Prentiss Creek Watershed

Appendix 4A:
Detailed Problem Areas

SUMMARY OF PROPOSED IMPROVEMENTS
PRENTISS CREEK WATERSHED

STORMWATER INFRASTRUCTURE IMPROVEMENT PLAN
VILLAGE OF DOWNERS GROVE

Problem Area ID	Subwatershed	Location	Priority	Recommend Improvements	Estimate of Cost	Design / Permit Schedule	Construction Schedule
PR 600	B	Vicinity of Fairmount Avenue and 62nd Street	Low	1. Clean Sewers 2. Replace & Add Inlet Structures 3. Improve Downstream Storm Sewer System 4. Upsize Storm Sewer & Correct Profile	$ 840,000	21 Months	2 Months
PR 601	A	O'Brien Park / Valley View Estates Pond	Moderate	1. Add Sediment Forebay in Pond 2. Eliminate Stagnant Pools in Pond 3. Pond Landscaping 4. Pond Maintenance	$ 2,353,000	24 Months	3 Months
PR 602	A	Vicinity of Claremont Drive to 73rd Street, east of Main Street	Low	1. Jetting of Storm Sewer 2. Add Additional Inlets/Change to Non-Clog Grates 3. Inspect Detention Pond Outlet Structures 4. Investigate Claim of Resident Filling Detention Area	$ 58,000	5.5 Months	2 Months
PR 603	D	6700 Block Saratoga / Mar-Duke Farm	Moderate	1. Install Additional Inlets/Change to Non-Clog Grates 2. Construct Rain Garden at Mar-Duke Farm	$ 486,000	15 Months	3 Months
PR 604	E	Vicinity of Woodward Avenue and Prentiss Drive	Moderate	1. Convert In-Line Retention to Off-Line Detention Pond 2. Establish Shoreline Vegetation 3. Perform Stream Maintenance 4. Perform Streambank Stabilization 5. Fix Broken Culvert	$ 1,098,000	30 Months	5 Months
PR 605	E	Vicinity of Concord Drive	High	1. Correct Backpitched Sewer 2. Add Additional Inlets/Change to Non-Clog Grates 3. Jetting of Storm Sewer	$ 599,000	24 Months	3 Months
PR 606	D	Springside Avenue along Nicor Gas Utility Easement	Low	1. Coordinate with Utility RE: Drainage Issue 2. Clean Clogged Grates/Add Additional Inlets	$ 46,000	9 Months	1 Month
PR 607	F	Oxnard Drive Cul-de-sac	Moderate	1. Extend Storm Sewer and Add Inlets 2. Add Additional Inlets/Change to Non-Clog Grates	$ 136,000	9 Months	1 Month
PR 608	B	Downers Grove Estates - Southeast	High	1. Roadway Reconstruction - Storm Sewers with Curb & Gutter	$ 7,307,000	24 Months	4 Months
PR 609	C	Downers Grove Estates - Northwest	High	1. Roadway Reconstruction - Storm Sewers with Curb & Gutter	$ 9,969,000	24 Months	6 Months
PR 610	F	Hobson Triangle	High	1. Roadway Reconstruction - Modified Rural Cross Section with Storm Sewer	$ 8,171,000	24 Months	10 Months
PR 611	E	Vicinity of Oxnard Drive and Bolson Drive	Low	1. Correct Backpitched Sewer 2. Add Additional Inlets/Change to Non-Clog Grates 3. Aid Residents with Individual Property Issues	$ 231,000	12 Months	2 Months
PR 612	D	Dunham Place Subdivisions	Low	1. Survey/Investigate Storm Sewer Segment 2. Jetting of Storm Sewers 3. Add Additional Inlets/Change to Non-Clog Grates	$ 182,000	6 Months	2 Months
PR 613	C	Vicinity of 62nd Lane East of Brookbank	Moderate	1. Fix Backpitched Sewer / Upsize Sewer 2. Modify Rear Yard Drainage Pipe 3. Add Storm Sewer to Clyde Avenue 4. Aid Residents with Individual Property Issues	$ 4,930,000	24 Months	4 Months
PR 614	B	Vicinity of Fairmount Avenue from 63rd St. to Oxford St.	High	1. Add Additional Inlets/Change to Non-Clog Grates 2. Replace Storm Sewer 3. Construct Detention Pond	$ 7,541,000	24 Months	8 Months
PR 615	A	Valley View Drive near Blackburn Avenue	Moderate	1. Fix Backpitched Sewer / Upsize Sewer 2. Add Additional Inlets/Change to Non-Clog Grates 3. Perform Detention Pond Study	$ 760,000	18 Months	1 Month
PR 616	A	Vicinity of Valley View Dr. from Main St. to Meadowcrest Dr.	Moderate	1. Correct Backpitched Sewer 2. Extend Storm Sewers to Aid with Yard Drainage	$ 294,000	9 Months	2 Months

PROBLEM AREA 600

PRENTISS CREEK SUBWATERSHED PR-B
PROBLEM AREA 600

Location: Vicinity of Fairmount Avenue and 62nd Street

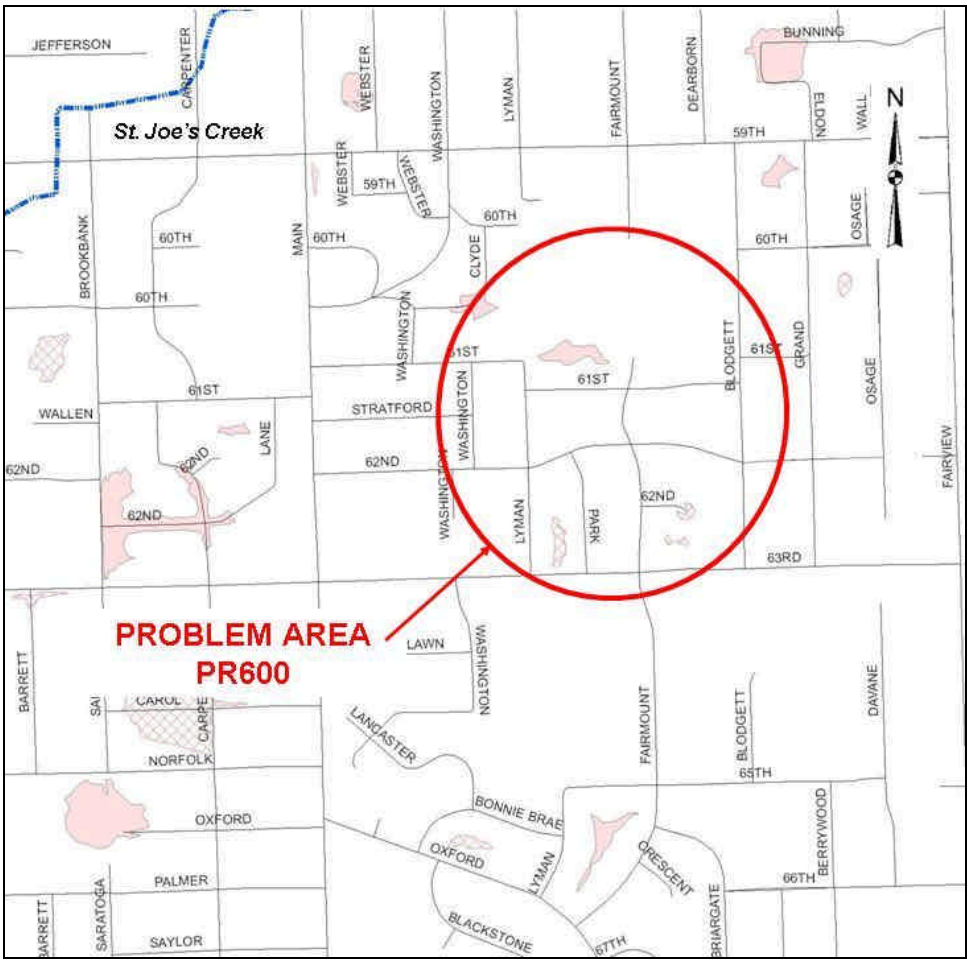


Figure 600-1
Problem Area Location Map

Description

Problem Area PR 600 is located in the far northeastern portion of the Prentiss Creek watershed. Land use consists of single-family residential. Fairmount School is located at the far northern end of the problem area, and there is a depressional area on the grounds of the school, just north of 61st Street. The topography is relatively flat, and this problem area is generally lower (in elevation) than surrounding areas. The area is drained by storm sewer, the trunk line of which travels south along Fairmount Avenue, eventually joining the 60-inch trunk line along 67th Street.

Street flooding and, to a lesser extent, yard flooding occur in the area. Surcharging storm sewers were observed during the October 2006 storm event, and Village staff has indicated that this is an area of recurring street flooding.

Results

A storm sewer survey was conducted for the main sewer line in this problem area. XP-SWMM modeling reveals that the system would surcharge during the 10-year storm event in the vicinity of 61st & Fairmount and 62nd & Fairmount. This is a low point along the street profile, and where the sewer will surcharge first.

Flooding occurs in this area because the storm sewer is increasing in elevation (is backpitched) at a location where the ground elevation is at its lowest. When the sewer was modeled assuming no restrictions downstream of 63rd Street, the hydraulic grade line was above the crown of the storm sewer for the segment along Fairmount from 61st Street to 62nd Street, but was still under the pavement. The portion of sewer from 61st Street to 62nd Street, which is 18-inch diameter, is undersized. Figure 600-2 illustrates the existing storm sewer profile along Fairmount Avenue.

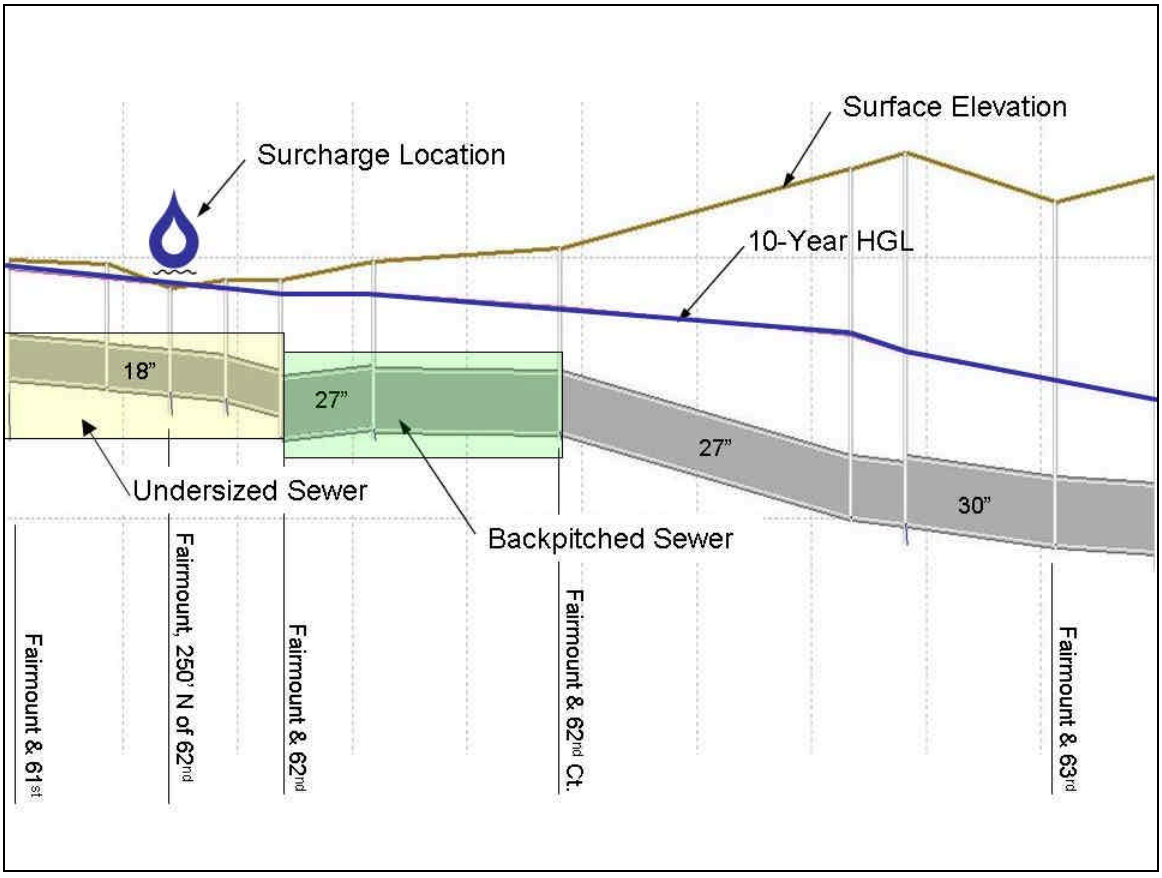


Figure 600-2
Storm Sewer Profile and 10-Year Hydraulic Grade Line, Fairmount Avenue

Multiple residents have indicated that the Village needs to improve street sweeping in the area. This suggests that some street flooding may be due to debris blocking the inlet structures,

therefore reducing inlet capacity. Setting up a maintenance program to regularly send a street sweeper through this area, particularly during the fall months, would be beneficial.

Recommendations

1. Increase Maintenance Frequency to Clean Backpitched Sewer

   The backpitched sewer in this problem area will promote sedimentation and may significantly reduce the hydraulic capacity of the storm sewers, especially if frequent sewer cleaning does not occur. The backpitched sewers should be inspected on a bi-annual basis and cleaned (jetted) as necessary. This reach of storm sewer will likely require more frequent maintenance than typical storm sewer.

2. Replace and Add Inlet Structures

   Being a depressional area, debris from upstream areas settles out at the inlets during rain events. Changing the existing inlet grates to a non-clogging grate will improve street drainage. Additionally, the Village needs to begin a street sweeping program, especially in the fall, to remove the debris.

3. Improve Downstream Storm Sewer System

   Improvements should first be made to Problem Area 614. Even if the storm sewer along Fairmount through Problem Area 600 is upsized, there is still a restriction downstream that will cause flooding in the area. Problem Area 614 should be addressed first, which will then provide relief upstream.

4. Upsize Storm Sewer and Correct Profile

   If flooding problems persist after improvements are made to the downstream portion of the system, the storm sewer along Fairmount Avenue between 61st Street and 62nd Street should be upsized (from 18" to 24") and the sewer profile corrected to eliminate the segment which is backpitched.

Priority

Low

Completing the improvements recommended in PR614 will relieve some of the flooding in this problem area. Therefore, it is recommended that the improvements detailed for PR600 be postponed until those for PR614 are completed.

Costs

A planning estimate of improvement costs is included below. A detailed breakdown can be found in Table 600-1.

1. Clean Backpitched Sewers	$3,000
2. Replace and Add Inlet Structures	$152,000
3. Improve Downstream Storm Sewer System	*See PR614 Cost Estimate*
4. Upsize Storm Sewer & Correct Profile	$424,000
Contingency and Fees	$261,000
Total Implementation Cost	**$840,000**

Schedule

An implementation schedule for the completion of the recommended improvements is as follows:

Design Phase	
Item 2 – Engineering & Design	3 months
Item 4 – Preliminary Design	*6 months*
Final Design	*6 months*
Permitting Phase	
Village of Downers Grove	6 months
IDNR/IEPA/COE	*9 months*
IDOT/DuDOT	6 months
Construction Phase	
Item 1 – Clean Sewers	1 week
Item 2 – Add Inlet Structures	2 weeks
Item 4 – Storm Sewer Improvements	1 month
TOTAL ESTIMATED TIME	23 MONTHS

Note: Some tasks can be completed concurrently. Limiting items in Design & Permitting Phases are shown in italics.

PROBLEM AREA 601

PRENTISS CREEK SUBWATERSHED PR-A
PROBLEM AREA 601

Location: O'Brien Park / Valley View Estates Pond

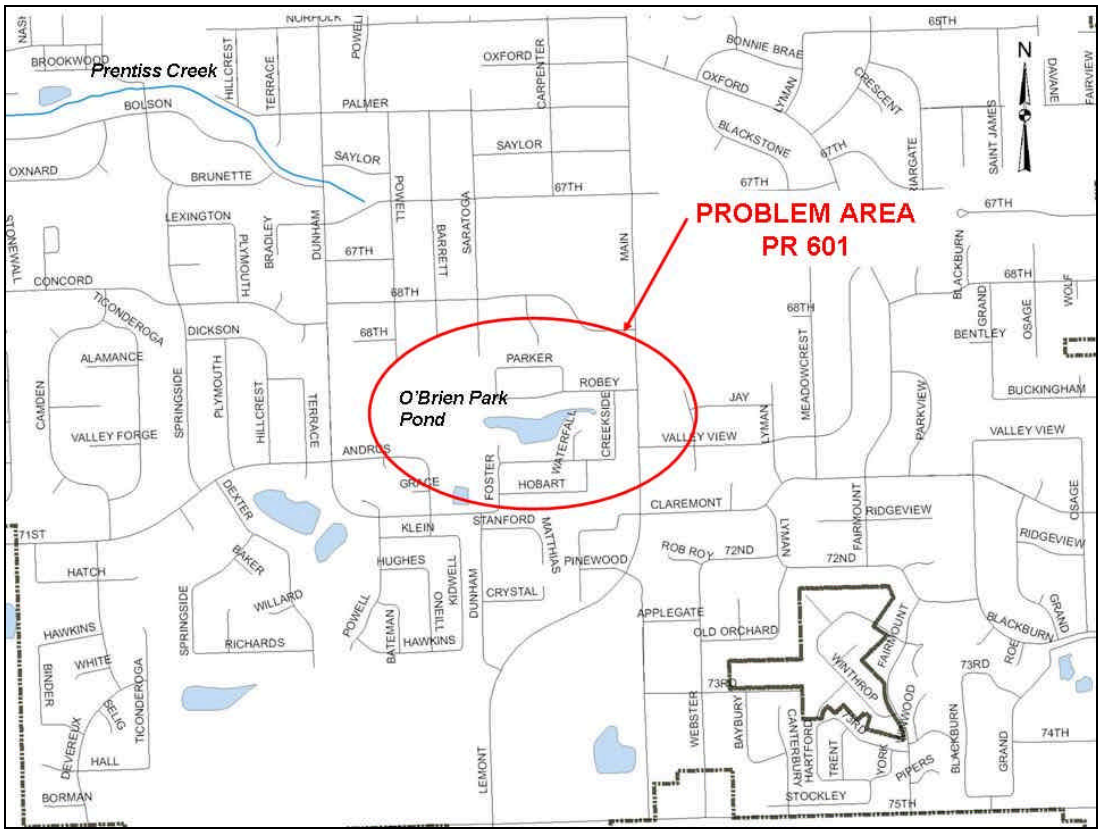


Figure 601-1
Problem Area Location

Description

O'Brien Park pond is a regional retention pond receiving flows from the area of the Village located roughly south of 68th Street between Main Street and Fairview Avenue. The pond has a drainage area of approximately 406 acres. Outflow from the pond is through a 42-inch storm sewer discharging to the northwest where it eventually intercepts the 66-inch storm sewer along 67th Street and shortly thereafter discharges into Prentiss Creek.

This retention pond has been the source of many complaints from adjoining property owners. There are reports of yard flooding, and also water quality complaints. The pond becomes stagnant, contributing to foul odors as well as sedimentation within the pond. Waterfowl (such as Canada Geese) are frequent visitors to the pond, and their waste has become a nuisance to residents bordering the pond.

Findings

The pond is designed as a wet extended retention pond, maintaining a minimum water level year-round and providing peak flow attenuation during rainfall events. This pond, over time, has suffered from the long-term impacts of urban runoff. Nutrient buildup from fertilizer runoff and animal waste along the pond has contributed to eutrophocation of the pond, leading to algal blooms and odor complaints. Retention ponds, by design, accumulate sediment; however, pond maintenance requirements include occasionally removing the sediment, which has not occurred.

In most locations around the pond perimeter, there are no natural banks. It is common for lawns to end at the banks, which consist only of a rocky shoreline. Waterfowl will congregate along unvegetated banks, since the lack of vegetation equates to a lack of cover in which their predators can hide. The pond banks are thus welcoming to the waterfowl, which residents find to be a nuisance.

Figure 601-2
View Looking West, O'Brien Park Pond

Recommendations

1. Pond Reconfiguration

   To properly utilize the basic function of the pond while keeping the pond as an amenity for area residents (as opposed to a nuisance), the pond should be redesigned to allow for

expedited future maintenance while continuing to provide similar water quality benefits. This includes the following recommendations:

1.1. Add a Sediment Forebay. A forebay should be provided at the east inlet to filter out sediment prior to discharge to the main pond. Typical design standards recommend sizing the forebay to hold 0.1 inches of runoff per impervious acre of contributing drainage, and should be 4 to 6 feet deep. The forebay should be a separate cell with a barrier, such as an earthen berm, dividing the forebay from the pond. This keeps the nutrient-laden sediment contained and easier to remove during pond maintenance.

The existing pond layout is ideal for the addition of a sediment forebay; the eastern arm of the pond can be regraded as necessary, including the construction of a berm to isolate the forebay area. The Village should establish a permanent easement to access the sediment forebay for regular maintenance. Typically, a sediment forebay should be cleaned out every 5-10 years, depending on the rate of sediment accumulation.

Based on preliminary calculations, this sedimentation area would have an approximate footprint of 0.4 acre, which will fit within the eastern arm of the pond.

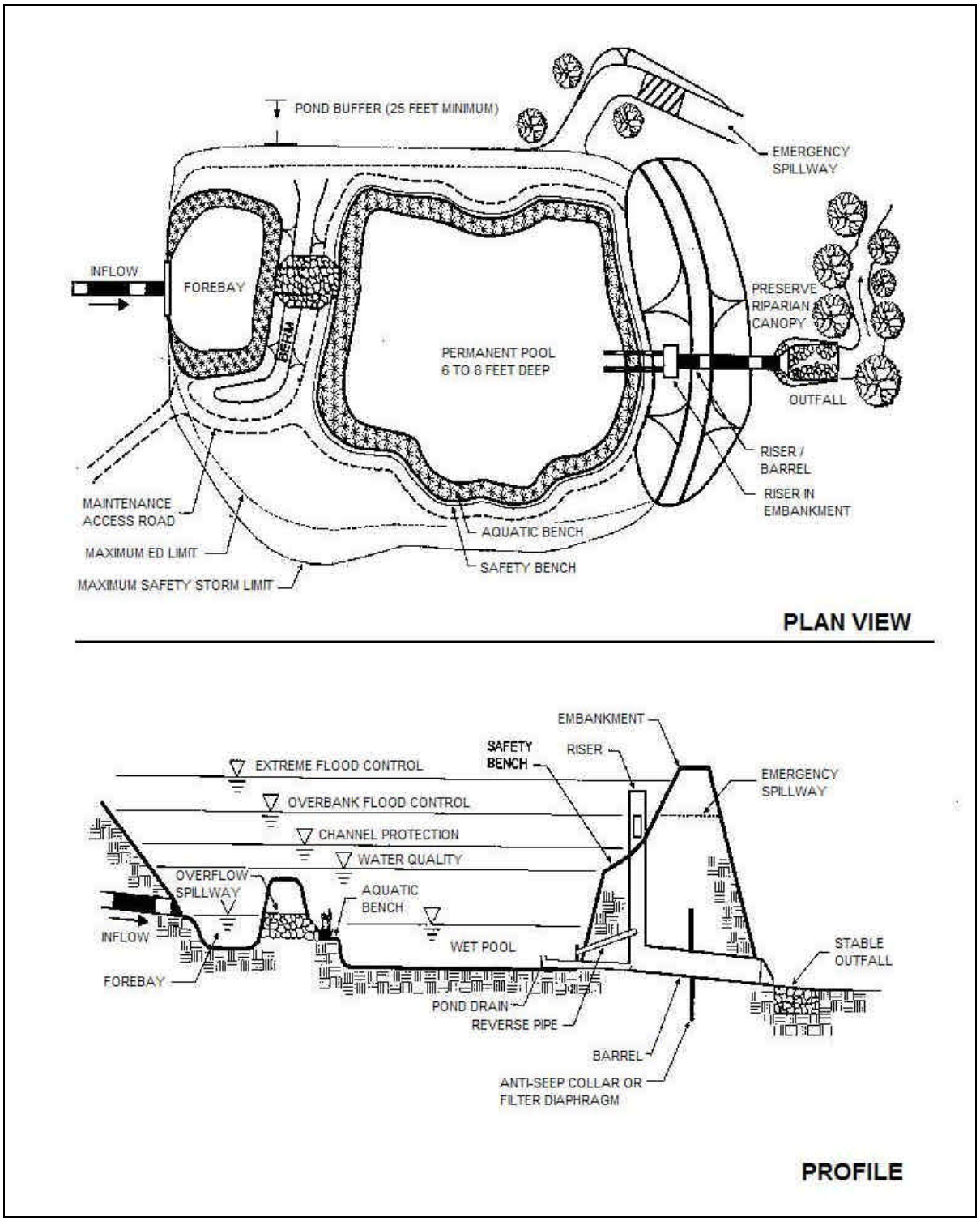
1.2. Eliminate Stagnant Pools. The existing shape of the pond creates stagnant pools on the south side. By dredging the sediment in the east-west flowline of the pond and relocating it to the south bay of the pond, an aquatic bench can be created. This would be an area with emergent wetland vegetation that can provide flood storage during heavy storm events, but which would not be permanently under water.

As an alternative, the Village may wish to add aeration to this part of the pond. While this solution does not offer the water quality or flood storage benefits of an aquatic bench, it is more economical and would be less disruptive to install.

In any case, the retention pond should be dredged to remove the nutrient-laden sediment from the pond bottom. This would help reduce the occurrence and severity of algal blooms and odor problems. The retention pond should have a minimum depth (as measured from the normal pool elevation) of 8 to 10 feet.

1.3. Pond Landscaping. The proper landscaping of the pond will help maintain the long-term health of the pond. Appropriate vegetation along the pond shoreline can be aesthetically pleasing, and also benefit adjacent property owners by discouraging waterfowl from congregating. The pond should be contoured to provide for an aquatic bench, which can support wetland fringe vegetation. Wetland plants are best established within six inches of the normal pool elevation. This also helps to dissipate wave action and protect the shoreline from erosion. Within the pond buffer, the planting of trees, shrubs or other native ground cover will provide a proper root structure to stabilize the shoreline and discourage the presence of waterfowl. Residents should be discouraged from mowing the ground cover within the buffer.

Figure 601-3 shows an example layout which can be modified to apply to the layout of the O'Brien Park Pond.



Source: www.stormwatercenter.net

Figure 601-3
Wet Extended Detention Pond

2. Pond Maintenance

A maintenance plan should be established for this and all major ponds within the Village to provide for proper functioning and maintain the aesthetics of the feature.

2.1. Remove sediment in the forebay every 5 to 7 years or when 50% of the forebay capacity has been lost.

2.2. Properly monitor the establishment of vegetation in the pond. When conducting the initial plantings, the new shoots should be protected so they cannot be eaten by geese or other animals.

Annual mowing of the pond buffer is only required along maintenance rights-of-way. The remaining buffer, if treated as a meadow, should only be mowed once every two years.

2.3. Keep inlets and outlets free of debris.

2.4. Maintain a pond inspection/maintenance log. Each detention/retention pond should be inspected once per year to verify proper function of the inlet and outlet, health of shoreline vegetation, and amount of accumulated sediment in the sediment forebay.

2.5. Educate homeowners along the pond on the purpose of a detention/retention pond and proper Best Management Practices to maintain a healthy and functioning water feature. The most important element of this education is to discourage homeowners from altering vegetation within the vegetated buffer around the pond perimeter.

Priority

Moderate

While the Village should make pond maintenance a priority to continue to receive the benefits a pond provides, there is no immediate hazard due to flooding.

Cost

A planning estimate of improvement costs is included below. A detailed breakdown can be found in Table 601-1.

1. Pond Reconfiguration	$1,623,000
2. Pond Maintenance	*Maintenance costs not included in capital costs*
Contingency and Fees	$730,000
Total Implementation Cost	**$2,353,000**

Schedule

An implementation schedule for the completion of the recommended improvements is as follows:

Design Phase	
Item 1 – Preliminary Design	*6 months*
Final Design	*6 months*
Permitting Phase	
Village of Downers Grove	6 months
IDNR/IEPA/COE	*12 months*
IDOT/DuDOT	6 months
Construction Phase	
Item 1 – Pond Improvements @ 1 ac-ft per 2 weeks	10 weeks
Pond Landscaping	2 weeks
TOTAL ESTIMATED TIME	27 MONTHS

Note: Some tasks can be completed concurrently. Limiting items in Design & Permitting Phases are shown in italics.

PROBLEM AREA 602

PRENTISS CREEK SUBWATERSHED PR-A
PROBLEM AREA 602

Location: Vicinity of Claremont Drive to 73rd Street, east of Main Street

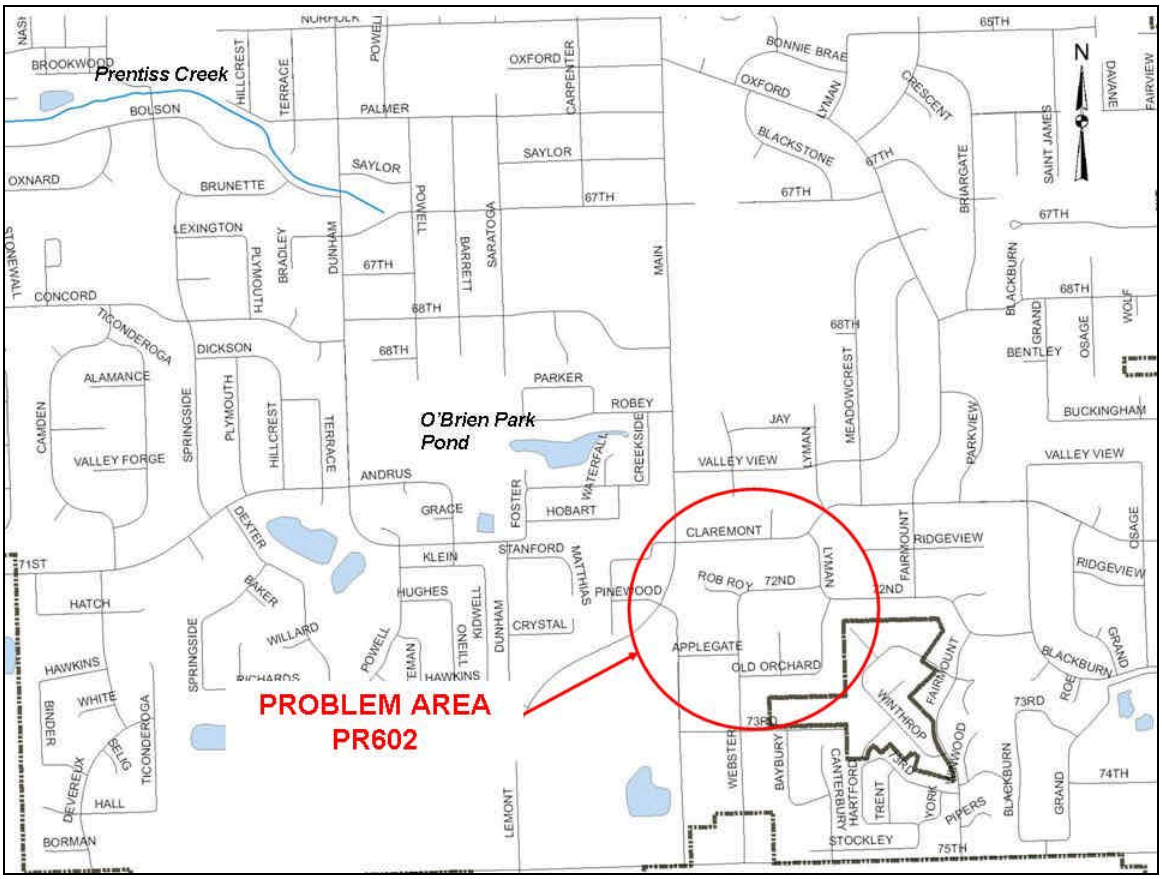


Figure 602-1
Problem Area Location Map

Description

Problem Area PR602 is located upstream of O'Brien Park Pond, on the southern side of the Prentiss Creek watershed. The area is drained by storm sewer, which drains to the 54-inch trunk sewer along Claremont Drive. There are two dry bottom detention ponds in the area: the Spring Green Village detention pond located north of Claremont Drive and east of Main Street, and the Spring Green South detention pond located north of 72nd Street west of Lyman Avenue. Land use in the area is single-family residential.

The predominant complaints in Problem Area PR602 are street flooding and yard flooding. Street flooding is a recurring problem along Claremont Drive between Main Street and Clayton Court. Yard flooding is a recurring problem in the vicinity of Webster Street and Applegate Avenue.

Findings

As-built drawings for the Spring Green Village subdivision were used to model the storm sewer along Claremont Drive where the flooding occurs. The results show that the storm sewer along Claremont Drive is adequately sized, but that the flow out of the pipe is greatly influenced by water depth in the detention ponds in the Spring Green Village and Spring Green South subdivisions. Figure 602-2 illustrates the location of the detention ponds as well as the storm sewer network connecting the ponds.

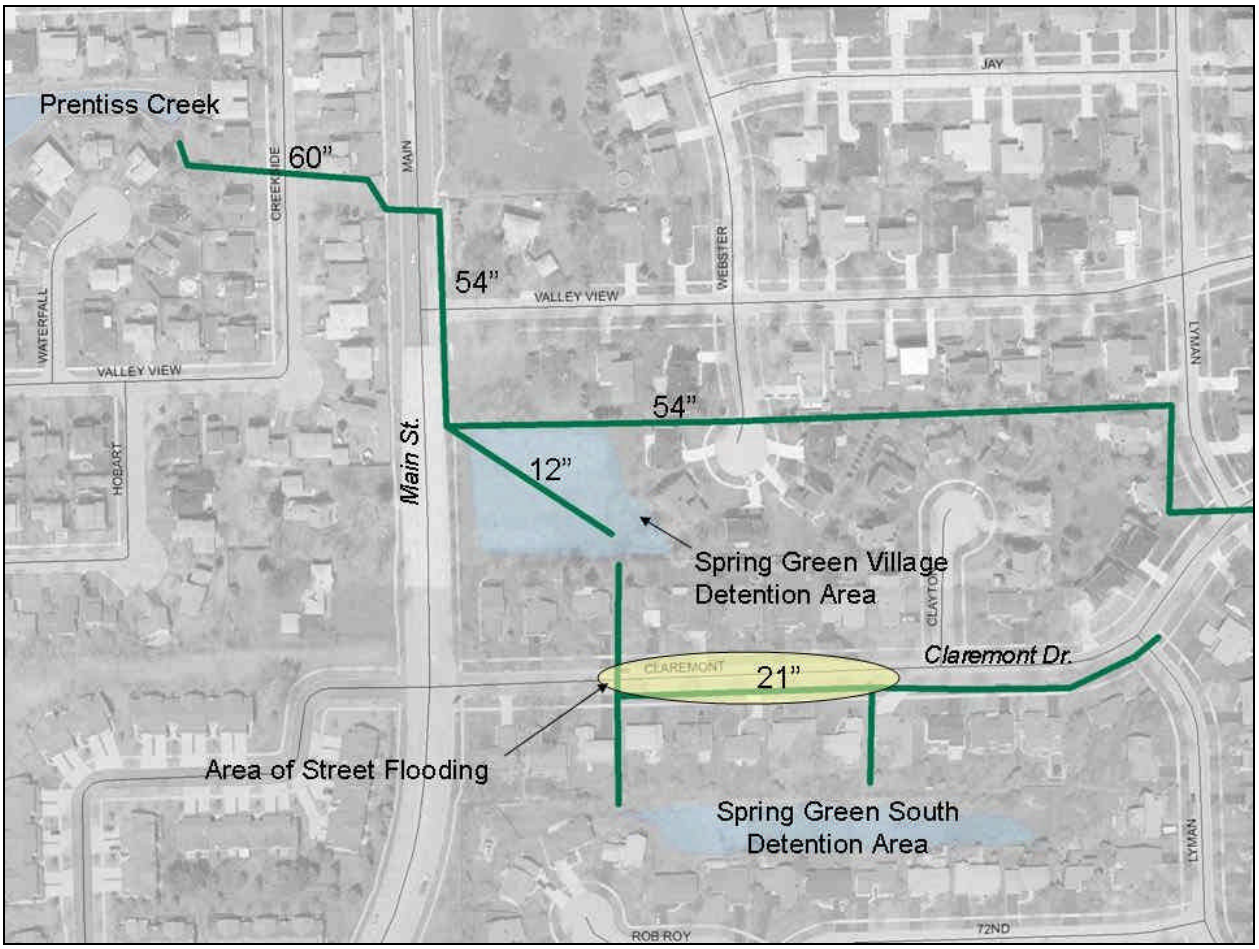


Figure 602-2
Storm Sewer and Detention Locations, Spring Green Village & Spring Green South Subdivisions

The 100-year design high water level of the Spring Green Village detention pond is 755.0; the rim elevation of the structure on Claremont Drive upstream of the pond (first structure east of Main Street) is 756.65. Thus, when the pond is full the hydraulic grade line of the 21-inch storm sewer into the pond is above the crown of the pipe, and there is no capacity left in the pipe. This would potentially cause flooding at this location. Figure 602-3 illustrates the 10-year hydraulic grade line in the system based on whether the Spring Green Village detention area is dry or at the design high water level.

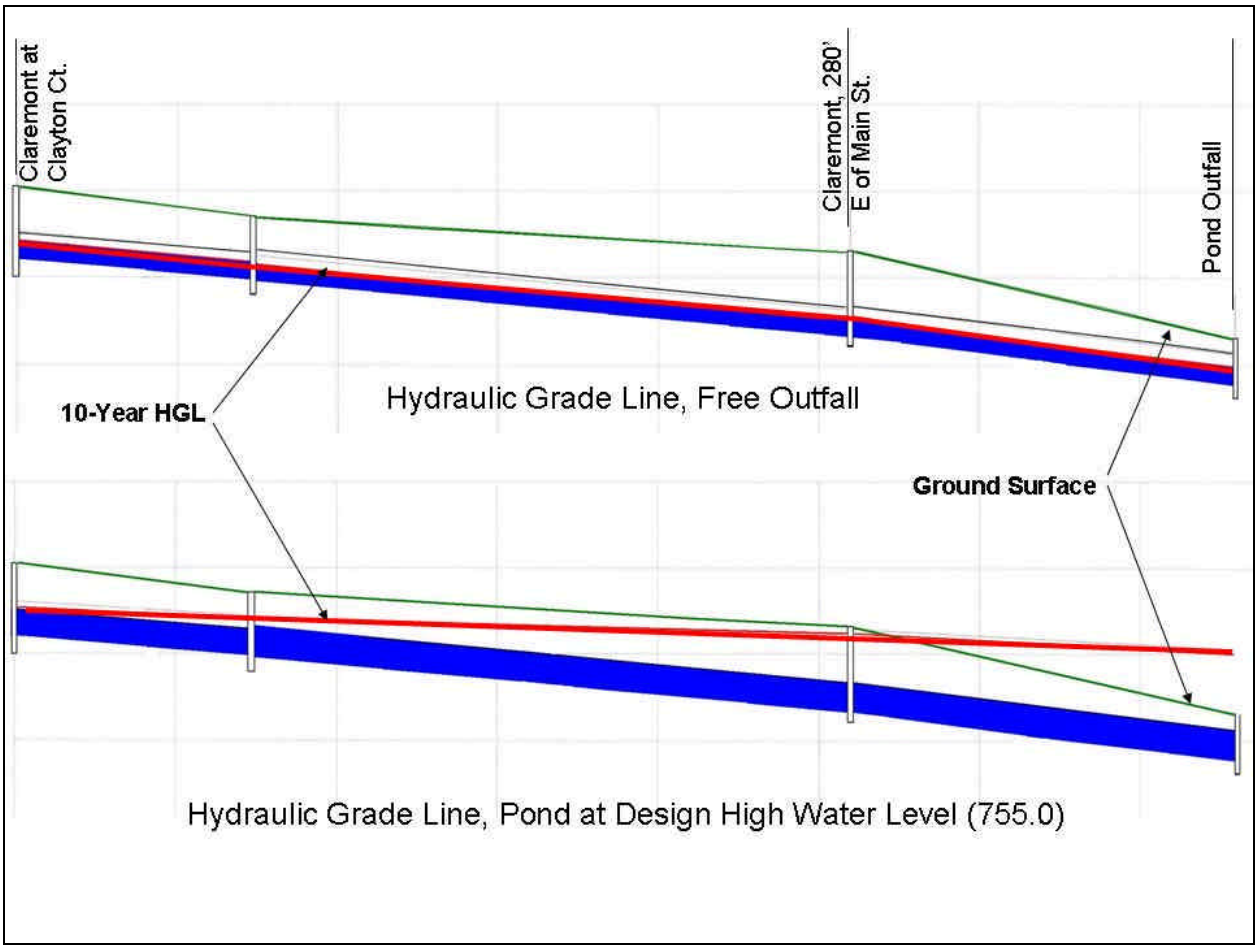


Figure 602-3
10-Year Hydraulic Grade Line, Claremont Drive to Pond Outfall

The structure located on Claremont Drive (280 feet east of Main Street) is at the low spot along the Claremont Drive street profile. Any overland flow which is not intercepted by an upstream inlet would collect at this spot. Additionally, residents have complained about debris collecting at the grates, decreasing their inlet capacity.

Yard flooding is a common complaint from residents living south of 72nd Street, in the vicinity of Webster Street, Applegate Avenue and Old Orchard Avenue, in the Orchard Grove subdivision. Storm sewers are located in the rear yards of these properties, and the sewers outlet to various small detention areas throughout the subdivision. Complaints of yard flooding predominantly originated from residences which abut these detention areas. In the case of the yard flooding south of Applegate Avenue and west of Webster Street, a resident has indicated that one of the property owners filled the detention area in his yard, which has caused drainage problems.

Recommendations

The following steps are recommended to ease street and yard flooding in PR602.

1. Street Flooding Recommendations

    1.1. Storm sewer maintenance – clean the storm sewer along Claremont Drive as well as the sewer segment through the Spring Green Village detention pond. Clogged storm sewers may be contributing to decreased outflow from the pond and, therefore, increased flood potential.

    1.2. Change existing grates to non-clog grates along Claremont Drive, and add additional inlets on Claremont Drive between Main Street and Clayton Court. This should be done to reduce the amount of debris clogging the grates. Additionally, the Village should initiate a street sweeping program in this area, especially during the fall months.

    1.3. Inspect detention pond outlet structures to verify the ponds have a proper outlet. Partially clogged (or damaged) outlet structures may result in high water levels above the intended design, which impacts the sewer performance at Claremont Drive. This inspection may need to include a portion of the receiving 54-inch trunk storm sewer downstream of the Spring Green Village detention pond.

2. Yard Flooding Recommendations

    2.1. Storm sewer maintenance – clean the storm sewers in the Orchard Grove subdivision. Since much of the storm sewer runs through backyards, significant yard debris has likely collected in the sewers over time. Additionally, this maintenance activity may reveal portions of the sewer system which are blocked due to root intrusion.

    2.2. Investigate the claim of a resident filling in a detention pond area on Applegate Avenue (claim made by resident at 911 Applegate Avenue). If this claim proves to be true, the property owner should be required to reestablish detention storage per the original subdivision design, at their expense. The Village may wish to survey this area to determine whether other portions of the detention pond have been filled.

Priority

Low

This problem consists of nuisance flooding, which does not prove to be a hazard to residents or be the cause of property damage.

Cost

A planning estimate of improvement costs is included below. A detailed breakdown can be found in Table 602-1.

1. Claremont Drive Improvements	$31,000
2. Yard Drainage Improvements	$9,000
Contingency and Fees	$18,000
Total Implementation Cost	**$58,000**

Schedule

An implementation schedule for the completion of the recommended improvements is as follows:

Design Phase	
Item 1 – Design	*3 months*
Permitting Phase	
Village of Downers Grove	*3 months*
Construction Phase	
Item 1 – Clean Sewers	2 weeks
Replace Grates, Add Inlets	2 weeks
Item 2 – Clean Sewers	2 weeks
TOTAL ESTIMATED TIME	7.5 MONTHS

Note: Some tasks can be completed concurrently. Limiting items in Design & Permitting Phases are shown in italics.

PROBLEM AREA 603

PRENTISS CREEK SUBWATERSHED PR-D
PROBLEM AREA 603

Location: 6700 Block Saratoga / Mar-Duke Farm

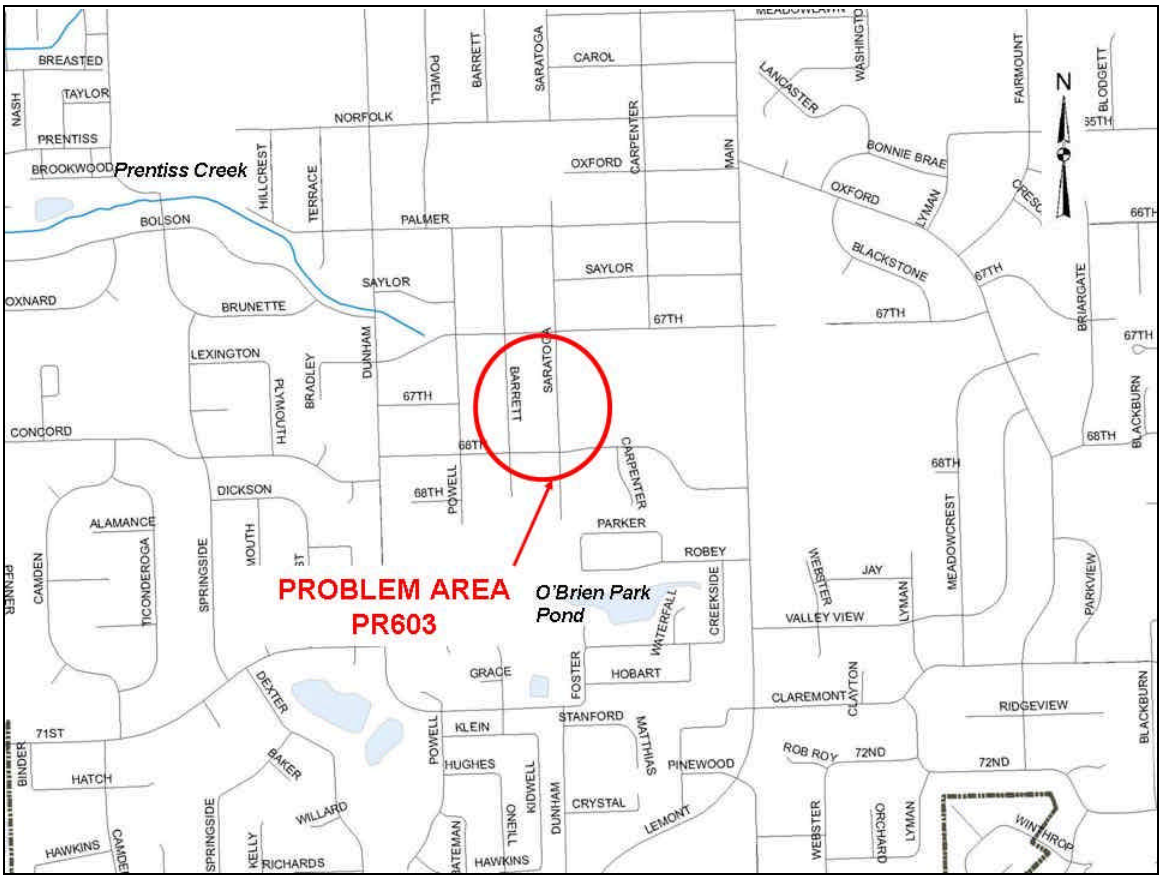


Figure 603-1
Problem Area Location Map

Description

Problem Area PR603 is located approximately 1,000 feet upstream of where Prentiss Creek daylights at 67th Street. The topography is fairly steep, with land slopes over 2% in areas. Land use is primarily single-family residential, and an open space area, Mar-Duke Farm, is located on the east side of Saratoga Avenue just north of 68th Street. Two trunk sewers are in the area: a 66-inch diameter sewer draining west along 67th Street, and a 78-inch storm sewer draining north between Powell and Barrett Streets.

Resident complaints in this area include street and yard flooding primarily along Saratoga Avenue, but also along Powell Street and Barrett Street. Downers Grove staff has indicated that flooding is a persistent problem along the 6700 block of Saratoga Avenue.

Results

Since the topography in this area is relatively steep, overland flow travels at fairly high velocities. The area of flooding on Saratoga Avenue is located directly across the street from the Mar-Duke Farm (Downers Grove Park District). The land slopes straight west, directly towards the residence at 6760 Saratoga. Reviewing the existing topography reveals that overland flow would naturally drain to the northwest towards Prentiss Creek. However, this natural flow path contains residential properties (the same properties reporting flooding problems).

To minimize flooding of streets and private property, the stormwater needs to be intercepted and conveyed directly to the existing large-diameter storm sewers. Flows originating on the Mar-Duke Farm property should be attenuated before entering the public right-of-way. This can be achieved by the construction of a vegetated filter strip and diversion berm.

Additional inlet structures need to be installed to intercept the overland flow. A site visit confirmed that only one inlet structure exists on Saratoga Avenue to intercept all the flow from the east. This inlet is overwhelmed during heavy storm events, leading to adjacent street flooding. Additional inlets should be placed in the yards and streets in the overland flow path.

Figure 603-2
Area of Flooding, 6700 Block Saratoga Avenue

Figure 603-3
Looking Northeast at Mar-Duke Farm

Recommendations

To remedy the flooding in this area, overland flow should be attenuated and intercepted upstream of Saratoga Avenue. The following methods are recommended:

1. Install additional inlets on Saratoga Avenue at the low spot in the roadway profile, as well as at the driveway apron from Mar-Duke Farm. According to preliminary calculations, the existing sewer has adequate hydraulic capacity to convey the higher flow rates resulting from additional inlets. Use non-clog grates to decrease the chance of grates being clogged with debris, and also change existing grates to the non-clogging type.

2. Add inlet structures on Powell Street north of 67th Place in the depressional area. According to preliminary calculations, the existing sewer has adequate hydraulic capacity to convey the higher flow rates resulting from additional inlets. Use non-clogging grates, and also change existing grates to the non-clogging type.

3. Construct a stormwater BMP (such as a vegetated filter strip, bioretention swale or rain garden) around the west edge of Mar-Duke Farm to attenuate the flow and to divert the overland flow towards the structures installed as part of Recommendation 1. The Park District can use the construction of the BMP as an educational amenity, adding signs explaining the function of the filter strip, similar to those previously installed on other Park District sites which explain the streambank stabilization improvements which have taken place.

Figure 603-4
Example of a Rain Garden with Native Plantings
Source: Wisconsin DNR

A rain garden, which is a man-made depressional area used as a landscape tool to improve water quality, consists of a grass buffer strip and a ponding area. The buffer strip slows the water down as it enters the ponding area and also filters out pollutants. The depressional area provides a place for the water to pond, evaporate or filter into the ground over time, and allow for more sediment filtering to occur. The ponding area should be approximately 6 inches deep and be able to drain in less than four days, to prevent mosquito breeding. Underdrains can be added if the soils have a large amount of clay to help with drainage.

The recommended size of a rain garden, depending on site characteristics, is 5% to 7% of its drainage area times the "c" value for landcover; thus, if this entire area was to be filtered through a rain garden, the approximate size would be 500'L x 25'W, which could be located along the western edge of the property.

Priority

Moderate

This has been an ongoing problem and is recommended for improvements in the near future.

Cost

A planning estimate of improvement costs is included below. A detailed breakdown can be found in Table 603-1.

1. Saratoga Avenue Improvements	$119,000
2. Powell Street Improvements	$91,000
3. Mar-Duke Farm Improvements	$125,000
Contingency and Fees	$151,000
Total Implementation Cost	**$486,000**

Schedule

An implementation schedule for the completion of the recommended improvements is as follows:

Design Phase	
Item 1 – Design	3 months
Item 2 – Design	3 months
Item 3 – Design	3 months
Permitting Phase	
Village of Downers Grove	3 months
IEPA/IDNR/COE	*6 months*
Construction Phase	
Item 1 – Saratoga Avenue	1 month
Item 2 – Powell Street	1 month
Item 3 – Mar-Duke Farm	1 month
TOTAL ESTIMATED TIME	18 MONTHS

Note: Some tasks can be completed concurrently. Limiting items in Design & Permitting Phases are shown in italics.

PROBLEM AREA 604

PRENTISS CREEK SUBWATERSHED PR-E
PROBLEM AREA 604

Location: Vicinity of Woodward Avenue and Prentiss Drive

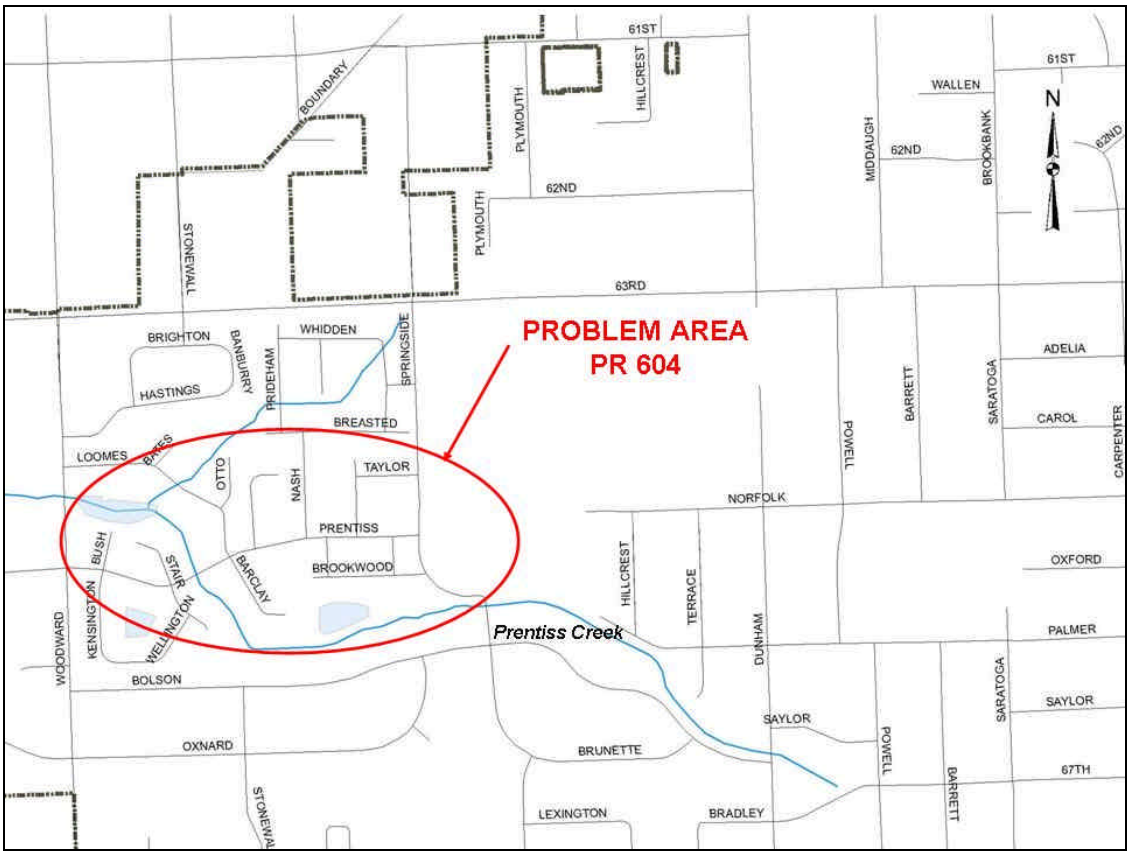


Figure 604-1
Problem Area Location

Description

This problem area encompasses the downstream reach of Prentiss Creek. The predominant concern in this area is water quality. A large in-line detention pond is located in the Kensington Place subdivision, just east of Woodward Avenue. This pond has stagnant water and sediment deposition. Farther upstream, in the Prentiss Brook Terrace subdivision, there are complaints about waterfowl droppings around the retention pond. The stream reach from the Village boundary at Puffer Road upstream through the problem area has previously been stabilized with toe protection techniques such as lunkers, ajax and coir rolls.

Findings

Water quality improvements are needed for this subbasin. Recommended improvements include (1) pond improvements, (2) pond shoreline improvements and (3) stream improvements.

1. Pond Improvements

   The in-line retention pond along Prentiss Creek, located downstream of the Prentiss Drive crossing, accumulates sediment. When water drops to the level of the weir under Woodward Avenue, the deposited sediment can be seen at the surface, which leads to increased odors and an unsightly view for the neighboring residences. Also, the water in Prentiss Creek flowing into the retention pond is stagnant during baseflow conditions.

Figure 604-2
Sedimentation in In-Line Retention Pond

2. Bank Improvements

The banks of the retention ponds in the subbasin, although stable, are steep (roughly 4:1 side slopes). A buffer zone is located around the retention areas, and is typically mowed. A common complaint from residents bordering the retention areas is the excess of goose droppings. The banks of the ponds are a favorable habitat for waterfowl, because they tend to frequent areas with a lack of bank vegetation to hide their predators.

Figure 604-3
Retention Pond with Unvegetated Banks

3. Stream Improvements

Figure 604-4
Overgrown Willow Stalks along Banks of Prentiss Creek

Prentiss Creek was stabilized using lunkers, coir rolls and ajax approximately 10 years ago, and the stabilization appears to be holding up in most locations. There is little erosion along the banks, with a few exceptions. During the stabilization work, willow stakes were planted to provide root structure, which stabilizes the banks. Typically, the willows need maintenance over the years, and are supposed to be trimmed so that they do not overwhelm the banks and shade the creek. The willow stakes along Prentiss Creek have become overgrown, and need to be cut back.

One area along Prentiss Creek, that was not previously stabilized, does have some bank erosion. The eroded bank is located at the inside of a meander, where velocities are relatively high and scour occurs. This section of erosion does not warrant immediate attention, because there is a large buffer between the creek and any residences, but still provides a safety hazard and water quality concern, and may become a future problem.

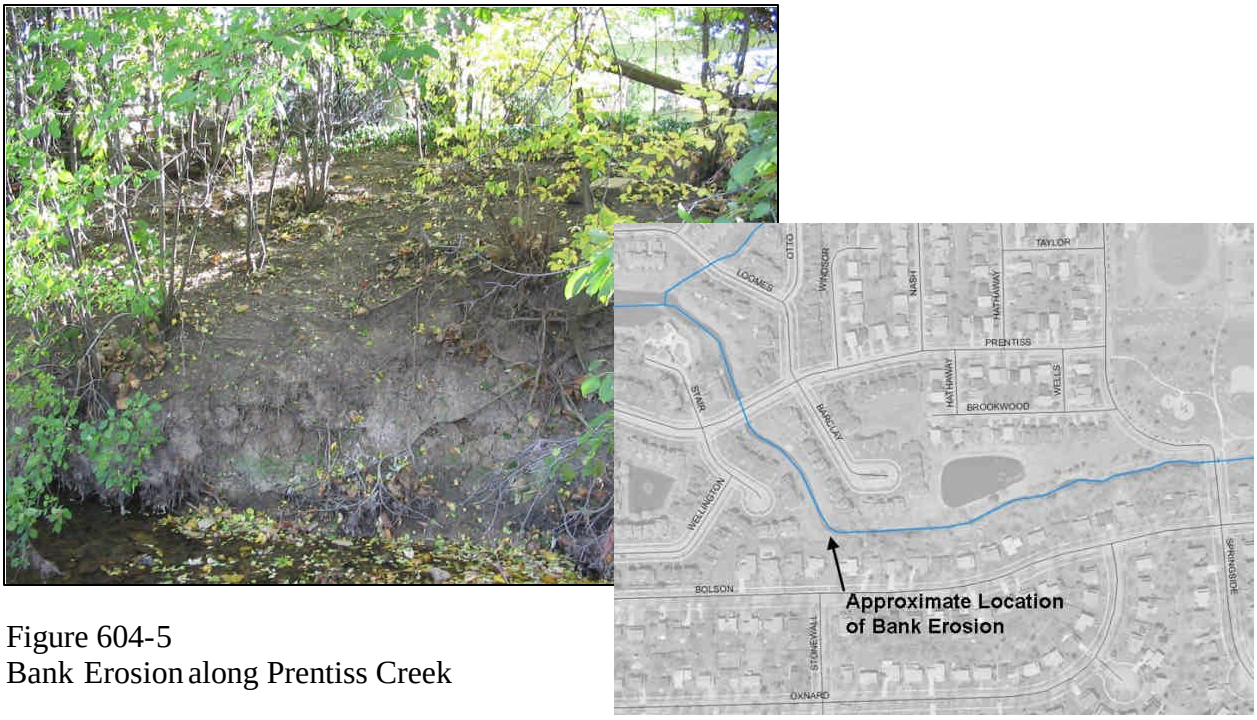


Figure 604-5
Bank Erosion along Prentiss Creek

Recommendations

1. Convert In-Line Retention to Off-Line Detention

To better use the retention area downstream (north) of Prentiss Drive, it is recommended that it be converted from an in-line pond to an off-line pond.

1.1. Create a low flow channel. A channel should be created along what is now the northern bank of the pond to be used for conveyance of the Prentiss Creek baseflow as well as storm flows up to the 2-year event.

1.2. Create an off-line detention area. A berm would separate the detention pond from the low flow channel. Flow would be diverted into the detention area only during large storm events (i.e. events exceeding a 2-year recurrence interval). This pond could be maintained as wet or dry, depending on the Village's and surrounding residents' preferences.

The new off-line pond component must contain an outlet structure designed to attenuate peak flows from the Kensington Place Subdivision. This outlet structure should be designed to provide adequate detention time for smaller (i.e. 1-year/2-year) storms in order to enhance stormwater quality. Larger storms would require no controls, as Prentiss Creek would overtop the berm and flood the pond area.

It is essential that the converted detention pond have a carefully designed landscaping plan. The water levels should be carefully considered when choosing pond vegetation; improper landscaping will lead to vegetation that cannot thrive, repeating the current problems within the pond.

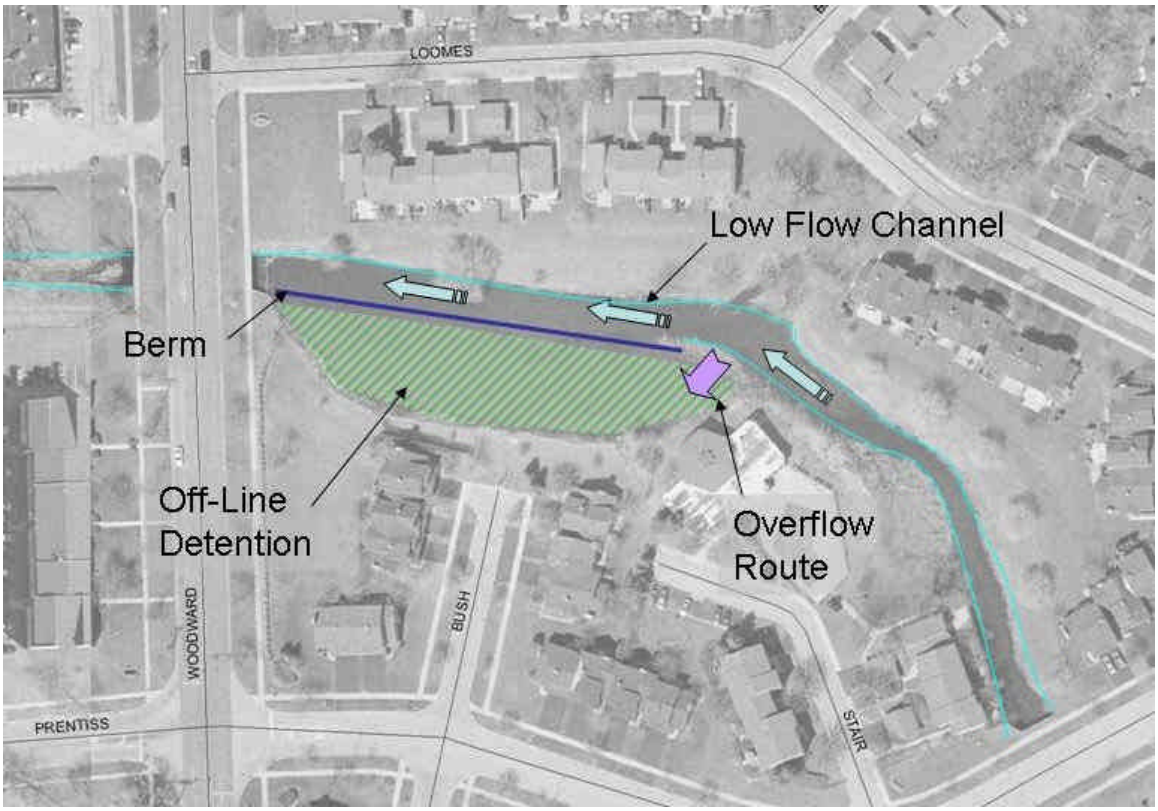


Figure 604-6
Recommended Pond Reconfiguration

1A. Alternative: Low Flow Channel with Floodplain Shelf

As an alternative to Option 1, the pond could be converted to a low flow channel with the excess volume used as a floodplain shelf. However, this option is not recommended, for the following reasons:

- Excess fill volume required, which would be expensive
- Reduces available storage volume during large rainfall events
- Eliminates peak flow attenuation for the Kensington Place Subdivision during smaller rainfall events.

2. Establish Shoreline Vegetation.

The banks of the retention ponds in the identified areas should be restored using native plantings. Unvegetated banks eliminate hiding places for predators of waterfowl, giving birds such as geese a safe place to land. Aside from the nuisance of goose droppings, geese and other birds also eat grasses, especially new shoots, and trample existing vegetation, creating bare spots prone to erosion up and down the bank slopes. Adding shrubs or native groundcover, in response to residents' preferences, will reduce the number of geese, provide for more stable banks and create a more aesthetic landscape.

3. Stream Improvements

3.1. Perform stream maintenance by trimming the willow stakes along the creek. This will allow more light into the streambanks, allowing other vegetation to take root. Willow stakes should not be allowed to grow taller than approximately four feet.

3.2. Perform streambank stabilization in two locations – Prentiss Creek near Bolson Drive and Stonewall Avenue, and the tributary to Prentiss Creek near Brested Avenue and Prideham Street.

For these locations, toe protection is recommended to prevent further erosion and subsidence of the bank. Willow stakes can be planted to help establish vegetation.

4. Maintenance Project – Fix the broken 36-inch culvert at Prentiss Drive and Woodward Avenue.

Priority

Moderate

Maintenance of ponds and streams is essential to their proper functioning. However, the current condition of the existing infrastructure, while it may be a nuisance to residents at times (particularly due to odor and waterfowl populations) is still in a working state and not causing flooding or other damages. The Village should schedule this problem area into a maintenance program in the future.

Cost

A planning estimate of improvement costs is included below. A detailed breakdown can be found in Table 604-1.

1. Convert Pond to Off-Line Detention	$514,000
2. Establish Shoreline Vegetation	$3,000
3. Stream Improvements	$238,000
4. Maintenance Project	$2,000
Contingency and Fees	$341,000
Total Implementation Cost	**$1,098,000**

Schedule

An implementation schedule for the completion of the recommended improvements is as follows:

Design Phase	
Item 1 – Preliminary Design	6 months
Final Design	6 months
Item 3 – Design	6 months
Permitting Phase	
Village of Downers Grove	3 months
IEPA/IDNR/COE	*12 months*
FEMA	12 months
Construction Phase	
Item 1 – Pond Redesign	2 months
Item 2 – Establish Vegetation	1 month
Item 3 – Stream Improvements	2 monoths
TOTAL ESTIMATED TIME	35 MONTHS

Note: Some tasks can be completed concurrently. Limiting items in Design & Permitting Phases are shown in italics.

PROBLEM AREA 605

PRENTISS CREEK SUBWATERSHED PR-E
PROBLEM AREA 605

Location: Vicinity of Concord Drive

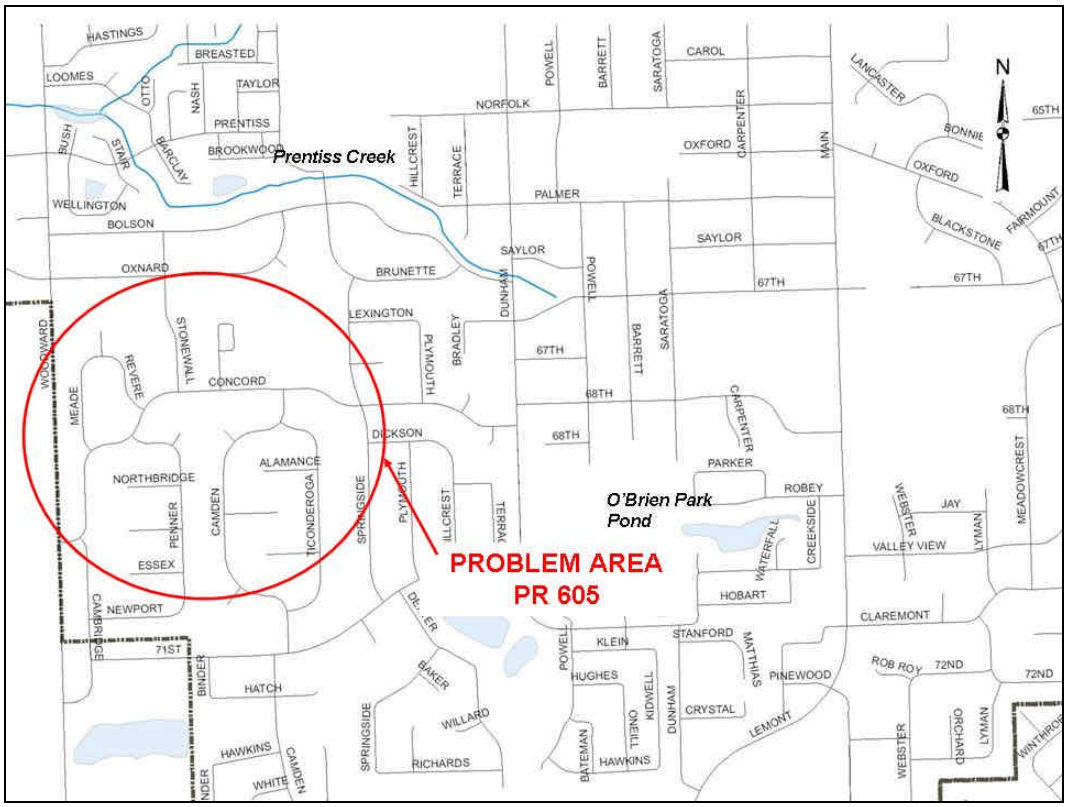


Figure 605-1
Problem Area Location Map

Description

This problem area encompasses the Dunham Place Unit 4 and Concord Square Unit 2 subdivisions, which both consist of single-family residential land use. Drainage is provided by a storm sewer system with outlets into two separate dry detention ponds located on the north side of Concord Drive. The topography is relatively steep, with slopes along the roadway profiles around 1% to 2%.

Resident complaints in Problem Area 605 consist of street and yard flooding. Street flooding has been reported at the intersection of Camden Road and Concord Drive, as well as in the Penner Place cul-de-sac. Yard flooding is reported in the homes along the south side of Concord Drive, as well as in the area bounded by Camden and Ticonderoga Roads.

Findings

A survey was completed of the major storm sewer in the area. It was found that there is a severely backpitched pipe just east of the intersection of Camden Road and Concord Drive. This is for the likely cause of the flooding at this intersection. Figure 605-2 illustrates the storm sewer profile along Concord Drive.

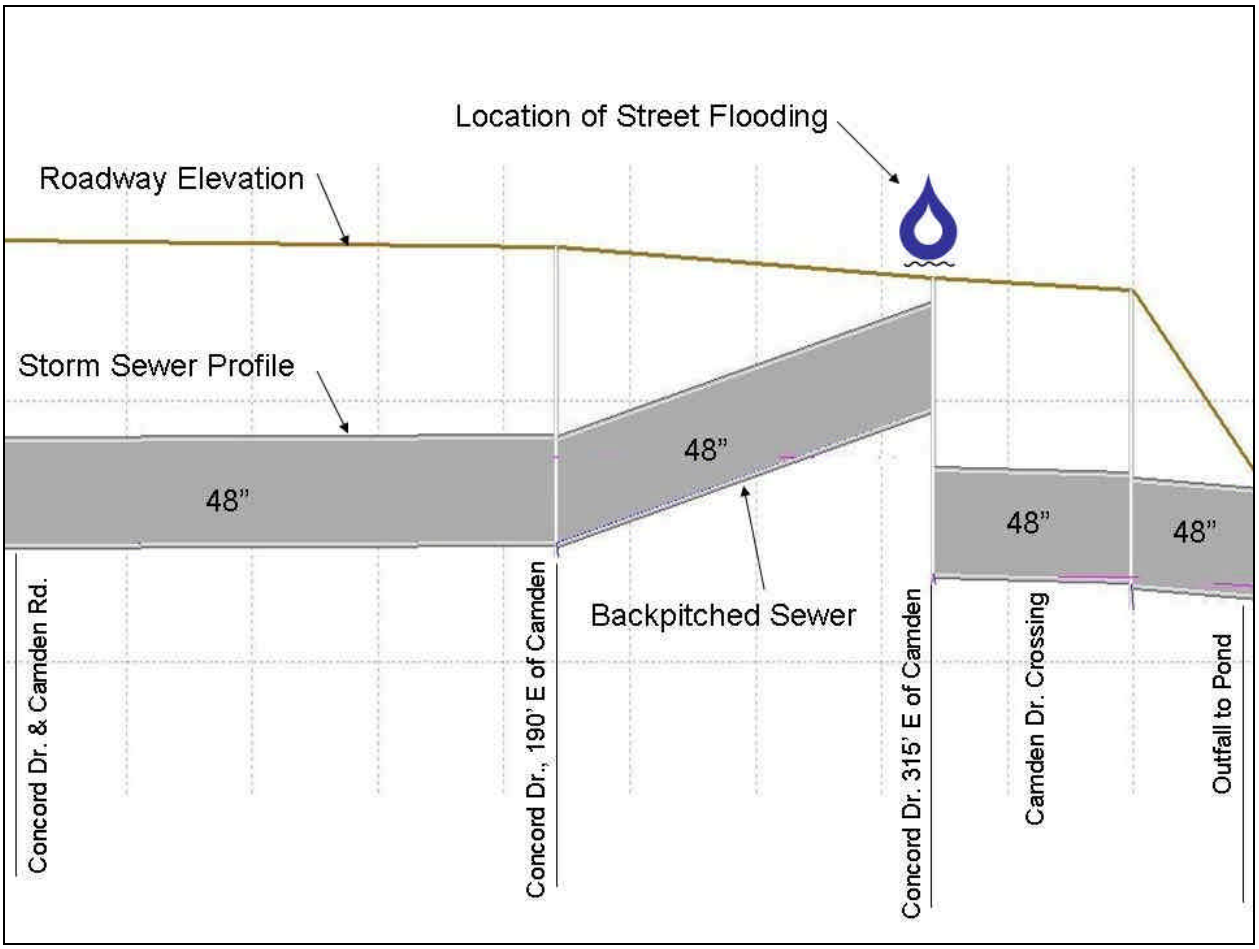


Figure 605-2
Storm Sewer Profile along Concord Drive from Camden Road to Pond Outfall

This problem area has relatively steep slopes and many overland flow paths which flow through residents' yards. Bushes, fences, and other similar obstructions impede the flow of water through the properties, contributing to yard flooding. Also, there are some small depressional areas throughout the yards which collect the stormwater, which takes a long time to infiltrate due to high groundwater levels.

The western part of the problem area, particularly around Penner Place, has particularly steep slopes and few inlets to intercept the drainage. Residents have reported over a foot of water depth in the Penner Place cul-de-sac; the street only has one inlet, and should this inlet be clogged or at capacity, the topography in this area would convey the excess runoff across private

property, and potentially affect residential structures. Figure 605-3 shows the Penner Place cul-de-sac.

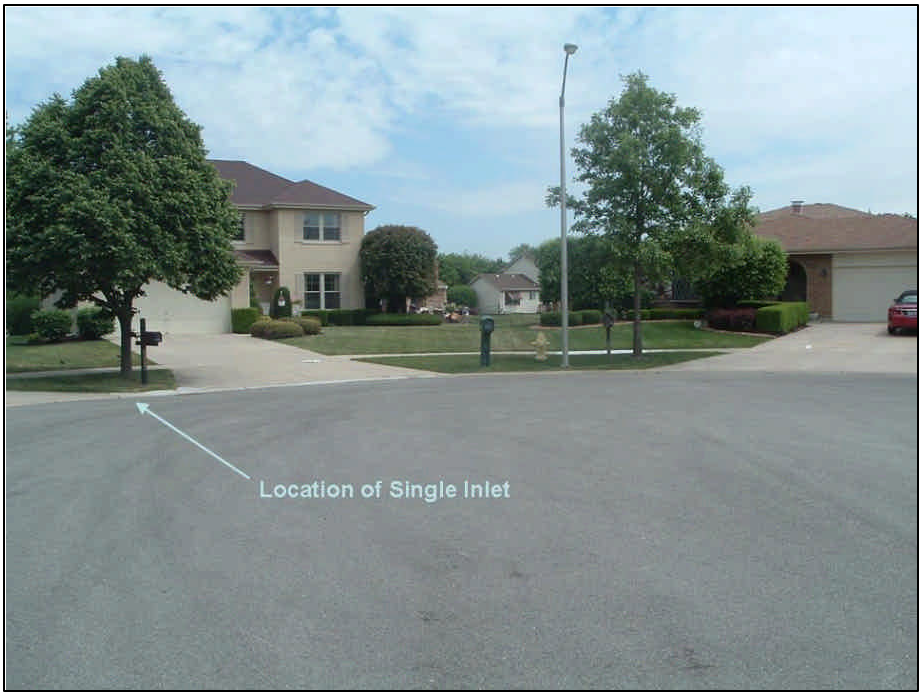


Figure 605-3
Looking Northeast
along Penner Place

Recommendations

The following improvements are recommended for Problem Area 605:

1. Concord Drive Storm Sewer Improvements

   The 48-inch storm sewer on Concord Drive is severly backpitched and causing flooding; this segment of sewer should be replaced. Prior to this project, the Village should verify whether a utility conflict would prevent such an improvement. *It may be possible that a major utility conflict during construction of this sewer resulted in the current backpitched scenario.*

   If the storm sewer is truly backpitched as the survey suggests, this is likely to have caused sedimentation in the line. It is recommended that the storm sewer be cleaned to remove sediment.

2. Penner Place Drainage Improvements

   More inlets should be installed to intercept overland flow. Additional inlets should be installed along Penner Place, as well as upstream of Penner Place along Penner Avenue to intercept stormwater before it ponds downstream. According to preliminary calculations, the existing sewer has adequate hydraulic capacity to convey the higher flow rates resulting from additional inlets. Any inlets installed should have non-clogging grates.

Additionally, a street sweeping program should be initiated, particularly in the fall, to clean debris that would otherwise clog the sewers.

3. Yard Drainage Improvements

Yard flooding should be addressed on an individual basis. The majority of yard flooding is due to high overland flow velocities coupled with obstructions to the overland flow path, such as fences and hedges. Most residents who have expressed concerns about yard flooding have storm sewer along their rear property line. The Village should work with these residents to make sure existing inlets are functioning properly and are placed in the proper spot, and that new yard drains are properly installed. The Village should clean the sewer lines to make sure there is no debris blocking flow in the pipe.

Priority

High

Due to the extent of property damage at the Penner Place location, as well as the severity of the backpitched sewer on Concord Drive, this problem area is recommended as a high priority.

Cost

A planning estimate of improvement costs is included below. A detailed breakdown can be found in Table 605-1.

1. Concord Drive Storm Sewer Improvements	$350,000
2. Penner Place Drainage Improvements	$50,000
3. Yard Drainage Improvements	$186,000
Contingency and Fees	$599,000
Total Implementation Cost	**$190,000**

Schedule

An implementation schedule for the completion of the recommended improvements is as follows:

Design Phase	
Item 1 – Preliminary Design	*6 months*
Final Design	*6 months*
Item 2 – Design	3 months
Permitting Phase	
Village of Downers Grove	3 months
IEPA/IDNR/COE	*12 months*
Construction Phase	
Item 1 – Concord Drive Improvements	1 month
Item 2 – Penner Place Improvements	1 month
Item 3 – Yard Drainage	2 weeks
TOTAL ESTIMATED TIME	27 MONTHS

Note: Some tasks can be completed concurrently. Limiting items in Design & Permitting Phases are shown in italics.

PROBLEM AREA 606

PRENTISS CREEK SUBWATERSHED PR-D
PROBLEM AREA 606

Location: Springside Avenue along Nicor Gas Utility Easement

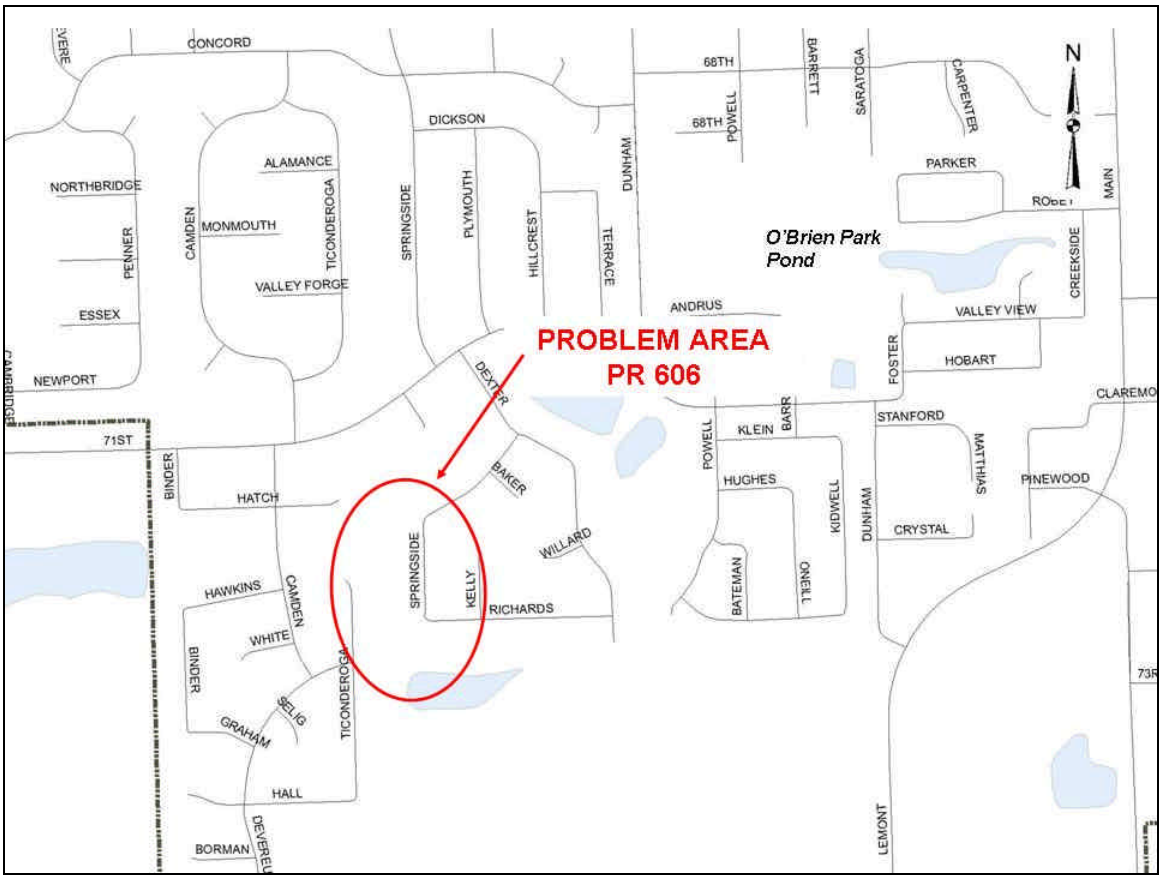


Figure 606-1
Problem Area Location Map

Description

Problem Area 606 is located in the southwest portion of the watershed. The land use in this area is single-family residential. Drainage is provided by storm sewer. A utility easement cuts through the backyards of the homes along Springside Avenue and Ticonderoga Road. The Grove shopping plaza is located south of Richards Avenue and east of the utility easement; this commercial area has a detention pond in the northwest corner of the property. Overland flow within the easement generally flows northerly toward the Dunham Place Unit 5 dry detention pond.

This area is prone to frequent prolonged power outages. Residents at the corner of Springside and Richards Avenues have reported that every time there is a fairly steady rainfall, the Nicor Gas easement in the back of their yards becomes flooded, leading to flooding of the electrical boxes which are located on the edge of the easement. These flooding events correspond to when

the power outages occur. There is a 12-inch diameter storm sewer along the rear property lines of the homes along Springside to collect runoff.

In addition to yard flooding, there have been reports of street flooding along Richards Avenue, at both the intersection with Springside Avenue and along Richards east of Kelly Place.

Findings

The Nicor easement drains northerly with an average slope of 0.8%. The land generally slopes towards the Dunham Place detention pond; however, the land does slope slightly east in some areas, towards the homes along Springside Avenue. There appear to be electrical boxes along the property lines of each residence; some of these boxes would be in the overland flow path. The land is fairly undulating in this easement, so there are occasional small depressional areas. There is also a high water table in this area, which prevents stormwater infiltration and promotes ponding in areas without direct access to storm sewers.

Figure 606-2
Nicor Gas Utility Easement located west of Springside Avenue

Recommendations

1. Easement Drainage Improvements

   The owner of the electrical boxes (presumably ComEd) should be contacted to discuss options for eliminating flooding near the electrical boxes. After confirming which electrical boxes are prone to flooding, the land can be slightly regraded so that it does not pool around the electrical boxes. There is a 12-inch storm sewer along the rear property line along Springside Avenue, into which some additional yard drains can tap.

   This flooding is as private property issue, and so should be paid for by the utility company or the residents. The Village should initiate discussions with the electrical utility about solving the problem, but should negotiate to have the improvements implemented by the utility.

2. Street Drainage Improvements

   A maintenance program is recommended to clean out clogged grates. It is likely that the main source of street flooding is debris over the grates; the locations with reported flooding are at the far upstream end of the sewer system, so the problem is not likely to be sewer capacity.

   The addition of extra inlet structures with non-clog grates is recommended at the intersection of Springside and Richards Avenues. According to preliminary calculations, the existing sewer has adequate hydraulic capacity to convey the higher flow rates resulting from additional inlets.

Priority

Low

Although this issue should be brought to Nicor Gas and ComEd's attention, it is a private property issue and not the responsibility of the Village.

Cost Estimate

A planning estimate of improvement costs is included below. A detailed breakdown can be found in Table 606-1.

1. Easement Drainage Improvements	*Private Property – No Capital Cost to Village*
2. Street Drainage Improvements	$32,000
Contingency and Fees	$14,000
Total Implementation Cost	**$46,000**

Schedule

An implementation schedule for the completion of the recommended improvements is as follows:

Design Phase	
Item 2 – Design	3 months
Permitting Phase	
Village of Downers Grove	3 months
IEPA/IDNR/COE	*6 months*
Construction Phase	
Item 2 – Street Drainage Improvements	1 month
TOTAL ESTIMATED TIME	10 MONTHS

Note: Some tasks can be completed concurrently. Limiting items in Design & Permitting Phases are shown in italics.

PROBLEM AREA 607

PRENTISS CREEK SUBWATERSHED PR-F
PROBLEM AREA 607

Location: Oxnard Drive Cul-de-Sac

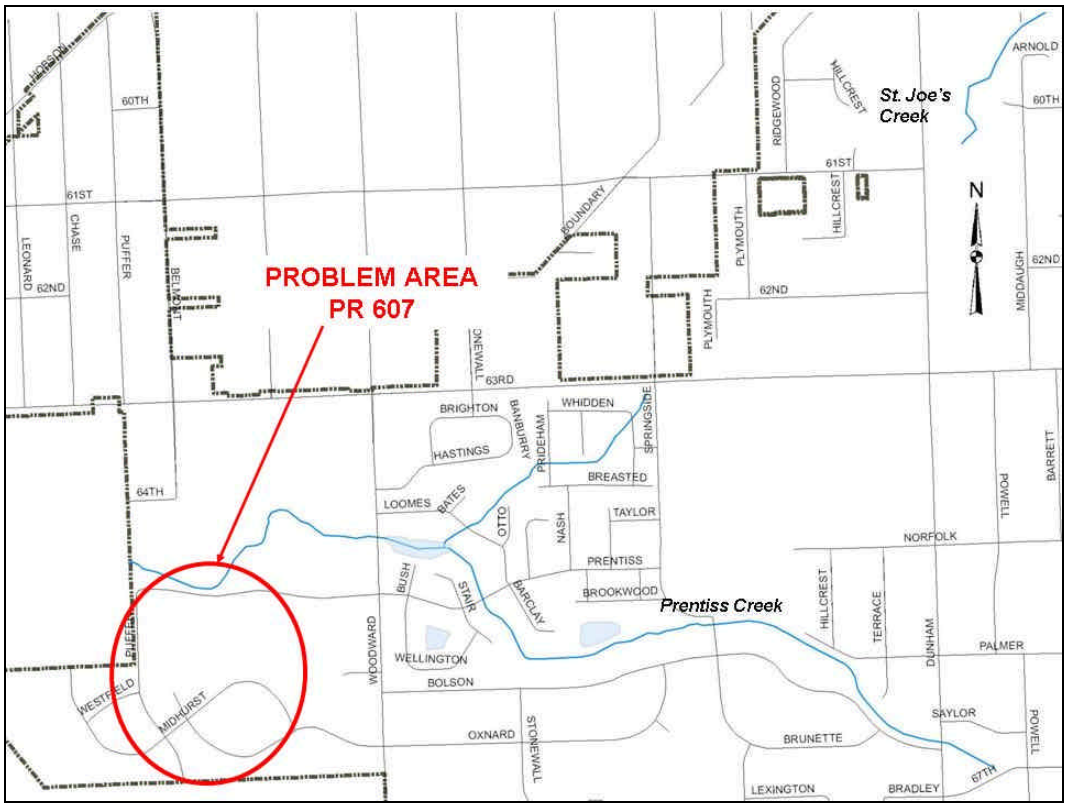


Figure 607-1
Problem Area Location Map

Description

Problem Area PR607 is located in the downstream reaches of the Prentiss Creek watershed, along the western Village boundary. The area is drained by relatively short storm sewer systems which outlet directly to Prentiss Creek. The topography is relatively steep, with slopes averaging from 1.5 to 2.5% along Puffer Road, Midhurst Road and Oxnard Drive. Land use in the area is primarily single-family residential, with high-density residential along Prentiss Drive.

Residents have reported street, house, garage and yard flooding on Oxnard Drive. Interior house damage and associated property damage was reported after the October 2, 2006 storm event. Residents have indicated that water ponded and overtopped the curve in the cul-de-sac.

Results

An XP-SWMM model was created for the storm sewer segment from the northern end of Oxnard Avenue down to the outfall at the creek. The model indicates sufficient hydraulic capacity in the storm sewer system. Due to the steep topography, there is enough elevation difference between the upstream sewer and its outfall at Prentiss Creek to prevent the creek water levels from creating a backup in the sewer system.

The natural overland flow path in this area flows towards northern end of Oxnard Drive. If the inlets at the intersection of Midhurst Road and Oxnard Drive are at capacity, the flow would continue along Oxnard Avenue. The end of Oxnard Drive, which is on the northern end of the subdivision and ends in a cul-de-sac, has only one inlet. If this inlet is at capacity, water would overflow directly towards the property at 2222 Oxnard Drive. Figure 607-2 illustrates the overland flow paths in the area; Figure 607-3 depicts the area of flooding.

Figure 607-2
Overland Flow Paths near Oxnard Avenue

Figure 607-3
Location of Street Flooding

Recommendations

Stormwater runoff in this area must be intercepted and conveyed in the existing storm sewer system before it reaches the downstream problem area.

1. Street Drainage Improvements

    1.1. Add inlets at the Oxnard Drive cul-de-sac. These inlets will intercept overland flow before flowing towards private property, and will also provide additional flow capacity should the existing inlet become clogged. According to preliminary calculations, the existing sewer has adequate hydraulic capacity to convey the higher flow rates resulting from additional inlets.

    1.2. Add inlets at the intersection of Midhurst Road and Oxnard Drive. This will allow for more flow to be intercepted coming off the steep, upstream slopes. Construct approximately 180 lineal feet of 12-inch storm sewer on Oxnard Drive, as illustrated in the *Proposed Improvements* figure. According to preliminary calculations, the existing sewer has adequate hydraulic capacity to convey the higher flow rates resulting from additional inlets.

    1.3. Change existing grates to non-clog type. This will reduce the amount of flooding due to clogged grates. Additionally, the Village should implement a street sweeping program in this area, particularly during fall months.

Priority

Moderate

While this is a localized drainage issue, it has caused considerable property damage to nearby residences, and thus should be addressed.

Cost

A planning estimate of improvement costs is included below. A detailed breakdown can be found in Table 607-1.

1. Street Drainage Improvements	$94,000
Contingency and Fees	$42,000
Total Implementation Cost	**$136,000**

Schedule

An implementation schedule for the completion of the recommended improvements is as follows:

Design Phase	
Item 1 – Design	3 months
Permitting Phase	
Village of Downers Grove	3 months
IEPA/IDNR/COE	*6 months*
Construction Phase	
Item 1 – Street Drainage Improvements	1 month
TOTAL ESTIMATED TIME	10 MONTHS

Note: Some tasks can be completed concurrently. Limiting items in Design & Permitting Phases are shown in italics.

PROBLEM AREA 608 & 609

PRENTISS CREEK SUBWATERSHED PR-B & PR-C
PROBLEM AREAS 608 & 609

LOCATION: Downers Grove Estates Subdivision

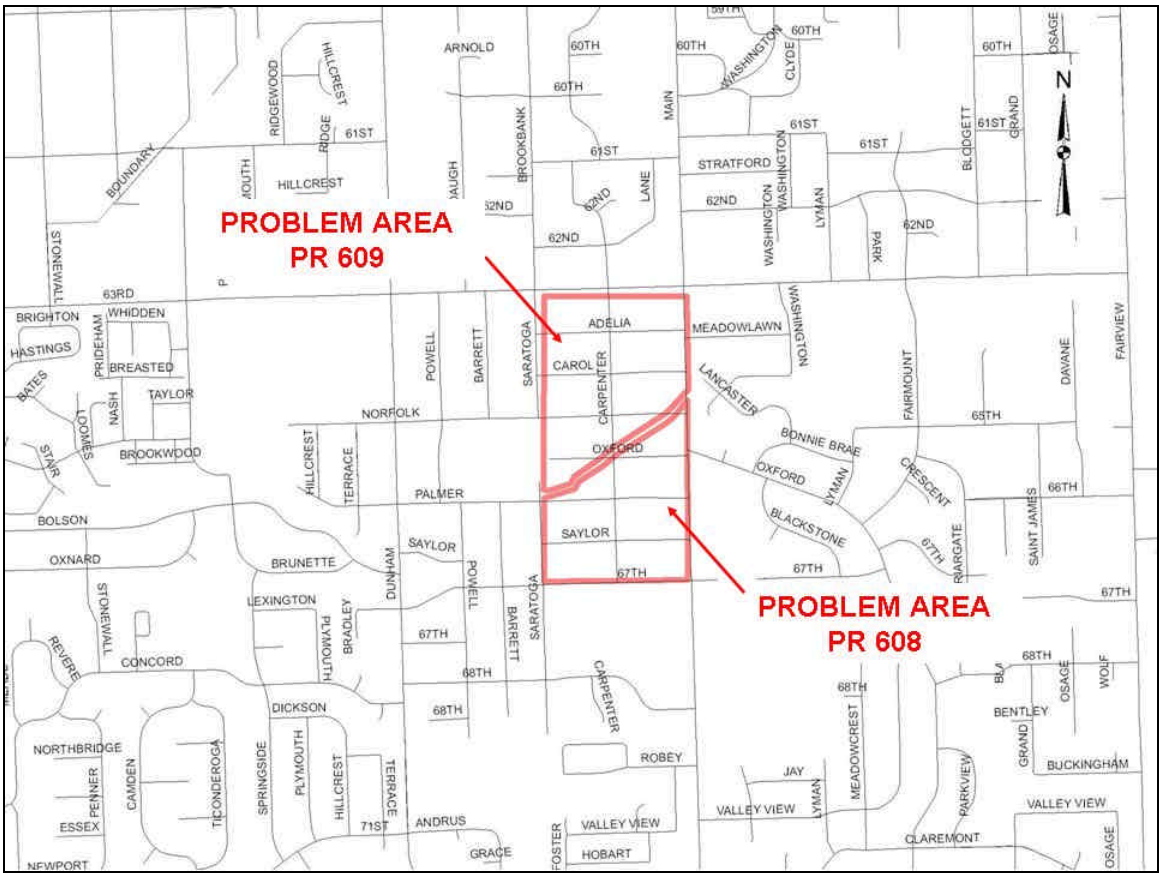


Figure 608-1
Problem Area Location Map

Description

Problem Areas PR608 and PR609, while in two different subwatersheds and thus assigned separate problem area designations, encompass the same neighborhood and are thus both covered in this section.

The area bound by 63rd Street on the north, Main Street on the east, Saylor Street on the South and Saratoga Avenue on the west receives numerous complaints for yard flooding. The area is unsewered, with the exception of a 36-inch diameter storm sewer running west along Carol Street. The neighborhood falls on a drainage divide, with the northwest portion of the area part of Subwatershed C (PR609), which drains towards the main sewer along 63rd Street, and the southeast portion of the area part of Subwatershed B (PR608), which generally flows east towards Main Street where it is intercepted by storm sewer and eventually drains to the 67th Street system.

This area was previously unincorporated, and so a storm sewer system was not installed at the same time sewer was installed in the surrounding area. With the exception of Carol Street, the neighborhood is drained with roadside ditches which, at times, do not have positive slope, resulting in ponding.

Findings

This area does not have an effective stormwater conveyance system. The portion of the area in Subwatershed B generally flows east, but the ditch system is inadequate, particularly along Saylor Street, where numerous homes report yard and structure flooding. The portion of the area in Subwatershed C has some storm sewer along Carol Street, but a survey of this sewer system found that there is a backpitched section of sewer on the western end of Carol Street, in the vicinity of the low point along Carol Street.

Figure 608-2
Typical Roadway Cross Section (taken along Saylor Street)

Recommendations

A new stormwater conveyance system is recommended for this area. Two separate systems are recommended: one to drain the northwest portion of the area (PR609), and one to drain the southeast portion (PR608).

The northwest system would ultimately tie into the existing 60-inch storm sewer along 63rd Street, and the southeast system would ultimately tie into the 66-inch storm sewer along 67th Street.

1. Problem Area PR 608

1.1. Installation of Storm Sewers with Curb & Gutter

Because of the proximity to storm sewers in this neighborhood and the severity of complaints, installation of curb and gutter with storm sewers is recommended along Saylor Street. A storm sewer would run easterly along Saylor Street, tapping into the storm sewer at Main Street and Saylor Street, which ultimately ties into the 66-inch storm sewer system along 67th Street.

For cost estimating purposes, it is assumed that the remainder of the neighborhood located in PR608 would be constructed with an urban cross section as well. This includes Oxford Street east of Carpenter, Palmer Street from Saratoga to Main, and Carpenter Street from Oxford to 67th.

1A Alternative– Modified Rural Cross Section

Along Palmer and Oxford Streets, storm sewer is not found to be necessary. There have been no reports of flooding along these streets, and the ditch system appears to be working adequately. If the Village and residents prefer a rural cross section in this area, it is recommended that ditch maintenance be performed to make sure the existing ditches are adequately graded and functioning properly and to clean out culverts.

2. Problem Area PR 609

2.1. Installation of Storm Sewer with Curb & Gutter

Similar to Problem Area PR 609, this section of the neighborhood is in close proximity to a storm sewer system, and an urban, curb and gutter cross section is found in bordering neighborhoods. Thus, the installation of curb and gutter with storm sewers is recommended in this area.

The storm sewer in this area would drain west to the 42-inch sewer on Saratoga, which drains to the 60-inch trunk line along 63rd Street and ultimately to Prentiss Creek. This system would include Adelia Street, Carol Street and Norfolk Street from Main to Saratoga, Carpenter Street from 63rd Street to Oxford, and Oxford Street from Saratoga to Carpenter.

2.2. Carol Street Drainage Improvements

The addition of storm sewer throughout the area will improve the drainage conditions on Carol Street. When improvements are being made, the backpitched 36-inch storm sewer on Carol Street east of Saratoga should be corrected. It appears the pipe was originally backpitched because of a lack of cover; when replacing the pipe, either an elliptical pipe or a box should be used instead, to provide the same cross-sectional area without losing capacity.

When storm sewer is being constructed throughout this system, the storm sewer along Adelia Street and Norfolk Street should flow directly into the system along Saratoga, and not to the system along Carol Street. This will relieve the system along Carol and alleviate any future flooding at the low spot in the Carol Street profile by taking a significant amount of flow volume off this portion of the system.

Priority

High

This project is recommended for high priority because of the number of residents affected and the severity of the flooding on Saylor Street and Carol Street.

Cost

Problem Area PR608

A planning estimate of improvement costs is included below. A detailed breakdown can be found in Table 608-1.

1. Storm Sewers with Curb & Gutter	$5.039,000
Contingency and Fees	$2,268,000
Total Implementation Cost	**$7,307,000**

Problem Area PR609

A planning estimate of improvement costs is included below. A detailed breakdown can be found in Table 609-1.

1. Storm Sewers with Curb & Gutter	$6,875,000
Contingency and Fees	$3,094,000
Total Implementation Cost	**$9,969,000**

Schedule

Problem Area PR608

An implementation schedule for the completion of the recommended improvements is as follows:

Design Phase	
Item 1 – Preliminary Engineering	6 months
Final Engineering	6 months
Permitting Phase	
Village of Downers Grove	3 months
IEPA/IDNR/COE	*12 months*
FEMA	12 months
Construction Phase	
Item 1 – Storm Sewer w/Curb & Gutter	4 months
TOTAL ESTIMATED TIME	28 MONTHS

Note: Some tasks can be completed concurrently. Limiting items in Design & Permitting Phases are shown in italics.

Problem Area PR609

An implementation schedule for the completion of the recommended improvements is as follows:

Design Phase	
Item 2 – Preliminary Engineering	6 months
Final Engineering	6 months
Permitting Phase	
Village of Downers Grove	3 months
IEPA/IDNR/COE	*12 months*
FEMA	12 months
Construction Phase	
Item 2 – Storm Sewer w/Curb & Gutter	5.5 months
TOTAL ESTIMATED TIME	30 MONTHS

Note: Some tasks can be completed concurrently. Limiting items in Design & Permitting Phases are shown in italics.

PROBLEM AREA 610

PRENTISS CREEK SUBWATERSHED PR-F
PROBLEM AREA 610

Location: Hobson Triangle

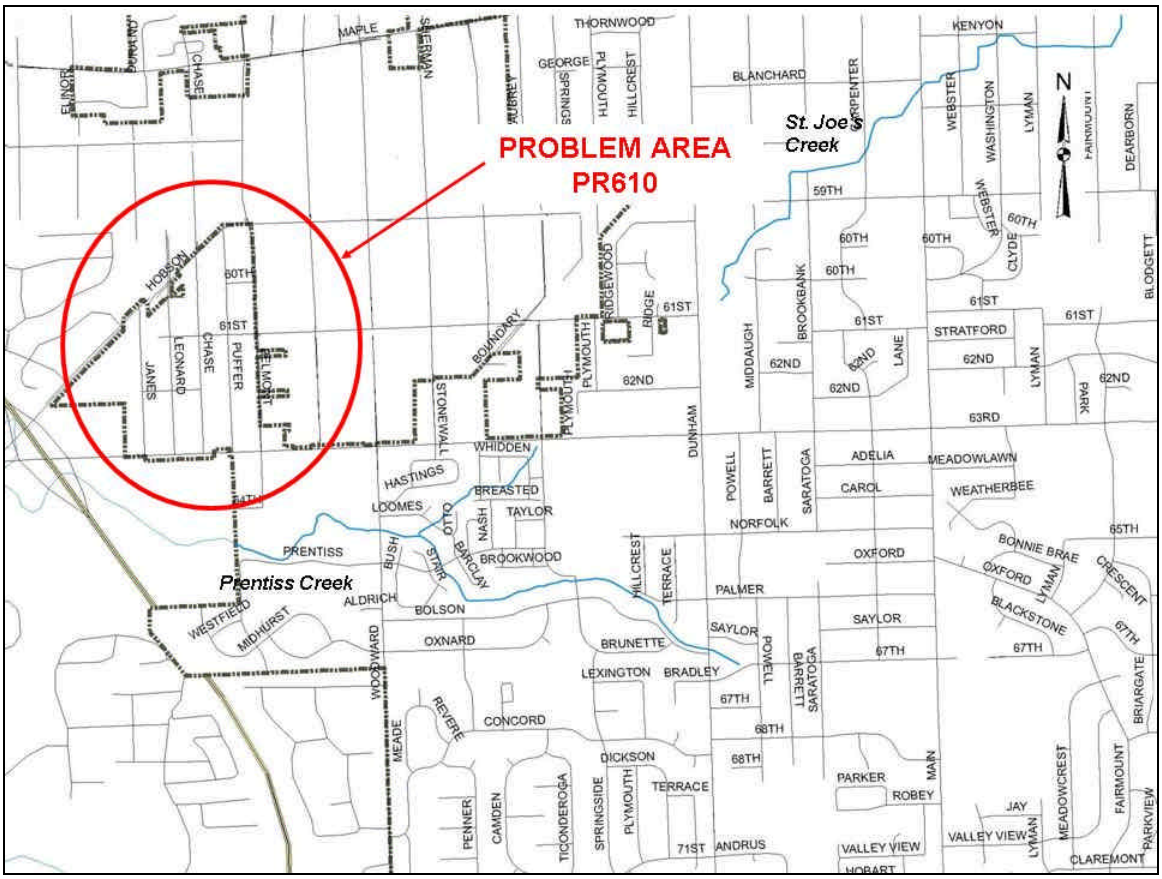


Figure 610-1
Problem Area Location Map

Description

Problem Area 610 includes the Hobson Triangle, the area bordered by Hobson Road, Belmont Road and 63rd Street. This area, located in the downstream reaches of the Prentiss Creek watershed, consists of single-family residential land use. The area was previously unincorporated, but has recently been annexed by the Village. When the Village annexed the land, water service was provided, but not services for storm sewer or sanitary sewer.

The area is currently drained by roadside ditches. There are small-diameter yard drains, but no main trunk sewer in the area. Residents at the downstream end of the ditches complain of yard and street flooding.

Findings

The roads in this neighborhood have a rural cross-section which, while contributing to a more rural feel, does not adequately convey stormwater flows. Additionally, this area contains septic fields. Water which ponds in the backyards of homes inundates these fields, adversely impacting private septic systems.

Figure 610-2
Typical Existing Roadway Cross Section in Hobson Triangle

Recommendations

1. A more effective stormwater drainage system should be installed in this neighborhood. Four options were explored to provide drainage in this area: (1A) roadside ditches, (1B) modified rural cross-section, (1C) modified rural cross-section with water quality BMPs, and (1D) traditional curb and gutter. The existing right-of-way is wide, approximately 66 feet, allowing for all of the above options to be feasible.

   It is assumed that all of the options would ultimately drain to a storm sewer system which would travel southerly along Puffer Road and discharge to Prentiss Cthe creek. The natural overland flow path is westerly down 63rd Street. It is likely not feasible to design for

stormwater runoff along this path since the outlet would be onto land outside of the Village's boundary, and the flow would have to cross the Tollway before entering Prentiss Creek.

Option 1A – Establish Roadside Ditches

Ditches would be reconstructed along James Avenue, Leonard Avenue, Chase Avenue, and Puffer Road from approximately 61st Street to 63rd Street, as well as along 62nd Street from James Avenue to Chase Avenue. While some ditches exist, there is no contiguous ditch system, and thus a completely new ditch would need to be excavated on both sides of the road. Installation of driveway and roadway culverts would be required. The ditch cross section would conform to the Village's standard rural cross section.

The pros and cons of this option include:

Pros	*Cons*
- Relatively higher times of concentration compared to traditional curb and gutter - Does not require pavement replacement (except at culvert crossings)	- Ditch modification by a single property owner can have significant effects on the system - Adds additional culverts for Village to maintain - Significantly increases flow over some properties; downstream properties would see fuller ditches when water, once previously attenuated, is allowed to flow freely downstream. - Wide ditches may require the removal of trees and other vegetation in the right-of-way

Option 1B – Establish a Modified Rural Cross Section

A modified rural cross section would consist of a localized ditch network, draining to a larger storm sewer network. Each block would drain by ditch, but at each intersection (or low spot, depending on topography), stormwater runoff would be collected by a catch basin and diverted to a storm sewer system.

The pros and cons of this option include:

Pros	*Cons*
- Relatively higher times of concentration compared to traditional curb and gutter - Provides more flexibility than (1A) since low spots, vegetated areas, and similar features can be worked around by the addition of an inlet	- Additional buried infrastructure for the Village to maintain - Some loss of trees and other vegetation in the right-of-way

Option 1C – Establish a Modified Rural Cross Section with Addition of BMPs

This option would have the same modified rural cross section as in 1B. However, BMPs such as permeable shoulders would be incorporated into the design.

The pros and cons of this option include:

Pros	*Cons*
- Provides water quality benefit - Relatively higher times of concentration compared to traditional curb and gutter - May qualify for grant money targeting water quality improvements	- More expensive to construct than traditional methods - Requires frequent maintenance - Existing soils are not amenable to high rates of infiltration - Permeable shoulders may not withstand heavy loads from vehicles such as garbage trucks - Some loss of trees and other vegetation in the right-of-way

Option 1D – Construct Traditional Curb and Gutter System

Option 1D consists of the construction of a traditional curb and gutter system, with the installation of inlets and a storm sewer system. The roadway cross section would conform to the Village's standard urban residential cross section.

The pros and cons of this option include:

Pros	*Cons*
- Requires least amount of right-of-way - Familiar construction technique to contractors - Least amount of trees removed	- Decreased times of concentration, resulting in slightly higher peak flows - Adds additional buried infrastructure for Village to maintain - Eliminates rural feel of the neighborhood

Recommended Option

Option 1B, Modified Rural Cross Section, should be implemented in this area. This option maintains the open feel of the rural cross section as well as the infiltration benefits of the ditches, yet also provides for the flexibility (and effective drainage) that a storm sewer system provides. Figure 610-3 illustrates a typical cross section of the combination ditch and sewer system.

Depending on site-specific constraints, it may be possible to use the ditches to attenuate flow by providing some detention in the ditches, which would relieve the loading on the proposed storm sewer system.

The roadway in this problem area is generally in good structural condition; to save money, the Village may wish to only perform pavement patching where needed, instead of street reconstruction. However, full street reconstruction is assumed for the planning level cost estimate.

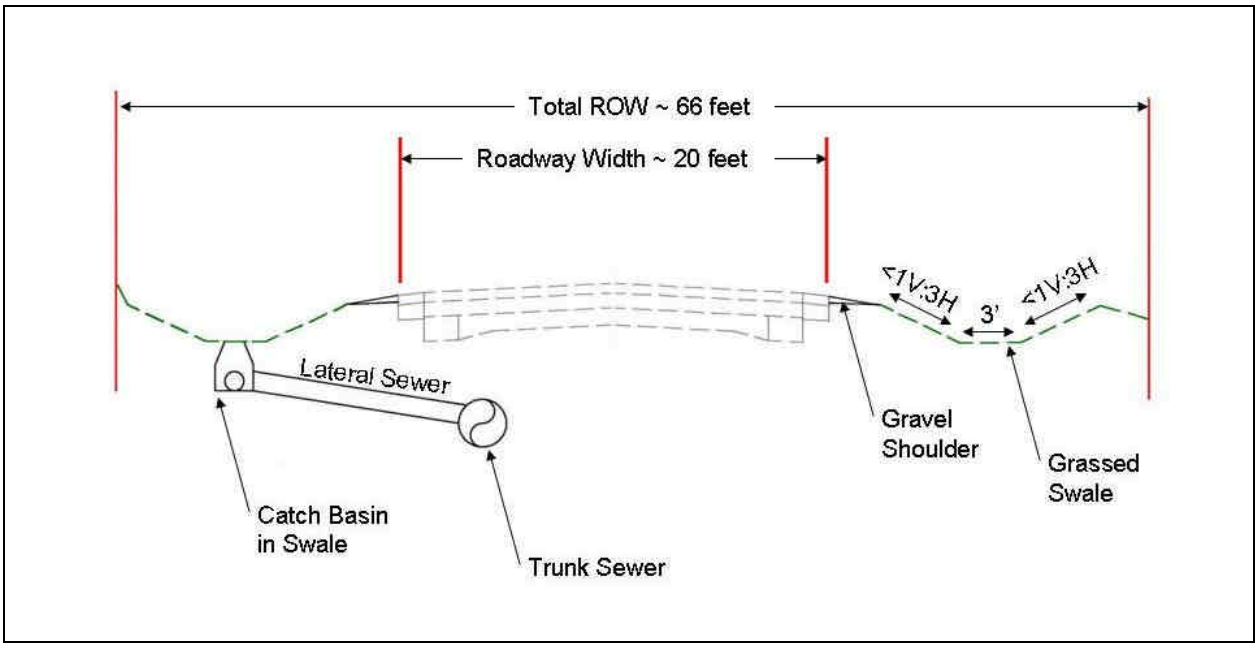


Figure 610-3
Modified Rural Cross Section

Residents in this problem area have also complained of rear yard flooding. When the sewer trunk line is constructed, considerations should be made for residents who wish to construct a yard drain and tie it into the Village's storm sewer. Additionally, the Village may wish to consider installing sanitary sewer service in this area at the same time the storm sewer is installed, as it will minimize future disruptions in the area.

Priority

High

This problem area is lacking a proper drainage system; it is recommended that the construction of the proper infrastructure be a high priority.

Cost

A planning estimate of improvement costs is included below. A detailed breakdown can be found in Table 610-1.

1. Hobson Triangle Reconstruction, Option 1B	$5,635,000
Contingency and Fees	$2,536,000
Total Implementation Cost	**$8,171,000**

Schedule

An implementation schedule for the completion of the recommended improvements is as follows:

Design Phase	
Item 1 – Preliminary Engineering	6 months
Final Engineering	6 months
Permitting Phase	
Village of Downers Grove	3 months
IEPA/IDNR/COE	*12 months*
FEMA	12 months
Construction Phase	
Item 1 – Hobson Triangle Reconstruction	10 months
TOTAL ESTIMATED TIME	34 MONTHS

Note: Some tasks can be completed concurrently. Limiting items in Design & Permitting Phases are shown in italics.

PROBLEM AREA 611

PRENTISS CREEK SUBWATERSHED PR-A
PROBLEM AREA 611

Location: Vicinity of Oxnard Drive and Bolson Drive

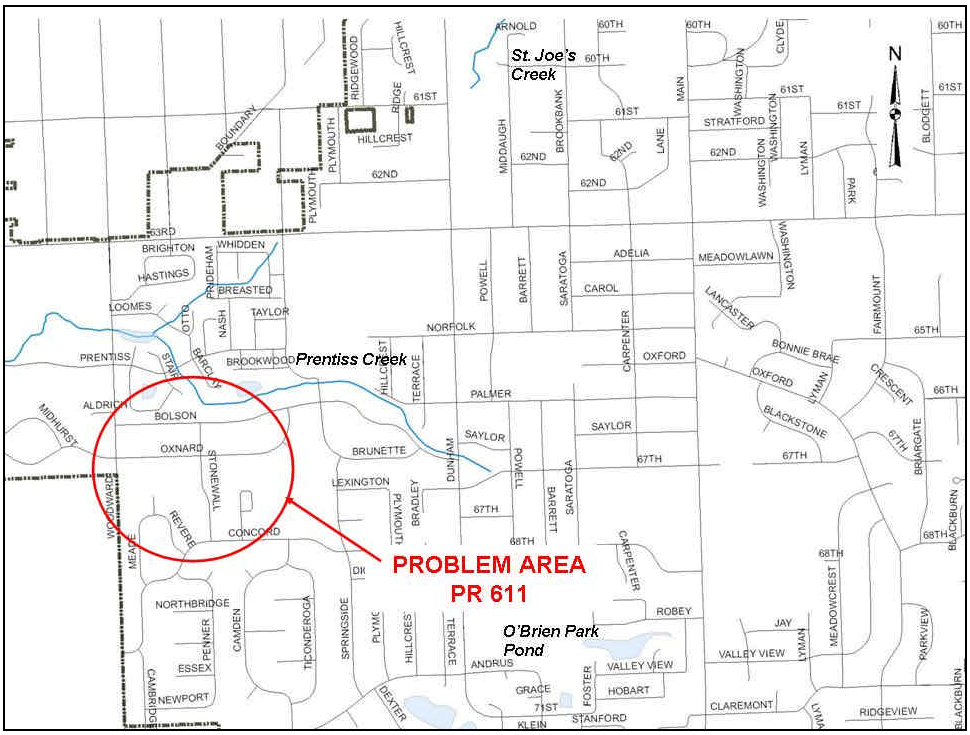


Figure 611-1
Problem Area Location Map

Description

Problem Area 611 is located towards the downstream end of the Prentiss Creek watershed, adjacent to the creek. The area is residential, with single-family homes as well as multi-family units near the creek. The area is drained by storm sewers which discharge directly into the creek.

This area has relatively steep topography; slopes range from 4% to 5% along Oxnard Drive, and slightly less steep along other roadways. Residents in the area have complained of structure and yard flooding, and have reported street flooding at the intersection of Stonewall Drive and Bolson Drive, as well as farther east along Bolson Drive.

Results

The main cause of flooding in this area is due to overland flow. Because of the steep slopes, stormwater runoff travels at a high velocity both through yards and along streets, making it difficult for existing sewer inlets to intercept a significant portion of the runoff. The homes on Oxnard Drive which have reported structure flooding are located in the natural flow path.

Figure 611-2
Steep rear yard slopes drain towards residential structures

Figure 611-3
Looking east along Oxnard Drive

Along Bolson Drive, the roadway profile flattens out and sags in the profile create a low point which accepts runoff from the surrounding streets. The high-velocity overland flow overwhelms the inlets in the sags, and water ponds. The intersection of Bolson Drive and Stonewall Avenue is a low spot which collects significant stormwater runoff; similarly, farther east along Bolson the profile becomes much flatter than the upstream areas, causing water to pond.

Recommendations

To remedy street flooding, additional inlets should be placed at known flooding areas. According to preliminary calculations, the existing sewer has adequate hydraulic capacity to convey the higher flow rates resulting from additional inlets. Additionally, the inlet type should be changed to one with a higher inlet capacity and which is less susceptible to flooding. The following are recommendations for this problem area:

1. Bolson Drive & Stonewall Avenue Drainage Improvements

   Additional inlets should be added at the intersection of Bolson Drive and Stonewall Avenue, using inlets with non-clog grates. According to preliminary calculations, the existing sewer has adequate hydraulic capacity to convey the higher flow rates resulting from additional inlets.

2. Bolson Drive & Springside Avenue Drainage Improvements

   Add approximately 400 LF of 12-inch storm sewer along Bolson Drive west of Springside Avenue, and tie into the existing 18-inch storm sewer located just west of Springside, to drain the low area along Bolson Drive. The inlet grates should be carefully selected to provide a high flow capacity at each inlet. According to preliminary calculations, the existing sewer has adequate hydraulic capacity to convey the higher flow rates resulting from additional inlets.

3. Yard Drainage Improvements

   Yard and structure flooding needs to be addressed on an individual basis. For some properties, a properly-placed catch basin or french drain may intercept overland flow. In other cases, such as the properties abutting Concord Square Park, a vegetated buffer or infiltration swale can be used to attenuate peak flows and encourage infiltration.

Priority

Low

While street flooding in the area is a nuisance, it is localized and does not affect a large number of residents. Structure flooding, while of a high priority to the affected resident, is due to private property issues; the Village should help the homeowners to solve these issues, but there is no associated capital cost.

Costs

A planning estimate of improvement costs is included below. A detailed breakdown can be found in Table 611-1.

1. Bolson & Stonewall Improvements	$53,000
2. Bolson & Springside Improvements	$106,000
3. Yard Drainage Improvements	*No Capital Cost to Village*
Contingency and Fees	$72,000
Total Implementation Cost	**$231,000**

Schedule

An implementation schedule for the completion of the recommended improvements is as follows:

Design Phase	
Item 1 – Design	3 months
Item 2 – Design	3 months
Permitting Phase	
Village of Downers Grove	3 months
IEPA/IDNR/COE	*6 months*
Construction Phase	
Item 1 – Bolson & Stonewall Improvements	1 month
Item 2 – Bolson & Springside Improvements	1 month
TOTAL ESTIMATED TIME	14 MONTHS

Note: Some tasks can be completed concurrently. Limiting items in Design & Permitting Phases are shown in italics.

PROBLEM AREA 612

PRENTISS CREEK SUBWATERSHED PR-D
PROBLEM AREA 612

LOCATION: Dunham Place Subdivisions

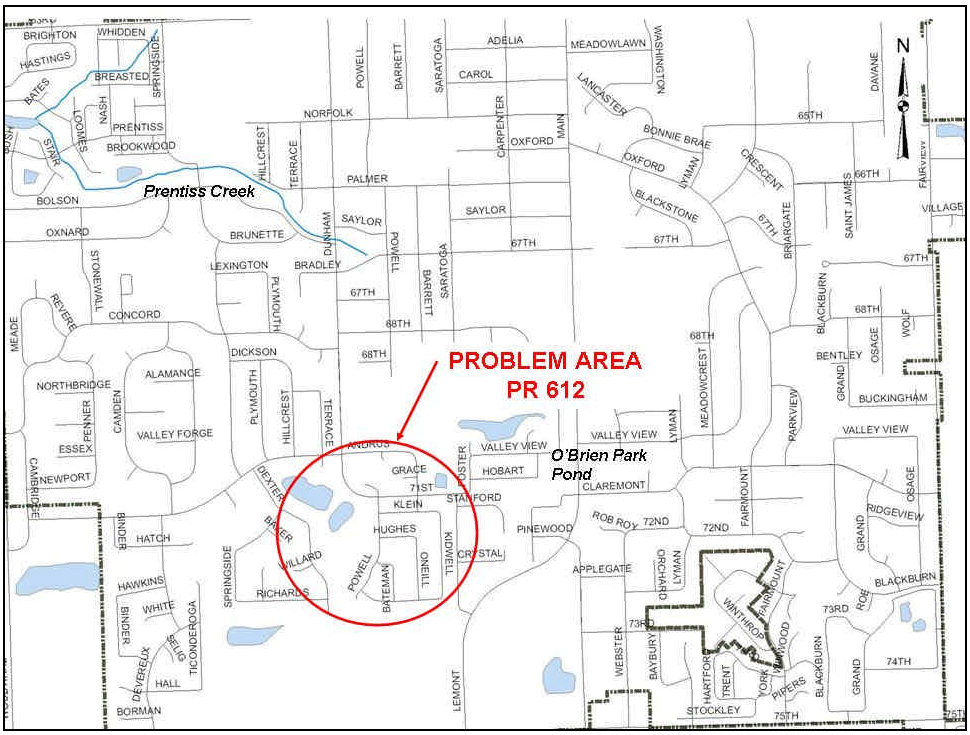


Figure 612-1
Problem Area Location Map

Description

This area consists of the Gallagher & Henry's Dunham Place Subdivisions, Units 1, 2, 8 and 11 as well as Dunham Crossings. The area is served by storm sewer which drains to an off-line detention pond south of 71st Street. There is also a detention pond serving the Dunham Crossings subdivision. The runoff from this area ultimately drains towards the O'Brien Park pond, and flows either to the pond or northwest towards Prentiss Creek, depending on pond water levels and system hydraulics.

Residents in the area complain of street and yard flooding. Street flooding is prevalent along the 6200 block of Powell Street, and has also been reported on Grace Court and near 71st and Dunham.

Results

XP-SWMM was used to model the trunk sewer in this area. The storm sewer system consists of a network of ponds, storm sewers and restrictors, as shown in Figures 612-2 and 612-3.

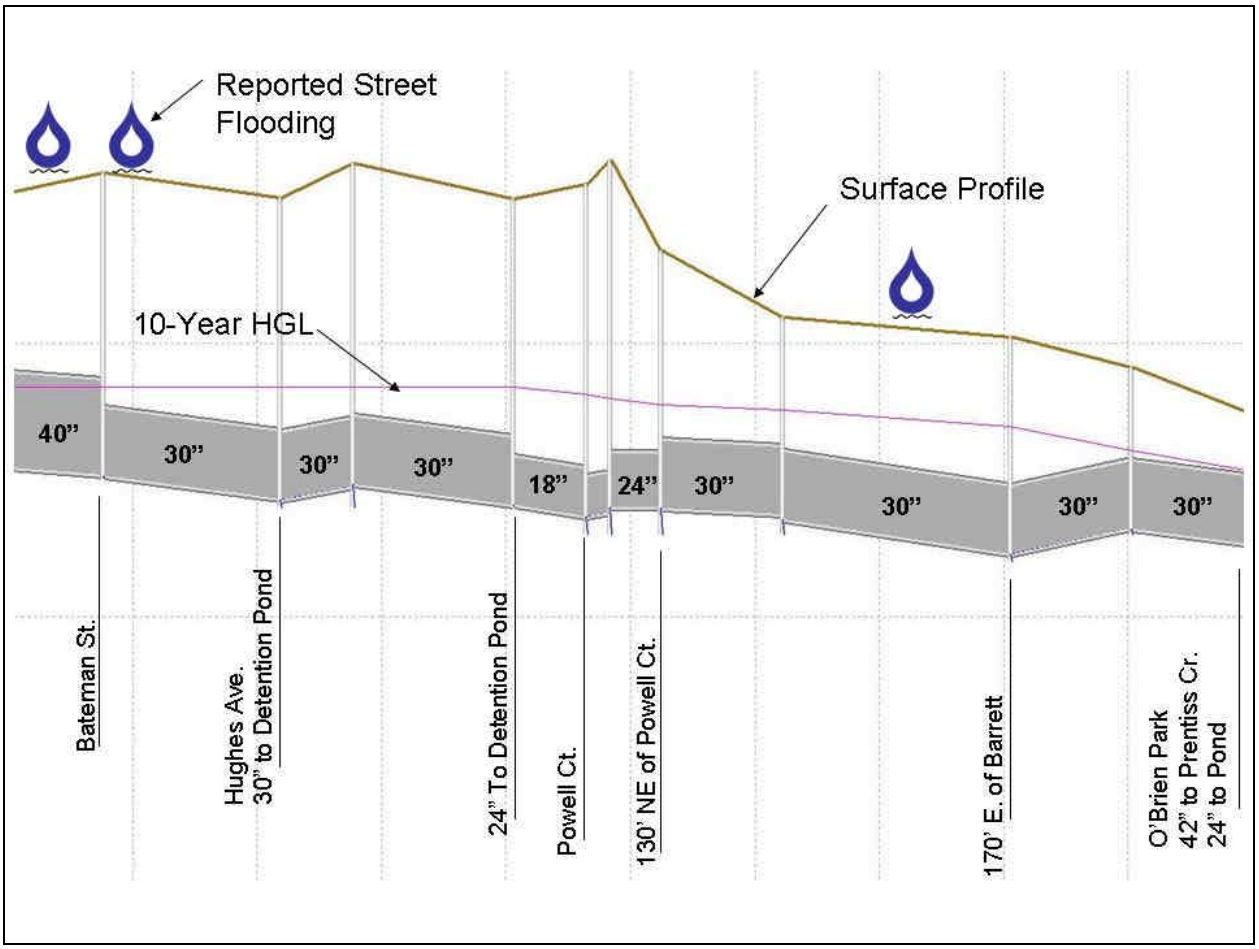


Figure 612-2
Storm Sewer Profile, Powell St. to O'Brien Park Pond

Hydraulic modeling of the subbasin suggests that the hydraulic grade line during the peak 10-year storm event is slightly above the crown of the pipe but well below the surface elevation. The outflow from the ponds is ultimately controlled by the 18-inch storm sewer at Powell Court. The trunk line along Powell Street decreases in diameter as it goes downstream; the excess flow is expected to back up into the detention ponds.

Due to the complex pond system and the numerous end sections to the pond, it is possible that the ponds may not be performing as designed, and that stormwater may be surcharging the system. However, street flooding is being reported in areas, particularly the section at Powell Street and Bateman Street, where the storm sewer is the deepest. This suggests that the cause of the flooding may be related to a lack of storm sewer inlets (as opposed to undersized storm sewers).

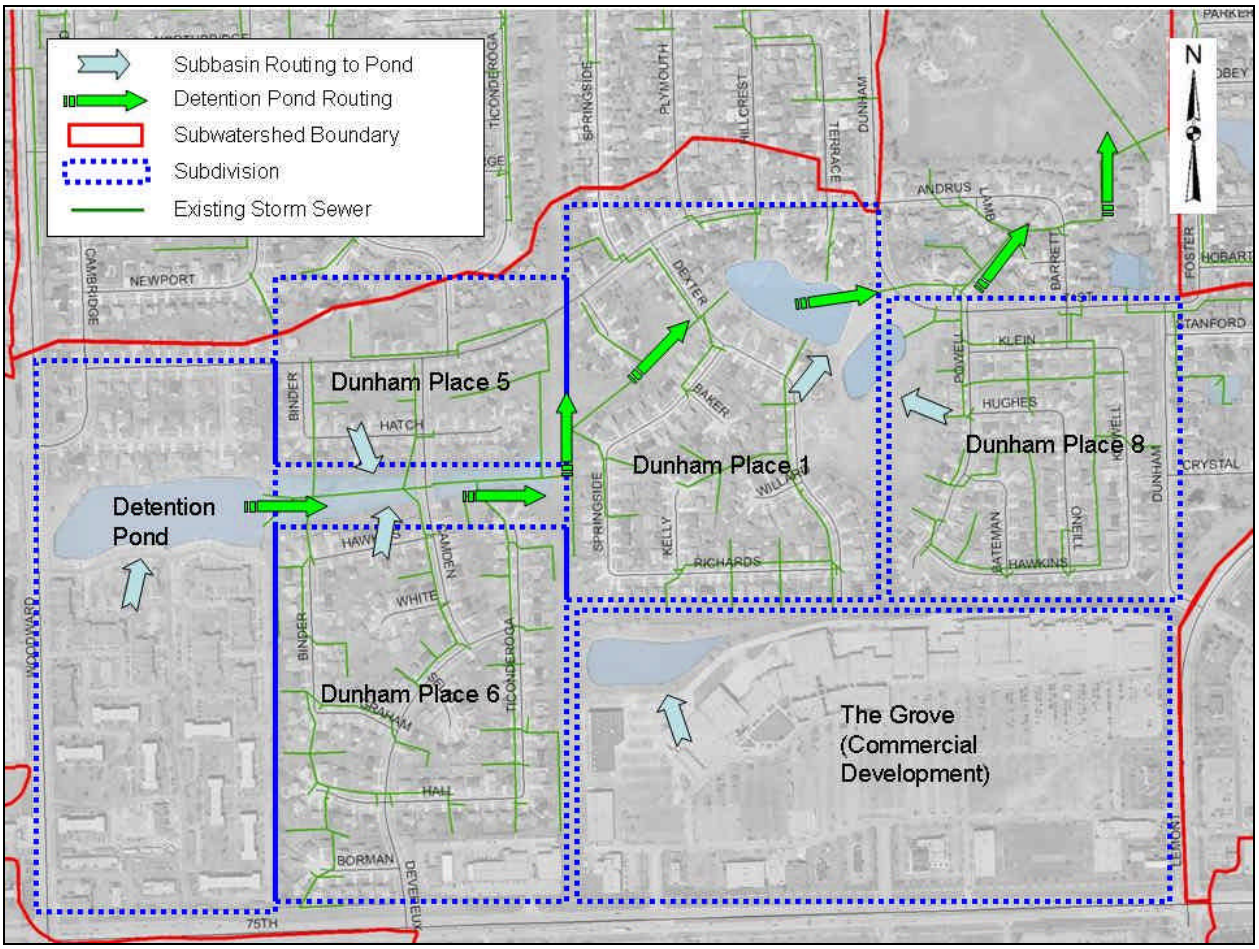


Figure 612-3
Detention Pond Locations and Routing, Subwatershed D

Recommendations

1. Storm Sewer Investigation

   Survey the storm sewer system along Hawkins Avenue from Powell Street to Kidwell Road to determine pipe sizes and slopes. Determine how Hawkins Avenue system drains; the Village's storm sewer atlas indicates the system is flowing west toward Powell Street, but the storm sewer survey conducted for this study did not indicate a storm sewer coming into the system from the east. Determine if this section of storm sewer is undersized or backpitched, or if a restriction is blocking flow towards Powell Street.

2. Storm Sewer Maintenance

   Clean the section of storm sewer along Powell Street and the outfalls to the detention ponds. Debris may be blocking the pipe, causing a backup upstream. This section of storm sewer is susceptible to debris accumulation because of the restriction near Powell Court, as well as the numerous headwalls at the ponds, which can allow debris into the storm sewer system.

3. Drainage Improvements

   Install additional inlets at the intersections of Powell and Bateman Streets, Bateman Street and Hawkins Avenue, and along Hughes Avenue. According to preliminary calculations, the existing sewer has adequate hydraulic capacity to convey the higher flow rates resulting from additional inlets. Initiate a street sweeping program in the area and install non-clog grates.

4. Yard Flooding Improvements

   A storm sewer system exists through the backyards of many of the property owners who complain of yard flooding. Fixing downstream problems along Powell Street may alleviate some of this flooding. Homeowners should be approached on an individual basis to determine if they have a yard drain, whether it is in the correct spot (i.e. lowest elevation), and if it is functioning properly. The Village should investigate, and, if necessary, clean the rear yard storm sewers, since they may have accumulated significant debris over the years.

5. Future Recommendations

   Preliminary modeling suggests the detention ponds are adequately sized to handle the incoming flows. However, if flooding problems continue, conduct a more detailed study of this problem area, including the interaction of the storm sewer system with the detention areas, to further understand the dynamics of the local storm sewer system. This will require additional survey of detention pond inlet/outlet structures, local storm sewers, and natural drainage pathways.

Priority

Low

Flooding in this area is moderate, and is in a residential neighborhood with low traffic volume.

Costs

A planning estimate of improvement costs is included below. A detailed breakdown can be found in Table 612-1.

1. Storm Sewer Investigation	$2,000
2. Storm Sewer Maintenance	$11,000
3. Drainage Improvements	$155,000
4. Yard Flooding Improvements	$15,000
5. Future Recommendations	*Not Included in This Estimate*
Contingency and Fees	$81,000
Total Implementation Cost	**$263,000**

Schedule

Schedule

An implementation schedule for the completion of the recommended improvements is as follows:

Design Phase	
Items 1,3 – Engineering & Design	3 months
Permitting Phase	
Village of Downers Grove	3 months
Construction Phase	
Item 2 – Clean Sewers	2 weeks
Item 3 – Add Inlet Structures	2 weeks
Item 4 – Yard Drainage/Clean Sewers	2 weeks
TOTAL ESTIMATED TIME	8 MONTHS

Note: Some tasks can be completed concurrently. Limiting items in Design & Permitting Phases are shown in italics.

PROBLEM AREA 613

PRENTISS CREEK SUBWATERSHED PR-C
PROBLEM AREA 613

LOCATION: Vicinity of 62nd Lane east of Brookbank

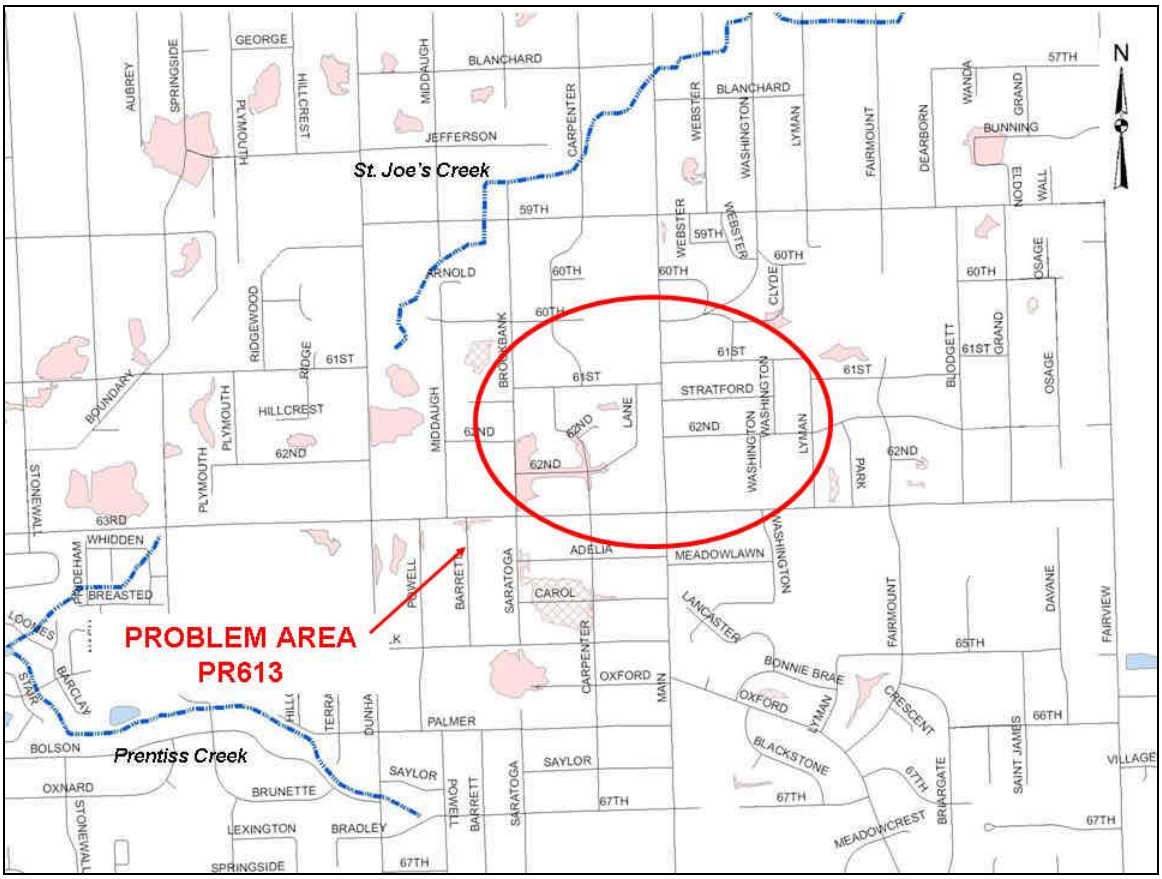


Figure 613-1
Problem Area Location Map

Description

Chronic street and yard flooding has been reported throughout this area. The subbasin lies in the upstream (northeast) portion of the Prentiss Creek Watershed, where slopes are relatively steep. Although there is some storm sewer in the area, there are several streets which have a rural section and rely on poorly-defined swales to convey stormwater runoff. Three depressional areas are located in this subbasin; one in the roadway along 62nd Lane, one in the backyards of the homes at the southwest corner of 62nd Lane and 61st Street, and one in the roadway along Clyde Avenue south of 60th Street.

Findings

The terrain is in this area is fairly steep, with slopes averaging roughly 2%, causing high runoff velocities. The overland flow paths are often through private property, and thus contribute to house and yard flooding.

Residents in the area have reported that recent construction of storm sewers has relieved the flooding problem. Plans from the *1993 Water Main and Storm Sewer Improvements* show an 18-inch relief sewer along 62nd Place, which has relieved some of the flooding. There were no reports of street flooding during the October 2006 storm along 61st Lane, a sign that the new storm sewers are an effective solution. House and yard flooding still occurs in portions of the subbasin.

A survey of a portion of the storm sewer system showed that the sewer is backpitched near the intersection of 62nd Lane and Carpenter Street; this also happens to be the local low spot along 62nd Lane. Figure 613-2 depicts the storm sewer profile and 10-year hydraulic grade line of the storm sewer along 62nd Lane.

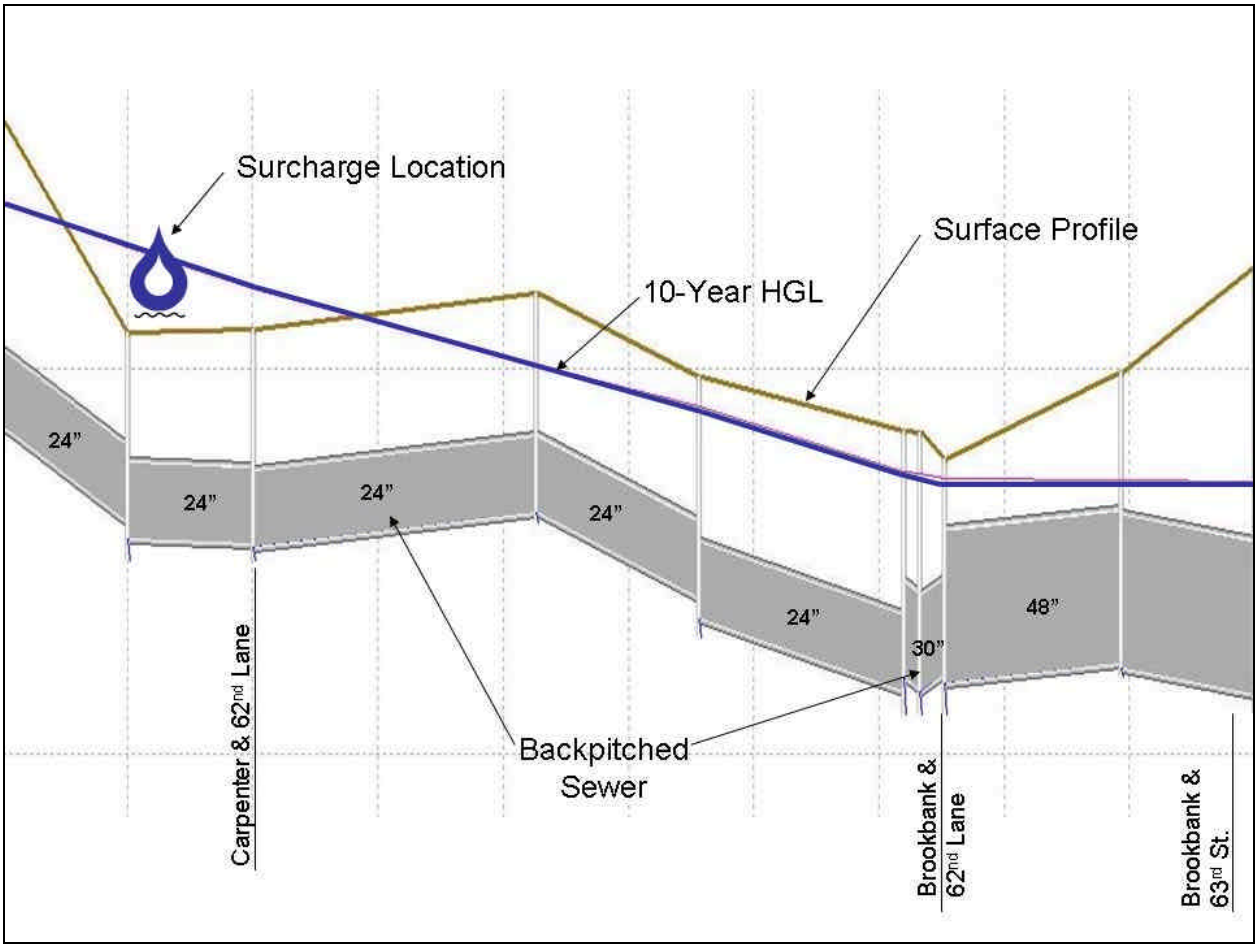


Figure 613-2
Storm Sewer Profile with 10-Year Hydraulic Grade Line, 62nd Lane from 61st St. to Brookbank

Recommendations

Solutions in this problem area include (1) fixing the existing storm sewer system and (2) properly draining depressional areas.

1. 62nd Place Storm Sewer Improvements

   The storm sewer system along 62nd Place is undersized and contains a section of backpitched sewer which contributes to flooding during heavy rainfall events. However, residents in the area have commented that previous work to the system performed by the Village has provided flooding relief. If street flooding recurs, the following steps are recommended:

   1.1. Replace and increase the size of the backpitched storm sewer along 62nd Place to provide positive drainage.

   Improving the storm sewer system to convey the 10-year storm event is not feasible. The downstream trunk line was designed to convey the 5-year storm event (per the original 1970s Master Plan), and so designing the system for the 10-year event would require upsizing all pipe to the outfall at Prentiss Creek. However, replacing the backpitched storm sewer segments with larger diameter sewers will provide additional flood protection for the 5-year storm event.

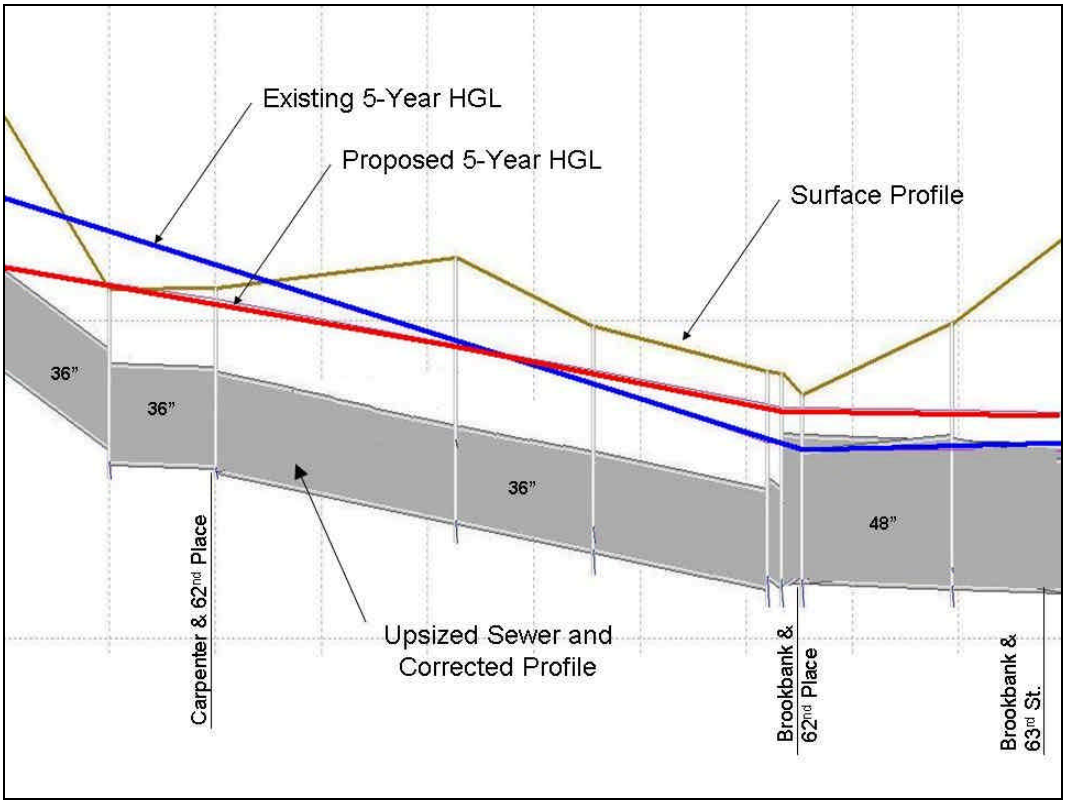


Figure 613-3
Proposed Storm Sewer Profile along 62nd Place

2. Depressional Area Drainage Improvements

2.1. The depressional area in the backyards of the properties at the southwest corner of 62nd Lane and 61st Street is drained via storm sewer east to the existing trunk storm sewer system. However, draining this flow to the east conveys the flow upstream of its natural flow path, to a storm sewer that is already undersized. During heavy rainfall events this would provide little to no flood relief for the depressional area. The area should instead drain southwest, through the backyards (either overland or through a yard drain) and along the natural flow path and enter the storm sewer system on Carpenter.

The Village should work with residents to install a 12-inch storm sewer through the backyard easements of the homes southeast of 61st Street and Carpenter, which would outlet to the storm sewer 62nd Place.

2.2. The depressional area on Clyde Avenue has no natural overland outlet. This area should be drained via storm sewer, which should be constructed from Clyde west to Washington and south to the storm sewer along 61st Street. Inlet structures can be placed in the low points of the ditches to drain the flow, thus creating a modified However, a design-level analysis should be performed to check that the storm sewer along 61st Street can adequately handle the additional stormwater runoff.

2.3. Other properties throughout this subbasin have documented complaints of yard and house flooding. The topography in this area is fairly steep, and much of the drainage is through backyards. These concerns should be addressed on an individual basis. Many of the flooding problems may be due to blocked overland flow paths through backyards. In these situations, backyard flooding potential can be reduced with catch basins and small diameter storm sewers which connect to the existing storm sewer. The Village should work with individual property owners to address these problems.

Priority

Moderate

Flooding in this area is chronic, but is not as widespread as other areas, and has been improved by recent projects.

Cost

A planning estimate of improvement costs is included below. A detailed breakdown can be found in Table 600-1.

1. 62nd Place Storm Sewer Improvements	$3,117,000
2. Depressional Area Improvements	$284,000
Contingency and Fees	$1,530,000
Total Implementation Cost	**$4,930,000**

Schedule

An implementation schedule for the completion of the recommended improvements is as follows:

Design Phase	
Item 1 – Preliminary Design	*6 months*
Final Design	*6 months*
Item 2 – Preliminary Design	6 months
Final Design	6 months
Permitting Phase	
Village of Downers Grove	3 months
IEPA/IDNR/COE	*12 months*
Construction Phase	
Item 1 – 62nd Place Improvements	2 months
Item 2 – Clyde Avenue Improvements	1 month
Yard Drainage Improvements	2 weeks
TOTAL ESTIMATED TIME	28 MONTHS

Note: Some tasks can be completed concurrently. Limiting items in Design & Permitting Phases are shown in italics.

PROBLEM AREA 614

PRENTISS CREEK SUBWATERSHED PR-B
PROBLEM AREA 614

LOCATION: Vicinity of Fairmount Avenue from 63rd St. to Oxford St.

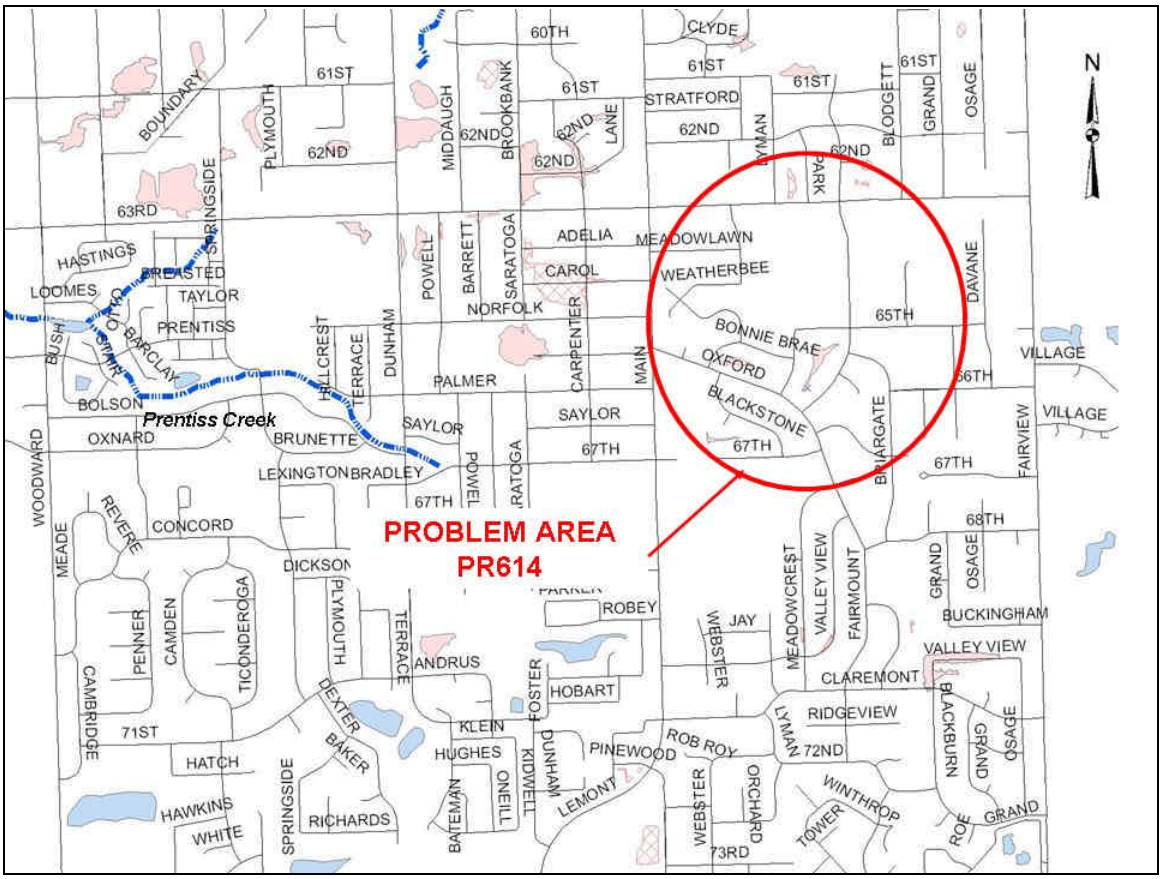


Figure 614-1
Problem Area Location Map

Description

Problem Area 614 is located in the upstream reaches of the Prentiss Creek watershed. The area is composed of single-family residential land use. Drainage is provided by a storm sewer system along Fairmount Avenue, which eventually drains into the 60-inch storm sewer trunk sewer along 67th Avenue.

This area experiences frequent street and yard flooding. The area has numerous low spots with no effective natural drainage outlet. A depressional area is located in the rear yards bordered by Lyman Avenue and Fairmount Avenue. The intersection of Fairmount Avenue and Oxford Street is a recurring flooding problem area; the areas near Briargate Drive and Fairmount Avenue as well as Oxford Street and Blackstone Drive have documented flooding problems.

Findings

Problem Area 614 is a low spot in the watershed. Overland flow drains towards Oxford Street and Blackstone Drive, and has no natural outlet. Figure 614-2 illustrates the topography of the area.

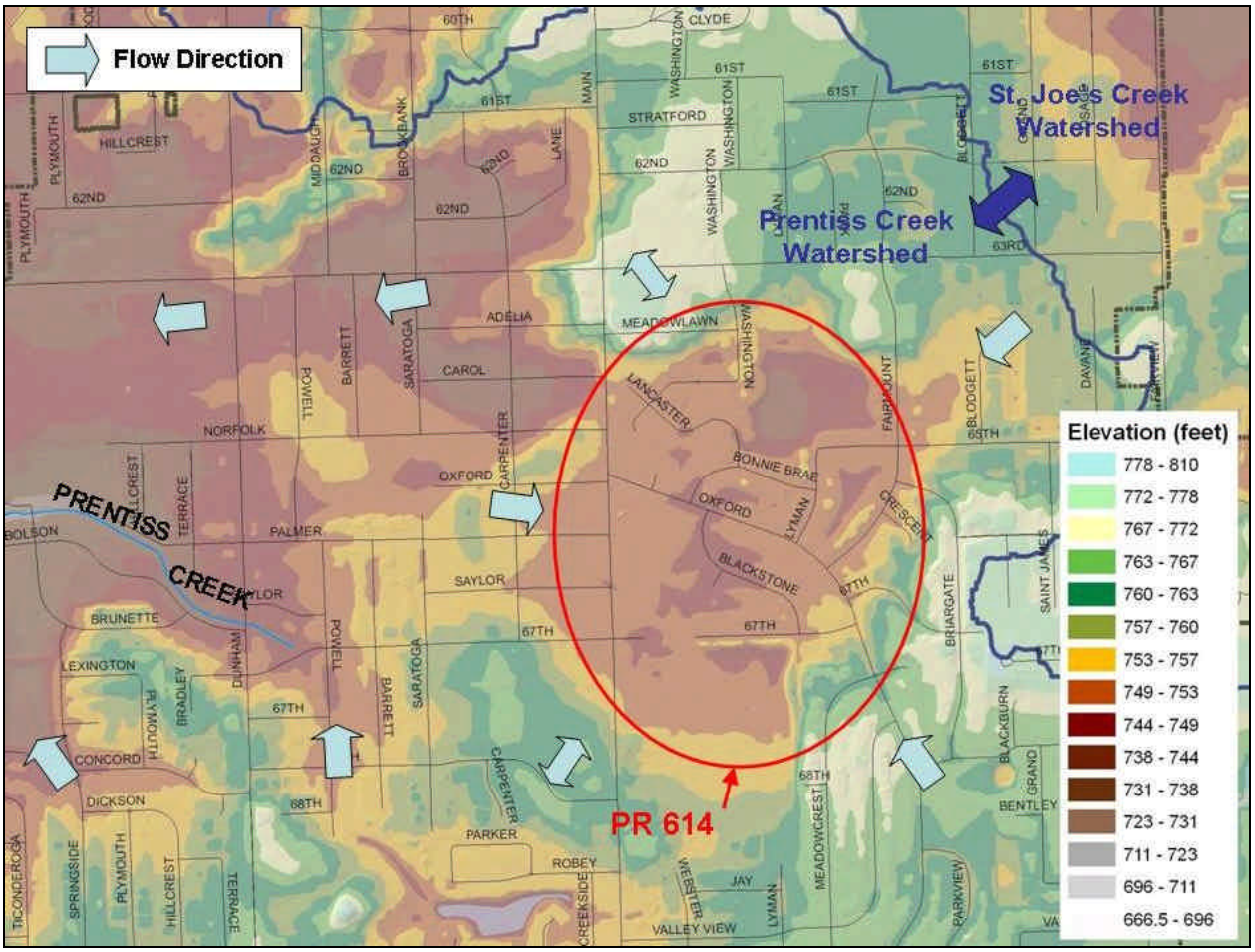


Figure 614-2
Topography, Vicinity of PR 614

A storm sewer survey was conducted for the trunk storm sewer along Fairmount Avenue. The survey indicates that the storm sewer is backpitched under a portion of the roadway that is also a low spot in the area, near the intersection of Fairmount Avenue and Briargate Drive. The lack of hydraulic capacity in this section causes the storm sewer to back up and floods adjacent depressional areas. Figure 614-3 illustrates the storm sewer profile along Fairmount Avenue.

One alternative considered (Option A) was to upsize the storm sewer along Fairmount, and eliminate the backpitched storm sewer. However, XP-SWMM modeling of this alternative showed no improvement, suggesting that, while the backpitched and undersized sewer may be a part of the problem, the main cause is a hydraulic restriction downstream. Figure 614-4 shows the revised (improved) storm sewer profile along Fairmount Avenue with the hydraulic grade

line for the 10-year storm event; comparing Figure 614-3 with Figure 614-4 shows little to no improvement in flooding conditions. Construction of a relief sewer along 67th Street was modeled, and results suggest that this will substantially improve conditions upstream. Figure 614-5 shows the hydraulic grade line along Fairmount Avenue after a 48-inch relief sewer with an outlet to Prentiss Creek is constructed and the storm sewer profile is revised.

Construction of the relief sewer would require over 4,000 LF of 48-inch storm sewer along 67th Street, according to this study (a detailed study would be required prior to final design). This would also increase the 10-year peak flow rate released to Prentiss Creek by approximately 43 cfs, from 253 cfs to 297 cfs, an increase of 17%. Figure 614-6 shows the location of this relief sewer.

To avoid the disruptive construction along 67th Street and to minimize the increase in discharge to Prentiss Creek, a detention facility should be constructed in McCollum Park (Option B). There is already a depressional area in the northeast corner of the park; this area could be increased to act as overflow for the 60-inch trunk storm sewer along 67th Street. Figure 614-7 illustrates the proposed location for a detention facility. Alternatively, underground storage could be constructed at this site if space becomes an issue.

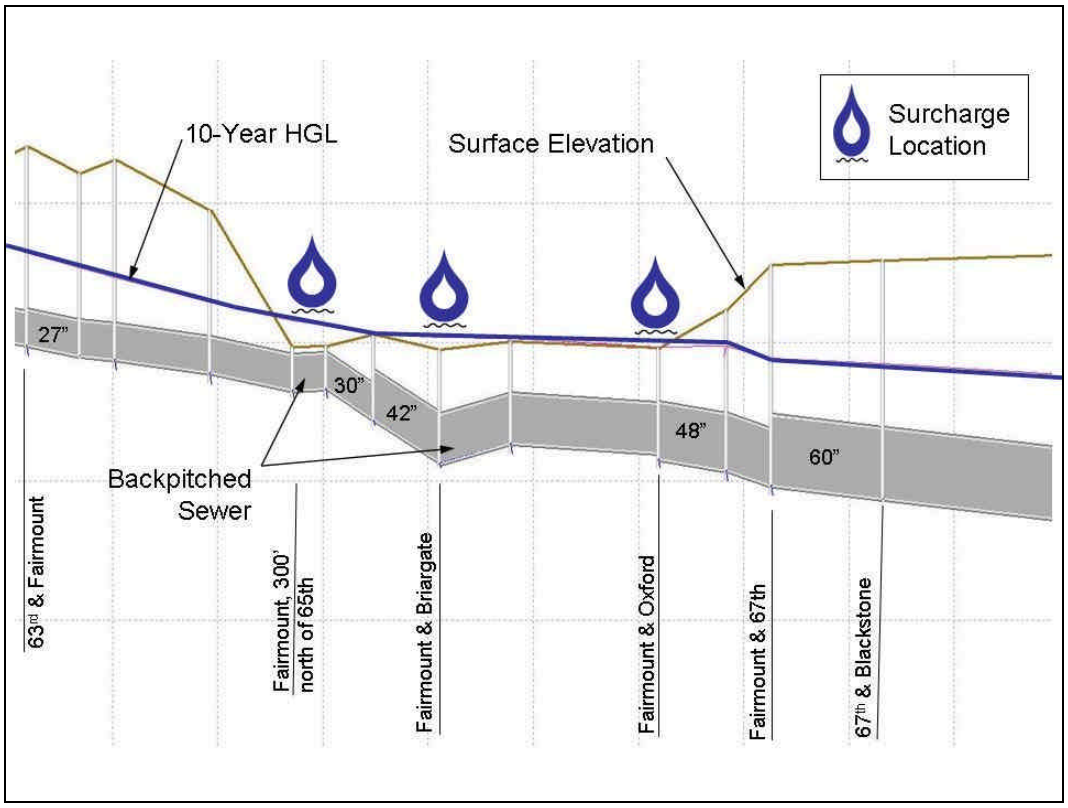


Figure 614-3
Storm Sewer Profile with 10-Year Hydraulic Grade Line, Fairmount Avenue

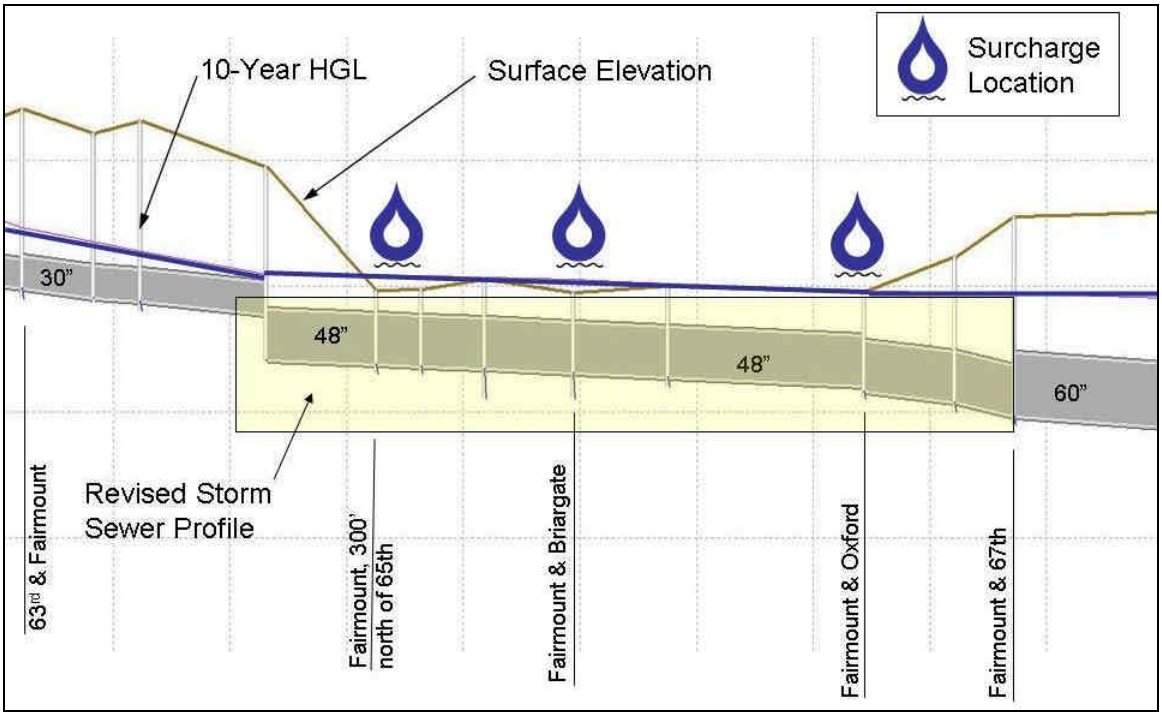


Figure 614-4
10-Year HGL, Revised Storm Sewer Profile along Fairmount Avenue

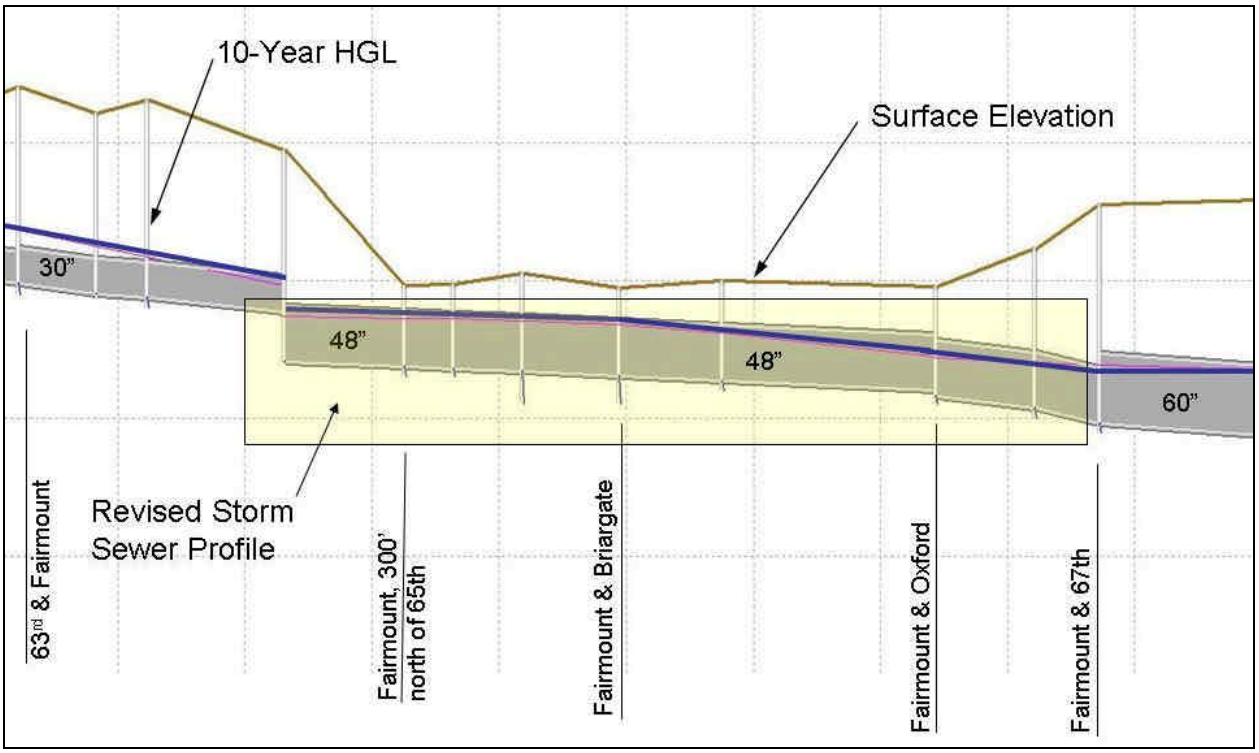


Figure 614-5
10-Year HGL, Revised Storm Sewer Profile & Downstream Relief Sewer

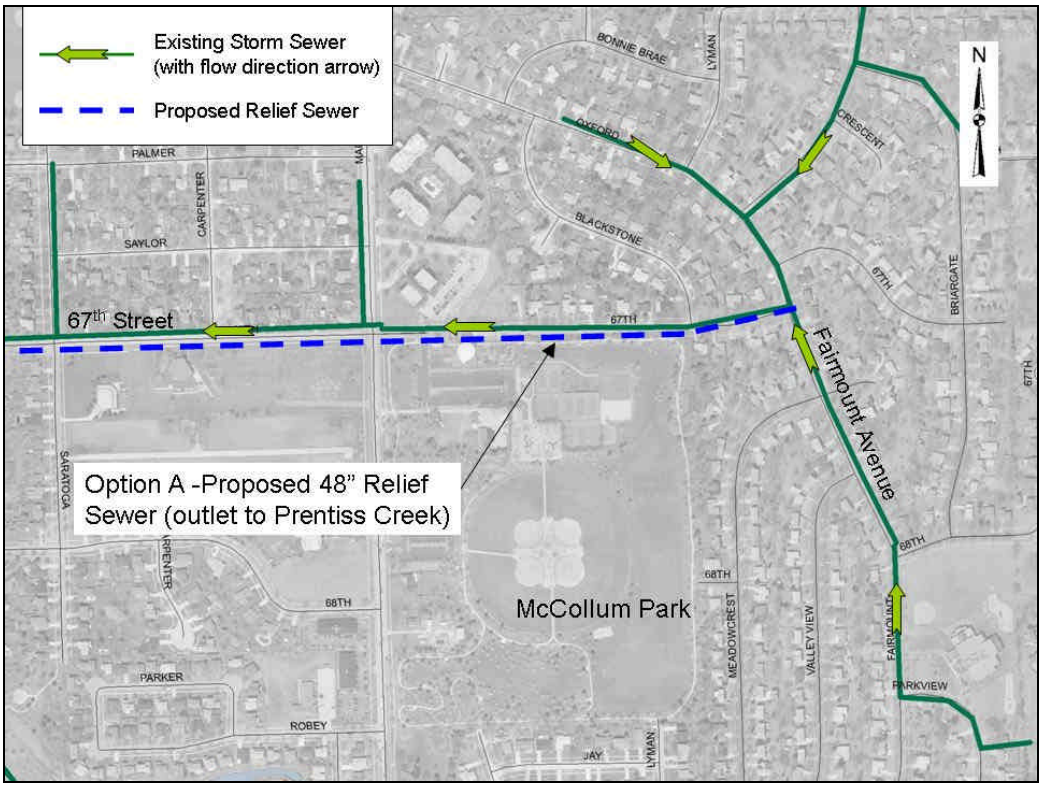


Figure 614-6
Option A – Construction of Relief Sewer

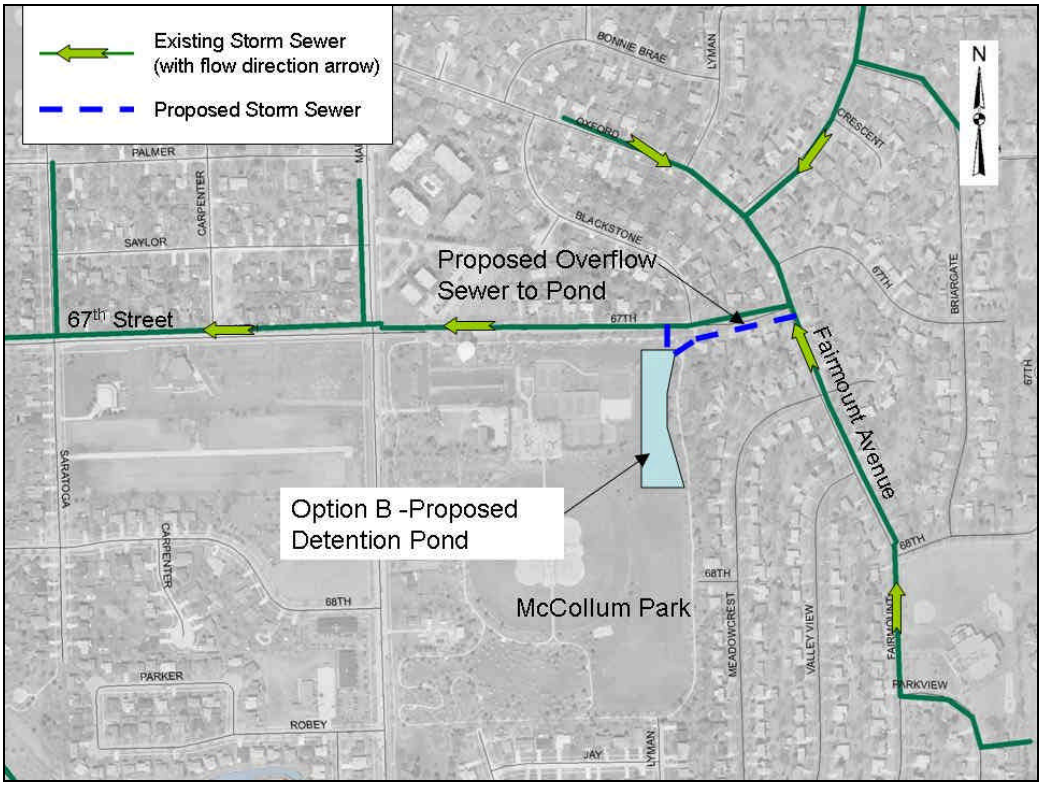


Figure 614-7
Option B – Construction of Detention Pond

Recommendations

Recommendations in this problem area include storm sewer improvements, addition of detention, and increased infrastructure maintenance.

1. Inlet Replacement and Maintenance

   Since this problem area is in a depressional area, upstream sediment and debris tends to settle out at the inlets in this area. Flooding during the smaller storm events can be reduced by replacing the grates on the existing inlets with non-clogging grates. Furthermore, the Village should initiate a street sweeping program in the area, especially during the fall months, to collect the debris.

2. Storm Sewer Improvements

   The storm sewer along Fairmount Drive is in poor condition and should be replaced within the next few years. The backpitched storm sewer at Fairmount and Briargate needs to be replaced. Although this will not, by itself, provide much flood relief during the 10-year event, it will help flow conditions during smaller events and will prevent sedimentation at sags in the sewer profile. The manhole located on Fairmount Avenue, approximately 250 feet south of 63rd Street, has ten feet of adjusting rings below the casting. It is recommended that the

storm sewer be upsized to a 48-inch diameter sewer along Fairmount Avenue from approximately 600' north of 65th Street to the intersection of Oxford and 67th.

The structures located along the rear property lines of the residences along Fairmount Drive (north of Oxford Street) are also in poor condition; the structures are full of water, and the storm sewer is not positively draining to the main storm sewer along Fairmount Drive. This system should be replaced when the Fairmount Drive improvements are taking place.

3. Detention Pond Construction

3.A As the existing sewer along 67th Street has been identified as a hydraulic restriction limiting the impact of upstream improvements, a detention pond is recommended for construction at the northeast corner of McCollum Park. This detention pond would attenuate peak flows until the trunk sewer has adequate capacity to discharge the excess flow.

3.B If the Village does not wish to construct a detention pond, a 48-inch relief sewer is recommended for construction along 67th Street, starting at Fairmont Avenue and extending downstream approximately 4,000 feet west along 67th Street to where it would daylight at Prentiss Creek, just west of Dunham Road.

The construction of the relief sewer is not recommended. This option would increase peak flows to the creek, whereas a detention pond would result in flows equal to of less than existing. Major roadway construction would be necessary for the relief sewer, which would be costly and disruptive. Additionally, the water quality benefits that a detention pond can provide would be lost.

Priority

High

This project is rated high priority because it would alleviate street flooding, both in the immediate area and in upstream areas. Providing relief to the 60-inch storm sewer along 67th Street will improve conditions within a wide area, not just in the immediate area where the construction will take place.

Cost

A planning estimate of improvement costs is included below. A detailed breakdown can be found in Table 614-1.

1. Inlet Replacement and Maintenance	*Cost included in Item 2*
2. Storm Sewer Improvements	$1,195,000
3. Stormwater Storage Facility [(1)]	$1,510,000
Contingency and Fees	$1,218,000
Total Implementation Cost	**$3,923,000**

[(1)] Cost for an above-ground stormwater storage facility is based on a unit price of $200,000 per acre-foot. However, due to the proposed location of the pond and assuming the excavated material can be spoiled on-site, the cost may become significantly lower.

Schedule

An implementation schedule for the completion of the recommended improvements is as follows:

Design Phase	
Item 2 – Preliminary Design	*6 months*
Final Design	*6 months*
Item 3 – Preliminary Design	6 months
Final Design	6 months
Permitting Phase	
Village of Downers Grove	3 months
IEPA/IDNR/COE	*12 months*
FEMA	12 months
Construction Phase	
Item 1 – Inlet Replacement	2 weeks
Item 2 – Storm Sewer Improvements	4 months
Item 3 – Detention Pond Construction	3 months
TOTAL ESTIMATED TIME	32 MONTHS

Note: Some tasks can be completed concurrently. Limiting items in Design & Permitting Phases are shown in italics.

PROBLEM AREA 615

PRENTISS CREEK SUBWATERSHED PR-A
PROBLEM AREA 615

Location: Valley View Drive near Blackburn Avenue

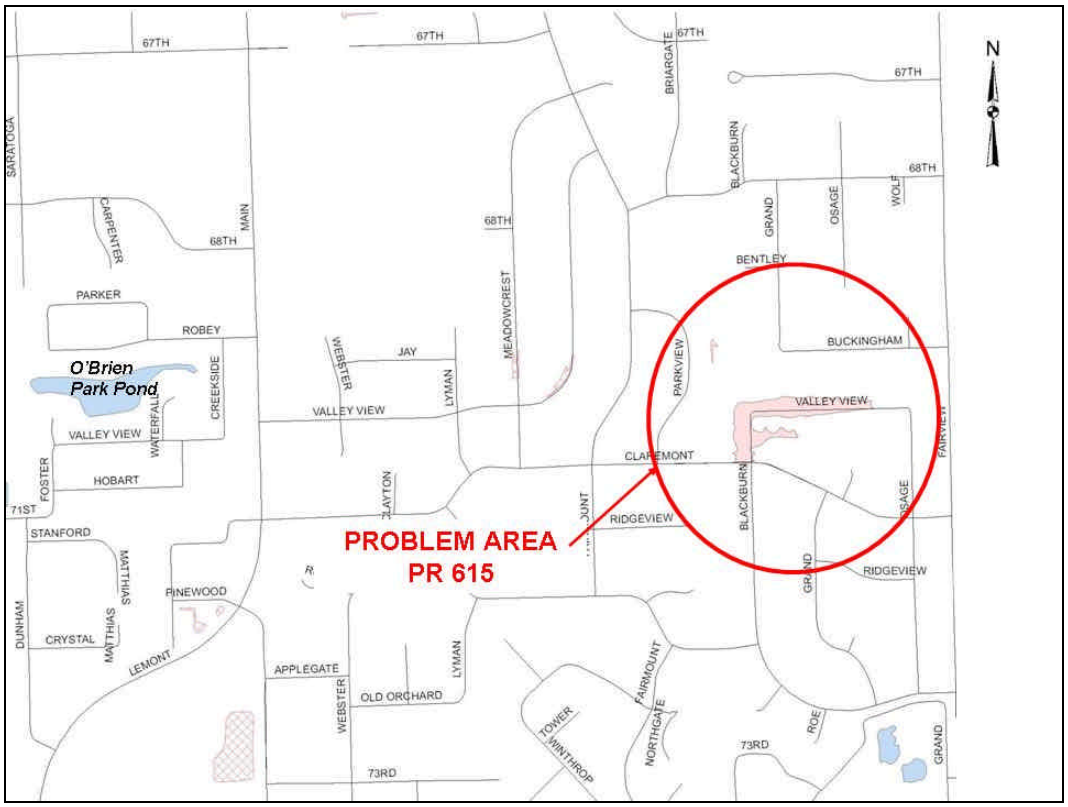


Figure 615-1
Problem Area Location Map

Description

Problem Area 615 is located on the eastern end of the Prentiss Creek watershed. The land use in this area is primarily single-family residential. Drainage is provided by storm sewer, which drains to the 54-inch trunk sewer along Claremont Drive, which eventually discharges to the O'Brien Park Pond west of Main Street.

The roadway along Valley View Drive and Blackburn Avenue is a depressional area, and the homeowners in the area experience frequent street and yard flooding. Street flooding is predominant near the intersection of Blackburn Avenue and Valley View Drive, as well as along Valley View Drive towards Osage Avenue.

Findings

Survey of the trunk line indicates that the storm sewer is backpitched just downstream of the flooding area at the intersection of Blackburn Avenue and Valley View Drive. Stormwater draining to Valley View Drive, a local low spot, will pond there until the sewer has capacity to drain the excess runoff. Figure 615-2 illustrates the storm sewer profile along Valley View Drive and Blackburn Avenue.

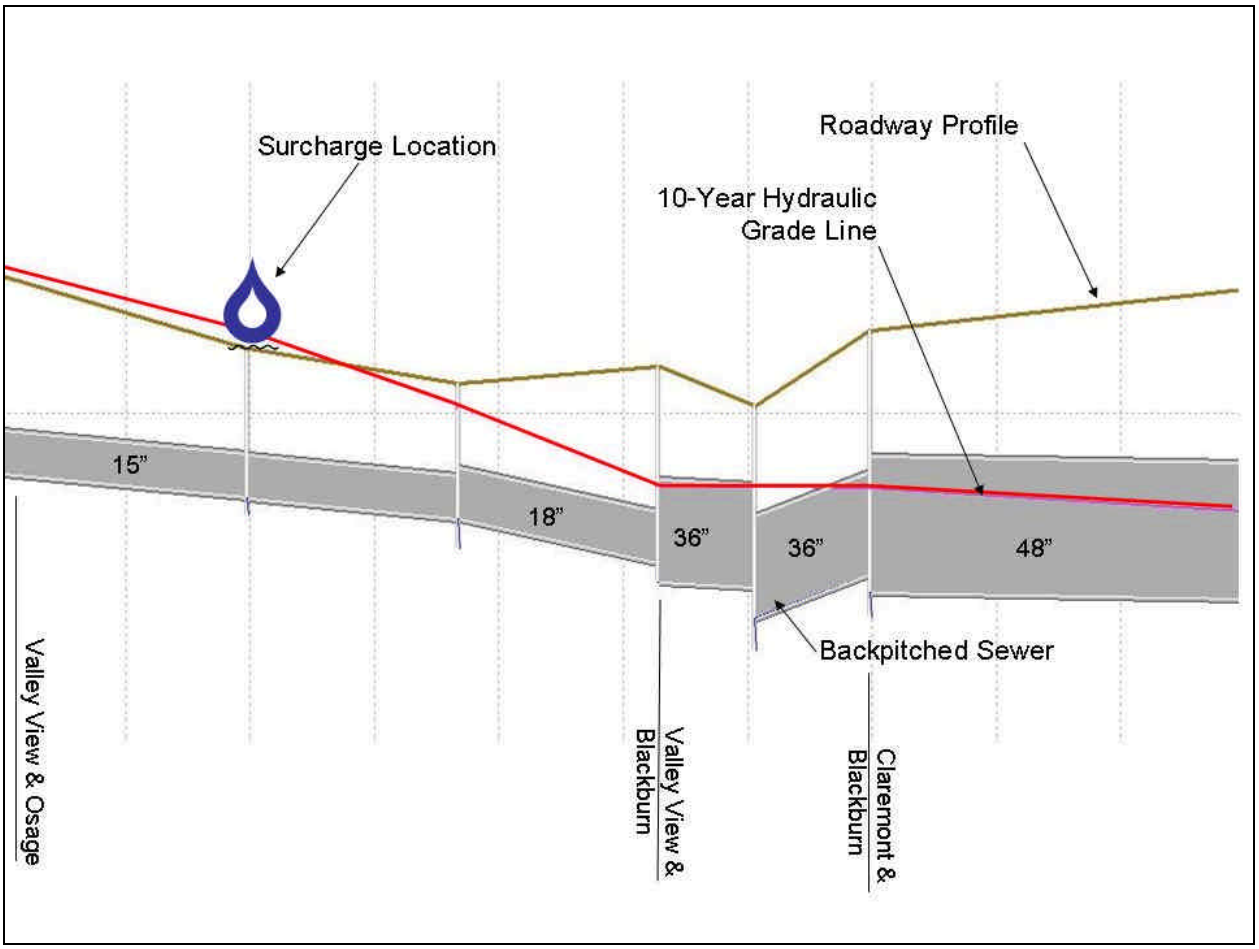


Figure 615-2
Storm Sewer Profile with 10-Year HGL, Valley View Dr. to Claremont Dr.

A dry-bottom detention pond is located in the Fairview Pointe subdivision. An overflow sewer may connect the Valley View storm sewer system to this detention pond. Also, a 36-inch storm sewer originating east of Fairview Avenue in Darien, located along the back property line of the residents along Valley View, may also enter the Valley View system at this overflow sewer. Although the storm sewer survey effort only located a single field inlet north of Valley View with a single sewer flowing south towards the Valley View system, the Fairview Pointe subdivision plan set indicates the presence of the Darien storm sewer. Additionally, the Valley View system changes from a 15-inch diameter to 36-diameter, suggesting additional flow is entering the system.

It is likely that there are numerous sewer systems in this area which are interconnected, and surcharging of one system may contribute to flooding in another. The Fairview Pointe detention area, located just west of Grand Avenue, connects the various systems. Depending on the water level in the detention pond and the hydraulic grade line of the sewer systems, sewers may be receiving more flow than they were originally designed to convey.

The large drainage area to the system, combined with the reduced hydraulic capacity of the Valley View system from the backpitched sewer, is causing the storm sewer to surcharge and causing flooding during large storm events.

Recommendations

1. Storm Sewer Improvements

   Fix the backpitched storm sewer and upsize the Valley View Drive storm sewer system. Preliminary modeling reveals the need to replace the existing 15-inch and 18-inch sewers along the east-west portion of Valley View Drive with a 24-inch storm sewer.

   The backpitched storm sewer, if at full capacity, does not provide a significant restriction to the system and does not necessarily need to be replaced. However, it is susceptible to sedimentation, and this debris build-up will decrease the capacity of the sewer. If the Village does not wish to replace the sewer at this time, it is recommended that this segment of the system receive regular cleaning to reduce the potential for sediment build-up.

2. Inlet Improvements

   Provide additional inlets along Valley View Drive, and change grates to non-clogging type. Additionally, a street sweeping program should be initiated in this area to clean debris from the streets, especially during fall months.

3. Detention Pond Study

   Recommendations (1) and (2) should substantially help the flooding along Valley View Drive. However, it is recommended that the Village conduct a study of the Fairview Pointe detention basin and its interconnection with the multiple storm sewer systems in more detail than was allowed for this report. The study should focus on the best way to utilize the pond and the benefit, if any, it provides to the Valley View Drive storm sewer system. The findings may suggest a (potentially more cost-effective) alternative to the infrastructure improvements found in Recommendations (1) and (2).

Priority

Moderate

This is a persistent problem; however, only a small fraction of the area residents is affected.

Cost

A planning estimate of improvement costs is included below. A detailed breakdown can be found in Table 615-1.

1. Storm Sewer Improvements	$457,000
2. Inlet Improvements	$67,000
3. Detention Pond Study	*Cost not included in capital improvements*
Contingency and Fees	$236,000
Total Implementation Cost	**$760,000**

Schedule

An implementation schedule for the completion of the recommended improvements is as follows:

Design Phase	
Item 1 – Preliminary Design	*6 months*
Final Design	*6 months*
Item 3 – Conduct Study	6 months
Permitting Phase	
Village of Downers Grove	3 months
IEPA/IDNR/COE	*6 months*
Construction Phase	
Item 1 – Storm Sewer Improvements	1 month
Item 2 – Inlet Improvements	*Concurrent with Item 1*
TOTAL ESTIMATED TIME	19 MONTHS

Note: Some tasks can be completed concurrently. Limiting items in Design & Permitting Phases are shown in italics.

PROBLEM AREA 616

PRENTISS CREEK SUBWATERSHED PR A
PROBLEM AREA 616

Location: Vicinity of Valley View Dr. from Main St. to Meadowcrest Dr.

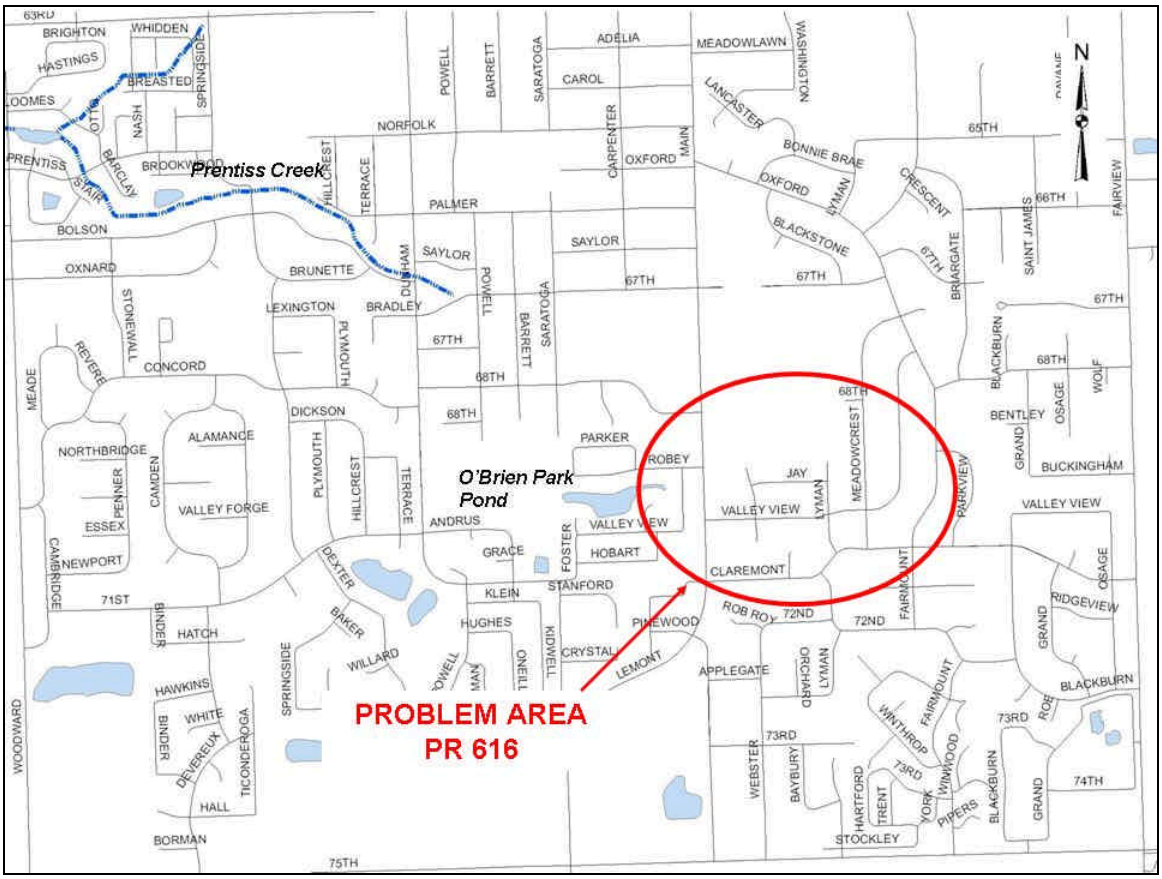


Figure 616-1
Problem Area Location Map

Description

This area is susceptible to recurring yard and street flooding. The terrain has many local low spots, causing nuisance flooding during rainfall events. Work has been done in this area to attempt to more effectively drain the low spots, most notably in the depressional areas on Meadowcrest Drive and Valley View Drive, by the addition of inlets in the low areas. Lyman Avenue near Jay Drive and Valley View Drive has experienced street flooding as recently as the October 2006 storm event.

Findings

The main storm sewer in this area outlets via a 33-inch sewer west of Webster Street into a drainage swale which flows westerly. This outlet pipe is backpitched, and there is approximately

3 feet of standing water in the manhole on Webster Street immediately upstream of the end section. It is likely that this hydraulic restriction is causing a decrease in capacity in the upstream portion of the system. Additionally, the sedimentation is likely to have occurred due to the backpitched sewer, leading to a further decrease of capacity.

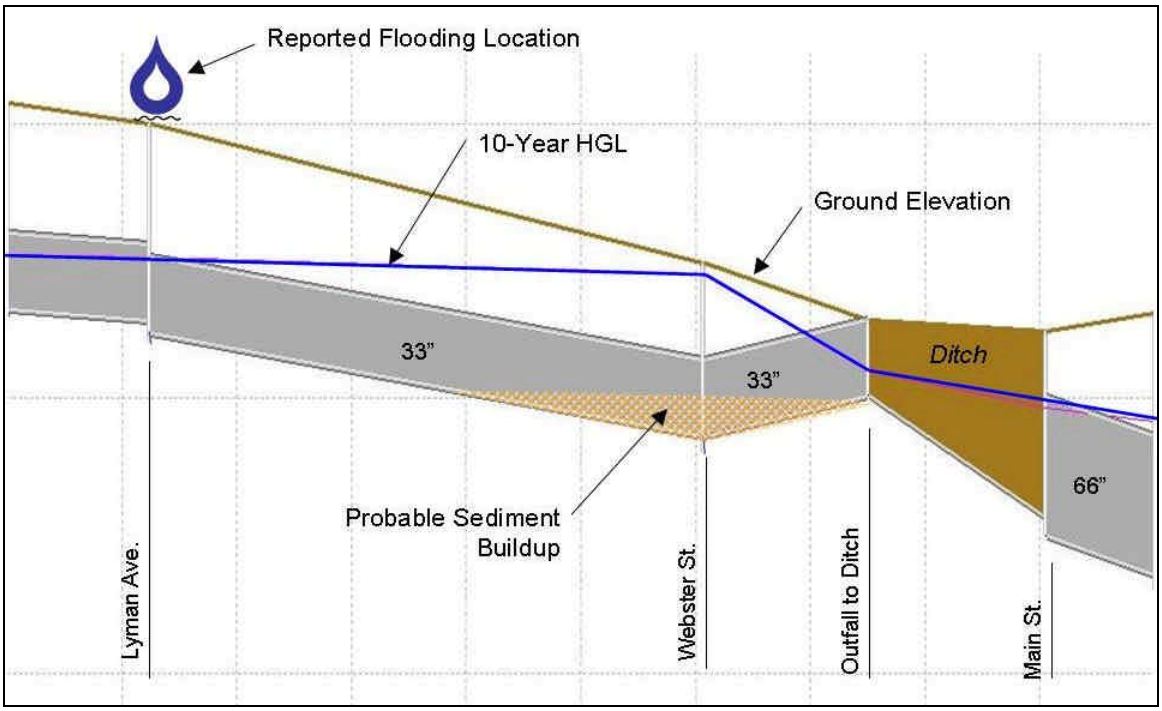


Figure 616-2
Storm Sewer Profile and Hydraulic Grade Line, Storm Sewer north of Valley View

Water may be backing up from the 15-inch storm sewer running northerly between Lyman and Meadowcrest; this sewer ultimately flows to the 60-inch trunk sewer along 67th Street. This sewer may backflow when the 66-inch sewer is at or above capacity, causing a backup in the Valley View system. Determination of the hydraulics of this sewer will require further investigation. Figure 616-3 illustrates the storm sewer in this area.

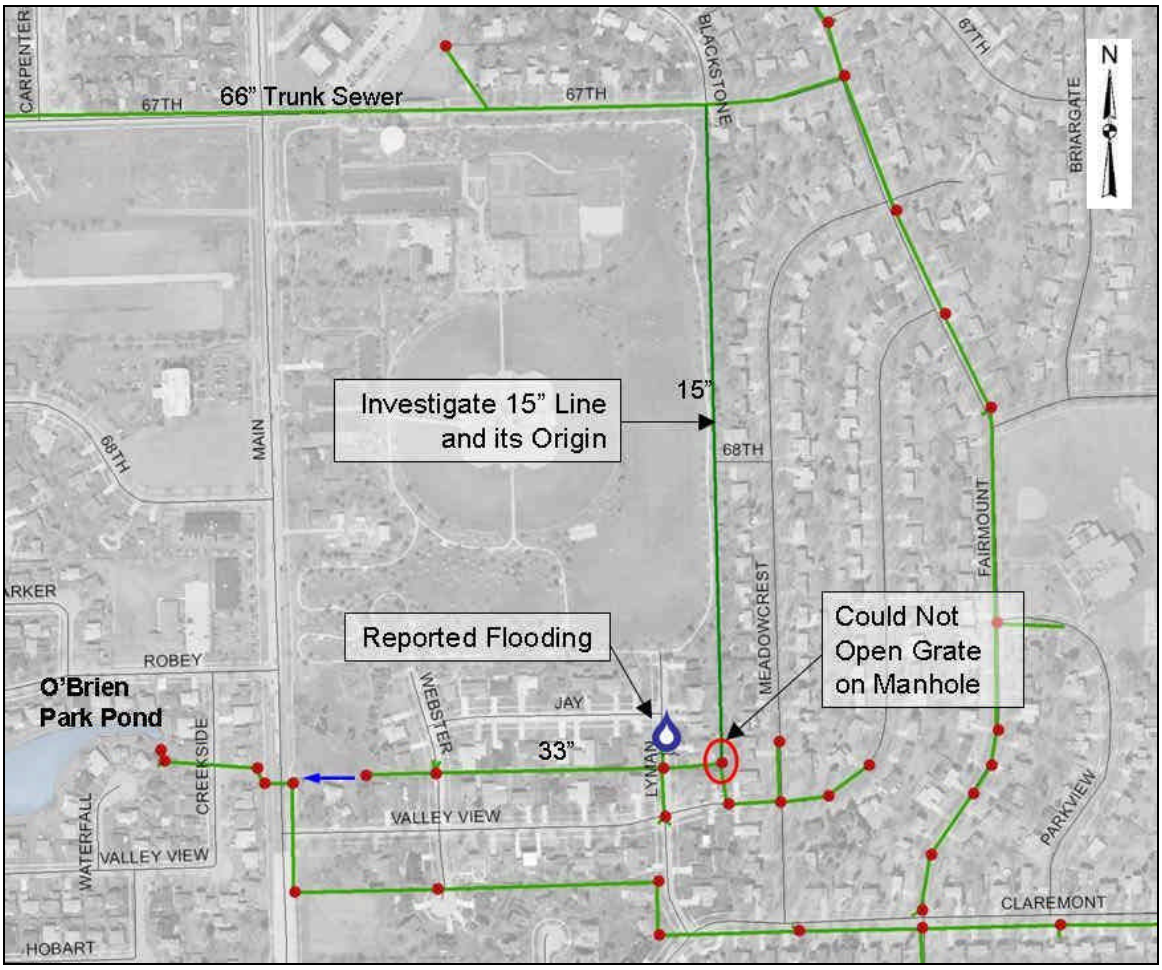


Figure 616-3
Storm Sewer System, Vicinity of Valley View Drive

Recommendations

1. Fix the backpitched culvert to provide a positive outlet for the system.

2. If Step 1 does not substantially improve drainage conditions, further investigate the 15-inch storm sewer line and its potential to deliver backflow from the 67th Street trunk sewer into the system.

3. Yard Drains for Residences

   The Village should assist residents to properly install yard drains to relieve areas of backyard flooding. This should be done at a cost to the residents. However, the Village will need to extend portions of the storm sewer system along Valley View and Meadowcrest to provide opportunities for residents to tap into a sewer system.

Priority

Moderate

This is a persistent problem; however, only a small fraction of residences is affected.

Cost

A planning estimate of improvement costs is included below. A detailed breakdown can be found in Table 616-1.

1. Culvert Improvements	$45,000
2. Further Investigate 15" Sewer	*Contingent on Need – Cost not Included*
3. Sewer Extensions along Valley View & Meadowcrest	$158,000
Contingency and Fees	$91,000
Total Implementation Cost	**$294,000**

Schedule

An implementation schedule for the completion of the recommended improvements is as follows:

Design Phase	
Item 1 – Design	*3 months*
Item 3 – Design	3 months
Permitting Phase	
Village of Downers Grove	3 months
IEPA/IDNR/COE	*6 months*
Construction Phase	
Item 1 – Culvert Improvements	2 weeks
Item 3 – Sewer Extensions	1 month
TOTAL ESTIMATED TIME	11 MONTHS

Note: Some tasks can be completed concurrently. Limiting items in Design & Permitting Phases are shown in italics.

APPENDIX B

PROBLEM AREA COST ESTIMATES

Village of Downers Grove
Stormwater Infrastructure Improvement Plan
Prentiss Creek Watershed

Conceptual Engineer's Estimated Opinion of Probable Construction Cost
For Planning Purposes

Problem Area	Cost	Priority
PR 600	$ 840,000	Low
PR 601	$ 2,353,000	Moderate
PR 602	$ 58,000	Low
PR 603	$ 486,000	Moderate
PR 604	$ 1,098,000	Moderate
PR 605	$ 599,000	High
PR 606	$ 46,000	Low
PR 607	$ 136,000	Moderate
PR 608	$ 7,307,000	High
PR 609	$ 9,969,000	High
PR 610	$ 8,171,000	High
PR 611	$ 231,000	Low
PR 612	$ 182,000	Low
PR 613	$ 4,930,000	Moderate
PR 614	$ 7,541,000	High
PR 615	$ 760,000	Moderate
PR 616	$ 294,000	Moderate

TOTAL COST	**$ 45,001,000**

Village of Downers Grove
Stormwater Infrastructure Improvement Plan
Prentiss Creek Watershed

Conceptual Engineer's Estimated Opinion of Probable Construction Cost
For Planning Purposes

Subwatershed	Problem Area	Cost	Priority
A	PR601	$ 2,353,000	MODERATE
	PR602	$ 58,000	
	PR615	$ 760,000	
	PR616	$ 294,000	
Subtotal, Subwatershed A		**$ 3,470,000**	
B	PR600	$ 840,000	HIGH
	PR608	$ 7,307,000	
	PR614	$ 7,541,000	
Subtotal, Subwatershed B		**$ 15,690,000**	
C	PR609	$ 9,969,000	HIGH
	PR613	$ 4,930,000	
Subtotal, Subwatershed C		**$ 14,900,000**	
D	PR603	$ 486,000	LOW
	PR606	$ 46,000	
	PR612	$ 182,000	
Subtotal, Subwatershed D		**$ 720,000**	
E	PR604	$ 1,098,000	MODERATE
	PR605	$ 599,000	
	PR611	$ 231,000	
Subtotal, Subwatershed E		**$ 1,930,000**	
F	PR607	$ 136,000	MODERATE
	PR610	$ 8,171,000	
Subtotal, Subwatershed F		**$ 8,310,000**	
TOTAL, ALL SUBWATERSHEDS		**$ 45,001,000**	

Table 600-1
Conceptual Engineer's Estimated Opinion of Probable Construction Cost for Planning Purposes
PR 600 Vicinity of Fairmount Avenue and 62nd Street

No.	Item	*Item No.*	Quantity	Unit	Unit Cost	Total Cost
1.0	**Clean Backpitched Sewers**					
1.1	Storm Sewer Jetting	18	750	LF	$ 4	$ 3,000
2.0	**Replace and Add Inlet Structures**					
2.1	Storm Sewer Inlet Repair or Replace	20	32	EA	$ 2,000	$ 64,000
2.2	12-inch Storm Sewer	1	480	LF	$ 90	$ 43,200
2.3	Pavement Patching	21	1000	SY	$ 45	$ 45,000
3.0	**Improve Downstream Storm Sewer System**					
3.1	*See PR614 for cost estimate*					
4.0	**Upsize Storm Sewer and Correct Profile** *(not recommended for immediate construction)*					
4.1	24-inch Storm Sewer	2	360	LF	$ 120	$ 43,200
4.2	30-inch Storm Sewer, 6-10 ft deep	3	750	LF	$ 125	$ 93,750
4.3	Precast Manhole, 4-ft diameter, 4-10 ft deep	13	8	EA	$ 2,850	$ 22,800
4.4	Roadway Reconstruction	22	1200	LF	$ 220	$ 264,000
	Subtotal, Construction Cost					**$ 579,000**
	Contingency (mobilization, maintenance of traffic, etc.) (20%)					$ 116,000
	Contigency (water quality BMP requirements) (10%)					$ 58,000
	Design and Construction Engineering (15%)					$ 87,000
	Total Estimated Implementation Cost					**$ 840,000**

Table 601-1
Conceptual Engineer's Estimated Opinion of Probable Construction Cost for Planning Purposes
PR 601 O'Brien Park / Valley View Estates Pond

No.	Item	*Item No.*	Quantity	Unit	Unit Cost	Total Cost
1.0	**Pond Reconfiguration**					
1.1	Refurbish Existing Pond[(1)]	26A	32,300	CY	$ 50	$ 1,615,000
1.2	Wetland / Buffer Vegetation Planting with Seed	40	2	AC	$ 4,000	$ 8,000
2.0	**Pond Maintenance**					
2.1	*Routine Maintenance Costs Not Included in Capital Costs*					
	Subtotal, Construction Cost					**$ 1,623,000**
	Contingency (mobilization, maintenance of traffic, etc.) (20%)					$ 325,000
	Contigency (water quality BMP requirements) (10%)					$ 162,000
	Design and Construction Engineering (15%)					$ 243,000
	Total Estimated Implementation Cost					**$ 2,353,000**

(1) Assumes dredging & regrading of volume 5 feet deep over 4 acre area

Table 602-1
Conceptual Engineer's Estimated Opinion of Probable Construction Cost for Planning Purposes
PR 602 Vicinity of Claremont Drive to 73rd Street, east of Main Street

No.	Item	*Item No.*	Quantity	Unit	Unit Cost	Total Cost
1.0	**Claremont Drive Improvements**					
1.1	Storm Sewer Jetting	18	3000	LF	$ 4	$ 12,000
1.2	Structure Cleaning	17	20	EA	$ 150	$ 3,000
1.3	Storm Sewer Inlet Repair or Replace	20	4	EA	$ 2,000	$ 8,000
1.4	Storm Sewer Inlet - Replace Grate	20A	8	EA	$ 1,000	$ 8,000
2.0	**Yard Drainage Improvements**					
2.1	Storm Sewer Jetting	18	1800	LF	$ 4	$ 7,200
2.2	Structure Cleaning	17	10	EA	$ 150	$ 1,500
	Subtotal, Construction Cost					**$ 40,000**
	Contingency (mobilization, maintenance of traffic, etc.) (20%)					$ 8,000
	Contigency (water quality BMP requirements) (10%)					$ 4,000
	Design and Construction Engineering (15%)					$ 6,000
	Total Estimated Implementation Cost					**$ 58,000**

Table 603-1
Conceptual Engineer's Estimated Opinion of Probable Construction Cost for Planning Purposes
PR 603 6700 Block Saratoga / Mar-Duke Farm

No.	Item	*Item No.*	Quantity	Unit	Unit Cost	Total Cost
1.0	**Saratoga Avenue Improvements**					
1.1	12-inch Storm Sewer	1	290	LF	$ 90	$ 26,100
1.2	Storm Sewer Inlet Repair or Replace (Powell)	20	6	EA	$ 2,000	$ 12,000
1.3	Storm Sewer Inlet Repair or Replace	13	3	EA	$ 2,850	$ 8,550
1.4	Roadway Reconstruction	22	330	LF	$ 220	$ 72,600
2.0	**Powell Street Improvements**					
2.1	12-inch Storm Sewer	1	220	LF	$ 90	$ 19,800
2.2	Storm Sewer Inlet Repair or Replace	20	4	EA	$ 2,000	$ 8,000
2.3	Precast Manhole, 4-ft diameter, 4-10 ft deep	13	2	EA	$ 2,850	$ 5,700
2.4	Roadway Reconstruction	22	260	LF	$ 220	$ 57,200
3.0	**Mar-Duke Farm Improvements**					
3.1	Rain Garden Construction	42	12500	SF	$ 10	$ 125,000
	Subtotal, Construction Cost					**$ 335,000**
	Contingency (mobilization, maintenance of traffic, etc.) (20%)					$ 67,000
	Contigency (water quality BMP requirements) (10%)					$ 34,000
	Design and Construction Engineering (15%)					$ 50,000
	Total Estimated Implementation Cost					**$ 486,000**

Table 604-1
Conceptual Engineer's Estimated Opinion of Probable Construction Cost for Planning Purposes
PR 604 Vicinity of Woodward Avenue and Prentiss Drive

No.	Item	*Item No.*	Quantity	Unit	Unit Cost	Total Cost
1.0	**Convert In-Line Retention to Off-Line Detention**					
1.1	Refurbish Existing Pond[(1)]	26A	10,000	CY	$ 50	$ 500,000
1.2	Wetland / Buffer Vegetation Planting with Seed	40	1	AC	$ 4,000	$ 4,000
1.3	Vegetation Planting, Specialty	41	1	AC	$ 10,000	$ 10,000
2.0	**Establish Shoreline Vegetation**					
2.1	Wetland / Buffer Vegetation Planting with Seed	40	0.75	AC	$ 4,000	$ 3,000
3.0	**Stream Improvements**					
3.1	Small Channel Maintenance (brush/debris removal)	34	3500	LF	$ 5	$ 17,500
3.2	Streambank Stabilization (Main Branch)	31	350	FT	$ 200	$ 70,000
3.3	Streambank Stabilization (Tributary)	31	750	FT	$ 200	$ 150,000
4.0	**Maintenance Project**					
4.1	Outfall Repair or Replace	19	1	EA	$ 2,000	$ 2,000
	Subtotal, Construction Cost					**$ 757,000**
	Contingency (mobilization, maintenance of traffic, etc.) (20%)					$ 151,000
	Contigency (water quality BMP requirements) (10%)					$ 76,000
	Design and Construction Engineering (15%)					$ 114,000
	Total Estimated Implementation Cost					**$ 1,098,000**

[(1)] Assumes dredging & regrading of volume 5 feet deep over 1.25 acre area

Table 605-1
Conceptual Engineer's Estimated Opinion of Probable Construction Cost for Planning Purposes
PR 605 Vicinity of Concord Drive

No.	Item	*Item No.*	Quantity	Unit	Unit Cost	Total Cost
1.0	**Concord Drive Storm Sewer Improvements**					
1.1	48-inch Storm Sewer, 6-10 ft deep	7	280	LF	$ 190	$ 53,200
1.2	Precast Manhole, 6-ft diameter, 4-10 ft deep	15	3	EA	$ 4,000	$ 12,000
1.3	Seeding and Surface Restoration	23	0.25	AC	$ 3,000	$ 750
1.4	Roadway Reconstruction - Curb & Gutter	22C	280	LF	$ 1,000	$ 280,000
1.5	Storm Sewer Jetting	18	1000	LF	$ 4	$ 4,000
2.0	**Penner Place Drainage Improvements**					
2.1	Storm Sewer Inlet Repair or Replace	20	3	EA	$ 2,000	$ 6,000
2.2	12-inch Storm Sewer	1	200	LF	$ 90	$ 18,000
2.3	Pavement Patching	21	300	SY	$ 45	$ 13,500
2.4	Storm Sewer Inlet - Replace Grate	20A	12	EA	$ 1,000	$ 12,000
3.0	**Yard Drainage Improvements**					
3.1	Storm Sewer Jetting	18	2600	LF	$ 4	$ 10,400
3.2	Structure Cleaning	17	18	EA	$ 150	$ 2,700
	Subtotal, Construction Cost					**$ 413,000**
	Contingency (mobilization, maintenance of traffic, etc.) (20%)					$ 83,000
	Contigency (water quality BMP requirements) (10%)					$ 41,000
	Design and Construction Engineering (15%)					$ 62,000
	Total Estimated Implementation Cost					**$ 599,000**

Table 606-1
Conceptual Engineer's Estimated Opinion of Probable Construction Cost for Planning Purposes
PR 606 Springside Avenue along Nicor Gas Utility Easement

No.	Item	*Item No.*	Quantity	Unit	Unit Cost	Total Cost
1.0	**Easement Drainage Improvements**					
1.1	*Private Property - No Capital Cost to Village*					
2.0	**Street Drainage Improvements**					
2.1	Structure Cleaning	17	1	EA	$ 150	$ 150
2.2	12-inch Storm Sewer	1	100	LF	$ 90	$ 9,000
2.3	Storm Sewer Inlet Repair or Replace	20	2	EA	$ 2,000	$ 4,000
2.4	Storm Sewer Inlet - Replace Grate	20A	1	EA	$ 1,000	$ 1,000
2.5	Pavement Patching	21	400	SY	$ 45	$ 18,000
	Subtotal, Construction Cost					**$ 32,000**
	Contingency (mobilization, maintenance of traffic, etc.) (20%)					$ 6,000
	Contigency (water quality BMP requirements) (10%)					$ 3,000
	Design and Construction Engineering (15%)					$ 5,000
	Total Estimated Implementation Cost					**$ 46,000**

Table 607-1
Conceptual Engineer's Estimated Opinion of Probable Construction Cost for Planning Purposes
PR 607 Oxnard Drive Cul-de-sac

No.	Item	*Item No.*	Quantity	Unit	Unit Cost	Total Cost
1.0	**Street Drainage Improvements**					
1.1	Storm Sewer Inlet (Oxnard Cul-de-Sac)	20	3	EA	$ 2,000	$ 6,000
1.2	Precast Manhole, 4-ft diameter, 4-10 ft deep	13	1	EA	$ 2,850	$ 2,850
1.3	12-inch Storm Sewer	1	150	LF	$ 90	$ 13,500
1.4	Pavement Patching	21	220	SY	$ 45	$ 9,900
1.5	Storm Sewer Inlet (Oxhard & Midhurst)	20	6	EA	$ 2,000	$ 12,000
1.6	Precast Manhole, 4-ft diameter, 4-10 ft deep	13	2	EA	$ 2,850	$ 5,700
1.7	12-inch Storm Sewer	1	270	LF	$ 90	$ 24,300
1.8	Pavement Patching	21	300	SY	$ 45	$ 13,500
1.9	Storm Sewer Inlet - Replace Grate	20A	6	EA	$ 1,000	$ 6,000
	Subtotal, Construction Cost					**$ 94,000**
	Contingency (mobilization, maintenance of traffic, etc.) (20%)					$ 19,000
	Contigency (water quality BMP requirements) (10%)					$ 9,000
	Design and Construction Engineering (15%)					$ 14,000
	Total Estimated Implementation Cost					**$ 136,000**

Table 608-1
Conceptual Engineer's Estimated Opinion of Probable Construction Cost for Planning Purposes
PR 608 Downers Grove Estates - Southeast

No.	Item	*Item No.*	Quantity	Unit	Unit Cost	Total Cost
1.0	**Street Drainage Improvements**					
1.1	Roadway Reconstruction - Curb & Gutter	22C	4410	LF	$ 1,000	$ 4,410,000
1.2	Precast Manhole, 4-ft diameter, 4-10 ft deep	13	17	EA	$ 2,850	$ 48,450
1.3	36-inch Storm Sewer	5	900	LF	$ 140	$ 126,000
1.4	24-inch Storm Sewer	2	1340	LF	$ 120	$ 160,800
1.5	18-inch Storm Sewer	1A	600	LF	$ 110	$ 66,000
1.6	12-inch Storm Sewer	1	1020	LF	$ 90	$ 91,800
1.7	Storm Sewer Inlet	20	68	EA	$ 2,000	$ 136,000
	Subtotal, Construction Cost					**$ 5,039,000**
	Contingency (mobilization, maintenance of traffic, etc.) (20%)					$ 1,008,000
	Contigency (water quality BMP requirements) (10%)					$ 504,000
	Design and Construction Engineering (15%)					$ 756,000
	Total Estimated Implementation Cost					**$ 7,307,000**

Table 609-1
Conceptual Engineer's Estimated Opinion of Probable Construction Cost for Planning Purposes
PR 609 Downers Grove Estates - Northwest

No.	Item	*Item No.*	Quantity	Unit	Unit Cost	Total Cost
1.0	**Street Drainage Improvements**					
1.1	Roadway Reconstruction - Curb & Gutter	22C	6100	LF	$ 1,000	$ 6,100,000
1.2	Precast Manhole, 4-ft diameter, 4-10 ft deep	13	23	EA	$ 2,850	$ 65,550
1.3	36-inch Storm Sewer	5	650	LF	$ 140	$ 91,000
1.4	24-inch Storm Sewer	2	900	LF	$ 120	$ 108,000
1.5	18-inch Storm Sewer	1A	2150	LF	$ 110	$ 236,500
1.6	12-inch Storm Sewer	1	1440	LF	$ 90	$ 129,600
1.7	Storm Sewer Inlet	20	72	EA	$ 2,000	$ 144,000
	Subtotal, Construction Cost					**$ 6,875,000**
	Contingency (mobilization, maintenance of traffic, etc.) (20%)					$ 1,375,000
	Contigency (water quality BMP requirements) (10%)					$ 688,000
	Design and Construction Engineering (15%)					$ 1,031,000
	Total Estimated Implementation Cost					**$ 9,969,000**

Table 610-1
Conceptual Engineer's Estimated Opinion of Probable Construction Cost for Planning Purposes
PR 610 Hobson Triangle

No.	Item	*Item No.*	Quantity	Unit	Unit Cost	Total Cost
1.0	**Construction of Modified Rural Cross Section in Hobson Triangle**					
1.1	Regrade Roadway Ditch	24	6000	LF	$ 20	$ 120,000
1.2	Roadway Reconstruction with Ditch	22B	7565	LF	$ 500	$ 3,782,500
1.3	Roadway Reconstruction - Resurfacing	22	1500	LF	$ 220	$ 330,000
1.3	Driveway Culvert Replacement	25	154	EA	$ 2,000	$ 308,000
1.4	Precast Manhole, 4-ft diameter, 4-10 ft deep	13	36	EA	$ 2,850	$ 102,600
1.5	Outfall	19	9	EA	$ 2,000	$ 18,000
1.6	Storm Sewer Inlet	20	58	EA	$ 2,000	$ 116,000
1.7	12-inch Storm Sewer	1	1160	LF	$ 90	$ 104,400
1.8	24-inch Storm Sewer	2	3800	LF	$ 120	$ 456,000
1.9	36-inch Storm Sewer, 6-10 ft deep	5	2100	LF	$ 140	$ 294,000
1.11	Seeding and Surface Restoration	23	1	AC	$ 3,000	$ 3,000
	Subtotal, Construction Cost					**$ 5,635,000**
	Contingency (mobilization, maintenance of traffic, etc.) (20%)					$ 1,127,000
	Contigency (water quality BMP requirements) (10%)					$ 564,000
	Design and Construction Engineering (15%)					$ 845,000
	Total Estimated Implementation Cost					**$ 8,171,000**

Table 611-1
Conceptual Engineer's Estimated Opinion of Probable Construction Cost for Planning Purposes
PR 611 Vicinity of Oxnard Drive and Bolson Drive

No.	Item	*Item No.*	Quantity	Unit	Unit Cost	Total Cost
1.0	**Bolson Dr. & Stonewall Ave. Drainage Improvements**					
1.1	Storm Sewer Inlet Repair or Replace	20	4	EA	$ 2,000	$ 8,000
1.2	12-inch Storm Sewer	1	250	LF	$ 90	$ 22,500
1.3	Storm Sewer Inlet - Replace Grate	20A	4	EA	$ 1,000	$ 4,000
1.4	Pavement Patching	21	400	SY	$ 45	$ 18,000
2.0	**Bolson Dr. & Springside Ave. Drainage Improvements**					
2.1	Storm Sewer Inlet Repair or Replace	20	4	EA	$ 2,000	$ 8,000
2.2	12-inch Storm Sewer	1	550	LF	$ 90	$ 49,500
2.3	Precast Manhole, 4-ft diameter, 4-10 ft deep	13	3	EA	$ 2,850	$ 8,550
2.4	Storm Sewer Inlet - Replace Grate	20A	4	EA	$ 1,000	$ 4,000
2.5	Pavement Patching	21	800	SY	$ 45	$ 36,000
3.0	**Yard Drainage Improvements**					
3.1	*Private Property - No Capital Cost to Village*					
	Subtotal, Construction Cost					**$ 159,000**
	Contingency (mobilization, maintenance of traffic, etc.) (20%)					$ 32,000
	Contigency (water quality BMP requirements) (10%)					$ 16,000
	Design and Construction Engineering (15%)					$ 24,000
	Total Estimated Implementation Cost					**$ 231,000**

Table 612-1
Conceptual Engineer's Estimated Opinion of Probable Construction Cost for Planning Purposes
PR 612 Dunham Place Subdivisions

No.	Item	*Item No.*	Quantity	Unit	Unit Cost	Total Cost
1.0	**Storm Sewer Investigation**					
1.1	Survey Existing Storm Sewer	0	1	LS	$ 2,000	$ 2,000
2.0	**Storm Sewer Maintenance**					
2.1	Storm Sewer Jetting	18	2500	LF	$ 4	$ 10,000
2.2	Structure Cleaning	17	5	EA	$ 150	$ 750
3.0	**Drainage Improvements**					
3.1	Storm Sewer Inlet, Powell & Bateman	20	4	EA	$ 2,000	$ 8,000
3.2	Precast Manhole, 4-ft diameter, 4-10 ft deep	13	1	EA	$ 2,850	$ 2,850
3.3	12-inch Storm Sewer	1	60	LF	$ 90	$ 5,400
3.4	Pavement Patching	21	300	SY	$ 45	$ 13,500
3.5	Storm Sewer Inlet, Powell & Hawkins	20	4	EA	$ 2,000	$ 8,000
3.6	Precast Manhole, 4-ft diameter, 4-10 ft deep	13	1	EA	$ 2,850	$ 2,850
3.7	12-inch Storm Sewer	1	60	LF	$ 90	$ 5,400
3.8	Pavement Patching	21	300	SY	$ 45	$ 13,500
3.9	Storm Sewer Inlet, Hughes Ave.	20	4	EA	$ 2,000	$ 8,000
3.10	Precast Manhole, 4-ft diameter, 4-10 ft deep	13	1	EA	$ 2,850	$ 2,850
3.11	12-inch Storm Sewer	1	560	LF	$ 90	$ 50,400
3.12	Pavement Patching	21	750	SY	$ 45	$ 33,750
4.0	**Yard Flooding Improvements**					
4.1	Storm Sewer Jetting	18	3000	LF	$ 4	$ 12,000
4.2	Structure Cleaning	17	20	EA	$ 150	$ 3,000
5.0	**Future Recommendations**					
	Contingent Upon Need - Cost Not Included in This Estimate					
	Subtotal, Construction Cost					**$ 182,000**
	Contingency (mobilization, maintenance of traffic, etc.) (20%)					$ 36,000
	Contigency (water quality BMP requirements) (10%)					$ 18,000
	Design and Construction Engineering (15%)					$ 27,000
	Total Estimated Implementation Cost					**$ 263,000**

Table 613-1
Conceptual Engineer's Estimated Opinion of Probable Construction Cost for Planning Purposes
PR 613 Vicinity of 62nd Lane East of Brookbank

No.	Item	*Item No.*	Quantity	Unit	Unit Cost	Total Cost
1.0	**62nd Place Storm Sewer Improvements**					
1.1	36-inch Storm Sewer, 6-10 ft deep	5	1650	LS	$ 140	$ 231,000
1.2	48-inch Storm Sewer, 6-10 ft deep	7	750	LS	$ 190	$ 142,500
1.3	Precast Manhole, 4-ft diameter, 4-10 ft deep	13	7	EA	$ 2,850	$ 19,950
1.4	Precast Manhole, 6-ft diameter, 4-10 ft deep	15	4	EA	$ 4,000	$ 16,000
1.5	Storm Sewer Inlet Repair or Replace	20	32	EA	$ 2,000	$ 64,000
1.6	12-inch Storm Sewer	1	480	LF	$ 90	$ 43,200
1.7	Roadway Reconstruction	22C	2600	LF	$ 1,000	$ 2,600,000
2.0	**Depressional Area Improvements**					
2.1	12-inch Storm Sewer (62nd Ct. Yard Drain)	1	550	LF	$ 90	$ 49,500
2.2	Precast Manhole, 4-ft diameter, 4-10 ft deep	13	1	EA	$ 2,850	$ 2,850
2.3	Storm Sewer Inlet Repair or Replace	20	4	EA	$ 2,000	$ 8,000
2.4	Seeding and Surface Restoration	23	1	AC	$ 3,000	$ 3,000
2.5	Pavement Patching	21	16	SY	$ 45	$ 720
2.6	12-inch Storm Sewer (Clyde Ave.)	1	500	LF	$ 90	$ 45,000
2.7	Precast Manhole, 4-ft diameter, 4-10 ft deep	13	3	EA	$ 2,850	$ 8,550
2.8	Storm Sewer Inlet Repair or Replace	20	6	EA	$ 2,000	$ 12,000
2.9	Roadway Reconstruction	22	700	LF	$ 220	$ 154,000
	Subtotal, Construction Cost					**$ 3,400,000**
	Contingency (mobilization, maintenance of traffic, etc.) (20%)					$ 680,000
	Contigency (water quality BMP requirements) (10%)					$ 340,000
	Design and Construction Engineering (15%)					$ 510,000
	Total Estimated Implementation Cost					**$ 4,930,000**

Table 614-1
Conceptual Engineer's Estimated Opinion of Probable Construction Cost for Planning Purposes
PR 614 Vicinity of Fairmount Avenue from 63rd St. to Oxford St.

No.	Item	*Item No.*	Quantity	Unit	Unit Cost	Total Cost
1.0	**Inlet Replacement and Maintenance**					
	Costs included in Item 2.0					
2.0	**Storm Sewer Improvements**					
2.1	48-inch Storm Sewer, 6-10 ft deep	7	2200	LF	$ 190	$ 418,000
2.2	Precast Manhole, 6-ft diameter, 4-10 ft deep	15	10	EA	$ 4,000	$ 40,000
2.3	Storm Sewer Inlet Repair or Replace	20	41	EA	$ 2,000	$ 82,000
2.4	12-inch Storm Sewer	1	1100	LF	$ 90	$ 99,000
2.5	Roadway Reconstruction	22C	2500	LF	$ 1,000	$ 2,500,000
2.6	Seeding and Surface Restoration	23	2	AC	$ 3,000	$ 6,000
3.0	**Stormwater Storage Facility**					
3.1	Aboveground Stormwater Storage Facility	26	6	AC-FT	$ 200,000	$ 1,200,000
3.2	48-inch Storm Sewer, 10-14 ft deep	8	700	LF	$ 195	$ 136,500
3.3	Precast Manhole, 6-ft diameter, 10-14 ft deep	16	4	EA	$ 4,950	$ 19,800
3.4	Roadway Reconstruction	22C	700	LF	$ 1,000	$ 700,000
	Subtotal, Construction Cost					**$ 5,201,000**
	Contingency (mobilization, maintenance of traffic, etc.) (20%)					$ 1,040,000
	Contigency (water quality BMP requirements) (10%)					$ 520,000
	Design and Construction Engineering (15%)					$ 780,000
	Total Estimated Implementation Cost					**$ 7,541,000**

Table 615-1
Conceptual Engineer's Estimated Opinion of Probable Construction Cost for Planning Purposes
PR 615 Valley View Drive near Blackburn Avenue

No.	Item	*Item No.*	Quantity	Unit	Unit Cost	Total Cost
1.0	**Storm Sewer Improvements**					
1.1	24-inch Storm Sewer	2	930	LF	$ 120	$ 111,600
1.2	36-inch Storm Sewer, 6-10 ft deep	5	300	LF	$ 140	$ 42,000
1.3	Precast Manhole, 4-ft diameter, 4-10 ft deep	13	6	EA	$ 2,850	$ 17,100
1.5	Roadway Reconstruction	22	1300	LF	$ 220	$ 286,000
2.0	**Inlet Improvements**					
2.1	12-inch Storm Sewer	1	300	LF	$ 90	$ 27,000
2.2	Storm Sewer Inlet Repair or Replace	20	20	EA	$ 2,000	$ 40,000
3.0	**Detention Pond Study**					
3.1	*Contingent Upon Need - Cost Not Included in This Estimate*					
	Subtotal, Construction Cost					**$ 524,000**
	Contingency (mobilization, maintenance of traffic, etc.) (20%)					$ 105,000
	Contigency (water quality BMP requirements) (10%)					$ 52,000
	Design and Construction Engineering (15%)					$ 79,000
	Total Estimated Implementation Cost					**$ 760,000**

Table 616-1
Conceptual Engineer's Estimated Opinion of Probable Construction Cost for Planning Purposes
PR 616 Vicinity of Valley View Dr. from Main St. to Meadowcrest Dr.

No.	Item	*Item No.*	Quantity	Unit	Unit Cost	Total Cost
1.0	**Fix Backpitched Culvert**					
1.1	36-inch Storm Sewer, 6-10 ft deep	5	220	LF	$ 140	$ 30,800
1.2	Outfall Repair or Replace	19	1	EA	$ 2,000	$ 2,000
1.3	Precast Manhole, 4-ft diameter, 4-10 ft deep	13	1	EA	$ 2,850	$ 2,850
1.4	Pavement Patching	21	16	SY	$ 45	$ 720
1.5	Seeding and Surface Restoration	23	1	AC	$ 3,000	$ 3,000
1.6	Ditch Regrading	0	220	LF	$ 25	$ 5,500
2.0	Further Investigate 15" Storm Sewer *Contingent on Need - Costs not included in this cost estimate*					
3.0	**Yard Drains on Resident Property**					
3.1	Yard drains - cost at resident expense					
3.2	12-inch Storm Sewer (Meadowcrest)	1	300	LF	$ 90	$ 27,000
3.3	12-inch Storm Sewer (Valley View)	1	300	LF	$ 90	$ 27,000
3.4	Precast Manhole, 4-ft diameter, 4-10 ft deep	13	2	EA	$ 2,850	$ 5,700
3.5	Storm Sewer Inlet Repair or Replace	20	4	EA	$ 2,000	$ 8,000
3.6	Pavement Patching	21	2000	SY	$ 45	$ 90,000
	Subtotal, Construction Cost					**$ 203,000**
	Contingency (mobilization, maintenance of traffic, etc.) (20%)					$ 41,000
	Contigency (water quality BMP requirements) (10%)					$ 20,000
	Design and Construction Engineering (15%)					$ 30,000
	Total Estimated Implementation Cost					**$ 294,000**