

# NICHOLAS DOWDEN PARK

## FLOOD CONTROL PROJECT



### PRESENTERS:

**Jeff Cooper, PE, CPESC**  
Village Engineer /  
Village of Libertyville

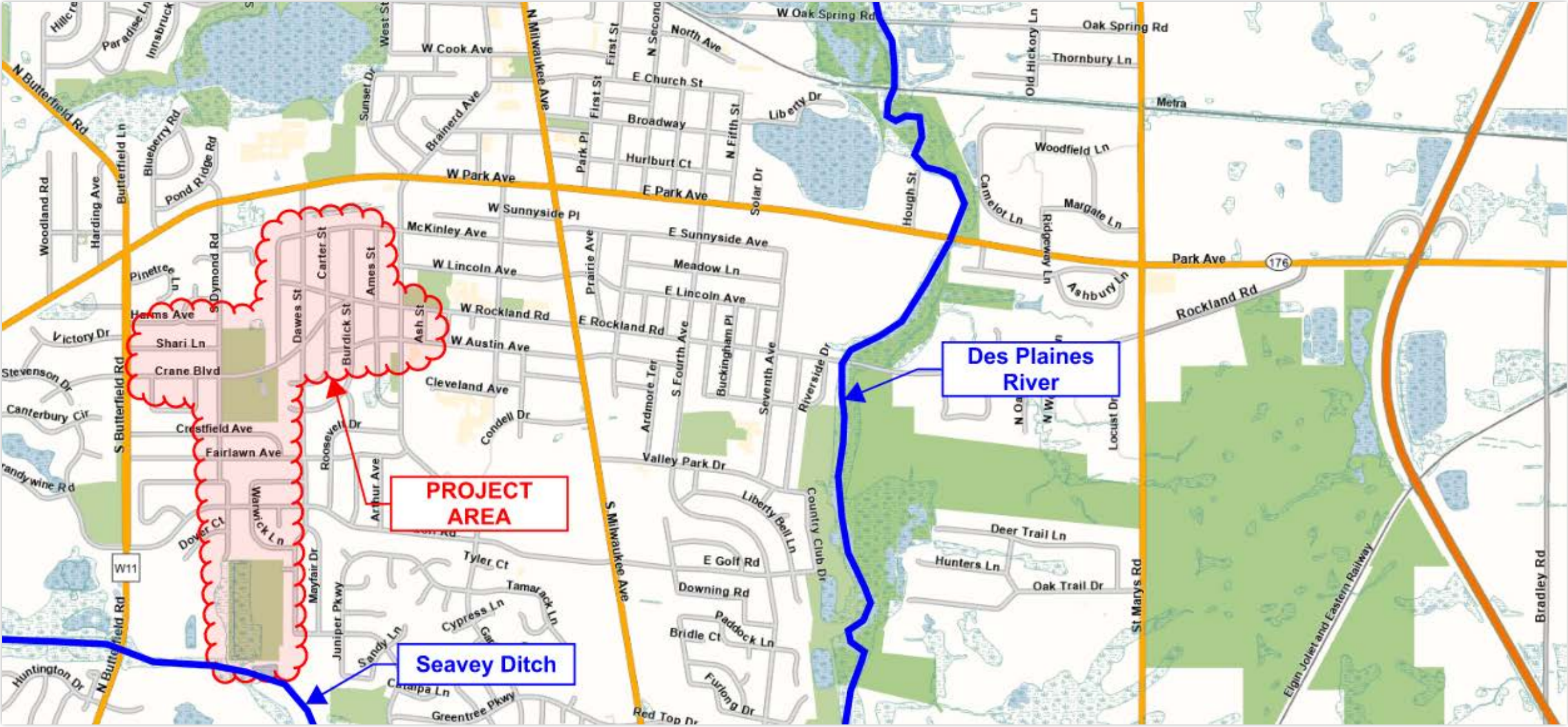
**Paul Kendzior, PE, CFM**  
Director of Public Works /  
Village of Libertyville

**Dave Buckley, PE, CFM, CPSWQ**  
Senior Water Resources  
Project Manager /  
Christopher B. Burke  
Engineering, Ltd.

# **Project Highlights**

- **550-Acre Watershed**
- **+/- 500 Residential Properties Impacted**
- **Drainage Studies Dating Back to 2014**
- **\$ 17 Million Invested To Date Over 4 Separate Construction Projects**
- **\$ 4.9 Million of DCEO Grants Secured**

# Project Area Background - General Location



# Project Area Background - General Drainage



# Project Area Background - 1939 Aerial



(Future)  
Nicholas Dowden Park

# Project Area Background - 1961 Aerial

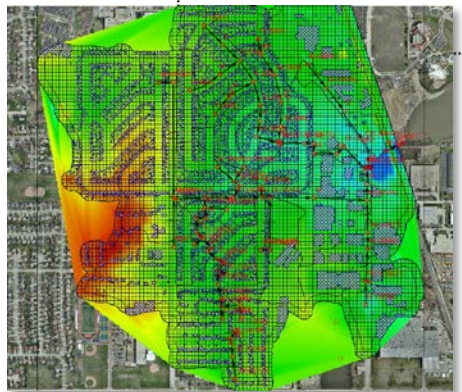
**30 years prior to  
stormwater regulations!**



# NICHOLAS DOWDEN PARK FLOOD CONTROL PROJECT

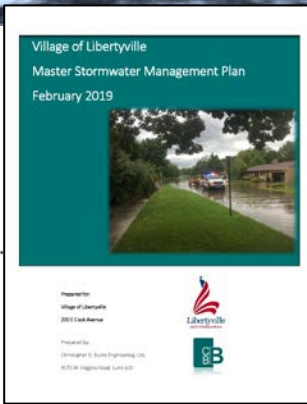
2014

CBBEL Burdick Street Drainage Study

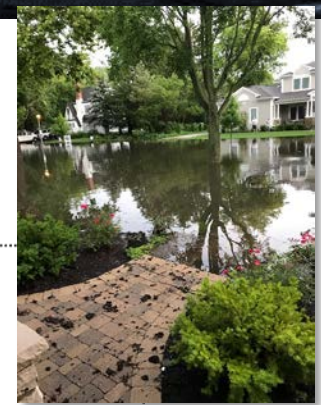


2017

CBBEL contracted for Master Stormwater Management Plan



July Storm Event



October Public Open House

2018



Charles Brown Reservoir Rehabilitation

Dowden Park Supplemental Storm Sewer

2019

Village establishment of a Stormwater Utility Fee

CBBEL contracted for design of Nicholas Dowden Flood Reduction project



Approval received for DCEO grants in the amount of \$4.9M through Lake County SMC

Commencement of Construction

2020

2021

2022

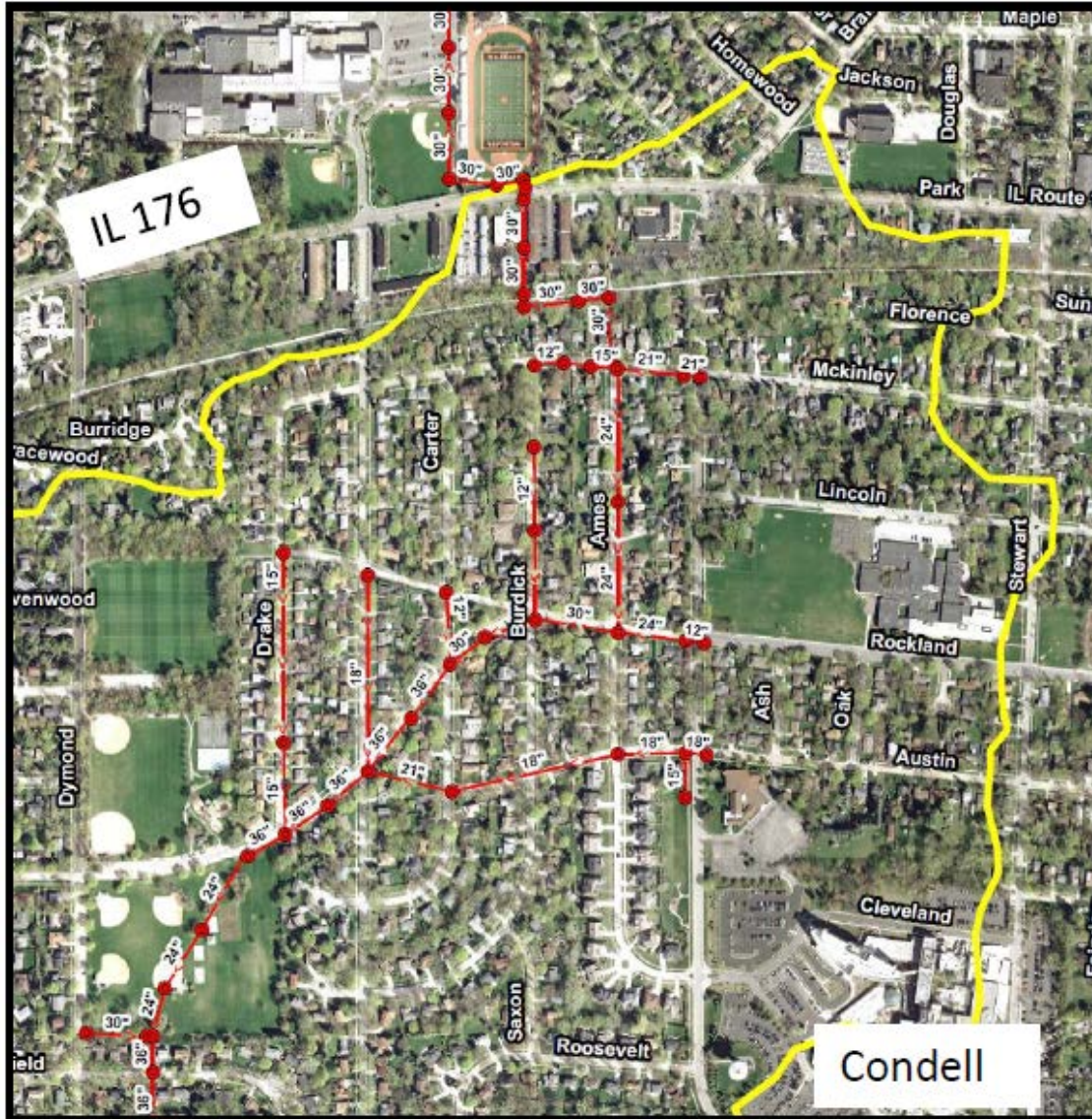


Completion of Construction

2023



# 2014 Burdick Street Drainage Study



## PURPOSE

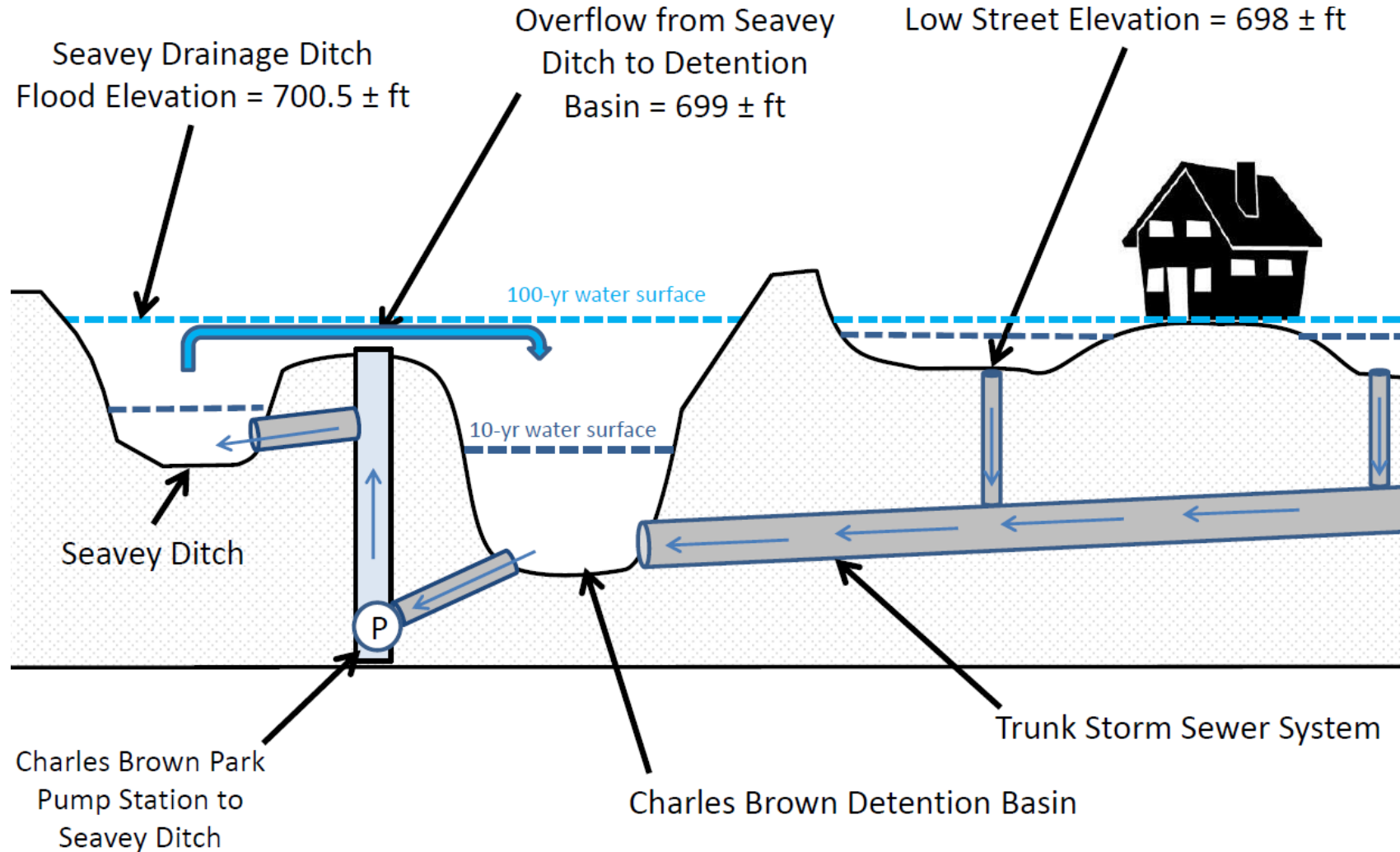
- Investigate frequent flooding of:
  - Burdick Street
  - Ames Street
  - Drake Street
  - Crane Boulevard
  - Nicholas Dowden Park
- Identify Potential Improvements



# 2014 Burdick Street Drainage Study

## FINDINGS

- **Undersized storm sewer system**
- **Insufficient overland flow paths**
- **Limited stormwater storage**
- **100-year flood elevation of 701.1'**
  - **Not Shown on FIRM as SFHA**
- **Low ground elevation in residential areas when compared to drainage outlet locations**
- **10-year rainfall event = 26 homes affected**
- **100-year rainfall event = 110 homes affected**
  - **Seavey Ditch is 1.25 miles away, with lift station (10 ft)**



# 2014 Burdick Street Drainage Study

## POTENTIAL IMPROVEMENTS

### **ALTERNATIVE #1**

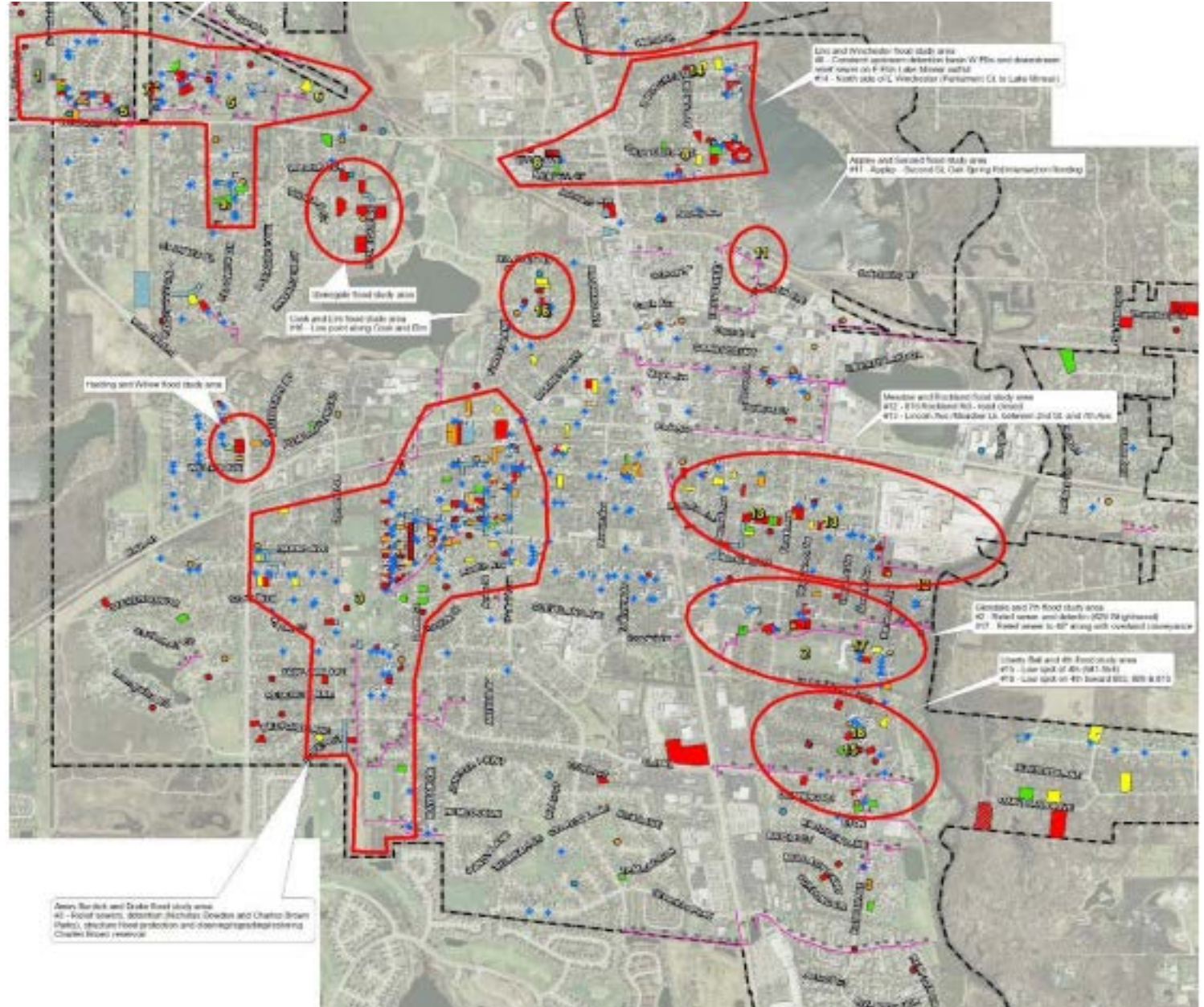
- Relief storm sewers along impacted roadways
- 10.8 acre-ft of storage at Dowden Park
- 64 homes still affected during 100-year events
- Street flooding reduced by 6 inches
- **Cost = \$4.9M**

### **ALTERNATIVE #2**

- Relief storm sewers along impacted roadways
- 10.8 acre-ft of storage at Dowden Park
- Berm at Charles Brown Park along Seavey Ditch
- 40 acre-ft of off-site flood storage required along Seavey Ditch
- 6 homes still affected during 100-year events
- Street flooding reduced by 24 inches
- **Cost = \$19.6M**

## Master Stormwater Plan (Commencement in 2017)

- Winchester / Interlaken / Stonegate – Areas (1,5,6,7,9,10) north of Winchester Road between Butterfield Road extending east to Bull Creek. Also included with this area are the following areas south of Winchester Road:
  - Sherborne Court
  - Wellington Avenue
  - Interlaken Lane
  - Stonegate Road
  - Wilshire Drive
- Copeland Manor – Areas (2&17) including Glendale Road:
  - 7<sup>th</sup> Avenue
  - 4<sup>th</sup> Avenue
- Burdick & Ames – Area (3) including Highlands Subdivision:
  - Dymond Road, Shari Lane, Crane Boulevard, Burdick Street, Ames Street, Drake Street, Dawes Street, Carter Street (Etc.)
  - Charles Brown Park
- Ellis East and West Avenue – Areas (8&14) including:
  - Sandstone Drive
  - \*East Winchester (Parliament Court to Lake Minear)
- Appley – Area (11) including 2<sup>nd</sup> Street and Oak Spring Road
- Rockland – Areas (12&13) including:
  - 2<sup>nd</sup> Avenue extending east to the Des Plaines River
  - Windsor Terrace, Meadow Lane, 7<sup>th</sup> Avenue, Riverside Drive
- Liberty Bell and 4<sup>th</sup> Avenue – Areas (15&18)
- Lange and Cook – Area (16) including Elm Drive
- Carriage Hill
- Harding and Willow – Area west of Butterfield Road and north of IL-176



## July 2017 Storm Event

7.0" of rainfall  
in 12 hour period



### 48 Hour Observed Precipitation

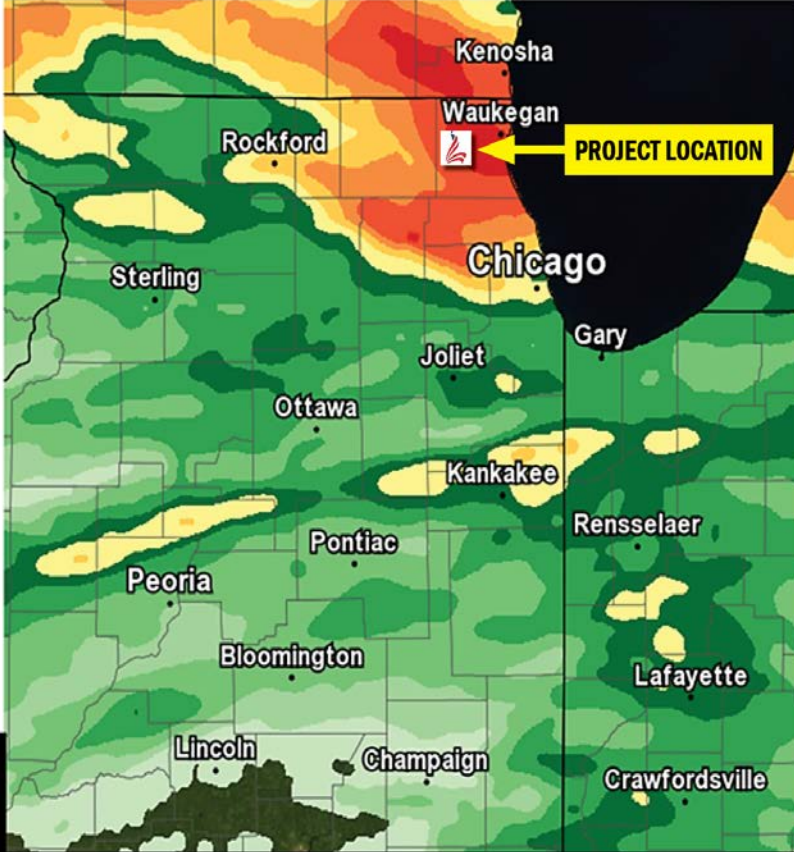
National Weather Service

Valid Ending Thursday July 13th, 2017 at 1 PM CDT

- Up to 0.1 inch
- 0.1 to 0.25 inches
- 0.25 to 0.5 inches
- 0.5 to 1.0 inches
- 1.0 to 1.5 inches
- 1.5 to 2.0 inches
- 2.0 to 3.0 inches
- 3.0 to 4.0 inches
- 4.0 to 6.0 inches
- 6.0 to 8.0 inches

#### Highest Amounts

- Illinois**
- Elgin: 7.31"
- Gurnee: 7.22"
- Lake Villa: 7.11"
- Lake Bluff: 6.69"
- Lake Forest: 6.46"
- Waukegan: 5.53"
- Mundelein: 5.49"
- Fox Lake: 5.15"
- Carpentersville: 5.00"
- Mundelein: 4.78"
- Riverwoods: 4.70"
- Wadsworth: 4.60"
- Gilberts: 4.60"



# October 2017 Open House




# Master Stormwater Plan (Adoption in 2019)


Flood Study Area	Engineer's Estimate of Probable Cost (2018 Dollars)
Burdick and Ames	\$7.6M
Rockland Road	\$7.3M
Winchester/Interlaken/Stonegate	\$12.1M
Copeland Manor	\$6.5M
Ellis Avenue	\$5.2M
Appley Avenue	\$800K
Liberty Bell Lane and 4 <sup>th</sup> Avenue	\$4.4M
Harding and Willow	\$15K
Carriage Hill	\$915K
Lange and Cook	\$706K
TOTAL	\$45.5M

- **50-year level of protection originally contemplated in Plan**
- **Later optimized to provide ~ 100-year level of protection**


Village of Libertyville  
Master Stormwater Management Plan  
February 2019



Prepared for:  
Village of Libertyville  
200 E Cook Avenue



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



# Stormwater Utility Fee

**Bi-Monthly Fee** = (ERU x Fee) + (IDF x Fee)

## ERU = Equivalent Residential Unit

- Impervious area of each parcel as a multiple of the average residential parcel

## IDF = Intensity of Development Factor

- Based on percentage of impervious area relative to parcel's total area

**Fee = \$13.00 at time of adoption**

**Approximately \$26.00 Bi-Monthly for Average Residential Parcel**

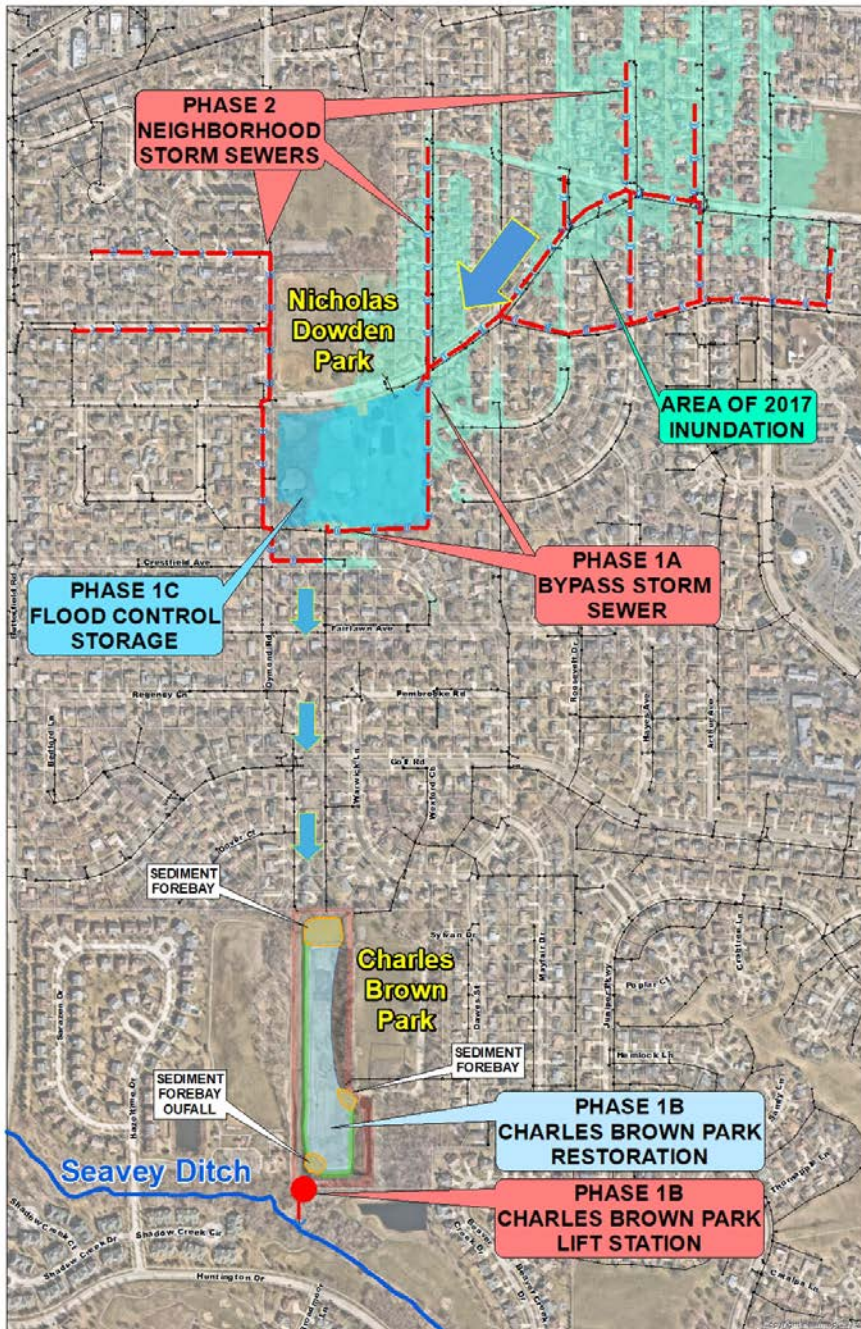


IDF Classification	% Impervious	IDF
Vacant	0%	0.2
Light Development	1% - 20%	0.5
Medium Development	21% - 40%	1.0
Heavy Development	41% - 70%	1.5
Very Heavy Development	>70%	2.0

Classification	Parcels	Total Area (ft <sup>2</sup> )	Pervious Area (ft <sup>2</sup> )	Impervious Area (ft <sup>2</sup> )
Single-Family Residential	5,432	84,016,413	61,060,511	22,955,902
Multi-Family Residential	1,766	12,739,474	8,412,811	4,326,663
Commercial	756	31,105,212	13,856,275	17,248,937
Industrial	202	26,237,323	13,073,851	13,163,472
Village Property	178	33,046,337	30,578,960	2,467,378
Tax Exempt	100	10,524,156	7,928,581	2,595,575
Apartments	31	776,092	310,939	465,153
Lake County Forest Preserve	16	3,708,399	3,695,403	12,995
Lake County	9	565,657	545,882	19,775
State of Illinois	6	432,306	373,716	58,590
Water	9	4,529,230	4,465,891	63,339
Railroad	5	708,687	657,180	51,507
Agriculture	6	8,895,493	7,473,782	1,421,712
<b>Totals</b>	<b>8,516</b>	<b>217,284,778</b>	<b>152,433,781</b>	<b>64,850,998</b>

## Funding is Addressed Constuction Begins

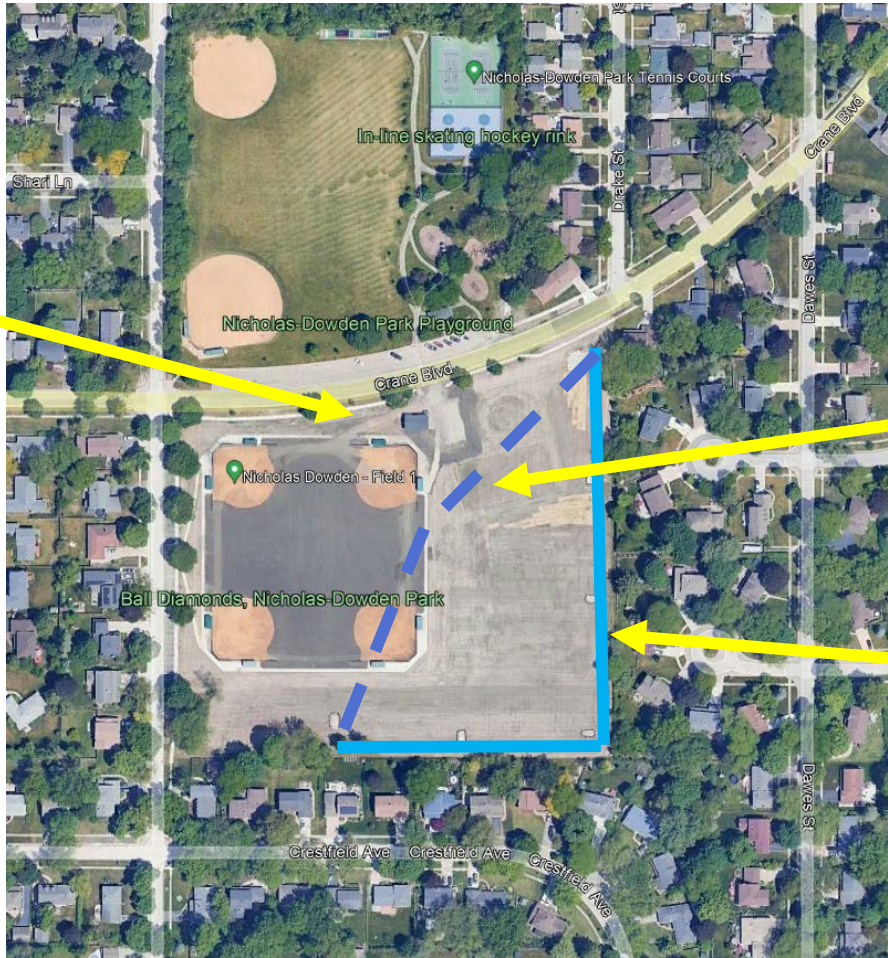
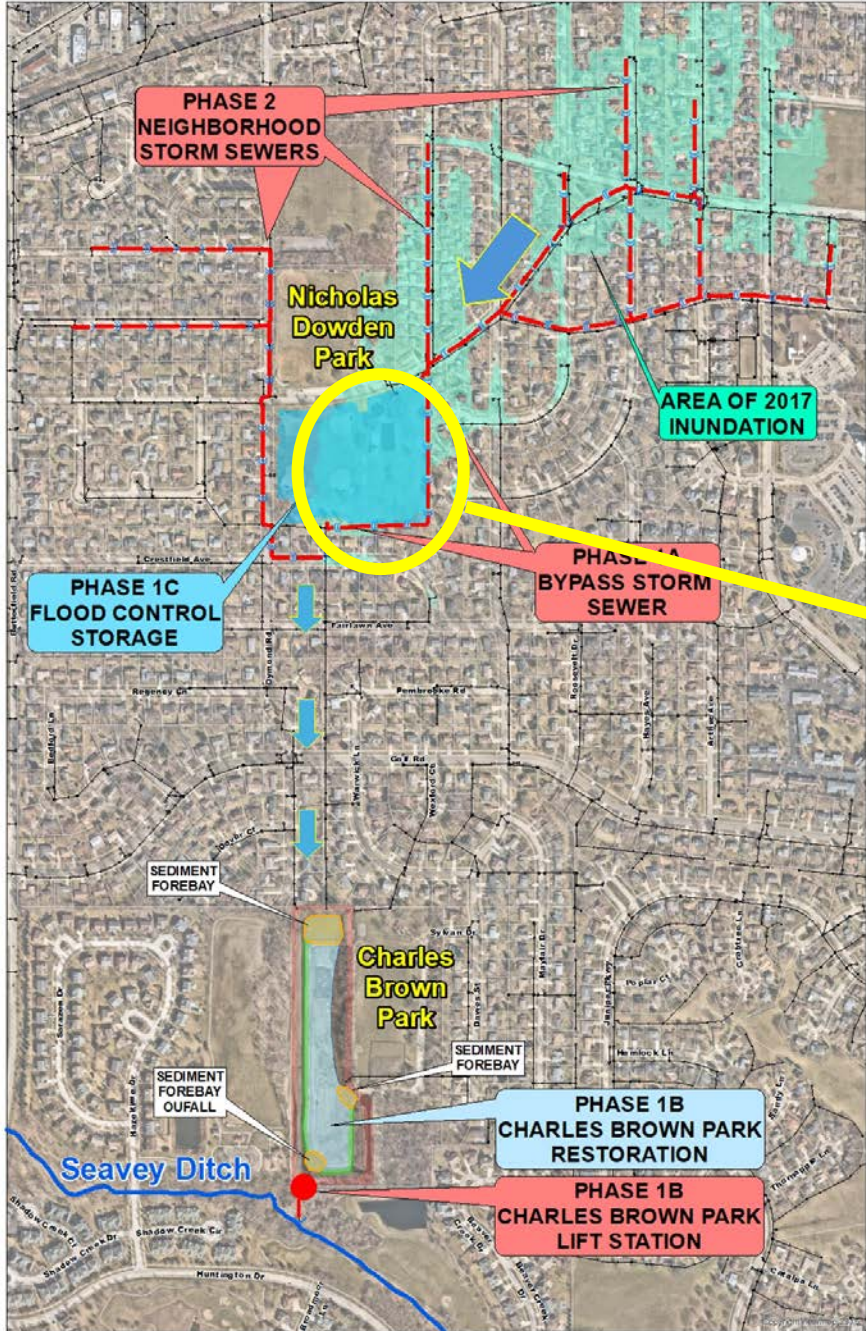
- One of the largest capital improvement projects in village history.
  - Over \$17 M
- 4 Phases over 6 years
  - Phase 1A – South Nicholas Dowden Park (2018)
    - Supplemental Storm Sewer
  - Phase 1B – Charles Brown Park (2019)
    - Restoration and Lift Station
  - Phase 1C – South Nicholas Dowden Park (2022)
    - Flood Storage
  - Phase 2 – Neighborhood (2023)
    - Storm Sewer Installation





# NICHOLAS DOWDEN PARK FLOOD CONTROL PROJECT

## Phase 1A - 2018 South Nicholas Dowden Park Supplemental Storm Sewer



Existing 24-inch clay drain

48-inch RCP

# Phase 1A - 2018

## South Nicholas Dowden Park Supplemental Storm Sewer



# **Phase 1A - 2018**

## **South Nicholas Dowden Park**

### **Supplemental Storm Sewer**

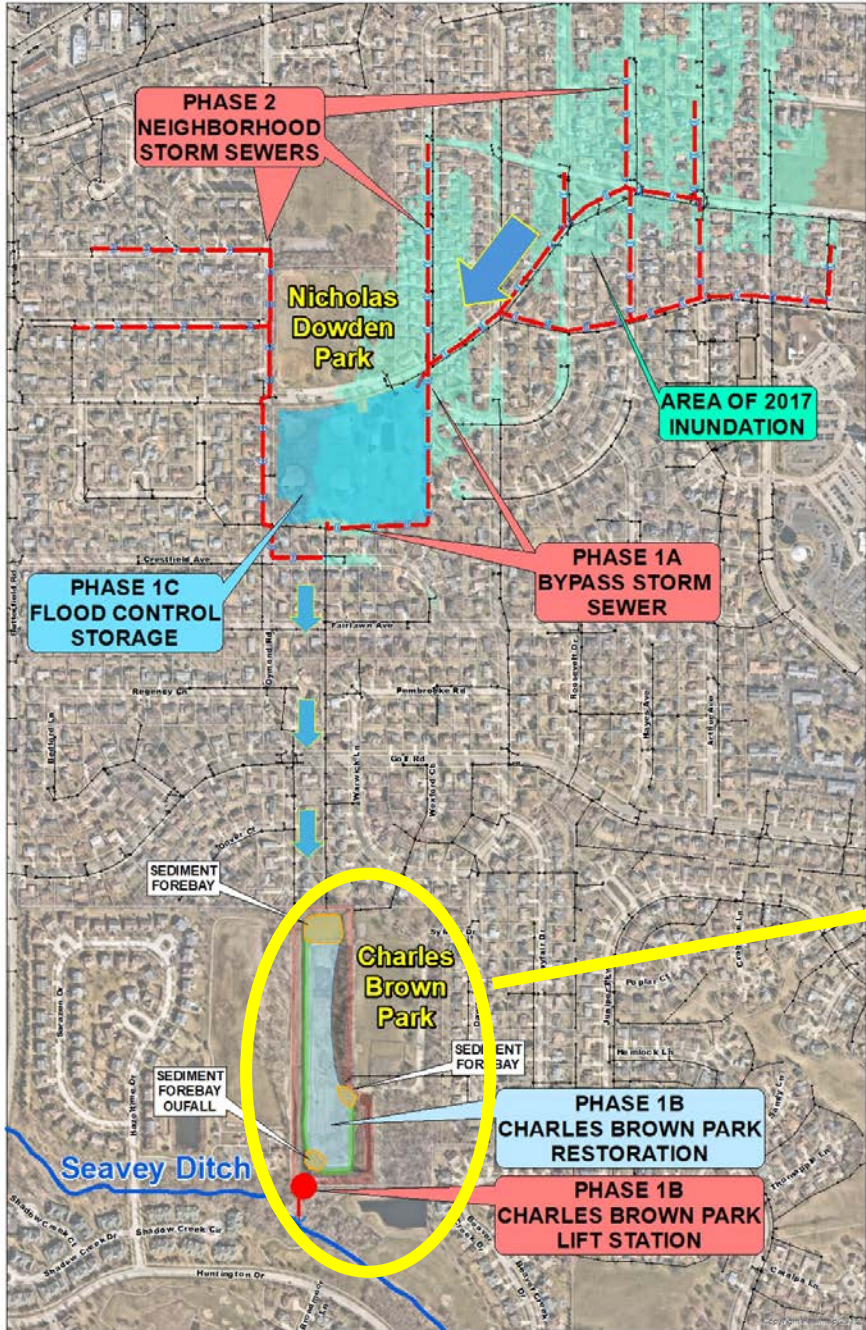


## **Phase 1A – 2018**

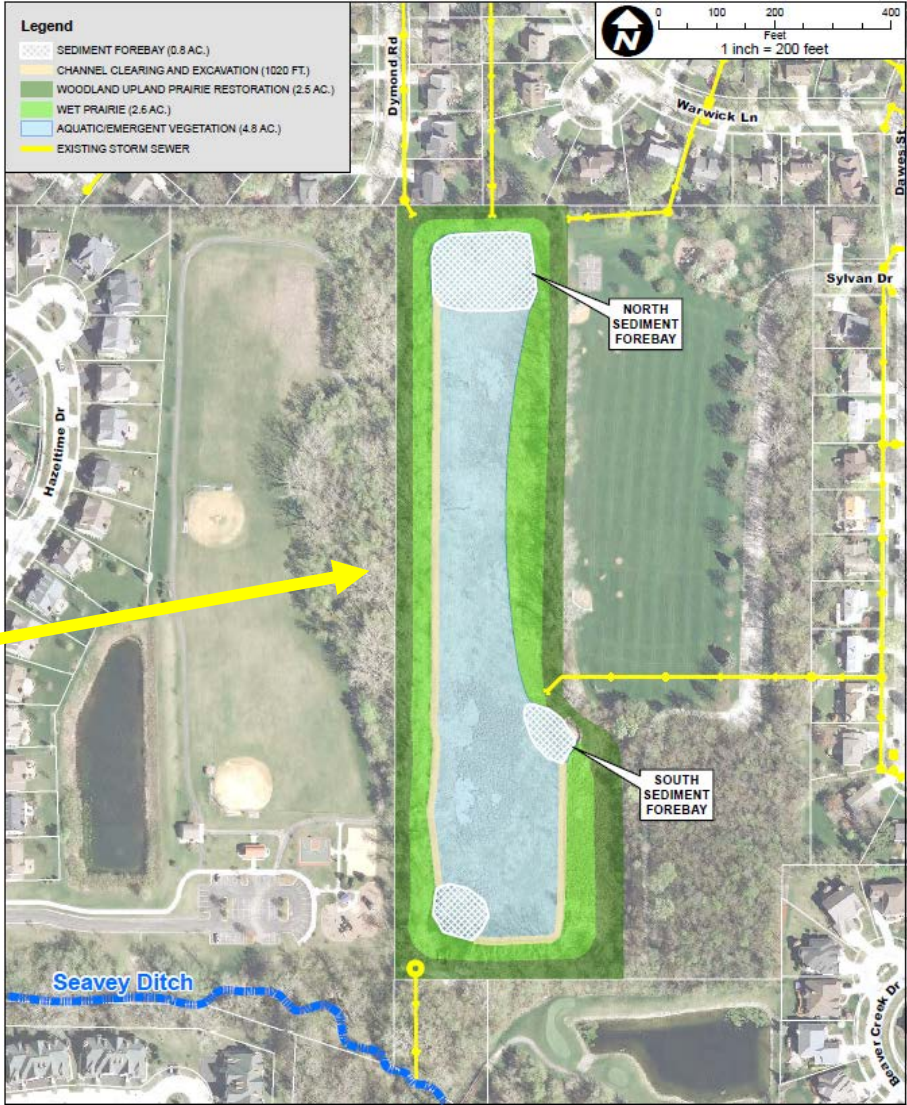
### **South Nicholas Dowden Park Supplemental Storm Sewer**

- **Project included the installation of 1,220 LF of 48-inch storm sewer pipe along the perimeter of the south park site to eliminate an existing constriction in the conveyance system.**
- **Provided relief for 10 Structures**
- **Sewer alignment was designed to serve as the outfall for the future contemplated detention basin.**
- **Final construction cost was approximately \$300,000 and Campanella & Sons, Inc. was the contractor.**
- **Project received \$40,000 in reimbursement funding from the LCSMC.**

# NICHOLAS DOWDEN PARK FLOOD CONTROL PROJECT



# Phase 1B - 2019 Charles Brown Park Rehabilitation & Lift Station



# Phase 1B – 2019

## Charles Brown Park Rehabilitation



**10,500 cubic yards of sludge removed**

# Phase 1B - 2019

## Charles Brown Park Rehabilitation



**As a BMP and educational feature this project created:**

- **2.5 acres of woodland upland prairie**
- **2.6 acres of wet prairie**
- **4.8 acres aquatic/emergent vegetation**

# Phase 1B - 2019

## Charles Brown Park Lift Station





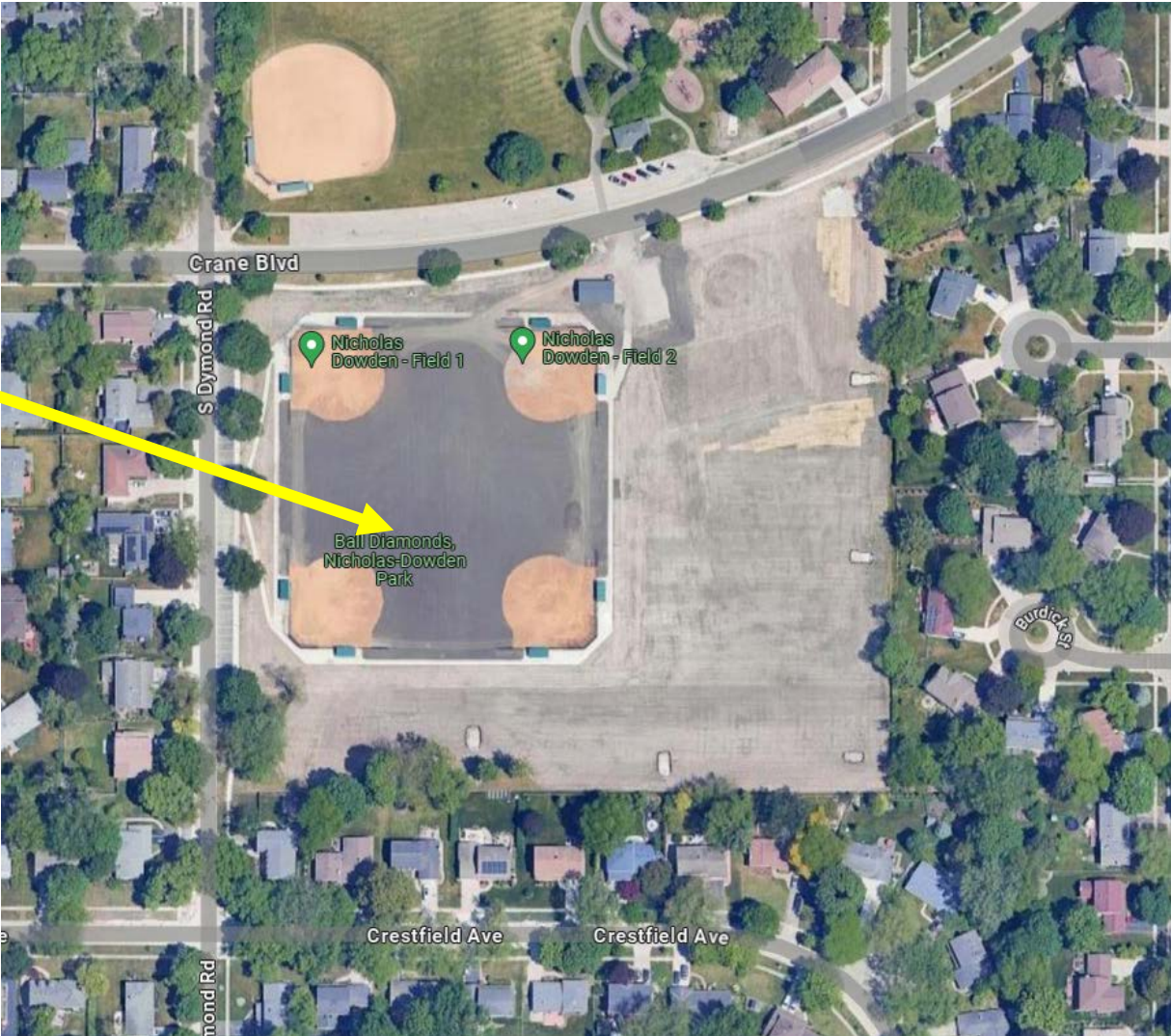
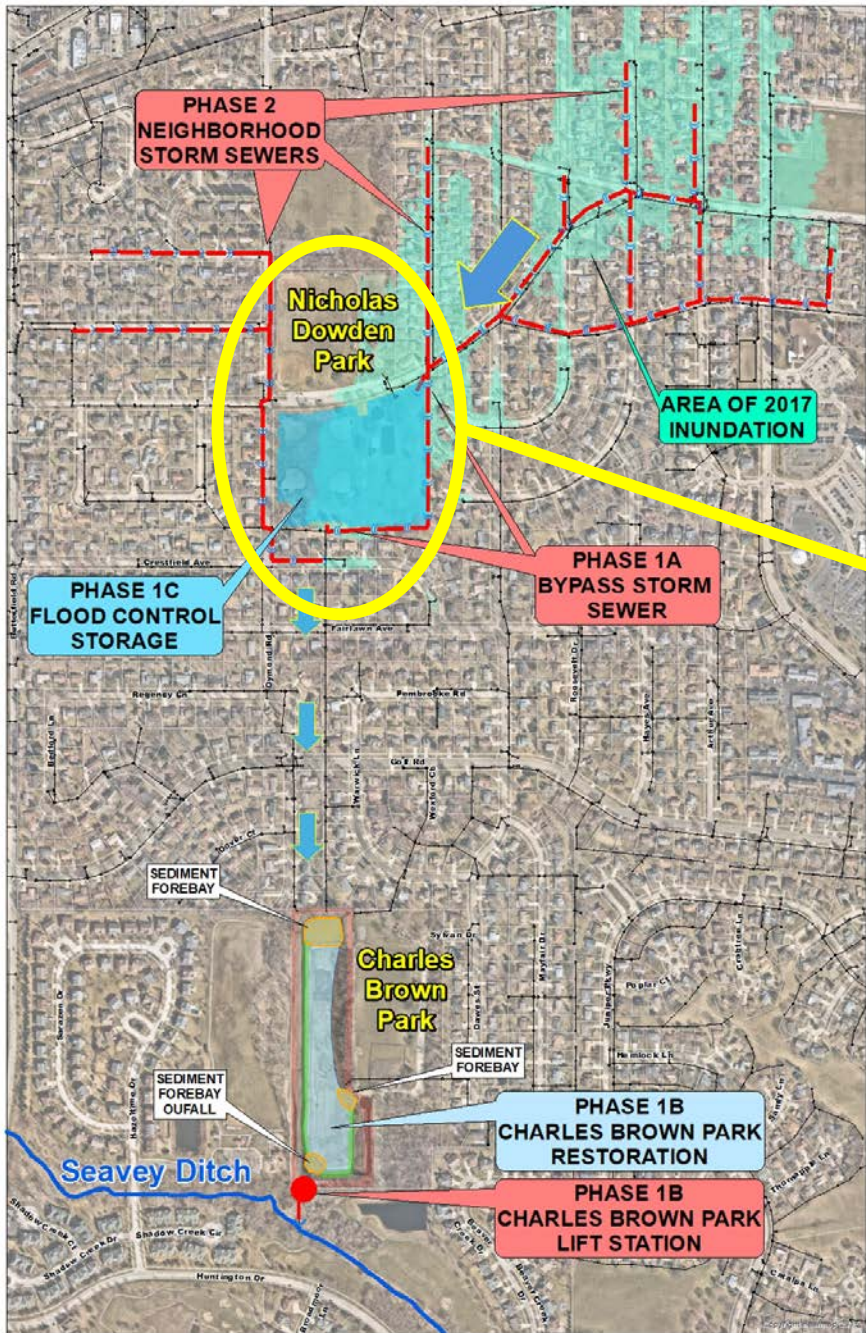
# **Phase 1B - 2019**

## **Charles Brown Park Rehabilitation & Lift Station**

- **Project started in fall of 2019 and was substantially completed in late 2020.**
- **Contractor was Earthwerks and final construction amount was \$1,660,000.**
- **Existing basin volume was increased from 74 ac-ft to 84 ac-ft with native plantings being established.**
- **Four inlet sewers and the outfall sewer were all rebuilt.**
- **Project received a \$135,000 IEPA 319 Grant.**
- **Existing pumping station consisting of three 30HP high-flow pumps and one 5HP low-pump was also replaced and modernized.**

# NICHOLAS DOWDEN PARK FLOOD CONTROL PROJECT

## Phase 1C - 2022 South Nicholas Dowden Park Flood Storage



# Phase 1C – 2022 – South Nicholas Dowden Park Flood Storage

Flood storage **design process** began in 2019 following adoption of the 2017 stormwater master plan.

Storage in the park was originally contemplated for the 50-year design event.

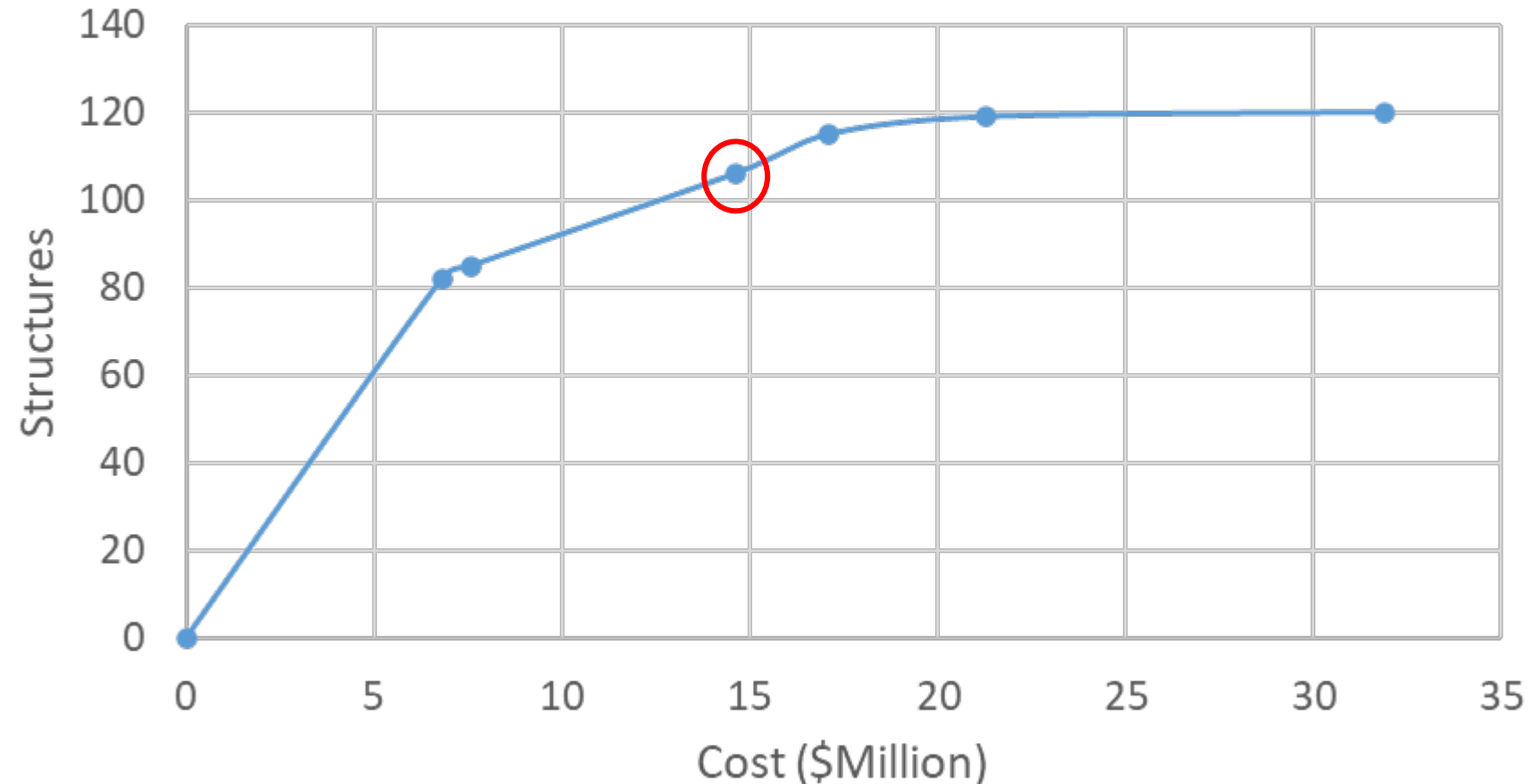
## Alternatives

Alternative	Level of Flood Protection	Dowden Park Storage Provided (acre-ft)	100-Year Water Depth in Street (ft)	Structures Protected in 100-Year Event	Construction Cost
Existing Conditions	2-year	0	3.1	0 of 121	N/A
1	25-year	12.5	2.4	82 of 121	\$6.8M
1A	50-Year	18	2.2	<b>85 of 121</b>	\$7.6M
1B	>50-Year	27	1.6	106 of 121	\$14.6M
1C	>50-Year	34	1.2	115 of 121	\$17.1M
2	100-Year	40	0.7	119 of 121	\$21.3M
3	July 2017	59	0.0	120 of 121	\$31.9

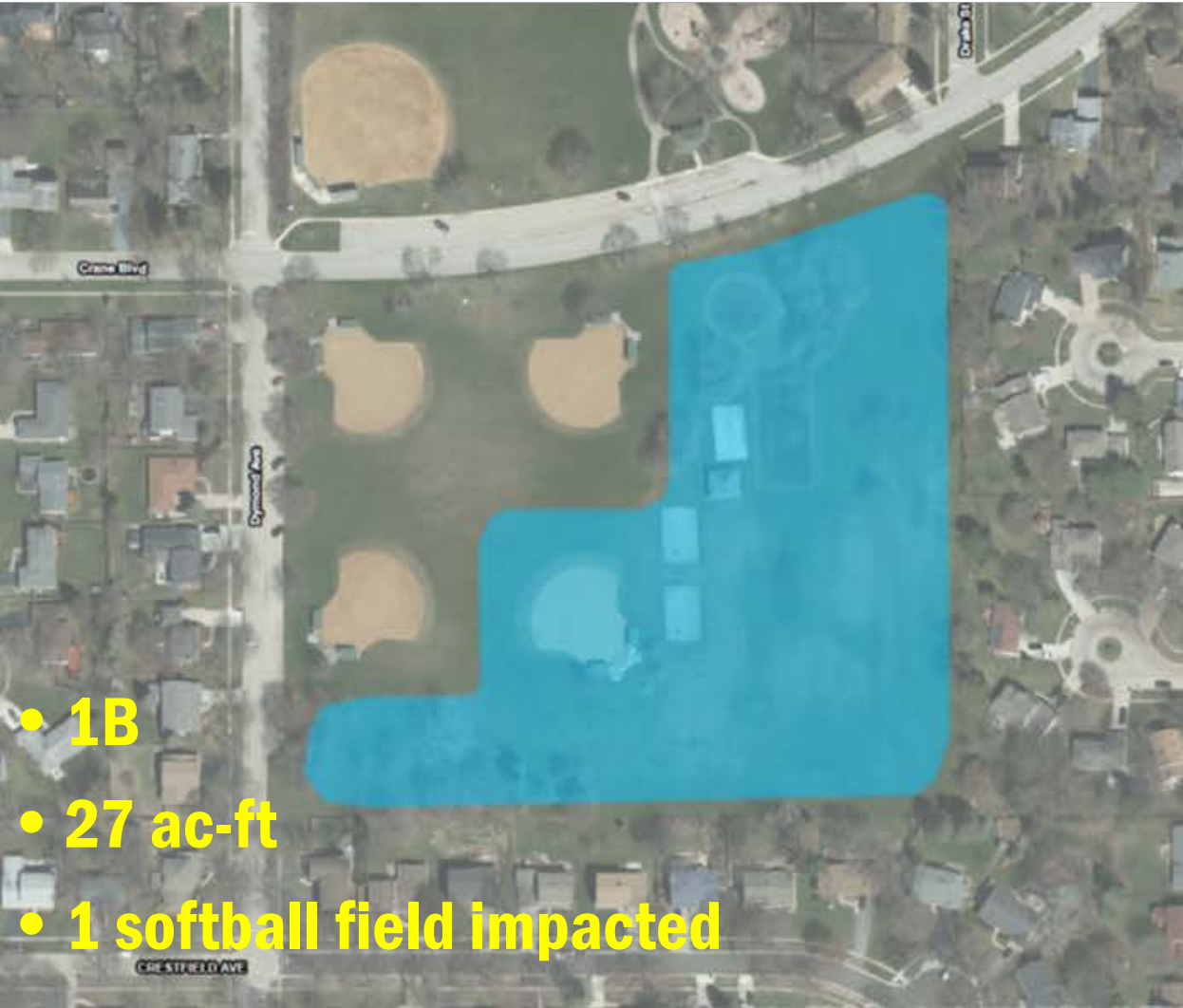
# Phase 1C – 2022 – South Nicholas Dowden Park Flood Storage

- **Public COW Meetings**
- **Public Info Meetings**
- **Iterations / Cost Options**
  - Inundation areas remapped for each
- **Option 1B --> 27 ac-ft**
  - 106 of 121
  - Vulnerable structures remaining (36)
  - LAG Analysis (7)

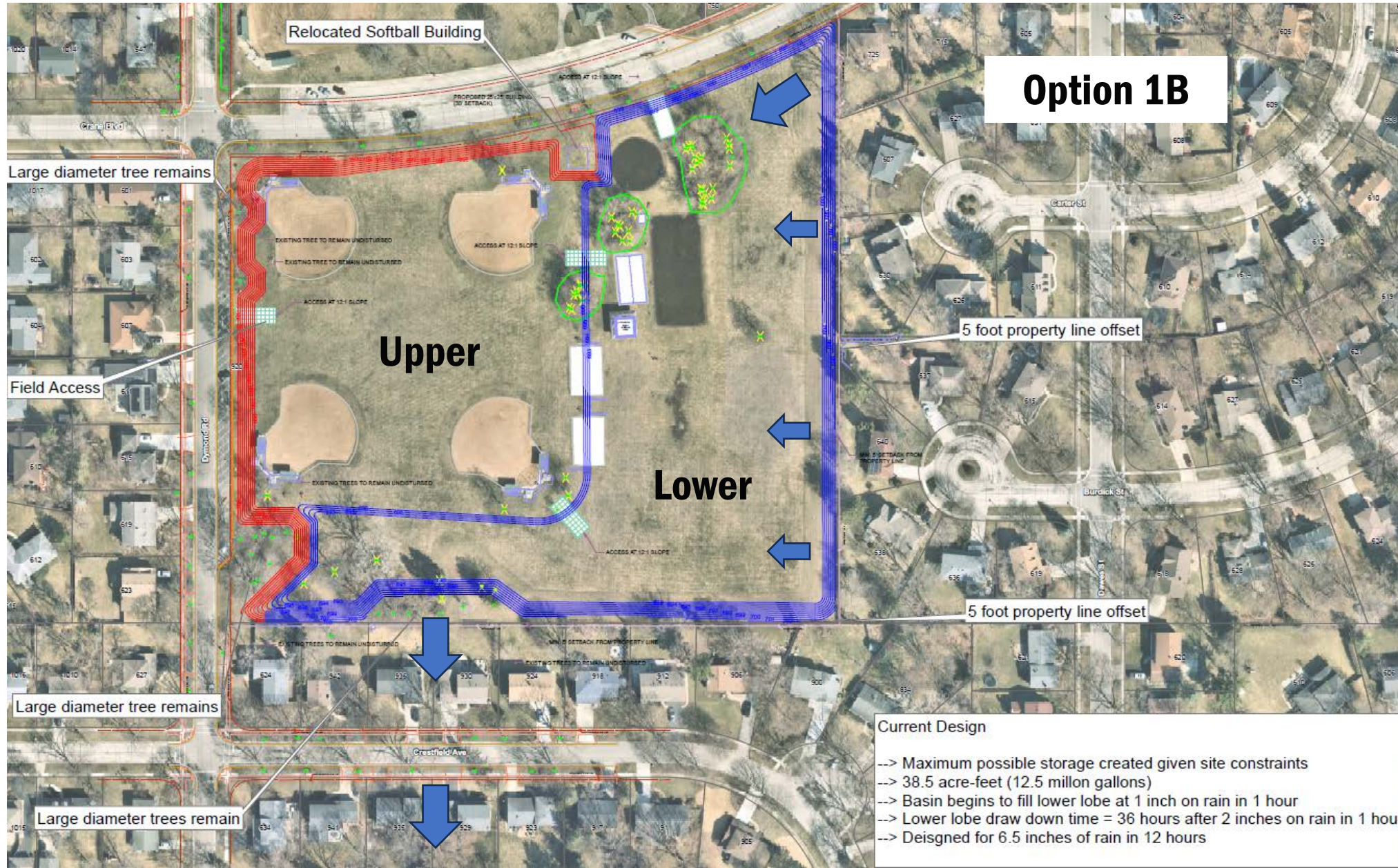
Structures with 100yr Protection



# Phase 1C – 2022 – South Nicholas Dowden Park Flood Storage



# Phase 1C - 2022 - South Nicholas Dowden Park Flood Storage



**Option 1B**

**Adoption of Bulletin 75**

**Upper Lobe  
6 feet below surface**

**Lower Lobe  
9 feet below surface**

**Open Houses**

**Playability  
short draw down times**

# DCEO-STOCIP Grant – **Shovel Ready Bonus**



Illinois  
Department of Commerce  
& Economic Opportunity

- **Phases 1C and 2 of the project received a total reimbursement grant in the amount of \$4,891,377 from the Illinois Department of Commerce and Economic Opportunity Stormwater Capital Improvement Program in 2022.**
- **Grant was administered by the LCSMC and contained requirements that included a Business Enterprise Program (BEP) with MBE and WBE goals for the contractor's work force.**
- **Extensive coordination and documentation between all parties involved to ensure grant requirements and BEP goals were being met.**

# Phase 1C – 2022

## South Nicholas Dowden Park Flood Storage

Concept --> Construction





# **Phase 1C – 2022**

## **South Nicholas Dowden Park Flood Storage**



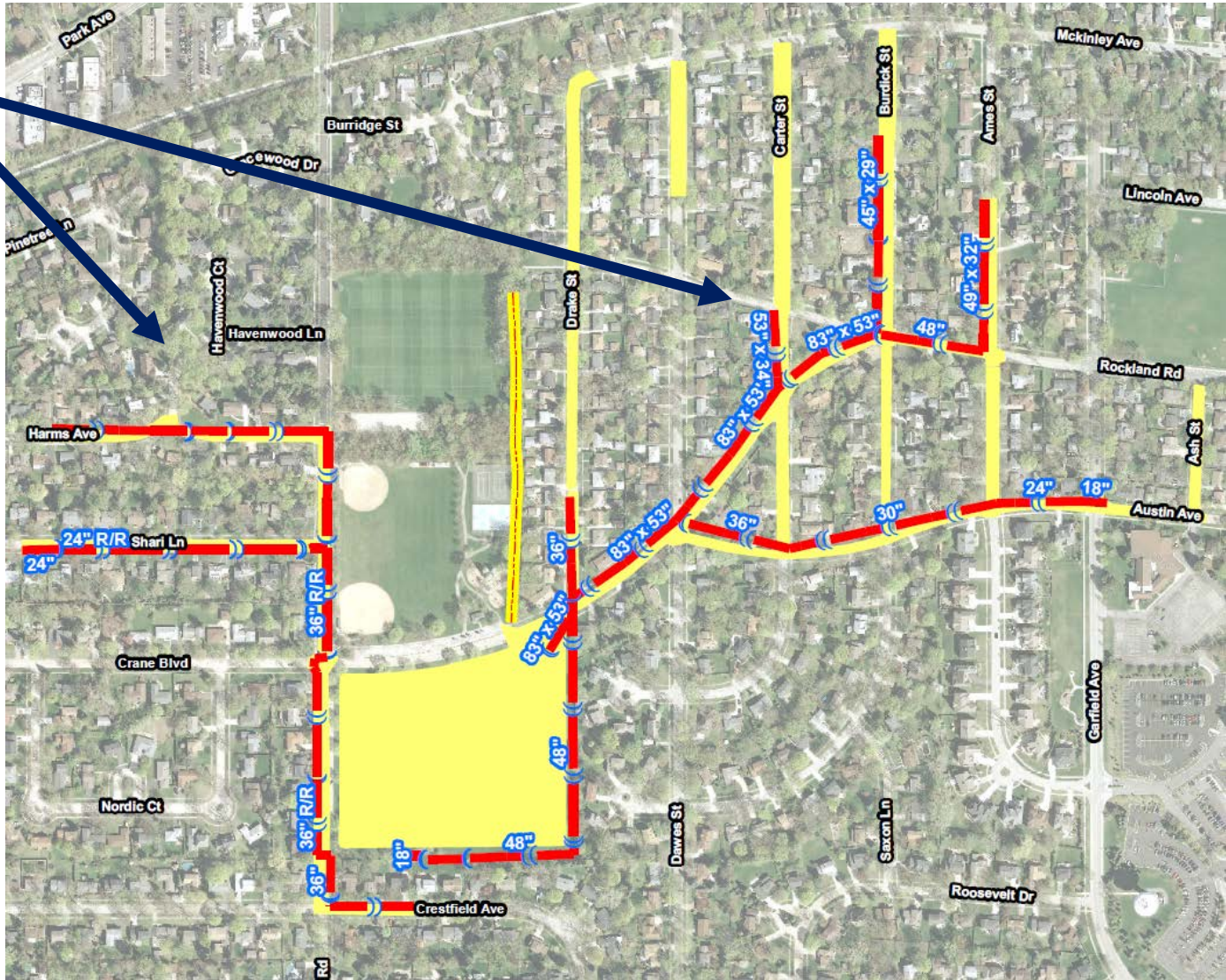
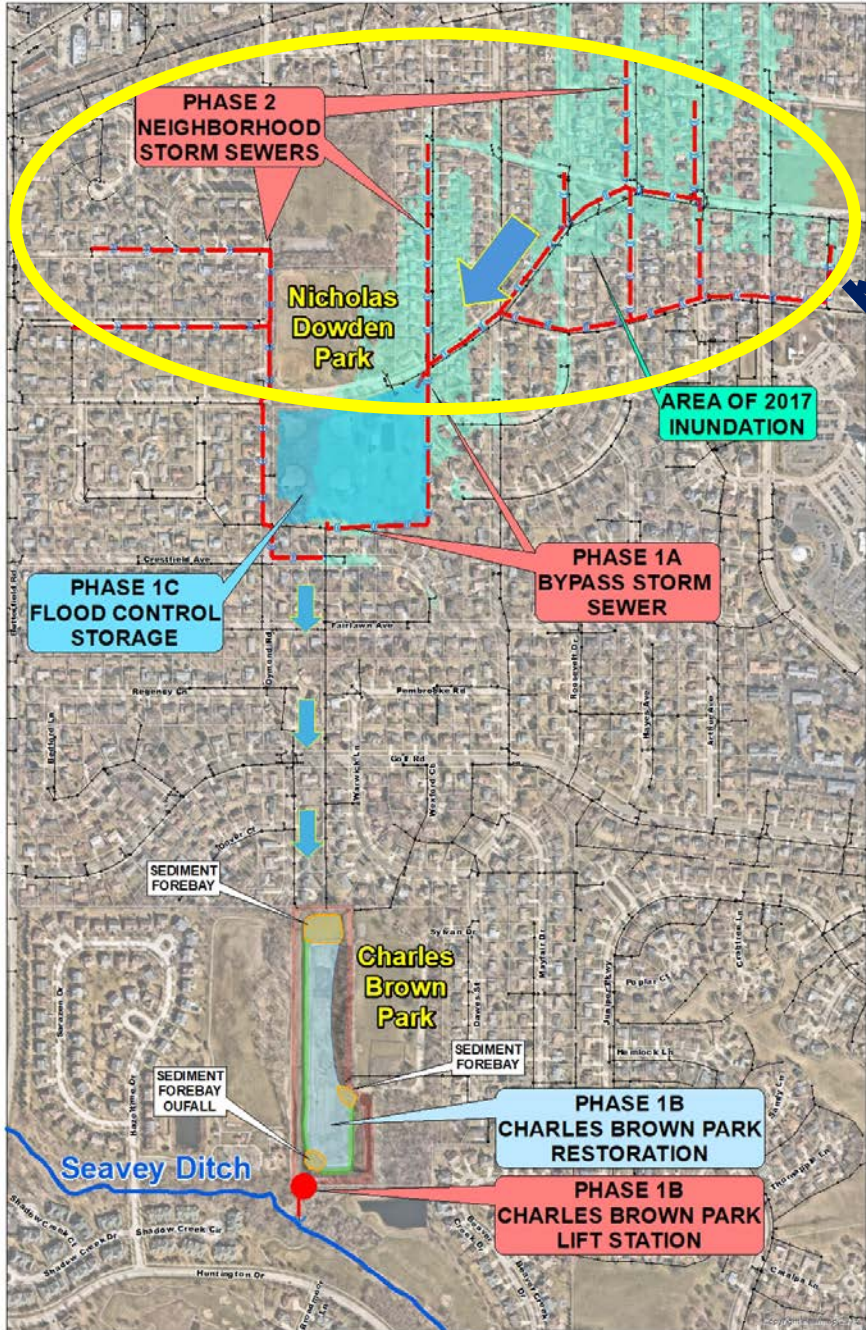
- **Contract Award = \$6.4 Million**
- **Final Contract = \$6.2 Million**



- **Truck routes and phasing requirements**
- **Constuction sequence limited to one off season for softball**
- **Separate start dates and interim completion dates incorporated into contracts**

# NICHOLAS DOWDEN PARK FLOOD CONTROL PROJECT

## Phase 2 - 2023 Neighborhood Storm Sewer Installation



# **Phase 2 – 2023**

## **Neighborhood Storm Sewer Installation**



- **Contract Award = \$8.9 Million**
- **Final Contract = \$7.6 Million**

- **Separate phases and stages to limit neighborhood impacts**
- **Extensive utility investigations**
- **Junction chambers**
- **Adapted truck routes**
- **Strict phasing schedule**

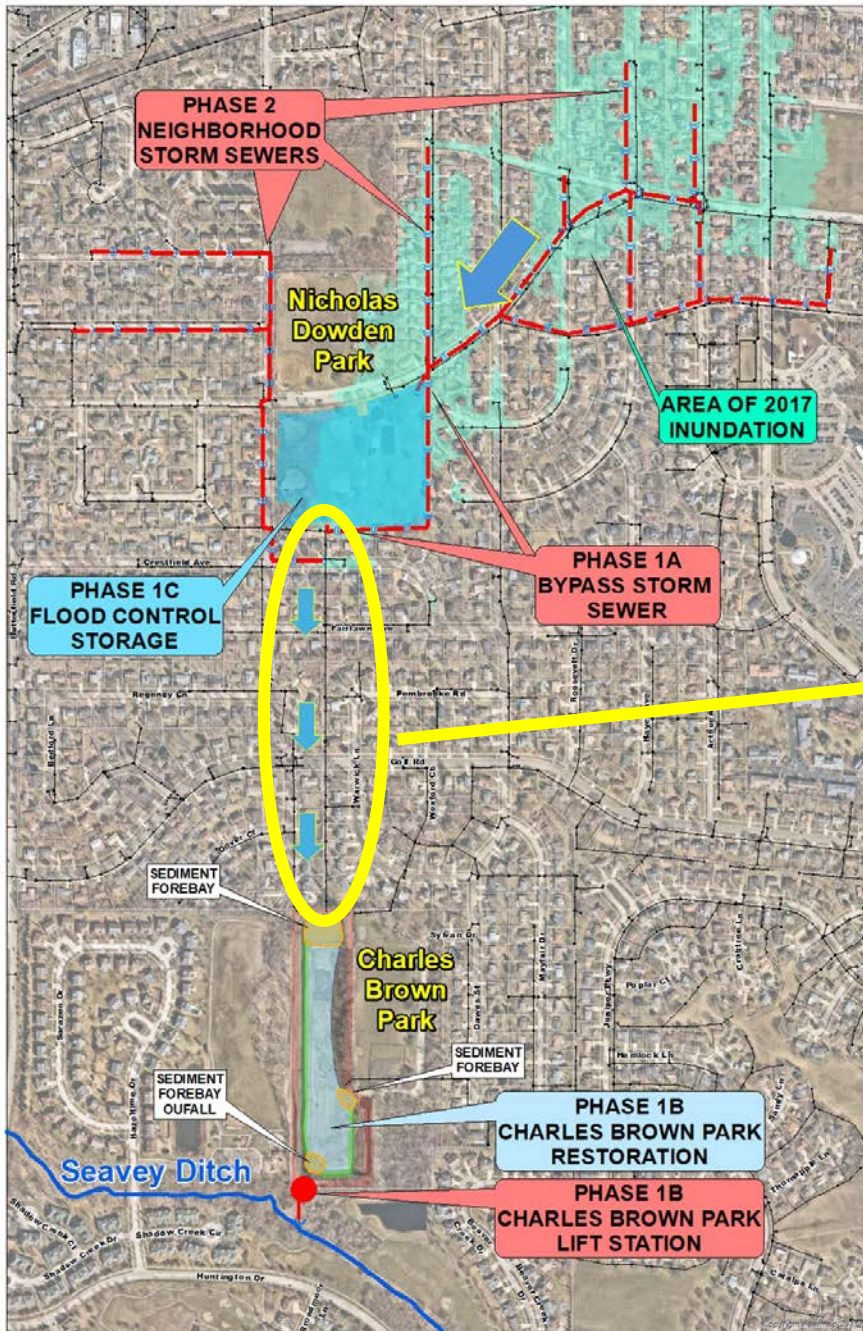
## **Phase 2 – 2023 Neighborhood Storm Sewer Installation**



- **15,500 linear feet of large diameter storm sewer**
- **Elliptical equivalent of 84-inch RCP**
- **35,000 square yards of pavement**
- **5,000 linear feet of curb replacement**

**Delivery of high unit cost items were required to meet expenditure dates of DCEO grant funding**

# 2024 Storm Sewer Lining – Final Conveyance Phase



- Conveyance from Nicholas Dowden Park to Charles Brown Park
- Design is in progress to line existing 48-inch CMP
- Easement access

# COMMUNITY RELATIONS

- PUBLIC MEETINGS THROUGHOUT DESIGN DEVELOPMENT
- DOOR TO DOOR INTRODUCTIONS
- PROJECT WEBSITE
- WEEKLY EMAIL BLAST
- PROJECT FLYERS
- CHANGEABLE MESSAGE SIGNS
- STUDENT EDUCATION

**BETWEEN CONCEPT AND COMPLETION, THERE WERE MORE THAN 15 PUBLIC MEETINGS DISCUSSING THE PROJECT.**

**HIGHLANDS SUBDIVISION FLOOD REDUCTION PROJECT**

**BACKGROUND:** This project consists of floodwater storage at Dowden Park and storm sewer improvements in the surrounding neighborhood. This project was first studied in detail in 2013 and was identified in the Village's 2019 Stormwater Master Plan.

**ANTICIPATED TIMING:** The project will be broken into two phases. Phase 1 will consist of work in Dowden Park and anticipated to start in August 2022. Phase 2 consists of storm sewer improvements in the neighborhood streets and will begin in 2023. Play fields to be open in Fall 2024.

**PROJECT COMPONENTS:**

**Flood Storage at Dowden Park (Phase 1)**

- Existing ground will be lowered by 6-9 feet
- Floodwater storage capacity of 38.5 acre-ft (12.5 million gallons)
- See Risk, Softball fields and amenities will be reconstructed with improved drainage
- Open space for practice fields will remain
- Low areas of park will be designed to start accepting flood water after approximately 1 inches of rain in 1 hour and drain down within 18 hours

**Storm Sewer Improvements (Phase 2)**

- Large diameter storm sewers required to convey water to flood storage at Dowden Park
- Drake, Crane, Carter, Burdick, Ames, Garfield, Crane and Rockland

**PROJECT BENEFITS:**

Improvements to Dowden Park drainage and without associated significant increases in flood protection to surrounding neighborhood

- Street ponding limited up to 10-year return interval storm event
- 20% chance of overflowing in any given year
- 4.5 inches of rain in 12 hours
- 2.4 inches of rain in 1 hour
- Floodwater depths lowered below residential structures up to 50-year return interval storm event
- 2% chance of overflowing in a given year
- 6.5 inches of rain in 12 hours
- 3.6 inches of rain in 1 hour
- Floodwater depth reduction of 2.5 feet for most extreme storm events including the 100-year return interval storm event and the July 2012 storm event
- 100-year = 2% chance of overflowing in a given year
- 1% chance of overflowing in a given year
- July 2017 storm event
- 7.7 inches of rain in 12 hours

FOR MORE INFORMATION PLEASE VISIT: [HTTPS://WWW.LIBERTYVILLEHIGHLANDSPLAN.COM/](https://www.libertyvillehighlandsplan.com/)

**Suburban Skyview: New floodwater basin, ball fields at Nicholas-Dowden Park**

The article features an aerial photograph of the construction site at Dowden Park, showing the large rectangular floodwater storage basin and the surrounding areas where ball fields and other amenities are being prepared.

**Part two of flood solution for Libertyville's Highlands neighborhood set to begin**

The article includes a map of the Highlands neighborhood, highlighting the streets that will be affected by the storm sewer improvements in Phase 2 of the project.



**HIGHLANDS SUBDIVISION FLOOD REDUCTION PROJECT**

9 likes

libertyville\_il 🇺🇸 The Highlands Subdivision Flood Reduction Project is advancing into the final phase of storm sewer installations. The work requires an extended road closure at the intersection of Garfield Ave and Austin Ave. The closure and detour route are scheduled to begin tomorrow, Tuesday, September 5th, and are anticipated to remain in place for approximately one week, weather permitting.

For details, including a map of the detour, visit the Village webpage.

September 4

**Big flood control project in Libertyville slated for early August start: 'We're excited to get it rolling'**

The article features a photograph of the construction site showing the layout of the floodwater storage basin and the surrounding areas.



**The project was a great overall experience producing a long-lasting relationship with all involved. Special thanks to the Village of Libertyville team.**