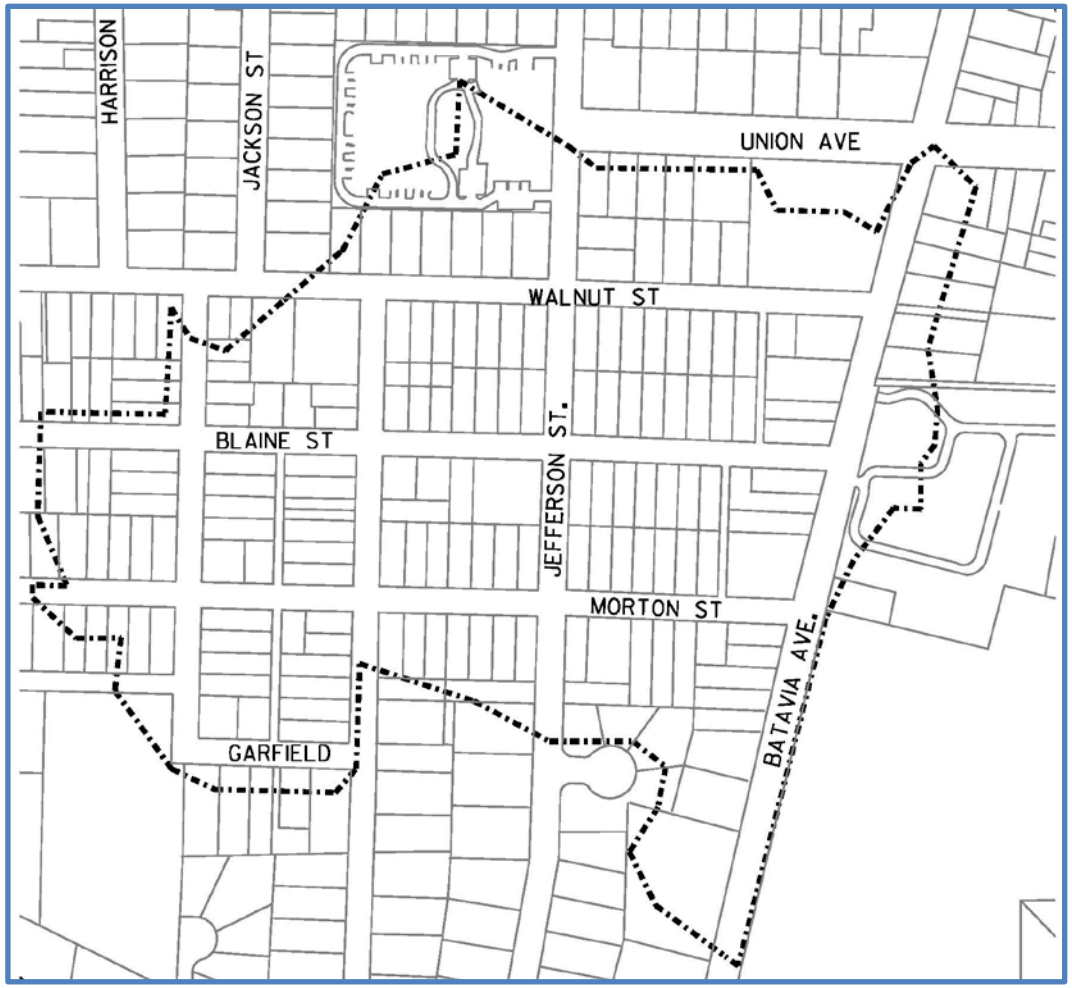
AREA 3
SEWER SEPARATION STUDY



Report Results
Presented to City of Batavia – Committee of the Whole
September 13, 2016

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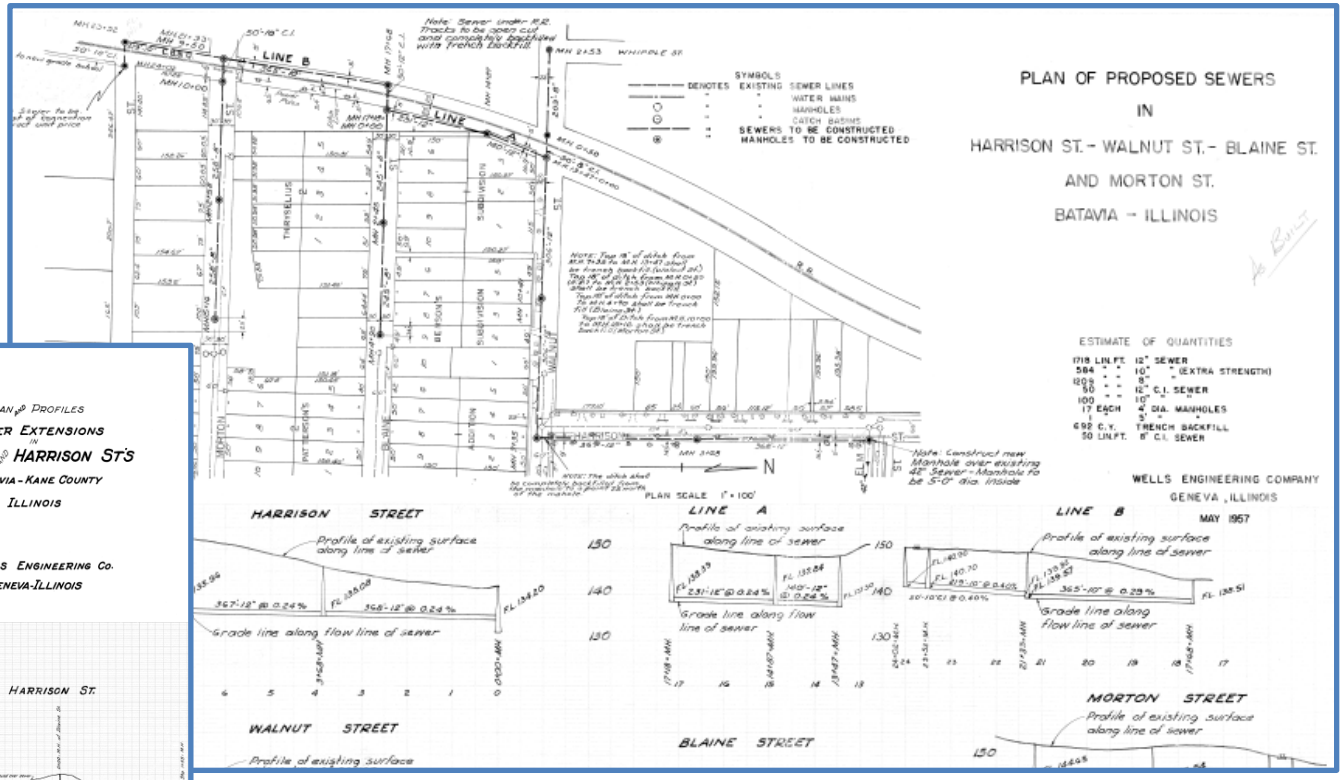
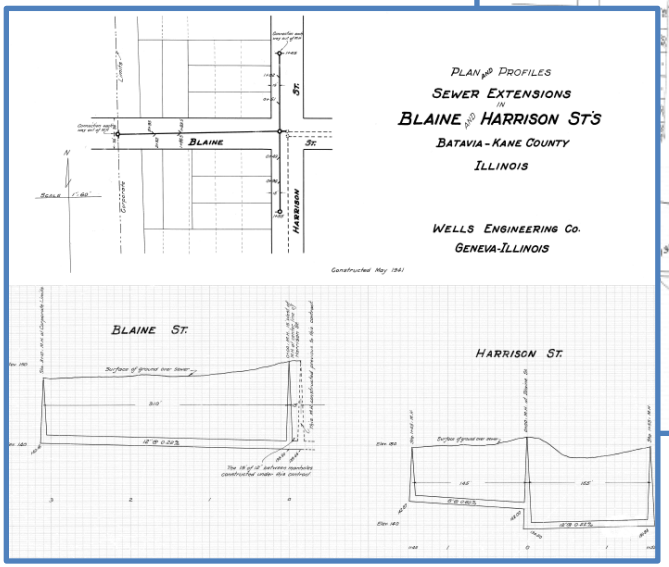
Geneva, Illinois

Area 3 Overview:





Wells Engineering became Rempe-Sharpe & Associates in 1964

- Has experienced repeated drainage complaints and sewer back-ups, with reports of flooding; most-recently June 15, 2015.
- Almost all of Area 3 (53+ acres) is presently served by 60+ year old combined sewers, primarily 8” and 10” in size.
- Typical new construction would require 8” and 10” for sanitary only, <u>in addition to</u> 12” to 48” for storm sewer.

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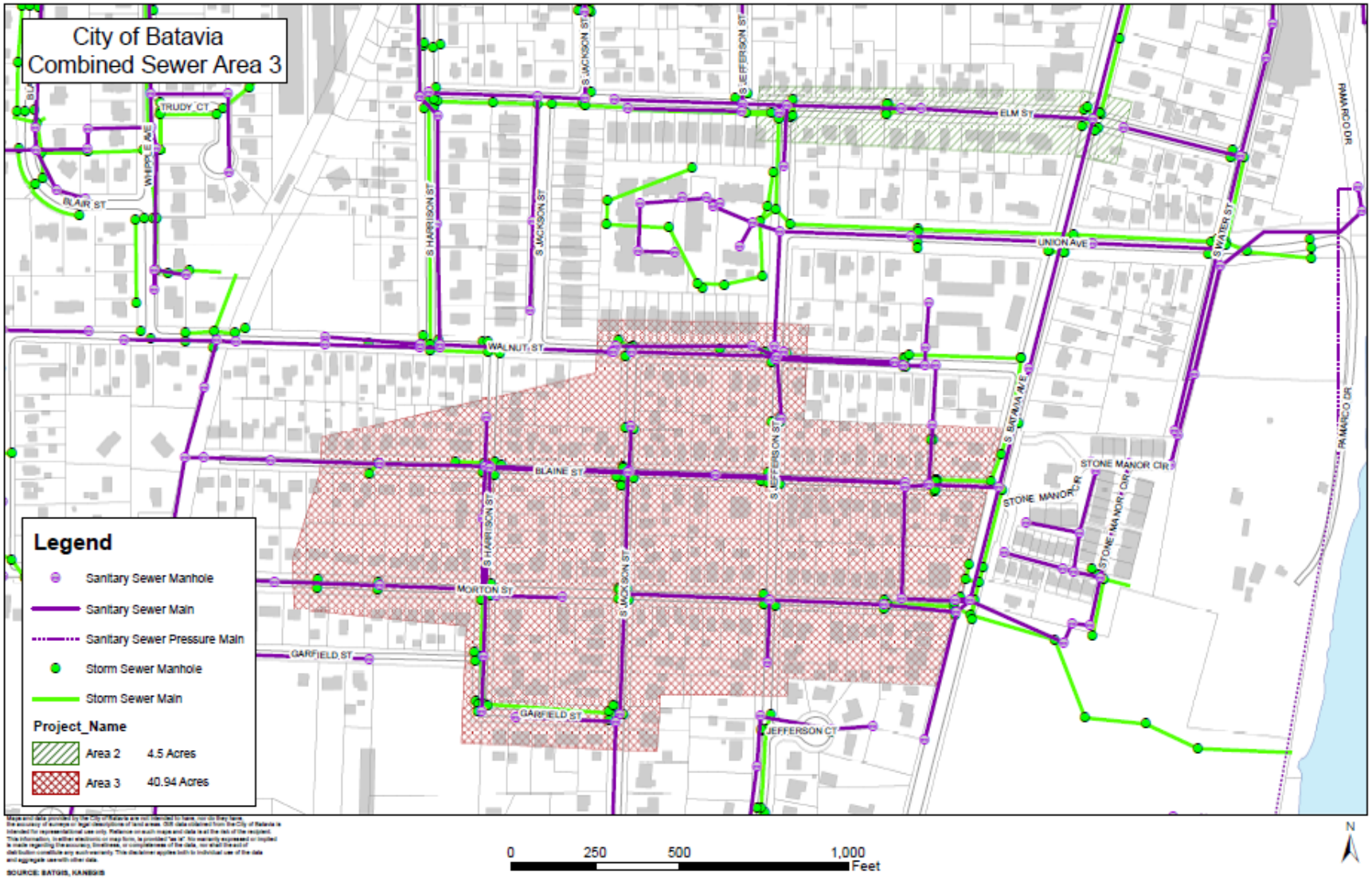

SOURCE: BATGIS, KANEGIS

Area 3 Overview:

REMPE-SHARPE & Associates, Inc.
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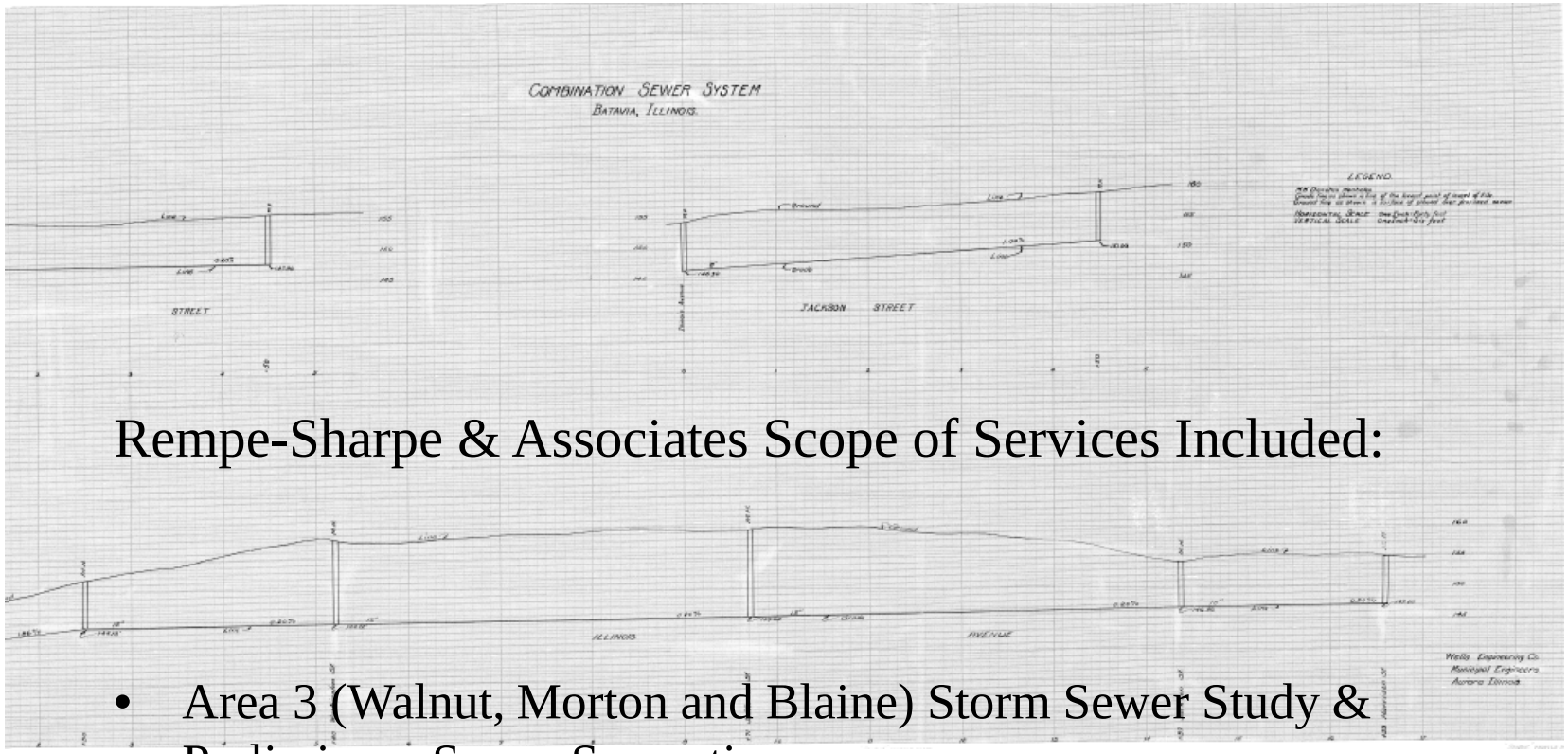

Rempe-Sharpe & Associates Scope of Services Included:

- Area 3 (Walnut, Morton and Blaine) Storm Sewer Study & Preliminary Sewer Separation:
  - Data Collection
  - Storm Sewer Capacity Study
  - Preliminary Engineering Plans
  - Preliminary Cost Estimates and Capital Improvement Projects for the Future

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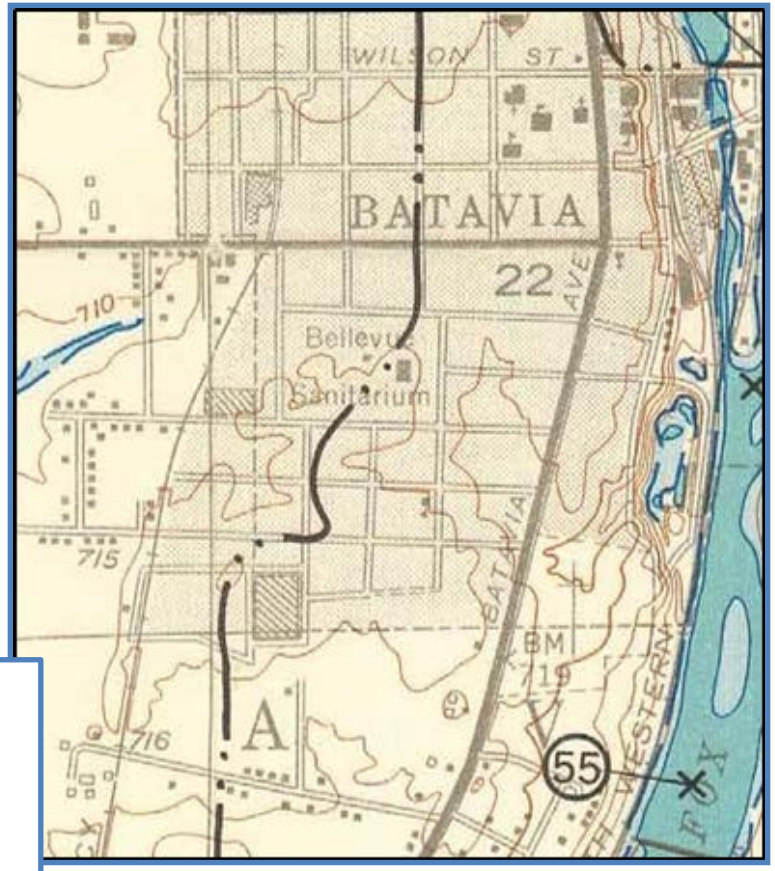
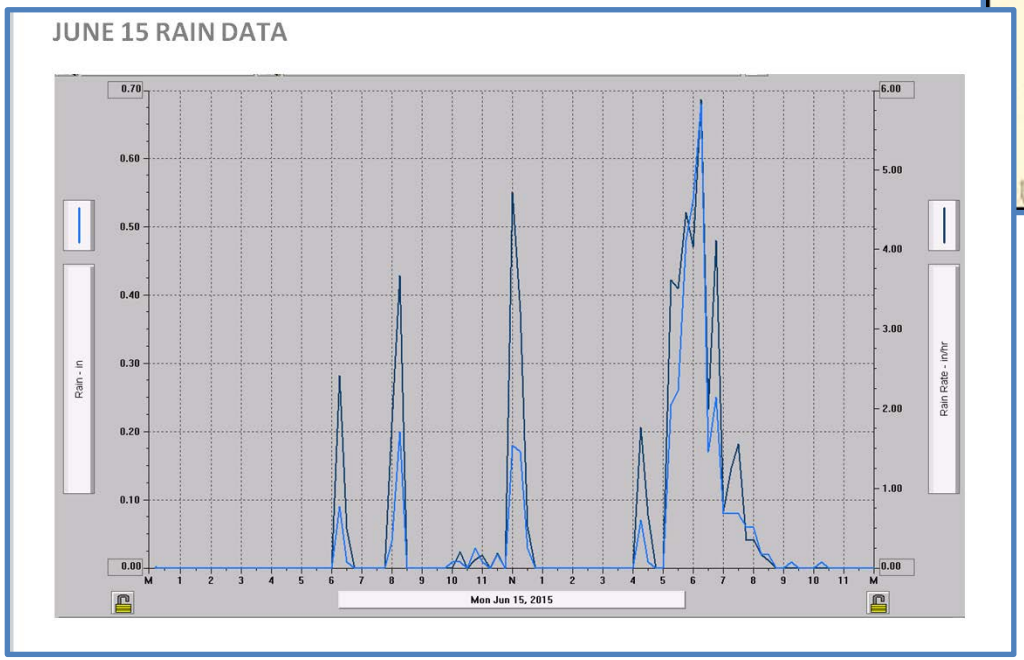
Tasks Completed:

- Review plans, as-builts, GIS, and conduct limited topographic survey.
- Develop and tabulate hydrologic characteristics of sub-areas. Create H&H (XPSWMM) model to determine *critical duration* 10-year storm. Design check of June 15th 2015 storm.
- Created proposed storm sewer concept routing (preliminary plan) and hydraulic model, sized to collect and convey stormwater runoff to outfall.
- Based on results from the 10-year design storm modeling, tabulate a list of infrastructure requirements and determined a preliminary opinion of probable cost of construction.





"We had 4" of rain on June 15th with about 1" in the morning prior to the main system and another 3" with the main system. Looks like the evening rain was about 3" in a 2-hour time frame with the highest rainfall rate at 6" per hour. Also included is the same info starting with June 6th so one could see that we had a fair amount of rain in the days prior to the June 15 event."

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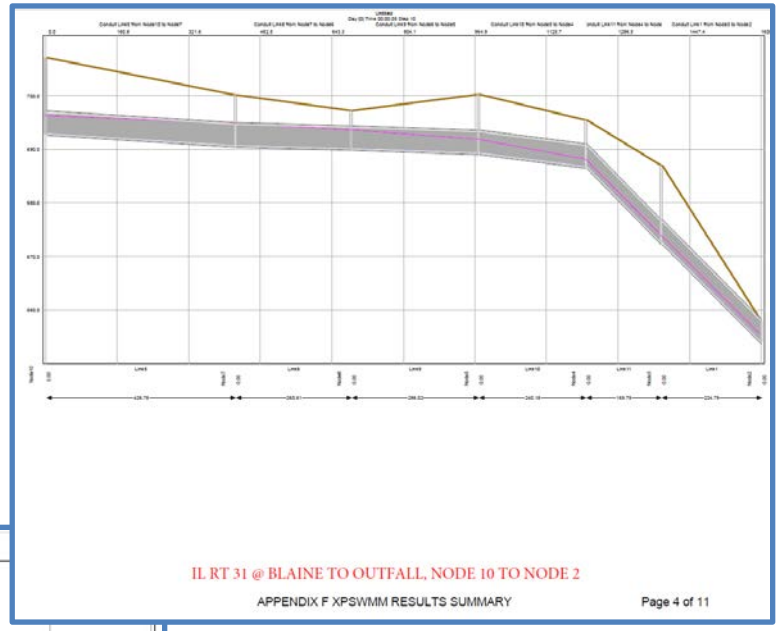
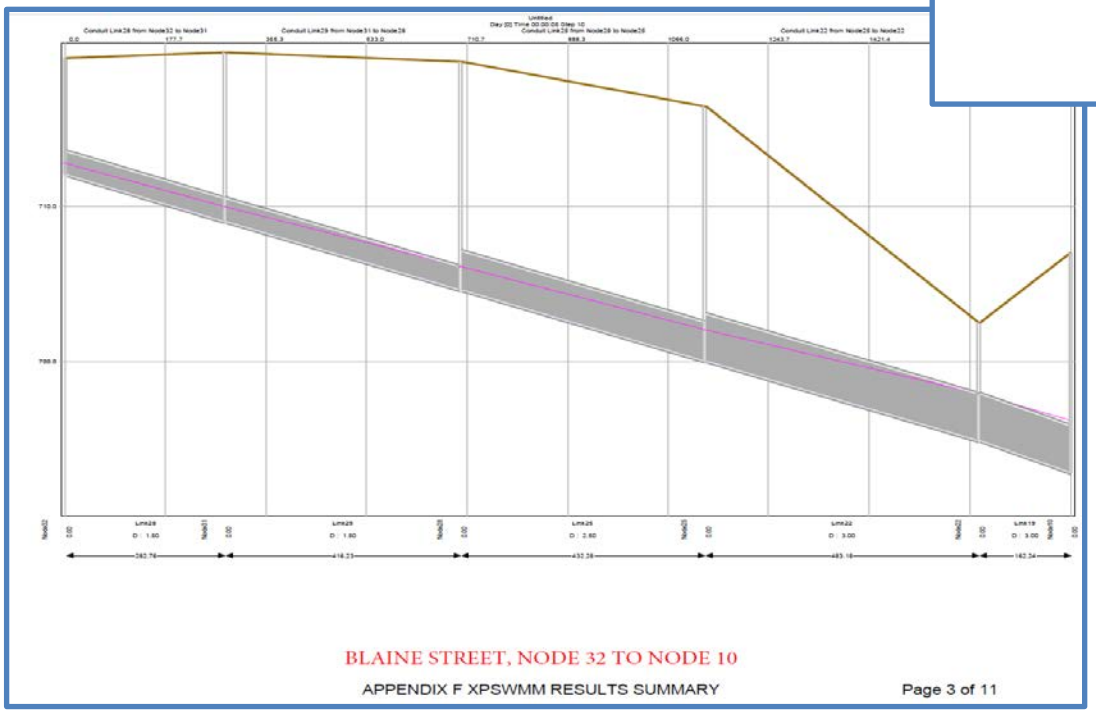
Purpose of Models:

- Establish and test routing and sizing for proposed storm sewer main based on 10-year design storm and design *check storm.*
- Check the capacity of the existing 27” outfall storm sewer and determine required added capacity.





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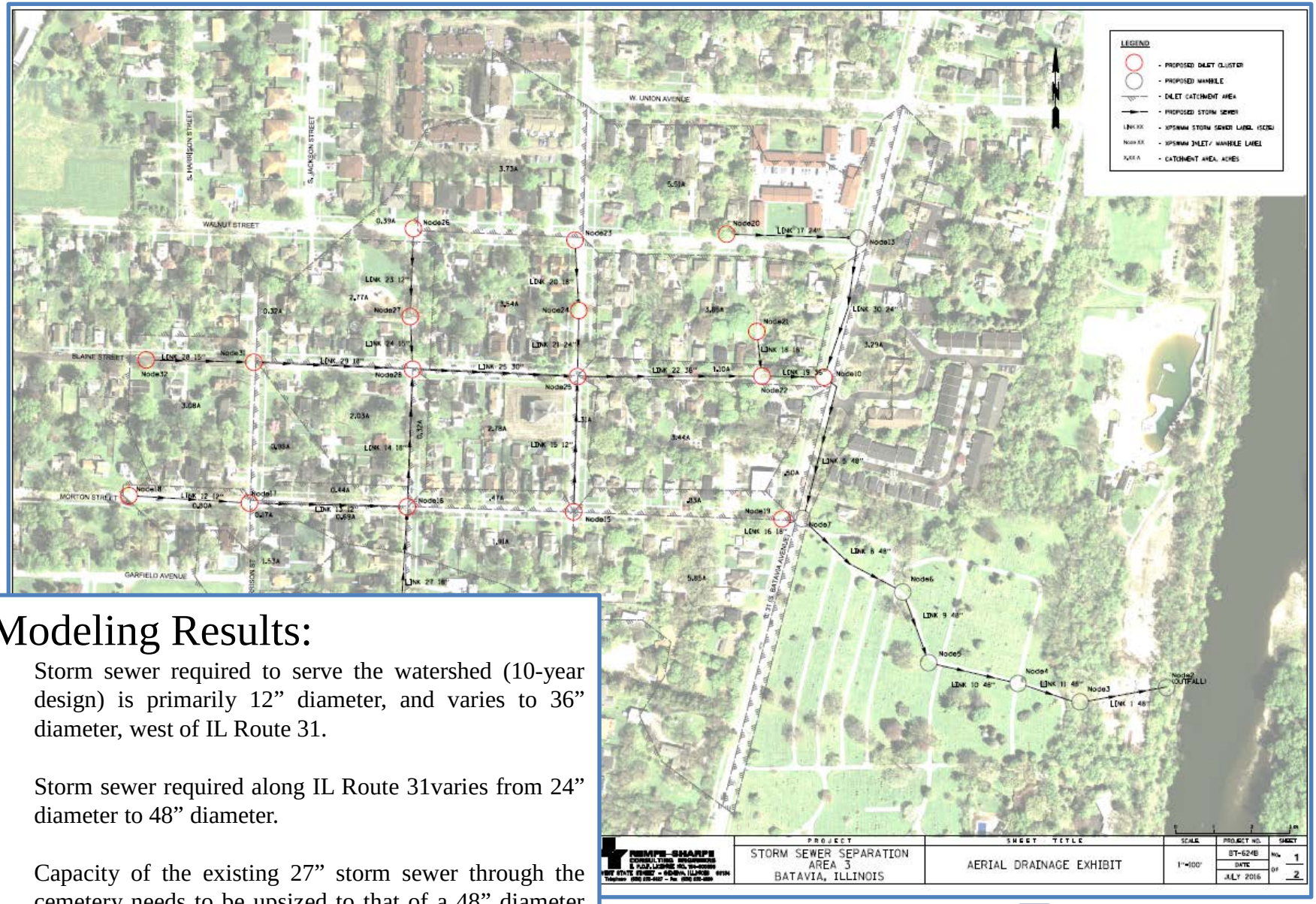

Modeling Results:

- Storm sewer required to serve the watershed (10-year design) is primarily 12” diameter, and varies to 36” diameter, west of IL Route 31.
- Storm sewer required along IL Route 31varies from 24” diameter to 48” diameter.
- Capacity of the existing 27” storm sewer through the cemetery needs to be upsized to that of a 48” diameter sewer. (Either by replacement to a single 48” line, or by the addition of a parallel 36” diameter sewer.)

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Future Project Costs

APPENDIX A
JUNE 15 RAIN DATA

DATE	TIME	RAINFALL (INCHES)		
6/15/2015	6:00	0		
6/15/2015	6:15	0.08		
6/15/2015	6:30	0.01		
6/15/2015	6:45	0		
6/15/2015	1:45	0		
6/15/2015	2:00	0		
6/15/2015	2:15	0		
6/15/2015	2:30	0		
6/15/2015	2:45	0		
6/15/2015	3:00	0		
6/15/2015	3:15	0		
6/15/2015	3:30	0		
6/15/2015	3:45	0		
6/15/2015	4:00	0		
6/15/2015	4:15	0.07		
6/15/2015	4:30	0.01		
6/15/2015	4:45	0		
6/15/2015	5:00	0		
6/15/2015	5:15	0.24		
6/15/2015	5:30	0.26		
6/15/2015	5:45	0.48		
6/15/2015	6:00	0.54		
6/15/2015	6:15	0.68	2.72	inches /hour max
6/15/2015	6:30	0.18		
6/15/2015	6:45	0.25		
6/15/2015	7:00	0.08		
6/15/2015	7:15	0.08		
6/15/2015	7:30	0.08		
6/15/2015	7:45	0.06		
6/15/2015	8:00	0.06		
6/15/2015	8:15	0.02		
6/15/2015	8:30	0.02		
6/15/2015	8:45	0		
6/15/2015	9:00	0		
6/15/2015	9:15	0.01		
6/15/2015	9:30	0		
6/15/2015	9:45	0		
6/15/2015	10:00	0		
6/15/2015	10:15	0.01		
6/15/2015	10:30	0	3.13	total inches

(developed from June 15 Rain Data Provided by City of Batavia - see page 2)

APPENDIX G

ESTIMATED COST BREAKDOWN BY STREET

LOCATION	SEWER LENGTH	LOCATION COST
BATAVIA WEST CEMETERY	1181	$657,000.00
ILLINOIS ROUTE 31	860	$475,338.20
BLAINE STREET	1894	$1,046,849.47
WALNUT STREET	345	$190,688.00
JEFFERSON STREET	712	$393,535.81
JACKSON STREET	1084	$599,147.21
MORTON STREET	730	$403,484.75
GARFIELD AVENUE	407	$224,956.56
		$3,991,000.00

APPENDIX G

CITY OF BATAVIA AREA 3 SEWER SEPARATION
PRELIMINARY CONCEPT ESTIMATE OF STORM SEWER IMPROVEMENTS CONSTRUCTION COST

8/31/2016 BY: BJB

NO.	DESCRIPTION	TOTAL UNITS	UNIT	UNIT PRICE	
	PART A. PRELIMINARY QUANTITIES PER PROPOSED CONCEPT STORM SEWER DESIGN				
1	STORM SEWER 12" RCP, TY 1, CL IV W/ RUBBER GASKETS	4,828	LF	$58.00	$280,011.24
2	STORM SEWER, 15" RCP, TY 1, CL IV W/ RUBBER GASKETS	537	LF	$87.00	$46,729.44
3	STORM SEWER, 18" RCP, TY 1, CL IV W/ RUBBER GASKETS	1,650	LF	$115.00	$189,792.55
4	STORM SEWER, 24" RCP, TY 1, CL IV W/RUBBER GASKETS	1,012	LF	$127.00	$128,521.46
6	STORM SEWER, 30" RCP, TY 1, CL IV W/RUBBER GASKETS	432	LF	$138.00	$59,654.64
7	STORM SEWER, 36" RCP, TY 1, CL IV W/RUBBER GASKETS	645	LF	$144.00	$92,940.48
8	STORM SEWER, 48" RCP, TY 1, CL IV W/RUBBER GASKETS	1,608	LF	$173.00	$278,184.00
9	INLET TY A OR JUNCTION BOX, 2' DIA., W/ FRAME AND GRATE	170	EA	$1,500.00	$255,000.00
10	48 "- MANHOLE W/FRAME AND GRATE	30	EA	$3,500.00	$105,000.00
11	60"- MANHOLE W/FRAME AND GRATE	5	EA	$4,000.00	$20,000.00
12	72"- MANHOLE W/FRAME AND GRATE	7	EA	$6,500.00	$45,500.00
13	TRENCH BACKFILL CA6, SPECIAL	16,330	CY	$35.00	$571,550.00
14	INLET AND PIPE PROTECTION	170	EA	$150.00	$25,500.00
				SUBTOTAL PART A	$2,098,383.81
	PART B. PRELIMINARY QUANTITIES ASSOCIATED WITH POTENTIAL REMOVAL AND REPLACEMENT QUANTITIES NECESSARY FOR CONSTRUCTION				
15	PIPE REMOVAL	4,500	LF	$15.00	$67,500.00
16	INLET TO BE REMOVED	60	EA	$200.00	$12,000.00
17	MANHOLES TO BE REMOVED	20	EA	$500.00	$10,000.00
18	PAVEMENT REPLACEMENT	6,094	SY	$44.00	$268,136.00
19	CURB AND GUTTER REMOVAL AND REPLACEMENT	3,500	SF	$30.00	$105,000.00
20	SANITARY SEWER SERVICES TO BE RECONSTRUCTED	50	EACH	$300.00	$15,000.00
21	TOPSOIL, SEEDING AND EROSION CONTROL BLANKET	4,000	SY	$10.50	$42,000.00
22	SIDEWALK TO BE REMOVED AND REPLACED (ADA COMPLIANCE)	6,240	SF	$8.00	$49,920.00
23	DETECTABLE WARNINGS	1,040	SF	$35.00	$36,400.00
				SUBTOTAL PART B	$605,956.00
				SUBTOTAL C (SUBTOTAL PART A + SUBTOTAL PART B)	$2,704,339.81
				MOBILIZATION 3% (OF SUBTOTAL C)	$81,130.19
				TRAFFIC CONTROL & PROTECTION 5.5% (OF SUBTOTAL C)	$148,738.69
				SUBTOTAL D (SUBTOTAL C + MOBILIZATION + TRAFFIC CONTROL)	$2,934,208.69
				ENGINEERING DESIGN 6.5% (OF SUBTOTAL D)	$190,723.57
				CONSTRUCTION MANAGEMENT 9.5% (OF SUBTOTAL D)	$278,749.83
				CONTINGENCY 20% (OF SUBTOTAL D)	$586,841.74
	GRAND TOTAL (SUBTOTAL D + ENGINEERING + MANAGEMENT + CONTINGENCY)				**$3,991,000.00**

NOTES

1 PART A QUANTITIES ARE BASED ON THE CONCEPT STORM SEWER MODEL QUANTITIES
SEE PAGE 2 FOR XPSWMM QUANTITIES

2 PART B QUANTITIES ARE ESTIMATED BASED ON ANTICIPATED TYPICAL REMOVAL AND REPLACEMENT ITEMS ASSOCATED WITH STORM SEWER CONSTRUCTION,
SOME OF THESE QUANTITIES MAY BE ABLE TO BE ELIMINATED OR REDUCED IF THE SCOPE OF WORK IS COMPLETED CONSURRENTLY WITH OTHER PROJECTS
THESE QUANTITIES ARE DEPENDANT ON FINAL DESIGN, TO BE DETERMINED, THEREFORE ACTUAL QUANTITIES MAY VARY SUBSTANTIALLY FROM THE ESTIMATES ASSUMED
SEE PAGE 3 FOR QUANTITY DEVELOPMENT/ASSUMPTIONS FOR THESE QUANTITIES

3 ESTIMATE DOES NOT INCLUDE WATERMAIN OR SANITARY SEWER MAIN RECONSTRUCTION, MISC. R&R, EXTRAORDINARY OR UNFORSEEN CONDITIONS, I.E. BEDROCK REMOVAL

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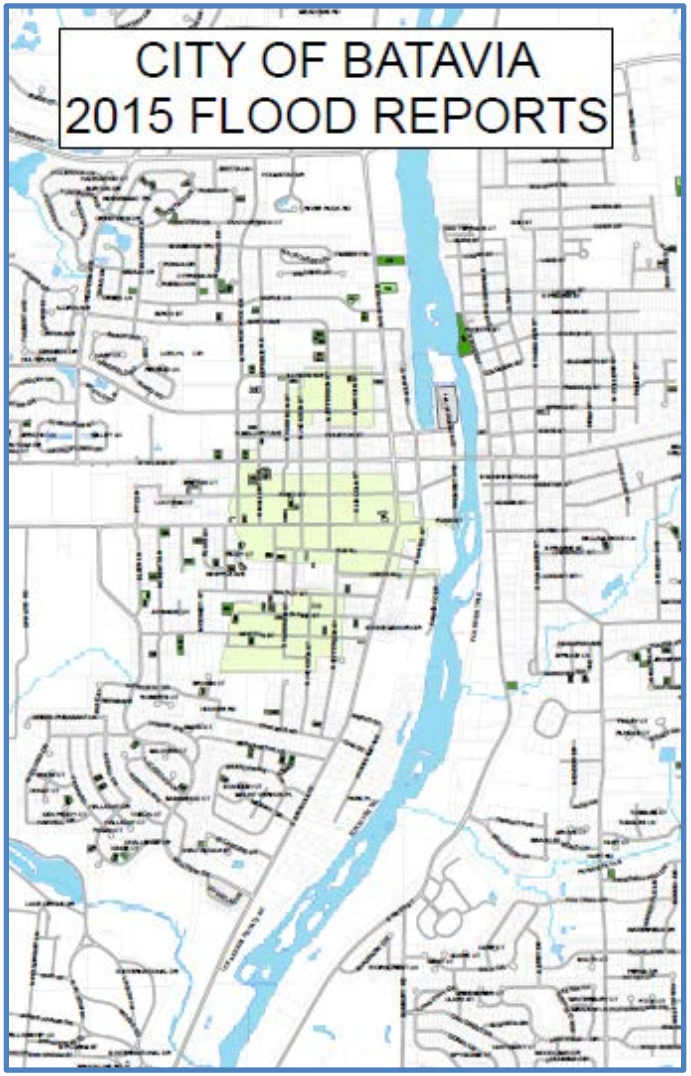
Geneva, Illinois

Possible Construction Phasing:

- Start with construction of improvement from outfall to IL Route 31.
- Coordinate subsequent storm sewer construction projects with street reconstruction projects.
- Subject streets within projects limits last paved …..

Area 3 Street Paving History

Street	Last Paved
Walnut @ Jackson	2000
Walnut @ Jefferson	2000
Blaine	2000
Morton St from Harrison to 31	1993
Morton St from McKinley to Harrison	1999
Garfield	1994
Jackson	2000
Jefferson	2000



Storm sewer design was purposefully set deep to clear existing sanitary sewer crossings along IL Route 31(proposed storm sewer pipe under existing sanitary). It is believed deep storm sewer will minimize conflicts and therefore limit necessary utility relocations thereby reducing overall construction costs.

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QUESTIONS?

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bbennett@rsaengr.com

REMPE-SHARPE
& Associates, Inc.
CONSULTING ENGINEERS
Geneva, Illinois

Don’t leave your project hanging.

[Washout of railroad embankment. Cherry Valley, Illinois August 2007.]