1200 Wilmette Avenue
Wilmette, IL 60091

DEPARTMENT OF
ENGINEERING AND PUBLIC WORKS

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NOTICE OF MEETING
of the
MUNICIPAL SERVICES COMMITTEE OF THE
BOARD OF TRUSTEES OF THE VILLAGE OF WILMETTE

Thursday, September 24, 2015 at 6:00 P.M. to 7:00 P.M.
Resident Open House
Second Floor Training Room
Wilmette Village Hall

Thursday, September 24, 2015 at 7:00 P.M.
Municipal Services Committee Meeting
Council Room
Wilmette Village Hall
1200 Wilmette Avenue, Wilmette, Illinois

AGENDA

1. Call to Order
2. Minutes of the Municipal Services Committee meeting of March 25, 2015
3. Review of Studies from Christopher B. Burke Engineering Ltd. for additional work related to the Separate Sewer Stormwater Study
4. Public Comment
5. Old Business
6. New Business
7. Adjournment

Trustee Cameron Krueger, Chair

IF YOU ARE A PERSON WITH A DISABILITY AND NEED SPECIAL ACCOMMODATIONS TO PARTICIPATE IN AND/OR ATTEND A VILLAGE OF WILMETTE PUBLIC MEETING, PLEASE NOTIFY THE VILLAGE MANAGER'S OFFICE AT (847) 853-7509 OR TDD (847) 853-7634 AS SOON AS POSSIBLE.

1200 Wilmette Avenue
WILMETTE, ILLINOIS 60091-0040

DRAFT MEETING MINUTES

MUNICIPAL SERVICES COMMITTEE OF THE VILLAGE BOARD

WEDNESDAY, MARCH 25, 2015
7:00 P.M.
COUNCIL CHAMBERS, SECOND FLOOR OF VILLAGE HALL

Members Present:	Trustee Julie Wolf, Chair Trustee Alan Swanson
Members Absent:	Trustee Cameron Krueger
Staff Present:	Brigitte Berger, P.E., Director of Engineering Services Michael Miller, Civil Engineer
Guests Present:	Mr. Olson, Christopher B. Burke Engineering Ltd. Michael Young, RJN Group See sign in sheet for guests

I. CALL TO ORDER.

Trustee Julie Wolf, Chair, called the meeting to order at 7:00 p.m. Committee member Trustee Swanson was present.

II. APPROVAL OF MINUTES; MUNICIPAL SERVICES COMMITTEE MEETING OF FEBRUARY 10, 2015.

Trustee Wolf directed the Committee's attention to the draft minutes of the Municipal Services Committee meeting of February 10, 2015.

Trustee Swanson moved that the Committee approve the minutes. The motion was seconded by Trustee Wolf and approved by unanimous voice vote. **The motion carried**.

III. REVIEW OF PROPOSALS FROM CHRISTOPHER B BURKE ENGINEERING LTD FOR ADDITIONAL WORK RELATED TO THE SEPARATE SEWER STORMWATER STUDY

Brigitte Berger, Director of Engineering, said at the January 28, 2015 Municipal Services Committee meeting, the consulting firm of Christopher B. Burke Engineering Ltd. (CBBEL) presented the results of the Separate Storm Sewer Study. The goal of the study was to determine the location of critical "bottlenecks" within the system and identify projects that will improve capacity, thereby reducing overland flooding. The identified performance standard used by CBBEL was to keep flood levels below street level for the ten-year rain event. CBBEL built and calibrated an accurate hydraulic model of the separate storm system. The model results concluded that the respective capacities of the storm water pump station (585 cubic feet per second (CFS) and the two outfalls (980 cfs) to convey the stormwater the pump station in an efficient manner. Two projects were identified to meet the standard and presented.

Ms. Berger said in response to the January 28 presentation, staff asked CBBEL to submit proposals to further explore some of the options that were discussed at the meeting. The proposals are presented in the report to the Committee and a summary of the proposals is also provided.

Ms. Berger said the first proposal is a refinement of alternatives developed in the stormwater report to allow stormwater storage on the street and up to the public right-of-way. The cost for this study is approximately $26,300.

A resident asked what defines the lowest point for allowing water to pond in the street.

Mr. Olson, Christopher B. Burke Engineering Ltd., said the model they are working from has five different sections of the Village that will be defined individually for the lowest point in each section.

Ms. Berger said the second proposal is investigation of potential surface storage at Community Playfield. The scope of this study includes determining a location within Community Playfield to excavate the basin, what amenities could be placed within the lowered area (parks, soccer fields, etc.) and developing a concept grading plan and cost estimate. The cost for this additional study is $16,000.

Ms. Berger said the third proposal includes coordination with the Village of Glenview on the feasibility of connecting to their stormwater project for drainage improvements for Lockerbie Lane and LeClaire Avenue. The cost for this study is approximately $14,000 for a preliminary drainage design and cost estimate.

Trustee Swanson asked how many hours would be involved for each of the three proposals.

Mr. Olson said for the first proposal there would be approximately 200 hours, the second proposal there would be approximately 100 hours and the third proposal there would be approximately 90 hours involved.

Trustee Wolf asked when the Village of Glenview would have to be made aware of the Glenview study.

Mr. Olson said it is important to start the coordination with Glenview as soon as possible.

Trustee Wolf asked about the potential surface storage of the Community Playfield and are there ways to construct it so the park would be fully functional.

Mr. Olson said they have designed parks that are depressed to allow the stormwater to be temporarily stored there, the stormwater drains out and the parks are then usable to play on.

Trustee Swanson asked what the water detention time cycle would be.

Mr. Olson said it depends on the type of system. The more water that you have to store and the longer it has to be held, obviously will take longer to drain out. They generally install under drains in systems like this so in some cases the water drains faster.

Trustee Wolf asked how deep the depressed area would have to be.

Mr. Olson said it depends on each situation, the area could be depressed 4-8 feet with gradual sloping.

Karleen McAllester, 323 Wilshire Drive East, said her street already experiences one and half feet of ponding so where would the water go.

Ms. Berger said the storm system has three components; the conveyance (pipes), the pump station at Lake and Harms and the outfalls where the water goes from the pump station out to the north branch of the Chicago River. As the report showed, the bottleneck is in the conveyance so there will still have to be larger pipes but they can allow some of the water to pond in the streets and up onto the curb to keep the size of the pipes and cost down.

Joel Kurzman, 2615 Greenleaf, said the idea of having water in the street rather than your home is conceptually fine but the right of way is often the way out of the home. He said if streets already have a large amount of water in the streets, would the proposed plan reduce the water amount in the street.

Trustee Swanson said they are trying to determine how big a conveyance system

is needed and how much water can be left in the street to pond up to the public right-of-way.

Mr. Kurzman said he is concerned that notice was not properly given for the February 10, 2015 meeting when the stormwater study was discussed.

Ms. Berger said the stormwater study was not on the agenda at the February 10, 2015 meeting. She said in new business at the end of the meeting, she provided a follow up regarding suggestions made at the January 28, 2015 meeting noting that proposals from Christopher B. Burke Engineering would be reviewed at a future Municipal Services Committee meeting.

Jerry Tater, 333 Wilshire West, said one of the items brought up in the January meeting was the suggestion of piping in the street being pumped out to provide immediate relief of water. He said that solution has been used in other areas of the country in streets which he believes would be less expensive.

Mr. Olson said that type of piping system is used when a river is over flooding its banks and the water is pumped back into the river system. There is no place in Mr. Tater's area that the water could be pumped to and the size of the pipes that would be needed would be very expensive.

Bob Davis, 227 Kilpatrick, said he relies on the Village Board meeting notices to tell him when stormwater will be discussed at an upcoming meeting. He believes re-grading the streets would help with flooding in his neighborhood.

Joel Feinstein, 407 Wilshire Drive West, said he would suggest placing berms in upland areas to help reduce the amount of water draining to lower areas in the neighborhood.

Trustee Swanson moved to recommend to the Village Board to enter into three agreements with Christopher B. Burke Engineering Ltd. as outlined in the March 25th memo provided by staff. The motion was seconded by Trustee Wolf and approved by unanimous voice vote. **The motion carried**.

IV. REVIEW OF SMOKE TESTING RESULTS FOR KENILWORTH GARDENS AND DISCUSSION OF ADDITIONAL INFILTRATION AND INFLOW (I/I) STUDIES

Ms. Berger said in response to widespread sanitary-related flooding in the separate sewer system west of Ridge Road, the Village implemented a multi-tiered approach to address sanitary sewer backups. Now that the large system improvements are either completed (Wilmette and Hibbard Relief Sewer project) or underway (West Park Sanitary Storage Project) staff is focusing on programs

to reduce inflow and infiltration (I/I).

Reducing non-sanitary flows in the sanitary system will further reduce the severity and frequency of sewer backups. From a regulatory standpoint, the Metropolitan Water Reclamation District of Greater Chicago (MWRD) has recently adopted changes to the Watershed Management Ordinance, also adopted by Wilmette, that requires local agencies tributary to MWRD to adopt an I/I program over the next five years. This includes developing a program to address I/I on private property. Smoke testing is one of the most economical methods of determining inflow and infiltration sources on both public and private property. In October 2013, RJN completed smoke testing of the Kenilworth Gardens subdivision to identify public and private sources of inflow and infiltration into the sanitary system.

Ms. Berger said Michael Young from RJN Group will give a brief presentation of the subject.

Mr. Young reviewed the report provided to the Committee noting the first part of the project (West Park Sanitary Storage Project) is proceeding and is on schedule. He said the second part of the project is expanding smoke testing to additional areas within the Princeton Basin. Using the methods outlined in the report, RJN will use smoke testing to identify various defects in the collection system as well as to find contributing sources of inflow and infiltration. Common identified concerns include cracked main lines and laterals, connected downspouts and window well drains, directly connected storm sewer, connected foundation drains, area, patio, and driveway drains, and broken cleanouts. Additionally, cross connections such as leaking storm sewers crossing sanitary sewers will also be identified for further inspection by dyed water flooding.

Mr. Young said they have finished the smoke testing in the Kenilworth Gardens area and a portion of the dye flooding. The immediate proposal is to finish the dye flooding in Kenilworth Gardens and start to expand the smoke testing outside of Kenilworth Gardens to a larger portion of the Princeton Basin.

Trustee Swanson said he believes that the work done up to this point has been very valuable. He has concerns with the 54% compliance rate of property owners making repairs, he would like to see everyone comply. Trustee Swanson said it is a large contract that is proposed and he believes the Village may need to request proposals.

Trustee Wolf said she agrees that it would be prudent to do a request for proposals (RFP). She said the information provided so far has been extremely helpful especially since MWRD requires a plan from the Village.

Trustee Swanson said the information has been extremely helpful as the problems have been identified as not only Village issues.

Trustee Wolf said the Committee is in agreement that staff will do an RFP for the project.

V. RESOLUTION NAMING THE WILMETTE WATER PLANT

Trustee Swanson said there have been several articles written about Carbon P. Dubbs who was a previous mayor of Wilmette when the decision was made to build the plant. He was the person most responsible for developing what has turned out to be of Wilmette's greatest assets. As a result of Mr. Dubbs' leadership, the Wilmette water treatment plant was completed in 1934 and Trustee Swanson believes that his service should be recognized.

Trustee Swanson moved that the Municipal Services Committee recommend to the Village Board that the Wilmette Water Plant be renamed after Mr. Carbon P. Dubbs, seconded by Trustee Wolf and approved by unanimous voice vote. **The motion carried**.

VI. NEW BUSINESS

There was no new business.

VII. PUBLIC COMMENT

There was no public comment.

VIII. ADJOURNMENT

Trustee Wolf asked for a motion to adjourn. Trustee Swanson moved to adjourn the meeting. The motion was seconded by Trustee Wolf. No further discussion occurred on the motion. Voting yes: Trustee Wolf and Trustee Swanson. Voting no: none. **The motion carried.**

The meeting was thereafter adjourned.

Minutes Respectfully Prepared by Barbara Hirsch.

Engineering and Public Works Department

(847) 853-7500
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DATE: September 17, 2015

TO: Municipal Services Committee

FROM: Brigitte Berger, P.E., Director of Engineering and Public Works

SUBJECT: Separate Storm Sewer System Study

Recommendation

Committee review and discussion of the following three supplemental storm sewer studies by Christopher B. Burke Engineering Ltd. (CBBEL):

1. Refinement of alternatives developed in the original stormwater report to lower the 10-year hydraulic grade line to the back of sidewalk instead of below street level.

2. Above-ground stormwater storage at Community Playfield

3. Glenview stormwater connection for drainage improvements in the Lockerbie Lane and LeClaire Avenue area.

Background

The Chicagoland region experienced several storms of record the past five years as shown in Attachment 1. In July of 2011, the Village recorded a 25-year storm event in which 4.48 inches of rain fell over 5 hours. In April of 2013, the Village received approximately 5 inches of rain over 24 hours which was scaled as a 17-year event. The 2013 storm was exacerbated by antecedent soil conditions that were already saturated because of melting snow.

These storms caused widespread basement and surface flooding throughout the entire region. Specifically in Wilmette, Table 1 shows the results of a resident flood survey taken after the April, 2013 storm.

April, 2013 Resident Flood Survey Results 15% response rate (1,597 respondents Village-wide)	
Description	Separate Sewer Area (West of Ridge Road)
Number of responses	916
Sanitary Sewer Backup	396 (43%)
Street Flooding Entered Home	126 (14%)
Yard Flooding Entered Home	69 (8%)

Table 1. Flood Survey Results

In response, the Village Board initiated an aggressive plan to address the performance of the sewer systems west of Ridge Road. The highest priority projects were those that focused on reducing the severity and frequency of sanitary sewer backups. The Village Board approved a $24 million general obligation bond issue to complete the following projects:

Project	Estimated Actual Cost
West Park Sanitary Storage Project	$18,397,000
Local Storage / Capacity Improvements	$ 3,285,000
Smoke Testing and I/I removal	$ 122,000
Manhole Rehabilitation	$ 1,574,000
Storm Sewer Study	**$ 307,000**
Total	$23,685,000

Table 2. Projects Included in the Bond Issue

With many of the above projects either completed or well underway, the Village Board turned their focus to the separate storm sewer system.

Separate Storm Sewer System Study

Table 3 provides a recap of the schedule and progress of the separate storm sewer study.

January, 2014	Village Board meeting	Christopher B. Burke Engineering Ltd (CBBEL) awarded contract
March, 2014	Open Houses	Resident input was gathered
August, 2014	MSC Meeting	Study update on progress
January, 2015	MSC Meeting	Presentation of results
March, 2015	MSC Meeting	Recommended supplemental studies
September, 2015	MSC Meeting	Presentation of results of the supplemental studies

Table 3. Separate Storm Study Progress Schedule

The separate storm sewer system, located west of Ridge Road, consists of three components:

- Trunk (large diameter) and lateral (small diameter) sewers that collect and convey the stormwater;
- Stormwater pump station on Lake Avenue;
- Two outfall pipes that discharge the stormwater from the pump station to the North Branch of the Chicago River.

The goal of the study was to determine the location of critical "bottlenecks" within the system and identify projects that would improve capacity, thereby reducing overland flooding. The identified performance standard recommended by the Municipal Services Committee was to keep ponding below street level for the 10-year storm event.

CBBEL built and calibrated a hydraulic model of the separate storm system. The model results concluded that the respective capacities of the stormwater pump station (585 cubic feet per second (cfs) and the two outfalls (980 cfs) are adequate to meet the performance standard of keeping flood levels below the street elevation for the 10-year storm event. The limiting factor in the system is the capacity of the existing storm sewers (300 cfs) to convey the stormwater to the pump station in an efficient manner. A summary of residential structures impacted by flooding is provided in Table 4.

Return Storm Interval	Number of Structures Impacted[1]
10-year	120
25-year	280
50-year	480
100-year	700

Table 4. Summary of structures impacted by flooding

[1] Structures are considered "impacted" if water reaches within 1-foot of the highest lot elevation.

At the January 28, 2015 Municipal Services Committee meeting, the consulting firm of Christopher B. Burke Engineering Ltd. (CBBEL) presented the results of the Separate Storm Sewer Study.

Two projects were identified that meet the performance standard of keeping flood levels below street level for the 10-year storm event.

- Alternative 1 includes building a relief storm sewer system to collect and convey excess storm flows to the stormwater pump station. This alternative includes installing 42,000 feet of new trunk and lateral sewers. The cost of this alternative is estimated to be $75 million.

- Alternative 2 includes building an 18 million gallon (55 acre-feet) underground storage tank under Community Playfield as well as 35,000 feet of new trunk and lateral sewers to route the stormwater to the storage facility. The cost of this alternative is estimated to be $70 million. (For comparison purposes, the tank

under Community Playfield would be three times larger than the recently constructed West Park sanitary storage tank.)

Alternative 3 identified Thornwood Park, Centennial Park and the Community Rec Center/Hibbard Park as possible locations for small (10-12 acre-feet) storage projects. The cost of this alternative is approximately $44 million. These projects do not, however, meet the performance standard of reducing the 10-year flood elevation below street level for all homes in the separate sewer area.

In addition to the major capital projects, the report identified small projects that could improve flooding in Wilmette such as a connection to Glenview's proposed storm system adjacent to southwest Wilmette.

It should be noted that all cost estimates have been calculated based on the concept level plans developed utilizing 2014 unit prices based on 2014 bid openings. If projects are constructed after 2014, it should be anticipated that these prices will increase.

Discussion

The purpose of the meeting on September 24, 2015 is to discuss the three supplemental studies recommended by the Committee in March.

Study A: Refinement of alternatives (Attachment 2)

The original study set a performance benchmark of reducing the 10-year storm flood depths on the streets from the existing depths (1-2 feet) to the street level (no street flooding). Given that the cost of achieving this goal is estimated at $75 million, the Committee refined the performance standard to reducing the 10-year storm flood depths on the street from the existing depths (1-2 feet) to the back of sidewalks elevation (approximate depths of 6-8 inches).

Each of the original alternatives was modeled with this new parameter and results are shown in Table 5.

Original Alternative	Description	Original Cost (No Ponding)	Refined Cost (Ponding in the ROW)
1	Relief Storm Sewer	$75 million	$65.8 million
2	Centralized Storage at Community Playfield	$70 million	$63.0 million
3	Neighborhood Stormwater Storage[1]	$44 million	$39.1 million

Table 5. Cost of Refined Alternatives

[1] This alternative does not achieve the goal 10-year level of protection for all streets in the separate sewer area.

Study B: Surface Storage at Community Playfield (Attachment 3)

The original study identified Alternative 2 which provides 18 million gallons of centralized underground storage at Community Playfield. The cost of Alternative 2 was estimated at $70 million. The purpose of the Supplemental Study B is to look at the feasibility and economics of providing above-ground stormwater storage at Community Playfield.

CBBEL modeled two possible options for Alternative 2:

Alternative 2.1

- Primarily above-ground storage with a small portion of underground storage.
- Above-ground portion is dry bottom basin suitable to replace athletic fields and stormwater management areas that currently exist within the basin footprint.
- The below-ground portion would be pumped to the existing storm sewer along Locust Road following storm events.
- Large diameter (6.5 foot) Reinforced Concrete Pipe (RCP) storm sewers under Locust Road to convey water from Lake Avenue and Wilmette Avenue into storage basin.
- Additional lateral sewers within the separate storm sewer area to convey water toward the large storm sewers under Locust Road.
- Estimated construction cost: $59.5 million

Alternative 2.2

- Above-ground storage that is drained by gravity.
- The bottom of the basin would be dry and suitable to replace athletic fields and stormwater management areas currently located within the basin footprint.
- Large Reinforced Concrete Box Culverts (RCBC's) under Locust Road to provide conveyance to the centralized storage basin. The RCBCs would extend from Lake Avenue and Wilmette Avenue into the storage basin.
- Additional lateral sewers within the separate storm sewer area to convey water toward the large storm sewers under Locust Road.
- Estimated construction cost: $53.0 million

It should be noted that Alternatives 2.1 and 2.2 achieve the performance measure of keeping ponding below street level for a 10-year storm event. In addition, these options provide flood storage for larger storm events.

Locust Road is slated for total reconstruction in 2017. As noted above, Alternatives 2.1 and 2.2 require major sewer construction under Locust Road. The storm sewer costs on Locust Road for Alternative 2.1 is $3.8 million and for Alternative 2.2 is $7 million.

Study C: Glenview Stormwater Connection

The purpose of this study is to evaluate the feasibility of a stormwater connection to Glenview's storm system to provide drainage improvements in the Lockerbie Lane and LeClaire Avenue neighborhood. CBBEL modeled the proposed sewer improvements and the results show minimal benefit for the Wilmette system. This is due to the capacity of the Glenview system located downstream of the proposed connection point. Based on information provided by Glenview and their consultant, the current and future improvements implemented by Glenview will provide between a 10-year and 100-year level of protection for the streets. With this option, only five homes would benefit during the 10 and 25-year storms, therefore this option has a high cost per home protected ratio.

Cost / Benefit Analysis

One of the metrics used when analyzing the benefits of the West Park Sanitary Storage Project was the cost per home protected from a sewer backup. Based on the hydraulic model of the sanitary sewer system, when operational, the West Park project will eliminate or reduce the severity of sewer backups for 1300 homes west of Romona Road. The cost v. homes benefited ratio is $14,152.

Table 6 shows a similar analysis of cost v. benefit of structure removed from the 100-year inundation area. As Table 6 indicates, the cost v. benefit ratio ranges from $203,846 per dwelling removed from the 100-year inundation zone to $411,579 per dwelling.

To place these options (ranging from $53-$75 million) into historical context, over the past 25 years, the Village has spent approximately $77 million on other sewer improvement projects Village-wide.

The Village increased the Sewer User Fee $0.80, approximately 24%, to fund the $24 million debt issuance for the current sewer improvement projects, including West Park. Funding additional projects would require proportionate increases in the Sewer User Fee or creation of a new revenue stream.

The table below compares financing a $55 million project (Option 2.2, including transaction costs such as use of the land) to the 2014-15 Sewer Improvement Program:

2014-15 Sewer Improvement Program		Proposed Stormwater Program	
Program Cost	$24,000,000	Program Cost	$55,000,000
Annual Debt Service[1]	$1,200,000	Annual Debt Service	$3,100,000
Dwellings Benefitting	1,300[2]	Dwellings Benefitting [3]	260
Cost per Dwelling	$14,152	Cost per Dwelling	$203,846
Annual Impact to Household Sewer Bill	$105	Annual Impact to Household Sewer Bill	$343

[1]The annual debt service for the 2014-15 program is based on the debt service budgeted for FY 2015. This figure will fluctuate each year based on how the debt was structured.

[2] Does not include homes benefitting from the relief sewer / local storage project.
[3] Homes removed from the 100-year flood inundation area.

Note that the Village's entire debt service for all its existing sewer fund debt in FY 2015 is $3.026 million, and is projected to be $3.4 million in FY 2016.

Further Discussion

Given the projected costs outlined above, the Committee may wish to discuss the possibility of retaining an additional stormwater consultant to conduct an independent review of CBBEL's study and provide a second opinion of project costs. The fee of an independent review would likely be in the range of $30,000.

In addition to verifying the costs and cost/benefit analysis, the Committee, with this information, will need to begin to discuss this data and make recommendations on how to proceed, which would necessarily include project viability, scope and what the source of funding would be for the debt issuance that would be needed.

Documents Attached

1. Storms of Record
2. CBBEL study dated July 1, 2015 Refinement of Alternatives for Separate Storm Sewer System
3. CBBEL study dated July 1, 2015 Above Ground Community Park Stormwater Storage Basin with Exhibits 2.1 and 2.2
4. CBBEL study dated August 10, 2015 Drainage Improvements at Lockerbie Lane and LeClaire Avenue, Wilmette and Glenview Coordination
5. Resident Comments

THE VILLAGE OF Wilmette EST. 1872

Separate Storm Sewer Study
Summary of Project Options / Costs / Benefits

Village of Wilmette, Summary of Alternatives (100 Year Design Storm)1	Alternative ID	Total Cost (Millions $ 2014)	Existing Number of Structures in 100-year Inundation Area	Number of Structures Removed from the 100-year Inundation Area	Number of Structures Remaining in the 100-year Inundation Area	Cost Per Structure Protected for 100-year Event
Relief Storm Sewer System	1	75.0	700	330	**370**	**$227,273**
Relief Storm Sewer System - Refined	1A	65.8	700	270	430	$243,704
Centralized Stormwater Storage at Community Playfield	2	70.0	700	210	490	$333,333
Centralized Stormwater Storage at Community Playfield – Refined	2A	63.0	700	160	540	$393,750
Centralized Stormwater Storage at Community Playfield Above & Below	2.1	59.5	700	285	**415**	**$208,772**
Centralized Stormwater Storage at Community Playfield Above Only	2.2	53.0	700	260	**440**	**$203,846**
Neighborhood Stormwater Storage	3	44.0	700	130	570	$338,462
Neighborhood Stormwater Storage – Refined	3A	39.1	700	95	605	$411,579
Table 6. Cost/Benefit	1 Refined alternative refers to reducing the 10-year HGL to the back of sidewalk or 6-8 inches in depth on the street and the Alternative ID includes an "A".					

Village of Wilmette
Storms of record 1980-2011

Rank	Date	Location	Inches	Minutes	Hours	Inches/hour	Storm Freq, yrs
1	8/2/2001	WTP	4.11	80	1.33	3.08	100
2	7/12/1981	SWPS	3.60	120	2.00	1.80	100
3	8/7/1989	SWPS	4.20	150	2.50	1.68	100
4	8/13/1987	SWPS	9.80	1440	24.00	0.41	100
5	9/12/2008	SWPS	6.60	1200	20.00	0.33	70
6	9/12/2008	WTP	6.29	1200	20.00	0.31	70
7	8/22/2002	WTP	3.85	210	3.50	1.10	50
8	8/22/2002	SWPS	3.80	210	3.50	1.09	50
9	8/16/1995	WTP	2.71	90	1.50	1.81	25
10	**7/23/2011**	**SWPS**	**4.48**	**300**	**5.00**	**0.90**	**25**
11	6/24/1994	SWPS	4.10	600	10.00	0.41	25
12	**4/17/2013**	**WTP**	**5.56**	**1440**	**24.00**	**0.23**	**25**
13	**4/17/2013**	**SWPS**	**5.00**	**1440**	**24.00**	**0.21**	**17**
14	8/14/1981	SWPS	2.30	60	1.00	2.30	15
15	8/18/1990	SWPS	2.75	120	2.00	1.38	15
16	**7/23/2011**	**WTP**	**3.39**	**300**	**5.00**	**0.68**	**10**
17	7/24/2010	SWPS	4.20	810	13.50	0.31	10
18	7/24/2010	WTP	3.81	810	13.50	0.28	10
19	7/10/2004	SWPS	2.41	100	1.67	1.45	10
20	7/19/1993	WTP	2.80	160	2.67	1.05	10
21	8/19/1990	WTP	3.75	720	12.00	0.31	10
22	10/25/1991	WTP	2.25	105	1.75	1.29	8
23	5/9/1990	WTP	3.80	840	14.00	0.27	8
24	6/19/2009	SWPS	3.96	1440	24.00	0.17	7
25	6/19/2009	WTP	3.93	1440	24.00	0.16	7
26	9/22/2006	SWPS	2.13	80	1.33	1.60	7
27	7/23/1997	WTP	2.42	150	2.50	0.97	7
28	**6/26/2013**	**WTP**	**2.67**	**240**	**4.00**	**0.67**	**7**
29	5/25/1991	WTP	1.40	30	0.50	2.80	5
30	8/2/1992	WTP	1.60	40	0.67	2.40	5
31	8/23/2007	SWPS	2.71	270	4.50	0.60	5
32	6/24/1994	WTP	2.62	480	8.00	0.33	5
33	2/24/1997	WTP	3.30	1260	21.00	0.16	5
34	2/24/1997	SWPS	3.30	1260	21.00	0.16	5
35	**6/26/2013**	**SWPS**	**3.32**	**240**	**4.00**	**0.83**	**5**
36	6/18/1993	WTP	1.53	45	0.75	2.04	4
37	8/5/1998	WTP	1.50	50	0.83	1.80	4
38	8/2/2001	SWPS	1.65	60	1.00	1.65	4
39	10/5/1991	WTP	2.54	330	5.50	0.46	4
40	5/9/1990	SWPS	2.80	720	12.00	0.23	4
41	9/8/1996	SWPS	1.89	120	2.00	0.95	3.5
42	8/11/1994	WTP	2.05	180	3.00	0.68	3.5
43	9/11/1986	SWPS	2.00	180	3.00	0.67	3.5
44	8/23/2007	WTP	2.18	270	4.50	0.48	3.50
45	10/22/1983	SWPS	2.40	420	7.00	0.34	3.5
46	11/27/1990	SWPS	2.58	690	11.50	0.22	3.5
47	7/9/2007	WTP	1.35	45	0.75	1.80	3
48	9/11/2000	WTP	1.70	80	1.33	1.28	3
49	10/17/1988	WTP	2.25	270	4.50	0.50	3
50	11/28/1990	WTP	2.40	510	8.50	0.28	3
51	6/13/1999	SWPS	1.50	90	1.50	1.00	2
52	7/10/2004	WTP	1.44	95	1.58	0.91	2
53	6/13/1999	WTP	1.50	100	1.67	0.90	2
54	9/11/2000	WTP	1.60	130	2.17	0.74	2
55	8/3/2004	SWPS	1.39	120	2.00	0.70	2

56	4/8/1999	SWPS	1.75	160	2.67	0.66	2
57	9/1/1989	SWPS	1.60	150	2.50	0.64	2
58	8/13/1985	SWPS	1.80	180	3.00	0.60	2
59	9/11/2000	SWPS	1.70	240	4.00	0.43	2
60	5/1/2003	WTP	1.85	300	5.00	0.37	2
61	5/1/2003	SWPS	1.80	300	5.00	0.36	2
62	10/17/1998	WTP	2.00	420	7.00	0.29	2
63	8/19/1991	SWPS	2.40	750	12.50	0.19	2
64	11/10/1995	SWPS	2.15	840	14.00	0.15	2
65	9/26/1996	SWPS	2.06	930	15.50	0.13	2
66	10/31/1994	WTP	2.11	1080	18.00	0.12	2
67	10/31/1994	SWPS	2.36	1320	22.00	0.11	2
68	5/30/2006	SWPS	0.81	45	0.75	1.08	1
69	5/30/2006	WTP	0.72	45	0.75	0.96	1
70	8/24/2004	SWPS	1.15	75	1.25	0.92	1
71	8/5/1998	SWPS	1.12	80	1.33	0.84	1
72	6/26/1993	WTP	1.48	135	2.25	0.66	1
73	8/3/2004	WTP	1.18	120	2.00	0.59	1
74	4/8/1999	WTP	1.50	160	2.67	0.56	1
75	9/13/1993	WTP	1.50	180	3.00	0.50	1
76	8/28/2004	SWPS	1.38	180	3.00	0.46	1
77	8/7/2007	SWPS	2.10	315	5.25	0.40	1
78	9/23/2006	SWPS	1.31	200	3.33	0.39	1
79	6/29/1990	SWPS	1.50	240	4.00	0.38	1
80	8/28/2004	WTP	1.31	225	3.75	0.35	1
81	8/20/2007	SWPS	1.42	270	4.50	0.32	1
82	8/20/2007	WTP	1.37	270	4.50	0.30	1
83	10/17/1998	SWPS	1.90	420	7.00	0.27	1
84	8/5/2007	WTP	1.67	375	6.25	0.27	1
85	8/5/2007	SWPS	1.61	375	6.25	0.26	1
86	7/22/1982	SWPS	1.80	420	7.00	0.26	1
87	4/23/1999	WTP	1.61	420	7.00	0.23	1
88	8/19/1999	SWPS	1.38	360	6.00	0.23	1
89	5/22/1984	SWPS	1.50	420	7.00	0.21	1
90	4/15/2001	WTP	1.60	540	9.00	0.18	1
91	3/31/1993	WTP	2.20	780	13.00	0.17	1
92	8/19/2007	SWPS	2.05	840	14.00	0.15	1
93	8/19/2007	WTP	1.82	840	14.00	0.13	1
94	11/10/1995	WTP	1.80	840	14.00	0.13	1
95	11/1/1992	WTP	1.80	870	14.50	0.12	1
96	4/20/2000	SWPS	1.52	780	13.00	0.12	1
97	9/26/1996	WTP	1.65	930	15.50	0.11	1
98	10/8/1990	WTP	1.60	1140	19.00	0.08	1
99	3/31/1993	SWPS	1.50	1080	18.00	0.08	1
100	5/9/1996	WTP	1.80	1440	24.00	0.08	1
101	11/4/1990	SWPS	1.60	1680	28.00	0.06	1
102	5/9/1996	SWPS	1.30	1440	24.00	0.05	1

Storm Frequency based on "Rainfall Intensity vs. Duration Chart"
from the US Dept of Commerce, Technical Paper 25 for Chicago, IL 1905-12 and 1926-51

Nabil Quafisheh
Water Plant Supt

Updated: 2-May-03
22-Jan-08
9/15/2008
7/25/2011
6/30/2013

MEMORANDUM

July 1, 2015

TO: Brigitte Berger, PE – Village of Wilmette Director of Engineering Services

FROM: Darren Olson, PE, D.WRE
Dave Buckley, PE

SUBJECT: Wilmette Stormwater Action Plan
Refinement of Alternatives for Separate Storm Sewer System Stormwater Management Report
(CBBEL Project 130605.00002)

Christopher B. Burke Engineering, Ltd. (CBBEL) recently completed the Separate Storm Sewer System Stormwater Management Report (Report) for the Village of Wilmette (Village) in January 2015 as part of the Village's Stormwater Action Plan. The Report indicated that the existing separate storm sewer system has approximately a 2-year capacity and the depth of street flooding reaches up to 2.3 feet for the 10-year return interval storm event. Three long term capital improvement projects were identified to lower the 10-year hydraulic grade line (HGL) below the street pavement elevation throughout the entire west side of the Village that is served by the separate storm sewer system. This design criterion was determined through direction from Village staff and the Municipal Services Committee. The three long term capital projects identified in the January 2015 Report included the following alternatives:

- Alternative 1 - Relief Storm Sewer System: This alternative includes large diameter storm sewers to increase conveyance to the existing pump station (Exhibit 10, January 2015 Report). The engineer's estimate of probable cost for this alternative in 2014 dollars is $75M.
- Alternative 2 - Centralized Storage at Community Playfield: This alternative includes approximately 55 ac-ft of underground storage and associated storm sewer improvements to convey water to the storage basin (Exhibit 11, January 2015). The engineer's estimate of probable cost for this alternative in 2014 dollars is $70M.
- Alternative 3 - Neighborhood Stormwater Storage: This alternative includes underground storage at Thornwood Park, Centennial Park and Community Recreation Center (Exhibit 12, January 2015 Report) and associated storm sewer improvements to convey water to the storage areas. While this alternative does not reduce the 10-year HGL below street elevation for all areas, it does satisfy this criteria for the areas adjacent to the storage basins. The engineer's estimate of probable cost for this alternative in 2014 dollars is $44M.

In an effort to reduce cost, the Village has directed CBBEL to determine the cost of the three capital improvement projects if the target criterion was changed such that the 10-year HGL would be lowered to the back of sidewalk rather than below the pavement as previously contemplated (Figure 1). The remaining depth of ponding in the street would be approximately 6-8 inches for the 10-year storm event. The purpose of this memorandum is

to summarize the costs and benefits resulting from the changes to the original alternatives identified in the report using the modified criteria.

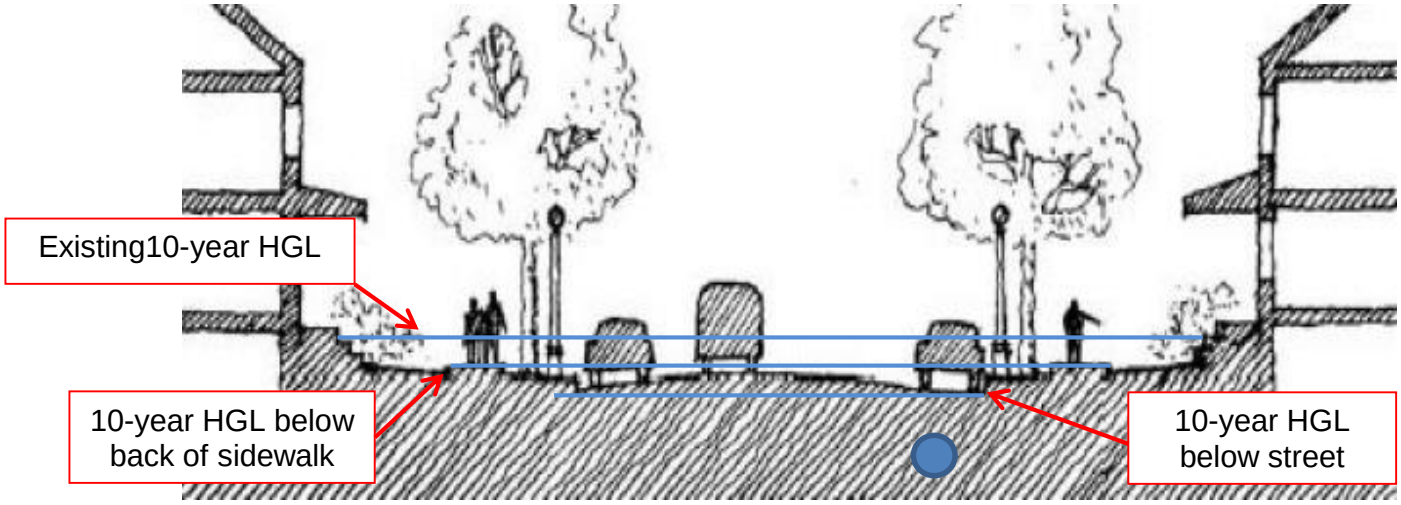

Figure 1. Residential Street Section Showing 10-Year HGL

The previously completed XP-SWMM modeling developed for the Report was used to refine the proposed storm sewer and storage basin sizes for each alternative to meet the new criteria. CBBEL developed Alternatives 1A, 2A and 3A with the new target of reducing the 10-year HGL to the back of curb or 6-8 inches in depth on the street by decreasing proposed pipe sizes and storage volumes identified in the Report. The overtopping elevation of reverse sloped driveways was also used as the controlling criteria in areas where applicable. The following is a description of the design changes for each alternative.

- Alternative 1A – Relief Storm Sewer System: Under this alternative, the proposed storm sewer sizes decreased an average of 6 inches in diameter from Alternative 1 as shown on Exhibit 10A. The engineer's estimate of probable cost for this alternative is $65.8M in 2014 dollars.
- Alternative 2A – Centralized Storage at Community Playfield: Under this alternative, the underground stormwater storage decreased by approximately 10% to 50 ac-ft and the storm sewer sizes decreased an average of 6 inches in diameter as compared to Alternative 2. This is shown on Exhibit 11A. The engineer's estimate of probable cost for this alternative is $63.0M in 2014 dollars.
- Alternative 3A – Neighborhood Stormwater Storage: Under this alternative, the underground storage decreased by approximately 10% at Thornwood Park, Centennial Park, Community Recreation Center accompanied by associated storm sewer size decreases as compared to Alternative 3. This is shown on Exhibit 12A. The engineer's estimate of probable cost for this alternative is $39.1M in 2014 dollars.

The resulting water surface elevations from each refined alternative were mapped and the benefits were quantified using the same methodology discussed in the previous Report. This methodology included a desktop GIS analysis to determine the number of structures impacted by flooding based on the property elevation compared to the peak water surface elevation. A structure was considered impacted by flooding if the peak water surface elevation rose to within 1 foot of the highest elevation on the parcel. A summary of the engineer's estimate of probable cost in 2014 dollars have been provided in Table 1 and supporting information has been included with this memorandum. The project costs includes design engineering, construction observation and permitting.

The average price decrease associated between the original alternatives and the "A" was approximately 10%. The benefits also deceased when compared to the number of structures flooded versus the original alternatives that were identified in the previous Report.

TABLE 1
Summary of Benefits and Costs

Design Storm	Existing	Relief Storm Sewer System		Centralized Stormwater Storage at Community Playfield		Neighborhood Stormwater Storage	
		Alternative 1	Alternative 1A	Alternative 2	Alternative 2A	Alternative 3	Alternative 3A
Number of Structures Impacted by Flooding							
10-year	**120**	0	0	0	0	50	50
25-year	**280**	60	95	90	115	160	170
50-year	**480**	190	235	240	290	320	350
100-year	**700**	370	430	490	540	570	605
Project Costs*							
2014 $		$75.0	$65.8	$70.0	$63.0	$44.0	$39.1

*Project costs for Alternatives 1A, 2A and 3A were also completed in 2015 dollars based on recent bid tabulations, which would increase the costs in Table 1 by approximately 2%. The project costs includes design engineering, construction observation and permitting.

DTO/DRB
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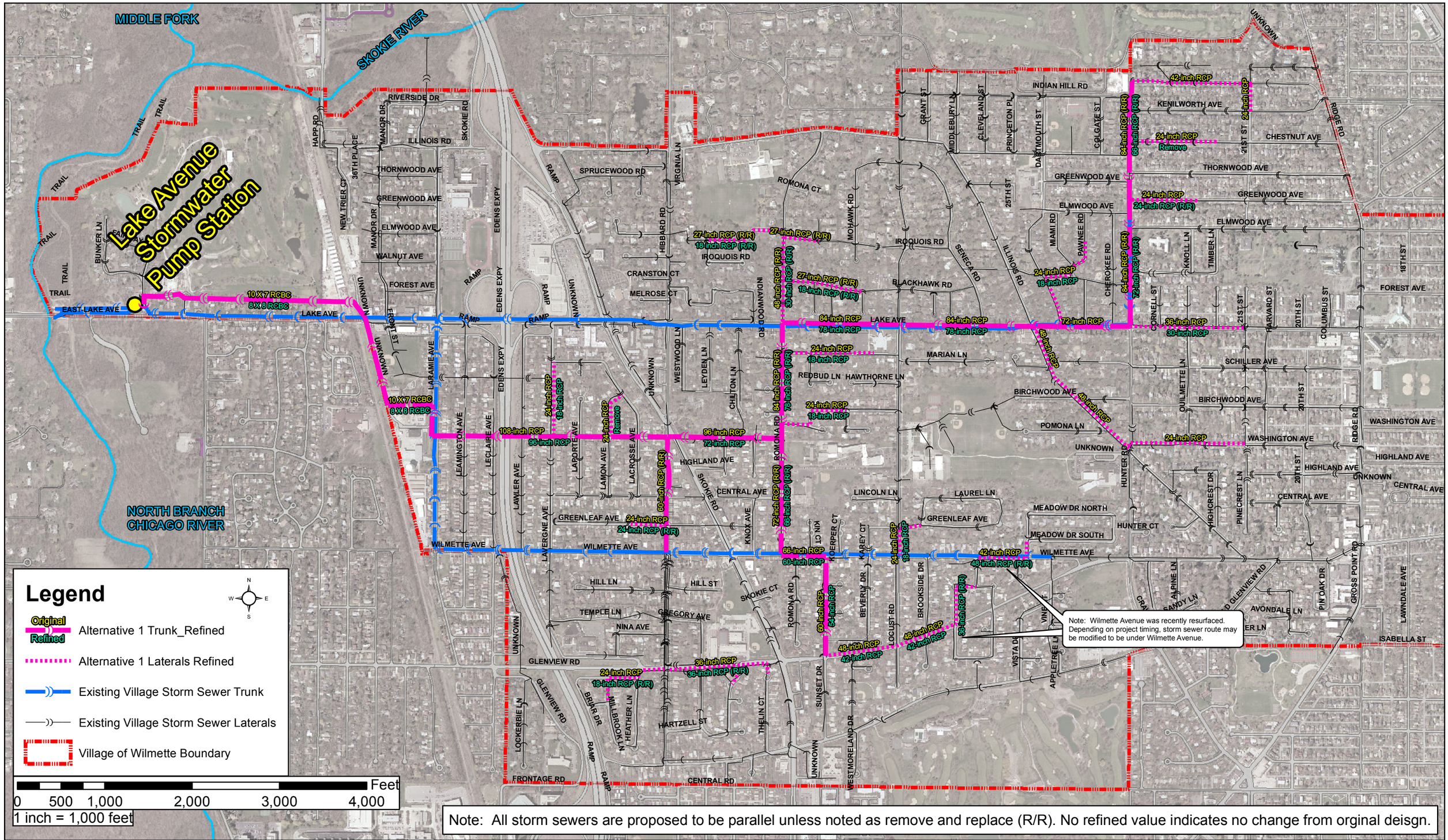


Note: All storm sewers are proposed to be parallel unless noted as remove and replace (R/R). No refined value indicates no change from orginal deisgn.

CHRISTOPHER B. BURKE ENGINEERING LTD.
9575 West Higgins Road, Suite 600
Rosemont, Illinois 60018
(847) 823-0500

CLIENT:

VILLAGE OF WILMETTE

NO.	DATE	NATURE OF REVISION	CHKD.

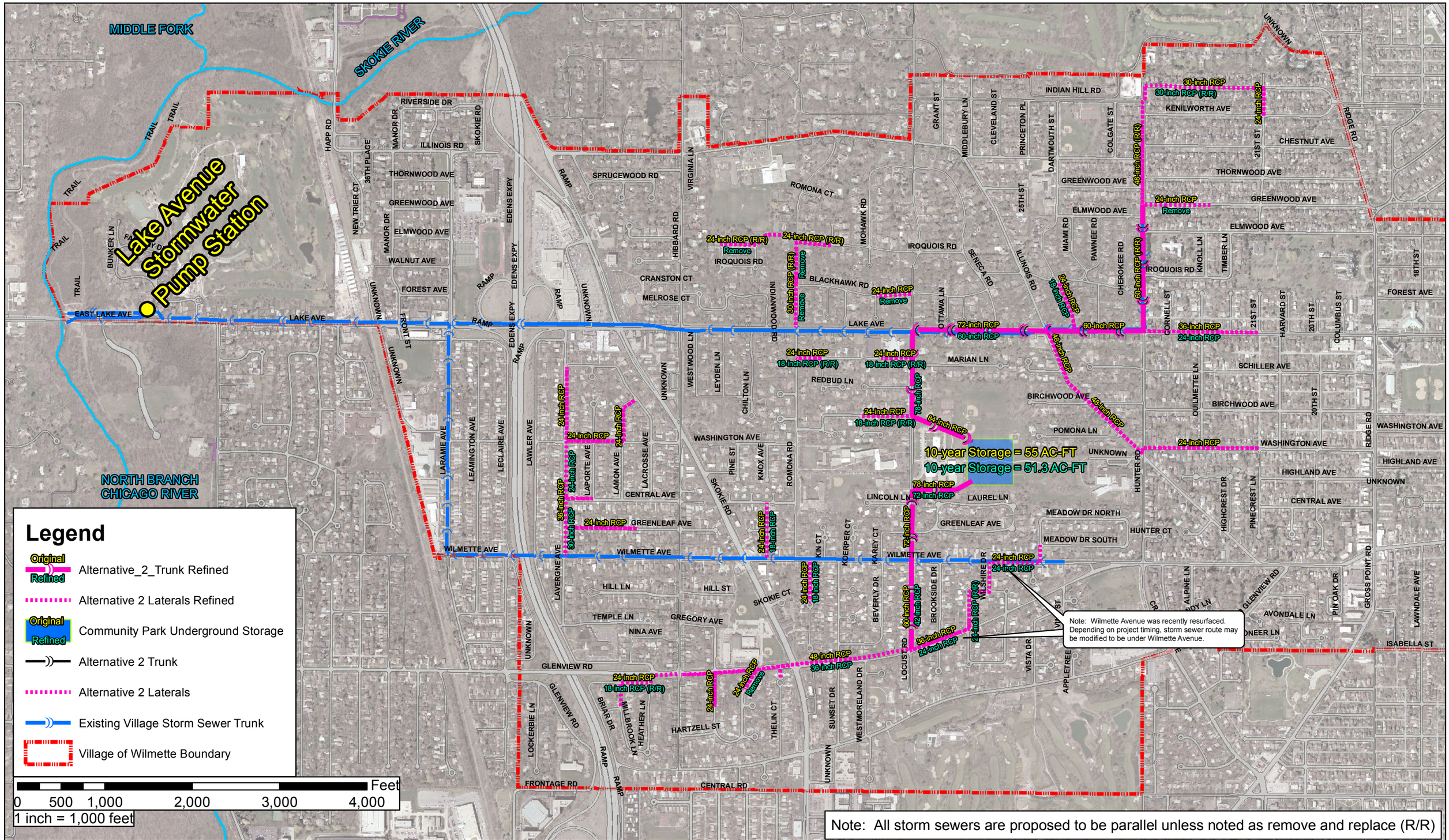
FILE NAME

DSGN.	DRB
DWN.	DRB
CHKD.	DTO
SCALE:	1"= 1,000'
PLOT DATE:	11/25/2014
CAD USER:	
MODEL:	

TITLE:

ALTERNATIVE 1A
RELIEF STORM SEWER SYSTEM

PROJ. NO. 13-0605
DATE: 7-2-15
SHEET 0 OF 0
DRAWING NO.
EXH 10A



Note: All storm sewers are proposed to be parallel unless noted as remove and replace (R/R)

CHRISTOPHER B. BURKE ENGINEERING LTD.
9575 West Higgins Road, Suite 600
Rosemont, Illinois 60018
(847) 823-0500

CLIENT:

VILLAGE OF WILMETTE

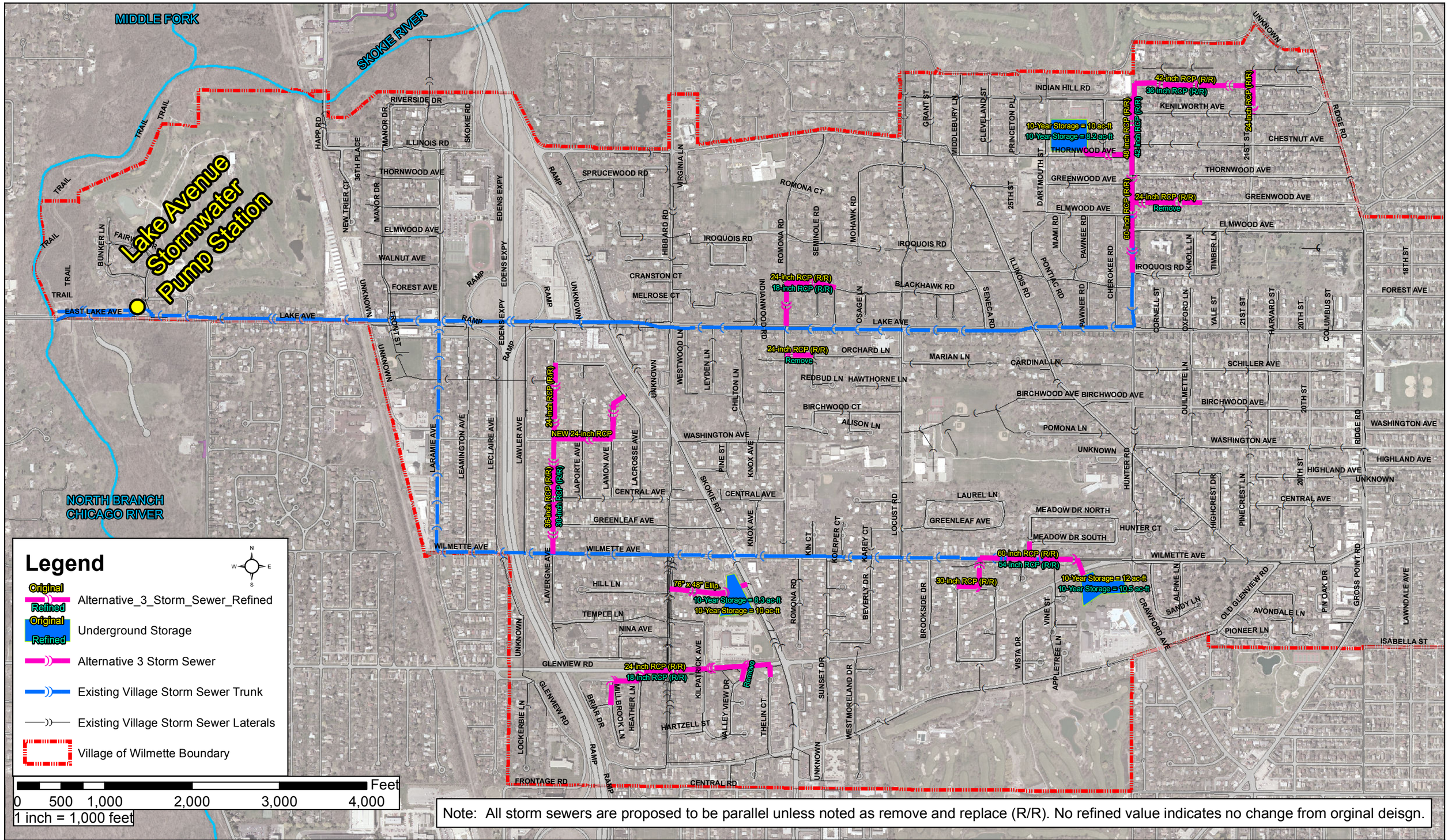
NO.	DATE	NATURE OF REVISION	CHKD.
FILE NAME			

DSGN.	DRB
DWN.	DRB
CHKD.	DTO
SCALE:	1"= 1,000'
PLOT DATE:	07/02/2015
CAD USER:	
MODEL:	

TITLE:

ALTERNATIVE 2A
CENTRALIZED STORAGE AT COMMUNITY PLAYFIELD

PROJ. NO. 13-0605
DATE: 07/02/2015
SHEET 0 OF 0
DRAWING NO.
EXH 11A



Note: All storm sewers are proposed to be parallel unless noted as remove and replace (R/R). No refined value indicates no change from orginal deisgn.

CHRISTOPHER B. BURKE ENGINEERING LTD.
9575 West Higgins Road, Suite 600
Rosemont, Illinois 60018
(847) 823-0500

CLIENT: **VILLAGE OF WILMETTE**

NO.	DATE	NATURE OF REVISION	CHKD.

FILE NAME

DSGN.	DRB
DWN.	DRB
CHKD.	DTO
SCALE:	1"= 1,000'
PLOT DATE:	07/02/2015
CAD USER:	
MODEL:	

TITLE: **ALTERNATIVE 3A NEIGHBORHOOD STORMWATER STORAGE**

PROJ. NO. 13-0605
DATE: 07/02/2015
SHEET 0 OF 0
DRAWING NO. **EXH 12A**

Christopher B. Burke Engineering, Ltd.
9575 West Higgins Road, Suite 600
Rosemont, Illinois 60018
Project Number: 13-0605
Date: January 15, 2015
Revised: June 30, 2015

Village of Wilmette, Proposed Storm Sewer Improvements
ALTERNATIVE 1A REFINED - New Trunk and Lateral Storm Sewer Relief System

			2014 COSTS		2015 COSTS	
ITEMS	**UNIT**	**QUANTITY**	**UNIT PRICE**	**TOTAL COST**	**UNIT PRICE**	**TOTAL COST**
TREE ROOT PRUNING	EACH	50	$145.00	$7,250.00	$150.00	$7,500.00
TREE PRUNING (1 TO 10 INCH DIAMETER)	EACH	50	$129.00	$6,450.00	$135.00	$6,750.00
TREE PRUNING (OVER 10 INCH DIAMETER)	EACH	50	$170.00	$8,500.00	$175.00	$8,750.00
TREE PROTECTION	EACH	50	$100.00	$5,000.00	$125.00	$6,250.00
TOPSOIL FURNISH AND PLACE	SQ YD	14,000	$7.00	$98,000.00	$7.00	$98,000.00
SODDING, SPECIAL	SQ YD	14,000	$11.00	$154,000.00	$11.00	$154,000.00
REMOVAL AND DISPOSAL OF UNSUITABLE MATERIAL	CU YD	2,950	$45.00	$132,750.00	$50.00	$147,500.00
TRENCH BACKFILL, CA-7	CU YD	130,000	$30.00	$3,900,000.00	$32.00	$4,160,000.00
AGGREGATE SUBGRADE IMPROVEMENT	CU YD	2,950	$54.00	$159,300.00	$60.00	$177,000.00
AGGREGATE FOR TEMPORARY ACCESS	TON	500	$22.00	$11,000.00	$25.00	$12,500.00
BITUMINOUS MATERIALS (PRIME COAT)	GAL	12,500	$3.00	$37,500.00	$3.00	$37,500.00
AGGREGATE (PRIME COAT)	TON	275	$15.00	$4,125.00	$20.00	$5,500.00
LEVELING BINDER (MACHINE METHOD), N50	TON	3,500	$88.00	$308,000.00	$110.00	$385,000.00
HOT-MIX ASPHALT BINDER COURSE, IL-19.0, N50 6"	TON	18,250	$76.00	$1,387,000.00	$80.00	$1,460,000.00
HOT-MIX ASPHALT SURFACE COURSE, MIX "D", N50 2.5"	TON	9,000	$89.00	$801,000.00	$95.00	$855,000.00
HOT-MIX ASPHALT SURFACE COURSE, MIX "D", N50 1.5"	TON	6,000	$89.00	$534,000.00	$95.00	$570,000.00
AGGREGATE BASE COURSE, 10"	SQ YD	59,000	$12.00	$708,000.00	$12.00	$708,000.00
PORTLAND CEMENT CONCRETE SIDEWALK 5 INCH	SQ FT	2,500	$6.00	$15,000.00	$6.50	$16,250.00
SIDEWALK REMOVAL	SQ FT	2,500	$2.00	$5,000.00	$3.00	$7,500.00
DETECTABLE WARNINGS	SQ FT	1,000	$43.00	$43,000.00	$50.00	$50,000.00
PAVEMENT REMOVAL	SQ YD	59,000	$13.50	$796,500.00	$15.00	$885,000.00
HOT-MIX ASPHALT SURFACE REMOVAL, 2"	SQ YD	85,250	$5.00	$426,250.00	$5.00	$426,250.00
COMBINATION CONCRETE CURB AND GUTTER REMOVAL AND REPLACEMENT	FOOT	50,000	$24.00	$1,200,000.00	$28.00	$1,400,000.00
CLASS B PATCH, SPECIAL	SQ YD	1,200	$90.00	$108,000.00	$95.00	$114,000.00
CLASS D PATCH, SPECIAL	SQ YD	28,500	$93.00	$2,650,500.00	$100.00	$2,850,000.00
STORM SEWER REMOVAL, 8"	FOOT	470	$10.00	$4,700.00	$10.00	$4,700.00
STORM SEWER REMOVAL, 10"	FOOT	1,190	$10.00	$11,900.00	$10.00	$11,900.00
STORM SEWER REMOVAL, 12"	FOOT	3,840	$10.00	$38,400.00	$10.00	$38,400.00
STORM SEWER REMOVAL, 15"	FOOT	1,490	$10.00	$14,900.00	$10.00	$14,900.00
STORM SEWER REMOVAL, 18"	FOOT	3,460	$10.00	$34,600.00	$10.00	$34,600.00
STORM SEWER REMOVAL, 21"	FOOT	1,165	$10.00	$11,650.00	$10.00	$11,650.00
STORM SEWER REMOVAL, 24"	FOOT	650	$10.00	$6,500.00	$10.00	$6,500.00
STORM SEWER REMOVAL, 27"	FOOT	695	$10.00	$6,950.00	$10.00	$6,950.00
STORM SEWER REMOVAL, 30"	FOOT	1,100	$20.00	$22,000.00	$20.00	$22,000.00
STORM SEWER REMOVAL, 36"	FOOT	830	$20.00	$16,600.00	$20.00	$16,600.00
STORM SEWER REMOVAL, 48"	FOOT	1,040	$20.00	$20,800.00	$20.00	$20,800.00
STORM SEWER REMOVAL, 54"	FOOT	530	$20.00	$10,600.00	$20.00	$10,600.00
STORM SEWER REMOVAL, 60"	FOOT	760	$20.00	$15,200.00	$20.00	$15,200.00
STORM SEWERS, 18" RCP	FOOT	8,400	$175.00	$1,470,000.00	$175.00	$1,470,000.00
STORM SEWERS, 24" RCP	FOOT	3,660	$192.00	$702,720.00	$192.00	$702,720.00
STORM SEWERS, 30" RCP	FOOT	2,985	$218.00	$650,730.00	$218.00	$650,730.00
STORM SEWERS, 36" RCP	FOOT	1,920	$252.00	$483,840.00	$252.00	$483,840.00
STORM SEWERS, 42" RCP	FOOT	2,440	$300.00	$732,000.00	$300.00	$732,000.00
STORM SEWERS, 48" RCP	FOOT	2,425	$328.00	$795,400.00	$328.00	$795,400.00
STORM SEWERS, 54" RCP	FOOT	1,150	$375.00	$431,250.00	$375.00	$431,250.00
STORM SEWERS, 60" RCP	FOOT	1,885	$414.00	$780,390.00	$414.00	$780,390.00
STORM SEWERS, 66" RCP	FOOT	2,990	$468.00	$1,399,320.00	$468.00	$1,399,320.00
STORM SEWERS, 72" RCP	FOOT	3,505	$650.00	$2,278,250.00	$650.00	$2,278,250.00
STORM SEWERS, 78" RCP	FOOT	4,220	$850.00	$3,587,000.00	$850.00	$3,587,000.00
STORM SEWERS, 96" RCP	FOOT	2,690	$1,152.00	$3,098,880.00	$1,152.00	$3,098,880.00
STORM SEWERS, 96" RCP (AUGURED)	FOOT	350	$5,000.00	$1,750,000.00	$5,000.00	$1,750,000.00
PRECAST CONCRETE BOX CULVERTS 8' X 8'	FOOT	4,100	$1,700.00	$6,970,000.00	$1,700.00	$6,970,000.00
PRECAST CONCRETE BOX CULVERTS 8' X 8' (AUGURED)	FOOT	100	$5,800.00	$580,000.00	$5,800.00	$580,000.00
JUNCTION BOX	EACH	4	$150,000.00	$600,000.00	$150,000.00	$600,000.00
MANHOLES, TYPE A, WITH RISER	EACH	30	$8,000.00	$240,000.00	$8,000.00	$240,000.00
MANHOLES, TYPE A, 4'-DIAMETER, TYPE 1 FRAME, CLOSED LID	EACH	60	$3,600.00	$216,000.00	$3,600.00	$216,000.00
MANHOLES, TYPE A, 5'-DIAMETER, TYPE 1 FRAME, CLOSED LID	EACH	25	$5,200.00	$130,000.00	$5,200.00	$130,000.00
MANHOLES, TYPE A, 6'-DIAMETER, TYPE 1 FRAME, CLOSED LID	EACH	10	$7,300.00	$73,000.00	$7,300.00	$73,000.00
MANHOLES, TYPE A, 7'-DIAMETER, TYPE 1 FRAME, CLOSED LID	EACH	18	$11,000.00	$198,000.00	$11,000.00	$198,000.00
MANHOLES, TYPE A, 8'-DIAMETER, TYPE 1 FRAME, CLOSED LID	EACH	15	$16,500.00	$247,500.00	$16,500.00	$247,500.00
MANHOLES, TYPE A, 9'-DIAMETER, TYPE 1 FRAME, CLOSED LID	EACH	5	$20,000.00	$100,000.00	$20,000.00	$100,000.00
MANHOLES, TYPE A, 10'x10', TYPE 1 FRAME, CLOSED LID	EACH	5	$48,000.00	$240,000.00	$48,000.00	$240,000.00
PUMP STATION UPDATED - 6th PUMP	L. SUM	1	$750,000.00	$750,000.00	$750,000.00	$750,000.00
RELOCATE WATER SERVICE LINE, LONG SIDE	EACH	241	$3,600.00	$867,600.00	$3,600.00	$867,600.00
REMOVE AND REPLACE WATER MAIN	FOOT	11,130	$240.00	$2,671,200.00	$240.00	$2,671,200.00
RELOCATE SANITARY SEWER SERVICE LINE	EACH	207	$1,900.00	$393,300.00	$1,900.00	$393,300.00
REMOVE AND REPLACE SANITARY MAIN	FOOT	11,100	$150.00	$1,665,000.00	$150.00	$1,665,000.00
THERMOPLASTIC PAVEMENT MARKINGS	L. SUM	1	$25,000.00	$25,000.00	$25,000.00	$25,000.00
TRAFFIC CONTROL	L. SUM	1	$750,000.00	$750,000.00	$750,000.00	$750,000.00
CONSTRUCTION LAYOUT	L. SUM	1	$200,000.00	$200,000.00	$200,000.00	$200,000.00
			SUBTOTAL =	$48,797,305.00		$49,839,430.00
			CONTINGENCY (20%) =	$9,759,461.00		$9,967,886.00
			CONSTRUCTION TOTAL =	**$58,556,766.00**		**$59,807,316.00**
			DESIGN ENGINEERING (6%) =	$3,513,405.96		$3,588,438.96
			CONSTRUCTION OBSERVATION (6%) =	$3,513,405.96		$3,588,438.96
			PERMITTING =	$250,000.00		$250,000.00
			TOTAL PROJECT COST INCLUDING ENGINEERING =	**$65,833,577.92**		**$67,234,193.92**

CATEGORY	2014 TOTAL COST	2015 TOTAL COST
UNDERGROUND	$32,655,080.00	$32,915,080.00
PAVING	$9,288,925.00	$10,058,250.00
WM RELOCATION	$3,646,800.00	$3,646,800.00
SANITARY RELOCATION	$2,166,300.00	$2,166,300.00
MISCELLANEOUS	$1,040,200.00	$1,053,000.00
TOTAL	$48,797,305.00	$49,839,430.00

NOTES:
1. THIS ESTIMATE DOES NOT INCLUDE ROW ACQUISTION, TEMPORARY OR CONSTRUCTION EASEMENTS, OR RELOCATING ANY EXISTING UTILITIES.
2. THE 2014 UNIT PRICES ARE BASED ON OUR DESIGN MEMO DATED DECEMBER 5, 2014.
3. PAVEMENT THICKNESS REMOVAL WAS ASSUMED TO BE 21".
4. TRENCH BACKFILL IS INCLUDED IN THE COST OF THE WATER MAIN AND SANITARY MAIN REMOVAL AND REPLACEMENT.

Christopher B. Burke Engineering, Ltd.
9575 West Higgins Road, Suite 600
Rosemont, Illinois 60018
Project Number: 13-0605
Date: January 15, 2015
Revised: June 30, 2015

Village of Wilmette, Proposed Storm Sewer Improvements
ALTERNATIVE 2A REFINED- Centralized Storage at Community Playfield

			2014 COSTS		2015 COSTS	
ITEMS	**UNIT**	**QUANTITY**	**UNIT PRICE**	**TOTAL COST**	**UNIT PRICE**	**TOTAL COST**
TREE ROOT PRUNING	EACH	50	$145.00	$7,250.00	$150.00	$7,500.00
TREE PRUNING (1 TO 10 INCH DIAMETER)	EACH	50	$129.00	$6,450.00	$135.00	$6,750.00
TREE PRUNING (OVER 10 INCH DIAMETER)	EACH	50	$170.00	$8,500.00	$175.00	$8,750.00
TREE PROTECTION	EACH	50	$100.00	$5,000.00	$125.00	$6,250.00
EARTH EXCAVATION	CU YD	83,000	$44.00	$3,652,000.00	$44.00	$3,652,000.00
UNDERGROUND STORAGE TANK	AC-FT	51.3	$300,000.00	$15,390,000.00	$300,000.00	$15,390,000.00
TOPSOIL FURNISH AND PLACE	SQ YD	7,000	$7.00	$49,000.00	$7.00	$49,000.00
SODDING, SPECIAL	SQ YD	7,000	$11.00	$77,000.00	$11.00	$77,000.00
SYNTHETIC TURF SURFACE	SQ FT	205,000	$6.00	$1,230,000.00	$6.00	$1,230,000.00
STONE BASE COURSE FOR TURF SURFACE, CA-7, 14"	SQ YD	23,000	$15.00	$345,000.00	$15.00	$345,000.00
LIME SOIL STABILIZATION	TON	6,600	$80.00	$528,000.00	$80.00	$528,000.00
UNDERDRAINS FOR TURF SURFACE (1"x12")	FOOT	9,500	$15.00	$142,500.00	$15.00	$142,500.00
REMOVAL AND DISPOSAL OF UNSUITABLE MATERIAL	CU YD	1,000	$45.00	$45,000.00	$50.00	$50,000.00
TRENCH BACKFILL, CA-7	CU YD	77,500	$30.00	$2,325,000.00	$32.00	$2,480,000.00
AGGREGATE SUBGRADE IMPROVEMENT	CU YD	1,000	$54.00	$54,000.00	$60.00	$60,000.00
AGGREGATE FOR TEMPORARY ACCESS	TON	500	$22.00	$11,000.00	$25.00	$12,500.00
BITUMINOUS MATERIALS (PRIME COAT)	GAL	9,500	$3.00	$28,500.00	$3.00	$28,500.00
AGGREGATE (PRIME COAT)	TON	210	$15.00	$3,150.00	$20.00	$4,200.00
LEVELING BINDER (MACHINE METHOD), N50	TON	1,000	$88.00	$88,000.00	$110.00	$110,000.00
HOT-MIX ASPHALT BINDER COURSE, IL-19.0, N50 6"	TON	6,300	$76.00	$478,800.00	$80.00	$504,000.00
HOT-MIX ASPHALT SURFACE COURSE, MIX "D", N50 2.5"	TON	2,000	$89.00	$178,000.00	$95.00	$190,000.00
HOT-MIX ASPHALT SURFACE COURSE, MIX "D", N50 1.5"	TON	6,800	$89.00	$605,200.00	$95.00	$646,000.00
AGGREGATE BASE COURSE, 10"	SQ YD	20,000	$12.00	$240,000.00	$12.00	$240,000.00
PORTLAND CEMENT CONCRETE SIDEWALK 5 INCH	SQ FT	2,500	$6.00	$15,000.00	$6.50	$16,250.00
SIDEWALK REMOVAL	SQ FT	2,500	$2.00	$5,000.00	$3.00	$7,500.00
DETECTABLE WARNINGS	SQ FT	1,000	$43.00	$43,000.00	$50.00	$50,000.00
PAVEMENT REMOVAL	SQ YD	20,000	$13.50	$270,000.00	$15.00	$300,000.00
HOT-MIX ASPHALT SURFACE REMOVAL, 2"	SQ YD	77,000	$5.00	$385,000.00	$5.00	$385,000.00
COMBINATION CONCRETE CURB AND GUTTER REMOVAL AND REPLACEMENT	FOOT	32,000	$24.00	$768,000.00	$28.00	$896,000.00
CLASS B PATCH, SPECIAL	SQ YD	350	$90.00	$31,500.00	$95.00	$33,250.00
CLASS D PATCH, SPECIAL	SQ YD	26,600	$93.00	$2,473,800.00	$100.00	$2,660,000.00
STORM SEWER REMOVAL, 10"	FOOT	825	$10.00	$8,250.00	$10.00	$8,250.00
STORM SEWER REMOVAL, 12"	FOOT	1,260	$10.00	$12,600.00	$10.00	$12,600.00
STORM SEWER REMOVAL, 15"	FOOT	1,820	$10.00	$18,200.00	$10.00	$18,200.00
STORM SEWER REMOVAL, 18"	FOOT	1,880	$10.00	$18,800.00	$10.00	$18,800.00
STORM SEWER REMOVAL, 21"	FOOT	860	$10.00	$8,600.00	$10.00	$8,600.00
STORM SEWER REMOVAL, 24"	FOOT	460	$10.00	$4,600.00	$10.00	$4,600.00
STORM SEWER REMOVAL, 27"	FOOT	65	$10.00	$650.00	$10.00	$650.00
STORM SEWER REMOVAL, 30"	FOOT	360	$10.00	$3,600.00	$10.00	$3,600.00
STORM SEWER REMOVAL, 36"	FOOT	90	$20.00	$1,800.00	$20.00	$1,800.00
STORM SEWER REMOVAL, 48"	FOOT	410	$20.00	$8,200.00	$20.00	$8,200.00
STORM SEWERS, 18" RCP	FOOT	4,135	$175.00	$723,625.00	$175.00	$723,625.00
STORM SEWERS, 24" RCP	FOOT	8,240	$192.00	$1,582,080.00	$192.00	$1,582,080.00
STORM SEWERS, 30" RCP	FOOT	2,200	$218.00	$479,600.00	$218.00	$479,600.00
STORM SEWERS, 36" RCP	FOOT	1,325	$252.00	$333,900.00	$252.00	$333,900.00
STORM SEWERS, 42" RCP	FOOT	2,385	$300.00	$715,500.00	$300.00	$715,500.00
STORM SEWERS, 48" RCP	FOOT	3,250	$328.00	$1,066,000.00	$328.00	$1,066,000.00
STORM SEWERS, 60" RCP	FOOT	4,155	$414.00	$1,720,170.00	$414.00	$1,720,170.00
STORM SEWERS, 72" RCP	FOOT	1,500	$650.00	$975,000.00	$650.00	$975,000.00
STORM SEWERS, 78" RCP	FOOT	1,645	$875.00	$1,439,375.00	$875.00	$1,439,375.00
MANHOLES, TYPE A, 4'-DIAMETER, TYPE 1 FRAME, CLOSED LID	EACH	59	$3,600.00	$212,400.00	$3,600.00	$212,400.00
MANHOLES, TYPE A, 5'-DIAMETER, TYPE 1 FRAME, CLOSED LID	EACH	30	$5,200.00	$156,000.00	$5,200.00	$156,000.00
MANHOLES, TYPE A, 6'-DIAMETER, TYPE 1 FRAME, CLOSED LID	EACH	18	$7,300.00	$131,400.00	$7,300.00	$131,400.00
MANHOLES, TYPE A, 7'-DIAMETER, TYPE 1 FRAME, CLOSED LID	EACH	16	$11,000.00	$176,000.00	$11,000.00	$176,000.00
MANHOLES, TYPE A, 8'-DIAMETER, TYPE 1 FRAME, CLOSED LID	EACH	8	$16,500.00	$132,000.00	$16,500.00	$132,000.00
MANHOLES, TYPE A, 9'-DIAMETER, TYPE 1 FRAME, CLOSED LID	EACH	4	$20,000.00	$80,000.00	$20,000.00	$80,000.00
MANHOLES, TYPE A, 10'x10', TYPE 1 FRAME, CLOSED LID	EACH	7	$48,000.00	$336,000.00	$48,000.00	$336,000.00
PUMP FOR UNDERGROUND STORAGE BASIN	L. SUM	1	$750,000.00	$750,000.00	$750,000.00	$750,000.00
PUMP STATION UPDATED - 6th PUMP	L. SUM	1	$750,000.00	$750,000.00	$750,000.00	$750,000.00
STABILIZED CONSTRUCTION ENTRANCE	L. SUM	1	$15,000.00	$15,000.00	$15,000.00	$15,000.00
RELOCATE WATER SERVICE LINE, LONG SIDE	EACH	180	$3,600.00	$648,000.00	$3,600.00	$648,000.00
REMOVE AND REPLACE WATER MAIN	FOOT	9,550	$240.00	$2,292,000.00	$240.00	$2,292,000.00
RELOCATE SANITARY SEWER SERVICE LINE	EACH	172	$1,900.00	$326,800.00	$1,900.00	$326,800.00
REMOVE AND REPLACE SANITARY MAIN	FOOT	5,840	$150.00	$876,000.00	$150.00	$876,000.00
SOIL EROSION/SEDIMENT CONTROL	L. SUM	1	$250,000.00	$250,000.00	$250,000.00	$250,000.00
THERMOPLASTIC PAVEMENT MARKINGS	L. SUM	1	$25,000.00	$25,000.00	$25,000.00	$25,000.00
TRAFFIC CONTROL	L. SUM	1	$750,000.00	$750,000.00	$750,000.00	$750,000.00
CONSTRUCTION LAYOUT	L. SUM	1	$200,000.00	$200,000.00	$200,000.00	$200,000.00
			SUBTOTAL =	$46,715,800.00		$47,343,100.00
			CONTINGENCY (20%) =	$9,343,160.00		$9,468,620.00
			CONSTRUCTION TOTAL =	**$56,058,960.00**		**$56,811,720.00**
			DESIGN ENGINEERING (6%) =	$3,363,537.60		$3,408,703.20
			CONSTRUCTION OBSERVATION (6%) =	$3,363,537.60		$3,408,703.20
			PERMITTING =	$250,000.00		$250,000.00
			TOTAL PROJECT COST INCLUDING ENGINEERING =	**$63,036,035.20**		**$63,879,126.40**

CATEGORY	2014 TOTAL COST	2015 TOTAL COST
UNDERGROUND	$12,669,350.00	$12,824,350.00
UNDERGROUND STORAGE	$22,661,500.00	$22,661,500.00
PAVING	$5,684,950.00	$6,144,450.00
WM RELOCATION	$3,066,000.00	$3,066,000.00
SANITARY RELOCATION	$1,328,800.00	$1,328,800.00
MISCELLANEOUS	$1,305,200.00	$1,318,000.00
TOTAL	$46,715,800.00	$47,343,100.00

NOTES:
1. THIS ESTIMATE DOES NOT INCLUDE ROW ACQUISTION, TEMPORARY OR CONSTRUCTION EASEMENTS, OR RELOCATING ANY EXISTING UTILITIES.
2. THE 2014 UNIT PRICES ARE BASED ON OUR DESIGN MEMO DATED DECEMBER 5, 2014.
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4. TRENCH BACKFILL IS INCLUDED IN THE COST OF THE WATER MAIN AND SANITARY MAIN REMOVAL AND REPLACEMENT.

Christopher B. Burke Engineering, Ltd.
9575 West Higgins Road, Suite 600
Rosemont, Illinois 60018
Project Number: 13-0605
Date: January 15, 2015
Revised: June 30, 2015

Village of Wilmette, Proposed Storm Sewer Improvements
ALTERNATIVE 3A REFINED - Neighborhood Stormwater Storage

			2014 COSTS		2015 COSTS	
ITEMS	**UNIT**	**QUANTITY**	**UNIT PRICE**	**TOTAL COST**	**UNIT PRICE**	**TOTAL COST**
TREE ROOT PRUNING	EACH	50	$145.00	$7,250.00	$150.00	$7,500.00
TREE PRUNING (1 TO 10 INCH DIAMETER)	EACH	50	$129.00	$6,450.00	$135.00	$6,750.00
TREE PRUNING (OVER 10 INCH DIAMETER)	EACH	50	$170.00	$8,500.00	$175.00	$8,750.00
TREE PROTECTION	EACH	50	$100.00	$5,000.00	$125.00	$6,250.00
EARTH EXCAVATION (HAUL OFF-SITE)	CU YD	71,950	$44.00	$3,165,800.00	$44.00	$3,165,800.00
EXCAVATION RE-SPREAD (STAY ON-SITE)	CU YD	84,700	$7.50	$635,250.00	$7.50	$635,250.00
UNDERGROUND STORAGE TANK	AC-FT	27	$300,000.00	$8,100,000.00	$300,000.00	$8,100,000.00
TOPSOIL EXCAVATION AND PLACEMENT	SQ YD	33,850	$6.15	$208,177.50	$6.15	$208,177.50
TOPSOIL FURNISH AND PLACE	SQ YD	1,100	$7.00	$7,700.00	$7.00	$7,700.00
SODDING, SPECIAL	SQ YD	1,100	$11.00	$12,100.00	$11.00	$12,100.00
SEEDING	SQ YD	32,750	$2.00	$65,500.00	$2.00	$65,500.00
EROSION CONTROL BLANKET	SQ YD	32,750	$2.00	$65,500.00	$2.00	$65,500.00
REMOVAL AND DISPOSAL OF UNSUITABLE MATERIAL	CU YD	500	$45.00	$22,500.00	$50.00	$25,000.00
TRENCH BACKFILL, CA-7	CU YD	40,000	$30.00	$1,200,000.00	$32.00	$1,280,000.00
AGGREGATE SUBGRADE IMPROVEMENT	CU YD	500	$54.00	$27,000.00	$60.00	$30,000.00
AGGREGATE FOR TEMPORARY ACCESS	TON	100	$22.00	$2,200.00	$25.00	$2,500.00
BITUMINOUS MATERIALS (PRIME COAT)	GAL	4,700	$3.00	$14,100.00	$3.00	$14,100.00
AGGREGATE (PRIME COAT)	TON	100	$15.00	$1,500.00	$20.00	$2,000.00
LEVELING BINDER (MACHINE METHOD), N50	TON	500	$88.00	$44,000.00	$110.00	$55,000.00
HOT-MIX ASPHALT BINDER COURSE, IL-19.0, N50 6"	TON	2,550	$76.00	$193,800.00	$80.00	$204,000.00
HOT-MIX ASPHALT SURFACE COURSE, MIX "D", N50 2.5"	TON	1,650	$89.00	$146,850.00	$95.00	$156,750.00
HOT-MIX ASPHALT SURFACE COURSE, MIX "D", N50 1.5"	TON	2,700	$89.00	$240,300.00	$95.00	$256,500.00
AGGREGATE BASE COURSE, 10"	SQ YD	10,000	$12.00	$120,000.00	$12.00	$120,000.00
PORTLAND CEMENT CONCRETE PAVEMENT, 7"	SQ YD	2,250	$64.00	$144,000.00	$75.00	$168,750.00
SUBBASE GRANULAR MATERIAL, TYPE B, 6"	SQ YD	2,250	$6.00	$13,500.00	$8.00	$18,000.00
PORTLAND CEMENT CONCRETE SIDEWALK 5 INCH	SQ FT	1,000	$6.00	$6,000.00	$6.50	$6,500.00
SIDEWALK REMOVAL	SQ FT	1,000	$2.00	$2,000.00	$3.00	$3,000.00
DETECTABLE WARNINGS	SQ FT	750	$43.00	$32,250.00	$50.00	$37,500.00
PAVEMENT REMOVAL	SQ YD	10,000	$13.50	$135,000.00	$15.00	$150,000.00
HOT-MIX ASPHALT SURFACE REMOVAL, 2"	SQ YD	39,000	$5.00	$195,000.00	$5.00	$195,000.00
COMBINATION CONCRETE CURB AND GUTTER REMOVAL AND REPLACEMENT	FOOT	10,000	$24.00	$240,000.00	$28.00	$280,000.00
CLASS B PATCH, SPECIAL	SQ YD	700	$90.00	$63,000.00	$95.00	$66,500.00
CLASS D PATCH, SPECIAL	SQ YD	11,500	$93.00	$1,069,500.00	$100.00	$1,150,000.00
STORM SEWER REMOVAL, 8"	FOOT	50	$10.00	$500.00	$10.00	$500.00
STORM SEWER REMOVAL, 10"	FOOT	200	$10.00	$2,000.00	$10.00	$2,000.00
STORM SEWER REMOVAL, 12"	FOOT	3,676	$10.00	$36,760.00	$10.00	$36,760.00
STORM SEWER REMOVAL, 15"	FOOT	2,229	$10.00	$22,290.00	$10.00	$22,290.00
STORM SEWER REMOVAL, 18"	FOOT	1,942	$10.00	$19,420.00	$10.00	$19,420.00
STORM SEWER REMOVAL, 21"	FOOT	761	$10.00	$7,610.00	$10.00	$7,610.00
STORM SEWER REMOVAL, 24"	FOOT	449	$20.00	$8,980.00	$20.00	$8,980.00
STORM SEWER REMOVAL, 27"	FOOT	65	$20.00	$1,300.00	$20.00	$1,300.00
STORM SEWER REMOVAL, 30"	FOOT	615	$20.00	$12,300.00	$20.00	$12,300.00
STORM SEWER REMOVAL, 36"	FOOT	836	$20.00	$16,720.00	$20.00	$16,720.00
STORM SEWER REMOVAL, 48"	FOOT	1,006	$20.00	$20,120.00	$20.00	$20,120.00
STORM SEWER REMOVAL, 54"	FOOT	533	$20.00	$10,660.00	$20.00	$10,660.00
STORM SEWER REMOVAL, 60"	FOOT	137	$20.00	$2,740.00	$20.00	$2,740.00
STORM SEWERS, 12" RCP	FOOT	600	$95.00	$57,000.00	$95.00	$57,000.00
STORM SEWERS, 21" RCP	FOOT	160	$120.00	$19,200.00	$120.00	$19,200.00
STORM SEWERS, 24" RCP	FOOT	3,730	$192.00	$716,160.00	$192.00	$716,160.00
STORM SEWERS, 30" RCP	FOOT	2,625	$218.00	$572,250.00	$218.00	$572,250.00
STORM SEWERS, 36" RCP	FOOT	2,583	$252.00	$650,916.00	$252.00	$650,916.00
STORM SEWERS, 42" RCP	FOOT	850	$300.00	$255,000.00	$300.00	$255,000.00
STORM SEWERS, 60" RCP	FOOT	1,340	$414.00	$554,760.00	$414.00	$554,760.00
STORM SEWERS, 45" x 29" RCEP	FOOT	200	$250.00	$50,000.00	$250.00	$50,000.00
STORM SEWERS, 76" x 48" RCEP	FOOT	675	$400.00	$270,000.00	$400.00	$270,000.00
PRECAST CONCRETE BOX CULVERTS 4' x 5'	FOOT	600	$1,100.00	$660,000.00	$1,100.00	$660,000.00
PRECAST CONCRETE BOX CULVERTS 3' x 6'	FOOT	450	$1,100.00	$495,000.00	$1,100.00	$495,000.00
MANHOLES, TYPE A, 4'-DIAMETER, TYPE 1 FRAME, CLOSED LID	EACH	8	$3,600.00	$28,800.00	$3,600.00	$28,800.00
MANHOLES, TYPE A, 5'-DIAMETER, TYPE 1 FRAME, CLOSED LID	EACH	8	$5,200.00	$41,600.00	$5,200.00	$41,600.00
MANHOLES, TYPE A, 6'-DIAMETER, TYPE 1 FRAME, CLOSED LID	EACH	14	$7,300.00	$102,200.00	$7,300.00	$102,200.00
MANHOLES, TYPE A, 7'-DIAMETER, TYPE 1 FRAME, CLOSED LID	EACH	6	$11,000.00	$66,000.00	$11,000.00	$66,000.00
MANHOLES, TYPE A, 8'-DIAMETER, TYPE 1 FRAME, CLOSED LID	EACH	5	$16,500.00	$82,500.00	$16,500.00	$82,500.00
MANHOLES, TYPE A, 9'-DIAMETER, TYPE 1 FRAME, CLOSED LID	EACH	3	$20,000.00	$60,000.00	$20,000.00	$60,000.00
MANHOLES, TYPE A, 10'x10', TYPE 1 FRAME, CLOSED LID	EACH	7	$48,000.00	$336,000.00	$48,000.00	$336,000.00
PUMP STATION UPDATED - 6th PUMP	L. SUM	1	$750,000.00	$750,000.00	$750,000.00	$750,000.00
PUMP FOR UNDERGROUND STORAGE BASINS	L. SUM	3	$500,000.00	$1,500,000.00	$500,000.00	$1,500,000.00
JUNCTION CHAMBER	EACH	2	$150,000.00	$300,000.00	$150,000.00	$300,000.00
4'x5' CONCRETE END SECTION	EACH	1	$2,500.00	$2,500.00	$2,500.00	$2,500.00
RIPRAP WITH FILTER FABRIC	SQ YD	20	$125.00	$2,500.00	$125.00	$2,500.00
BACKFLOW PREVENTER	EACH	2	$500.00	$1,000.00	$500.00	$1,000.00
UNDERDRAIN, 6" PVC	FOOT	500	$12.00	$6,000.00	$12.00	$6,000.00
BASEBALL FIELD REPLACEMENT	EACH	3	$330,000.00	$990,000.00	$330,000.00	$990,000.00
STABILIZED CONSTRUCTION ENTRANCE	L. SUM	4	$10,000.00	$40,000.00	$10,000.00	$40,000.00
RELOCATE WATER SERVICE LINE, LONG SIDE	EACH	97	$3,600.00	$349,200.00	$3,600.00	$349,200.00
REMOVE AND REPLACE WATER MAIN	FOOT	6,770	$240.00	$1,624,800.00	$240.00	$1,624,800.00
RELOCATE SANITARY SEWER SERVICE LINE	EACH	102	$1,900.00	$193,800.00	$1,900.00	$193,800.00
REMOVE AND REPLACE SANITARY MAIN	FOOT	100	$150.00	$15,000.00	$150.00	$15,000.00
SOIL EROSION/SEDIMENT CONTROL	L. SUM	1	$500,000.00	$500,000.00	$500,000.00	$500,000.00
THERMOPLASTIC PAVEMENT MARKINGS	L. SUM	1	$10,000.00	$10,000.00	$10,000.00	$10,000.00
TRAFFIC CONTROL	L. SUM	1	$750,000.00	$750,000.00	$750,000.00	$750,000.00
CONSTRUCTION LAYOUT	L. SUM	1	$500,000.00	$500,000.00	$500,000.00	$500,000.00
			SUBTOTAL =	$28,913,313.50		$29,223,963.50
			CONTINGENCY (20%) =	$5,782,662.70		$5,844,792.70
			CONSTRUCTION TOTAL =	**$34,695,976.20**		**$35,068,756.20**
			DESIGN ENGINEERING (6%) =	$2,081,758.57		$2,104,125.37
			CONSTRUCTION OBSERVATION (6%) =	$2,081,758.57		$2,104,125.37
			PERMITTING =	$250,000.00		$250,000.00
			TOTAL PROJECT COST INCLUDING ENGINEERING =	**$39,109,493.34**		**$39,527,006.94**

CATEGORY	2014 TOTAL COST	2015 TOTAL COST
UNDERGROUND	$8,929,786.00	$9,009,786.00
UNDERGROUND STORAGE	$13,221,427.50	$13,221,427.50
PAVING	$2,682,250.00	$2,904,100.00
WM RELOCATION	$1,993,800.00	$1,993,800.00
SANITARY RELOCATION	$228,600.00	$228,600.00
MISCELLANEOUS	$1,857,450.00	$1,866,250.00
TOTAL	$28,913,313.50	$29,223,963.50

NOTES:
1. THIS ESTIMATE DOES NOT INCLUDE ROW ACQUISTION, TEMPORARY OR CONSTRUCTION EASEMENTS, OR RELOCATING ANY EXISTING UTILITIES.
2. THE 2014 UNIT PRICES ARE BASED ON OUR DESIGN MEMO DATED DECEMBER 5, 2014.
3. PAVEMENT THICKNESS REMOVAL WAS ASSUMED TO BE 21".
4. TRENCH BACKFILL IS INCLUDED IN THE COST OF THE WATER MAIN AND SANITARY MAIN REMOVAL AND REPLACEMENT.

Location	Lowest Ground Elevation	Back of Sidewalk Elevation	Difference (depth of ponding at lowest point)	XP-SWMM ID	Existing Conditions Water Surface Elevation (WSEL)		Proposed Condition Water Surface Elevations and Reductions **Alternative 1A "Trunk & Laterals"**		Proposed Condition Water Surface Elevations and Reductions **Alternative 2A "Storage and Pipes at Community Park"**		Proposed Condition Water Surface Elevations and Reductions **Alternative 3A "Storage at Thornwood, Centennial and Hibbard Parks"**		Proposed Condition Water Surface Elevations and Reductions **Alternative 2-1 "Storage at Community Park "**		Proposed Condition Water Surface Elevations and Reductions **Alternative 2-2 "Storage at Community Park "**	
					10-year (ft)		**10-year (ft) Refined**		**10-year (ft) Refined**		**10-year (ft) Refined**		**10-year (ft) Above and Below**		**10-year (ft) Above Only**	
	spot shot (LIDAR)	spot shot (LIDAR)	(ft)	Node	WSEL	Flooding Depth Above Lowest Ground	WSEL	Flooding Depth Above Lowest Ground	WSEL	Flooding Depth Above Lowest Ground	WSEL	Flooding Depth Above Lowest Ground	WSEL	Flooding Depth Above Lowest Ground	WSEL	Flooding Depth Above Lowest Ground
Romona/Iroquois	622.31	622.63	0.32	5577	623.0	0.7	622.2	-0.1	621.0	-1.3	622.7	0.4	619.6	-2.7	619.5	-2.8
Shabona/Seminole	622.21	622.56	0.35	5400	622.8	0.6	622.4	0.2	622.0	-0.2	622.3	0.1	620.8	-1.5	620.3	-1.9
Romona/Blackhawk	621.38	621.96	0.58	5380	622.9	1.5	622.1	0.7	620.4	-1.0	622.1	0.7	619.3	-2.1	619.4	-1.9
Chilton	622.21	622.87	0.66	5356	621.8	-0.4	621.4	-0.8	618.3	-3.9	621.4	-0.9	619.0	-3.2	618.7	-3.5
Kilpatrick/Hartzell	619.83	620.40	0.57	5571	621.4	1.5	620.4	0.6	620.2	0.4	620.5	0.7	619.4	-0.5	619.6	-0.2
Valley View Rear Yards	620.39	NA	NA	5193	621.8	1.4	620.5	0.1	620.2	-0.2	620.6	0.3	619.3	-1.1	619.6	-0.8
Valley View	621.09	621.78	0.69	5191	622.0	0.9	621.0	-0.1	621.2	0.1	621.1	0.0	619.4	-1.7	619.6	-1.5
Thelin	619.98	620.42	0.44	5167	622.3	2.3	620.7	0.7	620.4	0.4	620.7	0.7	619.4	-0.6	619.6	-0.4
Lilac/Milbrook	621.12	621.57	0.45	4912	621.6	0.5	621.4	0.2	621.4	0.3	621.4	0.3	619.7	-1.5	619.7	-1.4
Kilpatrick/Gregory	620.44	621.19	0.75	4880	621.4	1.0	621.0	0.6	621.0	0.5	620.6	0.2	620.3	-0.2	620.1	-0.3
Lavergne N	621.18	621.73	0.55	5136	622.2	1.0	617.6	-3.6	621.5	0.4	621.3	0.1	620.2	-1.0	620.2	-1.0
Central/Laporte	620.64	621.29	0.65	5127	621.6	0.9	619.2	-1.4	619.9	-0.7	621.1	0.5	619.7	-0.9	619.5	-1.1
Lacrosse	620.78	621.59	0.81	5104	622.1	1.3	621.6	0.8	621.6	0.8	621.7	0.9	620.8	0.0	620.8	0.0
Greenleaf E	619.59	620.37	0.78	5090	621.3	1.7	619.8	0.2	619.9	0.3	620.8	1.2	619.6	0.0	619.4	-0.1
Nina	620.02	620.55	0.53	4907	621.1	1.1	620.4	0.4	620.3	0.3	620.5	0.5	619.6	-0.5	619.5	-0.5
Hill	619.71	620.41	0.70	4873	621.1	1.4	620.3	0.6	620.2	0.4	620.4	0.7	619.6	-0.1	619.5	-0.2
Lavergne S	620.41	620.59	0.18	4841	620.8	0.4	620.1	-0.3	620.1	-0.3	620.4	0.0	620.2	-0.2	620.1	-0.3
Central/Knox	621.08	621.45	0.37	5074	621.9	0.8	621.2	0.1	619.1	-2.0	621.8	0.7	619.1	-1.9	619.4	-1.7
Romona/Wilmette	622.03	622.45	0.42	5064	622.4	0.3	620.8	-1.2	621.9	-0.1	622.0	0.0	620.9	-1.1	620.9	-1.2
Sunset	621.11	621.51	0.40	5049	622.1	1.0	621.1	0.0	619.7	-1.4	621.2	0.1	619.1	-2.1	619.5	-1.6
Beverly	621.38	621.77	0.39	5034	622.8	1.4	621.5	0.1	619.9	-1.5	622.5	1.1	619.0	-2.4	619.6	-1.8
Brookside	621.35	622.00	0.65	4931	622.5	1.2	621.9	0.5	619.9	-1.5	621.9	0.5	618.9	-2.5	619.6	-1.8
Wilshire E	621.11	621.79	0.68	4793	622.6	1.5	621.7	0.6	620.8	-0.3	621.6	0.5	620.0	-1.1	619.8	-1.3
Wilshire W	620.90	621.41	0.51	4790	622.6	1.7	621.6	0.7	620.4	-0.5	621.8	0.9	619.4	-1.5	619.7	-1.2
Birchwood/Kenneth/Alison	621.50	622.38	0.88	5018	622.7	1.2	622.3	0.8	622.1	0.6	622.6	1.1	619.5	-2.0	619.8	-1.7
Redbud/Orchard W	621.99	622.43	0.44	4992	623.2	1.2	622.1	0.2	619.0	-3.0	623.2	1.2	619.3	-2.7	619.5	-2.5
Orchard/Locust/Hawthorne	621.85	622.23	0.38	4986	623.3	1.5	622.5	0.6	620.2	-1.6	623.3	1.4	619.4	-2.5	619.8	-2.0
Greenleaf/Locust/Laurel	621.21	621.61	0.40	4959	622.4	1.1	621.8	0.6	621.4	0.2	621.6	0.4	621.0	-0.2	621.1	-0.1
Meadow	621.57	622.47	0.90	4639	623.4	1.9	622.4	0.8	622.3	0.7	622.1	0.5	621.4	-0.1	621.7	0.1
Washington/Pinecrest	626.22	626.89	0.67	4522	628.4	2.2	626.9	0.7	624.8	-1.4	628.4	2.2	624.5	-1.8	623.9	-2.3
Beechwood E	622.79	623.43	0.64	4447	624.4	1.6	623.6	0.8	623.1	0.3	623.6	0.8	622.9	0.1	622.7	-0.1
Beechwood W	622.71	623.35	0.64	4445	624.4	1.7	623.6	0.8	623.0	0.3	623.6	0.9	622.8	0.1	622.6	-0.1
Kenilworth W	623.74	624.89	1.15	4428	624.6	0.9	623.8	0.1	623.1	-0.6	623.9	0.2	623.0	-0.8	622.8	-1.0
Kenilworth E	622.89	623.75	0.86	4426	624.4	1.5	623.7	0.8	623.1	0.2	623.6	0.7	623.0	0.1	622.8	-0.1
Chestnut W	624.67	625.83	1.16	4414	624.7	0.0	623.6	-1.0	622.6	-2.1	625.0	0.4	622.6	-2.0	622.2	-2.5
Chestnut E	624.22	625.03	0.81	4408	624.5	0.3	624.5	0.3	624.4	0.2	624.5	0.3	624.4	0.1	624.1	-0.1
Thornwood W	624.63	625.65	1.02	4397	625.2	0.6	624.4	-0.3	623.5	-1.1	624.8	0.2	623.5	-1.1	623.1	-1.5
Thornwood E	624.69	625.78	1.09	4392	625.2	0.5	624.6	-0.1	623.9	-0.8	625.2	0.5	623.9	-0.8	623.5	-1.2
Greenwood	624.11	625.34	1.23	4381	625.6	1.5	624.3	0.2	625.0	0.8	624.7	0.6	622.6	-1.5	622.0	-2.1
Elmwood	625.35	626.41	1.06	4336	625.5	0.2	625.1	-0.3	624.0	-1.3	624.8	-0.6	623.9	-1.5	623.8	-1.5
Miami	623.63	624.67	1.04	4322	624.8	1.2	624.2	0.5	623.4	-0.3	624.5	0.9	622.2	-1.5	621.5	-2.1
Pawnee	623.55	624.22	0.67	4318	624.8	1.3	624.1	0.5	623.1	-0.4	624.5	1.0	622.0	-1.6	621.3	-2.2
Iroquois E	623.50	624.62	1.12	4310	624.8	1.3	624.0	0.5	622.8	-0.7	624.4	0.9	621.8	-1.7	621.1	-2.4
Hunter S	623.96	625.00	1.04	4303	624.6	0.6	623.4	-0.6	621.3	-2.6	624.0	0.0	621.3	-2.7	620.6	-3.4

Min	**-0.4**
Max	**2.3**
Avg	1.1

Min	**-3.6**
Max	**0.8**
Avg	0.1

Min	**-3.9**
Max	**0.8**
Avg	-0.5

Min	**-0.9**
Max	**2.2**
Avg	0.5

Min	**-3.2**
Max	**0.1**
Avg	-1.2

Min	**-3.5**
Max	**0.1**
Avg	-1.3

Location	Lowest Ground Elevation	Back of Sidewalk Elevation	Difference (depth of ponding at lowest point)	XP-SWMM ID	Existing Conditions Water Surface Elevation (WSEL)		Proposed Condition Water Surface Elevations and Reductions **Alternative 1A "Trunk & Laterals"**		Proposed Condition Water Surface Elevations and Reductions **Alternative 2A "Storage and Pipes at Community Park"**		Proposed Condition Water Surface Elevations and Reductions **Alternative 3A "Storage at Thornwood, Centennial and Hibbard Parks"**		Proposed Condition Water Surface Elevations and Reductions **Alternative 2-1 "Storage at Community Park "**		Proposed Condition Water Surface Elevations and Reductions **Alternative 2-2 "Storage at Community Park "**	
					25-year (ft)		**25-year (ft) Refined**		**25-year (ft) Refined**		**25-year (ft) Refined**		**25-year (ft) Above and Below**		**25-year (ft) Above Only**	
	spot shot (LIDAR)	spot shot (LIDAR)	(ft)	Node	WSEL	Flooding Depth Above Lowest Ground	WSEL	Flooding Depth Above Lowest Ground	WSEL	Flooding Depth Above Lowest Ground	WSEL	Flooding Depth Above Lowest Ground	WSEL	Flooding Depth Above Lowest Ground	WSEL	Flooding Depth Above Lowest Ground
Romona/Iroquois	622.31	622.63	0.32	5577	623.4	1.1	623.3	1.0	623.1	0.8	623.2	0.9	622.6	0.3	622.3	0.0
Shabona/Seminole	622.21	622.56	0.35	5400	623.4	1.2	623.3	1.1	623.1	0.9	623.2	1.0	622.6	0.4	622.4	0.2
Romona/Blackhawk	621.38	621.96	0.58	5380	623.4	2.0	623.3	1.9	623.1	1.7	623.2	1.8	622.3	0.9	622.0	0.7
Chilton	622.21	622.87	0.66	5356	622.9	0.7	622.9	0.7	622.9	0.7	622.9	0.7	621.8	-0.4	620.9	-1.3
Kilpatrick/Hartzell	619.83	620.40	0.57	5571	621.7	1.8	621.1	1.3	621.5	1.6	621.4	1.6	621.0	1.2	621.3	1.5
Valley View Rear Yards	620.39	NA	NA	5193	622.1	1.7	621.3	0.9	621.6	1.2	621.5	1.1	621.0	0.6	621.4	1.0
Valley View	621.09	621.78	0.69	5191	622.3	1.2	622.0	1.0	622.1	1.0	622.1	1.0	621.1	0.0	621.4	0.3
Thelin	619.98	620.42	0.44	5167	622.7	2.7	621.5	1.6	621.8	1.8	621.6	1.6	621.1	1.1	621.4	1.5
Lilac/Milbrook	621.12	621.57	0.45	4912	621.8	0.7	621.7	0.6	621.7	0.6	621.7	0.6	621.3	0.2	621.3	0.1
Kilpatrick/Gregory	620.44	621.19	0.75	4880	621.8	1.3	621.6	1.1	621.6	1.1	621.5	1.1	621.6	1.1	621.5	1.1
Lavergne N	621.18	621.73	0.55	5136	622.4	1.3	618.7	-2.5	622.1	0.9	621.9	0.8	621.7	0.6	621.7	0.5
Central/Laporte	620.64	621.29	0.65	5127	621.9	1.3	620.5	-0.1	621.3	0.6	621.8	1.2	621.3	0.7	621.2	0.6
Lacrosse	620.78	621.59	0.81	5104	622.4	1.6	622.1	1.3	622.1	1.4	622.1	1.3	622.0	1.2	621.9	1.2
Greenleaf E	619.59	620.37	0.78	5090	621.7	2.1	620.7	1.1	621.0	1.4	621.5	1.9	621.0	1.4	621.0	1.4
Nina	620.02	620.55	0.53	4907	621.5	1.4	621.0	1.0	621.2	1.1	621.2	1.2	621.0	0.9	621.1	1.1
Hill	619.71	620.41	0.70	4873	621.4	1.7	620.9	1.2	621.1	1.4	621.2	1.4	620.9	1.2	621.0	1.3
Lavergne S	620.41	620.59	0.18	4841	621.3	0.9	621.0	0.6	621.0	0.6	621.1	0.7	621.2	0.8	621.1	0.7
Central/Knox	621.08	621.45	0.37	5074	622.2	1.1	621.8	0.8	621.6	0.5	622.2	1.1	620.9	-0.2	621.2	0.2
Romona/Wilmette	622.03	622.45	0.42	5064	622.7	0.7	621.7	-0.3	622.5	0.4	622.5	0.5	622.5	0.4	622.4	0.4
Sunset	621.11	621.51	0.40	5049	622.4	1.3	621.9	0.8	622.0	0.9	622.1	1.0	620.9	-0.2	621.5	0.4
Beverly	621.38	621.77	0.39	5034	622.9	1.6	622.2	0.9	622.2	0.8	622.9	1.6	621.0	-0.4	621.6	0.3
Brookside	621.35	622.00	0.65	4931	622.9	1.6	622.6	1.2	622.5	1.1	622.5	1.1	621.1	-0.2	621.9	0.5
Wilshire E	621.11	621.79	0.68	4793	622.9	1.8	622.4	1.3	622.5	1.3	622.5	1.4	621.8	0.7	622.1	1.0
Wilshire W	620.90	621.41	0.51	4790	622.9	2.0	622.3	1.4	622.5	1.6	622.5	1.6	621.5	0.6	622.0	1.1
Birchwood/Kenneth/Alison	621.50	622.38	0.88	5018	623.0	1.5	622.7	1.2	622.8	1.3	622.9	1.4	622.0	0.5	622.0	0.5
Redbud/Orchard W	621.99	622.43	0.44	4992	623.5	1.5	623.0	1.0	622.9	0.9	623.5	1.5	621.5	-0.5	621.5	-0.5
Orchard/Locust/Hawthorne	621.85	622.23	0.38	4986	623.6	1.8	623.3	1.5	622.9	1.1	623.6	1.8	621.9	0.1	622.0	0.1
Greenleaf/Locust/Laurel	621.21	621.61	0.40	4959	622.7	1.5	622.5	1.3	622.2	1.0	622.4	1.2	621.9	0.7	621.9	0.7
Meadow	621.57	622.47	0.90	4639	623.7	2.1	623.3	1.8	623.1	1.6	623.0	1.4	622.8	1.3	622.9	1.4
Washington/Pinecrest	626.22	626.89	0.67	4522	628.8	2.6	627.9	1.7	627.6	1.4	628.8	2.6	627.7	1.5	627.6	1.4
Beechwood E	622.79	623.43	0.64	4447	624.9	2.2	624.6	1.8	624.5	1.7	624.5	1.7	624.4	1.6	624.3	1.5
Beechwood W	622.71	623.35	0.64	4445	624.9	2.2	624.6	1.9	624.5	1.8	624.5	1.8	624.4	1.7	624.3	1.6
Kenilworth W	623.74	624.89	1.15	4428	625.0	1.2	624.6	0.9	624.6	0.9	624.7	0.9	624.4	0.7	624.3	0.6
Kenilworth E	622.89	623.75	0.86	4426	624.9	2.1	624.6	1.7	624.5	1.6	624.5	1.6	624.4	1.5	624.3	1.4
Chestnut W	624.67	625.83	1.16	4414	625.3	0.6	624.5	0.0	624.9	0.2	625.4	0.7	624.3	-0.3	624.3	-0.4
Chestnut E	624.22	625.03	0.81	4408	624.9	0.7	624.6	0.3	624.5	0.3	624.5	0.3	624.5	0.3	624.5	0.3
Thornwood W	624.63	625.65	1.02	4397	625.4	0.7	625.2	0.6	625.1	0.5	625.1	0.5	625.1	0.5	625.1	0.4
Thornwood E	624.69	625.78	1.09	4392	625.2	0.5	625.2	0.5	625.2	0.5	625.2	0.5	625.2	0.5	625.2	0.5
Greenwood	624.11	625.34	1.23	4381	626.0	1.9	625.4	1.3	625.8	1.7	625.4	1.3	624.8	0.7	624.7	0.6
Elmwood	625.35	626.41	1.06	4336	625.9	0.5	625.7	0.4	625.7	0.3	625.7	0.4	625.7	0.3	625.7	0.3
Miami	623.63	624.67	1.04	4322	625.3	1.7	624.8	1.2	624.6	1.0	625.1	1.4	624.4	0.7	624.3	0.6
Pawnee	623.55	624.22	0.67	4318	625.3	1.8	624.8	1.3	624.6	1.1	625.1	1.5	624.2	0.6	624.0	0.5
Iroquois E	623.50	624.62	1.12	4310	625.3	1.8	624.8	1.3	624.6	1.1	625.1	1.6	624.1	0.6	623.9	0.4
Hunter S	623.96	625.00	1.04	4303	625.2	1.2	624.4	0.4	625.0	1.0	625.1	1.1	623.7	-0.3	623.7	-0.3

Min	**0.5**
Max	**2.7**
Avg	1.5

Min	**-2.5**
Max	**1.9**
Avg	0.9

Min	**0.2**
Max	**1.8**
Avg	1.1

Min	**0.3**
Max	**2.6**
Avg	1.2

Min	**-0.5**
Max	**1.7**
Avg	0.6

Min	**-1.3**
Max	**1.6**
Avg	0.6

Location	Lowest Ground Elevation	Back of Sidewalk Elevation	Difference (depth of ponding at lowest point)	XP-SWMM ID	Existing Conditions Water Surface Elevation (WSEL)		Proposed Condition Water Surface Elevations and Reductions **Alternative 1A "Trunk & Laterals"**		Proposed Condition Water Surface Elevations and Reductions **Alternative 2A "Storage and Pipes at Community Park"**		Proposed Condition Water Surface Elevations and Reductions **Alternative 3A "Storage at Thornwood, Centennial and Hibbard Parks"**		Proposed Condition Water Surface Elevations and Reductions **Alternative 2-1 "Storage at Community Park "**		Proposed Condition Water Surface Elevations and Reductions **Alternative 2-2 "Storage at Community Park "**	
					50-year (ft)		**50-year (ft) Refined**		**50-year (ft) Refined**		**50-year (ft) Refined**		**50-year (ft) Above and Below**		**50-year (ft) Above Only**	
	spot shot (LIDAR)	spot shot (LIDAR)	(ft)	Node	WSEL	Flooding Depth	WSEL	Flooding Depth Above Lowest Ground	WSEL	Flooding Depth Above Lowest Ground	WSEL	Flooding Depth Above Lowest Ground	WSEL	Flooding Depth Above Lowest Ground	WSEL	Flooding Depth Above Lowest Ground
Romona/Iroquois	622.31	622.63	0.32	5577	623.7	1.4	623.7	1.3	623.5	1.2	623.6	1.3	623.2	0.9	623.1	0.8
Shabona/Seminole	622.21	622.56	0.35	5400	623.7	1.5	623.7	1.4	623.5	1.3	623.6	1.4	623.1	0.9	623.0	0.8
Romona/Blackhawk	621.38	621.96	0.58	5380	623.7	2.3	623.7	2.3	623.5	2.1	623.6	2.2	623.1	1.7	623.0	1.6
Chilton	622.21	622.87	0.66	5356	623.1	0.9	623.1	0.9	622.8	0.6	623.1	0.9	623.0	0.8	622.3	0.0
Kilpatrick/Hartzell	619.83	620.40	0.57	5571	621.9	2.1	621.5	1.7	621.9	2.1	621.8	2.0	621.6	1.8	621.8	2.0
Valley View Rear Yards	620.39	NA	NA	5193	622.4	2.0	621.7	1.3	622.0	1.6	621.9	1.5	621.6	1.2	621.9	1.5
Valley View	621.09	621.78	0.69	5191	622.4	1.3	622.3	1.2	622.3	1.2	622.3	1.2	621.7	0.6	621.9	0.8
Thelin	619.98	620.42	0.44	5167	623.0	3.0	622.0	2.0	622.2	2.2	622.0	2.0	621.7	1.8	622.0	2.0
Lilac/Milbrook	621.12	621.57	0.45	4912	622.1	1.0	622.0	0.9	622.0	0.9	622.0	0.9	621.8	0.6	621.8	0.6
Kilpatrick/Gregory	620.44	621.19	0.75	4880	622.0	1.6	621.9	1.4	621.9	1.4	621.9	1.4	621.9	1.5	621.9	1.4
Lavergne N	621.18	621.73	0.55	5136	622.6	1.4	619.1	-2.1	622.4	1.2	622.3	1.1	622.1	0.9	622.1	0.9
Central/Laporte	620.64	621.29	0.65	5127	622.1	1.5	621.2	0.5	621.7	1.1	622.1	1.5	621.8	1.1	621.8	1.1
Lacrosse	620.78	621.59	0.81	5104	622.7	1.9	622.2	1.4	622.4	1.6	622.4	1.6	622.2	1.5	622.2	1.5
Greenleaf E	619.59	620.37	0.78	5090	622.0	2.4	621.1	1.5	621.5	1.9	621.9	2.3	621.5	1.9	621.5	1.9
Nina	620.02	620.55	0.53	4907	621.7	1.6	621.4	1.3	621.5	1.5	621.6	1.5	621.4	1.4	621.5	1.5
Hill	619.71	620.41	0.70	4873	621.6	1.9	621.2	1.5	621.5	1.7	621.5	1.8	621.4	1.7	621.4	1.7
Lavergne S	620.41	620.59	0.18	4841	621.6	1.2	621.4	0.9	621.4	1.0	621.6	1.1	621.5	1.1	621.5	1.1
Central/Knox	621.08	621.45	0.37	5074	622.4	1.3	622.2	1.1	621.9	0.9	622.4	1.3	621.4	0.4	621.7	0.7
Romona/Wilmette	622.03	622.45	0.42	5064	622.9	0.9	622.1	0.0	622.7	0.7	622.8	0.8	622.7	0.7	622.7	0.7
Sunset	621.11	621.51	0.40	5049	622.6	1.5	622.3	1.2	622.3	1.2	622.5	1.4	621.6	0.4	622.1	1.0
Beverly	621.38	621.77	0.39	5034	623.0	1.7	622.6	1.2	622.5	1.2	623.0	1.7	621.7	0.3	622.3	0.9
Brookside	621.35	622.00	0.65	4931	623.2	1.8	622.9	1.5	622.8	1.5	623.0	1.6	621.8	0.5	622.5	1.2
Wilshire E	621.11	621.79	0.68	4793	623.1	2.0	622.8	1.7	622.9	1.8	622.8	1.7	622.3	1.2	622.6	1.5
Wilshire W	620.90	621.41	0.51	4790	623.1	2.2	622.7	1.8	622.9	2.0	622.9	2.0	622.1	1.2	622.6	1.7
Birchwood/Kenneth/Alison	621.50	622.38	0.88	5018	623.2	1.7	622.9	1.4	623.1	1.6	623.1	1.6	622.6	1.1	622.6	1.1
Redbud/Orchard W	621.99	622.43	0.44	4992	623.7	1.7	623.3	1.3	623.0	1.0	623.7	1.7	622.4	0.4	622.2	0.2
Orchard/Locust/Hawthorne	621.85	622.23	0.38	4986	623.7	1.9	623.6	1.8	623.3	1.5	623.7	1.9	622.6	0.7	622.6	0.8
Greenleaf/Locust/Laurel	621.21	621.61	0.40	4959	622.9	1.7	622.8	1.6	622.7	1.5	622.7	1.5	622.4	1.2	622.4	1.2
Meadow	621.57	622.47	0.90	4639	623.9	2.3	623.6	2.1	623.5	2.0	623.4	1.8	623.4	1.8	623.4	1.8
Washington/Pinecrest	626.22	626.89	0.67	4522	629.2	2.9	628.4	2.2	628.3	2.1	629.1	2.9	628.3	2.1	628.2	2.0
Beechwood E	622.79	623.43	0.64	4447	625.3	2.5	625.0	2.2	625.0	2.3	625.0	2.2	625.0	2.2	624.9	2.1
Beechwood W	622.71	623.35	0.64	4445	625.3	2.6	625.0	2.3	625.0	2.3	625.0	2.3	625.0	2.2	624.9	2.2
Kenilworth W	623.74	624.89	1.15	4428	625.3	1.6	625.0	1.3	625.0	1.3	625.0	1.3	625.0	1.2	624.9	1.2
Kenilworth E	622.89	623.75	0.86	4426	625.3	2.4	625.0	2.1	625.0	2.2	625.0	2.1	625.0	2.1	624.9	2.0
Chestnut W	624.67	625.83	1.16	4414	625.6	1.0	625.0	0.0	625.2	0.5	625.5	0.8	624.9	0.3	624.9	0.2
Chestnut E	624.22	625.03	0.81	4408	625.3	1.1	625.0	0.8	625.0	0.8	625.0	0.8	625.0	0.7	624.9	0.6
Thornwood W	624.63	625.65	1.02	4397	625.7	1.0	625.4	0.7	625.3	0.7	625.4	0.7	625.4	0.7	625.3	0.7
Thornwood E	624.69	625.78	1.09	4392	625.3	0.6	625.2	0.5	625.2	0.5	625.2	0.5	625.2	0.5	625.2	0.5
Greenwood	624.11	625.34	1.23	4381	626.2	2.1	625.8	1.7	626.0	1.9	625.9	1.8	625.5	1.4	625.3	1.2
Elmwood	625.35	626.41	1.06	4336	625.9	0.5	625.9	0.5	625.9	0.5	625.9	0.5	625.9	0.5	625.9	0.5
Miami	623.63	624.67	1.04	4322	625.7	2.1	625.3	1.7	625.3	1.6	625.5	1.9	625.1	1.5	625.0	1.4
Pawnee	623.55	624.22	0.67	4318	625.7	2.2	625.2	1.6	625.1	1.6	625.5	1.9	624.8	1.3	624.7	1.1
Iroquois E	623.50	624.62	1.12	4310	625.7	2.2	625.1	1.6	625.1	1.6	625.5	2.0	624.8	1.3	624.7	1.2
Hunter S	623.96	625.00	1.04	4303	625.7	1.7	624.8	0.9	625.1	1.1	625.5	1.5	624.5	0.6	624.4	0.5

Min	**0.5**
Max	**3.0**
Avg	1.7

Min	**-2.1**
Max	**2.3**
Avg	1.3

Min	**0.5**
Max	**2.3**
Avg	1.4

Min	**0.5**
Max	**2.9**
Avg	1.5

Min	**0.3**
Max	**2.2**
Avg	1.1

Min	**0.0**
Max	**2.2**
Avg	1.2

Location	Lowest Ground Elevation	Back of Sidewalk Elevation	Difference (depth of ponding at lowest point)	XP-SWMM ID	Existing Conditions Water Surface Elevation (WSEL)		Proposed Condition Water Surface Elevations and Reductions **Alternative 1A "Trunk & Laterals"**		Proposed Condition Water Surface Elevations and Reductions **Alternative 2A "Storage and Pipes at Community Park"**		Proposed Condition Water Surface Elevations and Reductions **Alternative 3A "Storage at Thornwood, Centennial and Hibbard Parks"**		Proposed Condition Water Surface Elevations and Reductions **Alternative 2-1 "Storage at Community Park "**		Proposed Condition Water Surface Elevations and Reductions **Alternative 2-2 "Storage at Community Park "**	
					100-year (ft)		**100-year (ft) Refined**		**100-year (ft) Refined**		**100-year (ft) Refined**		**100-year (ft) Above and Below**		**100-year (ft) Above Only**	
	spot shot (LIDAR)	spot shot (LIDAR)	(ft)	Node	WSEL	Flooding Depth	WSEL	Flooding Depth Above Lowest Ground	WSEL	Flooding Depth Above Lowest Ground	WSEL	Flooding Depth Above Lowest Ground	WSEL	Flooding Depth Above Lowest Ground	WSEL	Flooding Depth Above Lowest Ground
Romona/Iroquois	622.31	622.63	0.32	5577	623.9	1.6	623.9	1.6	623.8	1.5	623.9	1.6	623.5	1.2	623.4	1.1
Shabona/Seminole	622.21	622.56	0.35	5400	623.9	1.7	623.9	1.7	623.8	1.6	623.9	1.7	623.5	1.3	623.4	1.2
Romona/Blackhawk	621.38	621.96	0.58	5380	623.9	2.6	623.9	2.6	623.8	2.4	623.9	2.5	623.5	2.1	623.4	2.0
Chilton	622.21	622.87	0.66	5356	623.3	1.0	623.2	1.0	623.1	0.9	623.3	1.0	623.2	1.0	623.1	0.8
Kilpatrick/Hartzell	619.83	620.40	0.57	5571	622.2	2.4	621.9	2.0	622.2	2.4	622.1	2.3	622.1	2.2	622.2	2.4
Valley View Rear Yards	620.39	NA	NA	5193	622.5	2.1	622.1	1.7	622.3	1.9	622.2	1.8	622.1	1.7	622.2	1.9
Valley View	621.09	621.78	0.69	5191	622.5	1.4	622.4	1.3	622.4	1.3	622.4	1.3	622.1	1.0	622.3	1.2
Thelin	619.98	620.42	0.44	5167	623.2	3.3	622.4	2.4	622.5	2.6	622.3	2.4	622.2	2.3	622.4	2.4
Lilac/Milbrook	621.12	621.57	0.45	4912	622.3	1.2	622.3	1.1	622.3	1.2	622.3	1.1	622.1	1.0	622.1	1.0
Kilpatrick/Gregory	620.44	621.19	0.75	4880	622.3	1.8	622.1	1.7	622.2	1.7	622.2	1.7	622.2	1.7	622.2	1.7
Lavergne N	621.18	621.73	0.55	5136	622.7	1.6	619.9	-1.3	622.6	1.4	622.5	1.3	622.4	1.2	622.4	1.2
Central/Laporte	620.64	621.29	0.65	5127	622.5	1.8	621.6	1.0	622.1	1.4	622.4	1.7	622.1	1.5	622.1	1.5
Lacrosse	620.78	621.59	0.81	5104	622.8	2.0	622.4	1.6	622.7	1.9	622.7	1.9	622.6	1.8	622.6	1.8
Greenleaf E	619.59	620.37	0.78	5090	622.3	2.7	621.6	2.0	621.9	2.3	622.3	2.7	621.9	2.3	621.9	2.3
Nina	620.02	620.55	0.53	4907	621.9	1.8	621.7	1.6	621.8	1.8	621.8	1.8	621.8	1.7	621.8	1.8
Hill	619.71	620.41	0.70	4873	621.8	2.0	621.5	1.8	621.7	2.0	621.7	2.0	621.7	2.0	621.7	2.0
Lavergne S	620.41	620.59	0.18	4841	621.8	1.4	621.7	1.3	621.7	1.3	621.8	1.3	621.8	1.3	621.7	1.3
Central/Knox	621.08	621.45	0.37	5074	622.6	1.5	622.5	1.4	622.2	1.1	622.6	1.5	621.8	0.8	622.1	1.0
Romona/Wilmette	622.03	622.45	0.42	5064	623.1	1.0	622.5	0.4	623.0	1.0	623.0	1.0	623.0	0.9	623.0	0.9
Sunset	621.11	621.51	0.40	5049	622.9	1.8	622.7	1.6	622.6	1.5	622.8	1.7	622.2	1.0	622.5	1.4
Beverly	621.38	621.77	0.39	5034	623.2	1.8	622.9	1.5	622.8	1.5	623.1	1.8	622.3	0.9	622.7	1.3
Brookside	621.35	622.00	0.65	4931	623.4	2.1	623.1	1.7	623.1	1.8	623.3	2.0	622.5	1.2	623.0	1.6
Wilshire E	621.11	621.79	0.68	4793	623.3	2.2	623.0	1.9	623.2	2.1	623.2	2.0	622.7	1.6	623.0	1.9
Wilshire W	620.90	621.41	0.51	4790	623.3	2.4	623.0	2.1	623.2	2.3	623.2	2.3	622.6	1.7	623.0	2.1
Birchwood/Kenneth/Alison	621.50	622.38	0.88	5018	623.3	1.8	623.1	1.6	623.3	1.8	623.3	1.8	623.0	1.5	623.1	1.6
Redbud/Orchard W	621.99	622.43	0.44	4992	623.8	1.8	623.7	1.7	623.3	1.3	623.8	1.8	622.9	0.9	622.8	0.8
Orchard/Locust/Hawthorne	621.85	622.23	0.38	4986	623.8	2.0	623.7	1.9	623.7	1.8	623.8	1.9	623.1	1.3	623.2	1.3
Greenleaf/Locust/Laurel	621.21	621.61	0.40	4959	623.1	1.9	623.0	1.8	623.0	1.8	623.0	1.8	622.7	1.5	622.9	1.7
Meadow	621.57	622.47	0.90	4639	624.1	2.6	623.9	2.4	623.9	2.3	623.7	2.1	623.7	2.1	623.7	2.1
Washington/Pinecrest	626.22	626.89	0.67	4522	629.5	3.3	628.8	2.6	628.8	2.6	629.5	3.2	628.8	2.6	628.7	2.5
Beechwood E	622.79	623.43	0.64	4447	625.7	2.9	625.4	2.6	625.4	2.6	625.5	2.7	625.4	2.6	625.3	2.5
Beechwood W	622.71	623.35	0.64	4445	625.7	3.0	625.4	2.7	625.4	2.7	625.5	2.8	625.4	2.6	625.3	2.6
Kenilworth W	623.74	624.89	1.15	4428	625.7	2.0	625.4	1.6	625.4	1.7	625.5	1.7	625.4	1.6	625.3	1.5
Kenilworth E	622.89	623.75	0.86	4426	625.7	2.8	625.4	2.5	625.4	2.5	625.5	2.6	625.4	2.5	625.3	2.4
Chestnut W	624.67	625.83	1.16	4414	625.8	1.2	625.3	0.0	625.5	0.9	625.7	1.0	625.4	0.7	625.3	0.6
Chestnut E	624.22	625.03	0.81	4408	625.7	1.5	625.4	1.1	625.4	1.2	625.5	1.3	625.4	1.1	625.3	1.1
Thornwood W	624.63	625.65	1.02	4397	625.8	1.2	625.4	0.8	625.6	0.9	625.7	1.1	625.4	0.8	625.4	0.8
Thornwood E	624.69	625.78	1.09	4392	625.7	1.0	625.4	0.7	625.4	0.7	625.5	0.8	625.4	0.7	625.3	0.6
Greenwood	624.11	625.34	1.23	4381	626.4	2.3	626.2	2.1	626.3	2.2	626.1	2.0	626.0	1.9	625.9	1.8
Elmwood	625.35	626.41	1.06	4336	626.0	0.6	625.9	0.6	625.9	0.6	625.9	0.6	625.9	0.6	625.9	0.6
Miami	623.63	624.67	1.04	4322	626.0	2.4	625.6	1.9	625.6	1.9	625.8	2.2	625.5	1.9	625.5	1.9
Pawnee	623.55	624.22	0.67	4318	626.0	2.4	625.6	2.0	625.6	2.0	625.8	2.3	625.3	1.8	625.2	1.7
Iroquois E	623.50	624.62	1.12	4310	626.0	2.5	625.6	2.1	625.6	2.1	625.8	2.3	625.3	1.8	625.2	1.7
Hunter S	623.96	625.00	1.04	4303	626.0	2.0	625.2	1.3	625.4	1.5	625.8	1.9	625.1	1.1	625.0	1.0

Min	**0.6**	Min	**-1.3**	Min	**0.6**	Min	**0.6**	Min	**0.6**	Min	**0.6**
Max	**3.3**	Max	**2.7**	Max	**2.7**	Max	**3.2**	Max	**2.6**	Max	**2.6**
Avg	2.0	Avg	1.6	Avg	1.7	Avg	1.8	Avg	1.5	Avg	1.6

MEMORANDUM

July 1, 2015
Revised July 28, 2015

TO: Brigitte Berger, PE – Village of Wilmette Director of Engineering Services

FROM: Darren Olson, PE, D.WRE
Dave Buckley, PE

SUBJECT: Wilmette Stormwater Action Plan
Above Ground Community Park Stormwater Storage Basin
Separate Storm Sewer System Stormwater Management Report
(CBBEL Project 130605.00002)

Christopher B. Burke Engineering, Ltd. (CBBEL) recently completed the Separate Storm Sewer System Stormwater Management Report (Report) for the Village of Wilmette (Village) in January 2015 as part of the Village's Stormwater Action Plan. The Report indicated that the existing separate storm sewer system has approximately a 2-year capacity and the depth of street flooding reaches up to 2.3 feet for the 10-year return interval storm event. Three long term capital improvement projects were identified to lower the 10-year hydraulic grade line (HGL) below the street pavement elevation throughout the entire west side of the Village that is served by the separate storm sewer system. This design criterion was determined through direction from Village staff and the Municipal Services Committee.

Alternative 2 included the conceptual design of approximately 55 ac-ft of below-ground storage at Community Playfield in Community Park (Park) and associated storm sewer improvements to convey water to the storage basin. A portion of the cost associated with Alternative 2 was due to the below-ground storage vault. The Village subsequently directed CBBEL to determine the feasibility of providing storage above ground at the Park in an effort to reduce the overall cost of Alternative 2 and the storage basin. The purpose of this memorandum is to summarize the cost and benefits resulting from the modification of the below-ground storage vault to an above ground storage basin.

A kickoff and an additional follow-up meeting was held with Wilmette Park District, School District and Village staff to obtain feedback on the feasibility of providing above ground storage at the Park. Park District staff explained that Community Park is the Park District's largest and most used amenity. The Park District and School District were interested in knowing the frequency at which stormwater would access the storage basin and duration the Park would have standing water as compared to the current condition in which portions of the Park hold water after rain events. The Park District was also interested in the duration of construction and how long certain areas of the Park would be unusable due to construction activities. It was also noted that an existing 24-inch watermain extends through the center of the park in an east-west direction.

CBBEL used the previously completed XP-SWMM modeling for Alternative 2 in the Report to analyze two additional options for above ground storage at the Park. The criterion used for the two above ground options was to reduce the 10-year hydraulic grade line (HGL)

below the street pavement elevation throughout the entire Village. This is the same criteria used in the previously prepared Report. The two above ground storage options include the following:

Alternative 2.1 (Exhibit 11-2.1)

- Primarily above ground storage with a small portion of underground storage.
- Above-ground portion is dry-bottom basin suitable to replace athletic fields and stormwater management areas currently located within the basin footprint.
- The below-ground portion would be pumped to the existing storm sewer along Locust Road following storm events.
- Large diameter (6.5-foot) Reinforced Concrete Pipe (RCP) storm sewers under Locust Road to convey water from Lake Avenue and Wilmette Avenue into the storage basin.

Alternative 2.2 (Exhibit 11-2.2)

- Above ground storage that is drained by gravity.
- The bottom of the basin would be dry and suitable to replace athletic fields and stormwater management areas currently located within the basin footprint.
- Large Reinforced Concrete Box Culverts (RCBCs) under Locust Road to provide conveyance to the centralized storage basin. The RCBCs would extend from Lake Avenue and Wilmette Avenue into the storage basin.

Both Alternatives (2.1 and 2.2) provide approximately 50 acre-ft of flood storage for the 10-year event at a high water level (HWL) of 618 feet and 619 feet respectively. Stormwater will enter the storage basins via gravity once flow in the separate storm sewer system reaches a certain elevation. The existing grade at the Park will be lowered approximately 10 feet with 4:1 side slopes to provide storage at the required elevations and provide the appropriate level service throughout the Village for both alternatives. Under this concept, the lowered storage area will be underdrained sodded athletic fields graded at 1% slope with the proposed grading set back 40 feet from the property lines along the south side of the Park. The conceptual bottom footprint is generally large enough to accommodate the soccer fields as shown on the current aerial photograph (CBBEL understands that the soccer field configuration changes on a regular basis). The conceptual design also includes the relocation of the existing path and 24-inch diameter watermain (Exhibits 11-2.1 and 11-2.2). The storm sewer conveyance improvements previously identified for Alternative 2 in the Report will remain for Alternatives 2.1 and 2.2. Exhibits 11-2.1 Overall and 11-2.2 Overall show the storm sewer conveyance improvements previously identified for Alternative 2 in the Report combined with Alternatives 2.1 and 2.2 identified in this memorandum. This has been included in the engineer's estimate of probable cost accordingly.

According to the XP-SWMM analysis, the above ground portion of the storage area for Alternative 2.1 will begin to fill with stormwater for events that exceed approximately the 6-month, 3-hour design storm frequency (1.3 inches over 3 hours). The duration for which the above ground storage at the Park is flooded is limited to approximately 1 hour at a depth of 0.1 feet for the 6-month, 3-hour design storm event. The duration for which the above

ground portion of the storage in Alternative 2.1 is inundated is shown on Table 1 and the attached hydrograph for additional design storms.

Results from the analysis of Alternative 2.2 (above ground storage only) show that the storage area will begin to fill with stormwater for the 6-month, 3-hour critical duration design storm event (1.3 inches over 3 hours) at a maximum depth of approximately 0.4 feet. The duration for which the above ground storage in Alternative 2.2 is inundated is shown on Table 1 and the attached hydrograph for additional 3-hour critical duration design storms. Results from the analysis of both alternatives for the April 2013 storm event are also included in Table 1 and the attached hydrographs.

TABLE 1
Proposed Conditions Alternatives 2.1 and 2.2 Community Park Inundation Duration and Frequency

Design Storm Event	Depth of Rain over 3 hours (in)	Alternative 2.1		Alternative 2.2	
		Maximum Depth (ft)	Total Duration of Inundation (hr)	Maximum Depth (ft)	Total Duration of Inundation (hr)
6-month	1.3	0.1	1	0.4	2
1-year	1.6	1.0	4	1.1	4
2-year	1.9	1.8	6	1.9	5.5
10-year	2.9	4.9	11	5.6	9.5
Measured Storm Event	**Depth of Rain over 24 hours (in)**	**Alternative 2.1**		**Alternative 2.2**	
		Maximum Depth (ft)	**Total Duration of Inundation (hr)**	**Maximum Depth (ft)**	**Total Duration of Inundation (hr)**
April 2013	5.6	8.7	21	8.2	19

The resulting water surface elevations for both storage Alternatives were mapped and the benefits were quantified using the same methodology discussed in the previous Report. This methodology included a desktop GIS analysis to determine the number of structures impacted by flooding based on the property elevation compared to the peak water surface elevation. A structure was considered impacted by flooding if the peak water surface elevation rose to within 1 foot of the highest elevation on the parcel. A summary of the engineer's estimate of probable cost in 2014 dollars has been provided in Table 2 and supporting information has been included with this memorandum.

The added benefit for Alternatives 2.1 and 2.2 is that in events greater than the 10-year event, they will continue to provide additional flood storage up to a high water level (HWL) of approximately 623 ft, resulting in significant additional benefits for the 25-year to 100-year storm events as compared to Alternative 2.

TABLE 2
Summary of Benefits and Costs

Design Storm	Existing	Alternative 1	Alternative 2	Alternative 3	Alternative 2.1	Alternative 2.2
		Relief Storm Sewer System	Centralized Stormwater Storage at Community Playfield	Neighborhood Stormwater Storage	Centralized Stormwater Storage at Community Playfield Above & Below	Centralized Stormwater Storage at Community Playfield Above Only
Number of Structures Impacted by Flooding						
10-year	**120**	0	0	50	0	0
25-year	**280**	60	90	160	60	60
50-year	**480**	190	240	320	180	200
100-year	**700**	370	490	570	415	440
Project Costs (Millions)						
2014 $		**$75.0**	**$70.0**	**$44.0**	**$59.5**	**$53.0**

*Project costs for Alternatives 2.1 and 2.2 were also completed in 2015 dollars based on recent bid tabulations, which would increase the costs in Table 1 by approximately 2%.

The construction time is subject to weather, utility conflicts and other unforeseen circumstances that may arise during construction. It should be noted that the proposed storm sewer improvements for both alternatives include new storm sewer along Locust Road. It is recommended that any planned improvements should be incorporated into the upcoming Locust Road reconstruction project which could provide additional cost savings. The project costs shown in Table 2 include design engineering, construction observation and permitting.

DTO/DRB
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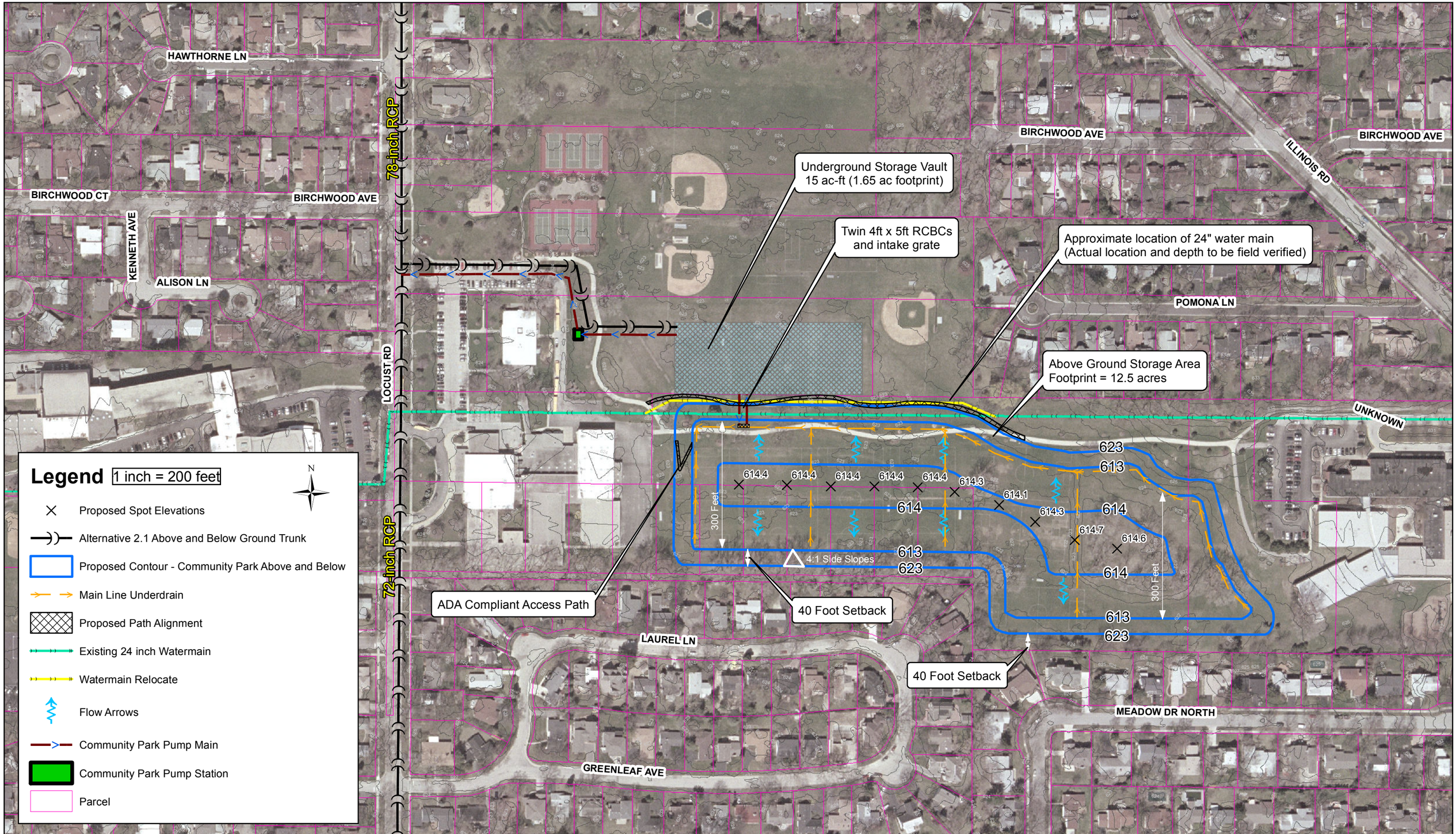

CHRISTOPHER B. BURKE ENGINEERING LTD.
9575 West Higgins Road, Suite 600
Rosemont, Illinois 60018
(847) 823-0500

CLIENT:

VILLAGE OF WILMETTE

NO.	DATE	NATURE OF REVISION	CHKD.

FILE NAME

DSGN.	DRB
DWN.	DRB
CHKD.	DTO
SCALE:	1"=
PLOT DATE:	
CAD USER:	
MODEL:	

TITLE:

ALTERNATIVE 2.1
ABOVE AND BELOW GROUND
CENTRALIZED STORAGE AT
COMMUNITY PLAYFIELD

PROJ. NO. 13-0605
DATE: 7-28-15
SHEET 0 OF 0
DRAWING NO.
EXH 11-2.1

Lake Avenue Stormwater Pump Station

Underground Storage Vault
15 ac-ft (1.65 ac footprint)
Pump Evacuated

Above Ground Storage Area
Footprint = 12.5 acres

Note: Wilmette Avenue was recently resurfaced. Depending on project timing, storm sewer route may be modified to be under Wilmette Avenue.

Note: All storm sewers are proposed to be parallel unless noted as remove and replace (R/R)

Legend

- Alternative 2.1 Trunk
- Alternative 2 Laterals
- Existing Village Storm Sewer Trunk
- Existing Village Storm Sewer Laterals
- Village of Wilmette Boundary

0 500 1,000 2,000 3,000 4,000 Feet

1 inch = 1,000 feet

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FILE NAME

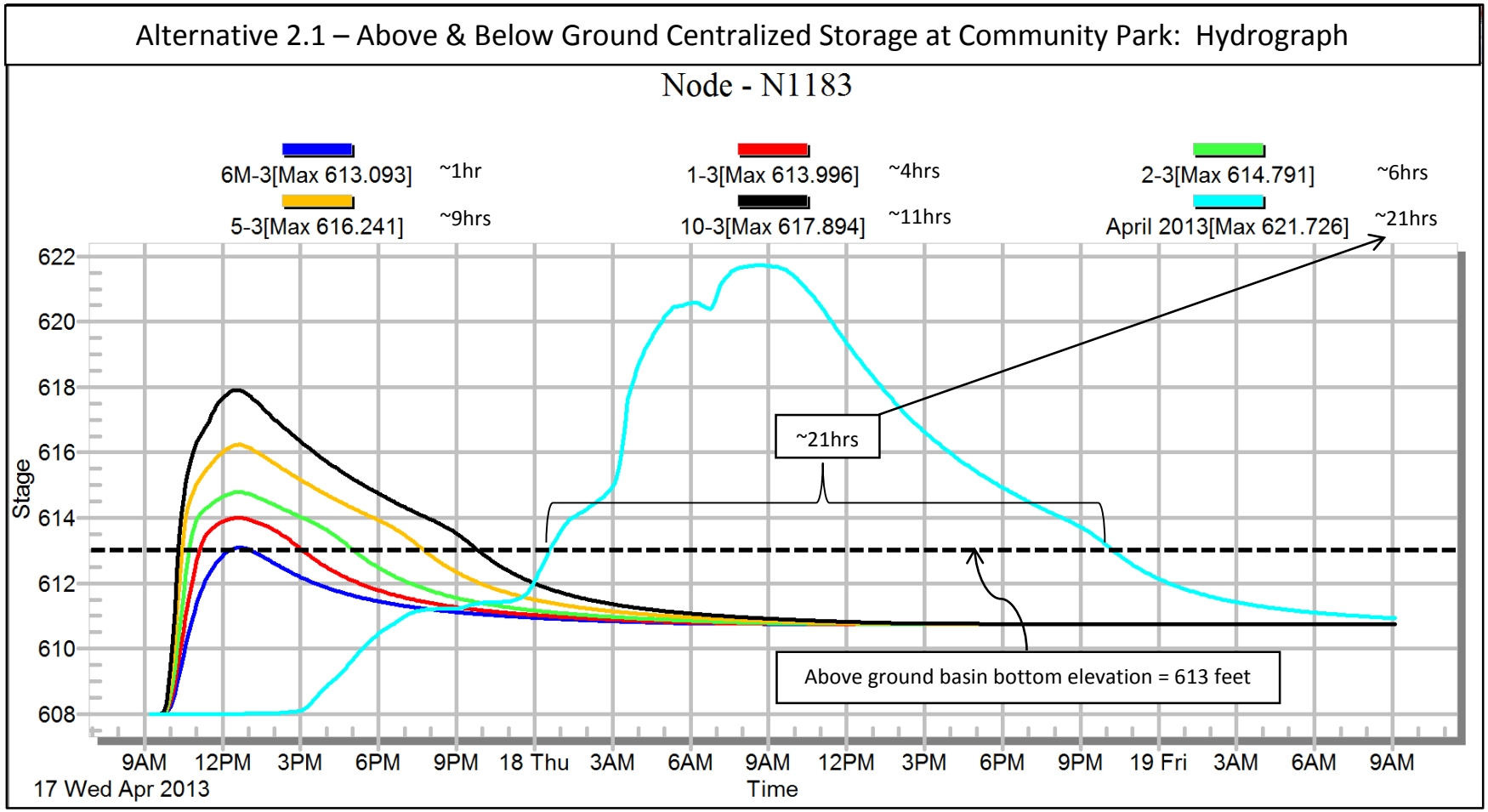
DSGN.	DRB
DWN.	DRB
CHKD.	DTO
SCALE:	1"= 1,000'
PLOT DATE:	11/25/2014
CAD USER:	
MODEL:	

TITLE: **ALTERNATIVE 2.1 ABOVE AND BELOW GROUND CENTRALIZED STORAGE AT COMMUNITY PLAYFIELD**

PROJ. NO. 13-0605
DATE: 7-28-15
SHEET 0 OF 0
DRAWING NO. EXH 11-2.1 (Overall)

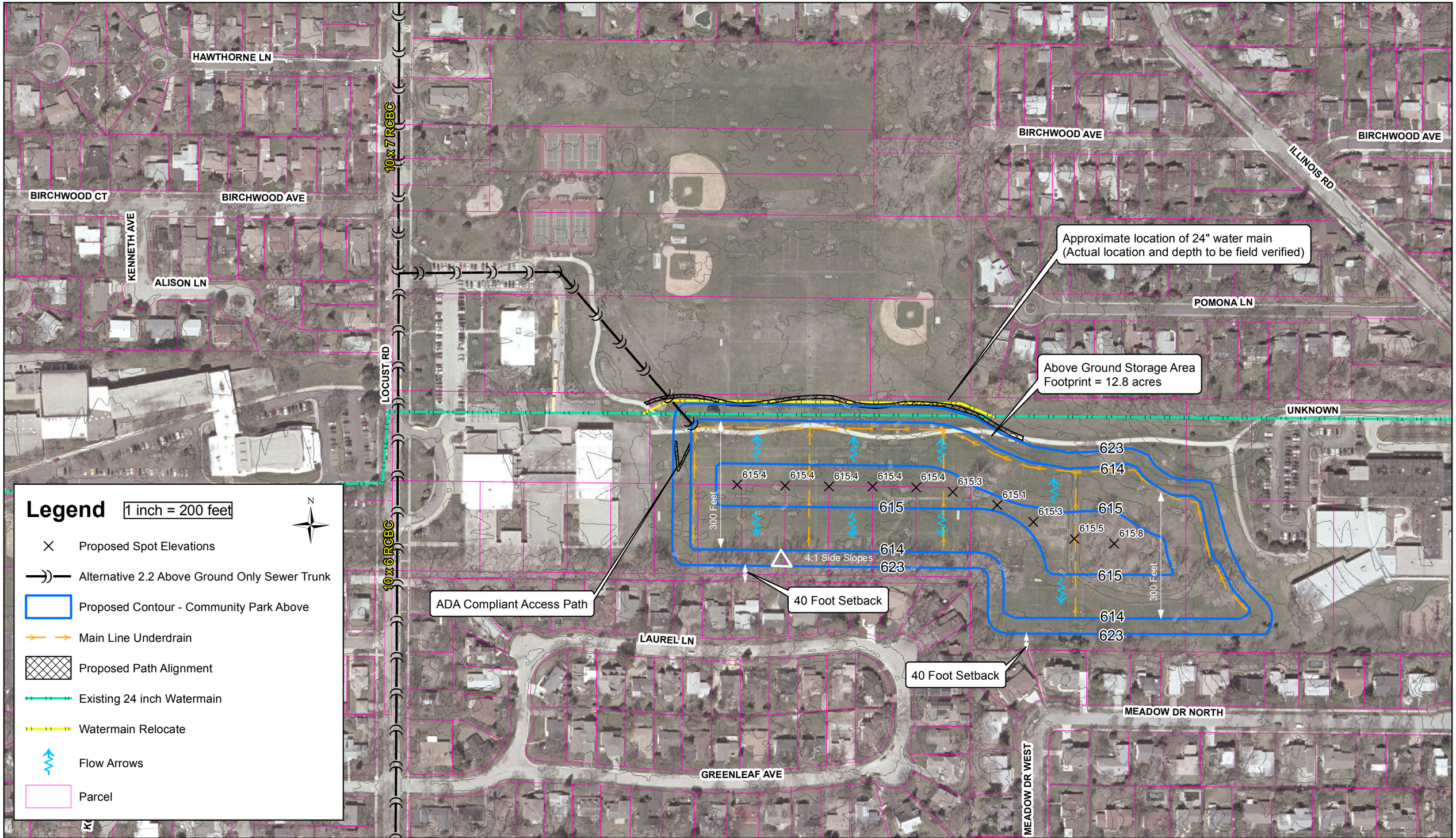
Stage Hydrograph - Length of time stormwater is in the storage basin (hours).

Graph depicts the elevation of water (stage) on the y-axis versus time on the x-axis within the Communinty Playfield Storage Basin.



Note 1: Outflow elevation from above ground basin to the below ground vault is 611 feet. The below ground storage vault is pump evacuated.

Note 2: 6M-3 refers to the 6-month, 3-hour (1.3 inches over 3 hours) design storm event, 1-3 refers to the 1-year, 3-hour design storm event, 2-3 refers to 2-year, 3-hour storm event, etc.



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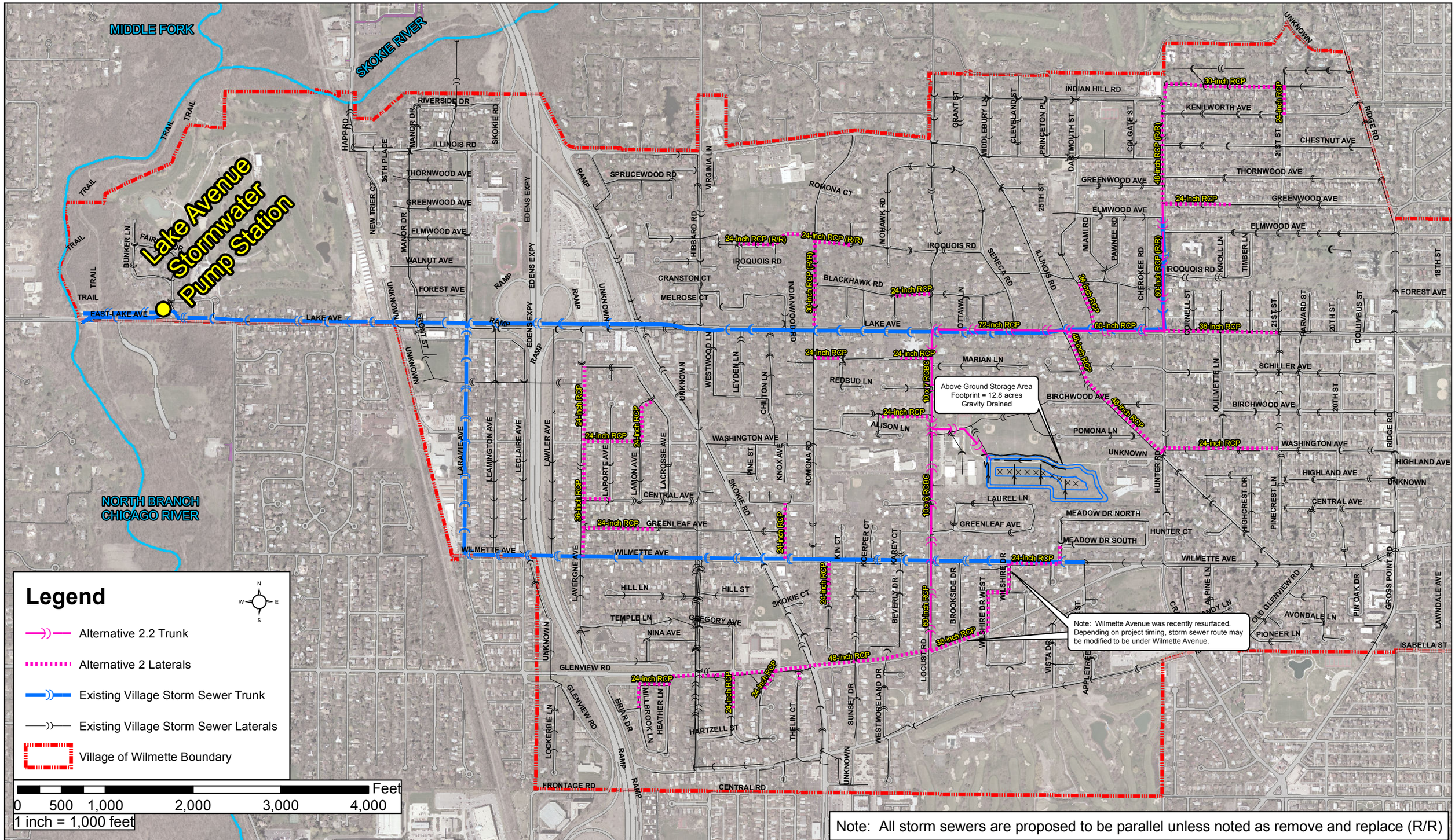
FILE NAME

DSGN.	DRB
DWN.	DRB
CHKD.	DTO
SCALE:	1"= 200'
PLOT DATE:	
CAD USER:	
MODEL:	

TITLE:
ALTERNATIVE 2.2
ABOVE GROUND ONLY
CENTRALIZED STORAGE AT
COMMUNITY PLAYFIELD

PROJ. NO. 13-0605
DATE: 07-28-15
SHEET 0 OF 0
DRAWING NO.
EXH 11-2.2



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(847) 823-0500

CLIENT:

VILLAGE OF WILMETTE

NO.	DATE	NATURE OF REVISION	CHKD.

FILE NAME

DSGN.	DRB
DWN.	DRB
CHKD.	DTO
SCALE:	1"= 1,000'
PLOT DATE:	11/25/2014
CAD USER:	
MODEL:	

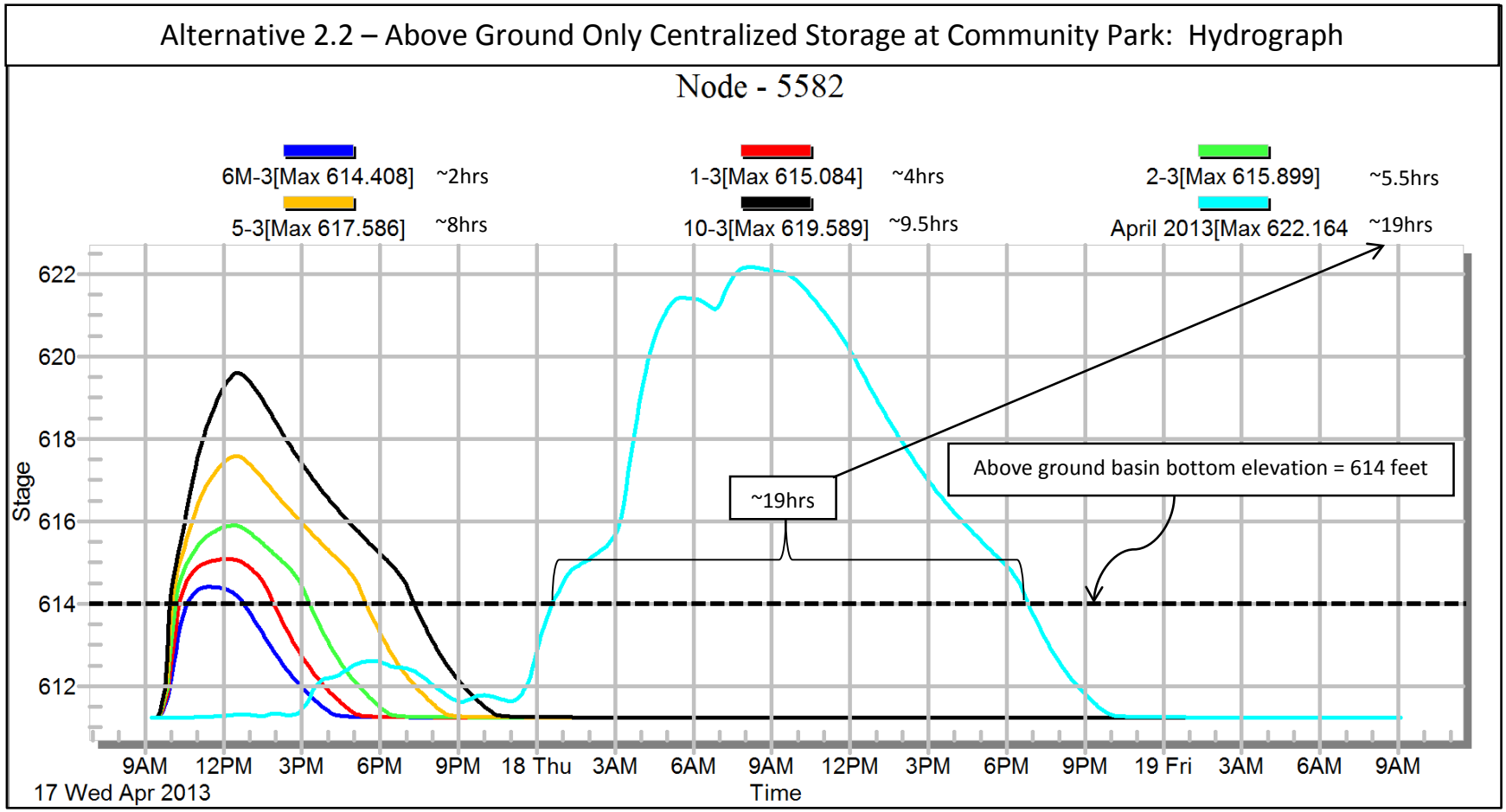
TITLE:

ALTERNATIVE 2.2
ABOVE GROUND ONLY
CENTRALIZED STORAGE AT
COMMUNITY PLAYFIELD

PROJ. NO. 13-0605
DATE: 7-28-15
SHEET 0 OF 0
DRAWING NO.
EXH 11-2.2 (Overall)

Stage Hydrograph - Length of time stormwater is in the storage basin (hours).

Graph depicts the elevation of water (stage) on the y-axis versus time on the x-axis within the Commuminty Playfield Storage Basin.



Note 1: Above ground only storage alternative is gravity drained.

Note 2: 6M-3 refers to the 6-month, 3-hour (1.3 inches over 3 hours) design storm event, 1-3 refers to the 1-year, 3-hour design storm event, 2-3 refers to 2-year, 3-hour storm event, etc.

Christopher B. Burke Engineering, Ltd.
9575 West Higgins Road, Suite 600
Rosemont, Illinois 60018
Project Number: 13-0605
Date: January 15, 2015
Revised: June 30, 2015

Village of Wilmette, Proposed Storm Sewer Improvements
ALTERNATIVE 2.1 - Centralized Storage at Community Playfield with Above/Below Ground Storage

			2014 COSTS		2015 COSTS	
ITEMS	**UNIT**	**QUANTITY**	**UNIT PRICE**	**TOTAL COST**	**UNIT PRICE**	**TOTAL COST**
TREE ROOT PRUNING	EACH	100	$145.00	$14,500.00	$150.00	$15,000.00
TREE PRUNING (1 TO 10 INCH DIAMETER)	EACH	100	$129.00	$12,900.00	$135.00	$13,500.00
TREE PRUNING (OVER 10 INCH DIAMETER)	EACH	100	$170.00	$17,000.00	$175.00	$17,500.00
TREE PROTECTION	EACH	100	$100.00	$10,000.00	$125.00	$12,500.00
EARTH EXCAVATION	CU YD	180,000	$44.00	$7,920,000.00	$44.00	$7,920,000.00
UNDERGROUND STORAGE TANK	AC-FT	15	$300,000.00	$4,500,000.00	$300,000.00	$4,500,000.00
TOPSOIL FURNISH AND PLACE	SQ YD	65,000	$7.00	$455,000.00	$7.00	$455,000.00
SODDING, SPECIAL	SQ YD	55,000	$11.00	$605,000.00	$11.00	$605,000.00
WETLAND SEEDING	SQ YD	10,000	$4.00	$40,000.00	$4.00	$40,000.00
EROSION CONTROL BLANKET	SQ YD	10,000	$2.50	$25,000.00	$2.50	$25,000.00
UNDERDRAINS FOR ABOVE GROUND STORAGE, 6" PVC	FOOT	225	$18.00	$4,050.00	$18.00	$4,050.00
UNDERDRAINS FOR ABOVE GROUND STORAGE, 8" PVC	FOOT	1,650	$22.00	$36,300.00	$22.00	$36,300.00
UNDERDRAINS FOR ABOVE GROUND STORAGE, 24" PVC	FOOT	800	$30.00	$24,000.00	$30.00	$24,000.00
UNDERDRAIN CATCH BASIN WITH GRATE	EACH	12	$1,000.00	$12,000.00	$1,000.00	$12,000.00
CATCH BASIN, TYPE C, 2'-DIAMETER	EACH	1	$3,000.00	$3,000.00	$3,000.00	$3,000.00
STORM SEWER, 24" RCP (ABOVE GROUND STORAGE CONNECTION)	FOOT	75	$192.00	$14,400.00	$192.00	$14,400.00
REMOVAL AND DISPOSAL OF UNSUITABLE MATERIAL	CU YD	1,000	$45.00	$45,000.00	$50.00	$50,000.00
TRENCH BACKFILL, CA-7	CU YD	89,000	$30.00	$2,670,000.00	$32.00	$2,848,000.00
AGGREGATE SUBGRADE IMPROVEMENT	CU YD	1,000	$54.00	$54,000.00	$60.00	$60,000.00
AGGREGATE FOR TEMPORARY ACCESS	TON	500	$22.00	$11,000.00	$25.00	$12,500.00
BITUMINOUS MATERIALS (PRIME COAT)	GAL	10,500	$3.00	$31,500.00	$3.00	$31,500.00
AGGREGATE (PRIME COAT)	TON	230	$15.00	$3,450.00	$20.00	$4,600.00
LEVELING BINDER (MACHINE METHOD), N50	TON	2,100	$88.00	$184,800.00	$110.00	$231,000.00
HOT-MIX ASPHALT BINDER COURSE, IL-19.0, N50 6"	TON	6,500	$76.00	$494,000.00	$80.00	$520,000.00
HOT-MIX ASPHALT SURFACE COURSE, MIX "D", N50 2.5"	TON	2,700	$89.00	$240,300.00	$95.00	$256,500.00
HOT-MIX ASPHALT SURFACE COURSE, MIX "D", N50 1.5"	TON	7,850	$89.00	$698,650.00	$95.00	$745,750.00
AGGREGATE BASE COURSE, 10"	SQ YD	27,000	$12.00	$324,000.00	$12.00	$324,000.00
PORTLAND CEMENT CONCRETE PATH REMOVAL AND REPLACEMENT	SQ YD	1,000	$70.00	$70,000.00	$70.00	$70,000.00
PORTLAND CEMENT CONCRETE SIDEWALK 5 INCH	SQ FT	2,500	$6.00	$15,000.00	$6.50	$16,250.00
SIDEWALK REMOVAL	SQ FT	2,500	$2.00	$5,000.00	$3.00	$7,500.00
DETECTABLE WARNINGS	SQ FT	1,000	$43.00	$43,000.00	$50.00	$50,000.00
PAVEMENT REMOVAL	SQ YD	20,000	$13.50	$270,000.00	$15.00	$300,000.00
HOT-MIX ASPHALT SURFACE REMOVAL, 2"	SQ YD	90,000	$5.00	$450,000.00	$5.00	$450,000.00
COMBINATION CONCRETE CURB AND GUTTER REMOVAL AND REPLACEMENT	FOOT	33,500	$24.00	$804,000.00	$28.00	$938,000.00
CLASS B PATCH, SPECIAL	SQ YD	350	$90.00	$31,500.00	$95.00	$33,250.00
CLASS D PATCH, SPECIAL	SQ YD	31,200	$93.00	$2,901,600.00	$100.00	$3,120,000.00
STORM SEWER REMOVAL, 8"	FOOT	50	$10.00	$500.00	$10.00	$500.00
STORM SEWER REMOVAL, 12"	FOOT	29	$10.00	$290.00	$10.00	$290.00
STORM SEWER REMOVAL, 15"	FOOT	100	$10.00	$1,000.00	$10.00	$1,000.00
STORM SEWER REMOVAL, 21"	FOOT	144	$10.00	$1,440.00	$10.00	$1,440.00
STORM SEWER REMOVAL, 36"	FOOT	665	$20.00	$13,300.00	$20.00	$13,300.00
STORM SEWER REMOVAL, 48"	FOOT	635	$20.00	$12,700.00	$20.00	$12,700.00
STORM SEWER REMOVAL, 54"	FOOT	791	$20.00	$15,820.00	$20.00	$15,820.00
STORM SEWER REMOVAL, 60"	FOOT	503	$20.00	$10,060.00	$20.00	$10,060.00
STORM SEWERS, 24" RCP	FOOT	12,795	$192.00	$2,456,640.00	$192.00	$2,456,640.00
STORM SEWERS, 30" RCP	FOOT	2,225	$218.00	$485,050.00	$218.00	$485,050.00
STORM SEWERS, 36" RCP	FOOT	3,300	$252.00	$831,600.00	$252.00	$831,600.00
STORM SEWERS, 48" RCP	FOOT	5,940	$328.00	$1,948,320.00	$328.00	$1,948,320.00
STORM SEWERS, 60" RCP	FOOT	3,675	$414.00	$1,521,450.00	$414.00	$1,521,450.00
STORM SEWERS, 72" RCP	FOOT	1,110	$650.00	$721,500.00	$650.00	$721,500.00
STORM SEWERS, 78" RCP	FOOT	3,250	$875.00	$2,843,750.00	$875.00	$2,843,750.00
STORM SEWERS, 84" RCP	FOOT	650	$1,000.00	$650,000.00	$1,000.00	$650,000.00
PRECAST CONCRETE BOX CULVERTS 4' x 5'	FOOT	200	$1,100.00	$220,000.00	$1,100.00	$220,000.00
JUNCTION CHAMBER FOR UNDERGROUND VAULT CONNECTION WITH GRATE	EACH	1	$300,000.00	$300,000.00	$300,000.00	$300,000.00
MANHOLES, TYPE A, 4'-DIAMETER, TYPE 1 FRAME, CLOSED LID	EACH	55	$3,600.00	$198,000.00	$3,600.00	$198,000.00
MANHOLES, TYPE A, 5'-DIAMETER, TYPE 1 FRAME, CLOSED LID	EACH	27	$5,200.00	$140,400.00	$5,200.00	$140,400.00
MANHOLES, TYPE A, 6'-DIAMETER, TYPE 1 FRAME, CLOSED LID	EACH	18	$7,300.00	$131,400.00	$7,300.00	$131,400.00
MANHOLES, TYPE A, 7'-DIAMETER, TYPE 1 FRAME, CLOSED LID	EACH	19	$11,000.00	$209,000.00	$11,000.00	$209,000.00
MANHOLES, TYPE A, 8'-DIAMETER, TYPE 1 FRAME, CLOSED LID	EACH	9	$16,500.00	$148,500.00	$16,500.00	$148,500.00
MANHOLES, TYPE A, 9'-DIAMETER, TYPE 1 FRAME, CLOSED LID	EACH	5	$20,000.00	$100,000.00	$20,000.00	$100,000.00
MANHOLES, TYPE A, 10'x10', TYPE 1 FRAME, CLOSED LID	EACH	9	$48,000.00	$432,000.00	$48,000.00	$432,000.00
PUMP FOR UNDERGROUND STORAGE BASIN	L. SUM	1	$750,000.00	$750,000.00	$750,000.00	$750,000.00
PUMP STATION UPDATED - 6th PUMP	L. SUM	1	$750,000.00	$750,000.00	$750,000.00	$750,000.00
STABILIZED CONSTRUCTION ENTRANCE	L. SUM	1	$15,000.00	$15,000.00	$15,000.00	$15,000.00
WATER MAIN RELOCATION, 24"	FOOT	1,000	$300.00	$300,000.00	$300.00	$300,000.00
RELOCATE WATER SERVICE LINE, LONG SIDE	EACH	197	$3,600.00	$709,200.00	$3,600.00	$709,200.00
REMOVE AND REPLACE WATER MAIN	FOOT	11,000	$240.00	$2,640,000.00	$240.00	$2,640,000.00
RELOCATE SANITARY SEWER SERVICE LINE	EACH	201	$1,900.00	$381,900.00	$1,900.00	$381,900.00
REMOVE AND REPLACE SANITARY MAIN	FOOT	5,840	$150.00	$876,000.00	$150.00	$876,000.00
SOIL EROSION/SEDIMENT CONTROL	L. SUM	1	$250,000.00	$250,000.00	$250,000.00	$250,000.00
THERMOPLASTIC PAVEMENT MARKINGS	L. SUM	1	$25,000.00	$25,000.00	$25,000.00	$25,000.00
TRAFFIC CONTROL	L. SUM	1	$750,000.00	$750,000.00	$750,000.00	$750,000.00
CONSTRUCTION LAYOUT	L. SUM	1	$200,000.00	$200,000.00	$200,000.00	$200,000.00
			SUBTOTAL =	$44,079,770.00		$44,805,920.00
			CONTINGENCY (20%) =	$8,815,954.00		$8,961,184.00
			CONSTRUCTION TOTAL =	**$52,895,724.00**		**$53,767,104.00**
			DESIGN ENGINEERING (6%) =	$3,173,743.44		$3,226,026.24
			CONSTRUCTION OBSERVATION (6%) =	$3,173,743.44		$3,226,026.24
			PERMITTING =	$250,000.00		$250,000.00
			TOTAL PROJECT COST INCLUDING ENGINEERING =	**$59,493,210.88**		**$60,469,156.48**

CATEGORY	2014 TOTAL COST	2015 TOTAL COST
UNDERGROUND	$15,542,720.00	$15,720,720.00
UNDERGROUND STORAGE	$7,396,000.00	$7,396,000.00
ABOVE GROUND STORAGE	$8,380,750.00	$8,380,750.00
PAVING	$6,568,800.00	$7,102,100.00
WM RELOCATION	$3,475,200.00	$3,475,200.00
SANITARY RELOCATION	$1,383,900.00	$1,383,900.00
MISCELLANEOUS	$1,332,400.00	$1,347,250.00
TOTAL	$44,079,770.00	$44,805,920.00

NOTES:
1. THIS ESTIMATE DOES NOT INCLUDE ROW ACQUISTION, TEMPORARY OR CONSTRUCTION EASEMENTS, OR RELOCATING ANY EXISTING UTILITIES.
2. THE 2014 UNIT PRICES ARE BASED ON OUR DESIGN MEMO DATED DECEMBER 5, 2014.
3. PAVEMENT THICKNESS REMOVAL WAS ASSUMED TO BE 21".
4. TRENCH BACKFILL IS INCLUDED IN THE COST OF THE WATER MAIN AND SANITARY MAIN REMOVAL AND REPLACEMENT.

Christopher B. Burke Engineering, Ltd.
9575 West Higgins Road, Suite 600
Rosemont, Illinois 60018
Project Number: 13-0605
Date: January 15, 2015
Revised: June 30, 2015

Village of Wilmette, Proposed Storm Sewer Improvements
ALTERNATIVE 2.2 - Centralized Storage at Community Playfield with Above Ground Storage

			2014 COSTS		2015 COSTS	
ITEMS	**UNIT**	**QUANTITY**	**UNIT PRICE**	**TOTAL COST**	**UNIT PRICE**	**TOTAL COST**
TREE ROOT PRUNING	EACH	100	$145.00	$14,500.00	$150.00	$15,000.00
TREE PRUNING (1 TO 10 INCH DIAMETER)	EACH	100	$129.00	$12,900.00	$135.00	$13,500.00
TREE PRUNING (OVER 10 INCH DIAMETER)	EACH	100	$170.00	$17,000.00	$175.00	$17,500.00
TREE PROTECTION	EACH	100	$100.00	$10,000.00	$125.00	$12,500.00
EARTH EXCAVATION	CU YD	125,000	$44.00	$5,500,000.00	$44.00	$5,500,000.00
TOPSOIL FURNISH AND PLACE	SQ YD	56,000	$7.00	$392,000.00	$7.00	$392,000.00
SODDING, SPECIAL	SQ YD	46,000	$11.00	$506,000.00	$11.00	$506,000.00
WETLAND SEEDING	SQ YD	10,000	$4.00	$40,000.00	$4.00	$40,000.00
EROSION CONTROL BLANKET	SQ YD	10,000	$2.50	$25,000.00	$2.50	$25,000.00
UNDERDRAINS FOR ABOVE GROUND STORAGE, 6" PVC	FOOT	225	$18.00	$4,050.00	$18.00	$4,050.00
UNDERDRAINS FOR ABOVE GROUND STORAGE, 8" PVC	FOOT	1,650	$22.00	$36,300.00	$22.00	$36,300.00
UNDERDRAINS FOR ABOVE GROUND STORAGE, 24" PVC	FOOT	800	$30.00	$24,000.00	$30.00	$24,000.00
UNDERDRAIN CATCH BASIN WITH GRATE	EACH	12	$1,000.00	$12,000.00	$1,000.00	$12,000.00
REMOVAL AND DISPOSAL OF UNSUITABLE MATERIAL	CU YD	1,000	$45.00	$45,000.00	$50.00	$50,000.00
TRENCH BACKFILL, CA-7	CU YD	90,000	$30.00	$2,700,000.00	$32.00	$2,880,000.00
AGGREGATE SUBGRADE IMPROVEMENT	CU YD	1,000	$54.00	$54,000.00	$60.00	$60,000.00
AGGREGATE FOR TEMPORARY ACCESS	TON	500	$22.00	$11,000.00	$25.00	$12,500.00
BITUMINOUS MATERIALS (PRIME COAT)	GAL	10,500	$3.00	$31,500.00	$3.00	$31,500.00
AGGREGATE (PRIME COAT)	TON	230	$15.00	$3,450.00	$20.00	$4,600.00
LEVELING BINDER (MACHINE METHOD), N50	TON	2,100	$88.00	$184,800.00	$110.00	$231,000.00
HOT-MIX ASPHALT BINDER COURSE, IL-19.0, N50 6"	TON	6,500	$76.00	$494,000.00	$80.00	$520,000.00
HOT-MIX ASPHALT SURFACE COURSE, MIX "D", N50 2.5"	TON	2,700	$89.00	$240,300.00	$95.00	$256,500.00
HOT-MIX ASPHALT SURFACE COURSE, MIX "D", N50 1.5"	TON	7,850	$89.00	$698,650.00	$95.00	$745,750.00
AGGREGATE BASE COURSE, 10"	SQ YD	27,000	$12.00	$324,000.00	$12.00	$324,000.00
PORTLAND CEMENT CONCRETE PATH REMOVAL AND REPLACEMENT	SQ YD	1,000	$70.00	$70,000.00	$70.00	$70,000.00
PORTLAND CEMENT CONCRETE SIDEWALK 5 INCH	SQ FT	2,500	$6.00	$15,000.00	$6.50	$16,250.00
SIDEWALK REMOVAL	SQ FT	2,500	$2.00	$5,000.00	$3.00	$7,500.00
DETECTABLE WARNINGS	SQ FT	1,000	$43.00	$43,000.00	$50.00	$50,000.00
PAVEMENT REMOVAL	SQ YD	20,000	$13.50	$270,000.00	$15.00	$300,000.00
HOT-MIX ASPHALT SURFACE REMOVAL, 2"	SQ YD	90,000	$5.00	$450,000.00	$5.00	$450,000.00
COMBINATION CONCRETE CURB AND GUTTER REMOVAL AND REPLACEMENT	FOOT	33,500	$24.00	$804,000.00	$28.00	$938,000.00
CLASS B PATCH, SPECIAL	SQ YD	350	$90.00	$31,500.00	$95.00	$33,250.00
CLASS D PATCH, SPECIAL	SQ YD	31,200	$93.00	$2,901,600.00	$100.00	$3,120,000.00
STORM SEWER REMOVAL, 8"	FOOT	50	$10.00	$500.00	$10.00	$500.00
STORM SEWER REMOVAL, 12"	FOOT	29	$10.00	$290.00	$10.00	$290.00
STORM SEWER REMOVAL, 15"	FOOT	100	$10.00	$1,000.00	$10.00	$1,000.00
STORM SEWER REMOVAL, 21"	FOOT	144	$10.00	$1,440.00	$10.00	$1,440.00
STORM SEWER REMOVAL, 36"	FOOT	665	$20.00	$13,300.00	$20.00	$13,300.00
STORM SEWER REMOVAL, 48"	FOOT	635	$20.00	$12,700.00	$20.00	$12,700.00
STORM SEWER REMOVAL, 54"	FOOT	791	$20.00	$15,820.00	$20.00	$15,820.00
STORM SEWER REMOVAL, 60"	FOOT	503	$20.00	$10,060.00	$20.00	$10,060.00
STORM SEWERS, 24" RCP	FOOT	12,795	$192.00	$2,456,640.00	$192.00	$2,456,640.00
STORM SEWERS, 30" RCP	FOOT	2,225	$218.00	$485,050.00	$218.00	$485,050.00
STORM SEWERS, 36" RCP	FOOT	3,300	$252.00	$831,600.00	$252.00	$831,600.00
STORM SEWERS, 48" RCP	FOOT	5,940	$328.00	$1,948,320.00	$328.00	$1,948,320.00
STORM SEWERS, 60" RCP	FOOT	3,675	$414.00	$1,521,450.00	$414.00	$1,521,450.00
STORM SEWERS, 78" RCP	FOOT	850	$875.00	$743,750.00	$875.00	$743,750.00
STORM SEWERS, 84" RCP	FOOT	650	$1,000.00	$650,000.00	$1,000.00	$650,000.00
PRECAST CONCRETE BOX CULVERTS 10' X 6'	FOOT	1,540	$1,700.00	$2,618,000.00	$1,700.00	$2,618,000.00
PRECAST CONCRETE BOX CULVERTS 10' X 7'	FOOT	2,000	$1,800.00	$3,600,000.00	$1,800.00	$3,600,000.00
MANHOLES, TYPE A, 4'-DIAMETER, TYPE 1 FRAME, CLOSED LID	EACH	55	$3,600.00	$198,000.00	$3,600.00	$198,000.00
MANHOLES, TYPE A, 5'-DIAMETER, TYPE 1 FRAME, CLOSED LID	EACH	27	$5,200.00	$140,400.00	$5,200.00	$140,400.00
MANHOLES, TYPE A, 6'-DIAMETER, TYPE 1 FRAME, CLOSED LID	EACH	18	$7,300.00	$131,400.00	$7,300.00	$131,400.00
MANHOLES, TYPE A, 7'-DIAMETER, TYPE 1 FRAME, CLOSED LID	EACH	19	$11,000.00	$209,000.00	$11,000.00	$209,000.00
MANHOLES, TYPE A, 8'-DIAMETER, TYPE 1 FRAME, CLOSED LID	EACH	9	$16,500.00	$148,500.00	$16,500.00	$148,500.00
MANHOLES, TYPE A, 9'-DIAMETER, TYPE 1 FRAME, CLOSED LID	EACH	5	$20,000.00	$100,000.00	$20,000.00	$100,000.00
MANHOLES, TYPE A, 10'x10', TYPE 1 FRAME, CLOSED LID	EACH	9	$48,000.00	$432,000.00	$48,000.00	$432,000.00
JUNCTION BOX	EACH	1	$150,000.00	$150,000.00	$150,000.00	$150,000.00
PUMP STATION UPDATED - 6th PUMP	L. SUM	1	$750,000.00	$750,000.00	$750,000.00	$750,000.00
STABILIZED CONSTRUCTION ENTRANCE	L. SUM	1	$15,000.00	$15,000.00	$15,000.00	$15,000.00
WATER MAIN RELOCATION, 24"	FOOT	1,000	$300.00	$300,000.00	$300.00	$300,000.00
RELOCATE WATER SERVICE LINE, LONG SIDE	EACH	197	$3,600.00	$709,200.00	$3,600.00	$709,200.00
REMOVE AND REPLACE WATER MAIN	FOOT	11,000	$240.00	$2,640,000.00	$240.00	$2,640,000.00
RELOCATE SANITARY SEWER SERVICE LINE	EACH	201	$1,900.00	$381,900.00	$1,900.00	$381,900.00
REMOVE AND REPLACE SANITARY MAIN	FOOT	5,840	$150.00	$876,000.00	$150.00	$876,000.00
SOIL EROSION/SEDIMENT CONTROL	L. SUM	1	$250,000.00	$250,000.00	$250,000.00	$250,000.00
THERMOPLASTIC PAVEMENT MARKINGS	L. SUM	1	$25,000.00	$25,000.00	$25,000.00	$25,000.00
TRAFFIC CONTROL	L. SUM	1	$750,000.00	$750,000.00	$750,000.00	$750,000.00
CONSTRUCTION LAYOUT	L. SUM	1	$200,000.00	$200,000.00	$200,000.00	$200,000.00
			SUBTOTAL =	$39,286,870.00		$40,015,020.00
			CONTINGENCY (20%) =	$7,857,374.00		$8,003,004.00
			CONSTRUCTION TOTAL =	**$47,144,244.00**		**$48,018,024.00**
			DESIGN ENGINEERING (6%) =	$2,828,654.64		$2,881,081.44
			CONSTRUCTION OBSERVATION (6%) =	$2,828,654.64		$2,881,081.44
			PERMITTING =	$250,000.00		$250,000.00
			TOTAL PROJECT COST INCLUDING ENGINEERING =	**$53,051,553.28**		**$54,030,186.88**

CATEGORY	2014 TOTAL COST	2015 TOTAL COST
UNDERGROUND	$18,969,220.00	$19,149,220.00
ABOVE GROUND STORAGE	$7,557,350.00	$7,557,350.00
PAVING	$6,568,800.00	$7,102,100.00
WM RELOCATION	$3,475,200.00	$3,475,200.00
SANITARY RELOCATION	$1,383,900.00	$1,383,900.00
MISCELLANEOUS	$1,332,400.00	$1,347,250.00
TOTAL	$39,286,870.00	$40,015,020.00

NOTES:
1. THIS ESTIMATE DOES NOT INCLUDE ROW ACQUISTION, TEMPORARY OR CONSTRUCTION EASEMENTS, OR RELOCATING ANY EXISTING UTILITIES.
2. THE 2014 UNIT PRICES ARE BASED ON OUR DESIGN MEMO DATED DECEMBER 5, 2014.
3. PAVEMENT THICKNESS REMOVAL WAS ASSUMED TO BE 21".
4. TRENCH BACKFILL IS INCLUDED IN THE COST OF THE WATER MAIN AND SANITARY MAIN REMOVAL AND REPLACEMENT.

MEMORANDUM

August 10, 2015

TO: Brigitte Berger, PE – Village of Wilmette Director of Engineering Services

FROM: Darren Olson, PE, D.WRE
Dave Buckley, PE

SUBJECT: Wilmette Stormwater Action Plan
Drainage Improvements at Lockerbie Lane and LeClaire Avenue
Wilmette and Glenview Coordination
Separate Storm Sewer System Stormwater Management Report
(CBBEL Project 130605.00002)

Christopher B. Burke Engineering, Ltd. (CBBEL) recently completed the Separate Storm Sewer System Stormwater Management Report (Report) for the Village of Wilmette (Village) in January 2015 as part of the Village's Stormwater Action Plan. The Report indicated that the existing separate storm sewer system along Lockerbie Lane and LeClaire Avenue north and south of Glenview Road has approximately a 2-year capacity. This area is approximately 25 acres in size and is currently drained by storm sewers to the Village of Wilmette Pump Station (Figure 1). The depth of street flooding reaches up to approximately 1 foot for the 10-year return interval storm event.

In the Report, CBBEL conceptually identified an improvement project to lower the 10-year hydraulic grade line (HGL) below the street pavement elevation along Lockerbie Lane and LeClaire Avenue in the Village of Wilmette (Figure 1). The concept utilizes the proposed improvements currently under construction within the Village of Glenview. Based on our preliminary discussions with the Village of Glenview (Glenview) and review of the storm sewer inverts, the Lockerbie Lane and LeClaire Avenue area (approximately 25 acres) in the Village of Wilmette could be diverted to the proposed Glenview pump stations at the North Branch of the Chicago River (River). The improvement project for Wilmette is in part feasible due to the proposed stormwater improvements that the Village of Glenview is currently pursuing. This includes Phase I Flood Mitigation Improvements (East of Harms Project) which included two pump stations to reduce flooding for the areas located east of the River in Glenview. According to the Village of Glenview staff, construction the two pump stations will be completed this fall.

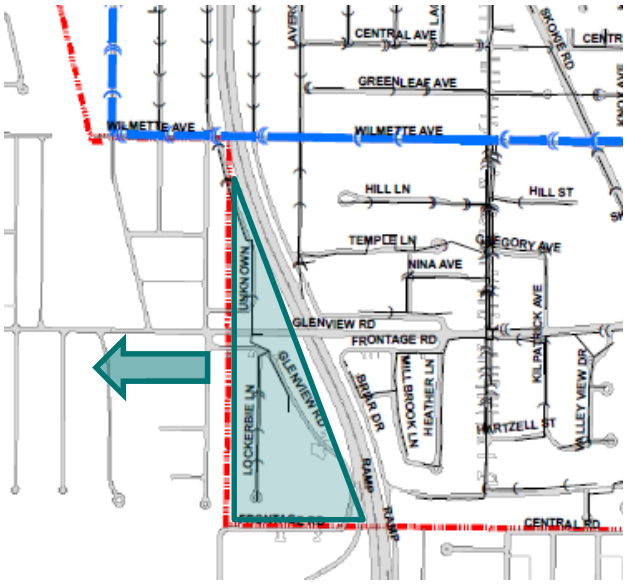


Figure 1. Potential Diversion Area to Glenview

CHRISTOPHER B. BURKE ENGINEERING, LTD.
9575 W Higgins Road, Suite 600 Rosemont, Illinois 60018-4920 Tel (847) 823-0500 Fax (847) 823-0520

As part of this follow-up study to the Report, a meeting with Wilmette and Glenview staff confirmed that the 25 acre portion in the Village of Wilmette is tributary to the proposed improvements identified in the East of Harms Project (Figure 1). The proposed Glenview pump stations associated with the improvements have been sized to accommodate the runoff from this area. It was agreed that Wilmette could tie the 25 acres into the Glenview storm sewer system south of Wilmette Avenue (Exhibit 1).

CBBEL used the previously completed XP-SWMM modeling in the Report to analyze a proposed storm sewer connection to the Glenview system at the intersection of Glenview and Long Roads. The criterion used for the new connection was to reduce the 10-year hydraulic grade line (HGL) below the street pavement elevation along Lockerbie Lane and LeClaire Avenue. This is the same criteria used in the previously prepared Report. The analysis of the new connection is based on the proposed condition tailwater information developed in the Glenview analysis for each design storm. The new connection option includes the following improvements in Wilmette as shown on Exhibit 1:

- A proposed 36-inch Reinforced Concrete Pipe (RCP) storm sewer connection to the existing 36-inch RCP along Glenview Road.
- Removal of the existing 15-18 inch RCP storm sewer and replace it with approximately 840 feet of 30-inch RCP along Lockerbie Lane.
- A proposed backflow preventer on the Wilmette storm sewer line draining into the main system at the intersection of Long Road and Wilmette Avenue. This will prevent additional flow from the Wilmette trunk (outside of the 25 acres identified in this analysis) from entering the Glenview system.
- A proposed backflow preventer on the Wilmette storm sewer line draining into the 36-inch Glenview system at the intersection of Long and Glenview Roads. This will prevent backflow flow from the Glenview system entering the Wilmette system.

The resulting water surface elevations from the proposed connection were mapped and the benefits were quantified using the same methodology discussed in the previous Report. This methodology included a desktop GIS analysis to determine the number of structures impacted by flooding based on the property elevation compared to the peak water surface elevation. A structure was considered impacted by flooding if the peak water surface elevation rose to within 1 foot of the highest elevation on the parcel. A summary of the engineer's estimate of probable cost in 2015 dollars have been provided in Table 1 and supporting information has been included with this memorandum. The project costs includes design engineering, construction observation and permitting.

TABLE 1
Summary of Benefits and Costs

Design Storm	Existing	Connection to Glenview Storm Sewer
Number of Structures Impacted by Flooding		
10-year	**120**	115
25-year	**280**	275
50-year	**480**	480
100-year	**700**	700
2015 $		$900,500

The results of the analysis show that the connection would provide very minor flood reduction benefits for this specific area, and do not result in flood reduction benefits for the remainder of Wilmette. The area is too small for the removal of it to significantly impact the capacity of Wilmette's trunk sewer system.

DTO/DRB
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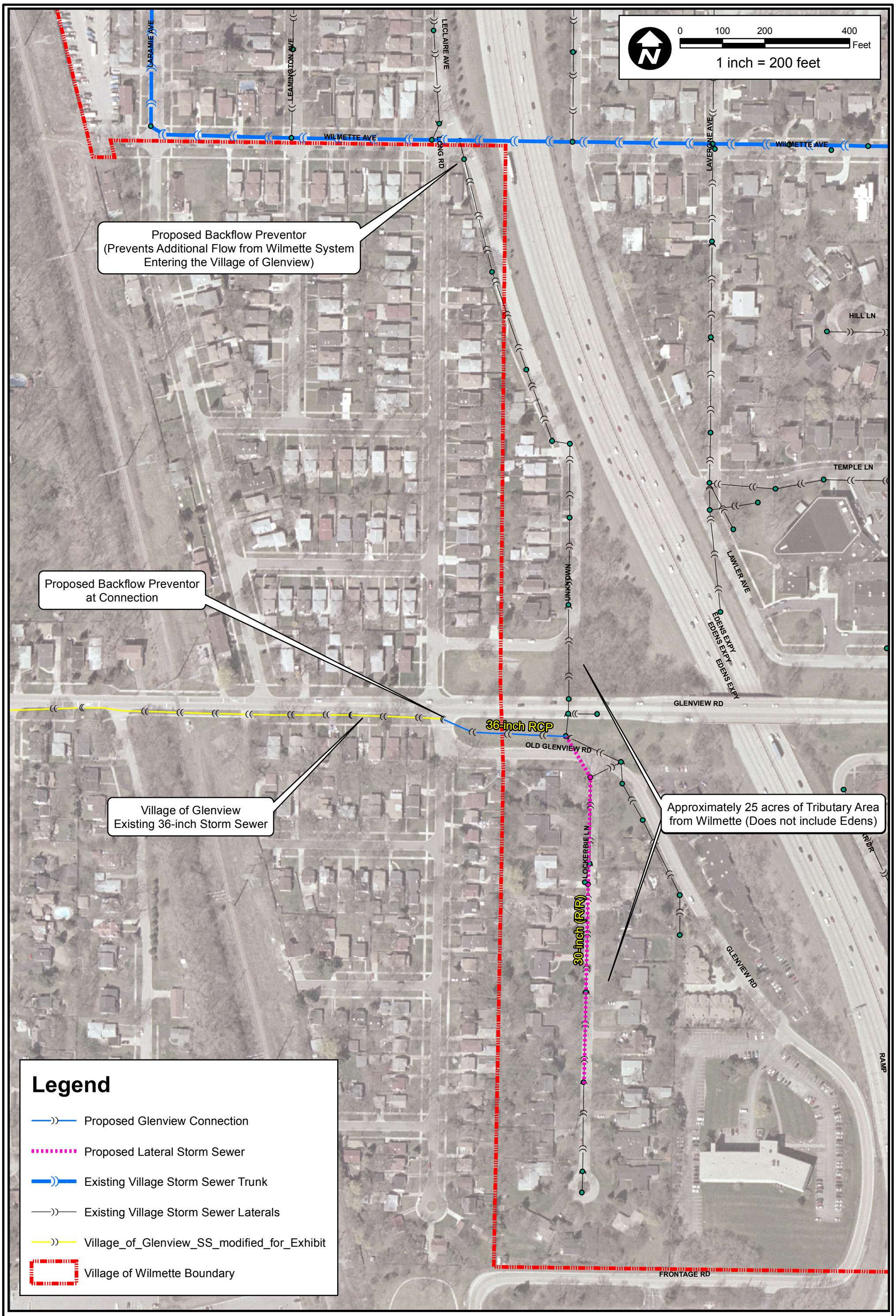

DSGN.	DRB	CHKD.	DTO

CHRISTOPHER B. BURKE ENGINEERING LTD.
9575 West Higgins Road, Suite 600
Rosemont, Illinois 60018
(847) 823-0500

CLIENT **VILLAGE OF WILMETTE**

PROJECT NO. 13-0605

TITLE **CONNECTION TO VILLAGE OF GLENVIEW STORM SEWER**

DATE 08/10/15

EXHIBIT 1

Christopher B. Burke Engineering, Ltd.
9575 West Higgins Road, Suite 600
Rosemont, Illinois 60018
Project Number: 13-0605
Date: August 11, 2015

Village of Wilmette, Proposed Storm Sewer Improvements
GLENVIEW CONNECTION

			2015 COSTS	
ITEMS	**UNIT**	**QUANTITY**	**UNIT PRICE**	**TOTAL COST**
TREE ROOT PRUNING	EACH	10	$150.00	$1,500.00
TREE PRUNING (1 TO 10 INCH DIAMETER)	EACH	5	$135.00	$675.00
TREE PRUNING (OVER 10 INCH DIAMETER)	EACH	5	$175.00	$875.00
TREE PROTECTION	EACH	10	$125.00	$1,250.00
TOPSOIL FURNISH AND PLACE	SQ YD	500	$7.00	$3,500.00
SODDING, SPECIAL	SQ YD	500	$11.00	$5,500.00
REMOVAL AND DISPOSAL OF UNSUITABLE MATERIAL	CU YD	50	$50.00	$2,500.00
TRENCH BACKFILL, CA-7	CU YD	1,000	$32.00	$32,000.00
AGGREGATE FOR TEMPORARY ACCESS	TON	25	$25.00	$625.00
BITUMINOUS MATERIALS (PRIME COAT)	GAL	250	$3.00	$750.00
AGGREGATE (PRIME COAT)	TON	5	$20.00	$100.00
LEVELING BINDER (MACHINE METHOD), N50	TON	120	$110.00	$13,200.00
HOT-MIX ASPHALT SURFACE COURSE, MIX "D", N50 1.5"	TON	240	$95.00	$22,800.00
PORTLAND CEMENT CONCRETE SIDEWALK 5 INCH	SQ FT	200	$6.50	$1,300.00
SIDEWALK REMOVAL	SQ FT	200	$3.00	$600.00
DETECTABLE WARNINGS	SQ FT	50	$50.00	$2,500.00
HOT-MIX ASPHALT SURFACE REMOVAL, 2"	SQ YD	2,500	$5.00	$12,500.00
COMBINATION CONCRETE CURB AND GUTTER REMOVAL AND REPLACEMENT	FOOT	250	$28.00	$7,000.00
CLASS D PATCH, SPECIAL	SQ YD	1,000	$100.00	$100,000.00
STORM SEWER REMOVAL, 15"	FOOT	230	$10.00	$2,300.00
STORM SEWER REMOVAL, 18"	FOOT	575	$10.00	$5,750.00
STORM SEWERS, 30" RCP	FOOT	250	$218.00	$54,500.00
STORM SEWERS, 36" RCP	FOOT	840	$252.00	$211,680.00
DRAINAGE STRUCTURES TO BE REMOVED	EACH	7	$1,000.00	$7,000.00
MANHOLES, TYPE A, 4'-DIAMETER, TYPE 1 FRAME, CLOSED LID	EACH	4	$3,600.00	$14,400.00
MANHOLES, TYPE A, 5'-DIAMETER, TYPE 1 FRAME, CLOSED LID	EACH	1	$5,200.00	$5,200.00
MANHOLES, TYPE A, 6'-DIAMETER, TYPE 1 FRAME, CLOSED LID	EACH	1	$7,300.00	$7,300.00
MANHOLES, TYPE A, 7'-DIAMETER, TYPE 1 FRAME, CLOSED LID	EACH	1	$11,000.00	$11,000.00
MANHOLES, TYPE A, 9'-DIAMETER, TYPE 1 FRAME, CLOSED LID	EACH	1	$20,000.00	$20,000.00
BACKFLOW PREVENTER, 27"	EACH	1	$2,500.00	$2,500.00
BACKFLOW PREVENTER, 36"	EACH	1	$3,000.00	$3,000.00
STABILIZED CONSTRUCTION ENTRANCE	L. SUM	1	$10,000.00	$10,000.00
RELOCATE WATER SERVICE LINE, LONG SIDE	EACH	10	$3,600.00	$36,000.00
RELOCATE SANITARY SEWER SERVICE LINE	EACH	10	$1,900.00	$19,000.00
SOIL EROSION/SEDIMENT CONTROL	L. SUM	1	$5,000.00	$5,000.00
THERMOPLASTIC PAVEMENT MARKINGS	L. SUM	1	$2,500.00	$2,500.00
TRAFFIC CONTROL	L. SUM	1	$25,000.00	$25,000.00
CONSTRUCTION LAYOUT	L. SUM	1	$15,000.00	$15,000.00
			SUBTOTAL =	$666,305.00
			CONTINGENCY (20%) =	$133,261.00
			CONSTRUCTION TOTAL =	**$799,566.00**
			DESIGN ENGINEERING (6%) =	$47,973.96
			CONSTRUCTION OBSERVATION (6%) =	$47,973.96
			PERMITTING =	$5,000.00
			TOTAL PROJECT COST INCLUDING ENGINEERING =	**$900,513.92**

CATEGORY	TOTAL COST
UNDERGROUND	$431,630.00
PAVING	$161,975.00
MISCELLANEOUS	$72,700.00
TOTAL =	**$666,305.00**

NOTES:
1. THIS ESTIMATE DOES NOT INCLUDE ROW ACQUISTION, TEMPORARY OR CONSTRUCTION EASEMENTS, OR RELOCATING ANY EXISTING UTILITIES.
2. PAVEMENT THICKNESS REMOVAL WAS ASSUMED TO BE 21".
3. TRENCH BACKFILL IS INCLUDED IN THE COST OF THE WATER MAIN AND SANITARY MAIN REMOVAL AND REPLACEMENT.

Berger, Brigitte

From: Cameron Krueger <YesWeCam@kruegers.com>
Sent: Tuesday, September 08, 2015 10:04 AM
To: 'Anna Beederman'; Berger, Brigitte
Cc: Wolf, Julie; Sullivan, Dan
Subject: RE: Storm Sewer Improvements

Thank you Anna. I am forward this on Brigitte Berger as well so it makes it to the official record.

Cam

From: Anna Beederman [redacted]
Sent: Tuesday, September 08, 2015 9:59 AM
To: kruegerc@wilmette.com
Cc: wolfj@wilmette.com; Sullivand@wilmette.com
Subject: Storm Sewer Improvements

We understand that a Municipal Services Committee meeting is scheduled for September 24 at which there will be a discussion/debate regarding flooding in west Wilmette (west of Ridge). Because we will not be able to attend that meeting, we are writing to voice our concern over the urgent need to find and implement a solution to this problem that causes our street to become a lake and damages so many homes after a significant rain fall.

We have reviewed the possible solutions proposed in the recent report from Christopher B. Burke Engineering Ltd. We believe that the installation of large diameter storm sewers to increase conveyance to the existing pump station is the best choice. However, regardless of the approach, we urge the Committee and the Village to take action to resolve this problem.

Thank you.

Daniel and Anna Beederman

[redacted]