

# Appendix A – Base Model Edits



**Minneapolis**  
Park & Recreation Board



## HR Green XPSWMM Model Edits

The following edits were performed by HR Green to adjust the City's base model to either make updates based on as-built or plat data or to improve the performance of the provided base model.

Affected Node or Link	Change Made	Why (error, model performance or other reason)	Discussed with City
All nodes	Ponding type changed from "Allowed" to "None"	Model performance and uniformity – to ensure the model wasn't losing water.	No
Lake, Node1721	Node deleted	Massive amount of water stored in Lake node led to a misrepresentation of the stability of the model.	Yes
WLake1 through WLake16, OV441959, LakeLink	Links deleted	Lake was no longer being modeled. A tailwater condition was applied instead.	Yes
Node 441959	Constant inflow of 20 cfs assigned	Represents constant inflow from Lake Harriet through the controlled inlet.	Yes
PI500402A through PI500402E	Inverts adjusted to 845.3, box culvert height set to 5.5	Eliminates instability	Yes
PI484584	Conduit turned off	Conduit was modeled as a one foot long 4 x 6 box culvert and was causing instability at the pump station.	No
Channel1 through Channel 12	All links regraded to assign each link a slope of 0.0767%, with node inverts from Nodes 441734 and 441960 serving as initial and final invert	Eliminates instability and increases model performance	Yes
PI436111	Link placed within multilink conduit with ST436111. ST436111 given correct elevations and PI436111 assigned as 45"x73" arch pipe at 0.0484% slope.	Error found by analyzing as-builts	Yes
ST500193	Elevations adjusted to reflect LiDAR	Error found by examining LiDAR	No
PI499821 and ST499821	Links and node eliminated. Conduit PS01 connected to Node 440941.	Connection didn't exist based on recent as-builts	Yes
Node 436043, Conduit PS01, PI499886	30" overflow added to Multilink PS01 at elevation 867.57'. Node 440941 spill crest adjusted to 878.712'. PI499886 upstream invert adjusted to 867.3'.	Connection errors found by analyzing as-builts	Yes
PI482366	Conduit upstream invert adjusted to 849.3	Error found by examining GIS data	No

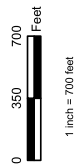
# Appendix B – Existing Flood Extents

# SW Harriet

## Existing Flood Extents

### Legend

- Pump Stations
- 10 Year Event Potentially Impacted Structures
- 100 Year Event Potentially Impacted Structures
- 10 Year Event Flood Extents
- 100 Year Event Flood Extents
- 10 Year Event Flooded Streets (>6")
- 100 Year Event Flooded Streets (>6")
- Study Area



# Appendix C – Optimatics Inputs



**Minneapolis**  
Park & Recreation Board



## Optimizer Analysis Procedures

HR Green ran through many iterations of optimization and slowly built upon the model by adding costs and penalties when the model was deemed to be working correctly. Each time a new solution strategy was implemented, HR Green analyzed the general trends apparent in the optimal solution and compared it to other possible solutions. HR Green first analyzed a scenario where only pipe upsizing was permitted. Next, boulevard boxes were included with pipe upsizing, followed by node storage. Finally, pump curve adjustment was assessed. In addition to solution strategies, storage and flow penalties were also adjusted to assess flow and flood sensitivity. For example, HR Green examined the effect of applying a penalty of \$200,000 and \$1,000,000 per flooded primary structure on the infrastructure improvements Optimizer proposed. The combination of costs and penalty values assessed in the final iteration of modelling are discussed in the sections below.

### Costs

The total cost equation input into Optimizer is the following,

$$Cost = CC + SC + UC + PC$$

CC is “Conduit Cost”, the cost to install a pipe at a specific depth. Pipe costs were assigned values based upon the following table, where the values shown in the table are dollars per linear foot. Extreme costs, such as \$100,000 per linear foot, were assigned to pipe size and depth combinations deemed unfeasible.

Size (ft)	Construction Depth (ft)				
	8	13	18	23	28
1	181	213	244	826	920
1.25	201	237	273	930	1039
1.5	212	248	285	963	1072
1.75	230	269	308	1040	1157
2	247	289	330	1116	1241
2.25	259	304	348	1178	1310
2.5	279	328	376	1269	1412
2.75	286	338	389	1319	1472
3	293	348	401	1365	1526
3.5	314	371	431	1471	1650
4	365	426	492	1672	1869
4.5	100000	468	543	1853	2077
5	100000	543	620	2094	2326
5.5	100000	583	666	2250	2500
6	100000	724	814	2710	2979
6.5	100000	780	881	2930	3216
7	100000	845	959	3182	3487
7.5	100000	919	1048	3468	3790
8	100000	986	1133	3739	4079
8.5	100000	100000	1206	3976	4334
9	100000	100000	1280	4216	4592
9.5	100000	100000	1350	4443	4837
10	100000	100000	1425	4686	5098
10.5	100000	100000	1500	4932	5362
11	100000	100000	1577	5178	5627
12	100000	100000	100000	5678	6163
15	100000	100000	100000	100000	100000

SC is “Storage Pipe Cost”, which represents the cost of placing a boulevard box at specified nodes in the system. These costs were input into Optimizer through the use of a script template provided by Optimatics. The following table displays the costs used in the script.

Boulevard Box Represented	Unit Cost (\$)
100'x4'x6'	30,000
100'x4'x8'	35,000
100'x6'x8'	40,000
300'x4'x6'	90,000
300'x4'x8'	105,000
300'x6'x8'	120,000
500'x4'x6'	150,000
500'x4'x8'	175,000
500'x6'x8'	200,000

UC refers to “Underground Storage Costs”. The underground storage locations subject to these costs are limited to Pershing Field Park, Lynnhurst Park, and three nodes near Minnehaha Creek. These costs were input into Optimizer through the use of a script template provided by Optimatics. The following table displays the costs used in the script.

Thousand Cubic Feet of Storage	Unit Cost (\$k)
10	200
20	400
30	600
40	750
50	850
60	1,000
75	1,250
100	1,500
200	2,500

PC refers to “Pump Curve Cost”. In order to determine the most optimal pump curve at any given pump station, a series of pump curves were created and assigned a cost of \$1 to implement. This was meant to keep track of when Optimizer suggested altering the pump curve at a pump station, and not to represent the real cost of altering pump station operations.

## Penalties

The total penalty equation input into Optimizer is the following,

$$Penalty = RP + LP + CP + SP$$

RP refers to “Road Flow Penalty”. During a 10 year storm, all street links determined to contain a flow greater than or equal to 10 cfs were assigned a penalty of \$1,000 per cfs exceeding 10. When flow is greater than 0.1 cfs, a penalty of \$100 is assigned per cfs exceeding 0.1. This penalty is to differentiate road flows below 10 cfs and to encourage Optimizer to select solutions that create no flow in the road.

LP refers to “Lake Flow Penalty”. During a 10 year storm, all outfall links that empty into Lake Harriet are assigned a penalty of \$50,000 plus \$100 for every cfs that exceed a value 10% higher than that outfall’s existing flow. When flows 10% higher than existing values are not applicable (e.g., an outfall with an existing flow of 0 cfs), a value of 5 cfs is used for the flow limit.

CP refers to “Creek Flow Penalty”. During a 10 year storm, all outfall links that empty into Minnehaha Creek or the channel between the Lake and the Creek are assigned a penalty of \$50,000 plus \$100 for every cfs that exceed a value higher than that outfall’s existing flow. A flow penalty of \$10 per cfs is applied if the outfall’s flow does not exceed its existing flow in order to encourage Optimizer to select solutions that reduce flows into Minnehaha Creek.

SP refers to “Storage Max Depth Penalty”. In the city’s XPSWMM model, storage nodes represent low points where structure flooding occurs. Penalties are applied to a storage node as the maximum depth reached in that node increases and impacts structures. HR Green utilized multiple penalty systems for these storage nodes, with the most commonly used system assigning a penalty of \$1,000,000 for each habitable residential or commercial structure impacted and a penalty of \$20,000 for each uninhabitable accessory structure impacted.

Due to high penalties assigned for increases in flow to the Lake, Creek, and the unnamed channel, it was necessary to increase the penalty assigned for impacted structures so that Optimizer would not preferentially allow flooding of structures to eliminate flow rate increases. The penalty associated with structure impacts are not intended to represent actual property values.

## Lessons Learned













As requested by the City from the perspective of the consulting engineer, HR Green's comments on using Optimizer™ to analyze this scenario are listed below.

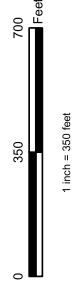
1. A significant amount of time was spent fine tuning costs and penalties that required additional re-modeling. Now that this project has been completed in Optimizer™, it will be beneficial in future projects to have the costs and penalties standardized prior to modeling. The City could develop a list of parameters including pipe cost, structure penalties, flow penalties, etc. and their corresponding costs and penalties for distribution.
2. The SW Harriet project was set up in Optimizer as one large model. After a majority of the optimizations was complete, HR Green questioned whether Optimizer would be more efficient if the project was broken into pipesheds. That way, Optimizer would narrow in more closely on optimizing costs and penalties specific to each pipeshed, rather than juggling restrictions for the entire Study Area. HR Green recommends breaking larger study areas into more manageable sections prior to an analysis in Optimizer.
3. When reviewing results, it was difficult to tell if the data was valid, or if user error (such as set up) was incorporated. The biggest problem HR Green experienced was using Optimizer's storage scripts. HR Green attempted to set node storage cost as free; however, it still chose to upsize pipe and provide inline storage at high cost, rather than take full advantage of the node storage. If possible, it would be nice if Optimizer produced some reasoning behind the results.
4. Optimizer runs on an open source EPA-SWMM software. It is not easy to apply the information obtained from Optimizer back into an XPSWMM model to check the results. Because any change Optimizer suggests needs to be verified in the original XPSWMM model, more time is consumed translating the possibilities into XPSWMM. If Optimizer was compatible with XPSWMM, much time and effort would be saved.

# Appendix D – Proposed Improvements

# SW Harriet Figure D.1 Piped 1-N Proposed Improvements

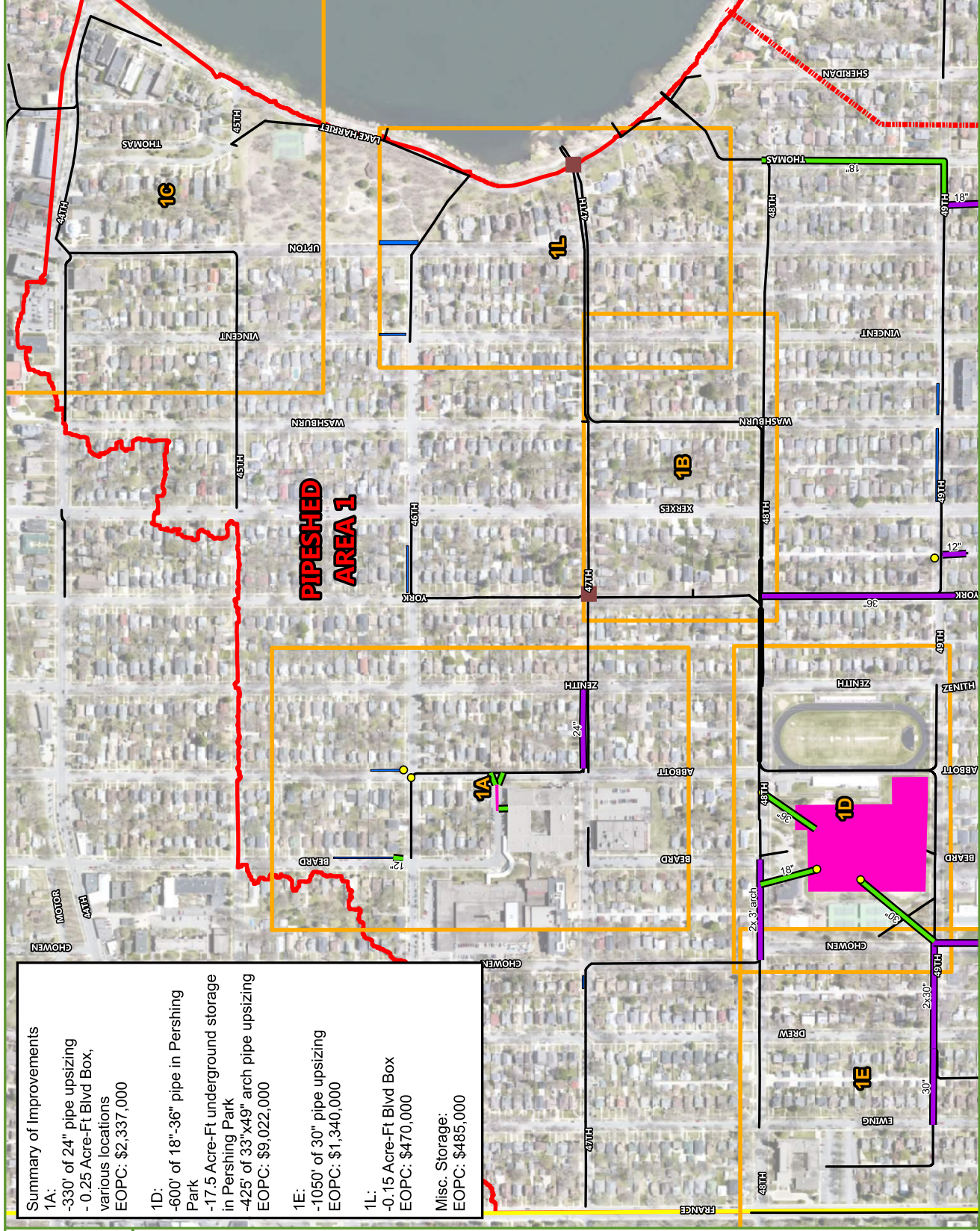
## Legend

-  Grit Chamber
-  Pump Station
-  Backflow Preventers
-  New Pipe
-  Upsized Pipe
-  Boulevard Boxes
-  Stormwater Detention
-  Existing Storm
-  Piped 1-N
-  Area of Interest
-  City Boundary
-  Study Area



## Summary of Improvements

- 1A:**  
-330' of 24" pipe upsizing  
-0.25 Acre-Ft Blvd Box,  
various locations  
EOPC: \$2,337,000
- 1D:**  
-600' of 18"-36" pipe in Pershing  
Park  
-17.5 Acre-Ft underground storage  
in Pershing Park  
-425' of 33"x49" arch pipe upsizing  
EOPC: \$9,022,000
- 1E:**  
-1050' of 30" pipe upsizing  
EOPC: \$1,340,000
- 1L:**  
-0.15 Acre-Ft Blvd Box  
EOPC: \$470,000
- Misc. Storage:**  
EOPC: \$485,000

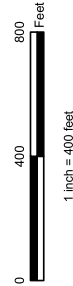


SW Harriet

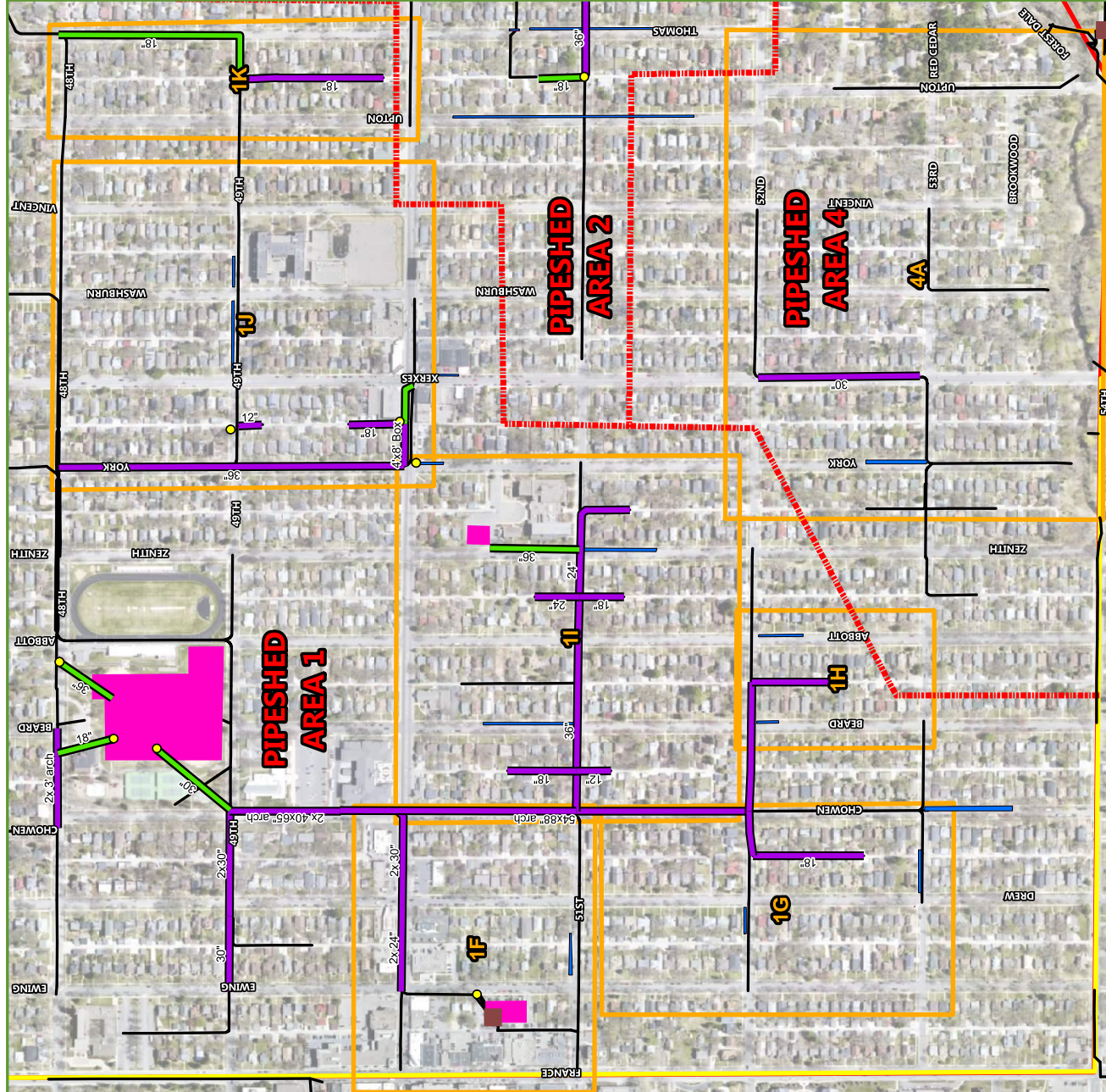
## Figure D.2 Pipesheds 1-S and 4 Proposed Improvements

### Legend

- Grit Chamber
- Pump Station
- Backflow Preventers
- New Pipe
- Upsized Pipe
- Boulevard Boxes
- Stormwater Detention
- Existing Storm
- Pipeshed Boundaries
- Area of Interest
- City Boundary
- Study Area



Summary of Improvements	
1F:	-0.225 Acre-Ft underground storage -330' of double barrel 24" pipe upsizing -360' of double barrel 30" pipe upsizing -0.05 Acre-Ft boulevard box EOPC: \$2,110,000
1G:	-560' of 18" pipe upsizing -0.45 Acre-Ft Blvd Box, various locations EOPC: \$2,571,000
1H:	-840' of 18" pipe upsizing -0.175 Acre-Ft Blvd Box EOPC: \$2,018,000
1I:	-420' of 40"x65" double barrel arch pipe upsizing -1575' of 54"x88" arch pipe upsizing -1125' of 24" and 36" pipe upsizing -865' of 12" to 24" alley pipe upsizing -380' of 36" new pipe -1.05 Acre-Ft stormwater detention EOPC: \$10,876,000
1J:	-330' of 4"x8' new box culvert -1320' of 36" pipe upsizing -300' of 12" and 18" alley pipe upsizing -0.45 Acre-Ft Blvd Box, various locations EOPC: \$3,379,000
1K:	-540' of 18" alley pipe upsizing -850' of 18" new pipe EOPC: \$2,236,000
4A:	-600' of 30" pipe upsizing -0.15 Acre-Ft Blvd Box EOPC: \$1,716,000















SW Harriet

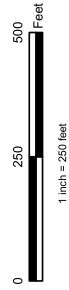
## Figure D.3

### Pipeshed 2

#### Proposed Improvements

#### Legend

-  Grit Chamber
-  Pump Station
-  Backflow Preventers
-  New Pipe
-  Upsized Pipe
-  Boulevard Boxes
-  Stormwater Detention
-  Existing Storm
-  Pipeshed Boundaries
-  Area of Interest
-  City Boundary
-  Study Area



**Summary of Improvements**

**2A:**

- 1850' of 60" pipe upsizing
- 550' of 7'x18' Box Culvert under Sheridan
- 900' of 18" to 24" alley pipe
- 500' of 18" to 36" pipe upsizing
- Additional 1.5 Acre-Ft of Blvd Box; various locations
- EOPC: \$16,797,000

**2B:**

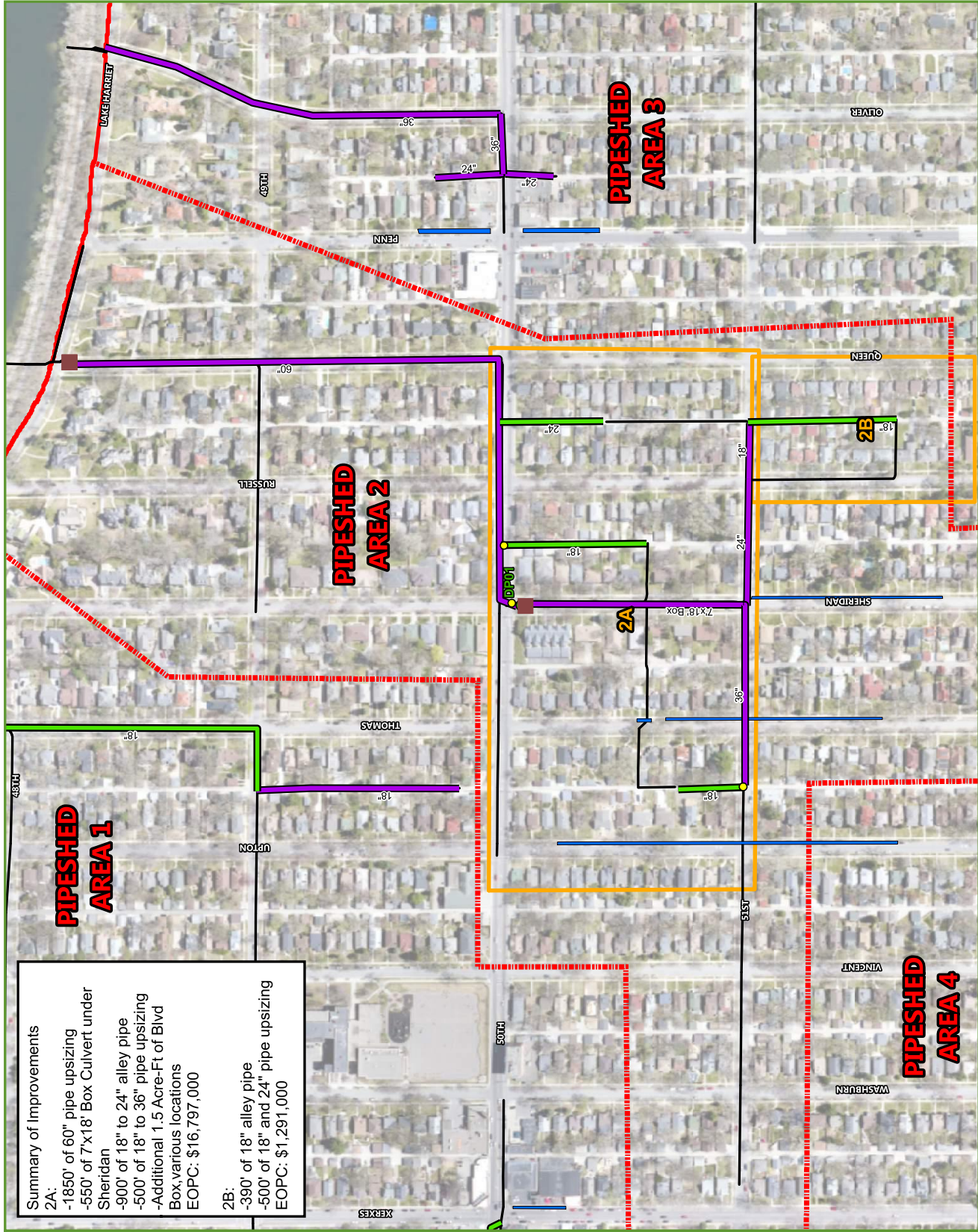
- 390' of 18" alley pipe
- 500' of 18" and 24" pipe upsizing
- EOPC: \$1,291,000

### PIPESHED AREA 1

### PIPESHED AREA 2

### PIPESHED AREA 3

### PIPESHED AREA 4



# SW Harriet















## Figure D.4

### Pipeshed 3

#### Proposed

#### Improvements

#### Legend

-  Grit Chamber
-  Filtration / Infiltration Device
-  Pump Station
-  Backflow Preventers
-  New Pipe
-  Upsized Pipe
-  Boulevard
-  Boxes
-  Stormwater Detention
-  Existing Storm
-  Pipeshed Boundaries
-  Area of Interest
-  City Boundary
-  Study Area



1 inch = 300 feet



#### Summary of Improvements

##### 3A:

- 1250' of 60" pipe upsizing
- 315' of 24" alley pipe upsizing
- 900' of 18" to 24" alley pipe
- 0.1 Acre-Ft boulevard box
- EOPC: \$3,187,000

##### 3B:

- 1290' of 15" to 30" new and upsized pipe
- 1.6 Acre-Ft underground storage under Mt Olivet parking lot
- 175' of 15" and 24" pipe under Mt Olivet parking lot
- 1.05 Acre-Ft stormwater pond south of 51st St
- EOPC: \$3,157,000

##### 3C:

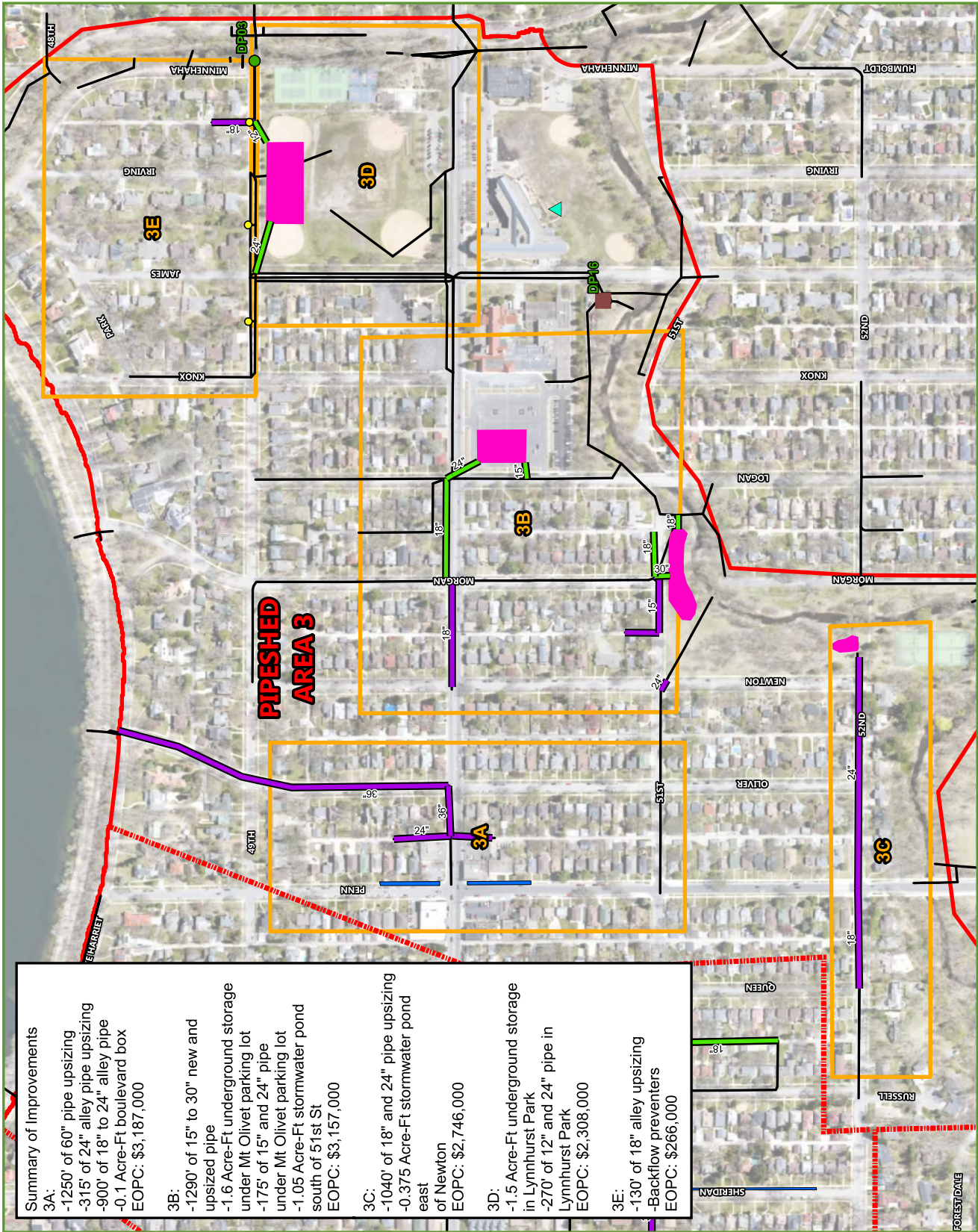
- 1040' of 18" and 24" pipe upsizing
- 0.375 Acre-Ft stormwater pond east of Newton
- EOPC: \$2,746,000

##### 3D:

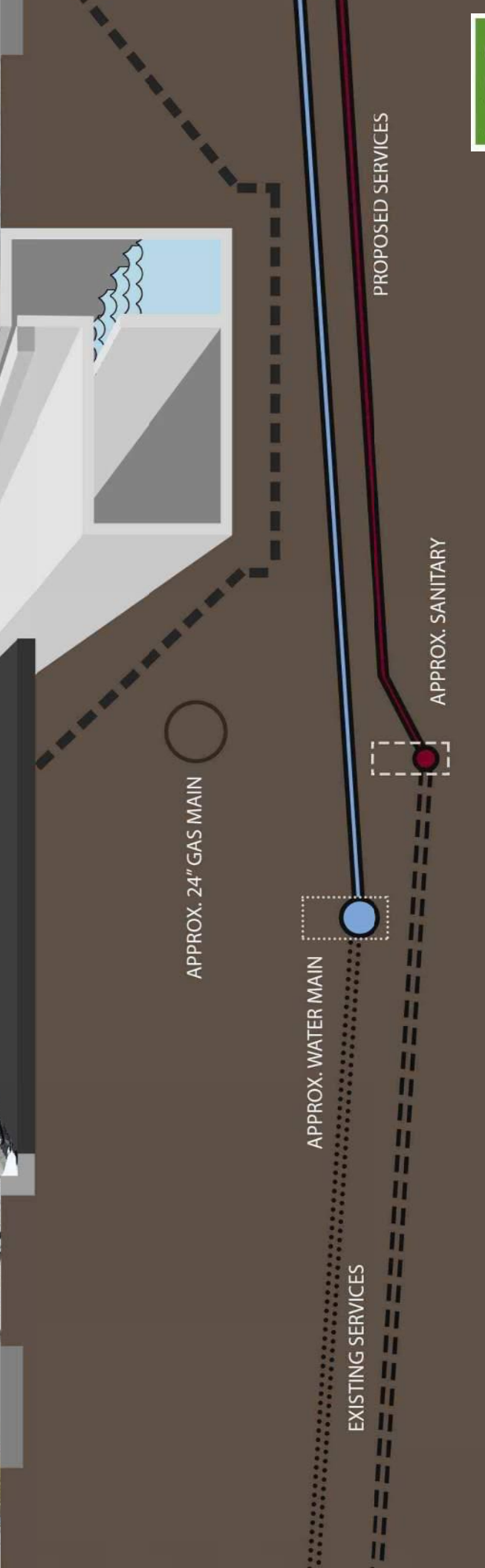
- 1.5 Acre-Ft underground storage in Lynnhurst Park
- 270' of 12" and 24" pipe in Lynnhurst Park
- EOPC: \$2,308,000

##### 3E:

- 130' of 18" alley upsizing
- Backflow preventers
- EOPC: \$266,000



# Appendix E – Boulevard Box Drawings



# Appendix F – Underground Detention System Options

## Option 1: StormTrap Chamber System

Suitable for Pershing Field Park and/or Lynnhurst Park



Retrieved from <http://stormtrap.com/products/singletrap/>

Chowen Ave S

Chowen Ave S

W 49th St

W 49th St

200.00 ft

1,939.85 ft

1,800.00 ft

1,600.00 ft




1,400.00 ft

1,000.00 ft

1,200.00 ft

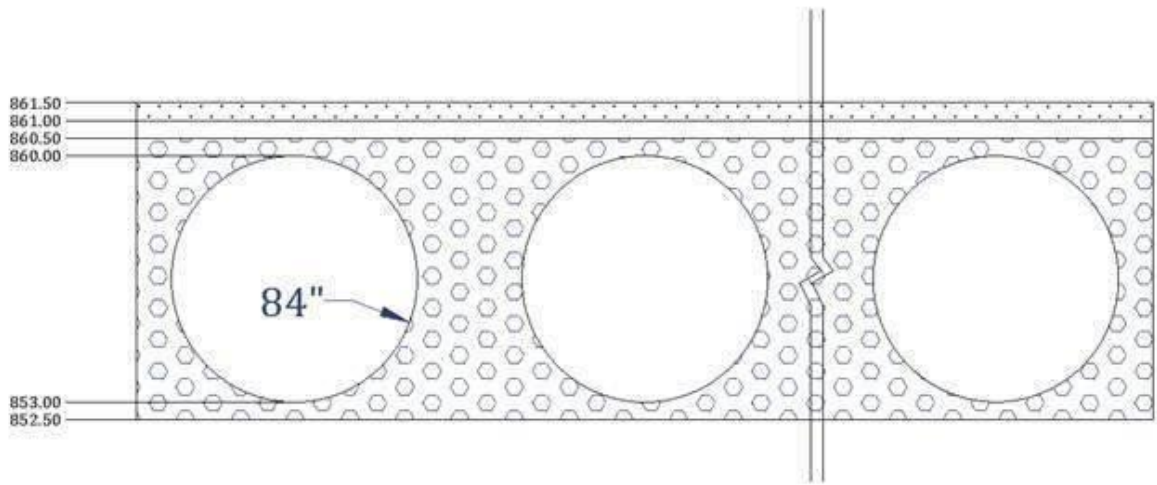
800.00 ft

Basketball Court

-  StormTrap chamber
-  Dimension line
-  Possible chamber extents

## Alternative Option: Perforated Steel Pipe

Suitable for Pershing Field Park, Lynnhurst Park, and/or Parking Lot Storage



Perforated Steel Pipe allows for seepage into gravel backfill for additional storage space.

## Proposed Perforated Steel Pipe Layout at Pershing Field Park



# Appendix G – Soil Boring Data



# Boring Location Diagram

Southwest Harriet Feasibility Study – Pershing Park

Minneapolis, Minnesota

NTI Project #: 18.MSP05550.000

NOTE: Boring locations are approximate.

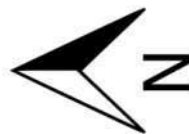


Completed Boring Locations: ●

Temporary Piezometer Locations: ●



**NTI**  
NORTHERN  
TECHNOLOGIES, LLC



Boring Location Diagram  
 Southwest Harriet Feasibility Study – Lynnhurst Park  
 Minneapolis, Minnesota  
 NTI Project #: 18.MSP05550.000  
 NOTE: Boring locations are approximate.

- Completed Boring Locations: ●
- Temporary Piezometer Locations: ●



**NTI**  
 NORTHERN  
 TECHNOLOGIES, LLC



Completed Boring Locations: ●

Boring Location Diagram

Southwest Harriet Feasibility Study – Minnehaha Creek Park

Minneapolis, Minnesota

NTI Project #: 18.MSP05550.000

NOTE: Boring locations are approximate.





Inver Grove Heights  
6160 Carmen Avenue East  
Inver Grove Heights, MN, 55076  
P: 651-389-4191

**CLIENT** Minneapolis Parks and Recreation Board **PROJECT NAME** Southwest Harriet Feasibility Study  
**PROJECT NUMBER** 18.MSP05550.000 **PROJECT LOCATION** Minneapolis, MN  
**DATE STARTED** 5/29/18 **COMPLETED** 5/29/18 **GROUND ELEVATION** 860 feet **HOLE SIZE** 6 1/2 in.  
**DRILLING CONTRACTOR** NTI **GROUND WATER LEVELS:**  
**DRILLING METHOD** 3 1/4 in H.S.A **AT TIME OF DRILLING** 15.50 ft / Elev 844.50 ft  
**LOGGED BY** RRH **CHECKED BY** SDG **AT END OF DRILLING** ---  
**CAVE IN (ft)** --- **FROST DEPTH (ft)** --- **72hrs AFTER DRILLING** 7.70 ft / Elev 852.30 ft  
**NOTES** Elevation determined using a Trimble GeoXH 6000 (NAVD 88 GeoID 09 datum).

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0												
1.0		TOPSOIL (12 Inches) 859.0	AU 1									
		POORLY GRADED SAND, (SP) brown to dark brown, fine to coarse grained, moist, trace gravel, trace organics (Undocumented Fill)	SS 2	67	6-4-4 (8)			5				5
5			SS 3	78	4-1-1 (2)							
5.5		PEAT, (Pt) black, moist, soft, trace gravel, fibrous (Paludal Deposit) NOTE: Organic content in sample 4 = 83.3%.	SS 4	89	2-1-1 (2)			403				
9.5		LEAN CLAY WITH SAND, (CL) gray, moist, soft to medium, trace gravel (Lacustrine Deposit) 850.5	SS 5	100	2-1-1 (2)			30				
			SS 6	22	2-2-3 (5)							
15		POORLY GRADED SAND WITH SILT, (SP-SM) gray, fine to coarse grained, saturated, very loose to loose, trace gravel (Glacial Outwash) 845.0	SS 7	89	1-1-2 (3)							
20		NOTE: Brown below 19.5 feet.	SS 8	100	2-2-2 (4)							
25			SS 9	89	2-2-3 (5)							
26.0		834.0										

Temporary piezometer installed after termination of  
boring.  
Bottom of borehole at 26.0 feet.



**P-2**  
PAGE 1 OF 1

NTI LOG - GENERAL (USE THIS ONE) - NTI-2017-09-14.GDT - 6/11/18 14:52 - R:\RAMSEY\1-PROJECTS\2018 PROJECTS\SOUTHWEST HARRIET FEASIBILITY STUDY GEO - 18.MSP\_05550.000\TESTING REPORTS\GINT\SOUTHWEST HARRIET STUDY.GPJ

[illegible]



Inver Grove Heights  
6160 Carmen Avenue East  
Inver Grove Heights, MN, 55076  
P: 651-389-4191

# BORING NUMBER SB-1

PAGE 1 OF 1

CLIENT	Minneapolis Parks and Recreation Board	PROJECT NAME	Southwest Harriet Feasibility Study
PROJECT NUMBER	18.MSP05550.000	PROJECT LOCATION	Minneapolis, MN
DATE STARTED	5/30/18	COMPLETED	5/30/18
GROUND ELEVATION	858.5 feet	HOLE SIZE	6 1/2 in.
DRILLING CONTRACTOR	NTI	GROUND WATER LEVELS:	
DRILLING METHOD	3 1/4 in H.S.A	AT TIME OF DRILLING	13.00 ft / Elev 845.50 ft
LOGGED BY	RRH	CHECKED BY	SDG
AT END OF DRILLING	---	AFTER DRILLING	---
CAVE IN (ft)	---	FROST DEPTH (ft)	---
NOTES	Elevation determined using a Trimble GeoXH 6000 (NAVD 88 GeoID 09 datum).		

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0												
		0.6 TOPSOIL (7 Inches) 857.9	AU 1									
		CLAYEY SAND, (SC) brown, fine to coarse grained, moist, trace gravel (Undocumented Fill)	SS 2	67	3-3-2 (5)							
5		4.5 PEAT, (Pt) black, moist, soft, trace gravel, fibrous (Paludal Deposit) NOTE: Organic content in sample 3 = 72.2%. 854.0	SS 3	78	2-1-1 (2)			321				
			SS 4	78	1-1-2 (3)							
10		9.5 LEAN CLAY WITH SAND, (CL) gray, moist, soft, trace gravel (Lacustrine Deposit) 849.0	SS 5	100	1-1-0 (1)			33				
		12.0 CLAYEY SAND, (SC) brown, fine to coarse grained, saturated, very loose, trace gravel (Lacustrine Deposit) 846.5	SS 6	100	1-1-2 (3)			15				11
15			SS 7	67	1-2-2 (4)							
20		19.5 POORLY GRADED SAND, (SP) light brown, fine to coarse grained, saturated, very loose, trace gravel (Glacial Outwash) 839.0	SS 8	100	2-1-2 (3)							
25			SS 9	100	1-1-2 (3)							
		26.0 832.5										

Bottom of borehole at 26.0 feet.



Inver Grove Heights  
6160 Carmen Avenue East  
Inver Grove Heights, MN, 55076  
P: 651-389-4191

# BORING NUMBER SB-2

PAGE 1 OF 1

CLIENT	Minneapolis Parks and Recreation Board	PROJECT NAME	Southwest Harriet Feasibility Study
PROJECT NUMBER	18.MSP05550.000	PROJECT LOCATION	Minneapolis, MN
DATE STARTED	5/30/18	COMPLETED	5/30/18
GROUND ELEVATION	860.5 feet	HOLE SIZE	6 1/2 in.
DRILLING CONTRACTOR	NTI	GROUND WATER LEVELS:	
DRILLING METHOD	3 1/4 in H.S.A	▽ AT TIME OF DRILLING	14.00 ft / Elev 846.50 ft
LOGGED BY	RRH	CHECKED BY	SDG
AT END OF DRILLING	---	AFTER DRILLING	---
CAVE IN (ft)	---	FROST DEPTH (ft)	---
NOTES	Elevation determined using a Trimble GeoXH 6000 (NAVD 88 GeoID 09 datum).		

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0												
0.7		TOPSOIL (8 Inches) 859.8	AU 1									
		SANDY LEAN CLAY, (CL) dark brown to black, moist, trace gravel, trace organics (Undocumented Fill) NOTE: Organic content in sample 2 = 3.2%.	SS 2	100	4-4-8 (12)			21				
4.5		856.0										
6.0		POORLY GRADED SAND WITH SILT, (SP-SM) brown, fine to coarse grained, moist, trace gravel (Undocumented Fill) 854.5	SS 3	100	5-4-3 (7)							
		PEAT, (Pt) black, moist, soft, trace gravel, fibrous (Paludal Deposit) NOTE: Organic content in sample 4 = 84.4%.	SS 4	100	3-1-2 (3)			394				
12.0		848.5										
		ORGANIC CLAY, (OH) black, moist, soft, trace gravel (Paludal Deposit) NOTE: Organic content in sample 6 = 10.6%.	SS 6	100	1-1-1 (2)			65				
14.5		846.0										
		POORLY GRADED SAND, (SP) brown, fine to coarse grained, saturated, loose to very loose, trace gravel (Glacial Outwash)	SS 7	89	1-2-3 (5)							
20			SS 8	100	2-3-2 (5)			16				2
26.0		834.5	SS 9	100	2-2-2 (4)							

Bottom of borehole at 26.0 feet.



Inver Grove Heights  
6160 Carmen Avenue East  
Inver Grove Heights, MN, 55076  
P: 651-389-4191

# BORING NUMBER SB-3

PAGE 1 OF 1

CLIENT	Minneapolis Parks and Recreation Board	PROJECT NAME	Southwest Harriet Feasibility Study
PROJECT NUMBER	18.MSP05550.000	PROJECT LOCATION	Minneapolis, MN
DATE STARTED	5/30/18	COMPLETED	5/30/18
GROUND ELEVATION	860.5 feet	HOLE SIZE	6 1/2 in.
DRILLING CONTRACTOR	NTI	GROUND WATER LEVELS:	
DRILLING METHOD	3 1/4 in H.S.A	▽ AT TIME OF DRILLING	19.50 ft / Elev 841.00 ft
LOGGED BY	RRH	CHECKED BY	SDG
AT END OF DRILLING	---		
CAVE IN (ft)	---	FROST DEPTH (ft)	---
AFTER DRILLING	---		
NOTES	Elevation determined using a Trimble GeoXH 6000 (NAVD 88 GeoID 09 datum).		

NTI LOG - GENERAL (USE THIS ONE) - NTI-2017-09-14.GDT - 61118 14.52 - R\RAMSEY\PROJECTS\2018 PROJECTS\SWHARHET\REPORTS\GINT\SWHARHET STUDY.GPJ

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0												
1.0		TOPSOIL (12 Inches) 859.5	AU 1									
		POORLY GRADED SAND WITH SILT, (SP-SM) light brown, fine to coarse grained, moist, trace gravel (Undocumented Fill)	SS 2	100	5-6-7 (13)			4				8
4.5		856.0										
5		PEAT, (Pt) black, moist, medium to soft, trace gravel, fibrous (Paludal Deposit) NOTE: Organic content in sample 3 = 72.3%.	SS 3	89	4-2-3 (5)			235				
			SS 4	89	2-2-1 (3)							
10			SS 5	89	1-1-2 (3)							
12.0		CLAYEY SAND, (SC) black, fine to coarse grained, saturated, very loose, trace gravel, trace organics (Lacustrine Deposit) 848.5	SS 6	89	2-0-1 (1)			40				
14.5		NOTE: Organic content in sample 6 = 4.4%. 846.0	SS 7	89	1-1-0 (1)							
15		LEAN CLAY, (CL) brown to dark brown, wet, soft, trace gravel, occasional wood debris, trace organics (Lacustrine Deposit)										
19.5	▽	841.0										
20		POORLY GRADED SAND, (SP) light brown, fine to coarse grained, saturated, loose to medium dense, little gravel (Glacial Outwash)	SS 8	100	3-2-3 (5)							
25			SS 9	100	8-7-6 (13)							
26.0		834.5										

Bottom of borehole at 26.0 feet.





Inver Grove Heights  
6160 Carmen Avenue East  
Inver Grove Heights, MN, 55076  
P: 651-389-4191

# BORING NUMBER SB-5

PAGE 1 OF 1

CLIENT	Minneapolis Parks and Recreation Board	PROJECT NAME	Southwest Harriet Feasibility Study
PROJECT NUMBER	18.MSP05550.000	PROJECT LOCATION	Minneapolis, MN
DATE STARTED	5/30/18	COMPLETED	5/30/18
GROUND ELEVATION	842.5 feet	HOLE SIZE	6 1/2 in.
DRILLING CONTRACTOR	NTI	GROUND WATER LEVELS:	
DRILLING METHOD	3 1/4 in H.S.A	▽ AT TIME OF DRILLING	8.00 ft / Elev 834.50 ft
LOGGED BY	RRH	CHECKED BY	SDG
AT END OF DRILLING	---	AFTER DRILLING	---
CAVE IN (ft)	---	FROST DEPTH (ft)	---
NOTES	Elevation determined using a Trimble GeoXH 6000 (NAVD 88 GeoID 09 datum).		

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0												
0.1		TOPSOIL (1 1/2 Inches)	AU 1									
		CLAYEY SAND, (SC) dark brown to brown, fine to medium grained, moist, trace gravel (Undocumented Fill)	SS 2	89	4-4-5 (9)			15				35
4.5		PEAT, (Pt) black, moist, soft, trace gravel, fibrous (Paludal Deposit)	SS 3	89	2-2-2 (4)							
8.0		POORLY GRADED SAND, (SP) brown, fine to coarse grained, saturated, very loose to medium dense, trace gravel (Glacial Outwash)	SS 4	78	3-2-2 (4)			13				3
			SS 5	89	2-2-3 (5)							
			SS 6	100	5-5-6 (11)							
			SS 7	89	1-1-2 (3)							
			SS 8	100	1-1-2 (3)							
			SS 9	100	1-1-2 (3)							
26.0												

Bottom of borehole at 26.0 feet.



Inver Grove Heights  
6160 Carmen Avenue East  
Inver Grove Heights, MN, 55076  
P: 651-389-4191

# BORING NUMBER SB-6

PAGE 1 OF 1

CLIENT Minneapolis Parks and Recreation Board PROJECT NAME Southwest Harriet Feasibility Study  
PROJECT NUMBER 18.MSP05550.000 PROJECT LOCATION Minneapolis, MN  
DATE STARTED 5/30/18 COMPLETED 5/30/18 GROUND ELEVATION 842 feet HOLE SIZE 6 1/2 in.  
DRILLING CONTRACTOR NTI GROUND WATER LEVELS:  
DRILLING METHOD 3 1/4 in H.S.A ▽ AT TIME OF DRILLING 7.00 ft / Elev 835.00 ft  
LOGGED BY RRH CHECKED BY SDG AT END OF DRILLING ---  
CAVE IN (ft) --- FROST DEPTH (ft) --- AFTER DRILLING ---  
NOTES Elevation determined using a Trimble GeoXH 6000 (NAVD 88 GeoID 09 datum).

DEPTH (ft)	GRAPHIC LOG	MATERIAL DESCRIPTION	SAMPLE TYPE NUMBER	RECOVERY % (RQD)	BLOW COUNTS (N VALUE)	POCKET PEN. (tsf)	DRY UNIT WT. (pcf)	MOISTURE CONTENT (%)	ATTERBERG LIMITS			FINES
									LIQUID LIMIT	PLASTIC LIMIT	PLASTICITY INDEX	
0												
0.3		TOPSOIL (3 Inches)	AU 1									
		SANDY LEAN CLAY, (CL) black, moist, trace gravel (Undocumented Fill) NOTE: Organic content in sample 2 = 2.9%.	SS 2	78	2-2-4 (6)			28				
4.5		CLAYEY SAND, (SC) brown to black, fine to medium grained, moist, trace gravel, trace organics (Undocumented Fill)	SS 3	89	2-2-2 (4)							
7.0		POORLY GRADED SAND WITH SILT, (SP-SM) brown, fine to medium grained, moist, trace gravel (Undocumented Fill)	SS 4	89	2-2-3 (5)							
			SS 5	89	2-3-5 (8)							
12.0		LEAN CLAY WITH SAND, (CL) black to dark brown, moist, soft, trace gravel, trace organics (Lacustrine Deposit) NOTE: Organic content in sample 6 = 2.4%.	SS 6	89	1-1-1 (2)			51				
			SS 7	89	1-1-2 (3)			49				
19.5		POORLY GRADED SAND WITH SILT, (SP-SM) dark gray to black, fine to coarse grained, saturated, loose, trace gravel, trace organics (Lacustrine Deposit)	SS 8	89	1-4-4 (8)							
24.5		LEAN CLAY WITH SAND, (CL) brown to gray, wet, medium, trace gravel, trace organics (Lacustrine Deposit)	SS 9	100	3-4-4 (8)			36				
26.0												

Bottom of borehole at 26.0 feet.

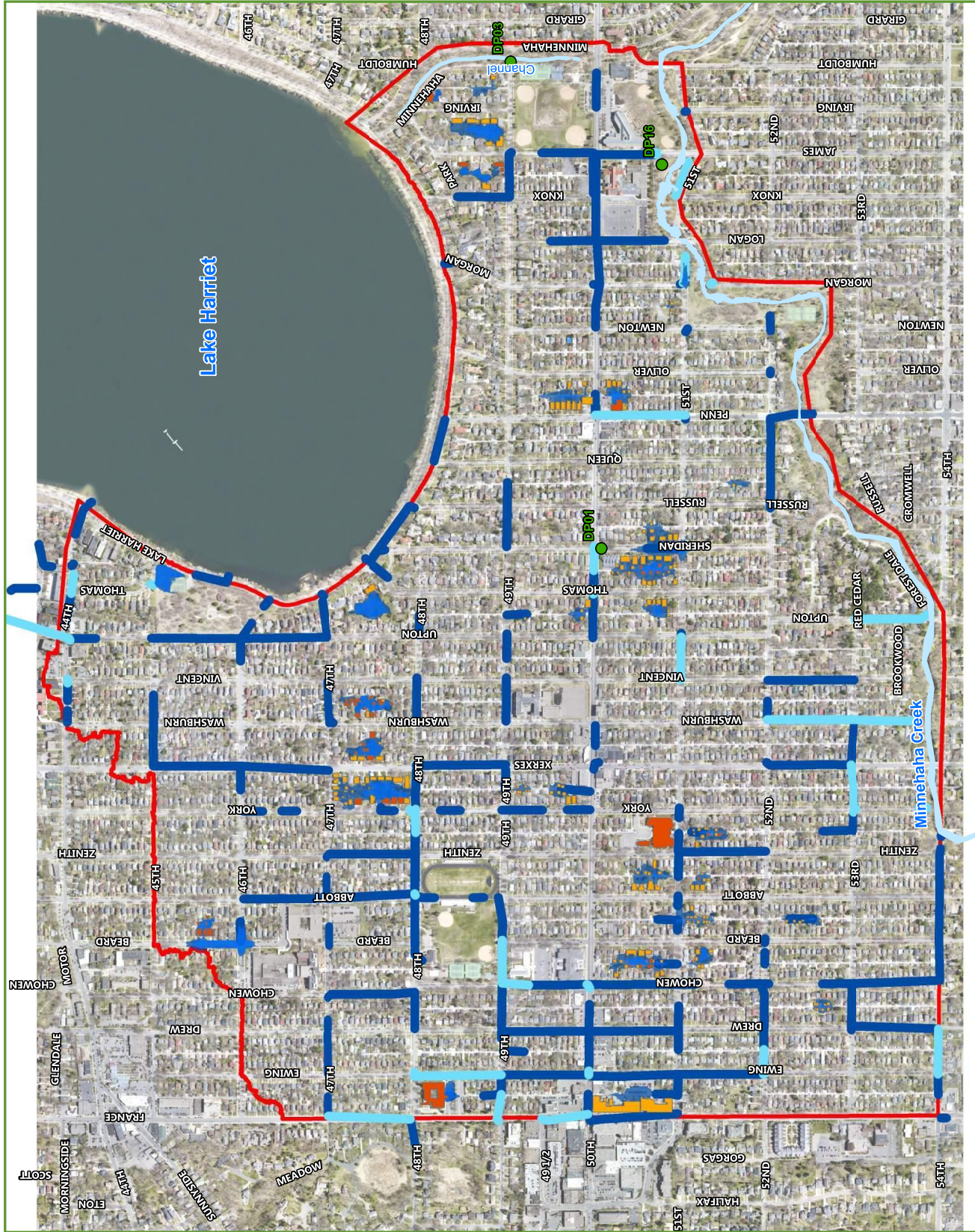
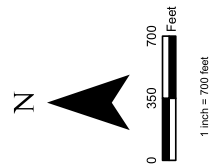
# Appendix H – Proposed Flood Extents

# SW Harriet

## Proposed Flood Extents

### Legend

- Pump Stations
- 10 Yr Proposed Potentially Impacted Structures
- 100 Yr Proposed Potentially Impacted Structures
- Proposed 10 Year Flood Extents
- Proposed 100 Year Flood Extents
- Proposed 10 Year Flooded Streets (>6")
- Proposed 100 Year Flooded Streets (>6")
- Study Area



# Appendix I – Outfall Flow Rates

SW Harriet

Outfall Flows

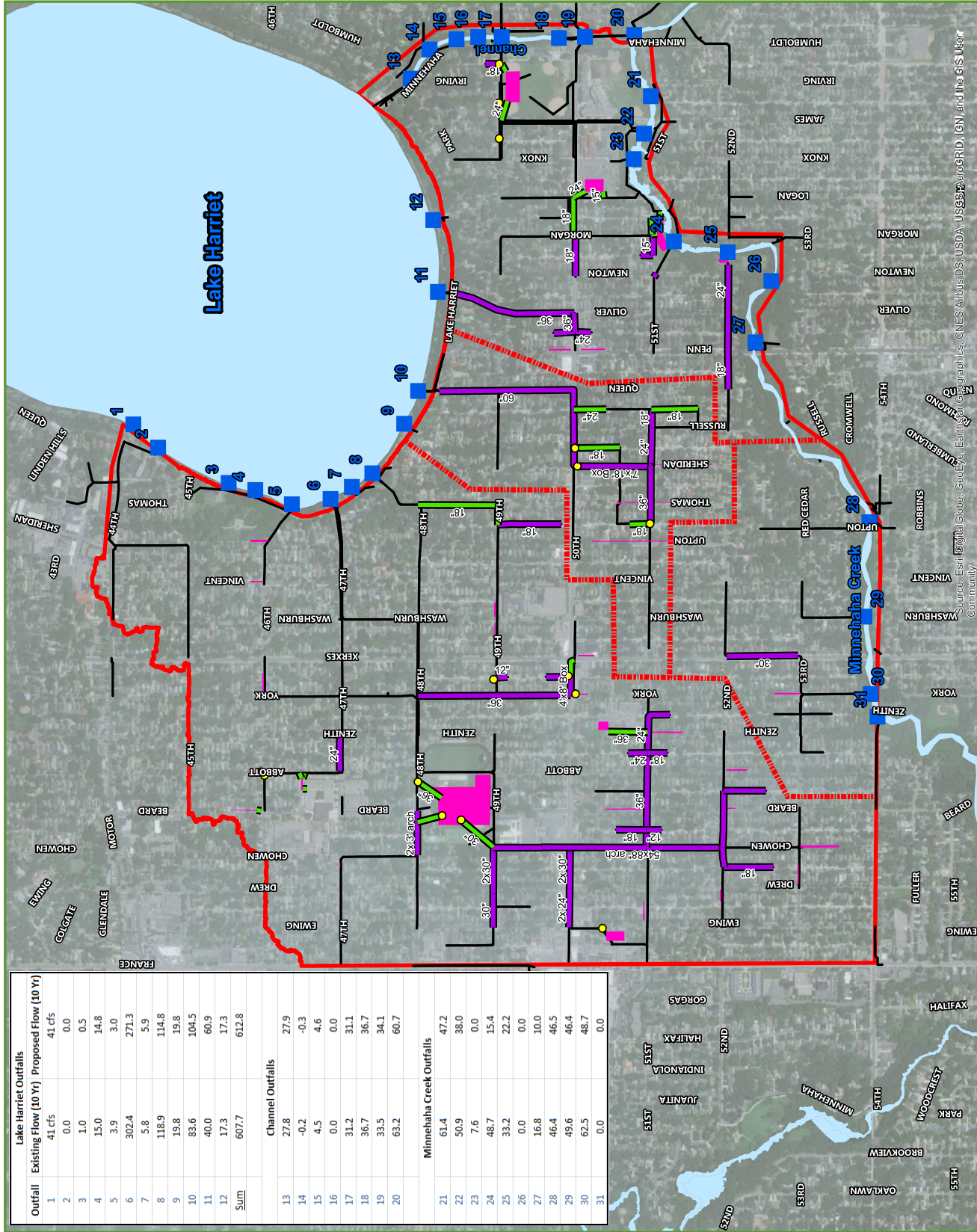
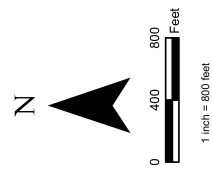
Legend

- Outfall
- Backflow Preventers
- New Pipe
- Upsized Pipe
- Stormwater Detention
- Existing Storm
- Pipeshed Boundaries
- Study Area

Lake Harriet Outfalls		
Outfall	Existing Flow (10 Yr)	Proposed Flow (10 Yr)
1	41 cfs	41 cfs
2	0.0	0.0
3	1.0	0.5
4	15.0	14.8
5	3.0	3.0
6	302.4	271.3
7	5.8	5.9
8	118.9	114.8
9	19.8	19.8
10	83.6	104.5
11	40.0	60.9
12	17.3	17.3
Sum	607.7	612.8

Channel Outfalls	
13	27.8
14	-0.2
15	4.5
16	0.0
17	31.2
18	36.7
19	33.5
20	63.2

Minnehaha Creek Outfalls	
21	61.4
22	50.9
23	7.6
24	48.7
25	33.2
26	0.0
27	16.8
28	46.4
29	49.6
30	62.5
31	0.0



Source: Esri, DigitalGlobe, GeoEye, Earthstar, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

# Appendix J – Opinions of Probable Cost

**The following cost sheets do not include:**

Engineering fees for design and field survey work

Mitigation for groundwater effects on underground detention systems



**Minneapolis**  
Park & Recreation Board



SW Harriett  
 1A- 47th - Abbott to Zenith  
 6/15/2018

DESCRIPTION	UNIT	AMOUNT	UNIT COST	TOTAL COST	COMMENTS
<b>Contract/Services</b>					
Mobilization/Permits/Testing/Survey	%		5.00%	\$18,664	
Traffic Control	%		2.50%	\$9,332	
<b>Sitework</b>					
Dewatering	%		2.50%	\$9,332	
Protect Existing Utilities	%		5.00%	\$18,664	
Bypass During Construction-water, sewer, elec, gas, comm	%		5.00%	\$18,664	
Bypass During Construction-Storm water	%		10.00%	\$37,328	
Erosion Control					
Silt Fence	LF	700	\$7	\$4,900	
Filter Logs	LF	350	\$7	\$2,450	
Inlet Protection	EA	15	\$200	\$3,000	
Demolition and Disposal					
Pavement	YD2	1245	\$30	\$37,350	full width
Curb and Gutter	LF	350	\$15	\$5,250	one side
Sidewalk	YD2	160	\$30	\$4,800	one side
Trees (with stump grind)	EA	6	\$1,500	\$9,000	one side
Street Lights/Power Poles	EA	2	\$1,500	\$3,000	one side
Street Signs	EA	6	\$20	\$120	one side
Catch Basins	EA	5	\$500	\$2,500	
Manholes	EA	4		\$0	In replace MH
Pipe	LF	0		\$0	In replace pipe
<b>Storm Sewer</b>					
24 in Dia Pipe - "Shallow" invert	LF	350	\$225	\$78,750	Incl Cut and Fill
72 - in MH - Base, Barrel, Top, Casting, Cover - "Shallow"	EA	3	\$15,000	\$45,000	Incl Cut and Fill
48 - in MH - Base, Barrel, Top, Casting, Cover - "Shallow"	EA	1	\$12,500	\$12,500	Incl Cut and Fill
Catch Basins - Base, "Barrel", Top, Casting	EA	5	\$5,000	\$25,000	Incl Cut and Fill
Connections to Existing Storm Sewer	EA	2	\$5,000	\$10,000	Incl Cut and Fill
<b>Street and Sidewalk</b>					
Pavement and Pavement Base	YD2	1245	\$75	\$93,375	full width
Curb and Gutter	LF	350	\$27	\$9,275	one side
Driveway and Driveway Base	YD2	0	\$75	\$0	
Driveway Aprons	EA	2	\$2,500	\$5,000	
Sidewalk and Sidewalk Base	YD2	160	\$47	\$7,488	one side
Sidewalk Aprons	EA	2	\$1,500	\$3,000	
<b>Restoration</b>					
Topsoil	YD3	26	\$90	\$2,340	one side
Trees and Bushes	EA	6	\$500	\$3,000	one side
Sod - Large Areas	FT2	0	\$0.60	\$0	one side
Sod - Small Areas	FT2	1400	\$1.20	\$1,680	one side
Street Lights/Power Poles	EA	2	\$1,500	\$3,000	one side
Signage	EA	6	\$250	\$1,500	one side
Misc Items - Retain Walls, Fences, Gardens, etc	LS	1	\$1	\$1	
					\$373,279
<b>SUB TOTAL</b>				\$485,263	
<b>CONTINGENCY (ADD 35 %)</b>				\$130,648	
<b>TOTAL - OPINION OF PROBABLE CONSTRUCTION COST</b>				\$615,910	

SW Harriett  
1A-Abbott - 45th to 46th  
6/15/2018

DESCRIPTION	UNIT	AMOUNT	UNIT COST	TOTAL COST	COMMENTS
<b>Contract/Services</b>					
Mobilization/Permits/Testing/Survey	%		5.00%	\$13,735	
Traffic Control	%		2.50%	\$6,868	
<b>Sitework</b>					
Dewatering	%		2.50%	\$6,868	
Protect Existing Utilities	%		5.00%	\$13,735	
Bypass During Construction-water, sewer, elec, gas, comm	%		5.00%	\$13,735	
Bypass During Construction-Storm water	%		10.00%	\$27,470	
Erosion Control					
Silt Fence	LF	400	\$7	\$2,800	
Filter Logs	LF	200	\$7	\$1,400	
Inlet Protection	EA	8	\$200	\$1,600	
Demolition and Disposal					
Pavement (Street and Alley)	YD2	710	\$30	\$21,300	full width
Curb and Gutter	LF	200	\$15	\$3,000	one side
Sidewalk	YD2	90	\$30	\$2,700	one side
Trees (with stump grind)	EA	6	\$1,500	\$9,000	one side
Street Lights/Power Poles	EA	2	\$1,500	\$3,000	one side
Street Signs	EA	4	\$20	\$80	one side
Catch Basins	EA	4	\$500	\$2,000	
Manholes	EA	1		\$0	In replace MH
Pipe	LF	0		\$0	In replace pipe
<b>Storm Sewer</b>					
12 in Dia Pipe - "Medium" invert	LF	80	\$300	\$24,000	Incl Cut and Fill
4' by 6' Culvert Section - "Medium Depth" 8 to 13 foot invert	LF	100	\$800	\$80,000	Incl Cut and Fill
72 - in MH - Base, Barrel, Top, Casting, Cover - "Med deep"	EA	1	\$20,000	\$20,000	Incl Cut and Fill
Catch Basins - Base, "Barrel", Top, Casting	EA	3	\$5,000	\$15,000	Incl Cut and Fill
Connections to Existing Storm Sewer	EA	1	\$5,000	\$5,000	Incl Cut and Fill
<b>Street and Sidewalk</b>					
Pavement and Pavement Base	YD2	710	\$75	\$53,250	full width
Curb and Gutter	LF	200	\$27	\$5,300	one side
Driveway and Driveway Base	YD2	50	\$75	\$3,750	
Driveway Aprons	EA	2	\$2,500	\$5,000	
Sidewalk and Sidewalk Base	YD2	90	\$47	\$4,212	one side
Sidewalk Aprons	EA	2	\$1,500	\$3,000	
<b>Restoration</b>					
Topsoil	YD3	15	\$90	\$1,350	one side
Trees and Bushes	EA	6	\$500	\$3,000	one side
Sod - Large Areas	FT2	0	\$0.60	\$0	one side
Sod - Small Areas	FT2	800	\$1.20	\$960	one side
Street Lights/Power Poles	EA	2	\$1,500	\$3,000	one side
Signage	EA	4	\$250	\$1,000	one side
Misc Items - Retain Walls, Fences, Gardens, etc	LS	1	\$1	\$1	
					\$274,703
<b>SUB TOTAL</b>				\$357,114	
<b>CONTINGENCY (ADD 35 %)</b>				\$96,146	
<b>TOTAL - OPINION OF PROBABLE CONSTRUCTION COST</b>				\$453,260	

SW Harriett  
1A-Beard - 45th to 46th and Associated  
6/15/2018

DESCRIPTION	UNIT	AMOUNT	UNIT COST	TOTAL COST	COMMENTS
<b>Contract/Services</b>					
Mobilization/Permits/Testing/Survey	%		5.00%	\$21,317	
Traffic Control	%		2.50%	\$10,659	
<b>Sitework</b>					
Dewatering	%		2.50%	\$10,659	
Protect Existing Utilities	%		5.00%	\$21,317	
Bypass During Construction-water, sewer, elec, gas, comm	%		5.00%	\$21,317	
Bypass During Construction-Storm water	%		10.00%	\$42,635	
Erosion Control					
Silt Fence	LF	600	\$7	\$4,200	
Filter Logs	LF	300	\$7	\$2,100	
Inlet Protection	EA	12	\$200	\$2,400	
Demolition and Disposal					
Pavement (Street and Alley)	YD2	1070	\$30	\$32,100	full width
Curb and Gutter	LF	300	\$15	\$4,500	one side
Sidewalk	YD2	135	\$30	\$4,050	one side
Trees (with stump grind)	EA	4	\$1,500	\$6,000	one side
Street Lights/Power Poles	EA	1	\$1,500	\$1,500	one side
Street Signs	EA	3	\$20	\$60	one side
Catch Basins	EA	3	\$500	\$1,500	
Manholes	EA	1		\$0	In replace MH
Pipe	LF	0		\$0	In replace pipe
<b>Storm Sewer</b>					
12 in Dia Pipe - "Medium" invert	LF	80	\$300	\$24,000	Incl Cut and Fill
4' by 6' Culvert Section - "Medium Depth" 8 to 13 foot invert	LF	220	\$800	\$176,000	Incl Cut and Fill
4' by 6' Culvert End Section	EA	2	\$6,000	\$12,000	Incl Cut and Fill
72 - in MH - Base, Barrel, Top, Casting, Cover - "Med deep"	EA	1	\$20,000	\$20,000	Incl Cut and Fill
Catch Basins - Base, "Barrel", Top, Casting	EA	3	\$5,000	\$15,000	Incl Cut and Fill
Connections to Existing Storm Sewer	EA	1	\$5,000	\$5,000	Incl Cut and Fill
<b>Street and Sidewalk</b>					
Pavement and Pavement Base	YD2	1070	\$75	\$80,250	full width
Curb and Gutter	LF	300	\$27	\$7,950	one side
Driveway and Driveway Base	YD2	0	\$75	\$0	
Driveway Aprons	EA	4	\$2,500	\$10,000	
Sidewalk and Sidewalk Base	YD2	135	\$47	\$6,318	one side
Sidewalk Aprons	EA	1	\$1,500	\$1,500	
<b>Restoration</b>					
Topsoil	YD3	23	\$90	\$2,070	one side
Trees and Bushes	EA	4	\$500	\$2,000	one side
Sod - Large Areas	FT2	0	\$0.6	\$0	
Sod - Small Areas	FT2	3000	\$1.20	\$3,600	one side
Street Lights/Power Poles	EA	1	\$1,500	\$1,500	one side
Signage	EA	3	\$250	\$750	one side
Misc Items - Retain Walls, Fences, Gardens, etc	LS	1	\$1	\$1	
					\$426,349
<b>SUB TOTAL</b>				\$554,254	
<b>CONTINGENCY (ADD 35 %)</b>				\$149,222	
<b>TOTAL - OPINION OF PROBABLE CONSTRUCTION COST</b>				\$703,476	

SW Harriett  
 1A- School - Abbott & Beard  
 6/15/2018

DESCRIPTION	UNIT	AMOUNT	UNIT COST	TOTAL COST	COMMENTS
<b>Contract/Services</b>					
Mobilization/Permits/Testing/Survey	%		5.00%	\$17,099	
Traffic Control	%		2.50%	\$8,550	
<b>Sitework</b>					
Dewatering	%		2.50%	\$8,550	
Protect Existing Utilities	%		5.00%	\$17,099	
Bypass During Construction-water, sewer, elec, gas, comm	%		5.00%	\$17,099	
Bypass During Construction-Storm water	%		10.00%	\$34,199	
Erosion Control					
Silt Fence	LF	400	\$7	\$2,800	
Filter Logs	LF	200	\$7	\$1,400	
Inlet Protection	EA	8	\$200	\$1,600	
Demolition and Disposal					
Pavement (Street and Alley)	YD2	1140	\$30	\$34,200	full width
Curb and Gutter	LF	450	\$15	\$6,750	one side
Sidewalk	YD2	27	\$30	\$810	one side
Trees (with stump grind)	EA	5	\$1,500	\$7,500	one side
Street Lights/Power Poles	EA	0	\$1,500	\$0	one side
Street Signs	EA	0	\$20	\$0	one side
Catch Basins	EA	0	\$500	\$0	
Manholes	EA	1		\$0	In replace MH
Pipe	LF	0		\$0	In replace pipe
<b>Storm Sewer</b>					
12 in Dia Pipe - "Medium" invert	LF	150	\$300	\$45,000	Incl Cut and Fill
4' by 6' Culvert Section - "Medium Depth" 8 to 13 foot invert	LF	110	\$800	\$88,000	Incl Cut and Fill
4' by 6' Culvert End Section	EA	2	\$6,000	\$12,000	Incl Cut and Fill
72 - in MH - Base, Barrel, Top, Casting, Cover - "Med deep"	EA	2	\$20,000	\$40,000	Incl Cut and Fill
Catch Basins - Base, "Barrel", Top, Casting	EA	0	\$5,000	\$0	Incl Cut and Fill
Connections to Existing Storm Sewer	EA	0	\$5,000	\$0	Incl Cut and Fill
<b>Street and Sidewalk</b>					
Pavement and Pavement Base	YD2	1140	\$75	\$85,500	full width
Curb and Gutter	LF	450	\$27	\$11,925	one side
Driveway and Driveway Base	YD2	0	\$75	\$0	
Driveway Aprons	EA	0	\$2,500	\$0	
Sidewalk and Sidewalk Base	YD2	27	\$47	\$1,264	one side
Sidewalk Aprons	EA	0	\$1,500	\$0	
<b>Restoration</b>					
Topsoil	YD3	5	\$90	\$450	one side
Trees and Bushes	EA	5	\$500	\$2,500	one side
Sod - Small Areas	FT2	0	\$0.60	\$0	one side
Sod - Small Areas	FT2	240	\$1.20	\$288	one side
Street Lights/Power Poles	EA	0	\$1,500	\$0	one side
Signage	EA	0	\$250	\$0	one side
Misc Items - Retain Walls, Fences, Gardens, etc	LS	1	\$1	\$1	retain wall
					\$341,988
<b>SUB TOTAL</b>				\$444,584	
<b>CONTINGENCY (ADD 35 %)</b>				\$119,696	
<b>TOTAL - OPINION OF PROBABLE CONSTRUCTION COST</b>				\$564,280	

SW Harriett  
1D-Pershing Park Storage and Area  
5/8/2018

DESCRIPTION	UNIT	AMOUNT	UNIT COST	TOTAL COST	COMMENTS
<b>Contract/Services</b>					
Mobilization/Permits/Testing/Survey	%		5.00%	\$311,105	
Traffic Control	%		2.50%	\$155,553	
<b>Sitework</b>					
Dewatering	%		2.50%	\$155,553	
Protect Existing Utilities	%		5.00%	\$0	No Utilities
Bypass During Construction-water, sewer, elec, gas, comm	%		5.00%	\$0	No Utilities
Bypass During Construction-Storm water	%		10.00%	\$0	No Utilities
Erosion Control					
Silt Fence	LF	3400	\$7	\$23,800	
Filter Logs	LF	575	\$7	\$4,025	
Inlet Protection	EA	14	\$200	\$2,800	
Demolition and Disposal					
Pavement	YD2	2670	\$30	\$80,100	entire width
Curb and Gutter	LF	650	\$15	\$9,750	one side
Sidewalk	YD2	280	\$30	\$8,400	one side
Trees (with stump grind)	EA	12	\$1,500	\$18,000	one side
Street Lights/Power Poles	EA	4	\$1,500	\$6,000	one side
Street Signs	EA	10	\$20	\$200	one side
Catch Basins	EA	6	\$500	\$3,000	
Manholes	EA	5		\$0	incl w/ replace
Pipe	LF	375		\$0	incl w/replace
<b>Storm Sewer</b>					
18 - inch dia pipe - cost "Shallow"	LF	230	\$200	\$46,000	Incl Cut and Fill
30 - inch dia pipe - cost "Shallow"	LF	250	\$250	\$62,500	Incl Cut and Fill
36 - inch dia pipe - cost "Shallow"	LF	250	\$300	\$75,000	Incl Cut and Fill
33 x 49 Arch pipe - 42 - inch dia pipe equiv - cost "Shallow"	LF	375	\$350	\$131,250	Incl Cut and Fill
72 - in MH - Base, Barrel, Top, Casting, Cover - "Shallow"	EA	7	\$15,000	\$105,000	Incl Cut and Fill
96 - in MH - Base, Barrel, Top, Casting, Cover - "Shallow"	EA	5	\$22,500	\$112,500	Incl Cut and Fill
Catch Basins - Base, "Barrel", Top, Casting	EA	6	\$5,000	\$30,000	Incl Cut and Fill
Connections to Existing Storm Sewer	EA	4	\$5,000	\$20,000	Incl Cut and Fill
<b>Storage Basin -</b>					
Storm Tec or Storm Trap Type System	EA	1	\$5,000,000	\$5,000,000	StormTrap Est.
<b>Street and Sidewalk</b>					
Pavement and Pavement Base	YD2	2670	\$75	\$200,250	full width
Curb and Gutter	LF	650	\$27	\$17,225	one side
Driveway and Driveway Base	YD2	0	\$75	\$0	placeholder
Driveway Aprons	EA	2	\$2,500	\$5,000	
Sidewalk and Sidewalk Base	YD2	280	\$47	\$13,104	one side
Sidewalk Aprons	EA	3	\$1,500	\$4,500	
<b>Restoration</b>					
Topsoil	YD3	1500	\$90	\$135,000	
Trees and Bushes	EA	12	\$500	\$6,000	
Sod - Large Areas	FT2	157000	\$0.60	\$94,200	
Sod - Large Areas	FT2	0	\$1.20	\$0	
Street Lights/Power Poles	EA	4	\$1,500	\$6,000	
Signage	EA	10	\$250	\$2,500	
Misc Items - Retain Walls, Fences, Gardens, etc	LS	1	\$1	\$1	Ballfields?
					\$6,222,105
<b>SUB TOTAL</b>				\$6,844,316	
<b>CONTINGENCY (ADD 35 %)</b>				\$2,177,737	
<b>TOTAL - OPINION OF PROBABLE CONSTRUCTION COST</b>				\$9,022,052	

SW Harriett  
 1E-W49th - Ewing to Drew  
 6/15/2018

DESCRIPTION	UNIT	AMOUNT	UNIT COST	TOTAL COST	COMMENTS
<b><u>Contract/Services</u></b>					
Mobilization/Permits/Testing/Survey	%		5.00%	\$40,599	
Traffic Control	%		2.50%	\$20,300	
<b><u>Sitework</u></b>					
Dewatering	%		2.50%	\$20,300	
Protect Existing Utilities	%		5.00%	\$40,599	
Bypass During Construction-water, sewer, elec, gas, comm	%		5.00%	\$40,599	
Bypass During Construction-water, sewer, elec, gas, comm	%		10.00%	\$81,199	
Erosion Control					
Silt Fence	LF	1400	\$7	\$9,800	
Filter Logs	LF	700	\$7	\$4,900	
Inlet Protection	EA	15	\$200	\$3,000	
Demolition and Disposal					
Pavement	YD2	2420	\$30	\$72,600	full width
Curb and Gutter	LF	680	\$15	\$10,200	one side
Sidewalk	YD2	300	\$30	\$9,000	one side
Trees (with stump grind)	EA	12	\$1,500	\$18,000	
Street Lights/Power Poles	EA	2	\$1,500	\$3,000	
Street Signs	EA	8	\$20	\$160	
Catch Basins	EA	6	\$500	\$3,000	
Manholes	EA	6		\$0	incl in mh repl
Pipe	LF	680		\$0	incl in pipe repl
<b><u>Storm Sewer</u></b>					
30 in Dia Pipe - "Shallow" invert	LF	1020	\$250	\$255,000	Incl Cut and Fill
72 - in MH - Base, Barrel, Top, Casting, Cover - "Shallow"	EA	3	\$15,000	\$45,000	Incl Cut and Fill
96 - in MH - Base, Barrel, Top, Casting, Cover - "Shallow"	EA	4	\$22,500	\$90,000	Incl Cut and Fill
Catch Basins - Base, "Barrel", Top, Casting	EA	6	\$5,000	\$30,000	Incl Cut and Fill
Connect to Existing Storm Sewer	EA	2	\$5,000	\$10,000	
<b><u>Street and Sidewalk</u></b>					
Pavement and Pavement Base	YD2	2420	\$75	\$181,500	full width
Curb and Gutter	LF	680	\$27	\$18,020	one side
Driveway and Driveway Base	YD2	0	\$75	\$0	
Driveway Aprons	EA	4	\$2,500	\$10,000	
Sidewalk and Sidewalk Base	YD2	300	\$47	\$14,040	one side
Sidewalk Aprons	EA	4	\$1,500	\$6,000	
<b><u>Restoration</u></b>					
Topsoil	YD3	50	\$90	\$4,500	
Trees and Bushes	EA	12	\$500	\$6,000	
Sod - Large Areas	FT2	0	\$0.6	\$0	
Sod - Small Areas	FT2	2720	\$1.2	\$3,264	
Street Lights/Power Poles	EA	2	\$1,500	\$3,000	
Signage	EA	8	\$250	\$2,000	
Misc Items - Retain Walls, Fences, Gardens, etc	LS	1	\$1	\$1	
					\$811,985
<b>SUB TOTAL</b>				\$1,055,581	
<b>CONTINGENCY (ADD 35 %)</b>				\$284,195	
<b>TOTAL - OPINION OF PROBABLE CONSTRUCTION COST</b>				\$1,339,775	

SW Harriett  
1F-Ewing  
5/8/2018

DESCRIPTION	UNIT	AMOUNT	UNIT COST	TOTAL COST	COMMENTS
<b>Contract/Services</b>					
Mobilization/Permits/Testing (5 percent)	%		5.00%	\$63,937	
Traffic Control	%		2.50%	\$31,969	
<b>Sitework</b>					
Dewatering	%		2.50%	\$31,969	
Protect Existing Utilities	%		5.00%	\$63,937	
Bypass During Construction-water, sewer, elec, gas, comm	%		5.00%	\$63,937	
Bypass During Construction- storm water	%		10.00%	\$127,874	
Erosion Control					
Silt Fence	LF	1350	\$7	\$9,450	
Filter Logs	LF	675	\$7	\$4,725	
Inlet Protection	EA	6	\$200	\$1,200	
Demolition and Disposal					
Pavement	YD2	5000	\$30	\$150,000	full width
Curb and Gutter	LF	700	\$15	\$10,500	one side
Sidewalk	YD2	320	\$30	\$9,600	one side
Trees (with stump grind)	EA	11	\$1,500	\$16,500	one side
Street Lights/Power Poles	EA	4	\$1,500	\$6,000	one side
Street Signs	EA	7	\$20	\$140	one side
Catch Basins	EA	9	\$500	\$4,500	
Manholes	EA	6		\$0	In replace MH
<b>Storm Sewer</b>					
30in Storm Pipe - "Shallow"	LF	360	\$250	\$90,000	Incl Cut and Fill
24in Storm Pipe - "Shallow"	EA	325	\$225	\$73,125	Incl Cut and Fill
4 ft x 8 ft BLVD Box - "Shallow" - 6 foot invert	LF	70	\$700	\$49,000	Incl Cut and Fill
4 ft x 8 ft End Section	EA	1	\$6,500	\$6,500	Incl Cut and Fill
72 - in MH - Base, Barrel, Top, Casting, Cover - "Shallow"	EA	3	\$15,000	\$45,000	
96 - in MH - Base, Barrel, Top, Casting, Cover - "Shallow"	EA	6	\$27,500	\$165,000	
Catch Basins - Base, "Barrel", Top, Casting	EA	9	\$5,000	\$45,000	Incl Cut and Fill
Connections to Existing Sewer	EA	7	\$5,000	\$35,000	Incl Cut and Fill
<b>Storage Basin -</b>					
ADS or Storm Trap Type System - per Bridget	AC-FT	0.225	\$500,000	\$112,500	
<b>Street and Sidewalk</b>					
Pavement and Pavement Base	YD2	5000	\$75	\$375,000	full width
Curb and Gutter	LF	700	\$27	\$18,550	one side
Driveway and Driveway Base	YD2	0	\$75	\$0	
Driveway Aprons	EA	7	\$2,500	\$17,500	
Sidewalk and Sidewalk Base	YD2	320	\$47	\$14,976	one side
Sidewalk Aprons	EA	3	\$1,500	\$4,500	
<b>Restoration</b>					
Topsoil	YD3	10	\$90	\$900	
Trees and Bushes	EA	11	\$500	\$5,500	one side
Sod - Large Areas	FT2	0	\$0.60	\$0	
Sod - Small Areas	FT2	270	\$1.20	\$324	
Street Lights/Power Poles	EA	4	\$1,500	\$6,000	one side
Signage	EA	7	\$250	\$1,750	one side
Misc Items - Retain Walls, Fences, Gardens, etc	LS	1	\$1	\$1	Fence/Aesthetics
<b>SUB TOTAL</b>				\$1,662,363	\$1,278,741
<b>CONTINGENCY (ADD 35 %)</b>				\$447,559	
<b>TOTAL - OPINION OF PROBABLE CONSTRUCTION COST</b>				\$2,109,923	

SW Harriett  
1G-52nd & Drew, 53rd & Chowen  
6/15/2018

DESCRIPTION	UNIT	AMOUNT	UNIT COST	TOTAL COST	COMMENTS
<b>Contract/Services</b>					
Mobilization/Permits/Testing/Survey	%		5.00%	\$77,911	
Traffic Control	%		2.50%	\$38,955	
<b>Sitework</b>					
Dewatering	%		2.50%	\$38,955	
Protect Existing Utilities	%		5.00%	\$77,911	
Bypass During Construction-water, sewer, elec, gas, comm	%		5.00%	\$77,911	
Bypass During Construction-Storm water	%		10.00%	\$155,821	
Erosion Control					
Silt Fence	LF	2460	\$7	\$17,220	
Filter Logs	LF	1230	\$7	\$8,610	
Inlet Protection	EA	27	\$200	\$5,400	
Demolition and Disposal					
Pavement	YD2	4114	\$30	\$123,420	full width
Curb and Gutter	LF	975	\$15	\$14,625	one side
Sidewalk	YD2	466	\$30	\$13,980	one side
Trees (with stump grind)	EA	30	\$1,500	\$45,000	
Street Lights/Power Poles	EA	6	\$1,500	\$9,000	one side
Street Signs	EA	20	\$20	\$400	one side
Catch Basins	EA	8	\$500	\$4,000	
Manholes	EA	12		\$0	In replace MH
Pipe	LF	505		\$0	In replace pipe
<b>Storm Sewer</b>					
18 in Dia Pipe - "shallow" invert	LF	585	\$200	\$117,000	Incl Cut and Fill
4 x 6 Box Section - "Shallow" invert	LF	380	\$600	\$228,000	Incl Cut and Fill
4 x 6 Box End Section	EA	4	\$6,000	\$24,000	Incl Cut and Fill
4 x 8 Box Section - "Shallow" invert	LF	341	\$700	\$238,700	Incl Cut and Fill
4 x 8 Box End Section	EA	2	\$6,500	\$13,000	Incl Cut and Fill
48 - in MH - Base, Barrel, Top, Casting, Cover - "Shallow"	EA	10	\$12,500	\$125,000	Incl Cut and Fill
84 - in MH - Base, Barrel, Top, Casting, Cover - "Medium depth"	EA	2	\$22,500	\$45,000	Incl Cut and Fill
Catch Basins - Base, "Barrel", Top, Casting	EA	8	\$5,000	\$40,000	Incl Cut and Fill
Connections to Existing Storm Sewer	EA	4	\$5,000	\$20,000	Incl Cut and Fill
<b>Street and Sidewalk</b>					
Pavement and Pavement Base	YD2	4114	\$75	\$308,550	full width
Curb and Gutter	LF	975	\$27	\$25,838	one side
Driveway and Driveway Base	YD2	0	\$75	\$0	
Driveway Aprons	EA	24	\$2,500	\$60,000	
Sidewalk and Sidewalk Base	YD2	466	\$47	\$21,809	one side
Sidewalk Aprons	EA	6	\$1,500	\$9,000	
<b>Restoration</b>					
Topsoil	YD3	77	\$90	\$6,930	
Trees and Bushes	EA	30	\$500	\$15,000	
Sod - Large Areas	FT2	0	\$0.60	\$0	one side
Sod - Small Areas	FT2	3940	\$1.20	\$4,728	one side
Street Lights/Power Poles	EA	6	\$1,500	\$9,000	one side
Signage	EA	20	\$250	\$5,000	one side
Misc Items - Retain Walls, Fences, Gardens,etc	LS	1	\$1	\$1	long alley
					\$1,558,210
<b>SUB TOTAL</b>				\$2,025,673	
<b>CONTINGENCY (ADD 35 %)</b>				\$545,374	
<b>TOTAL - OPINION OF PROBABLE CONSTRUCTION COST</b>				\$2,571,047	

SW Harriett  
1H-52nd- Abbott to Chowen  
6/15/2018

DESCRIPTION	UNIT	AMOUNT	UNIT COST	TOTAL COST	COMMENTS
<b>Contract/Services</b>					
Mobilization/Permits/Testing/Survey	%		5.00%	\$61,139	
Traffic Control	%		2.50%	\$30,570	
<b>Sitework</b>					
Dewatering	%		2.50%	\$30,570	
Protect Existing Utilities	%		5.00%	\$61,139	
Bypass During Construction-water, sewer, elec, gas, comm	%		5.00%	\$61,139	
Bypass During Construction-Storm water	%		10.00%	\$122,278	
Erosion Control					
Silt Fence	LF	2400	\$7	\$16,800	
Filter Logs	LF	1200	\$7	\$8,400	
Inlet Protection	EA	14	\$200	\$2,800	
Demolition and Disposal					
Pavement	YD2	3713	\$30	\$111,390	full width
Curb and Gutter	LF	875	\$15	\$13,125	one side
Sidewalk	YD2	375	\$30	\$11,250	one side
Trees (with stump grind)	EA	25	\$1,500	\$37,500	
Street Lights/Power Poles	EA	4	\$1,500	\$6,000	one side
Street Signs	EA	20	\$20	\$400	one side
Catch Basins	EA	2	\$500	\$1,000	
Manholes	EA	9		\$0	In replace MH
Pipe	LF	865		\$0	In replace pipe
<b>Storm Sewer</b>					
18 in Dia Pipe - "shallow" invert	LF	865	\$200	\$173,000	Incl Cut and Fill
4 ft x 6ft Culvert Section - "shallow" invert	LF	91	\$600	\$54,600	Incl Cut and Fill
4 ft x 6ft Culvert Section - "medium" invert	LF	227	\$800	\$181,600	Incl Cut and Fill
4 ft x 6ft Culvert End Section	EA	4	\$6,000	\$24,000	Incl Cut and Fill
48 - in MH - Base, Barrel, Top, Casting, Cover - "Shallow"	EA	8	\$12,500	\$100,000	Incl Cut and Fill
48 - in MH - Base, Barrel, Top, Casting, Cover - "Medium"	EA	3	\$17,500	\$52,500	Incl Cut and Fill
Catch Basins - Base, "Barrel", Top, Casting	EA	2	\$5,000	\$10,000	Incl Cut and Fill
Connections to Existing Storm Sewer	EA	2	\$5,000	\$10,000	Incl Cut and Fill
<b>Street and Sidewalk</b>					
Pavement and Pavement Base	YD2	3713	\$75	\$278,475	full width
Curb and Gutter	LF	875	\$27	\$23,188	one side
Driveway and Driveway Base	YD2	0	\$75	\$0	
Driveway Aprons	EA	20	\$2,500	\$50,000	
Sidewalk and Sidewalk Base	YD2	375	\$47	\$17,550	one side
Sidewalk Aprons	EA	4	\$1,500	\$6,000	
<b>Restoration</b>					
Topsoil	YD3	63	\$90	\$5,670	
Trees and Bushes	EA	25	\$500	\$12,500	
Sod - Small Areas	FT2	0	\$0.60	\$0	one side
Sod - Small Areas	FT2	3360	\$1.20	\$4,032	one side
Street Lights/Power Poles	EA	4	\$1,500	\$6,000	one side
Signage	EA	20	\$250	\$5,000	one side
Misc Items - Retain Walls, Fences, Gardens, etc	LS	1	\$1	\$1	long alley
					\$1,222,781
<b>SUB TOTAL</b>				\$1,589,615	
<b>CONTINGENCY (ADD 35 %)</b>				\$427,973	
<b>TOTAL - OPINION OF PROBABLE CONSTRUCTION COST</b>				\$2,017,588	

SW Harriett  
1I (Chowen and 51st)  
6/15/2018

DESCRIPTION	UNIT	AMOUNT	UNIT COST	TOTAL COST	COMMENTS
<b>Contract/Services</b>					
Mobilization/Permits/Testing (5 percent)	%		5.00%	\$329,588	
Traffic Control	%		2.50%	\$164,794	
<b>Sitework</b>					
Dewatering	%		2.50%	\$164,794	
Protect Existing Utilities	%		5.00%	\$329,588	
Bypass During Construction-water, sewer, elec, gas, comm	%		5.00%	\$329,588	
Bypass During Construction- storm water	%		10.00%	\$659,177	
Erosion Control					
Silt Fence	LF	10000	\$7	\$70,000	
Filter Logs	LF	5000	\$7	\$35,000	
Inlet Protection	EA	30	\$200	\$6,000	
Demolition and Disposal					
Pavement	YD2	16000	\$30	\$480,000	full width
Curb and Gutter	LF	4000	\$15	\$60,000	one side
Sidewalk	YD2	3500	\$30	\$105,000	one side
Trees (with stump grind)	EA	80	\$1,500	\$120,000	one side
Street Lights/Power Poles	EA	20	\$1,500	\$30,000	one side
Street Signs	EA	20	\$20	\$400	one side
Catch Basins	EA	30	\$500	\$15,000	
Manholes	EA	30		\$0	In replace MH
<b>Storm Sewer</b>					
40in x 65in Arch Pipe, Double Barrel, - "Medium"	LF	840	\$450	\$378,000	Incl Cut and Fill
54in x 88in Arch Pipe - "Medium"	LF	1575	\$850	\$1,338,750	Incl Cut and Fill
36in Storm Pipe, - "Shallow"	LF	1190	\$300	\$357,000	Incl Cut and Fill
30in Storm Pipe - "Shallow"	LF	190	\$250	\$47,500	Incl Cut and Fill
24in Storm Pipe - "Shallow"	EA	310	\$225	\$69,750	Incl Cut and Fill
21in Storm Pipe - "Shallow"	LF	185	\$225	\$41,625	
18in Storm Pipe - "Shallow"	LF	440	\$200	\$88,000	Incl Cut and Fill
12in Storm Pipe, - "Shallow"	LF	130	\$200	\$26,000	Incl Cut and Fill
4 ft x 8 ft BLVD Box - "Shallow" - 6 foot invert	LF	615	\$700	\$430,500	
4 ft x 8 ft End Section	EA	4	\$6,500	\$26,000	Incl Cut and Fill
48 - in MH - Base, Barrel, Top, Casting, Cover - "Shallow"	EA	2	\$12,500	\$25,000	
72 - in MH - Base, Barrel, Top, Casting, Cover - "Shallow"	EA	16	\$15,000	\$240,000	
96 - in MH - Base, Barrel, Top, Casting, Cover - "Shallow"	EA	12	\$22,500	\$270,000	Incl Cut and Fill
Catch Basins - Base, "Barrel", Top, Casting	EA	35	\$5,000	\$175,000	Incl Cut and Fill
Connections to Existing Sewer	EA	12	\$5,000	\$60,000	Incl Cut and Fill
Specialty Structure	EA	6	\$20,000	\$120,000	
<b>Storage Basin -</b>					
ADS or Storm Trap Type System - per Bridget	AC-FT	0.6	\$500,000	\$300,000	
<b>Street and Sidewalk</b>					
Pavement and Pavement Base	YD2	16000	\$75	\$1,200,000	full width
Curb and Gutter	LF	4000	\$27	\$106,000	one side
Driveway and Driveway Base	YD2	360	\$75	\$27,000	
Driveway Aprons	EA	45	\$2,500	\$112,500	
Sidewalk and Sidewalk Base	YD2	1800	\$47	\$84,240	one side
Sidewalk Aprons	EA	20	\$1,500	\$30,000	
<b>Restoration</b>					
Topsoil	YD3	300	\$90	\$27,000	
Trees and Bushes	EA	75	\$500	\$37,500	one side
Sod - Large Areas	FT2	0	\$0.60	\$0	
Sod - Small Areas	FT2	15000	\$1.20	\$18,000	
Street Lights/Power Poles	EA	20	\$1,500	\$30,000	one side
Signage	EA	20	\$250	\$5,000	one side

Misc Items - Retain Walls, Fences, Gardens, etc	LS	1	\$1	\$1	Alley Construct
					\$6,591,766
SUB TOTAL				\$8,569,296	
CONTINGENCY (ADD 35 %)				\$2,307,118	
TOTAL - OPINION OF PROBABLE CONSTRUCTION COST				\$10,876,414	

SW Harriett  
1J-York (50th to 48th)  
6/15/2018

DESCRIPTION	UNIT	AMOUNT	UNIT COST	TOTAL COST	COMMENTS
<b>Contract/Services</b>					
Mobilization/Permits/Testing (5 percent)	%		5.00%	\$102,392	
Traffic Control	%		2.50%	\$51,196	
<b>Sitework</b>					
Dewatering	%		2.50%	\$51,196	
Protect Existing Utilities	%		5.00%	\$102,392	
Bypass During Construction-water, sewer, elec, gas, comm	%		5.00%	\$102,392	
Bypass During Construction- storm water	%		10.00%	\$204,784	
Erosion Control					
Silt Fence	LF	5100	\$7	\$35,700	
Filter Logs	LF	2500	\$7	\$17,500	
Inlet Protection	EA	12	\$200	\$2,400	
Demolition and Disposal					
Pavement	YD2	1100	\$30	\$33,000	full width
Curb and Gutter	LF	2200	\$15	\$33,000	one side
Sidewalk	YD2	1000	\$30	\$30,000	one side
Trees (with stump grind)	EA	32	\$1,500	\$48,000	one side
Street Lights/Power Poles	EA	5	\$1,500	\$7,500	one side
Street Signs	EA	15	\$20	\$300	one side
Catch Basins	EA	10	\$500	\$5,000	
Manholes	EA	15		\$0	In replace MH
<b>Storm Sewer</b>					
36in Storm Pipe, - "Shallow"	LF	1320	\$300	\$396,000	Incl Cut and Fill
18in Storm Pipe - "Shallow"	LF	230	\$200	\$46,000	Incl Cut and Fill
12in Storm Pipe, - "Shallow"	LF	100	\$200	\$20,000	Incl Cut and Fill
4 ft x 8 ft BLVD Box - "Shallow" - 6 foot invert	LF	930	\$700	\$651,000	
4 ft x 8 ft End Section	EA	10	\$6,500	\$65,000	Incl Cut and Fill
72 - in MH - Base, Barrel, Top, Casting, Cover - "Shallow"	EA	9	\$15,000	\$135,000	
96 - in MH - Base, Barrel, Top, Casting, Cover - "Medium"	EA	4	\$27,500	\$110,000	
Catch Basins - Base, "Barrel", Top, Casting	EA	10	\$5,000	\$50,000	Incl Cut and Fill
Connections to Existing Sewer	EA	5	\$5,000	\$25,000	Incl Cut and Fill
Specialty Structure	EA	2	\$20,000	\$40,000	
<b>Street and Sidewalk</b>					
Pavement and Pavement Base	YD2	1100	\$75	\$82,500	full width
Curb and Gutter	LF	2200	\$27	\$58,300	one side
Driveway and Driveway Base	YD2	50	\$75	\$3,750	
Driveway Aprons	EA	18	\$2,500	\$45,000	
Sidewalk and Sidewalk Base	YD2	1000	\$47	\$46,800	one side
Sidewalk Aprons	EA	9	\$1,500	\$13,500	
<b>Restoration</b>					
Topsoil	YD3	130	\$90	\$11,700	
Trees and Bushes	EA	32	\$500	\$16,000	one side
Sod - Large Areas	FT2		\$0.60	\$0	
Sod - Small Areas	FT2	7200	\$1.20	\$8,640	
Street Lights/Power Poles	EA	5	\$1,500	\$7,500	one side
Signage	EA	15	\$250	\$3,750	one side
Misc Items - Retain Walls, Fences, Gardens, etc	LS	1	\$1	\$1	Alley
					\$2,047,841
<b>SUB TOTAL</b>				\$2,662,193	
<b>CONTINGENCY (ADD 35 %)</b>				\$716,744	
<b>TOTAL - OPINION OF PROBABLE CONSTRUCTION COST</b>				\$3,378,938	

SW Harriett  
1K-Thomas and Alley - 48th to 50th  
6/15/2018

DESCRIPTION	UNIT	AMOUNT	UNIT COST	TOTAL COST	COMMENTS
<b>Contract/Services</b>					
Mobilization/Permits/Testing/Survey	%		5.00%	\$67,761	
Traffic Control	%		2.50%	\$33,881	
<b>Sitework</b>					
Dewatering	%		2.50%	\$33,881	
Protect Existing Utilities	%		5.00%	\$67,761	
Bypass During Construction-water, sewer, elec, gas, comm	%		5.00%	\$67,761	
Bypass During Construction-Storm water	%		10.00%	\$135,523	
Erosion Control					
Silt Fence	LF	2800	\$7	\$19,600	
Filter Logs	LF	1400	\$7	\$9,800	
Inlet Protection	EA	4	\$200	\$800	
Demolition and Disposal					
Pavement	YD2	3723	\$30	\$111,690	full width
Curb and Gutter	LF	850	\$15	\$12,750	one side
Sidewalk	YD2	380	\$30	\$11,400	one side
Trees (with stump grind)	EA	40	\$1,500	\$60,000	
Street Lights/Power Poles	EA	5	\$1,500	\$7,500	one side
Street Signs	EA	20	\$20	\$400	one side
Catch Basins	EA	0	\$500	\$0	
Manholes	EA	6		\$0	In replace MH
Pipe	LF	0		\$0	In replace pipe
<b>Storm Sewer</b>					
18 in Dia Pipe - "medium" invert	LF	1400	\$300	\$420,000	Incl Cut and Fill
48 - in MH - Base, Barrel, Top, Casting, Cover - "Medium deep"	EA	14	\$17,500	\$245,000	Incl Cut and Fill
Catch Basins - Base, "Barrel", Top, Casting	EA	6	\$5,000	\$30,000	Incl Cut and Fill
Connections to Existing Storm Sewer	EA	2	\$5,000	\$10,000	Incl Cut and Fill
<b>Street and Sidewalk</b>					
Pavement and Pavement Base	YD2	3723	\$75	\$279,225	full width
Curb and Gutter	LF	850	\$27	\$22,525	one side
Driveway and Driveway Base	YD2	0	\$75	\$0	
Driveway Aprons	EA	20	\$2,500	\$50,000	
Sidewalk and Sidewalk Base	YD2	380	\$47	\$17,784	one side
Sidewalk Aprons	EA	3	\$1,500	\$4,500	
<b>Restoration</b>					
Topsoil	YD3	63	\$90	\$5,670	
Trees and Bushes	EA	40	\$500	\$20,000	
Sod - Small Areas	FT2	0	\$0.60	\$0	one side
Sod - Small Areas	FT2	3400	\$1.20	\$4,080	one side
Street Lights/Power Poles	EA	5	\$1,500	\$7,500	one side
Signage	EA	20	\$250	\$5,000	one side
Misc Items - Retain Walls, Fences, Gardens, etc	LS	1	\$1	\$1	long alley
					\$1,355,225
<b>SUB TOTAL</b>				\$1,761,793	
<b>CONTINGENCY (ADD 35 %)</b>				\$474,329	
<b>TOTAL - OPINION OF PROBABLE CONSTRUCTION COST</b>				\$2,236,121	

SW Harriett  
 1L - 46th @ Vincent and Upton  
 5/8/2018

DESCRIPTION	UNIT	AMOUNT	UNIT COST	TOTAL COST	COMMENTS
<b>Contract/Services</b>					
Mobilization/Permits/Testing (5 percent)	%		5.00%	\$14,177	
Traffic Control	%		2.50%	\$7,089	
<b>Sitework</b>					
Dewatering	%		2.50%	\$7,089	
Protect Existing Utilities	%		5.00%	\$14,177	
Bypass During Construction-water, sewer, elec, gas, comm	%		5.00%	\$14,177	
Bypass During Construction- storm water	%		10.00%	\$28,354	
Erosion Control					
Silt Fence	LF	900	\$7	\$6,300	
Filter Logs	LF	450	\$7	\$3,150	
Inlet Protection	EA	10	\$200	\$2,000	
Demolition and Disposal					
Pavement	YD2	235	\$30	\$7,050	full width
Curb and Gutter	LF	210	\$15	\$3,150	one side
Sidewalk	YD2	100	\$30	\$3,000	one side
Trees (with stump grind)	EA	4	\$1,500	\$6,000	one side
Street Lights/Power Poles	EA	1	\$1,500	\$1,500	one side
Street Signs	EA	2	\$20	\$40	one side
Catch Basins	EA	2	\$500	\$1,000	
Manholes	EA	2		\$0	In replace MH
<b>Storm Sewer</b>					
4 ft x 8 ft BLVD Box - "Shallow" - 6 foot invert	LF	210	\$700	\$147,000	Incl Cut and Fill
4 ft x 8 ft End Section	EA	2	\$6,500	\$13,000	Incl Cut and Fill
72 - in MH - Base, Barrel, Top, Casting, Cover - "Shallow"	EA	2	\$15,000	\$30,000	Incl Cut and Fill
Catch Basins - Base, "Barrel", Top, Casting	EA	2	\$5,000	\$10,000	Incl Cut and Fill
Connections to Existing Sewer	EA	2	\$5,000	\$10,000	Incl Cut and Fill
<b>Street and Sidewalk</b>					
Pavement and Pavement Base	YD2	235	\$75	\$17,625	full width
Curb and Gutter	LF	210	\$27	\$5,565	one side
Driveway and Driveway Base	YD2	0	\$75	\$0	
Driveway Aprons	EA	2	\$2,500	\$5,000	
Sidewalk and Sidewalk Base	YD2	100	\$47	\$4,680	one side
Sidewalk Aprons	EA	1	\$1,500	\$1,500	
<b>Restoration</b>					
Topsoil	YD3	10	\$90	\$900	
Trees and Bushes	EA	4	\$500	\$2,000	one side
Sod - Large Areas	FT2	0	\$0.60	\$0	
Sod - Small Areas	FT2	900	\$1.20	\$1,080	
Street Lights/Power Poles	EA	1	\$1,500	\$1,500	one side
Signage	EA	2	\$250	\$500	one side
Misc Items - Retain Walls, Fences, Gardens, etc	LS	0	\$1	\$0	
					\$283,540
<b>SUB TOTAL</b>				\$368,602	
<b>CONTINGENCY (ADD 35 %)</b>				\$99,239	
<b>TOTAL - OPINION OF PROBABLE CONSTRUCTION COST</b>				\$467,841	

SW Harriett  
Misc. Storage @ 46th and York, Vincent, Upton & 47th and Chowen & 51st and Ewing  
5/8/2018

DESCRIPTION	UNIT	AMOUNT	UNIT COST	TOTAL COST	COMMENTS
<b>Contract/Services</b>					
Mobilization/Permits/Testing (5 percent)	%		5.00%	\$14,694	
Traffic Control	%		2.50%	\$7,347	
<b>Sitework</b>					
Dewatering	%		2.50%	\$7,347	
Protect Existing Utilities	%		5.00%	\$14,694	
Bypass During Construction-water, sewer, elec, gas, comm	%		5.00%	\$14,694	
Bypass During Construction- storm water	%		10.00%	\$29,388	
Erosion Control					
Silt Fence	LF	350	\$7	\$2,450	
Filter Logs	LF	175	\$7	\$1,225	
Inlet Protection	EA	5	\$200	\$1,000	
Demolition and Disposal					
Pavement	YD2	580	\$30	\$17,400	full width
Curb and Gutter	LF	175	\$15	\$2,625	one side
Sidewalk	YD2	80	\$30	\$2,400	one side
Trees (with stump grind)	EA	4	\$1,500	\$6,000	one side
Street Lights/Power Poles	EA	1	\$1,500	\$1,500	one side
Street Signs	EA	3	\$20	\$60	one side
Catch Basins	EA	3	\$500	\$1,500	
Manholes	EA	2		\$0	In replace MH
<b>Storm Sewer</b>					
4 ft x 8 ft BLVD Box - "Shallow" - 6 foot invert	LF	175	\$700	\$122,500	Incl Cut and Fill
4 ft x 8 ft End Section	EA	2	\$6,500	\$13,000	Incl Cut and Fill
72 - in MH - Base, Barrel, Top, Casting, Cover - "Shallow"	EA	2	\$15,000	\$30,000	Incl Cut and Fill
Catch Basins - Base, "Barrel", Top, Casting	EA	3	\$5,000	\$15,000	Incl Cut and Fill
Connections to Existing Sewer	EA	2	\$5,000	\$10,000	Incl Cut and Fill
<b>Street and Sidewalk</b>					
Pavement and Pavement Base	YD2	580	\$75	\$43,500	full width
Curb and Gutter	LF	175	\$27	\$4,638	one side
Driveway and Driveway Base	YD2	0	\$75	\$0	
Driveway Aprons	EA	2	\$2,500	\$5,000	
Sidewalk and Sidewalk Base	YD2	80	\$47	\$3,744	one side
Sidewalk Aprons	EA	2	\$1,500	\$3,000	
<b>Restoration</b>					
Topsoil	YD3	25	\$90	\$2,250	
Trees and Bushes	EA	4	\$500	\$2,000	one side
Sod - Large Areas	FT2	0	\$0.60	\$0	
Sod - Small Areas	FT2	700	\$1.20	\$840	
Street Lights/Power Poles	EA	1	\$1,500	\$1,500	one side
Signage	EA	3	\$250	\$750	one side
Misc Items - Retain Walls, Fences, Gardens, etc	LS	0	\$1	\$0	
					\$293,882
<b>SUB TOTAL</b>				\$382,046	
<b>CONTINGENCY (ADD 35 %)</b>				\$102,859	
<b>TOTAL - OPINION OF PROBABLE CONSTRUCTION COST</b>				\$484,904	

SW Harriett  
 2A-W50th and Queen and Associated  
 5/8/2018

DESCRIPTION	UNIT	AMOUNT	UNIT COST	TOTAL COST	COMMENTS
<b>Contract/Services</b>					
Mobilization/Permits/Testing/Survey	%		5.00%	\$177,214	
Traffic Control	%		2.50%	\$88,607	
<b>Sitework</b>					
Dewatering	%		2.50%	\$88,607	
Protect Existing Utilities	%		5.00%	\$177,214	
Bypass During Construction-water, sewer, elec, gas, comm	%		5.00%	\$177,214	
Bypass During Construction-Storm water	%		10.00%	\$354,428	
Erosion Control					
Silt Fence	LF	5200	\$7	\$36,400	
Filter Logs	LF	2600	\$7	\$18,200	
Inlet Protection	EA	30	\$200	\$6,000	
Demolition and Disposal					
Pavement	YD2	7660	\$30	\$229,800	full width
Curb and Gutter	LF	3720	\$15	\$55,800	both sides
Sidewalk	YD2	1654	\$30	\$49,620	both sides
Trees (with stump grind)	EA	60	\$1,500	\$90,000	both sides
Street Lights/Power Poles	EA	12	\$1,500	\$18,000	both sides
Street Signs	EA	25	\$20	\$500	both sides
Catch Basins	EA	25	\$500	\$12,500	
Manholes	EA			\$0	In replace MH
Pipe	LF			\$0	In replace pipe
<b>Storm Sewer</b>					
60 in Dia Pipe - "Deep" invert over 13 feet	LF	1860	\$650	\$1,209,000	Incl Cut and Fill
24 in Dia Pipe - "Shallow" 6 to 8 foot invert - added pipe	LF	300	\$225	\$67,500	Incl Cut and Fill
12 - in Dia Pipe - "Shallow" 6 to 8 foot invert - added pipe	LF	435	\$200	\$87,000	Incl Cut and Fill
96 - in MH - Base, Barrel, Top, Casting, Cover - "Deep"	EA	12	\$35,000	\$420,000	Incl Cut and Fill
48 - in MH - Base, Barrel, Top, Casting, Cover - "Shallow"	EA	9	\$12,500	\$112,500	Incl Cut and Fill
Catch Basins - Base, "Barrel", Top, Casting	EA	25	\$5,000	\$125,000	Incl Cut and Fill
Connections to Existing Sewer	EA	5	\$5,000	\$25,000	Incl Cut and Fill
<b>Street and Sidewalk</b>					
Pavement and Pavement Base	YD2	7660	\$75	\$574,500	full width
Curb and Gutter	LF	3720	\$27	\$98,580	both sides
Driveway and Driveway Base	YD2	0	\$75	\$0	
Driveway Aprons	EA	50	\$2,500	\$125,000	
Sidewalk and Sidewalk Base	YD2	1654	\$47	\$77,407	both sides
Sidewalk Aprons	EA	16	\$1,500	\$24,000	
<b>Restoration</b>					
Topsoil	YD3	180	\$90	\$16,200	both sides
Trees and Bushes	EA	60	\$500	\$30,000	both sides
Sod - Large Areas	FT2	0	\$0.6	\$0	
Sod - Small Areas	FT2	9600	\$1.20	\$11,520	both sides
Street Lights/Power Poles	EA	12	\$1,500	\$18,000	both sides
Signage	EA	25	\$250	\$6,250	both sides
Misc Items - Retain Walls, Fences, Gardens, etc	LS	1	\$1	\$1	garage proximity
					\$3,544,278
<b>SUB TOTAL</b>				\$4,607,562	
<b>CONTINGENCY (ADD 35 %)</b>				\$1,240,497	
<b>TOTAL - OPINION OF PROBABLE CONSTRUCTION COST</b>				\$5,848,059	

SW Harriett  
 2A-W51st - Thomas to Russell and Associated  
 5/8/2018

DESCRIPTION	UNIT	AMOUNT	UNIT COST	TOTAL COST	COMMENTS
<b>Contract/Services</b>					
Mobilization/Permits/Testing/Survey	%		5.00%	\$36,373	
Traffic Control	%		2.50%	\$18,186	
<b>Sitework</b>					
Dewatering	%		2.50%	\$18,186	
Protect Existing Utilities	%		5.00%	\$36,373	
Bypass During Construction-water, sewer, elec, gas, comm	%		5.00%	\$36,373	
Bypass During Construction-Storm water	%		10.00%	\$72,745	
Erosion Control					
Silt Fence	LF	1300	\$7	\$9,100	
Filter Logs	LF	650	\$7	\$4,550	
Inlet Protection	EA	15	\$200	\$3,000	
Demolition and Disposal					
Pavement	YD2	1945	\$30	\$58,350	full width
Curb and Gutter	LF	480	\$15	\$7,200	one side
Sidewalk	YD2	215	\$30	\$6,450	one side
Trees (with stump grind)	EA	13	\$1,500	\$19,500	one side
Street Lights/Power Poles	EA	2	\$1,500	\$3,000	one side
Street Signs	EA	12	\$20	\$240	one side
Catch Basins	EA	10	\$500	\$5,000	
Manholes	EA	4		\$0	In replace MH
Pipe	LF	480		\$0	In replace pipe
<b>Storm Sewer</b>					
36 in Dia Pipe - "Shallow" 6 to 8 foot invert	LF	480	\$400	\$192,000	Incl Cut and Fill
18 - in Dia Pipe - "Shallow" 6 to 8 foot invert - added pipe	LF	175	\$200	\$35,000	Incl Cut and Fill
72 - in MH - Base, Barrel, Top, Casting, Cover - "Shallow"	EA	5	\$15,000	\$75,000	Incl Cut and Fill
48 - in MH - Base, Barrel, Top, Casting, Cover - "Shallow"	EA	2	\$12,500	\$25,000	Incl Cut and Fill
Catch Basins - Base, "Barrel", Top, Casting	EA	10	\$5,000	\$50,000	Incl Cut and Fill
Connections to Existing Sewer	EA	2	\$5,000	\$10,000	Incl Cut and Fill
<b>Street and Sidewalk</b>					
Pavement and Pavement Base	YD2	1945	\$75	\$145,875	full width
Curb and Gutter	LF	480	\$27	\$12,720	one side
Driveway and Driveway Base	YD2	0	\$75	\$0	
Driveway Aprons	EA	10	\$2,500	\$25,000	
Sidewalk and Sidewalk Base	YD2	215	\$47	\$10,062	one side
Sidewalk Aprons	EA	8	\$1,500	\$12,000	
<b>Restoration</b>					
Topsoil	YD3	40	\$90	\$3,600	one side
Trees and Bushes	EA	13	\$500	\$6,500	one side
Sod - Large Areas	FT2	0	\$0.6	\$0	
Sod	FT2	1920	\$1.20	\$2,304	one side
Street Lights/Power Poles	EA	2	\$1,500	\$3,000	one side
Signage	EA	12	\$250	\$3,000	one side
Misc Items - Retain Walls, Fences, Gardens, etc	LS	1	\$1	\$1	garage proximity
					\$727,452
<b>SUB TOTAL</b>				\$945,688	
<b>CONTINGENCY (ADD 35 %)</b>				\$254,608	
<b>TOTAL - OPINION OF PROBABLE CONSTRUCTION COST</b>				\$1,200,296	

SW Harriett  
 2A-Sheridan south of W51st  
 5/8/2018

DESCRIPTION	UNIT	AMOUNT	UNIT COST	TOTAL COST	COMMENTS
<b>Contract/Services</b>					
Mobilization/Permits/Testing/Survey	%		5.00%	\$52,831	
Traffic Control	%		2.50%	\$26,416	
<b>Sitework</b>					
Dewatering	%		2.50%	\$26,416	
Protect Existing Utilities	%		5.00%	\$52,831	
Bypass During Construction-water, sewer, elec, gas, comm	%		5.00%	\$52,831	
Bypass During Construction-Storm water	%		10.00%	\$105,662	
Erosion Control					
Silt Fence	LF	1200	\$7	\$8,400	
Filter Logs	LF	600	\$7	\$4,200	
Inlet Protection	EA	8	\$200	\$1,600	
Demolition and Disposal					
Pavement (Street and Alley)	YD2	2134	\$30	\$64,020	full width
Curb and Gutter	LF	1200	\$15	\$18,000	both sides
Sidewalk	YD2	534	\$30	\$16,020	both sides
Trees (with stump grind)	EA	25	\$1,500	\$37,500	both sides
Street Lights/Power Poles	EA	4	\$1,500	\$6,000	both sides
Street Signs	EA	20	\$20	\$400	both sides
Catch Basins	EA	6	\$500	\$3,000	
Manholes	EA	1		\$0	In replace MH
9 inch to 24 inch Pipe	LF	0		\$0	In replace pipe
<b>Storm Sewer</b>					
4' by 8' Culvert Section - "Deep" over 13 foot invert	LF	335	\$1,100	\$368,500	Incl Cut and Fill
4' by 8' Culvert Section - "Medium Depth" 8 to 13 foot invert	LF	165	\$900	\$148,500	Incl Cut and Fill
72 - in MH - Base, Barrel, Top, Casting, Cover - "Med deep"	EA	1	\$20,000	\$20,000	Incl Cut and Fill
Catch Basins - Base, "Barrel", Top, Casting	EA	6	\$5,000	\$30,000	Incl Cut and Fill
Connections to Existing Storm Sewer	EA	1	\$5,000	\$5,000	Incl Cut and Fill
<b>Street and Sidewalk</b>					
Pavement and Pavement Base	YD2	2134	\$90	\$192,060	full width
Curb and Gutter	LF	1200	\$35	\$42,000	both sides
Driveway and Driveway Base	YD2	0	\$140	\$0	
Driveway Aprons	EA	0	\$2,500	\$0	
Sidewalk and Sidewalk Base	YD2	534	\$90	\$48,060	both sides
Sidewalk Aprons	EA	4	\$1,500	\$6,000	
<b>Restoration</b>					
Topsoil	YD3	90	\$90	\$8,100	both sides
Trees and Bushes	EA	25	\$500	\$12,500	both sides
Sod - Large Area	FT2	0	\$0.6	\$0	
Sod - Small Area	FT2	4800	\$1.20	\$5,760	both sides
Street Lights/Power Poles	EA	4	\$1,500	\$6,000	both sides
Signage	EA	20	\$250	\$5,000	both sides
Misc Items - Retain Walls, Fences, Gardens, etc	LS	1	\$1	\$1	
					\$1,056,621
<b>SUB TOTAL</b>				\$1,373,607	
<b>CONTINGENCY (ADD 35 %)</b>				\$369,817	
<b>TOTAL - OPINION OF PROBABLE CONSTRUCTION COST</b>				\$1,743,425	

SW Harriett  
 2A-Sheridan - W50th to W51st  
 5/8/2018

DESCRIPTION	UNIT	AMOUNT	UNIT COST	TOTAL COST	COMMENTS
<b>Contract/Services</b>					
Mobilization/Permits/Testing/Survey	%		5.00%	\$105,014	
Traffic Control	%		2.50%	\$52,507	
<b>Sitework</b>					
Dewatering	%		2.50%	\$52,507	
Protect Existing Utilities	%		5.00%	\$105,014	
Bypass During Construction-water, sewer, elec, gas, comm	%		5.00%	\$105,014	
Bypass During Construction-Storm water	%		10.00%	\$210,029	
Erosion Control					
Silt Fence	LF	1400	\$7	\$9,800	
Filter Logs	LF	700	\$7	\$4,900	
Inlet Protection	EA	18	\$200	\$3,600	
Demolition and Disposal					
Pavement (Street and Alley)	YD2	2560	\$30	\$76,800	full width
Curb and Gutter	LF	1400	\$15	\$21,000	both sides
Sidewalk	YD2	580	\$30	\$17,400	both sides
Trees (with stump grind)	EA	40	\$1,500	\$60,000	both sides
Street Lights/Power Poles	EA	4	\$1,500	\$6,000	both sides
Street Signs	EA	15	\$20	\$300	both sides
Catch Basins	EA	4	\$500	\$2,000	
Manholes	EA	4		\$0	In replace MH
Pipe	LF	1200		\$0	In replace pipe
<b>Storm Sewer</b>					
8' by 20' Box Section - "Deep" over 13 foot invert	LF	300	\$2,500	\$750,000	Incl Cut and Fill
8' by 20' Box Section - "Medium Depth" 8 to 13 foot invert	LF	300	\$2,300	\$690,000	Incl Cut and Fill
Piling for Box Section	LS	1	\$1	\$1	
72 - in MH - Base, Barrel, Top, Casting, Cover - "Med deep"	EA	4	\$20,000	\$80,000	Incl Cut and Fill
Catch Basins - Base, "Barrel", Top, Casting	EA	4	\$5,000	\$20,000	Incl Cut and Fill
Connections to Existing Storm Sewer	EA	2	\$5,000	\$10,000	Incl Cut and Fill
Specialty Structure	EA	2	\$20,000	\$40,000	
<b>Street and Sidewalk</b>					
Pavement and Pavement Base	YD2	2560	\$75	\$192,000	full width
Curb and Gutter	LF	1400	\$27	\$37,100	both sides
Driveway and Driveway Base	YD2	0	\$75	\$0	
Driveway Aprons	EA	0	\$2,500	\$0	
Sidewalk and Sidewalk Base	YD2	580	\$47	\$27,144	both sides
Sidewalk Aprons	EA	4	\$1,500	\$6,000	
<b>Restoration</b>					
Topsoil	YD3	100	\$90	\$9,000	both sides
Trees and Bushes	EA	40	\$500	\$20,000	both sides
Sod - Large Areas	FT2	0	\$0.6	\$0	
Sod - Small Areas	FT2	5200	\$1.20	\$6,240	both sides
Street Lights/Power Poles	EA	4	\$1,500	\$6,000	both sides
Signage	EA	20	\$250	\$5,000	both sides
Misc Items - Retain Walls, Fences, Gardens, etc	LS	1	\$1	\$1	
					\$2,100,286
<b>SUB TOTAL</b>				\$2,730,372	
<b>CONTINGENCY (ADD 35 %)</b>				\$735,100	
<b>TOTAL - OPINION OF PROBABLE CONSTRUCTION COST</b>				\$3,465,472	

SW Harriett  
 2A-Thomas south of W51st  
 5/8/2018

DESCRIPTION	UNIT	AMOUNT	UNIT COST	TOTAL COST	COMMENTS
<b>Contract/Services</b>					
Mobilization/Permits/Testing/Survey	%		5.00%	\$54,580	
Traffic Control	%		2.50%	\$27,290	
<b>Sitework</b>					
Dewatering	%		2.50%	\$27,290	
Protect Existing Utilities	%		5.00%	\$54,580	
Bypass During Construction-water, sewer, elec, gas, comm	%		5.00%	\$54,580	
Bypass During Construction-water, sewer, elec, gas, comm	%		10.00%	\$109,159	
Erosion Control					
Silt Fence	LF	1400	\$7	\$9,800	
Filter Logs	LF	700	\$7	\$4,900	
Inlet Protection	EA	7	\$200	\$1,400	
Demolition and Disposal					
Pavement (Street and Alley)	YD2	2350	\$30	\$70,500	full width
Curb and Gutter	LF	1280	\$15	\$19,200	both sides
Sidewalk	YD2	570	\$30	\$17,100	both sides
Trees (with stump grind)	EA	20	\$1,500	\$30,000	both sides
Street Lights/Power Poles	EA	4	\$1,500	\$6,000	both sides
Street Signs	EA	10	\$20	\$200	both sides
Catch Basins	EA	4	\$500	\$2,000	
Manholes	EA	2		\$0	In replace MH
9 inch to 24 inch Pipe	LF	0		\$0	In replace pipe
<b>Storm Sewer</b>					
4' by 8' Culvert Section - "Deep" over 13 foot invert	LF	380	\$1,100	\$418,000	Incl Cut and Fill
4' by 8' Culvert Section - "Medium Depth" 8 to 13 foot invert	LF	190	\$900	\$171,000	Incl Cut and Fill
72 - in MH - Base, Barrel, Top, Casting, Cover - "Med deep"	EA	2	\$20,000	\$40,000	Incl Cut and Fill
Catch Basins - Base, "Barrel", Top, Casting	EA	4	\$5,000	\$20,000	Incl Cut and Fill
Connections to Existing Storm Sewer	EA	1	\$5,000	\$5,000	Incl Cut and Fill
<b>Street and Sidewalk</b>					
Pavement and Pavement Base	YD2	2350	\$75	\$176,250	full width
Curb and Gutter	LF	1280	\$27	\$33,920	both sides
Driveway and Driveway Base	YD2	0	\$75	\$0	
Driveway Aprons	EA	0	\$2,500	\$0	
Sidewalk and Sidewalk Base	YD2	570	\$47	\$26,676	both sides
Sidewalk Aprons	EA	4	\$1,500	\$6,000	
<b>Restoration</b>					
Topsoil	YD3	100	\$90	\$9,000	both sides
Trees and Bushes	EA	20	\$500	\$10,000	both sides
Sod - Large Area	FT2	0	\$0.6		
Sod - Small Area	FT2	5120	\$1.20	\$6,144	both sides
Street Lights/Power Poles	EA	4	\$1,500	\$6,000	both sides
Signage	EA	10	\$250	\$2,500	both sides
Misc Items - Retain Walls, Fences, Gardens, etc	LS	1	\$1	\$1	
					\$1,091,591
<b>SUB TOTAL</b>				\$1,419,068	
<b>CONTINGENCY (ADD 35 %)</b>				\$382,057	
<b>TOTAL - OPINION OF PROBABLE CONSTRUCTION COST</b>				\$1,801,125	

SW Harriett  
 2A-Upton - north and south of W51st  
 5/8/2018

DESCRIPTION	UNIT	AMOUNT	UNIT COST	TOTAL COST	COMMENTS
<b>Contract/Services</b>					
Mobilization/Permits/Testing/Survey	%		5.00%	\$82,997	
Traffic Control	%		2.50%	\$41,498	
<b>Sitework</b>					
Dewatering	%		2.50%	\$41,498	
Protect Existing Utilities	%		5.00%	\$82,997	
Bypass During Construction-water, sewer, elec, gas, comm	%		5.00%	\$82,997	
Bypass During Construction-Storm water	%		10.00%	\$165,993	
Erosion Control					
Silt Fence	LF	1200	\$7	\$8,400	
Filter Logs	LF	600	\$7	\$4,200	
Inlet Protection	EA	8	\$200	\$1,600	
Demolition and Disposal					
Pavement (Street and Alley)	YD2	3380	\$30	\$101,400	full width
Curb and Gutter	LF	1800	\$15	\$27,000	both sides
Sidewalk	YD2	800	\$30	\$24,000	both sides
Trees (with stump grind)	EA	40	\$1,500	\$60,000	both sides
Street Lights/Power Poles	EA	8	\$1,500	\$12,000	both sides
Street Signs	EA	20	\$20	\$400	both sides
Catch Basins	EA	7	\$500	\$3,500	
Manholes	EA	2		\$0	In replace MH
Pipe	LF	0		\$0	In replace pipe
<b>Storm Sewer</b>					
4' by 8' Culvert Section - "Deep" over 13 foot invert	LF	600	\$1,100	\$660,000	Incl Cut and Fill
4' by 8' Culvert Section - "Medium Depth" 8 to 13 foot invert	LF	300	\$900	\$270,000	Incl Cut and Fill
72 - in MH - Base, Barrel, Top, Casting, Cover - "Med deep"	EA	2	\$20,000	\$40,000	Incl Cut and Fill
Catch Basins - Base, "Barrel", Top, Casting	EA	7	\$5,000	\$35,000	Incl Cut and Fill
Connections to Existing Storm Sewer	EA	2	\$5,000	\$10,000	Incl Cut and Fill
<b>Street and Sidewalk</b>					
Pavement and Pavement Base	YD2	3380	\$75	\$253,500	full width
Curb and Gutter	LF	1800	\$27	\$47,700	both sides
Driveway and Driveway Base	YD2	0	\$75	\$0	
Driveway Aprons	EA	0	\$2,500	\$0	
Sidewalk and Sidewalk Base	YD2	800	\$47	\$37,440	both sides
Sidewalk Aprons	EA	4	\$1,500	\$6,000	
<b>Restoration</b>					
Topsoil	YD3	135	\$90	\$12,150	both sides
Trees and Bushes	EA	40	\$500	\$20,000	both sides
Sod - Large Area	FT2	0	\$0.6	\$0	
Sod - Small Area	FT2	7200	\$1.20	\$8,640	both sides
Street Lights/Power Poles	EA	8	\$1,500	\$12,000	both sides
Signage	EA	20	\$250	\$5,000	both sides
Misc Items - Retain Walls, Fences, Gardens, etc	LS	1	\$1	\$1	
					\$1,659,931
<b>SUB TOTAL</b>				\$2,157,910	
<b>CONTINGENCY (ADD 35 %)</b>				\$580,976	
<b>TOTAL - OPINION OF PROBABLE CONSTRUCTION COST</b>				\$2,738,886	

SW Harriett  
 2B-W51st - Thomas to Russell and Associated  
 5/8/2018

DESCRIPTION	UNIT	AMOUNT	UNIT COST	TOTAL COST	COMMENTS
<b>Contract/Services</b>					
Mobilization/Permits/Testing/Survey	%		5.00%	\$39,116	
Traffic Control	%		2.50%	\$19,558	
<b>Sitework</b>					
Dewatering	%		2.50%	\$19,558	
Protect Existing Utilities	%		5.00%	\$39,116	
Bypass During Construction-water, sewer, elec, gas, comm	%		5.00%	\$39,116	
Bypass During Construction-Storm water	%		10.00%	\$78,233	
Erosion Control					
Silt Fence	LF	1800	\$7	\$12,600	
Filter Logs	LF	900	\$7	\$6,300	
Inlet Protection	EA	15	\$200	\$3,000	
Demolition and Disposal					
Pavement	YD2	2270	\$30	\$68,100	full width
Curb and Gutter	LF	480	\$15	\$7,200	one side
Sidewalk	YD2	215	\$30	\$6,450	one side
Trees (with stump grind)	EA	17	\$1,500	\$25,500	one side
Street Lights/Power Poles	EA	2	\$1,500	\$3,000	one side
Street Signs	EA	12	\$20	\$240	one side
Catch Basins	EA	10	\$500	\$5,000	
Manholes	EA	4		\$0	In replace MH
Pipe	LF	480		\$0	In replace pipe
<b>Storm Sewer</b>					
24 in Dia Pipe - "Shallow" 6 to 8 foot invert	LF	480	\$225	\$108,000	Incl Cut and Fill
12 - in Dia Pipe - "Shallow" 6 to 8 foot invert - added pipe	LF	420	\$200	\$84,000	Incl Cut and Fill
72 - in MH - Base, Barrel, Top, Casting, Cover - "Shallow"	EA	5	\$15,000	\$75,000	Incl Cut and Fill
48 - in MH - Base, Barrel, Top, Casting, Cover - "Shallow"	EA	3	\$12,500	\$37,500	Incl Cut and Fill
Catch Basins - Base, "Barrel", Top, Casting	EA	10	\$5,000	\$50,000	Incl Cut and Fill
Connections to Existing Sewer	EA	3	\$5,000	\$15,000	Incl Cut and Fill
<b>Street and Sidewalk</b>					
Pavement and Pavement Base	YD2	2270	\$75	\$170,250	full width
Curb and Gutter	LF	480	\$27	\$12,720	one side
Driveway and Driveway Base	YD2	0	\$75	\$0	
Driveway Aprons	EA	20	\$2,500	\$50,000	
Sidewalk and Sidewalk Base	YD2	215	\$47	\$10,062	one side
Sidewalk Aprons	EA	8	\$1,500	\$12,000	
<b>Restoration</b>					
Topsoil	YD3	40	\$90	\$3,600	one side
Trees and Bushes	EA	17	\$500	\$8,500	one side
Sod - Large Areas	FT2	0	\$0.6	\$0	
Sod - Small Areas	FT2	1920	\$1.20	\$2,304	one side
Street Lights/Power Poles	EA	2	\$1,500	\$3,000	one side
Signage	EA	12	\$250	\$3,000	one side
Misc Items - Retain Walls, Fences, Gardens, etc	LS	1	\$1	\$1	garage proximity
					\$782,327
<b>SUB TOTAL</b>				\$1,017,025	
<b>CONTINGENCY (ADD 35 %)</b>				\$273,814	
<b>TOTAL - OPINION OF PROBABLE CONSTRUCTION COST</b>				\$1,290,840	

SW Harriett  
3A-Oliver Ave S. (50th to Harriet Parkway, and Associated)  
5/8/2018

DESCRIPTION	UNIT	AMOUNT	UNIT COST	TOTAL COST	COMMENTS
<b>Contract/Services</b>					
Mobilization/Permits/Testing/Survey	%		5.00%	\$96,561	
Traffic Control	%		2.50%	\$48,280	
<b>Sitework</b>					
Dewatering	%		2.50%	\$48,280	
Protect Existing Utilities	%		5.00%	\$96,561	
Bypass During Construction-water, sewer, elec, gas, comm	%		5.00%	\$96,561	
Bypass During Construction-Storm water	%		10.00%	\$193,122	
Erosion Control					
Silt Fence	LF	2800	\$7	\$19,600	
Filter Logs	LF	1000	\$7	\$7,000	
Inlet Protection	EA	18	\$200	\$3,600	
Demolition and Disposal					
Pavement (Street and Alley)	YD2	5000	\$30	\$150,000	full width
Curb and Gutter	LF	1365	\$15	\$20,475	one side
Sidewalk	YD2	490	\$30	\$14,700	one side
Trees (with stump grind)	EA	20	\$1,500	\$30,000	one side
Street Lights/Power Poles	EA	8	\$1,500	\$12,000	one side
Street Signs	EA	10	\$20	\$200	one side
Catch Basins	EA	12	\$500	\$6,000	
Manholes	EA	11		\$0	In replace MH
9 inch to 24 inch Pipe	LF	1970		\$0	In replace pipe
<b>Storm Sewer</b>					
36 in Dia Pipe - "Medium Depth" 8 to 15 foot invert	LF	1260	\$400	\$504,000	Incl Cut and Fill
24 in Dia Pipe - "Shallow Depth" 6 to 8 foot invert	LF	385	\$225	\$86,625	Incl Cut and Fill
4' by 6' Culvert Section - "Medium Depth" 8 to 13 foot invert	LF	325	\$800	\$260,000	Incl Cut and Fill
4' by 6' Culvert Section End Sections	EA	4	\$6,000	\$24,000	Incl Cut and Fill
72 - in MH - Base, Barrel, Top, Casting, Cover - "Med deep"	EA	11	\$20,000	\$220,000	Incl Cut and Fill
Catch Basins - Base, "Barrel", Top, Casting	EA	12	\$5,000	\$60,000	Incl Cut and Fill
Connections to Existing Storm Sewer	EA	3	\$5,000	\$15,000	Incl Cut and Fill
<b>Street and Sidewalk</b>					
Pavement and Pavement Base	YD2	4986	\$75	\$373,950	full width
Curb and Gutter	LF	1362	\$27	\$36,093	one side
Driveway and Driveway Base	YD2	100	\$75	\$7,500	
Driveway Aprons	EA	4	\$2,500	\$10,000	
Sidewalk and Sidewalk Base	YD2	490	\$47	\$22,932	one side
Sidewalk Aprons	EA	5	\$1,500	\$7,500	
<b>Restoration</b>					
Topsoil	YD3	100	\$90	\$9,000	one side
Trees and Bushes	EA	20	\$500	\$10,000	one side
Sod - Large Areas	FT2	0	\$0.6	\$0	
Sod - Small Areas	FT2	5450	\$1.20	\$6,540	one side
Street Lights/Power Poles	EA	8	\$1,500	\$12,000	one side
Signage	EA	10	\$250	\$2,500	one side
Misc Items - Retain Walls, Fences, Gardens, etc	LS	1	\$1	\$1	
					\$1,931,216
<b>SUB TOTAL</b>				\$2,510,581	
<b>CONTINGENCY (ADD 35 %)</b>				\$675,926	
<b>TOTAL - OPINION OF PROBABLE CONSTRUCTION COST</b>				\$3,186,506	

SW Harriett  
3B-W50th from Newton Ave S to Logan Ave S and Parking Lot Storage  
5/8/2018

DESCRIPTION	UNIT	AMOUNT	UNIT COST	TOTAL COST	COMMENTS
<b>Contract/Services</b>					
Mobilization/Permits/Testing/Survey	%		5.00%	\$95,666	
Traffic Control	%		2.50%	\$47,833	
<b>Sitework</b>					
Dewatering	%		2.50%	\$47,833	
Protect Existing Utilities	%		5.00%	\$95,666	
Bypass During Construction-water, sewer, elec, gas, comm	%		5.00%	\$95,666	
Bypass During Construction-Storm water	%		10.00%	\$191,332	
Erosion Control					
Silt Fence	LF	2000	\$7	\$14,000	
Filter Logs	LF	1000	\$7	\$7,000	
Inlet Protection	EA	19	\$200	\$3,800	
Demolition and Disposal					
Pavement	YD2	5800	\$30	\$174,000	full width
Curb and Gutter	LF	700	\$15	\$10,500	one side
Sidewalk	YD2	290	\$30	\$8,700	one side
Trees (with stump grind)	EA	6	\$1,500	\$9,000	one side
Street Lights/Power Poles	EA	4	\$1,500	\$6,000	one side
Street Signs	EA	10	\$20	\$200	one side
Catch Basins	EA	12	\$500	\$6,000	
Manholes	EA	4		\$0	In replace MH
Pipe	LF	325		\$0	In replace pipe
<b>Storm Sewer</b>					
24 - in Dia Pipe - "Shallow" 6 to 8 foot invert	LF	120	\$225	\$27,000	Incl Cut and Fill
18 - in Dia Pipe - "Shallow" 6 to 8 foot invert	LF	650	\$200	\$130,000	Incl Cut and Fill
15 - in Dia Pipe - "Shallow" 6 to 8 foot invert	LF	60	\$200	\$12,000	Incl Cut and Fill
72 - in MH - Base, Barrel, Top, Casting, Cover - "Shallow"	EA	2	\$15,000	\$30,000	Incl Cut and Fill
48 - in MH - Base, Barrel, Top, Casting, Cover - "Shallow"	EA	3	\$12,500	\$37,500	Incl Cut and Fill
Catch Basins - Base, "Barrel", Top, Casting	EA	12	\$5,000	\$60,000	Incl Cut and Fill
Connections to Existing Sewer	EA	3	\$5,000	\$15,000	Incl Cut and Fill
Specialty Structure	EA	1	\$20,000	\$20,000	
<b>Storage</b>					
ADS or Storm Trap Type System - Per Bridget	AC-FT	1.7	\$500,000	\$850,000	
<b>Street and Sidewalk</b>					
Pavement and Pavement Base	YD2	5800	\$75	\$435,000	full width
Curb and Gutter	LF	700	\$27	\$18,550	one side
Driveway and Driveway Base	YD2	0	\$75	\$0	
Driveway Aprons	EA	2	\$2,500	\$5,000	
Sidewalk and Sidewalk Base	YD2	290	\$47	\$13,572	one side
Sidewalk Aprons	EA	6	\$1,500	\$9,000	
<b>Restoration</b>					
Topsoil	YD3	0	\$90	\$0	
Trees and Bushes	EA	6	\$500	\$3,000	one side
Sod - Large Areas	FT2	0	\$0.6	\$0	
Sod - Small Areas	FT2	0	\$1.20	\$0	one side
Street Lights/Power Poles	EA	4	\$1,500	\$6,000	one side
Signage	EA	10	\$250	\$2,500	one side
Misc Items - Retain Walls, Fences, Gardens, etc	LS	1	\$1	\$1	
					\$1,913,323
<b>SUB TOTAL</b>				\$2,487,320	
<b>CONTINGENCY (ADD 35 %)</b>				\$669,663	

TOTAL - OPINION OF PROBABLE CONSTRUCTION COST				\$3,156,983	

SW Harriett  
3C-Newton Area 51st to 52nd Piping and Ponds  
5/8/2018

DESCRIPTION	UNIT	AMOUNT	UNIT COST	TOTAL COST	COMMENTS
<b><u>Contract/Services</u></b>					
Mobilization/Permits/Testing/Survey	%		5.00%	\$83,213	
Traffic Control	%		2.50%	\$41,606	
<b><u>Sitework</u></b>					
Dewatering	%		2.50%	\$41,606	
Protect Existing Utilities	%		5.00%	\$83,213	
Bypass During Construction-water, sewer, elec, gas, comm	%		5.00%	\$83,213	
Bypass During Construction-Storm water	%		10.00%	\$166,425	
Erosion Control					
Silt Fence	LF	3650	\$7	\$25,550	
Filter Logs	LF	1100	\$7	\$7,700	
Inlet Protection	EA	22	\$200	\$4,400	
Demolition and Disposal					
Pavement	YD2	4255	\$30	\$127,650	full width
Curb and Gutter	LF	1325	\$15	\$19,875	one side
Sidewalk	YD2	585	\$30	\$17,550	one side
Trees (with stump grind)	EA	20	\$1,500	\$30,000	one side
Street Lights/Power Poles	EA	2	\$1,500	\$3,000	one side
Street Signs	EA	10	\$20	\$200	one side
Catch Basins	EA	13	\$500	\$6,500	
Manholes	EA	8		\$0	In replace MH
Pipe	LF	1420		\$0	In replace pipe
<b><u>Storm Sewer</u></b>					
24 in Dia Pipe - "Shallow" 6 to 8 foot invert	LF	1110	\$225	\$249,750	Incl Cut and Fill
18 - in Dia Pipe - "Shallow" 6 to 8 foot invert	LF	245	\$200	\$49,000	Incl Cut and Fill
15 in Dia Pipe - "Shallow" 6 to 8 foot invert	LF	310	\$200	\$62,000	Incl Cut and Fill
72 - in MH - Base, Barrel, Top, Casting, Cover - "Shallow"	EA	2	\$15,000	\$30,000	Incl Cut and Fill
48 - in MH - Base, Barrel, Top, Casting, Cover - "Shallow"	EA	11	\$12,500	\$137,500	Incl Cut and Fill
Catch Basins - Base, "Barrel", Top, Casting	EA	13	\$5,000	\$65,000	Incl Cut and Fill
Connections to Existing Sewer	EA	3	\$5,000	\$15,000	Incl Cut and Fill
Outfall to Creek with Rip Rap	EA	1	\$10,000	\$10,000	Incl Cut and Fill
<b><u>Pond</u></b>					
Excavation	YD3	5860	\$10	\$58,600	
Sand	YD3	896	\$30	\$26,880	
Geomembrane	FT2	48400	\$2	\$96,800	
Topsoil	YD3	1792	\$90	\$161,280	
Sod - Large Area	FT2	48400	\$0.60	\$29,040	
<b><u>Street and Sidewalk</u></b>					
Pavement and Pavement Base	YD2	4255	\$75	\$319,125	full width
Curb and Gutter	LF	1325	\$27	\$35,113	one side
Driveway and Driveway Base	YD2	0	\$75	\$0	
Driveway Aprons	EA	2	\$2,500	\$5,000	
Sidewalk and Sidewalk Base	YD2	585	\$47	\$27,378	one side
Sidewalk Aprons	EA	9	\$1,500	\$13,500	
<b><u>Restoration</u></b>					
Topsoil	YD3	100	\$90	\$9,000	one side
Trees and Bushes	EA	20	\$500	\$10,000	one side
Sod - Large Areas	FT2	0	\$0.60	\$0	
Sod - Small Areas	FT2	5300	\$1.20	\$6,360	one side
Street Lights/Power Poles	EA	2	\$1,500	\$3,000	one side
Signage	EA	10	\$250	\$2,500	one side
Misc Items - Retain Walls, Fences, Gardens, etc	LS	0	\$1	\$0	
					\$1,664,251
<b>SUB TOTAL</b>				\$2,163,526	
<b>CONTINGENCY (ADD 35 %)</b>				\$582,488	
<b>TOTAL - OPINION OF PROBABLE CONSTRUCTION COST</b>				\$2,746,013	

SW Harriett  
3D-Lynhurst Park Storage  
5/8/2018

DESCRIPTION	UNIT	AMOUNT	UNIT COST	TOTAL COST	COMMENTS
<b>Contract/Services</b>					
Mobilization/Permits/Testing/Survey	%		5.00%	\$69,947	
Traffic Control	%		2.50%	\$34,973	
<b>Sitework</b>					
Dewatering	%		2.50%	\$34,973	
Protect Existing Utilities	%		5.00%	\$69,947	
Bypass During Construction-water, sewer, elec, gas, comm	%		5.00%	\$69,947	
Bypass During Construction-Storm water	%		10.00%	\$139,893	
Erosion Control					
Silt Fence	LF	1700	\$7	\$11,900	
Filter Logs	LF	200	\$7	\$1,400	
Inlet Protection	EA	7	\$200	\$1,400	
Demolition and Disposal					
Pavement	YD2	70	\$30	\$2,100	
Curb and Gutter	LF	50	\$15	\$750	
Sidewalk	YD2	30	\$30	\$900	
Trees (with stump grind)	EA	0	\$1,500	\$0	
Street Lights/Power Poles	EA	0	\$1,500	\$0	
Street Signs	EA	0	\$20	\$0	
Catch Basins	EA	5	\$500	\$2,500	
Manholes	EA	2		\$0	incl w/ replace
Pipe	LF	0		\$0	incl w/replace
<b>Storm Sewer</b>					
24 - inch dia pipe - cost "Shallow"	LF	160	\$225	\$36,000	Incl Cut and Fill
12 - inch dia pipe - cost "Shallow"	LF	80	\$200	\$16,000	Incl Cut and Fill
72 - in MH - Base, Barrel, Top, Casting, Cover - "Shallow"	EA	4	\$15,000	\$60,000	Incl Cut and Fill
Catch Basins - Base, "Barrel", Top, Casting	EA	5	\$5,000	\$25,000	Incl Cut and Fill
Connections to Existing Storm Sewer	EA	2	\$5,000	\$10,000	
Specialty Structure	EA	1	\$20,000	\$20,000	
<b>Storage Basin -</b>					
ADS or Storm Trap Type System - per Bridget	AC-FT	2.25	\$500,000	\$1,125,000	
<b>Street and Sidewalk</b>					
Pavement and Pavement Base	YD2	70	\$75	\$5,250	
Curb and Gutter	LF	50	\$27	\$1,325	
Driveway and Driveway Base	YD2	0	\$75	\$0	
Driveway Aprons	EA	0	\$2,500	\$0	
Sidewalk and Sidewalk Base	YD2	30	\$47	\$1,404	
Sidewalk Aprons	EA	1	\$1,500	\$1,500	
<b>Restoration</b>					
Topsoil	YD3	350	\$90	\$31,500	replace 25%
Trees and Bushes	EA	0	\$500	\$0	
Sod - Large Areas	FT2	75000	\$0.60	\$45,000	
Sod - Small Areas	FT2	0	\$1.20	\$0	
Street Lights/Power Poles	EA	0	\$1,500	\$0	
Signage	EA	0	\$250	\$0	
Misc Items - Retain Walls, Fences, Gardens, etc	LS	1	\$1	\$1	two ball fields ?
<b>SUB TOTAL</b>				\$1,818,609	
<b>CONTINGENCY (ADD 35 %)</b>				\$489,626	
<b>TOTAL - OPINION OF PROBABLE CONSTRUCTION COST</b>				\$2,308,235	

SW Harriett  
3E-West 49th St (Minnehaha to Knox)  
5/8/2018

DESCRIPTION	UNIT	AMOUNT	UNIT COST	TOTAL COST	COMMENTS
<b>Contract/Services</b>					
Mobilization/Permits/Testing/Survey	%		5.00%	\$8,063	
Traffic Control	%		2.50%	\$4,031	
<b>Sitework</b>					
Dewatering	%		2.50%	\$4,031	
Protect Existing Utilities	%		5.00%	\$8,063	
Bypass During Construction-water, sewer, elec, gas, comm	%		5.00%	\$8,063	
Bypass During Construction-Storm water	%		10.00%	\$16,125	
Erosion Control					
Silt Fence	LF	400	\$7	\$2,800	
Filter Logs	LF	200	\$7	\$1,400	
Inlet Protection	EA	3	\$200	\$600	
Demolition and Disposal					
Pavement	YD2	225	\$30	\$6,750	
Curb and Gutter	LF	50	\$15	\$750	
Sidewalk	YD2	0	\$30	\$0	
Trees (with stump grind)	EA	0	\$1,500	\$0	
Street Lights/Power Poles	EA	0	\$1,500	\$0	
Street Signs	EA	0	\$20	\$0	
Catch Basins	EA	1	\$500	\$500	
Manholes	EA	1		\$0	incl w/ replace
Pipe	LF	135		\$0	incl w/replace
<b>Storm Sewer</b>					
18 - inch dia pipe - cost "Shallow"	LF	135	\$200	\$27,000	Incl Cut and Fill
48 - in MH - Base, Barrel, Top, Casting, Cover - "Shallow"	EA	1	\$12,500	\$12,500	Incl Cut and Fill
72 - in MH - Base, Barrel, Top, Casting, Cover - "Shallow"	EA	3	\$15,000	\$45,000	Incl Cut and Fill
Backflow Preventer	EA	3	\$10,000	\$30,000	
Catch Basins - Base, "Barrel", Top, Casting	EA	2	\$5,000	\$10,000	Incl Cut and Fill
<b>Street and Sidewalk</b>					
Pavement and Pavement Base	YD2	225	\$75	\$16,875	
Curb and Gutter	LF	50	\$27	\$1,325	
Driveway and Driveway Base	YD2	10	\$75	\$750	
Driveway Aprons	EA	2	\$2,500	\$5,000	
Sidewalk and Sidewalk Base	YD2	0	\$47	\$0	
Sidewalk Aprons	EA	0	\$1,500	\$0	
<b>Restoration</b>					
Topsoil	YD3	0	\$90	\$0	replace 25%
Trees and Bushes	EA	0	\$500	\$0	
Sod - Large Areas	FT2	0	\$0.60	\$0	
Sod - Small Areas	FT2	0	\$1.20	\$0	
Street Lights/Power Poles	EA	0	\$1,500	\$0	
Signage	EA	0	\$250	\$0	
Misc Items - Retain Walls, Fences, Gardens, etc	LS	0	\$1	\$0	
					\$161,250
<b>SUB TOTAL</b>				\$209,625	
<b>CONTINGENCY (ADD 35 %)</b>				\$56,438	
<b>TOTAL - OPINION OF PROBABLE CONSTRUCTION COST</b>				\$266,063	

SW Harriett  
 4A-Xerxes (52W to 53W)  
 6/15/2018

DESCRIPTION	UNIT	AMOUNT	UNIT COST	TOTAL COST	COMMENTS
<b>Contract/Services</b>					
Mobilization/Permits/Testing/Survey	%		5.00%	\$32,425	
Traffic Control	%		2.50%	\$16,212	
<b>Sitework</b>					
Dewatering	%		2.50%	\$16,212	
Protect Existing Utilities	%		5.00%	\$32,425	
Bypass During Construction-water,sewer,elec,gas, comm	%		5.00%	\$32,425	
Bypass During Construction-Storm water	%		10.00%	\$64,849	
Erosion Control					
Silt Fence	LF	1200	\$7	\$8,400	
Filter Logs	LF	400	\$7	\$2,800	
Inlet Protection	EA	8	\$200	\$1,600	
Demolition and Disposal					
Pavement	YD2	2600	\$30	\$78,000	full width
Curb and Gutter	LF	700	\$15	\$10,500	one side
Sidewalk	YD2	300	\$30	\$9,000	one side
Trees (with stump grind)	EA	15	\$1,500	\$22,500	one side
Street Lights/Power Poles	EA	4	\$1,500	\$6,000	one side
Street Signs	EA	10	\$20	\$200	one side
Catch Basins	EA	4	\$500	\$2,000	
Manholes	EA	4		\$0	In replace MH
21 - in Pipe	LF	620		\$0	In replace pipe
<b>Storm Sewer</b>					
36 in Dia Pipe - "Shallow" 6 to 8 foot invert	LF	203	\$300	\$60,900	Incl Cut and Fill
30 in Dia Pipe - "Shallow" 6 to 8 foot invert	LF	440	\$250	\$110,000	Incl Cut and Fill
72 - in MH - Base, Barrel, Top, Casting, Cover - "Shallow"	EA	4	\$15,000	\$60,000	Incl Cut and Fill
Catch Basins - Base, "Barrel", Top, Casting	EA	4	\$5,000	\$20,000	Incl Cut and Fill
Connections to Existing Sewer	EA	2	\$5,000	\$10,000	Incl Cut and Fill
<b>Street and Sidewalk</b>					
Pavement and Pavement Base	YD2	2600	\$75	\$195,000	full width
Curb and Gutter	LF	700	\$27	\$18,550	one side
Driveway and Driveway Base	YD2	0	\$75	\$0	
Driveway Aprons	EA	0	\$2,500	\$0	
Sidewalk and Sidewalk Base	YD2	300	\$47	\$14,040	one side
Sidewalk Aprons	EA	2	\$1,500	\$3,000	
<b>Restoration</b>					
Topsoil	YD3	0	\$90	\$0	
Trees and Bushes	EA	15	\$500	\$7,500	one side
Sod - Large Areas	FT2	0	\$0.60	\$0	
Sod - Small Areas	FT2	0	\$1.20	\$0	
Street Lights/Power Poles	EA	4	\$1,500	\$6,000	one side
Signage	EA	10	\$250	\$2,500	one side
Misc Items - Retain Walls, Fences, Gardens, etc	LS	1	\$1	\$1	
<b>SUB TOTAL</b>				\$843,038	\$648,491
<b>CONTINGENCY (ADD 35 %)</b>				\$295,063	
<b>TOTAL - OPINION OF PROBABLE CONSTRUCTION COST</b>				\$1,138,102	

SW Harriett  
4A-York (53W to 52W)  
5/8/2018

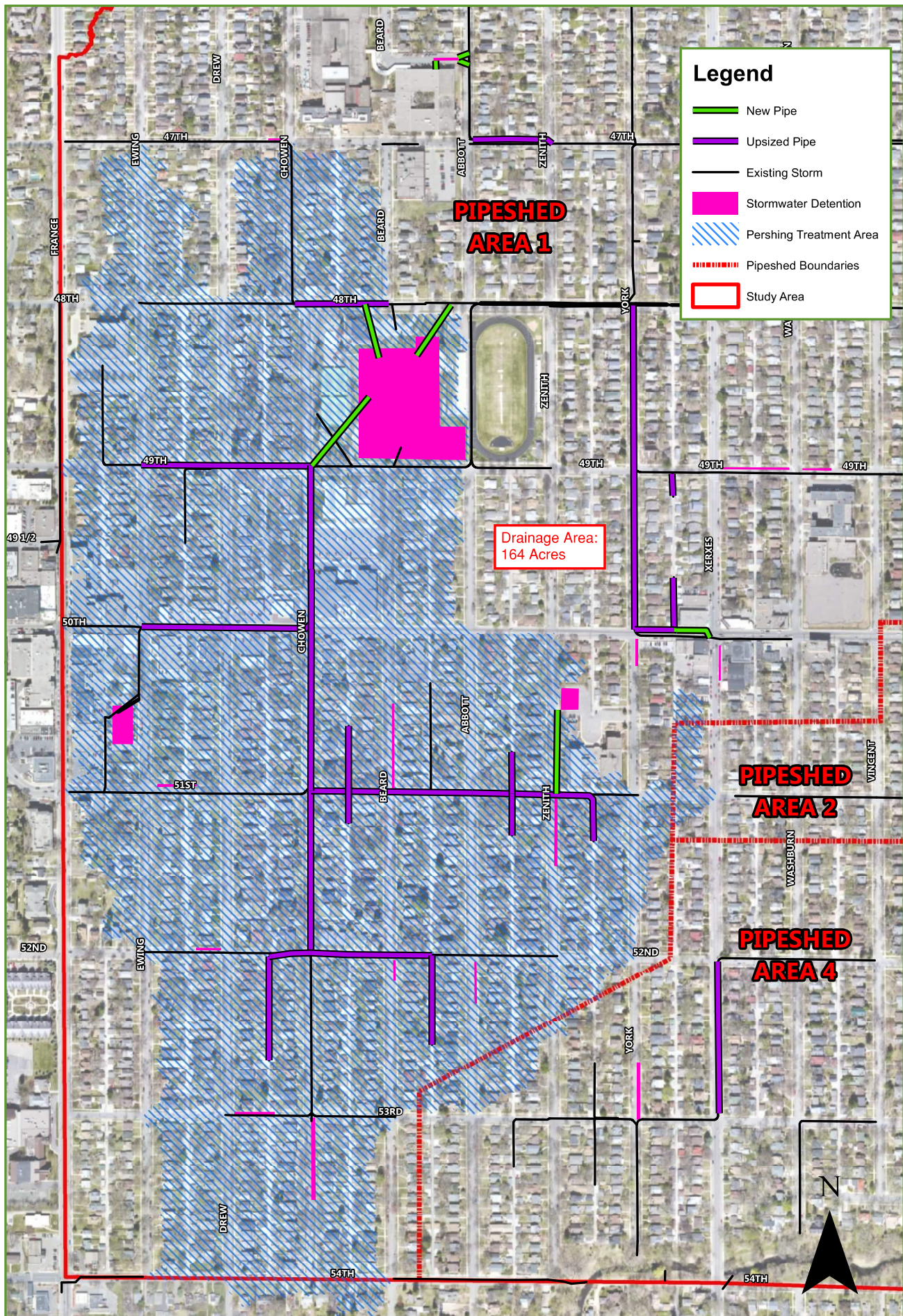
DESCRIPTION	UNIT	AMOUNT	UNIT COST	TOTAL COST	COMMENTS
<b>Contract/Services</b>					
Mobilization/Permits/Testing (5 percent)	%		5.00%	\$17,512	
Traffic Control	%		2.50%	\$8,756	
<b>Sitework</b>					
Dewatering	%		2.50%	\$8,756	
Protect Existing Utilities	%		5.00%	\$17,512	
Bypass During Construction-water, sewer, elec, gas, comm	%		5.00%	\$17,512	
Bypass During Construction- storm water	%		10.00%	\$35,025	
Erosion Control					
Silt Fence	LF	500	\$7	\$3,500	
Filter Logs	LF	200	\$7	\$1,400	
Inlet Protection	EA	6	\$200	\$1,200	
Demolition and Disposal					
Pavement	YD2	1040	\$30	\$31,200	full width
Curb and Gutter	LF	275	\$15	\$4,125	one side
Sidewalk	YD2	112	\$30	\$3,360	one side
Trees (with stump grind)	EA	5	\$1,500	\$7,500	one side
Street Lights/Power Poles	EA	0	\$1,500	\$0	one side
Street Signs	EA	3	\$20	\$60	one side
Catch Basins	EA	2	\$500	\$1,000	
Manholes	EA	2		\$0	In replace MH
<b>Storm Sewer</b>					
4 ft x 8 ft BLVD Box - "Shallow" - 6 foot invert	LF	200	\$700	\$140,000	Incl Cut and Fill
4 ft x 8 ft End Section	EA	2	\$6,500	\$13,000	Incl Cut and Fill
72 - in MH - Base, Barrel, Top, Casting, Cover - "Shallow"	EA	2	\$15,000	\$30,000	Incl Cut and Fill
Catch Basins - Base, "Barrel", Top, Casting	EA	2	\$5,000	\$10,000	Incl Cut and Fill
Connections to Existing Sewer	EA	1	\$5,000	\$5,000	Incl Cut and Fill
<b>Street and Sidewalk</b>					
Pavement and Pavement Base	YD2	1040	\$75	\$78,000	full width
Curb and Gutter	LF	275	\$27	\$7,288	one side
Driveway and Driveway Base	YD2	0	\$75	\$0	
Driveway Aprons	EA	0	\$2,500	\$0	
Sidewalk and Sidewalk Base	YD2	112	\$47	\$5,242	one side
Sidewalk Aprons	EA	1	\$1,500	\$1,500	
<b>Restoration</b>					
Topsoil	YD3	20	\$90	\$1,800	
Trees and Bushes	EA	5	\$500	\$2,500	one side
Sod - Large Areas	FT2	0	\$0.60	\$0	
Sod - Small Areas	FT2	1100	\$1.20	\$1,320	
Street Lights/Power Poles	EA	0	\$1,500	\$0	one side
Signage	EA	5	\$250	\$1,250	one side
Misc Items - Retain Walls, Fences, Gardens, etc	LS	1	\$1	\$1	
					\$350,245
<b>SUB TOTAL</b>				\$455,319	
<b>CONTINGENCY (ADD 35 %)</b>				\$122,586	
<b>TOTAL - OPINION OF PROBABLE CONSTRUCTION COST</b>				\$577,904	

# Appendix K – Water Quality Treatment Areas



**Minneapolis**  
Park & Recreation Board





**Legend**

- New Pipe
- Upsized Pipe
- Existing Storm
- Stormwater Detention
- Pershing Treatment Area
- Pipeshed Boundaries
- Study Area

Drainage Area:  
164 Acres








**PIPESHED  
AREA 2**

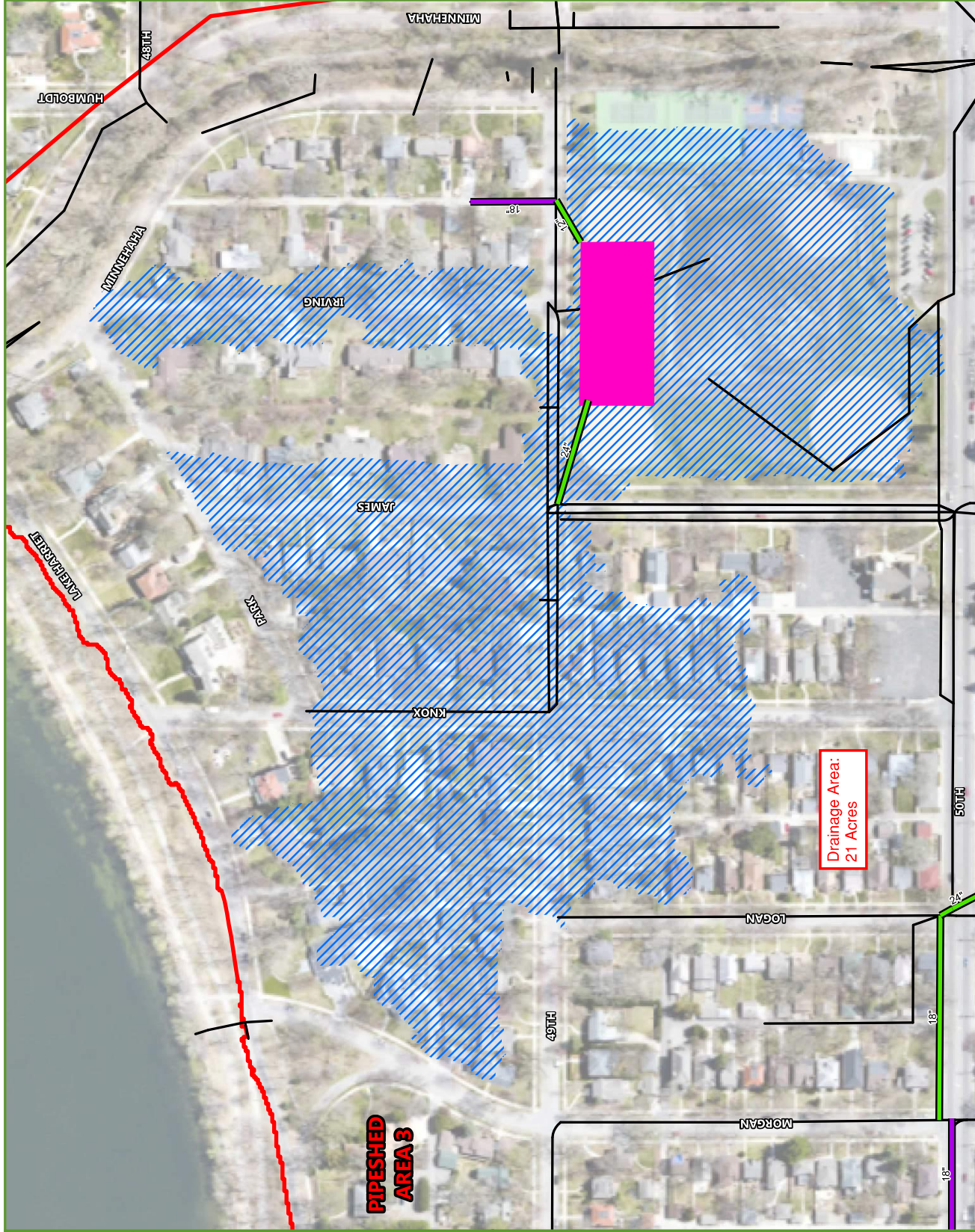
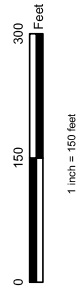
**PIPESHED  
AREA 4**

SW Harriet

**Water Quality  
Treatment Area  
Lynnhurst Park**


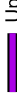





**Legend**

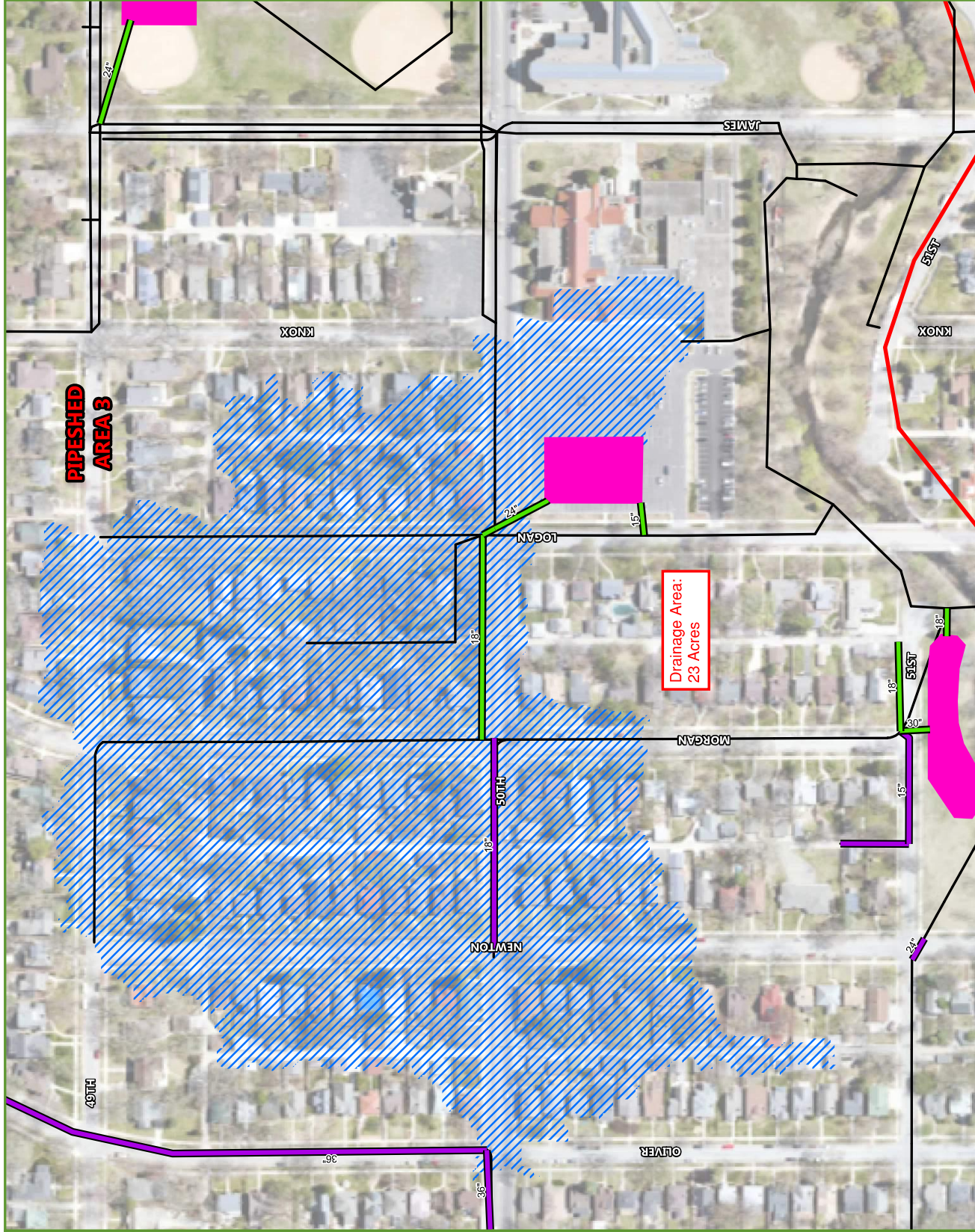
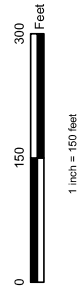
-  New Pipe
-  Upsized Pipe
-  Stormwater Detention
-  Existing Storm
-  Lynnhurst Treatment Area
-  Pipeshed Boundaries
-  Study Area



SW Harriet  
Water Quality  
Treatment Area  
Mt Olivet

Legend

-  New Pipe
-  Upsized Pipe
-  Stormwater Detention
-  Existing Storm
-  Mt Olivet Treatment Area
-  Pipeshed Boundaries
-  Study Area

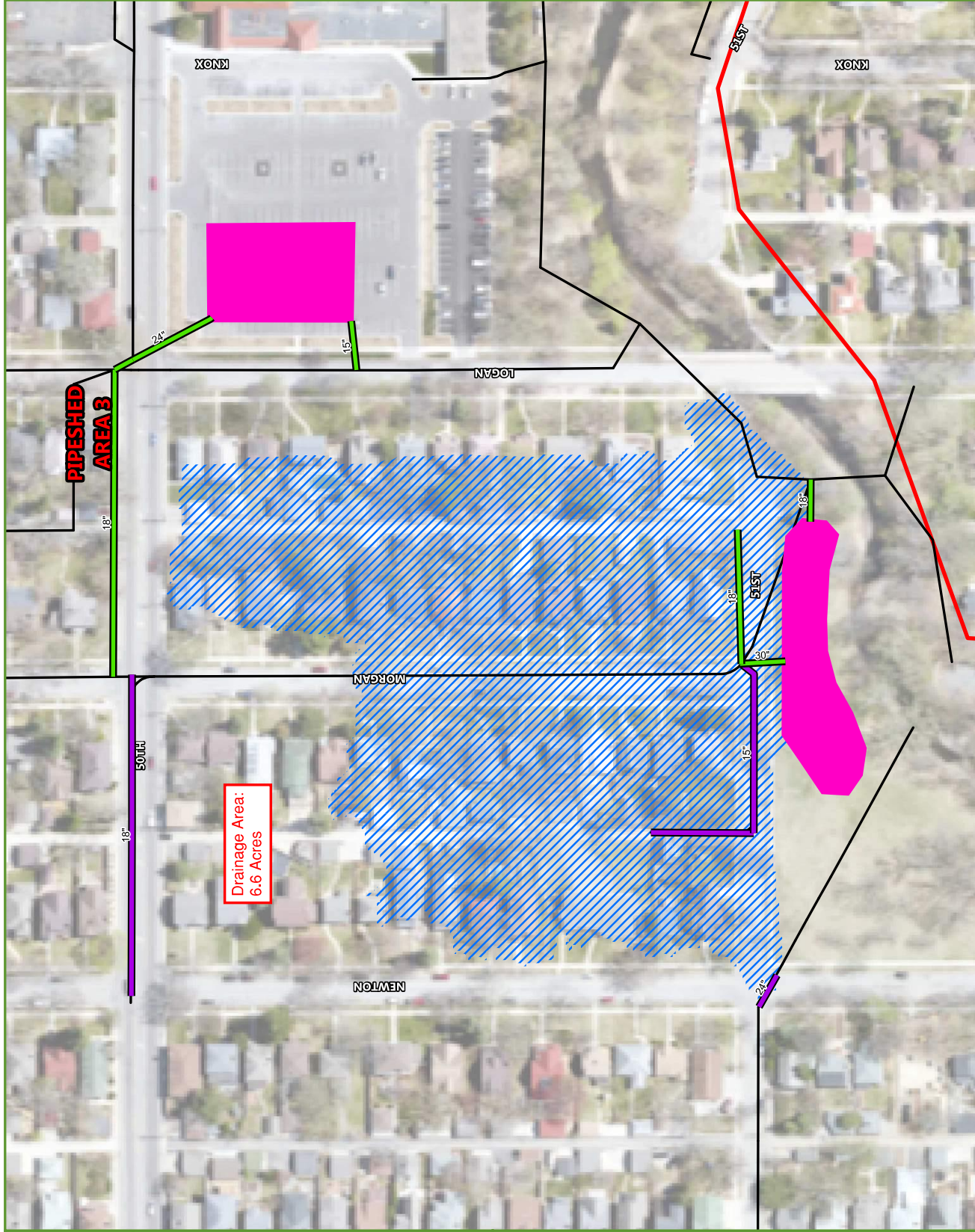
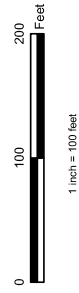


SW Harriet

# Water Quality Treatment Area Morgan Pond

## Legend

- New Pipe
- Upsized Pipe
- Stormwater Detention
- Existing Storm
- Morgan Pond Treatment Area
- Piped Area
- Piped Boundaries
- Study Area

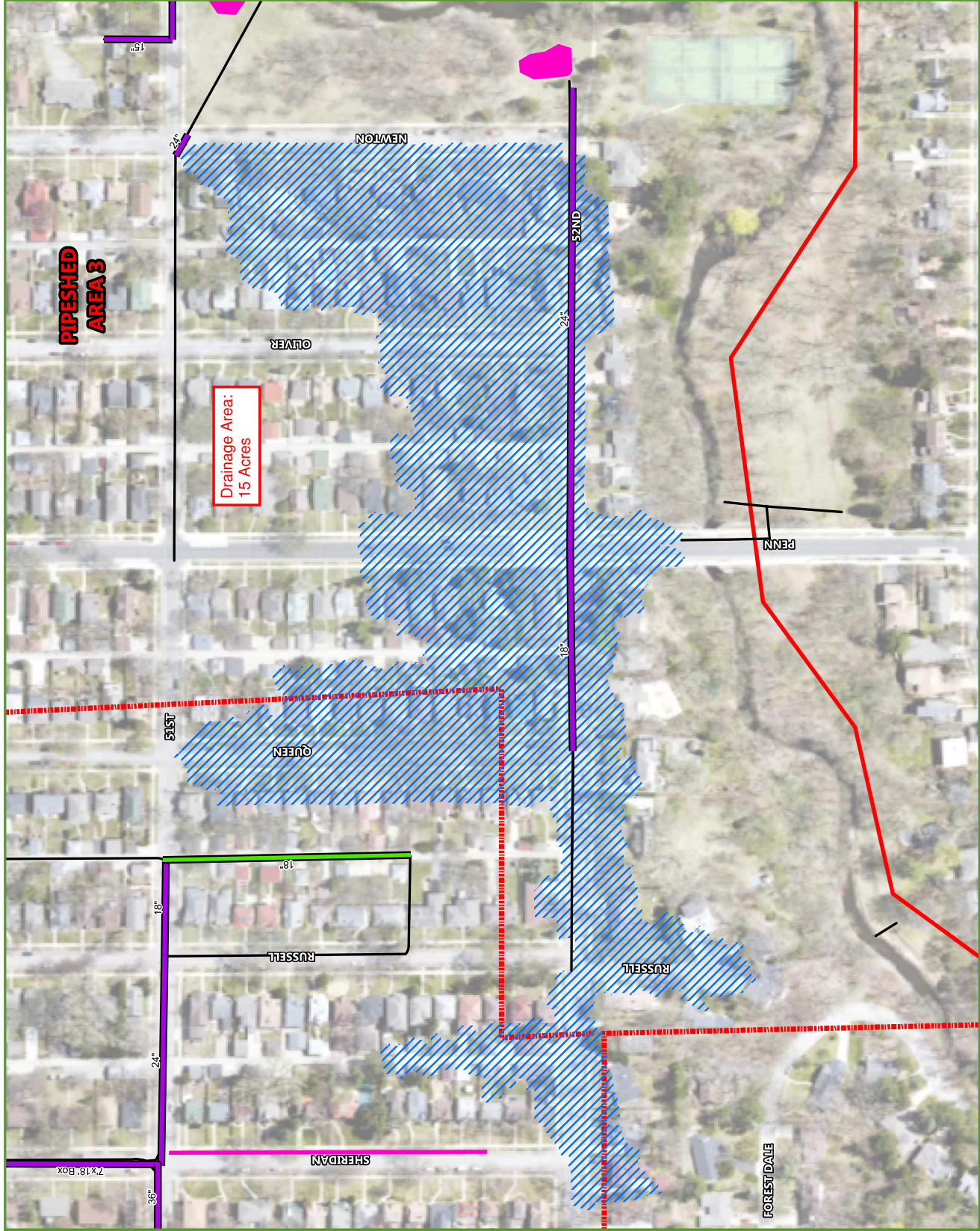
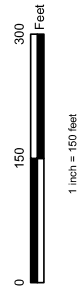


SW Harriet

# Water Quality Treatment Area Newton Pond

## Legend

- New Pipe
- Upsized Pipe
- Stormwater Detention
- Existing Storm
- Newton Pond Treatment Area
- Piped Area
- Piped Boundaries
- Study Area



SW Harriet

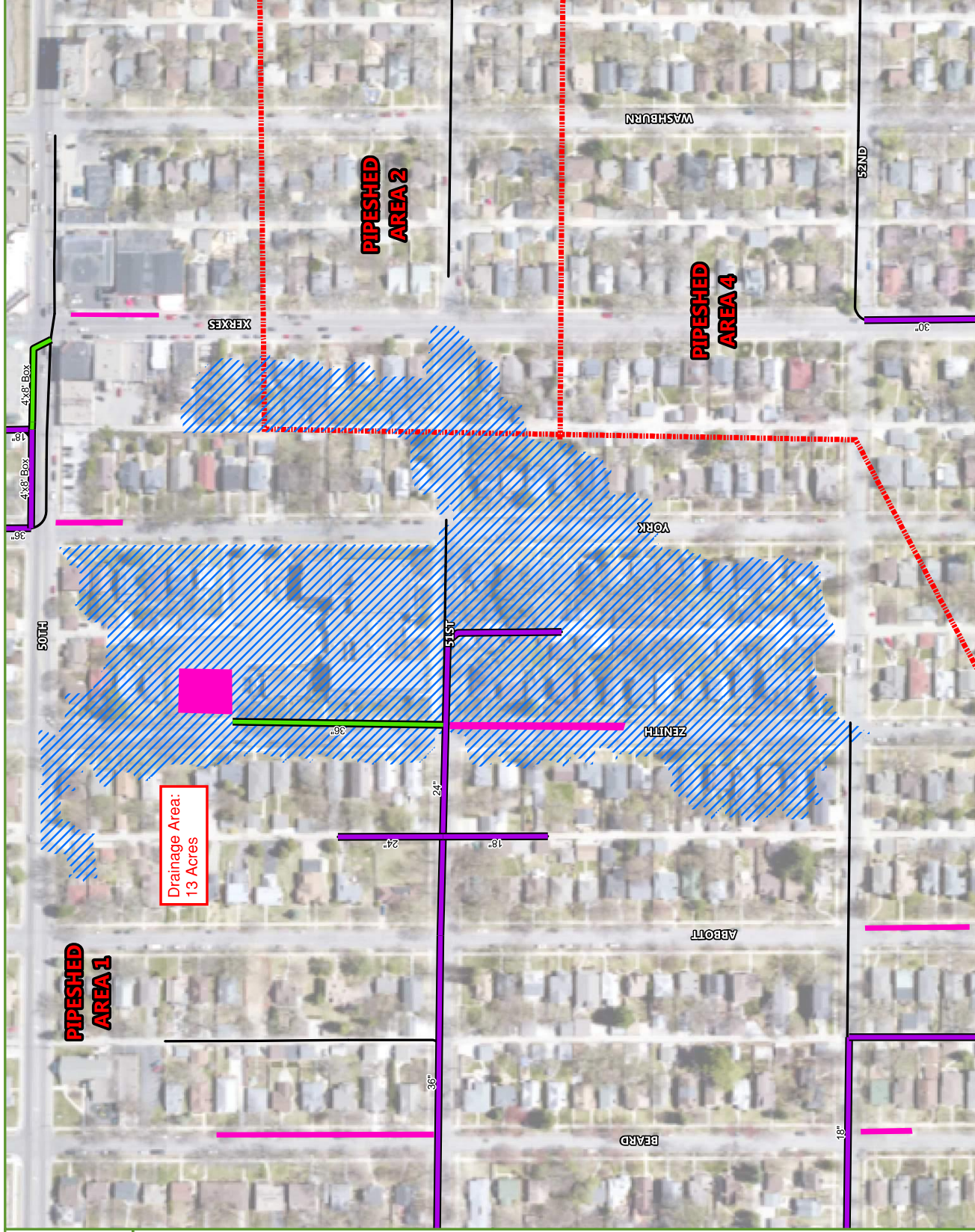
# Water Quality Treatment Area Christ the King

## Legend

- New Pipe
- Upsized Pipe
- Stormwater Detention
- Existing Storm
- Christ the King Treatment Area
- Pipedshed Boundaries
- Study Area



1 inch = 150 feet



SW Harriet

**Water Quality  
Treatment Area  
Ewing Parking Lot**

**Legend**

New Pipe

Upsized Pipe

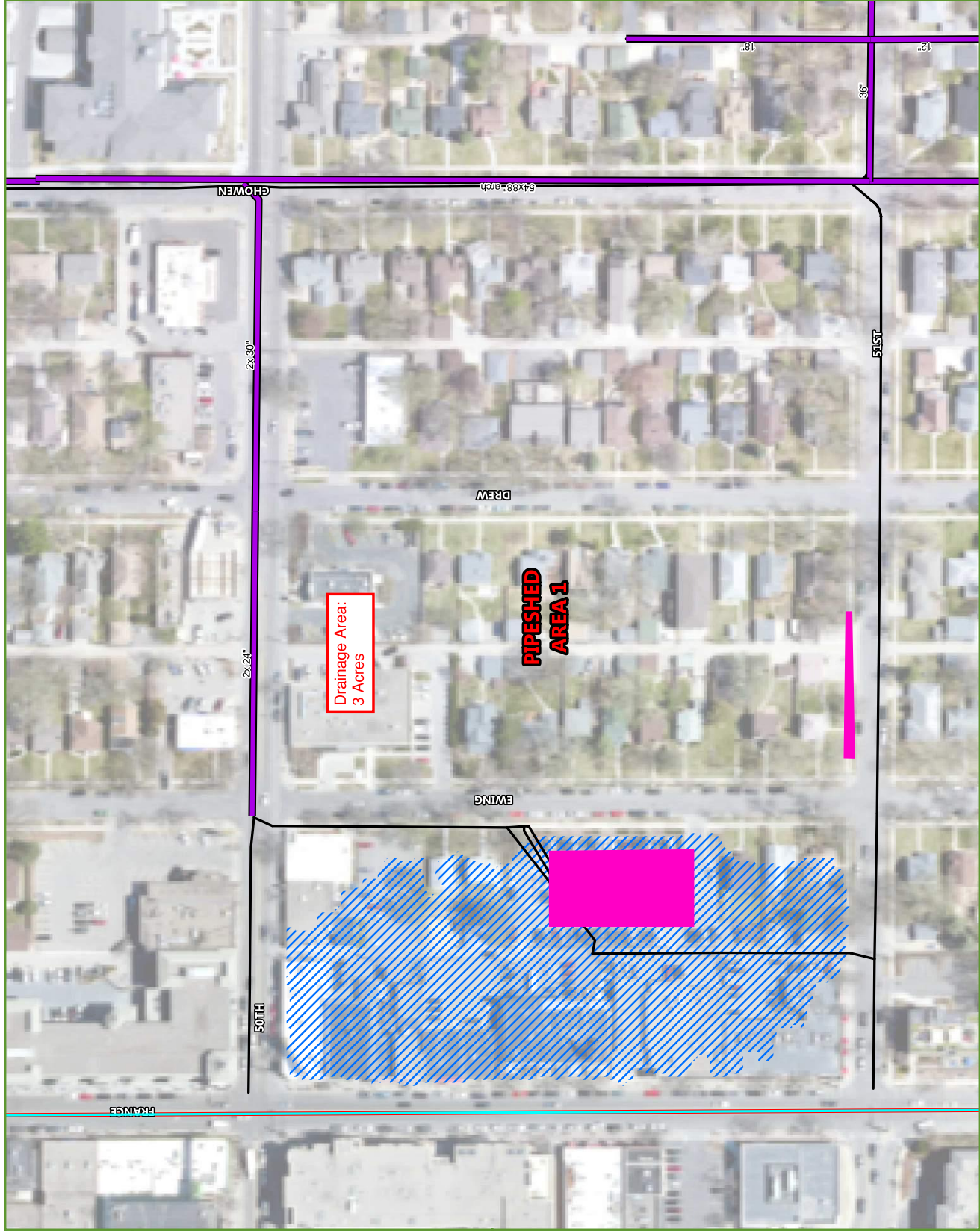
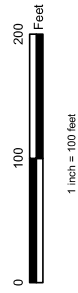
Stormwater  
Detention

Existing Storm

Ewing Parking  
Treatment  
Area

Pipedshed  
Boundaries

Study Area



# Appendix L – Project Team

## Southwest Harriet Feasibility Study Project Team

### City of Minneapolis

Lisa Goddard  
Liz Heyman  
Paul Hudalla  
Katrina Kessler  
Kelly Moriarity

### Minneapolis Park and Recreation Board

Adam Arvidson  
Colleen O'Dell

### Minnehaha Creek Watershed District

Chris Meehan  
Tiffany Schaufler

### HR Green (Project Consultant)

Justin Conner  
Costa Dimitracopolous  
Conner Dunteman  
Ajay Jain  
Jake Krukowski  
Bridget Osborn  
Kyle Riley  
Tim Thoreen  
Shawn Tracy

