well as surrounding area. Some initial work has already been completed with the North Broadway reconstruction in 2005.

The North Area Sewers (NAS) watershed is tributary to the Route 53 pump station which pumps to the East Branch of the DuPage River. Currently the Village has an engineering company designing a replacement pump station. The sewer separation study was used to provide data for that project. The majority of the NAS watershed is separated. The remaining area to be separated is from Elizabeth Street to Grace Street (east-west) and St. Charles Road to Maple Street (north-south). There are two alternative storm sewer improvements. Alternative 1 would involve replacing a storm sewer under Main Street from Parkside Avenue to Grove Street ($3.2 M). Alternative 2 places storm sewer under Parkside and crosses the Railroad at Elizabeth ($2.6 M). The sewer separation work has not currently been scheduled into the CIP.

Attached are the executive summaries for each watershed. CBBEL will be presenting the results of the study.

DAD/pfk

GATZ POND WATERSHED
SEWER SEPARATION ANALYSIS AND PRIORITIZATION PLAN
TECHNICAL REPORT

Prepared By

Christopher B. Burke Engineering, Ltd.
9575 W. Higgins Road, Suite 600
Rosemont, IL 60018

Prepared For

Village of Lombard
255 E. Wilson Street
Lombard, IL 60148

CBBEL Project No. 07-0386

APRIL 2013

Jeff Julkowski, PE
Illinois Registered Professional Engineer
#062-057976

EXECUTIVE SUMMARY

Christopher B. Burke Engineering, Ltd. (CBBEL) has completed an analysis of the watershed tributary to the 108" Hickory Street combined sewer. This watershed has been referred to as the Gatz Pond watershed due to the large detention basin (Gatz Pond) located within its limits. The purpose of the study was to determine the capacity of the existing storm and combined sewer systems, identify any combined sewer overflows (CSO), and develop a plan to separate the storm and combined sewers in the watershed.

The XP-SWMM modeling software was used to model the existing sewer systems. The model was developed using limited survey data and the Village's sewer atlases and aerial topography. To improve the accuracy of the model, flow meters were installed at two locations in the watershed. Actual storm events were analyzed, and the model results were compared to the measured flows. The existing conditions model was calibrated based on the flow meter data and provides a good representation of the existing system performance. The model indicated several locations throughout the watershed where there is a potential for CSO during 5- and 10-year storm events. These locations are shown on Exhibits 4 and 5 of this report.

A proposed sewer separation plan was developed, which involved sizing new storm sewer networks. Storm sewers were sized for the 10-year storm event. It was assumed that the existing combined sewers would no longer be used for storm sewer runoff, except in specific locations where overflow capacity is required.

A full sewer separation of the watershed requires significant infrastructure improvements. Aside from the street-by-street sewer separation, the major items include the expansion of a pump station on North Broadway and an outfall sewer to the East Branch DuPage River (EBDR). The existing elements of the pump station were built during the recent North Broadway Improvements, and it was envisioned at that time to be expanded to five cells with a capacity of approximately 400 cfs. The outfall sewer is a 108" pipe to be located along the Illinois Prairie Path (IPP) between the pump station and the EBDR. Both elements are required for a full separation of the watershed.

An interim conditions separation plan was also developed to begin the process of sewer separation without these major elements. The interim conditions plan includes constructing one cell of the North Broadway pump station, and pumping into an existing storm sewer on Hickory Street. The Village's SCADA system would be used to monitor water levels in the system, and the flow from the pump station would be varied depending on the levels. This system will allow use of the existing storm sewer system as an outfall without causing any downstream impacts.

It was assumed that the Village would choose to implement the interim condition plan. Based on this assumption, several projects were identified and prioritized, and concept-level cost estimates were prepared. ***The costs presented in this report are for the sewer separation projects only; they do not include cost for other utility replacement such as watermain, roadway resurfacing, landscaping, etc.*** These projects are listed below:

Project #1 – Interim Pump Station and Forcemain - $1.2 million

Project #2 – Gatz Pond Outfall Sewer (separation Phase 1)- $1.1 million

Project #3 – Storm Sewer Separations (broken into Phases 2-5) - $10.9 million

Project #4 – Illinois Prairie Path Outfall - $9.9 million

Project #5 – Storm Sewer Separation Phase 6 - $7.3 million

Project #6 – North Broadway Pump Station Upgrades - $2.4 million

TOTAL ESTIMATED COST = $32.8 million

Additional details are provided in the following report.

NAS WATERSHED
ROUTE 53 PUMP STATION AND SEWER SEPARATION ANALYSIS
TECHNICAL REPORT

Prepared By

Christopher B. Burke Engineering, Ltd.
9575 W. Higgins Road, Suite 600
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Prepared For

Village of Lombard
255 E. Wilson Street
Lombard, IL 60148

CBBEL Project No. 07-0386

APRIL 2013

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EXECUTIVE SUMMARY

Christopher B. Burke Engineering, Ltd. (CBBEL) has completed an analysis of the watershed tributary to the 72" storm sewer that conveys flow to the Route 53 Pump Station. This watershed has been referred to as the Northern Area Sewers (NAS) watershed. This watershed is mostly separated but does have some areas within the watershed with combined sewer drainage. The purpose of this study was to determine the capacity requirements for the Route 53 Pump Station to reduce flooding along Philips Court, and to determine an ultimate separation plan for this watershed. The study has determined the capacity of the existing storm sewer and combined sewer systems, identified any combined sewer overflows (CSO), and developed a plan to separate the storm and combined sewers in the watershed.

The XP-SWMM modeling software was used to model the existing sewer systems. The model was developed using the Village's sewer atlases, aerial topography, and supplemental survey data. The model uses the same hydrologic input parameters as the Gatz Pond watershed. The Gatz Pond model was calibrated to the July and September 2008 rainfall events. Because the watershed characteristics of the NAS watershed are similar to the Gatz Pond watershed, the same hydrologic parameters were used in the NAS watershed model. The model indicated areas where there is potential for CSO during the 10-year storm event. These locations are shown on Exhibit 4 of this report.

Two sewer separation plans were developed, which involved sizing new storm sewer networks. Storm sewers were sized for the 10-year storm event. It was assumed that the existing combined sewers would no longer be used for storm sewer runoff and that new sanitary sewers would be installed as each street is separated.

A full sewer separation of the watershed will require infrastructure improvements. Aside from the street-to-street sewer separation, enlarging the existing storm sewer along West Road, Eugenia Street, Elizabeth Street, Grove Street, Main Street and Parkside Avenue will be required. The sewer separation will increase the tributary area to the Route 53 Pump Station which will require capacity upgrades or detention storage within the watershed to prevent flooding increases within the Philips Court corridor.

Based on the assumption that the pump station will be upgraded under a separate contract, the costs presented in this report are for the sewer separation projects only; they do not include the cost for the other utility replacement such as watermain, roadway resurfacing, landscaping, etc.

The proposed separation plan includes the following:

Alternative 1

- Upsizing the main storm line on West Road, Eugenia Street, Elizabeth Street, Grove Street, and Main Street (see Exhibit 5);
- New storm sewer laterals on streets along St. Charles Road and south of St. Charles Road (Parkside/Main/Charlotte/Martha/Randolph/Lombard);
- Pump Station upgrades at Route 53;
- **Total Cost (excluding pump station) = $3.2 million**

Alternative 2

- New storm sewer on streets along St. Charles Road and south of St. Charles Road (Parkside/Main/Charlotte/Martha/Craig/Stewart/Lombard/Elm);
- Tunneling under the Union Pacific Railroad at Elizabeth Street;
- Pump Station upgrades at Route 53;
- **Total Cost (excluding pump station) = $2.6 million**