VILLAGE OF WILMETTE NEIGHBORHOOD STORAGE PROJECT

November 6, 2020
• History of Flooding in West Wilmette
• Stormwater Management Plan (2013-2016)
• Village Decision on Preferred Alternative (2017-2018)
• Plan Refinement and Optimization (2019)
• Park District and School District Coordination (2019-2020)
• Underground Vault Configurations (2019)
• Execution of Phase 1 (2019-2020)
The Village of Wilmette

- Located 14 miles north of Chicago
- Established in 1872
- Population = 27,000
- Land Area = 5.4 mi²

Village of Wilmette
• A town divided......

• Separate Sewer Area
  • West of Ridge Rd
  • Service Area = 2.8 mi$^2$
  • Built-out 1930-1950
    • Prior to modern stormwater practices
Historic Drainage in West Wilmette

- West Ridge Road
  - Flat topography
  - Historically wet area
  - Ditch drainage to North Branch Chicago River

1929 USGS Quadrangle Maps

1926 Historical Aerial Map – Looking West
• **1950s Stormwater**
  
  • Undersized storm sewers
  
  • Little stormwater detention
  
  • No safe overland flow paths
When 21st century rainfall interacts with stormwater infrastructure from the 1950’s.....
Development of the Separate Storm Sewer Stormwater Management Plan 2013-2016
• April 2013 was Village storm of record for west side separate storm sewer system
• Sanitary system undergoing upgrade, inflow and infiltration tied to surcharged storm sewer system
• Village engaged CBBEL in December 2013 to develop plan
  • Extensive public outreach
  • Complete survey of storm sewer system and flow monitoring (RJN)
  • Analyze existing system and identify capacity/bottlenecks
  • Develop proposed drainage improvements and costs
Heat Map from April 2013 Flood Event

April 2013 - Flooding from street response is “Yes”
Function of Existing Storm Sewer System
Limitations of Existing Storm Sewer System

N.B. Chicago River
Floodplain Elevation = 623.5 ft

Lake Ave Stormwater Pump Station to North Branch Chicago River

Typical Roadway Elevation 622-619 ft

Distance up to ±3 miles

624 ft
614 ft
610 ft
602 ft

622 - 619 ft
Topographic Limitations of Existing System

Topographic Map of West Wilmette with Trunk Storm Sewers

Legend:
- Trunk Storm Sewer
- Elevation

- Kenilworth Gardens
- West Wilmette
- Wilshire Drive
• Calibration of models to High Water Marks
Hydrologic and Hydraulic Modeling

North Branch
Chicago River
BFE = 623.5 ft

Lake Ave Stormwater Pump
Station to North Branch
Chicago River

Pump Station
Capacity = 585 cfs
10-Year Flowrate = 290 cfs
100-Year Flowrate = 295 cfs

Separate Storm Sewer System
Capacity = 300 cfs
10-Year Flowrate = 290 cfs
100-Year Flowrate = 295 cfs

Outflow Storm Sewer
Capacity = 980 cfs
10-Year Flowrate = 290 cfs
100-Year Flowrate = 295 cfs

10-Year flood elevation
Results of Existing Conditions Analysis

- Storm sewer system has 2-year capacity
- 10-Year storm event
  - Street flooding over 2 feet in depth – 310 Structures Impacted
- 100-year storm event
  - Street flooding up to 3 feet in depth
- April 2013 storm event
  - Equivalent to a 25-year storm event
  - Street flooding over 2.5 feet in depth
- June 2014 storm event
  - Equivalent to a 5-year storm event
  - Street flooding reported

Village goal was for “dry streets” in 10-year storm event
Development of Alternatives

- Alternative 1 – New Trunk Storm Sewers

- 21,000 linear feet of trunk storm sewers
- 21,000 linear feet of lateral storm sewers
- Project cost of $75M (2014)
Development of Alternatives

• **Alternative 2 – Centralized Stormwater Storage**

- 10,000 linear feet of trunk storm sewers
- 25,000 linear feet of lateral storm sewers
- 55 acre-ft of flood storage
- Project cost of $70M (2014)
• Alternative 3 – Neighborhood Stormwater Storage

- Kenilworth Gardens: Storage at Thornwood Park
- Valley View/Hill: Storage at Community Rec Center/Hibbard Park
- Wilshire/Meadow: Storage at Centennial Park

- 2,700 linear feet of trunk storm sewers
- 11,050 linear feet of lateral storm sewers
- 32 acre-ft of flood storage
- Project cost of $44M (2014)
- Did not provide protection for all 310 structures or all roadways
Summary of Stormwater Management Plan

• Short Term Projects
  • Residential flood-proofing
  • High capacity inlets

• Green Infrastructure
  • Village owned property
  • Privately owned property
  • Ordinance requirements

• Long Term Capital Projects
  • Alternative 1 – Relief Sewer System ($75M)
  • Alternative 2 – Centralized Storage at Community Playfield ($70M)
  • Alternative 3 – Neighborhood Stormwater Storage ($44M)*

*did not provide 10-year flood protection to all residential structures
Village Decision on Preferred Alternative 2017-2018
Village Project Decision and Steps Forward

- Extensive Value Engineering Study
  - Completed by Stantec
  - Validation of projects and costs
  - Project costs range from $48M-$95M (2017 Dollars)

- Extensive Public Outreach

- April 2018 - Village Board Approves Neighborhood Storage Project (Alt 3)
  - Anticipated Project Cost of $48M-$53M (2017 Dollars)
  - Request to optimize project to improve benefits

- August 2018 – Design Contract Award
  - CBBEL/B&W Team
  - Optimization of Neighborhood Storage Project
  - Preliminary and Final Design of First Project Phases

Project Components:
PH 1A – Early Storm Sewer
PH 1 – Centennial Storage
PH 2 – Hibbard Storage
PH 3 – Thornwood Storage
• Phase 1 – Stormwater Storage at Centennial Park vs. Community Playfields?

• Community Playfields
  • Pros
    • Project Cost
    • Access
    • Permitting
    • Overburden
    • Site Constraints
  • Cons
    • Adjacent Schools
    • Construction timing
“What is the most cost-effective way to implement this project to help the most number of residents, now and into the future?”

Approximately 90 “Vulnerable Structures” remain for the 10-year event after implementation of Base Project.
• Additional Stormwater Storage at 2 Parks
• Additional Lateral Storm Sewers
• 85 of the 90 “vulnerable structures” would be benefitted
### Optimization Summary

#### Additional Project Costs May Include:
- Easement requirement for Community Playfield storm sewer connection
- Park District site amenities

<table>
<thead>
<tr>
<th>Project</th>
<th>Cost ($ Millions)</th>
<th>Vulnerable Structures Protected</th>
<th>Cost Per Structure Removed</th>
<th>Storage Required (ac-ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Base Project(^1)</td>
<td>$52.4</td>
<td>220</td>
<td>$238K</td>
<td>32.5</td>
</tr>
<tr>
<td>Scenario 1</td>
<td>$1.2</td>
<td>6</td>
<td>$200K</td>
<td>0</td>
</tr>
<tr>
<td>Scenario 2</td>
<td>$2.3</td>
<td>7</td>
<td>$329K</td>
<td>0.5</td>
</tr>
<tr>
<td>Scenario 3</td>
<td>$7.8</td>
<td>47</td>
<td>$166K</td>
<td>6.6</td>
</tr>
<tr>
<td>Scenario 4</td>
<td>$4.5</td>
<td>25</td>
<td>$180K</td>
<td>2.9</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>$68.2</strong></td>
<td><strong>305</strong></td>
<td><strong>$224K</strong></td>
<td><strong>42.5</strong></td>
</tr>
</tbody>
</table>

\(^1\)Assumes Phase 1 Storage at Community Playfields

\(^2\)Base structures removed is based on the 2017 Stantec vulnerable for the 10-year event (310)
## Comparison to Previous Alternatives

<table>
<thead>
<tr>
<th>Project</th>
<th>Cost ($ Millions)</th>
<th>Vulnerable Structures Protected</th>
<th>Reduction in Vulnerable Structures</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 CBBEL Alternative 1 - Relief Sewer (Stantec Estimate)</td>
<td>82.5 - 98.0</td>
<td>295</td>
<td>95%</td>
</tr>
<tr>
<td>2 Stantec Alternative 2 - Reduced Relief Sewer + Thornwood (Stantec Estimate)</td>
<td>72.2 - 82.5</td>
<td>253</td>
<td>81%</td>
</tr>
<tr>
<td>4 CBBEL Alternative 3 - Base</td>
<td>52.4</td>
<td>220</td>
<td>71%</td>
</tr>
<tr>
<td>4 CBBEL Alternative 3 - Optimized</td>
<td>68.2</td>
<td>305</td>
<td>98%</td>
</tr>
</tbody>
</table>

1. Cost estimates are based on 2018 dollars.
2. Structures protected is based on the 2017 Stantec vulnerable structures for 10-year storm event (311).
3. Stantec estimates have been escalated from 2017 dollars to 2018 dollars using 3.2% for inflation for comparison.
4. Cost estimates for Alternative 3 assume underground storage is located at Community Playfield.
Park District and School District Coordination
2019-2020
### Community Playfield

<table>
<thead>
<tr>
<th></th>
<th>Original Configuration</th>
<th>Alt. Configuration 1</th>
<th>Alt. Configuration 2</th>
<th>Alt. Configuration 3</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Overview map</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Original Configuration</strong></td>
<td>$7,430,000</td>
<td>$6,280,000 ($1,150,000↓)</td>
<td>$6,340,000 ($1,090,000↓)</td>
<td>$7,180,000 ($250,000↓)</td>
</tr>
<tr>
<td><strong>Gravity Outlet</strong></td>
<td>Gravity Outlet</td>
<td>Gravity &amp; Pumped Outlet</td>
<td>Gravity &amp; Pumped Outlet</td>
<td>Gravity &amp; Pumped Outlet</td>
</tr>
<tr>
<td><strong>2.0 Acre footprint</strong></td>
<td>2.0 Acre footprint</td>
<td>1.0 Acre footprint</td>
<td>1.0 Acre footprint</td>
<td>0.8 Acre footprint</td>
</tr>
<tr>
<td><strong>6 feet Tall (underground)</strong></td>
<td>6 feet Tall (underground)</td>
<td>11’-4” Tall (underground)</td>
<td>11’-4” Tall (underground)</td>
<td>15 feet Tall (underground)</td>
</tr>
<tr>
<td><strong>Removal of 36 trees</strong></td>
<td>Removal of 36 trees</td>
<td>Removal of 8 trees on east side</td>
<td>Removal of 8 trees on west side</td>
<td>Removal of 2 trees on west side</td>
</tr>
<tr>
<td><strong>Temp. disrupts 2 baseball fields</strong></td>
<td>Temp. disrupts 2 baseball fields</td>
<td>Temp. disrupts 1 baseball field</td>
<td>Temp. disrupts 1 baseball field</td>
<td>Temp. disrupts 1 baseball field</td>
</tr>
</tbody>
</table>
Worked with Park District Architect to determine future build-out potential
## Hibbard Park

<table>
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<th>Alt. Configuration 1</th>
<th>Alt. Configuration 2</th>
<th>Alt. Configuration 3</th>
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<tr>
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<tr>
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<td>Alt. Configuration 1</td>
<td>Alt. Configuration 2</td>
<td></td>
</tr>
<tr>
<td>------------------------</td>
<td>----------------------</td>
<td>----------------------</td>
<td></td>
</tr>
<tr>
<td>$8,610,000</td>
<td>$8,810,000 ($200,000)</td>
<td>$7,060,000 ($1,550,000↓)</td>
<td></td>
</tr>
<tr>
<td>Gravity Outlet</td>
<td>Gravity Outlet</td>
<td>Gravity &amp; Pumped Outlet</td>
<td></td>
</tr>
<tr>
<td>3.0 Acre footprint</td>
<td>3.0 Acre footprint</td>
<td>1.4 Acre footprint</td>
<td></td>
</tr>
<tr>
<td>6 feet Tall (underground)</td>
<td>6 feet Tall (underground)</td>
<td>11’-4” Tall (underground)</td>
<td></td>
</tr>
<tr>
<td>Removal of 53 trees</td>
<td>Removal of 60 trees</td>
<td>Removal of 3 trees</td>
<td></td>
</tr>
<tr>
<td>Impacts Oak grove</td>
<td>Preserves Oak grove</td>
<td>Preserves Oak grove</td>
<td></td>
</tr>
<tr>
<td>Temp impact of 2 baseball fields</td>
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</table>
Phase 1 – Community Playfields

[Map showing community playfields with various markings]
Phase 1 Community Playfield

32 Trees Removed
SAVE THE COTTONWOODS!
Phase 1 Community Playfield

STORAGE VOLUME: 18.6 AC-FT
DEPTH: NORTH = 7.0', SOUTH 6.0'
EXCAVATION FOOTPRINT: 3.53 AC

NOTE:
STAGING AREAS TO BE USED FOR TEMPORARY CONSTRUCTION ACTIVITIES INCLUDING STORAGE OF EQUIPMENT, STOCKPILE TOPSOIL, AND EXCAVATED MATERIAL, AND STORAGE OF VAULT COMPONENTS PRIOR TO INSTALLATION.

THE VILLAGE OF WILMETTE ENDEAVORS TO PROTECT AS MANY TREES AS POSSIBLE. HOWEVER, ADDITIONAL TREES MAY BE IDENTIFIED FOR REMOVAL DURING THE FINAL DESIGN. ALL EXISTING TREES TO REMAIN IN PLACE WILL BE PROTECTED DURING CONSTRUCTION. THE VILLAGE...
Phase 1 Community Playfield

School District IGA
- Parking Lot Improvements
- New School Sign
- Temporary A/C
- Point-to-Point WiFi
- Intersection Pedestrian Improvements
- Restricted Construction Access

Park District IGA
- Set Dollar Value
  - Drainage Improvements
  - Irrigation
  - Restroom
  - Other Improvements

Private Property Easement
Limited Site Access

HIGHCREST MIDDLE SCHOOL FULL ACCESS – JUNE 12, 2020 TO AUGUST 15, 2020
VILLAGE OF WILMETTE, ILLINOIS
COVID-19!

- Virtual Construction meetings
- Virtual Public Meetings
- Produced Project Videos
- Construction Health and Safety plan
- Construction Production plan
- Early Full Access to Community Playfield (silver lining)
• Public Open House
• Pre-construction mailing with detailed information
• Door hangers handed out by Resident Engineer
• Residents will have cell phone number of onsite Stakeholder Liaison
• Project website updated regularly
• Monthly paper newsletter
• Hand-delivered notices as needed
• Video Public Service Announcements
• Streaming Progress Videos
• Drone flyovers to document progress

NEIGHBORHOOD STORMWATER STORAGE IMPROVEMENT PROJECT: PHASE I

CONSTRUCTION UPDATE
Over the last several months, the engineering team hired by the Village has been finalizing the design of the Community Playfield underground storage vault, site drainage improvements, and new storm sewers. The project is anticipated to be out to bid in January 2020.

The majority of the vault installation will occur during the eight weeks of summer recess. This aggressive schedule means that the contractor may have to work longer days and weekends.

The Village will establish truck routes for the project that will generally limit impacts to major roads, such as Lake Avenue, Hildreth Road, and Birchwood Road. Primary access to the Playfield will be through the Highland Middle School parking lot during the summer recess. If construction runs longer than the summer recess, a secondary access point will be necessary through Birchwood Avenue.

WHAT WILL COMMUNITY PLAYFIELD LOOK LIKE WHEN THE PROJECT IS COMPLETED?
Since the vault will be completely underground, Community Playfield will look like it does today when construction is over. In addition to providing significant flood relief, the project will also resolve the major drainage problems within the southwest quadrant of the park, thereby reducing standing water and making the park more usable throughout the year.

WHAT AREAS OF COMMUNITY PLAYFIELD WILL BE IMPACTED AND WHEN WILL THE PARK REOPEN?

Only the southeastern portion of the park (highlighted on the map to the right) will be under construction from April 2020 through November 2020. The area cleared by construction will be restored with sod in the fall of 2020. Since the new sod requires time to establish roots, it is anticipated that the entire playfield will be open for the public to enjoy in the spring of 2021.
Vault Construction

STRIPPING OF TOPSOIL IN PREPARATION FOR EXCAVATION

EXCAVATION FOR DETENTION VAULT

PREPARING BASE FOR DETENTION VAULT

PREPARING BASE FOR DETENTION VAULT
Excavation:
- 1,630,000 CF
- ~6,000 truck loads
- 200+ trucks/day

StormTrap:
- 25+ trucks/day
- Second largest vault by volume in IL
- Vault with most pieces ever
- 20.2 ACFT -> 6.5M Gal
  -> 10 Olympic Swimming Pools

StormTrap Pre-order = ~$5M
Berger Excavating = ~$12M
TOTAL = ~$17M