



## City Administrator & Staff Update

2025.08.01

- **Pool:** Good event with 107.3 this past Thursday. Beautiful day, a little warmer and busier would have been nice. If we want a Friday or Saturday or an evening event, we should discuss sooner rather than later. Closer is currently set for 8/17 which seems in line with other pools. Asking if we can get anyone for the following weekend...we shall see.
- **Employee Recognition:** Looking for 1-2 volunteers to work on this. Thinking a pool event if we could get a guard – week after we close, or September event when a bit cooler along with a breakfast in February or so – with certificates for every 5 years of service, perhaps some logo wear or gift cards. Willing to host as well.
- **Stormwater Master Plan:** I have the final plan (lengthy) and will look to share via one drive. Report attached but the appendix is not given its length.
- **Senior Multi-Res Complex:** A temporary CO was issued Thursday, but they still have work to do on alarms and rental inspections will need to be done on a per apartment basis when ready. Looking to schedule tour.
- **Downtown Conference:** Attending the Iowa Downtown conference on Tuesday in Muscatine.
- **Wal-Mart:** Met with the Wal-Mart Manager on their grant program and how to get access to the program. We discussed Wal-Mart's appeal which runs through corporate, and he was unaware. Review our annual calls for service, value, etc. He will follow up on the topic and look at other options including the funding of an officer for the store.
- **Trail:** The last step prior to close out will be before the council next week. This is a no cost item prior to final payments and retainage. Jones still has paperwork to upload. Final reimbursement will be submitted following the last pay app and retainage payment.
- **Ring Road:** We are three costs (attached to update). We also have a video to review with council showing the three stopping points we have reviewed. \$100,000 is budgeted for this project.
- **Touch-a-Truck Event:** Flyer attached, and we plan to attend again this year.
- **Wal-Mart Intersection:** Plan attached. Also discussed Wal-marts internal design for the area where you enter their parking lot from Broadway Street. That internal three-way stop has seen several issues. Looking into the matter.

- **Droppett:** Attached please find the Droppett PowerPoint and Contract. The plan would be to have this up and running the first week of September. Community Park is an ideal location – parking, traffic flow signs in place, electrical already there, should really interfere with any activities and in fact, the little league, schools, any of the sport teams, booster club and any other charity could use the Droppett site to run fundraisers. Easy to do with their sticker system and they are willing to work with groups on larger pick-ups as well. We plan to have a city account as well. Personally, I think this “pop fund” would be ideal for employee recognition and related activities. Ideally, please send me your questions in advance of the meeting and I will get those to Andrew at Droppett.
- **Project Funding:** I know it’s been a little bit since we have talked about funding for projects, so I wanted to reach out and see if it would be beneficial to set a time in mid/late August for me to come to West Burlington. We could review your CIP and discuss projects that are on the horizon that need funding, you could highlight what projects you want to see happen, and note which projects are Council favorites that would be good to prioritize. Lots we could discuss! Following the meeting, the funding team could do some funding research and present a suggested funding plan for a project or two, or at minimum know what funding would be important to communicate to you when new programs become available. Let me know your thoughts! I’d love to get some time on the calendar to touch base. Madison Burke, Senior Funding Specialist Leader, Bolton & Menk, Inc.

## **Building (Crooks)**

### **Building**

1. One new permit was issued for demolition of an older single car garage
2. Two permit applications received and awaiting additional information
3. Multiple visits were done at Alice Place working towards a Certificate of Occupancy

### **Code Enforcement**

1. No new additional nuisance letters mailed out this week
2. Follow up was completed on outstanding nuisance issues

### **Rental**

1. Three new rental applications received, and I’ve scheduled inspections
2. Time spent working on the Meadow Street apartment issues

### **License**

1. Two new mobile food licenses issued

### **Misc.**

1. Talked to architect regarding questions about a commercial roof replacement project
2. Completed a zoning review on 701 E. Pennington St for out of state firm
3. Spoke to property owner with questions on possible fence installation.

## **Finance (Moore)**

- This week, I’ve been working on getting some internal organization done while also responding to various requests from the auditors.



- Kelly and I have also been working together to sort through the changes related to the new EBS bank account for Partial Self-Funding. We're still in the process of understanding how the new setup impacts our workflows and ensuring everything is aligned properly moving forward.
- A few key items have been completed:
  - The Workers' Compensation audit was submitted on July 25th and is now finalized.
  - The Outstanding Debt Obligations report was completed and filed with the state on July 22nd.
  - GASB 77 letters were mailed out on July 28th, meeting the state's required deadline. All the key deadlines for the state have been met, and we're in good shape on those fronts.

### **IT (Newberry)**

- Successfully upgraded and redeployed the Remote Desktop Server, improving performance and stability for remote users.
- Deployed several new computers at the Streets Department to support day-to-day operations and replace aging hardware.
- Began testing our new LME (Log and Metrics Endpoint) server—agents have been deployed across the network and initial server testing is underway.
- Placed an order for additional computers as we continue working toward completing all workstation upgrades ahead of the October Windows 11 compliance deadline.

### **Police/Fire (Logan)**

- Done several walk throughs out at Alice Place this week. They have the sprinkler room up and running with no issues. As of today, still working on the Fire Alarm Test.
- Posting for open Police Officer Position once again.
- Working with Building Inspector Crooks with some other issues around town reference to building violations.
- Did annual inspection on all the ladders at the Fire Station. Should be getting the report back by next week for a more official update.
- Been working through some vacations and training on the PD side the past month into next month. Been working anywhere from 0300 AM in the morning up till 1100 PM. PT Officer Parker has been putting in some hours when he can also.

### **Public Works (Williams)**

#### **Streets**

- Water and sewer labs

#### **Utilities**

- Lift station rounds
- Clean lift stations
- Locates (33)

### **Other Activities**

- Parks and Broadway trash and recycling
- Service trucks and squad cars.
- Sign maintenance
- Building maintenance and clean up.
- Work on pool
- Haul brush/grass.
- Mow
- Sweep
- Water plants
- Paint intersections and arrows across town
- Replace sidewalks
- Backfill sidewalks with dirt
- Rebuild 2 broken hydrants

### **Projects**

- ImOn has fixed alley and has a couple more spot to pour back
- Alice place has their driveway poured. We will be starting the sidewalk in the next couple of weeks
- Four seasons have started the dirt work for the Va clinic
- Hartco with Mediacom has come back and fixed spots in alleys
- Pro line has finished painting our lines across town
- We are working on getting the new turn lane ready at Walmart

### **Additional Items/Upcoming Items of Interest**

- Cole is signing up to take is grade 1 water treatment.
- Jacob signed up to take grade 3 wastewater test.
- MVP has come down to put our pump back in the pool house. We are still waiting on the pump that runs our drainage pit.

## DROPPETT LOCATION AGREEMENT

This License Agreement is entered into effective as of August \_\_\_\_\_, 2025 (the "**Commencement Date**"), by and between City of West Burlington Iowa ("**Licensor**"), and DROPPETT, an Iowa limited liability company ("**Licensee**").

**1. PREMISES.** Licensor hereby grants Licensee the right to use that certain area depicted on the map attached hereto as Exhibit A (the "**Licensed Premises**") located at \_\_\_\_\_ and known as Parcel No. \_\_\_\_\_ (the "**Real Estate**"), in addition to access to the Licensed Premises across the Real Estate. Licensee shall also have the right to the non-exclusive use of certain common areas, including, without limitation, the parking areas, on the Real Estate as may be designated from time to time by Licensor (the "**Common Areas**"), subject however to reasonable rules and regulations for the use thereof as prescribed from time to time by Licensor.

**2. TERM.** This License shall commence on the Commencement Date and shall continue on a month-to-month basis. Either party may terminate this License at any time by giving the other party at least thirty (30) days' prior written notice. Licensee's obligation to pay rent shall commence on the Commencement Date. Upon termination of this License, Licensee shall return to Licensor any security access cards or keys issued by Licensor to Licensee.

**3. USE OF LICENSED PREMISES.** Licensee shall use the Licensed Premises for the purpose of placing one structure used for the collection of cans and bottles for redemption (the "**Structure**") and for Licensee's employees, agents, and invitees to use to access and park on the Licensed Premises while using the Structure and for no other purpose whatsoever. Licensee shall not use or permit the Licensed Premises to be used for any nuisance, noisy, offensive, dangerous, or illegal purpose. Said structure shall be a shipping container or similar container appropriate for the collection of cans and bottles. Licensee shall comply with all applicable present and future laws, statutes, rules, regulations, and ordinances in connection with the use of the Licensed Premises. Licensee shall use, and shall cause its employees, agents, and invitees to use, the Licensed Premises and the Common Areas in a safe, orderly, reasonable, courteous, and professional manner, and, in all events, so as not to interfere with Licensor's or any other party's use and enjoyment of the Common Areas. After each use of the Licensed Premises, Licensee shall leave the Licensed Premises in good order and in a clean and sanitary condition. Licensee shall not commit or suffer to be committed any waste to the Licensed Premises, and Licensee shall reimburse Licensor for the cost to repair any damage caused by Licensee, its employees, or agents.

## **4. OBLIGATIONS.**

**a. Licensor Obligations.** Licensor shall be responsible for the following:  
Paying for and providing electricity and data to the Structure, paying for and providing technological assistance as needed for the Structure (e.g. manually re-setting power to the Structure in the event of a power outage), and paying for and providing additional agreed-upon

graphic vinyl wrap on the Structure. The Licensor shall continue to provide snow removal services in the winter months on the parking lot, as has been usual and customary.

**b. Licensee Obligations.** Licensee shall be responsible for the following:

- i. **RENT.** On or before the first day of each month during the License term, Licensee shall pay Licensor rent equal to \$1.00 on or before the first day of the next calendar month. Any delinquent rent shall bear interest at the rate of 0% per month from the date due until paid.
- ii. **PUBLIC PURPOSE.** Licensee shall operate a can and bottle redemption facility as a service to the public and shall conduct such other non-profit activities associated with the same.
- iii. **REPORTING TO THE CITY COUNCIL.** Licensee shall provide at least an annual report to the City Council in either written or oral form, and shall provide such financial statements as may be necessary to satisfy the City's auditors.

**5. INDEMNIFICATION OF LICENSOR AND LIABILITY INSURANCE.**

Licensee, as a material part of the consideration to Licensor under this License, hereby agrees to indemnify, defend, and hold Licensor harmless from any and all expenses, claims, causes of action or costs (including court costs and reasonable attorney fees to enforce this provision) for injury to any person, or the property of any person, including, but not limited to, Licensee's employees and agents, arising from the use of the Licensed Premises by Licensee. Licensee agrees to maintain, at its expense and at all times during the lease term, full liability insurance properly protecting and indemnifying Licensor and naming Licensor as additional insured and/or loss payee, as instructed by the Licensor, in an amount not less than \$1,000,000 per occurrence for injuries or damages to persons, and not less than \$300,000 damage destruction of property, written by insurers licensed to do business in the State of Iowa. Licensee shall deliver to Licensor certificates of such insurance, which shall declare that the respective insurer may not cancel the same in whole or in part without giving Licensor written notice of its intention so to do at least thirty (30) days in advance. The Licensee shall carry sufficient workers' compensation insurance as required by Iowa law. Proof of all insurance shall be placed on file with the City prior to the start of operations on the premises.

**6. ALTERATIONS AND FIXTURES.** Licensee accepts the Licensed Premises in its "as-is" condition. Licensee shall not attach any fixtures, except for the Structure, or make any alterations to the Licensed Premises, or any part thereof, without the prior written consent of Licensor, which may be withheld in Licensor's sole discretion, and any additions to, or alterations of, the Licensed Premises, shall become at once a part of the realty and belong to Licensor without any compensation to Licensee. Licensee shall be liable for any/all expenses for any alterations made to Licensed Premises, i.e., (electrical, foundation, bollards). The Structure shall never become a part of the realty and is the property of Licensee.

**7. RIGHT OF ENTRY.** Licensor for itself and its employees and agents reserve the right to always enter the Licensed Premises (but may not enter the Structure), including times reserved for Licensee, without notice to Licensee for any purpose that Licensor deems necessary

or desirable. Licensee acknowledges that the Licensed Premises will be used by other parties at times not reserved for Licensee.

**8. ASSIGNMENT AND SUBLETTING.** Licensee shall not assign this License or any interest herein, and shall not sublet the Licensed Premises or any part thereof, or permit any other person to occupy or use the Licensed Premises or any portion thereof, without the prior written consent of Licensor, which consent may be withheld by Licensor in its sole discretion.

**9. DEFAULT AND REMEDIES.** Licensee shall be in default under this License, (1) if the Licensee shall fail to pay any part of the rent when due under this License, or (2) if Licensee fails to perform any of the other covenants or conditions on its part to be performed and such failure continues for ten (10) days after notice thereof from Licensor to Licensee, unless such failure to perform cannot be cured within ten (10) days and Licensee is diligently proceeding to cure said nonperformance; provided, however, that if such nonperformance continues for a period of thirty (30) days after such notice, Licensee shall be in default. If Licensee is in default under this License, then Licensor, besides any other rights or remedies it may have at law or in equity, shall have the immediate right to declare this License terminated without further notice. None of Licensor's remedies shall be considered exclusive of any other remedy, but the same shall be cumulative. No delay or omission of Licensor to exercise any right or power arising from any default shall impair any such default or constitute a waiver thereof. In the event of litigation to enforce this License, the prevailing party shall be entitled to recover from the costs of such litigation, including reasonable attorneys' fees as determined by the court and not by a jury.

**10. NOTICES.** Whenever notice is given by either party to this License to the other, such notice or demand shall be given in writing and shall be deemed given and completed, (a) if sent by certified mail, return receipt requested, addressed as follows:

To Licensor:

City of West Burlington  
122 Broadway St  
West Burlington, IA 52655

To Licensee:

DROPPETT  
Attn.: Shane Ort, President/CEO  
1600 E Euclid Ave.  
Des Moines, IA 50313

three days after deposit thereof in the United States mail with postage prepaid or on the date received as shown on the return receipt, whichever is earlier, or (b) if delivered in person, upon receipt thereof. Either party may change such address by written notice to the other as provided herein.

**11. RELATIONSHIP.** Licensor and Licensee agree that nothing contained in this License shall be deemed to create a partnership or any other relationship between the parties other than that of licensor and licensee.

**12. ENTIRE AGREEMENT.** This License sets forth all the covenants, promises, agreements, conditions, or undertakings, either oral or written, between the Licensor and Licensee. This License supersedes and replaces all prior agreements between Licensor and Licensee. Except

as herein otherwise provided, no subsequent alteration, amendment, change or addition to this License shall be binding upon Licensor or Licensee unless reduced to writing and signed by both parties.

**IN WITNESS WHEREOF**, the parties have duly executed this License as of the date first above written.

**LICENSOR:**

City of West Burlington

**LICENSEE:**

DROPPETT

By: \_\_\_\_\_  
Name: \_\_\_\_\_  
Title: \_\_\_\_\_

By: \_\_\_\_\_  
Name: Shane Ort  
Title: President/CEO

EXHIBIT A  
Drawing of Licensed Premises






Droppett  
Clean &  
Convenient  
Recycling



# Droppett Clean & Convenient Recycling

It's as simple as...

Droppett is on a mission to make redemption-based recycling so easy, clean, and convenient that it feels silly not to participate. Create your Droppett account online, and we will promptly mail your personalized welcome packet with bag tags. Save your containers and get your \$\$\$ back to use at your discretion!

- Keeps deposit containers out of landfills! 
- Get your \$.05 deposit back that you paid for! 
- No more waiting in line or using RVM machines! 

Check us out!

[www.droppett.com](http://www.droppett.com)

[www.facebook.com/droppett](https://www.facebook.com/droppett)



**Bag it:**

Place aluminum and plastic containers in the same bag; place glass bottles in a taped box.



**Tag it:**

Affix your personalized bag tag securely to your bag or your box.



**Drop it:**

Below each drop door is a scanner that will read your bag tag bar code, unlatching the lock. Then open the door to drop your bag and/or box inside.

# Droppett Gives You More



## More Time for You

Droppett lets you drop off bags of redeemable bottles and cans in 15 seconds or less and accumulate deposit fees in your Droppett electronic account, which you can withdraw at your discretion.

## More for Your Community

With Droppett, you can give back to hundreds of community organizations by directing your deposit proceeds to a good cause or using them to raise money for your organization, school, or fundraiser.



## More for Our Planet

When you redeem the Droppett way, you'll receive personalized environmental impact statistics demonstrating how your recycling benefits our planet.

Recycling has saved  
enough energy to light



**292,806 lightbulbs**  
for a year

Recycling has saved  
emissions equivalent of  
driving a car



**10,162,331 miles**

Recycling has diverted  
enough containers to  
completely fill



**344 small grain silos**

# Current Fundraising Partners

We have over 90 organizations using Droppett to raise funds!

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With Droppett, you can give back to your community!

Organizations can partner with us for can drives, hand out their bag tags, or receive funds directly from other Droppett users.

Check out our list of partners!

[www.droppett.com/charity-partners/](http://www.droppett.com/charity-partners/)



Big thanks to Dave and John, volunteers from the Knights of Columbus!

They just made a huge glass drop-off for their organization using Droppett 🌱 turning recyclables into real impact for their mission! 🍷

We ❤️ seeing our community in action and making a difference, one container at a time.

Thanks for choosing Droppett to support your cause!



Visit our locations tab to view each city's Droppett depot!

[www.droppett.com/#droppett-locations](http://www.droppett.com/#droppett-locations)



## 📍 Our Locations

1600 East Euclid Avenue, Des Moines Iowa 50313

203 8th Street, Corning, Iowa 50841

210 S Broadway Street, Red Oak, Iowa 51566

400 East Page Street, Clarinda, Iowa 51632

7111 NW Aurora Avenue, Urbandale, Iowa 50322

(Located at Urbandale High School)

306 South Vine Street, Glenwood, Iowa 51534

206 Vine Avenue NE Mitchellville, Iowa 50169

125 E Ayers Street Osceola, Iowa 50213

2900 SE Grimes Boulevard Grimes, Iowa 50111

100 North Front Street, Burlington Iowa 52601

# Location Requirements

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Must have 24/7/365 safe access and snow removal

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110v Hardwire connection- Will be installed by certified electrician

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Level ground (Boxes are 10'x24') 360 sq ft. area

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All boxes will come with a standard Droppett wrap  
(Custom wraps can be created)

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Location Agreement signed by all parties

---

City requirements completed and filed

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Location point of contact for limited support

## ABOUT US

At Droppett, we believe redeeming beverage containers should be easy, clean, and convenient. That's why we're reimagining the redemption experience for Iowans—making it faster, simpler, and hassle-free.

With the opening of our 10th bag drop location, Droppett is quickly becoming the preferred way to redeem in Iowa. Just bag, tag, and drop—no sorting, lines, or mess. Already the fastest-growing redemption method in Maine, New York, Connecticut, and Oregon, Droppett is now bringing that same clean and modern experience to communities across Iowa.

Droppett is powered by CRINC (Container Recovery Inc.), a statewide logistics company with more than 40 years of experience in beverage container processing. CRINC collects from all 99 counties weekly—now, with Droppett, that expertise is working directly for you.

We're proud to build a better, more sustainable container drop system for Iowa—one drop at a time.

# Next Steps- What questions do you have?

*Thank You!*



**Bates Sanitation & Asphalt, Inc.**  
**2189 303<sup>rd</sup> Avenue**  
**Ft. Madison, IA 52627**  
**Tel: 319-372-7838**  
**Fax: 319-372-8859**

## **PROPOSAL**

Proposal Submitted To:  
City of West Burlington  
122 Broadway St.  
West Burlington, IA 52655  
Attn: Chase Williams

Work To Be Performed At:  
South of Westland Mall  
West Burlington, IA

**April 25, 2025**

We hereby propose to furnish all the materials and perform all the labor necessary for the completion of:  
Milling down high areas. Milling at each end and entrances of mall and motel for even transition when  
overlayed. Cleaning, tack coating, installing leveling course and proceeding with 2 inch hot mix asphalt overlay  
On 630 LFT, 16,650.00 Sq. Ft. **Total \$61,771.50**

**Price for 910 LFT 33,670 Sq. Ft. Total \$ 89,670.50**

Material is guaranteed to be as specified, and the above work to be performed in accordance with the drawing  
and specifications submitted for above work and completed in a substantial workmanlike manner.

With payment to be made within **30 days** after completion.

Any alteration or deviation from above specifications involving extra costs, will be executed only upon written  
orders, and will become an extra charge over and above the estimate, all agreements contingent upon strikes,  
accidents or delays beyond our control, owner to carry fire, tornado and other necessary insurance upon above  
work. Workmen's compensation and Public Liability Insurance on above work to be taken out by us, Bates  
Sanitation & Asphalt, Inc.

Respectfully submitted \_\_\_\_\_  
Kevin L. Bates

\*\*\*Note-This proposal may be withdrawn by us if not accepted within 30 days.

## **ACCEPTANCE OF PROPOSAL**

The above prices, specifications and conditions are satisfactory and are hereby accepted. You are authorized to  
do the work as specified. Payment will be made as outlined above.

Accepted \_\_\_\_\_ Signature \_\_\_\_\_

Date \_\_\_\_\_ Signature \_\_\_\_\_





**Bates Sanitation & Asphalt, Inc.**  
**2189 303<sup>rd</sup> Avenue**  
**Ft. Madison, IA 52627**  
**Tel: 319-372-7838**  
**Fax: 319-372-8859**

## **PROPOSAL**

Proposal Submitted To:  
City of West Burlington  
122 Broadway St.  
West Burlington, IA 52655  
Attn: Chase Williams

Work To Be Performed At:  
South of Westland Mall  
West Burlington, IA

**April 16, 2025**

We hereby propose to furnish all the materials and perform all the labor necessary for the completion of: Milling down high areas. Milling at each end and entrances of mall and motel for even transition when overlayed. Cleaning, tack coating, installing leveling course and proceeding with 2 inch hot mix asphalt overlay On 16,650.00 Sq. Ft. **Total \$44,122.50**

Material is guaranteed to be as specified, and the above work to be performed in accordance with the drawing and specifications submitted for above work and completed in a substantial workmanlike manner.

With payment to be made within **30 days** after completion.

Any alteration or deviation from above specifications involving extra costs, will be executed only upon written orders, and will become an extra charge over and above the estimate, all agreements contingent upon strikes, accidents or delays beyond our control, owner to carry fire, tornado and other necessary insurance upon above work. Workmen's compensation and Public Liability Insurance on above work to be taken out by us, Bates Sanitation & Asphalt, Inc.

Respectfully submitted \_\_\_\_\_  
Kevin L. Bates

\*\*\*Note-This proposal may be withdrawn by us if not accepted within 30 days.

## **ACCEPTANCE OF PROPOSAL**

The above prices, specifications and conditions are satisfactory and are hereby accepted. You are authorized to do the work as specified. Payment will be made as outlined above.

Accepted \_\_\_\_\_ Signature \_\_\_\_\_

Date \_\_\_\_\_ Signature \_\_\_\_\_



Preliminary Engineering Report

# Stormwater Infrastructure Improvement Plan

West Burlington, IA  
July 8, 2025

**Submitted by:**

Bolton & Menk, Inc.  
401 1<sup>st</sup> Street SE  
Suite 201  
Cedar Rapids, IA 52401  
P: (319) 362-3219  
E: CedarRapids@bolton-menk.com



**BOLTON  
& MENK**

Real People. Real Solutions.

# Certification


Preliminary Engineering Report

for

Stormwater Infrastructure Improvement Plan

City of West Burlington  
122 Broadway St  
West Burlington, Iowa 52655  
OT7.133148

July 8, 2025

	<p>I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.</p> <p><u>Ryan Benjegerdes</u> Date: <u>7/25/2025</u></p> <p>Ryan M. Benjegerdes, P.E. License No. 23767 My renewal date is December 31, 2025 Pages or sheets covered by this seal: <u>All</u></p>
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# Table of Contents

I.	INTRODUCTION .....	5
A.	Background.....	5
B.	Scope of Study.....	5
II.	STUDY METHODOLOGY.....	6
A.	Identification of Problem Areas .....	6
B.	Design Criteria .....	6
C.	Geographic Information Systems (GIS) .....	6
D.	Hydrologic & Hydraulic Analysis.....	6
E.	Cost Estimate Assumptions .....	8
III.	EXISTING CONDITIONS .....	9
A.	Watershed Area .....	9
B.	Downstream Conditions.....	9
C.	Results .....	9
IV.	RECOMMENDED IMPROVEMENTS .....	10
0.	Project #0: Izaak Walton Lake Restoration.....	11
1.	Project #1: Regrade Luer’s Park Channel .....	12
2.	Project #2: Create a detention basin north of West Burlington Community Park .....	13
3.	Project #3: Create detention basin to the north of GE.....	14
4.	Project #4: Create detention basin in the northeast corner of Rorer Steet and E Pennington Street .....	15
5.	Project #5: Upsize and reroute E Pennington Street.....	16
6.	Project #6: Upsize storm sewer along E Huston Street .....	17
7.	Project #7: Create grass swale and upsize pipe around Pat Klein Park .....	18
V.	FUNDING OPPORTUNITIES.....	19
VI.	LAKE RESTORATION OPPORTUNITIES .....	19
VII.	CONCLUSION .....	20

# Tables

Table 1: Total Rainfall Amount for Design Event .....	7
Table 2: Summary of Curve Number Values .....	7
Table 3: Summary Cost Estimate of Project #1 .....	12
Table 4: Summary Cost Estimate of Project #2 .....	13
Table 5: Summary Cost Estimate of Project #3 .....	14
Table 6: Summary Cost Estimate of Project #4 .....	15
Table 7: Summary Cost Estimate of Project #5 .....	16
Table 8: Summary Cost Estimate of Project #6 .....	17
Table 9: Summary Cost Estimate of Project #7 .....	18

# Appendix

Appendix A: Drawings
Appendix B: Cost Estimates
Appendix C: Hydraulic Performance Maps
Appendix D: Supporting Information
Appendix E: GeoStorm Model Output Reports

## I. INTRODUCTION

### A. Background

The City of West Burlington frequently experiences stormwater issues and localized flooding throughout town during moderate to heavy rainfall events. The flooding causes damage to buildings, infrastructure and parks and places a burden on property owners as well as the City. Therefore, the city has contracted Bolton & Menk, Inc. to complete a Stormwater Infrastructure Improvement Plan. The primary goal of the improvement plan is to evaluate the existing stormwater infrastructure and identify a shortlist of recommended improvements to address deficiencies. The following tasks were completed for each recommended improvement project:

- Concept-level engineering design and storm sewer sizing;
- Preparation of a budgetary cost estimate; and
- Creation of a project improvement map.

This report describes the study methodology, assumptions, and recommended improvement projects. It is intended to help inform the city's capital improvement planning efforts.

Two primary watersheds within city were evaluated to provide solutions for specific problems identified through preliminary modeling and/or identified by city staff. Six total improvement projects were identified and are described within the findings of this report, each with varying degrees of magnitude. The improvements include new storm sewer pipe, manholes, intakes, regrading channels and creating detention. The associated project costs such as pavement removal and reconstruction were also considered.

### B. Scope of Study

This study includes an investigation of major problems areas identified by city staff and investigation of the existing storm water infrastructure. A preliminary layout for improvements to the storm sewer system is also included. The recommended solutions are intended to reduce flooding and improve city-wide drainage.

Bolton & Menk conducted a detailed evaluation of the study area to:

- delineate contributing drainage areas
- identify deficiencies in the existing stormwater conveyance system
- develop a set of recommended infrastructure improvement projects to mitigate flooding
- estimate the capital cost of the recommended improvements

Several key strategies were used to identify and analyze a range of solutions. These key strategies include:

1. *Increasing conveyance capacity* – Increasing the capacity of the conveyance system may include upsizing storm sewer piping, upsizing culvert crossings and/or increasing capacity for channels and ditches. Implementing this strategy allows the drainage system to convey flood waters downstream more safely, thereby directly reducing flood risk.
2. *Increasing stormwater detention and flood storage capacity* – Increasing stormwater detention and storage may include creating new retention/detention ponds, modifying existing retention/detention ponds, and/or modifying the outlet control structures of existing retention/detention ponds. Properly implementing this strategy reduces the flow rate downstream, thereby directly reducing flood risk.

3. *Diverting stormwater runoff around problem areas* – Rerouting and diverting stormwater runoff may include providing new storm sewer mains to help convey runoff downstream and reducing the load on the original sewer main, providing secondary outlets for stormwater conveyance systems, and/or providing emergency overflow routes for floodwater. Implementing this strategy can split up drainage areas, reducing the stormwater flow rate through existing storm sewer networks.

The above strategies were analyzed throughout town in various ways. Several possible solutions were considered and evaluated. Those solutions that were identified as most effective in mitigating flood losses are recommended within this report.

## II. STUDY METHODOLOGY

### A. Identification of Problem Areas

A model was created in order investigate the City's two primary watersheds and identify where the existing storm sewer system was lacking. Once areas were identified they were narrowed down by the first-hand accounts provided by City staff and where the town has a history of localized flooding.

### B. Design Criteria

Storm sewer was preliminarily sized to limit surface ponding during the 5-year design storm, in accordance with the Iowa Statewide Urban Design and Specifications manual. Stormwater runoff was analyzed for the 5-year, 10-year, and 100-year recurrence intervals. The proposed solutions are designed to significantly reduce flood damage during these events.

### C. Geographic Information Systems (GIS)

Records of the existing collection system were provided by the by Des Moines County via GIS shapefiles. These shapefiles contained the locations of the storm sewer's pipes and structures but did not include key information the information necessary to develop a hydraulic model.

Additional information was collected in the field by Bolton & Menk staff. The field data collected included:

- Pipe Diameter
- Invert Elevation
- Rim Elevation

All channel sizes and detention facilities were modeled based on publicly available LiDAR data. Once a complete data set was created, the data was conditioned for direct input into the hydraulic model.

### D. Hydrologic & Hydraulic Analysis

The SCS TR-55 Hydrology Method was used to develop watershed runoff hydrographs for each of the sub-watersheds. This methodology is widely accepted at local and national regulatory agencies as an engineering standard. Input parameters are described below.

## 1. Rainfall

Precipitation was modeled using NRCS MSE 4, 24-hour rainfall distribution. The MSE 4 rainfall distribution was developed in 2015 and is based on precipitation-frequency data compiled within NOAA Atlas 14.

Rainfall amounts for each design event were selected from the NOAA Atlas 14, Volume 8, Version 2 – Point Precipitation Frequency Estimates. Estimates were taken from the project site in West Burlington, IA at 40.826 latitude and -91.1616 longitude. A summary of the values used within the analysis is shown in Table 1

Table 1: Total Rainfall Amount for Design Event	
Recurrence Interval	Point Precipitation Frequency Estimate (inches)
5-year	3.90
10-year	4.59
100-year	7.35

## 2. Time of Concentration

Time of concentration for each subbasin was computed using the NRCS TR-55 method. A minimum time of concentration of 6 minutes was used for small and mostly impervious subbasins. Times of concentration were calculated to be between 6 and 71 minutes for individual sub-watersheds within the study area.

## 3. Curve Number

The SCS Curve Number Method was used to model rainfall losses. Composite curve numbers were calculated for each sub-watershed using the 2021 Land Cover Categories from the National Land Cover Database (NLCD).

The following curve number values were used as part of the analysis to determine composite values.

Table 2: Summary of Curve Number Values	
Condition	Curve Number
Developed, Open Space on NRCS Type C Soil	76
Developed, Low Density on NRCS Type C Soil	82
Developed, Low Density on NRCS Type D Soil	86
Developed, Medium Density on NRCS Type C Soil	90
Developed, Medium Density on NRCS Type D Soil	92
Developed, High Density on NRCS Type C Soil	96
Developed, High Density on NRCS Type D Soil	96
Agricultural, Cultivated Crops on NRCS Type C	78
Agricultural, Cultivated Crops on NRCS Type D	81
Impervious Surfaces	98



#### 4. Hydraulic Model

GeoSTORM was used within the area of study to create a complete and comprehensive model of the drainage network. The model incorporates runoff hydrographs generated for the TR-55 Hydrology Method into a one-dimensional, hydrodynamic, hydraulic model based on a complex network of links and nodes. The model accounted for all components of the conveyance network, including storm sewer piping, culverts, channels, detention basins, flow control structures, etc.

Sub-watersheds were delineated from each catch basin or general drainage location. LiDAR was analyzed to determine overland drainage patterns and delineate sub-watersheds. In total, approximately 1,126 acres were delineated into 368 sub-watersheds. Each sub-watershed was assigned a weighted curve number, time of concentration, and routed to its respective catch basin. The characteristics of each sub-watershed were input into GeoSTORM to create a comprehensive model of the drainage network.

Hydraulic models were created for the existing conditions, as a basis of comparison. Then a second hydraulic model for the recommended improvements was created to determine the improved hydraulic performance and reduce flooding.

#### E. Cost Estimate Assumptions

Cost estimates were developed for each recommended improvement. For each cost estimate, a construction contingency of 20% was assumed. In general, road replacement was assumed that half of the roadway would require replacement to conduct proposed storm sewer construction, intersections would be completely reconstructed, and sod restoration would be required along the proposed street reconstruction. The cost estimates created are conservative given the preliminary nature of design and are using 2024 prices since it is not known when construction will occur. Public and private utilities are not known at this time or in future, additional costs may occur due to construction conflicts with other utilities or changes to the preliminary design.

### III. EXISTING CONDITIONS

#### A. Watershed Area

Two of the City's primary watershed areas were evaluated, one which discharges underneath E Mount Pleasant Street and ultimately to Izaak Walton Lake and one which leaves the city through a culvert that goes underneath the railroad tracks into an unnamed tributary. For this report the water that discharges to the Izaak Walton Lake will be referred to as the East Watershed and the watershed that discharges into the unnamed tributary will be referred to as the West Watershed.

Refer to Figure A.1: Overall Watershed Map within the appendix for the existing storm sewer network map and contributing sub-watersheds used for the study.

#### B. Downstream Conditions

In the east watershed, stormwater runoff leaves town through a combination of channels and storm sewer until it is funneled through a culvert that passes under E Mount Pleasant Street and eventually to Izaak Walton Lake.

In the west watershed, stormwater runoff leaves town through a combination of channels, storm sewer and existing detention until it passes under the railroad tracks into an unnamed tributary.

#### C. Results

Three parameters from the existing model output were used as performance indicators: total time flooded of nodes (manholes/intakes), flooded depth of nodes (manholes/intakes) and time surcharged for pipes. Results from the existing conditions model displayed areas of great concern for flooding and surcharge.

Based on the preliminary results and discussions with City staff, the east watershed exhibited greater drainage issues than the west. The main cause of flooding and surcharge throughout the east watershed is an inadequate outlet, undersized storm sewer and lack of detention. The outlet that ultimately drains into Izaak Walton Lake is largely below the lake's normal water level (NWL). As a result of the insufficient outlet, water is not freely flowing and driving head must build upstream in order for the water to be pushed through. This causes severe ponding at outlet locations. This backflow then causes significant ponding in the east watershed. Along with backflow issues, the overwhelmed storm sewer causes ponding in other low points throughout the watershed along E Huston Street, E Pennington Street, and Pat Klein Park. There is also significant stormwater issues at the West Burlington Community Center due to the lack of existing infrastructure and significant amounts of water coming from the industrial area to the south of Highway 34.

The west watershed also displayed localized flooding due to undersized storm sewers and the underutilization of existing detention facilities. However, it did not show the same degree of flooding as the east watershed, and was therefore not prioritized for improvements.

Refer to Appendix C for graphical representations of the inundation.

## IV. RECOMMENDED IMPROVEMENTS

It is not feasible to completely eliminate the risk of flooding; however, improvements can be implemented to significantly reduce flooding throughout town. Solutions were developed to improve the capacity of the storm sewer system, decrease the duration of flooding within street intakes and open channels, and address recurring localized flooding in many identified problem areas. Detention basins, storm sewer pipes, culverts, and channels sized to adequately manage the storm runoff will all help to reduce flooding.

Seven recommended improvement projects were identified within city limits (Projects #1 through #7). One project lying outside of city limits was also evaluated and determined to have significant benefits (Project #0). The projects are generally listed in order of greatest benefit to the city while taking into account project staging and construction:

- Project #0: Izaak Walton Lake Restoration
- Project #1: Regrade Luer's Park channel
- Project #2: Create detention basin to the north of West Burlington Community Park
- Project #3: Create detention basin to the north of 510 E Agency Rd
- Project #4: Create detention basin in the northeast corner of Rorer St and E Pennington St
- Project #5: Upsize and reroute storm sewer along E Pennington St
- Project #6: Upsize the storm sewer along E Huston St
- Project #7: Create grass swale and upsize pipe around Pat Klein Park

Each recommendation is described in the sections below, including preliminary cost estimates and associated property acquisition needs.

These projects will work together to detain and safely convey flood flows through town. All projects were evaluated under the assumption that the Izaak Walton Lake (Project #0) will undergo future restoration resulting in the normal water level of the lake being lowered. This reduction will allow water to flow more freely from the city to its ultimate destination, the lake. The recommendations still provide flood benefit to the city, even without completion of Project #0, but their potential is limited without addressing the downstream bottlenecks and tailwater conditions.

## 0. Project #0: Izaak Walton Lake Restoration

Although any changes made to Izaak Walton Lake are outside the city limits, the lake is the outfall of half the drainage area within the City of West Burlington. At present, the normal water level (NWL) of the lake is approximately 6.5 feet above the culvert underneath the railroad, which serves as the outlet for the City's East Watershed. As a result of the high tailwater conditions, a significant amount of water must be built up on the upstream end before it is pushed through to the lake resulting in major flooding and back up in West Burlington's storm sewer system. The current lake layout and culvert configuration also contributes to major sedimentation within the City's stormwater pipe, further reducing outlet capacity.

To create greater flow capacity, the NWL of the lake should be lowered and the culvert underneath the railroad should be cleaned and/or replaced. It is to the city's benefit if modifications and/or reconstruction of the Izaak Walton Lake outlet structure were made to lower the level of the lake by three to five feet (approximately from elevation 656.0 down to 651.0). The lake should be dredged to maintain lake depth and to remove accumulated sediment at the railroad culvert.

Additionally, the culvert beneath the railroad should be cleaned out, at minimum, but more appropriately, it should be replaced and raised by three to five feet. Raising the culvert above the lake's pool level would provide positive drainage and significantly reduce the ongoing sedimentation problem. This change would also require no change to the city's current outlet flowline.

These recommended improvements would occur within Des Moines County Conservation property and within the BNSF railroad right-of-way. The full scope of a lake restoration and costs to implement this project are unknown at this time, as they are largely dependent on cooperation from Des Moines County Conservation, BNSF, and other stakeholders. It is recommended that discussions begin with the goal of identifying a solution that achieves flood relief for the City of West Burlington while also meeting the needs and lake uses of Des Moines County Conservation. Additional data collection and evaluation of the Izaak Walton Lake project is recommended.

Refer to Figure A.3: Project #0 Map for a concept map of the project.

## 1. Project #1: Regrade Luer's Park Channel

The existing channel located within Luer's Park has a well-defined cross section as it enters the culvert under E. Mount Pleasant Street. However, approximately 170 feet upstream of E. Mount Pleasant Street, the channel becomes shallow and allows Luer's Park to be flooded with significant ponding for longer periods of time.

To allow greater flow capacity, the channel's cross-sectional area and slope will be increased. Approximately 1,000 linear feet of channel is recommended to be reconstructed with a trapezoidal cross section that increases the conveyance area by approximately 60% and adds between 0.25' and 3.5' of depth. This reduces the amount of water that would otherwise spill out of the channel. The project will also accommodate future improvements to the upstream storm sewer system.

Most of the construction would occur within Luer's Park. However, portions of the channel repair will require an easement or land acquisition from three different private landowners. This project helps to reduce flooding by increasing the existing capacity while also providing the excess capacity necessary to accommodate other future improvements upstream.

**Table 3: Summary Cost Estimate of Project #1**

Roadway Costs	\$40,000
Storm Sewer Costs	\$45,000
Misc. Costs (Grading, Utilities, Mobilization, Traffic Control, & Erosion Control)	\$65,000
<i>Construction Subtotal</i>	<i>\$150,000</i>
Contingency (20%)	\$30,000
<b><i>Estimated Construction Cost</i></b>	<b><i>\$180,000</i></b>
Engineering, Administration, and Legal (25%)	\$45,000
Property Acquisition/Easement	\$30,000
<b><i>Total Estimated Project Cost</i></b>	<b><i>\$255,000</i></b>

Refer to Figure A.4: Project #1 Map for a concept map of the project and Appendix B for a detailed cost estimate.

## 2. Project #2: Create a detention basin north of West Burlington Community Park

Currently the land to the north of the West Burlington Community Park is a localized low point which serves as the outlet for much of the surrounding area. However, this area also lacks adequate outlet capacity, causing it to flood frequently. As a result, many of the areas upstream also back up and flood.

The proposed detention basin will allow a place for the stormwater to pond without disrupting the surrounding areas. The recommended detention basin will create approximately 6.4 acre-feet of stormwater storage capacity. A multi-stage outlet structure should be designed and constructed to maximize stormwater detention. Approximately 400 linear feet of 36-inch storm sewer pipe is recommended to safely convey the detention pond outflow downstream directly to the Luers Park channel. Surface runoff from the east should be diverted to enter the detention basin prior to discharging downstream.

This detention basin will slow down the flow of water, reducing flow rates, and helping to relieve the downstream storm sewer system. This project will require the acquisition of a portion of the property to the north of the West Burlington Community Park and an easement or land acquisition on the property to the west of the Caspian Village Apartments.

This project will help to reduce unwanted flooding and the intensity of runoff making its way downstream, thereby allowing the storm sewer system to have the capacity to handle larger storms.

Table 4: Summary Cost Estimate of Project #2	
Roadway Cost	\$135,000
Storm Sewer Cost	\$110,000
Mobilization, Traffic Control, & Erosion Control Cost	\$101,000
<i>Construction Subtotal</i>	<i>\$346,000</i>
Contingency (20%)	\$70,000
<b><i>Estimated Construction Cost</i></b>	<b><i>\$416,000</i></b>
Engineering, Administration, and Legal (25%)	\$104,000
Property Acquisition/Easement	\$37,000
<b><i>Total Estimated Project Cost</i></b>	<b><i>\$557,000</i></b>

Refer to Figure A.5: Project #2 Map for a concept map of the improvements and Appendix B for a detailed cost estimate.

### 3. Project #3: Create detention basin to the north of 510 E Agency Road

The culvert below Highway 34, north of the 510 E Agency Rd property, receives a large amount of stormwater runoff from the property itself as well as the surrounding industrial properties. Runoff from this area is then funneled into a culvert that flows north underneath Highway 34 and directly to West Burlington Community Park. The large volume of water causes ponding at the culvert as well as significant stress on the downstream stormwater infrastructure.

The proposed detention basin will slow and control the release of stormwater runoff, helping to alleviate downstream flooding. The recommended detention basin will create approximately 8.8 acre-feet of stormwater storage capacity. A multi-stage outlet structure should be designed and constructed to maximize stormwater detention. Approximately 75 linear feet of 30-inch storm sewer pipe is recommended to safely convey the detention pond outflow downstream into the Highway 34 ditch. This project will require an easement or land acquisition on the land north of the 510 E Agency Rd property.

This project will help to further reduce the flowrate of the water making its way downstream, thereby allowing the storm sewer to have the available capacity to handle larger storms.

Table 5: Summary Cost Estimate of Project #3	
Roadway Cost	\$129,000
Storm Sewer Cost	\$34,000
Mobilization, Traffic Control, & Erosion Control Cost	\$91,000
<i>Construction Subtotal</i>	<i>\$254,000</i>
Contingency (20%)	\$51,000
<b><i>Estimated Construction Cost</i></b>	<b><i>\$305,000</i></b>
Engineering, Administration, and Legal (25%)	\$77,000
Property Acquisition/Easement	\$26,000
<b><i>Total Estimated Project Cost</i></b>	<b><i>\$408,000</i></b>

Refer to Figure A.6: Project #3 Map for a concept map of the improvements and Appendix B for a detailed cost estimate.

4. Project #4: Create detention basin in the northeast corner of Rorer Steet and E Pennington Street

The south side of Luers Park contains shallow low-lying areas that receive stormwater runoff from upstream to the south. An opportunity exists to transform this area into a detention basin to help control runoff prior to entering the Luers Park channel.

The proposed detention basin will slow and control the release of the stormwater runoff from upstream, helping to alleviate downstream flooding. The recommended detention basin will create approximately 10.3 acre-feet of stormwater storage capacity. A multi-stage outlet structure should be designed and constructed to maximize stormwater detention.

Approximately 75 linear feet of 42-inch storm sewer pipe is recommended to safely convey the detention pond outflow downstream into the Luer's Park channel. This project will occur partly within E Pennington Street right of way but will also require an easement or the acquisition of a portion of the land to the south of Luers Park and north of E Pennington Street.

Upstream stormwater infrastructure from E Pennington Street may be rerouted to discharge into this detention basin (Project #5)

Table 6: Summary Cost Estimate of Project #4	
Roadway Cost	\$121,000
Storm Sewer Cost	\$56,000
Mobilization, Traffic Control, & Erosion Control Cost	\$70,000
Construction Subtotal	\$247,000
Contingency (20%)	\$50,000
<b>Estimated Construction Cost</b>	<b>\$297,000</b>
Engineering, Administration, and Legal (25%)	\$75,000
Property Acquisition/Easement	\$30,000
<b>Total Estimated Project Cost</b>	<b>\$402,000</b>

Refer to Figure A.7: Project #4 Map for a concept map of the improvements and Appendix B for a detailed cost estimate.



## 5. Project #5: Upsize and reroute E Pennington Street

E Pennington Street contains a main branch of the City's storm sewer and experiences surface ponding during rainfall events. Sections of this branch are undersized which causes ponding at many intersections along the corridor. The existing storm sewer joins with the branch along E Huston Street, which is also undersized, and discharges directly to the Luers Park channel.

It is recommended to upsize several of the storm sewer pipes along this branch to allow an increase in flow capacity and less ponding along the street. Recommended storm sewer sizes vary from 15 inches at the upstream end near Swan Street, to 60 inches near W Burlington Avenue.

Additionally, the storm sewer outlet should be rerouted to flow through the recommended Project #4 detention basin. Rerouting this branch allows it to be detained and reduces peak flow downstream. It further provides relief to the E. Huston Street storm sewer system by removing the flow.

Most of the construction would occur within the right-of-way. However, a portion of it will require property acquisition or an easement for the property to the north of E Pennington Street and south of Luers Park.

This phase will help with flooding issues along the E Pennington Street corridor, reduce flows downstream, and allow greater flow capacity for the upstream portions of the branch.

Table 7: Summary Cost Estimate of Project #5	
Roadway Cost	\$505,000
Storm Sewer Cost	\$753,000
Mobilization, Traffic Control, & Erosion Control Cost	\$183,000
<i>Construction Subtotal</i>	<i>\$1,441,000</i>
Contingency (20%)	\$289,000
<b><i>Estimated Construction Cost</i></b>	<b><i>\$1,730,00</i></b>
Engineering, Administration, and Legal (25%)	\$433,000
Property Acquisition/Easement	\$9,000
<b><i>Total Estimated Project Cost</i></b>	<b><i>\$2,172,000</i></b>

Refer to Figure A.8: Project #5 Map for a concept map of the improvements and Appendix B for a detailed cost estimate.

6. Project #6: Upsize storm sewer along E Huston Street

E Huston Street is a localized low point, one of the main storm sewer branches of the City's East Watershed and experiences surface ponding during rainfall events. Sections of this branch are undersized which causes ponding at many of the intersections along the corridor and the side streets that tie into it.

Upsizing the pipe along this branch and increasing the slope of the pipes will allow an increase in flow resulting in less ponding along the corridor and a decrease in upstream flooding. Recommended storm sewer sizes range from 36 inches near Broadway Street up to 48 inches near W Burlington Avenue. The sewer system downstream of these improvements will be sufficient, following the reroute of the Pennington Street storm sewer system, as recommended by Project #5.

This project will occur within E Huston Street right-of-way, and permanent easement or land acquisition is not anticipated.

This phase will help with flooding along E Huston Street and will decrease the flooding upstream.

Table 8: Summary Cost Estimate of Project #6	
Roadway Cost	\$511,000
Storm Sewer Cost	\$573,000
Mobilization, Traffic Control, & Erosion Control Cost	\$159,000
<i>Construction Subtotal</i>	<i>\$1,243,000</i>
Contingency (20%)	\$249,000
<b><i>Estimated Construction Cost</i></b>	<b><i>\$1,492,000</i></b>
Engineering, Administration, and Legal (25%)	\$373,000
<b><i>Total Estimated Project Cost</i></b>	<b><i>\$1,865,000</i></b>

Refer to Figure A.9 Project #6 Map for a concept map of the improvements and Appendix B for a detailed cost estimate.

7. Project #7: Create grass swale and upsize pipe around Pat Klein Park

Pat Klein Park is located in a localized low spot and is the location of another main branch of the East Watershed. Currently, ponding occurs at the park and throughout the storm sewer infrastructure adjacent to the park.

The recommended solution provides a grass swale to store the surface water before entering the storm sewer system. Upsizing the pipe and increasing the slope will also increase the capacity of the storm sewer network and assist in conveyance. This will help reduce ponding in the park and throughout the downstream neighborhood. The recommended pipe sizes vary from 15 inches within the park to 48 inches where it meets the E Pennington Street storm sewer system. Approximately 0.6 acre-feet of additional flood storage are recommended to be added by the grassed swale.

This project will take place within Pat Klein Park and within the right of way for various streets. Permanent easement or land acquisition is not anticipated.

Table 9: Summary Cost Estimate of Project #7	
Roadway Cost	\$418,000
Storm Sewer Cost	\$719,000
Mobilization, Traffic Control, & Erosion Control Cost	\$180,000
<i>Construction Subtotal</i>	<i>\$1,317,000</i>
Contingency (20%)	\$264,000
<b><i>Estimated Construction Cost</i></b>	<b><i>\$1,581,000</i></b>
Engineering, Administration, and Legal (25%)	\$396,000
<b><i>Total Estimated Project Cost</i></b>	<b><i>\$1,977,000</i></b>

Refer to Figure A.10: Project #7 Map for a concept map of the improvements and Appendix B for a detailed cost estimate.

## V. FUNDING OPPORTUNITIES

The overall improvements recommended represent a significant capital investment. The improvements can be implemented as quickly or as slowly as desired and as funding allows. Outside funding opportunities may be utilized through multiple programs to help with cost-share or low interest loans.

- FEMA Hazard Mitigation Assistance Program has multiple forms of funding available through the Iowa Homeland Security and Emergency Management Division (IHSEMD). The funding opportunities include planning grants, hazard mitigation grant program, and building resilient infrastructure and committees' program, to name a few. Each of these grants are rather competitive.
- Another possibility would be to apply for Continuing Authorities Program (CAP) funding through the U.S. Army Corps of Engineers. This program can allow for planning, design, and implementation of several water resources related projects without specific congressional authorization. The purpose of the CAP is to plan and implement projects of limited size, scope, cost and complexity. Sections 205 and 208 both allow for flood control projects including the removal of obstructions and the clearing of channels.
- Low interest loans for storm water projects are available through the state of Iowa through the State Revolving Fund (SRF). Additionally, projects meeting the general non-point source requirements may be eligible for 0% interest for up to \$500,000.
- The Iowa Department of Agriculture and Land Stewardship (IDALS) offers water quality initiative (WQI) grants for qualifying urban conservation projects. The grants will fund up to \$250,000.
- Another funding mechanism to consider is to establish a drainage district for the watershed within the City of West Burlington. By creating a drainage district, it would provide a legally organized means to construct and maintain drainage outlets for the purpose of protecting the land and public from surface overflow. Once the district is established, construction, maintenance, and repair cost are funded by the landowners within the district. Project costs are assessed based on the benefits received and can be distributed over a 20-year period. Importantly, drainage districts also have legal authority and precedent to dictate necessary drainage improvements across railroad rights-of-way. Establishment of a drainage district could serve as a strategic mechanism to improve drainage under the railroad where cooperation has otherwise been lacking.

## VI. LAKE RESTORATION OPPORTUNITIES

As stated throughout the report, the City of West Burlington would benefit from the reduction of the normal water level of Izaak Walton Lake. However, the lake is owned and managed by Des Moines County Conservation. There are several programs that may be pursued to help fund a mutually-beneficial lake restoration project, including:

- Iowa DNR Fish Habitat Grant
- Iowa DNR Water Resource Access Cost-Share Program
- Iowa DNR Lake Restoration Program
- Iowa DNR REAP

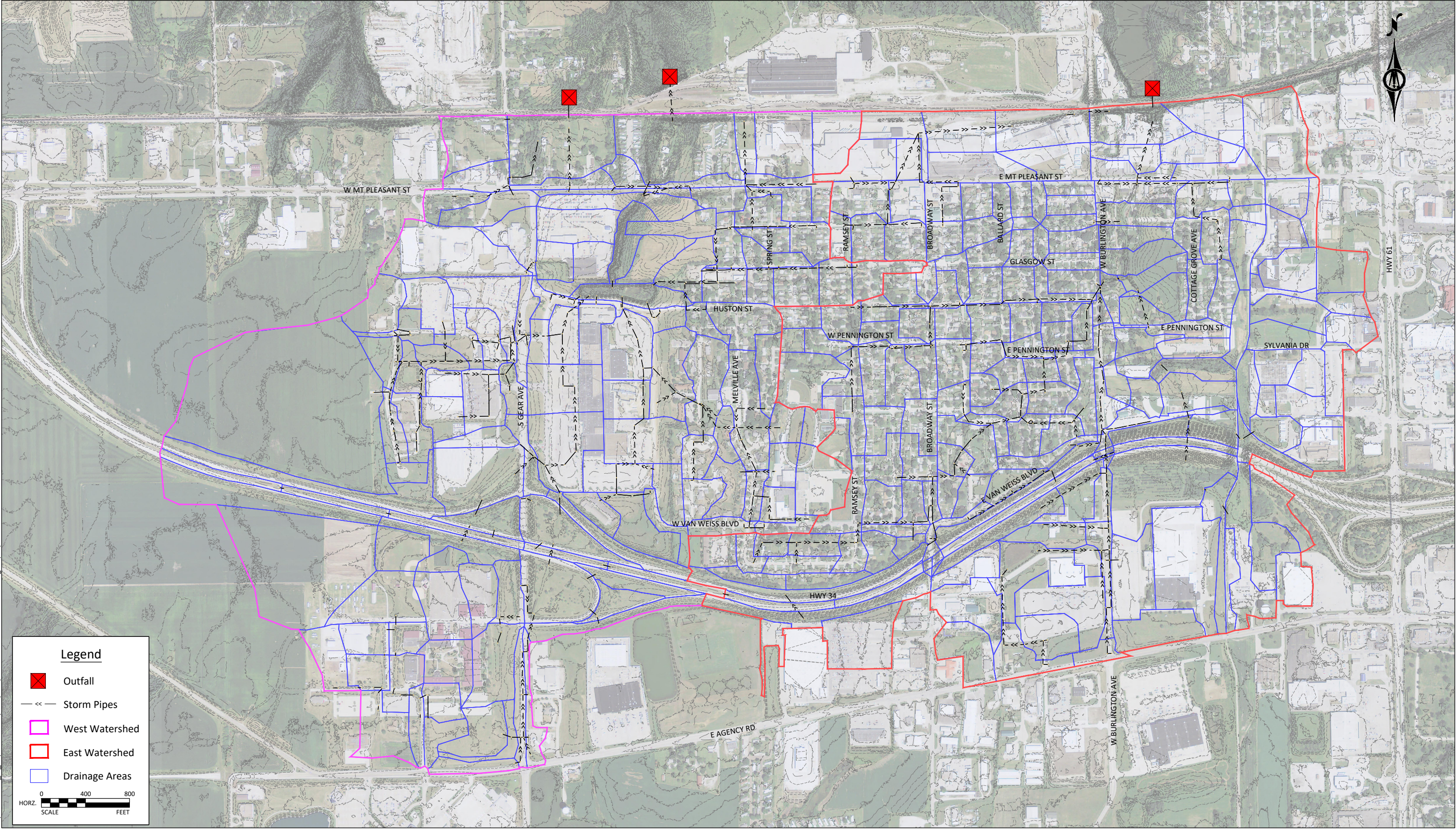
## VII. CONCLUSION

A comprehensive stormwater model was created to analyze the existing storm sewer system within the City of West Burlington. The existing storm system displayed lack of outlet conveyance and undersized storm sewers. These existing characteristics cause frequent and prolonged surcharging of pipes and flooding along streets and other public areas. Recommended solutions were developed to help remedy the current drainage problems and, if implemented, the recommended solutions will significantly reduce the risk of flood damage within the City of West Burlington. The recommendations contained within this report can be used as both a planning tool to help guide future infrastructure improvements and as a resource to help support future funding applications.

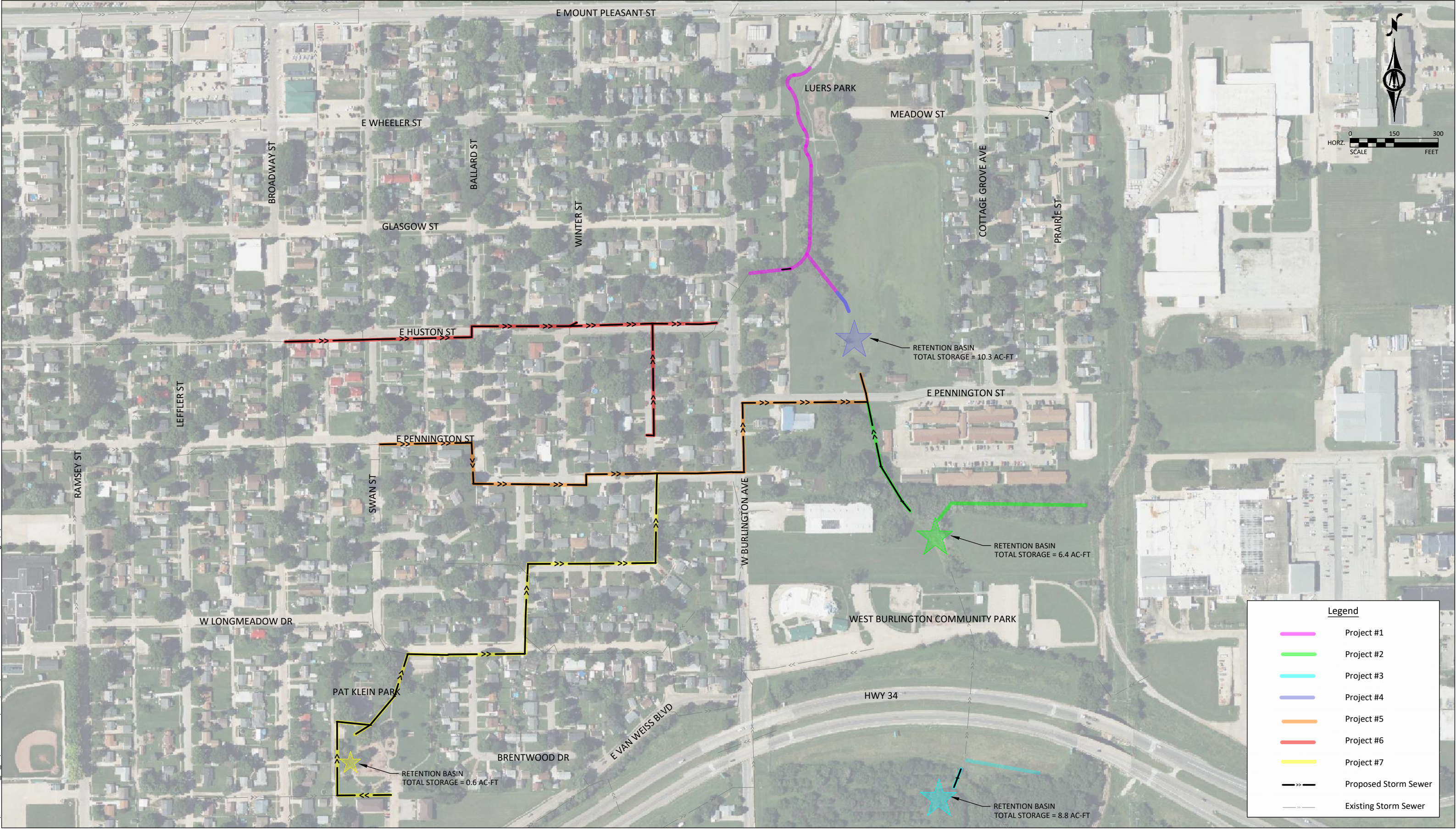
# Appendix A: Drawings

- Figure A.1 Overall Watershed Map
- Figure A.2 Overall Project Map
- Figure A.3 Project #0 Map
- Figure A.4 Project #1 Map
- Figure A.5 Project #2 Map
- Figure A.6 Project #3 Map
- Figure A.7 Project #4 Map
- Figure A.8 Project #5 Map
- Figure A.9 Project #6 Map
- Figure A.10 Project #7 Map





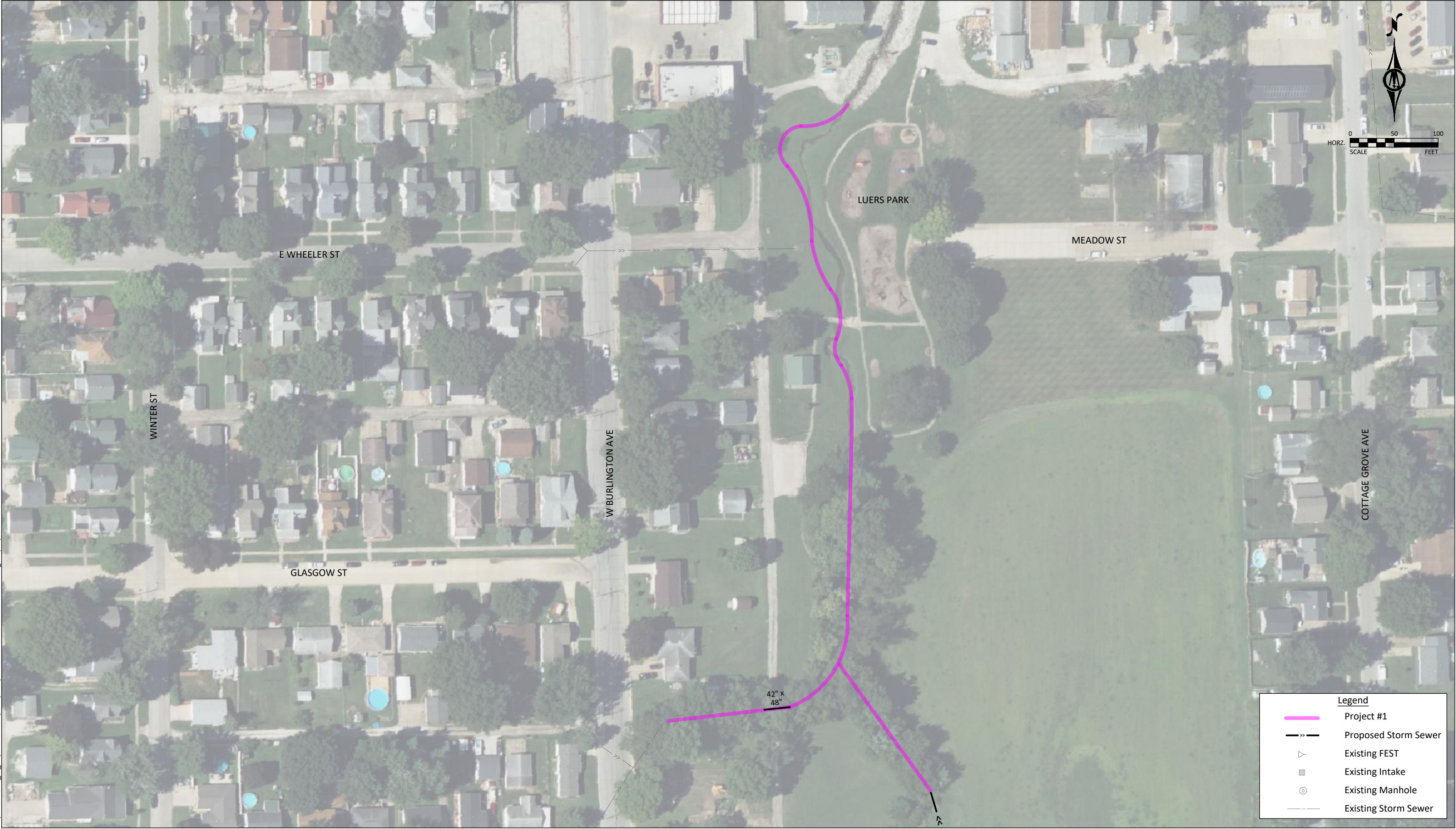
















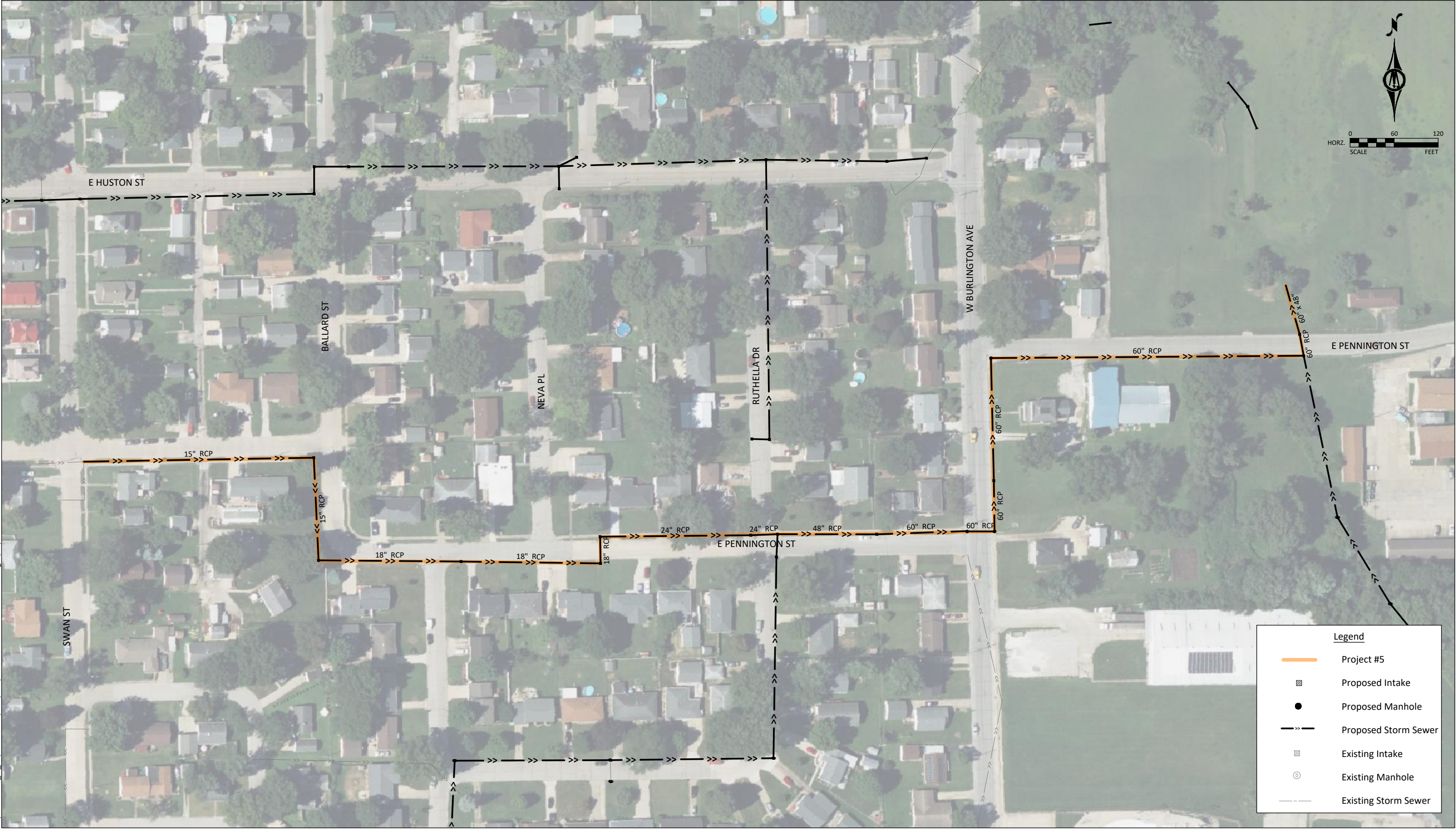










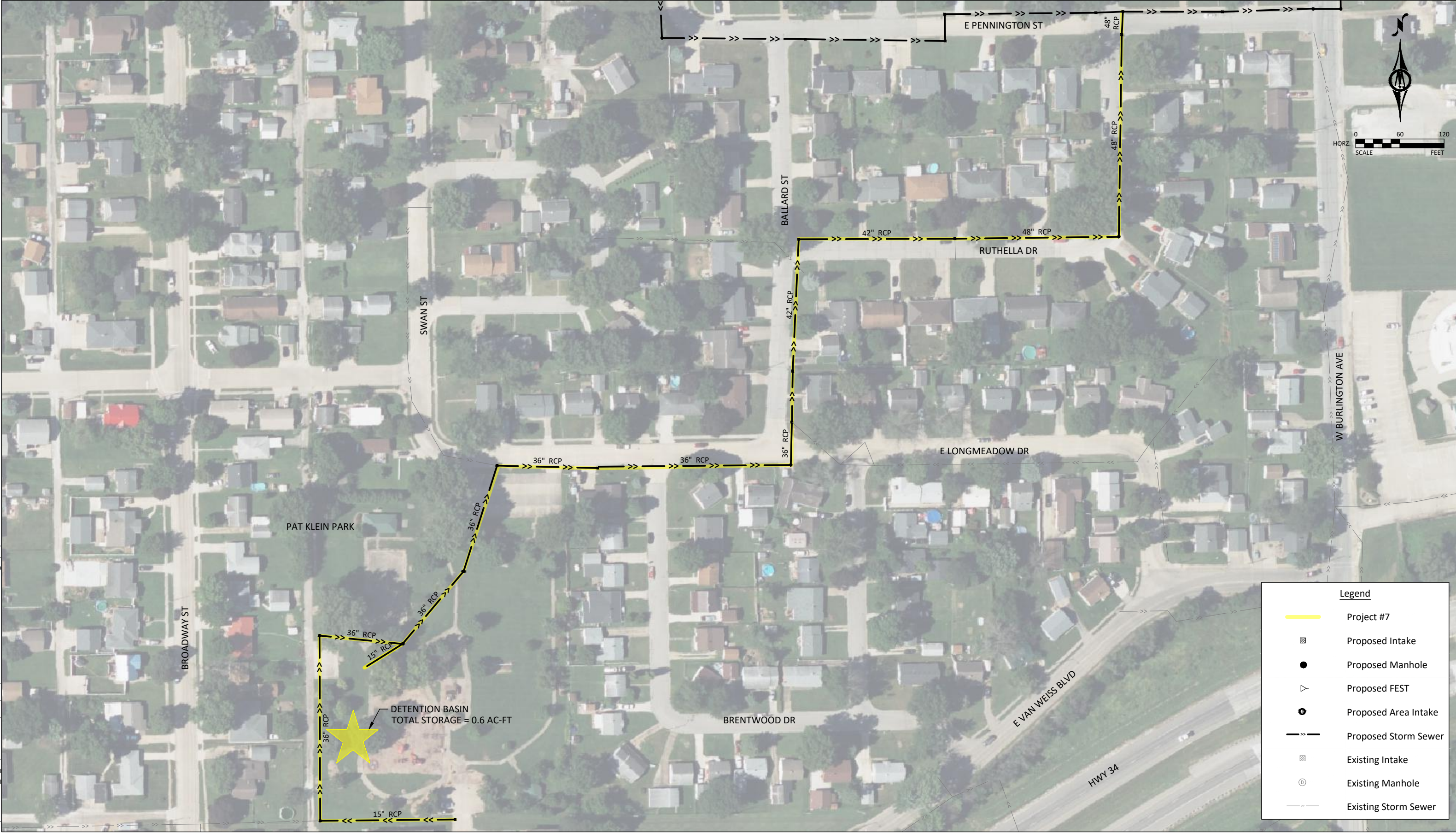


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# Appendix B: Cost Estimates

Cost Estimate B.1	Overall Cost Estimate
Cost Estimate B.2	Project #1
Cost Estimate B.3	Project #2
Cost Estimate B.4	Project #3
Cost Estimate B.5	Project #4
Cost Estimate B.6	Project #5
Cost Estimate B.7	Project #6
Cost Estimate B.8	Project #7

**ENGINEER'S ESTIMATE**

**2023 STORMWATER INFRASTRUCTURE IMPROVEMENTS PLAN**

**CITY OF WEST BURLINGTON**

BMI PROJECT NO. 0T7.133148



Real People. Real Solutions.

January 23, 2025

Item						
No.	Item	Unit	Quantity	Unit Price	Total Amount	
1	Project 1	LS	1	\$253,910.00	\$253,910.00	
2	Project 2	LS	1	\$556,680.00	\$556,680.00	
3	Project 3	LS	1	\$407,500.00	\$407,500.00	
4	Project 4	LS	1	\$401,550.00	\$401,550.00	
5	Project 5	LS	1	\$2,171,640.00	\$2,171,640.00	
6	Project 6	LS	1	\$1,864,920.00	\$1,864,920.00	
7	Project 7	LS	1	\$1,977,070.00	\$1,977,070.00	
				<b>TOTAL PROJECT COST:</b>	<b>\$7,633,270.00</b>	



January 23, 2025

PROJECT 1									
Item No.	Item Code	Item	Unit	Street	Storm	Misc.	Unit Price	Total Amount	
1	2010-B	CLEARING AND GRUBBING	AC	0	0	0.5	\$5,000.00	\$2,500.00	
2	2010-D-1	TOPSOIL, ON-SITE	CY	0	0	1500	\$20.00	\$30,000.00	
3	2010-E	EXCAVATION, CLASS 10	CY	3150	0	0	\$12.00	\$37,800.00	
4	2010-G	SUBGRADE PREPARATION	SY	25	0	0	\$2.75	\$68.75	
5	2010-J	SUBBASE, MODIFIED, 6 INCHES	SY	25	0	0	\$12.50	\$312.50	
6	2010-K-1	REMOVAL OF STRUCTURE, HEADWALL	EA	0	2	0	\$500.00	\$1,000.00	
7	2010-K-3-A	REMOVAL OF KNOWN PIPE AND CONDUIT, HDPE, 36 INCH	LF	0	40	0	\$10.00	\$400.00	
8	4030-A-1	PIPE CULVERT, TRENCHED, RCB, 42 INCH BY 48 INCH	LF	0	30	0	\$1,000.00	\$30,000.00	
9	7020-B	PAVEMENT, ASPHALT, ST, 5 INCH	SY	10	0	0	\$120.00	\$1,200.00	
10	7040-H	PAVEMENT REMOVAL	SY	10	0	0	\$12.00	\$120.00	
11	9010-B	HYDRAULIC SEEDING, SEEDING, FERTILIZING, AND MULCHING, TYPE 2 - COOL SEASON DITCHES	AC	0	0	1	\$3,000.00	\$3,000.00	
12	9040-A-1	SWPPP PREPARATION	LS	0	0	1	\$2,500.00	\$2,500.00	
13	9040-A-2	SWPPP MANAGEMENT	LS	0	0	1	\$3,500.00	\$3,500.00	
14	9040-D-1	FILTER SOCK, 9 INCH	LF	0	0	2200	\$2.50	\$5,500.00	
15	9040-D-2	FILTER SOCKS, REMOVAL	LF	0	0	2200	\$1.00	\$2,200.00	
16	9040-J	RIP RAP, CLASS E	TON	0	200	0	\$67.00	\$13,400.00	
17	11010-A	CONSTRUCTION SURVEY	LS	0	0	1	\$1,400.00	\$1,400.00	
18	11020-A	MOBILIZATION	LS	0	0	1	\$14,000.00	\$14,000.00	
OPINION OF PROBABLE CONSTRUCTION COST:				\$39,510.00	\$44,800.00	\$64,600.00		\$148,910.00	
PROJECT 1 - 20% CONTINGENCY:				\$8,000.00	\$9,000.00	\$13,000.00		\$30,000.00	
TOTAL ESTIMATED CONSTRUCTION COST:				\$47,510.00	\$53,800.00	\$77,600.00		\$178,910.00	
ENGINEERING, LEGAL, ADMIN (25%):				\$12,000.00	\$14,000.00	\$20,000.00		\$45,000.00	
PROPERTY ACQUISITION:								\$30,000.00	
TOTAL PROJECT COST:								\$253,910.00	

PROJECT 2									
Item No.	Item Code	Item	Unit	Street	Storm	Misc.	Unit Price	Total Amount	
D1	2010-B	CLEARING AND GRUBBING	AC	0	0	1	\$5,000.00	\$5,000.00	
D2	2010-D-1	TOPSOIL, ON-SITE	CY	0	0	1500	\$20.00	\$30,000.00	
D3	2010-E	EXCAVATION, CLASS 10	CY	11250	0	0	\$12.00	\$135,000.00	
D4	4020-A-1	STORM SEWER, TRENCHED, RCP, 36 INCH	LF	0	410	0	\$190.00	\$77,900.00	
D5	4030-B	PIPE APRON, RCP, 36 INCH	EA	0	1	0	\$2,800.00	\$2,800.00	
D6	4030-C	FOOTING FOR CONCRETE PIPE APRON, RCP, 36 INCH	EA	0	1	0	\$1,250.00	\$1,250.00	
D7	4030-D	PIPE APRON GUARD, RCP, 36 INCH	EA	0	1	0	\$1,800.00	\$1,800.00	
D8	6010-A	STORM MANHOLE, SW-401, 60 INCH	EA	0	1	0	\$6,600.00	\$6,600.00	
D9	6010-B	INTAKE, SW-513	EA	0	1	0	\$8,000.00	\$8,000.00	
D10	6010-G	CONNECTION TO EXISTING INTAKE	EA	0	1	0	\$1,600.00	\$1,600.00	
D11	8030-A	TEMPORARY TRAFFIC CONTROL	LS	0	0	1	\$2,000.00	\$2,000.00	
D12	9010-B	HYDRAULIC SEEDING, SEEDING, FERTILIZING, AND MULCHING, TYPE 2 - COOL SEASON DITCHES	AC	0	0	2	\$3,000.00	\$6,000.00	
D13	9040-A-1	SWPPP PREPARATION	LS	0	0	1	\$2,500.00	\$2,500.00	
D14	9040-A-2	SWPPP MANAGEMENT	LS	0	0	1	\$3,500.00	\$3,500.00	
D15	9040-D-1	FILTER SOCK, 9 INCH	LF	0	0	1800	\$2.50	\$4,500.00	
D16	9040-D-2	FILTER SOCKS, REMOVAL	LF	0	0	1800	\$1.00	\$1,800.00	
D17	9040-E	TEMPORARY RCP, 2.B	SY	0	0	5000	\$2.00	\$10,000.00	
D18	9040-J	RIP RAP, CLASS E	TON	0	150	0	\$67.00	\$10,050.00	
D19	9040-T-1	INLET PROTECTION DEVICE, DROP-IN	EA	0	0	1	\$150.00	\$150.00	
D20	9040-T-2	INLET PROTECTION DEVICE, MAINTENANCE	EA	0	0	1	\$30.00	\$30.00	
D21	11010-A	CONSTRUCTION SURVEY	LS	0	0	1	\$3,200.00	\$3,200.00	
D22	11020-A	MOBILIZATION	LS	0	0	1	\$32,000.00	\$32,000.00	
OPINION OF PROBABLE CONSTRUCTION COST:				\$135,000.00	\$110,000.00	\$100,680.00	\$345,680.00		
PROJECT 5 - 20% CONTINGENCY:				\$27,000.00	\$22,000.00	\$21,000.00	\$70,000.00		
TOTAL ESTIMATED CONSTRUCTION COST:				\$162,000.00	\$132,000.00	\$121,680.00	\$415,680.00		
ENGINEERING, LEGAL, ADMIN, (25%):				\$41,000.00	\$33,000.00	\$31,000.00	\$104,000.00		
PROPERTY ACQUISITION:							\$37,000.00		
TOTAL PROJECT COST:							\$556,680.00		

PROJECT 3								
Item No.	Item Code	Item	Unit	Street	Storm	Misc.	Unit Price	Total Amount
E1	2010-B	CLEARING AND GRUBBING	AC	0	0	0.5	\$5,000.00	\$2,500.00
E2	2010-D-1	TOPSOIL, ON-SITE	CY	0	0	2100	\$20.00	\$42,000.00
E3	2010-E	EXCAVATION, CLASS 10	CY	10750	0	0	\$12.00	\$129,000.00
E4	4020-A-1	STORM SEWER, TRENCHED, RCP, 30 INCH	LF	0	70	0	\$165.00	\$11,550.00
E5	4030-B	PIPE APRON, RCP, 30 INCH	EA	0	1	0	\$2,600.00	\$2,600.00
E6	4030-C	FOOTING FOR CONCRETE PIPE APRON, RCP, 30 INCH	EA	0	1	0	\$850.00	\$850.00
E7	4030-D	PIPE APRON GUARD, RCP, 30 INCH	EA	0	1	0	\$1,600.00	\$1,600.00
E8	6010-B	INTAKE, SW-513	EA	0	1	0	\$7,000.00	\$7,000.00
E9	9010-B	HYDRAULIC SEEDING, SEEDING, FERTILIZING, AND MULCHING, TYPE 2 - COOL SEASON DITCHES	AC	0	0	1.5	\$3,000.00	\$4,500.00
E10	9040-A-1	SWPPP PREPARATION	LS	0	0	1	\$2,500.00	\$2,500.00
E11	9040-A-2	SWPPP MANAGEMENT	LS	0	0	1	\$3,500.00	\$3,500.00
E12	9040-D-1	FILTER SOCK, 9 INCH	LF	0	0	1300	\$2.50	\$3,250.00
E13	9040-D-2	FILTER SOCKS, REMOVAL	LF	0	0	1300	\$1.00	\$1,300.00
E14	9040-E	TEMPORARY RECIP, 2.B	SY	0	0	3000	\$2.00	\$6,000.00
E15	9040-J	RIP RAP, CLASS E	TON	0	150	0	\$67.00	\$10,050.00
E16	11010-A	CONSTRUCTION SURVEY	LS	0	0	1	\$2,300.00	\$2,300.00
E17	11020-A	MOBILIZATION	LS	0	0	1	\$23,000.00	\$23,000.00
OPINION OF PROBABLE CONSTRUCTION COST:				\$129,000.00	\$33,650.00	\$90,850.00		\$253,500.00
PROJECT 6 - 20% CONTINGENCY:				\$26,000.00	\$7,000.00	\$19,000.00		\$51,000.00
TOTAL ESTIMATED CONSTRUCTION COST:				\$155,000.00	\$40,650.00	\$109,850.00		\$304,500.00
ENGINEERING, LEGAL, ADMIN (25%):				\$39,000.00	\$11,000.00	\$28,000.00		\$77,000.00
PROPERTY ACQUISITION:								\$26,000.00
TOTAL PROJECT COST:								\$407,500.00

PROJECT 4								
Item No.	Item Code	Item	Unit	Street	Storm	Misc.	Unit Price	Total Amount
F1	2010-D-1	TOPSOIL, ON-SITE	CY	0	0	1200	\$20.00	\$24,000.00
F2	2010-E	EXCAVATION, CLASS 10	CY	10050	0	0	\$12.00	\$120,600.00
F3	4020-A-1	STORM SEWER, TRENCHED, RCP, 42 INCH	LF	0	75	0	\$300.00	\$22,500.00
F4	4030-B	PIPE APRON, RCP, 42 INCH	EA	0	2	0	\$3,800.00	\$7,600.00
F5	4030-C	FOOTING FOR CONCRETE PIPE APRON, RCP, 42 INCH	EA	0	2	0	\$1,800.00	\$3,600.00
F6	4030-D	PIPE APRON GUARD, RCP, 42 INCH	EA	0	2	0	\$2,000.00	\$4,000.00
F7	6010-A	STORM MANHOLE, SW-401, 72 INCH	EA	0	1	0	\$8,700.00	\$8,700.00
F8	9010-B	HYDRAULIC SEEDING, SEEDING, FERTILIZING, AND MULCHING, TYPE 2 - COOL SEASON DITCHES	AC	0	0	1.5	\$3,000.00	\$4,500.00
F9	9040-A-1	SWPPP PREPARATION	LS	0	0	1	\$2,500.00	\$2,500.00
F10	9040-A-2	SWPPP MANAGEMENT	LS	0	0	1	\$3,500.00	\$3,500.00
F11	9040-D-1	FILTER SOCK, 9 INCH	LF	0	0	1000	\$2.50	\$2,500.00
F12	9040-D-2	FILTER SOCKS, REMOVAL	LF	0	0	1000	\$1.00	\$1,000.00
F13	9040-E	TEMPORARY RECP, 2.B	SY	0	0	3100	\$2.00	\$6,200.00
F14	9040-J	RIP RAP, CLASS E	TON	0	150	0	\$67.00	\$10,050.00
F15	11010-A	CONSTRUCTION SURVEY	LS	0	0	1	\$2,300.00	\$2,300.00
F16	11020-A	MOBILIZATION	LS	0	0	1	\$23,000.00	\$23,000.00
OPINION OF PROBABLE CONSTRUCTION COST:				\$120,600.00	\$56,450.00	\$69,500.00		\$246,550.00
PROJECT ALTERNATE - 20% CONTINGENCY:				\$25,000.00	\$12,000.00	\$14,000.00		\$50,000.00
TOTAL ESTIMATED CONSTRUCTION COST:				\$145,600.00	\$68,450.00	\$83,500.00		\$296,550.00
ENGINEERING, LEGAL, ADMIN (25%):				\$37,000.00	\$18,000.00	\$21,000.00		\$75,000.00
PROPERTY ACQUISITION:								\$30,000.00
TOTAL PROJECT COST:								\$401,550.00

PROJECT 5								
Item No.	Item Code	Item	Unit	Street	Storm	Misc.	Unit Price	Total Amount
B1	2010-D-1	TOPSOIL, ON-SITE	CY	0	0	500	\$20.00	\$10,000.00
B2	2010-G	SUBGRADE PREPARATION	SY	2950	0	0	\$2.75	\$8,112.50
B3	2010-J	SUBBASE, MODIFIED, 6 INCHES	SY	2950	0	0	\$12.50	\$36,875.00
B4	2010-K-1	REMOVAL OF STRUCTURE, STORM	EA	0	12	0	\$500.00	\$6,000.00
B5	2010-K-3-A	REMOVAL OF KNOWN PIPE AND CONDUIT, RCP, 36 INCH OR LESS	LF	0	1500	0	\$10.00	\$15,000.00
B6	2010-L-1	FILLING AND PLUGGING OF KNOWN PIPE CULVERTS, PIPES AND CONDUITS, RCP, 36 INCH OR LESS	LF	0	350	0	\$10.00	\$3,500.00
B7	2010-M	COMPACTION TESTING	LS	1	0	0	\$4,000.00	\$4,000.00
B8	3010-C	TRENCH FOUNDATION	TON	0	125	0	\$40.00	\$5,000.00
B9	3010-F	TRENCH COMPACTION TESTING	LS	0	1	0	\$3,000.00	\$3,000.00
B10	4020-A-1	STORM SEWER, TRENCHED, RCP, 15 INCH	LF	0	445	0	\$95.00	\$42,275.00
B11	4020-A-1	STORM SEWER, TRENCHED, RCP, 18 INCH	LF	0	415	0	\$105.00	\$43,575.00
B12	4020-A-1	STORM SEWER, TRENCHED, RCP, 24 INCH	LF	0	245	0	\$135.00	\$33,075.00
B13	4020-A-1	STORM SEWER, TRENCHED, RCP, 48 INCH	LF	0	30	0	\$330.00	\$9,900.00
B14	4020-A-1	STORM SEWER, TRENCHED, RCP, 60 INCH	LF	0	985	0	\$350.00	\$344,750.00
B15	4030-A-1	PIPE CULVERT, TRENCHED, RCB, 60 INCH BY 48 INCH	LF	0	70	0	\$1,150.00	\$80,500.00
B16	6010-A	STORM MANHOLE, SW-401, 48 INCH	EA	0	1	0	\$4,500.00	\$4,500.00
B17	6010-A	STORM MANHOLE, SW-401, 96 INCH	EA	0	2	0	\$16,000.00	\$32,000.00
B18	6010-A	STORM MANHOLE, SW-402, 96 INCH	EA	0	4	0	\$11,000.00	\$44,000.00
B19	6010-B	INTAKE, SW-502	EA	0	4	0	\$12,000.00	\$48,000.00
B20	6010-B	INTAKE, SW-509	EA	0	4	0	\$9,000.00	\$36,000.00
B21	6010-G	CONNECTION TO EXISTING INTAKE	EA	0	1	0	\$1,600.00	\$1,600.00
B22	7010-A	PAVEMENT, PCC, 8 INCH, C MIX	SY	2000	0	0	\$78.00	\$156,000.00
B23	7030-A-1	REMOVAL OF SIDEWALK	SY	445	0	0	\$12.00	\$5,340.00
B24	7030-A-3	REMOVAL OF DRIVEWAY	SY	225	0	0	\$12.00	\$2,700.00
B25	7030-E	SIDEWALK, PCC, 5 INCH	SY	445	0	0	\$65.00	\$28,925.00
B26	7030-H-1	DRIVEWAY, PAVED, PCC, 6 INCH	SY	225	0	0	\$70.00	\$15,750.00
B27	7040-H	PAVEMENT REMOVAL	SY	2600	0	0	\$12.00	\$31,200.00
B28	8030-A	TEMPORARY TRAFFIC CONTROL	LS	0	0	1	\$10,000.00	\$10,000.00
B29	8040-I	REMOVE AND REINSTALL TRAFFIC SIGNS	EA	0	0	8	\$300.00	\$2,400.00
B30	9020-A	SOD	SY	2400	0	0	\$90.00	\$216,000.00
B31	9040-A-1	SWPPP PREPARATION	LS	0	0	1	\$2,500.00	\$2,500.00
B32	9040-A-2	SWPPP MANAGEMENT	LS	0	0	1	\$3,500.00	\$3,500.00
B33	9040-D-1	FILTER SOCK, 9 INCH	LF	0	0	2200	\$2.50	\$5,500.00
B34	9040-D-2	FILTER SOCKS, REMOVAL	LF	0	0	2200	\$1.00	\$2,200.00
B35	9040-T-1	INLET PROTECTION DEVICE, DROP-IN	EA	0	0	12	\$150.00	\$1,800.00
B36	9040-T-2	INLET PROTECTION DEVICE, MAINTENANCE	EA	0	0	12	\$30.00	\$360.00
B37	11010-A	CONSTRUCTION SURVEY	LS	0	0	1	\$13,000.00	\$13,000.00
B38	11020-A	MOBILIZATION	LS	0	0	1	\$130,000.00	\$130,000.00
B39	11050-A	CONCRETE WASHOUT	LS	0	0	1	\$2,000.00	\$2,000.00

OPINION OF PROBABLE CONSTRUCTION COST:	\$504,910.00	\$752,680.00	\$183,260.00	\$1,440,840.00
PROJECT 3 - 20% CONTINGENCY:	\$101,000.00	\$151,000.00	\$37,000.00	\$289,000.00
TOTAL ESTIMATED CONSTRUCTION COST:	\$605,910.00	\$903,680.00	\$220,260.00	\$1,729,840.00
ENGINEERING, LEGAL, ADMIN (25%):	\$152,000.00	\$226,000.00	\$56,000.00	\$433,000.00

PROPERTY ACQUISITION:	\$8,800.00
TOTAL PROJECT COST:	\$2,171,640.00

PROJECT 6									
Item No.	Item Code	Item	Unit	Street	Storm	Misc.	Unit Price	Total Amount	
A1	2010-D-1	TOPSOIL, ON-SITE	CY	0	0	400	\$20.00	\$8,000.00	
A2	2010-G	SUBGRADE PREPARATION	SY	2900	0	0	\$2.75	\$7,975.00	
A3	2010-J	SUBBASE, MODIFIED, 6 INCHES	SY	2900	0	0	\$12.50	\$36,250.00	
A4	2010-K-1	REMOVAL OF STRUCTURE, STORM	EA	0	11	0	\$500.00	\$5,500.00	
A5	2010-K-3-A	REMOVAL OF KNOWN PIPE AND CONDUIT, RCP, 36 INCH OR LESS	LF	0	1850	0	\$10.00	\$18,500.00	
A6	2010-L-1	FILLING AND PLUGGING OF KNOWN PIPE CULVERTS, PIPES AND CONDUITS, RCP, 36 INCH OR LESS	LF	0	185	0	\$10.00	\$1,850.00	
A7	2010-M	COMPACTION TESTING	LS	1	0	0	\$4,000.00	\$4,000.00	
A8	3010-C	TRENCH FOUNDATION	TON	0	75	0	\$40.00	\$3,000.00	
A9	3010-F	TRENCH COMPACTION TESTING	LS	0	1	0	\$3,000.00	\$3,000.00	
A10	4020-A-1	STORM SEWER, TRENCHED, RCP, 18 INCH	LF	0	405	0	\$105.00	\$42,525.00	
A11	4020-A-1	STORM SEWER, TRENCHED, RCP, 36 INCH	LF	0	720	0	\$190.00	\$136,800.00	
A12	4020-A-1	STORM SEWER, TRENCHED, RCP, 42 INCH	LF	0	570	0	\$300.00	\$171,000.00	
A13	4020-A-1	STORM SEWER, TRENCHED, RCP, 48 INCH	LF	0	220	0	\$330.00	\$72,600.00	
A14	6010-B	INTAKE, SW-S02	EA	0	8	0	\$12,000.00	\$96,000.00	
A15	6010-B	INTAKE, SW-S07	EA	0	3	0	\$7,000.00	\$21,000.00	
A16	6010-G	CONNECTION TO EXISTING INTAKE	EA	0	1	0	\$1,600.00	\$1,600.00	
A17	7010-A	PAVEMENT, PCC, 8 INCH, C MIX	SY	1750	0	0	\$78.00	\$136,500.00	
A18	7030-A-1	REMOVAL OF SIDEWALK	SY	615	0	0	\$12.00	\$7,380.00	
A19	7030-A-3	REMOVAL OF DRIVEWAY	SY	250	0	0	\$12.00	\$3,000.00	
A20	7030-E	SIDEWALK, PCC, 5 INCH	SY	615	0	0	\$65.00	\$39,975.00	
A21	7030-H-1	DRIVEWAY, PAVED, PCC, 6 INCH	SY	250	0	0	\$70.00	\$17,500.00	
A22	7040-H	PAVEMENT REMOVAL	SY	2800	0	0	\$12.00	\$33,600.00	
A23	8030-A	TEMPORARY TRAFFIC CONTROL	LS	0	0	1	\$8,000.00	\$8,000.00	
A24	8040-I	REMOVE AND REINSTALL TRAFFIC SIGNS	EA	0	0	9	\$300.00	\$2,700.00	
A25	9020-A	SOD	SY	2500	0	0	\$90.00	\$225,000.00	
A26	9040-A-1	SWPPP PREPARATION	LS	0	0	1	\$2,500.00	\$2,500.00	
A27	9040-A-2	SWPPP MANAGEMENT	LS	0	0	1	\$3,500.00	\$3,500.00	
A28	9040-D-1	FILTER SOCK, 9 INCH	LF	0	0	1800	\$2.50	\$4,500.00	
A29	9040-D-2	FILTER SOCKS, REMOVAL	LF	0	0	1800	\$1.00	\$1,800.00	
A30	9040-T-1	INLET PROTECTION DEVICE, DROP-IN	EA	0	0	12	\$150.00	\$1,800.00	
A31	9040-T-2	INLET PROTECTION DEVICE, MAINTENANCE	EA	0	0	12	\$30.00	\$360.00	
A32	11010-A	CONSTRUCTION SURVEY	LS	0	0	1	\$11,200.00	\$11,200.00	
A33	11020-A	MOBILIZATION	LS	0	0	1	\$112,000.00	\$112,000.00	
A34	11050-A	CONCRETE WASHOUT	LS	0	0	1	\$2,000.00	\$2,000.00	
OPINION OF PROBABLE CONSTRUCTION COST:				\$511,180.00	\$573,380.00	\$158,360.00		\$1,242,920.00	
PROJECT 2 - 20% CONTINGENCY:				\$103,000.00	\$115,000.00	\$32,000.00		\$249,000.00	
TOTAL ESTIMATED CONSTRUCTION COST:				\$614,180.00	\$688,380.00	\$190,360.00		\$1,491,920.00	
ENGINEERING, LEGAL, ADMIN (25%):				\$154,000.00	\$173,000.00	\$48,000.00		\$373,000.00	
TOTAL PROJECT COST:								\$1,864,920.00	



PROJECT 7								
Item No.	Item Code	Item	Unit	Street	Storm	Misc.	Unit Price	Total Amount
C1	2010-D-1	TOPSOIL, ON-SITE	CY	0	0	800	\$20.00	\$16,000.00
C2	2010-E	EXCAVATION, CLASS 10	CY	1375	0	0	\$12.00	\$16,500.00
C3	2010-G	SUBGRADE PREPARATION	SY	1950	0	0	\$2.75	\$5,362.50
C4	2010-J	SUBBASE, MODIFIED, 6 INCHES	SY	1950	0	0	\$12.50	\$24,375.00
C5	2010-K-1	REMOVAL OF STRUCTURE, STORM	EA	0	7	0	\$500.00	\$3,500.00
C6	2010-K-3-A	REMOVAL OF KNOWN PIPE AND CONDUIT, RCP, 36 INCH OR LESS	LF	0	1850	0	\$10.00	\$18,500.00
C7	2010-L-1	FILLING AND PLUGGING OF KNOWN PIPE CULVERTS, PIPES AND CONDUITS, RCP, 36 INCH OR LESS	LF	0	275	0	\$10.00	\$2,750.00
C8	2010-M	COMPACTION TESTING	LS	1	0	0	\$4,000.00	\$4,000.00
C9	3010-C	TRENCH FOUNDATION	TON	0	85	0	\$40.00	\$3,400.00
C10	3010-F	TRENCH COMPACTION TESTING	LS	0	1	0	\$3,000.00	\$3,000.00
C11	4020-A-1	STORM SEWER, TRENCHED, RCP, 15 INCH	LF	0	185	0	\$95.00	\$17,575.00
C12	4020-A-1	STORM SEWER, TRENCHED, RCP, 36 INCH	LF	0	1095	0	\$190.00	\$208,050.00
C13	4020-A-1	STORM SEWER, TRENCHED, RCP, 42 INCH	LF	0	460	0	\$300.00	\$138,000.00
C14	4020-A-1	STORM SEWER, TRENCHED, RCP, 48 INCH	LF	0	495	0	\$330.00	\$163,350.00
C15	4030-B	PIPE APRON, RCP, 15 INCH	EA	0	1	0	\$1,800.00	\$1,800.00
C16	4030-C	FOOTING FOR CONCRETE PIPE APRON, RCP, 15 INCH	EA	0	1	0	\$750.00	\$750.00
C17	4030-D	PIPE APRON GUARD, RCP, 15 INCH	EA	0	1	0	\$1,100.00	\$1,100.00
C18	6010-A	STORM MANHOLE, SW-401, 84 INCH	EA	0	5	0	\$12,000.00	\$60,000.00
C19	6010-B	INTAKE, SW-502	EA	0	6	0	\$12,000.00	\$72,000.00
C20	6010-B	INTAKE, SW-509	EA	0	1	0	\$9,000.00	\$9,000.00
C21	6010-B	INTAKE, SW-513	EA	0	1	0	\$8,000.00	\$8,000.00
C22	6010-G	CONNECTION TO EXISTING INTAKE	EA	0	1	0	\$1,600.00	\$1,600.00
C23	7010-A	PAVEMENT, PCC, 8 INCH, C MIX	SY	1400	0	0	\$78.00	\$109,200.00
C24	7030-A-1	REMOVAL OF SIDEWALK	SY	10	0	0	\$12.00	\$120.00
C25	7030-A-3	REMOVAL OF DRIVEWAY	SY	350	0	0	\$12.00	\$4,200.00
C26	7030-E	SIDEWALK, PCC, 5 INCH	SY	10	0	0	\$65.00	\$650.00
C27	7030-H-1	DRIVEWAY, PAVED, PCC, 6 INCH	SY	350	0	0	\$70.00	\$24,500.00
C28	7040-H	PAVEMENT REMOVAL	SY	2550	0	0	\$12.00	\$30,600.00
C29	8030-A	TEMPORARY TRAFFIC CONTROL	LS	0	0	1	\$10,000.00	\$10,000.00
C30	8040-I	REMOVE AND REINSTALL TRAFFIC SIGNS	EA	0	0	12	\$300.00	\$3,600.00
C31	9020-A	SOD	SY	2200	0	0	\$90.00	\$198,000.00
C32	9040-A-1	SWPPP PREPARATION	LS	0	0	1	\$2,500.00	\$2,500.00
C33	9040-A-2	SWPPP MANAGEMENT	LS	0	0	1	\$3,500.00	\$3,500.00
C34	9040-D-1	FILTER SOCK, 9 INCH	LF	0	0	2000	\$2.50	\$5,000.00
C35	9040-D-2	FILTER SOCKS, REMOVAL	LF	0	0	2000	\$1.00	\$2,000.00
C36	9040-J	RIP RAP, CLASS E	TON	0	100	0	\$67.00	\$6,700.00
C37	9040-T-1	INLET PROTECTION DEVICE, DROP-IN	EA	0	0	11	\$150.00	\$1,650.00
C38	9040-T-2	INLET PROTECTION DEVICE, MAINTENANCE	EA	0	0	11	\$30.00	\$330.00
C39	11010-A	CONSTRUCTION SURVEY	LS	0	0	1	\$11,900.00	\$11,900.00
C40	11020-A	MOBILIZATION	LS	0	0	1	\$119,000.00	\$119,000.00
C41	11050-A	CONCRETE WASHOUT	LS	0	0	1	\$2,000.00	\$2,000.00
C42	12000-999-X	REMOVE AND REINSTALL FIELD GOALS	EACH	0	0	2	\$1,500.00	\$3,000.00
OPINION OF PROBABLE CONSTRUCTION COST:				\$417,510.00	\$719,080.00	\$180,480.00		\$1,317,070.00
PROJECT 4 - 20% CONTINGENCY:				\$84,000.00	\$144,000.00	\$37,000.00		\$264,000.00
TOTAL ESTIMATED CONSTRUCTION COST:				\$501,510.00	\$863,080.00	\$217,480.00		\$1,581,070.00
ENGINEERING, LEGAL, ADMIN (25%):				\$126,000.00	\$216,000.00	\$55,000.00		\$396,000.00
TOTAL PROJECT COST:								\$1,977,070.00

# Appendix C: Hydraulic Performance Maps

- Figure C.1 Existing 5-Year West Watershed Performance Map
- Figure C.2 Existing 10-Year West Watershed Performance Map
- Figure C.3 Existing 100-Year West Watershed Performance Map
- Figure C.4 Existing 5-Year East Watershed Performance Map
- Figure C.5 Proposed 5-Year East Watershed Performance Map
- Figure C.6 Existing 10-Year East Watershed Performance Map
- Figure C.7 Proposed 10-Year East Watershed Performance Map
- Figure C.8 Existing 100-Year East Watershed Performance Map
- Figure C.9 Proposed 100-Year East Watershed Performance Map



Information

This map shows the surface ponding of various storm sewer structures throughout town. The green color indicates water is contained within the structure; red indicates surface ponding. Identified is the corresponding available freeboard or ponding depth.

Legend



Pipes



Channels



Manholes

- Available Freeboard
- < 0.5 ft Ponding
- 0.5 - 2.0 ft Ponding
- > 2.0 ft Ponding

Junctions

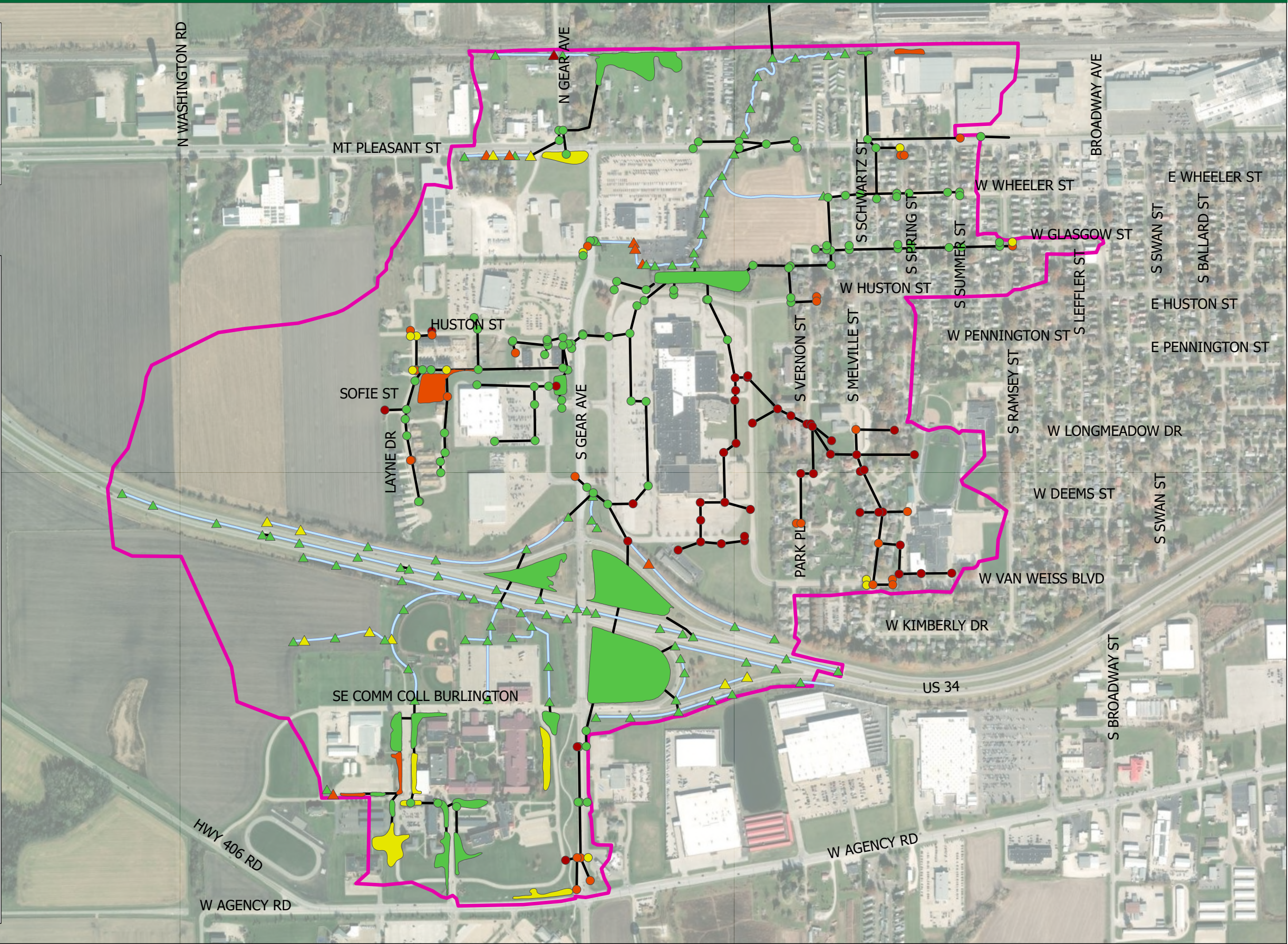
- Available Freeboard
- < 0.5 ft Ponding
- 0.5 - 2.0 ft Ponding
- > 2.0 ft Ponding

Detention Basins

- > 0.5 ft Freeboard
- < 0.5 ft Freeboard
- No Available Freeboard



Source:





**Information**

This map shows the surface ponding of various storm sewer structures throughout town. The green color indicates water is contained within the structure; red indicates surface ponding. Identified is the corresponding available freeboard or ponding depth.

**Legend**

**Pipes**

—

**Channels**

—

**Manholes**

- Available Freeboard
- < 0.5 ft Ponding
- 0.5 - 2.0 ft Ponding
- > 2.0 ft Ponding

**Junctions**

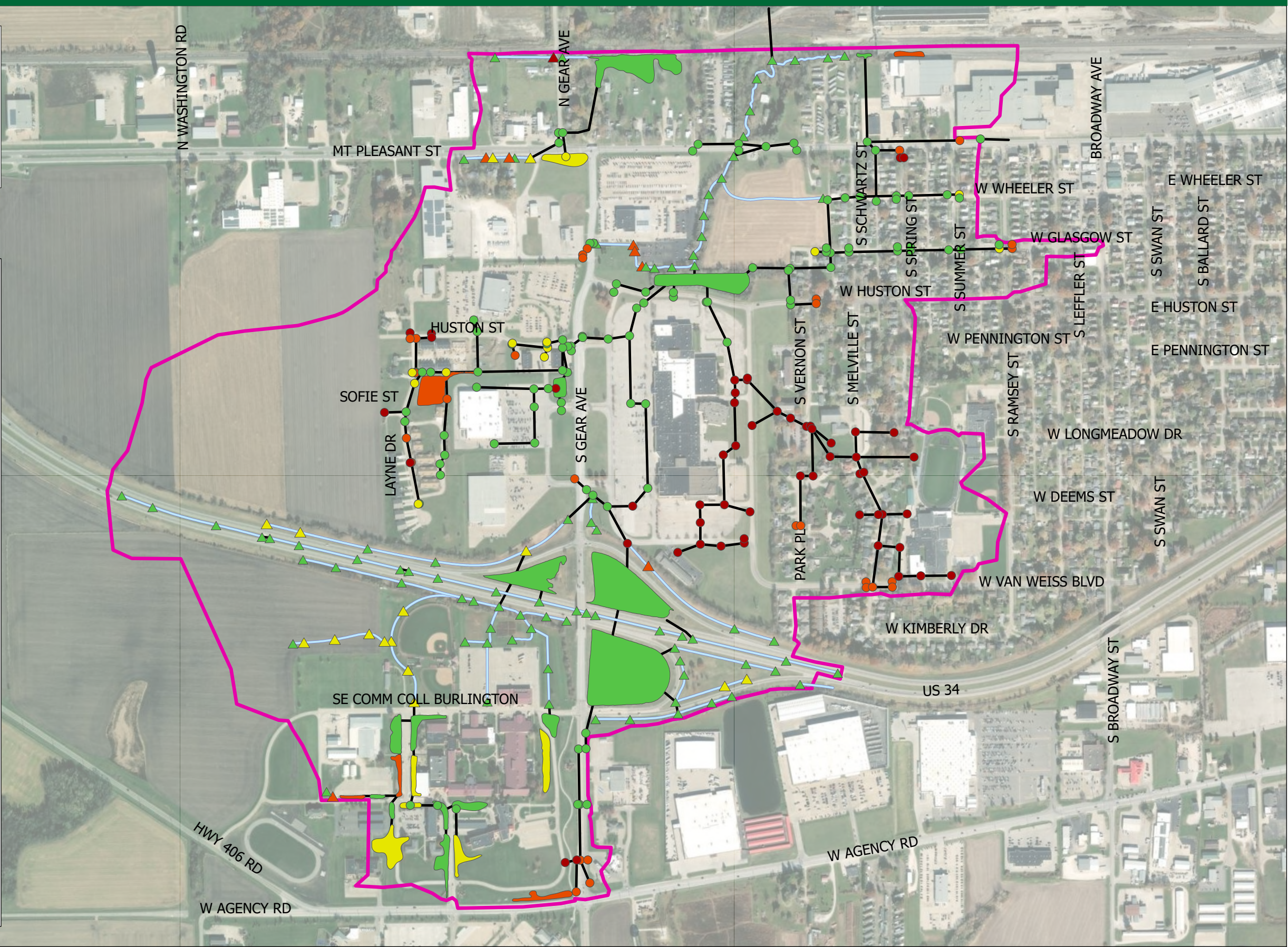
- ▲ Available Freeboard
- ▲ < 0.5 ft Ponding
- ▲ 0.5 - 2.0 ft Ponding
- ▲ > 2.0 ft Ponding

**Detention Basins**

- > 0.5 ft Freeboard
- < 0.5 ft Freeboard
- No Available Freeboard

0 2,000 Feet

Source:





Information

This map shows the surface ponding of various storm sewer structures throughout town. The green color indicates water is contained within the structure; red indicates surface ponding. Identified is the corresponding available freeboard or ponding depth.

Legend

Pipes



Channels



Manholes

- Available Freeboard
- < 0.5 ft Ponding
- 0.5 - 2.0 ft Ponding
- > 2.0 ft Ponding

Junctions

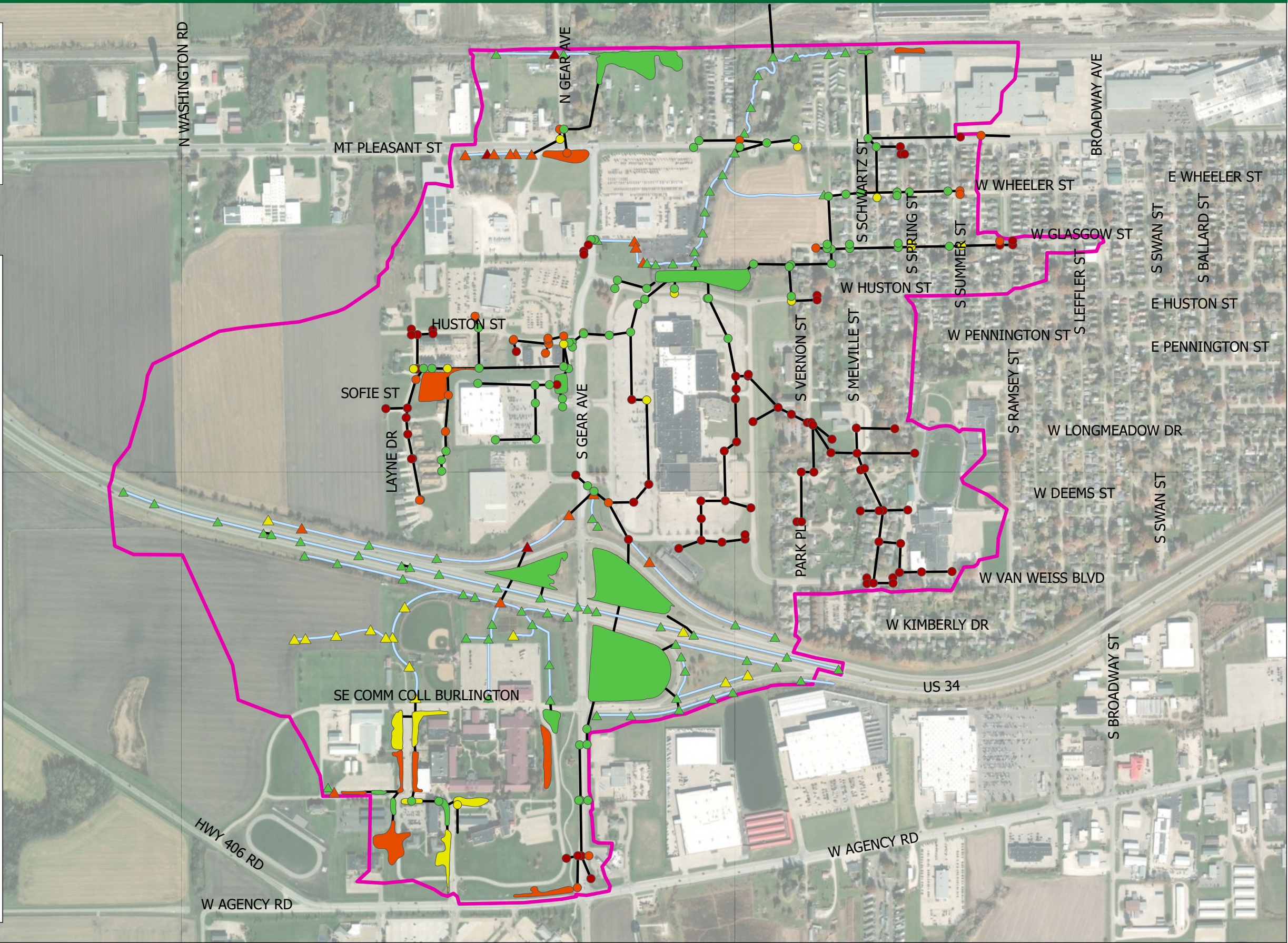
- Available Freeboard
- < 0.5 ft Ponding
- 0.5 - 2.0 ft Ponding
- > 2.0 ft Ponding

Detention Basins

- > 0.5 ft Freeboard
- < 0.5 ft Freeboard
- No Available Freeboard

0 2,000 Feet

Source:





Information

This map shows the surface ponding of various storm sewer structures throughout town. The green color indicates water is contained within the structure; red indicates surface ponding. Identified is the corresponding available freeboard or ponding depth.

Legend

Pipes

Channels

Manholes

- Available Freeboard
- < 0.5 ft Ponding
- 0.5 - 2.0 ft Ponding
- > 2.0 ft Ponding

Junctions

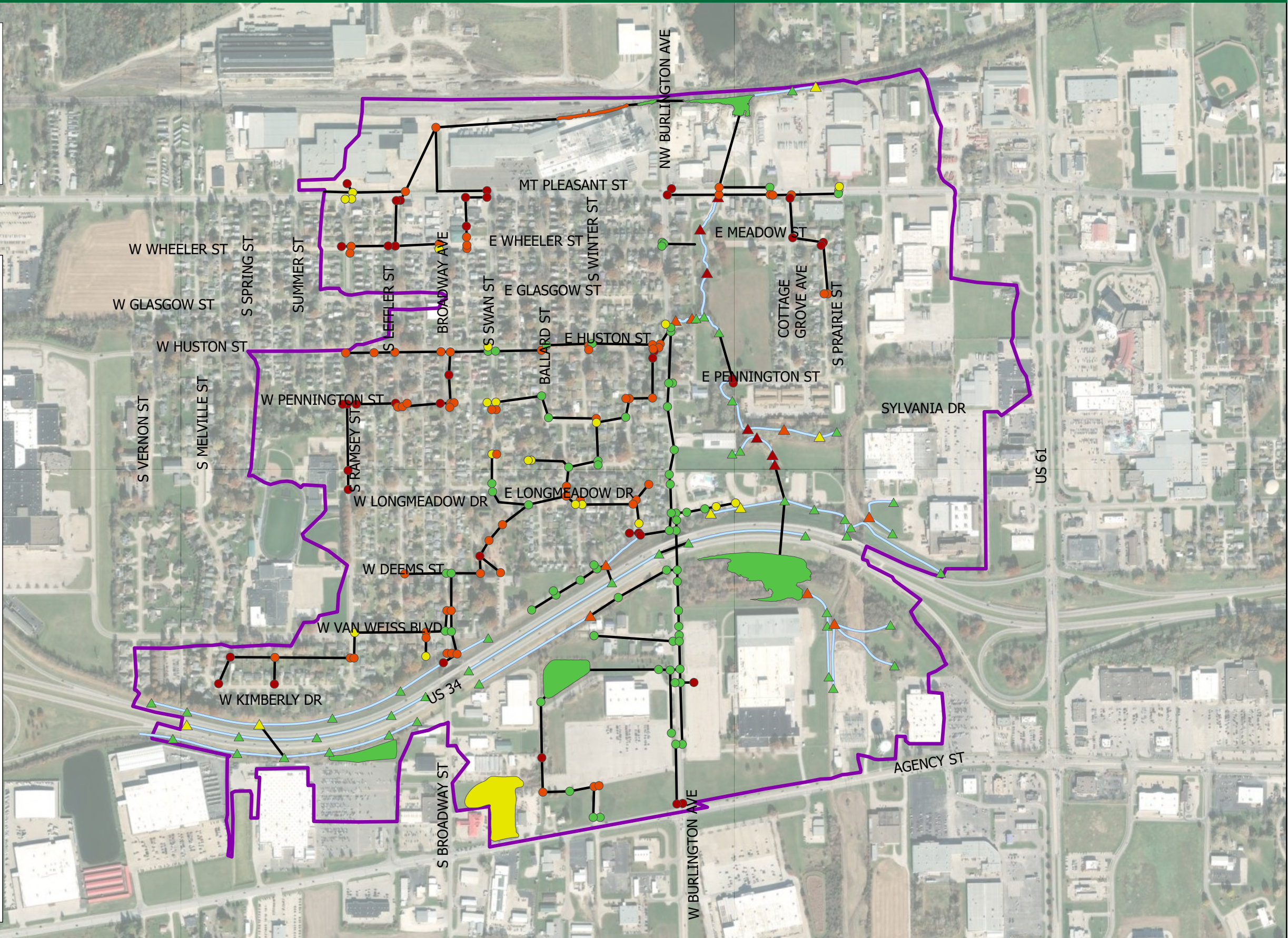
- Available Freeboard
- < 0.5 ft Ponding
- 0.5 - 2.0 ft Ponding
- > 2.0 ft Ponding

Detention Basins

- > 0.5 ft Freeboard
- < 0.5 ft Freeboard
- No Available Freeboard

0 2,000 Feet

Source:





Information

This map shows the surface ponding of various storm sewer structures throughout town. The green color indicates water is contained within the structure; red indicates surface ponding. Identified is the corresponding available freeboard or ponding depth.

Legend

Pipes

Channels

Manholes

- Available Freeboard
- < 0.5 ft Ponding
- 0.5 - 2.0 ft Ponding
- > 2.0 ft Ponding

Junctions

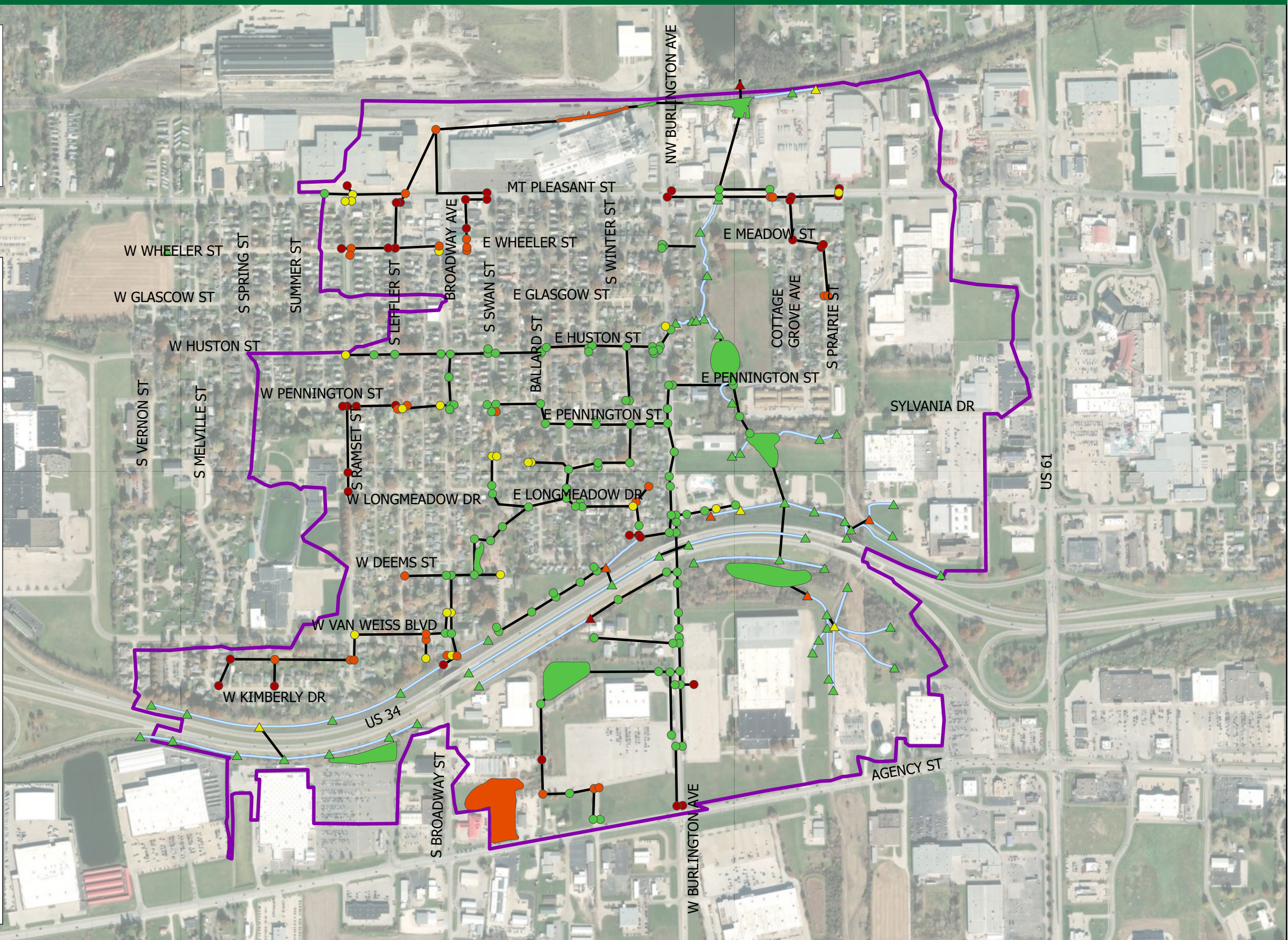
- Available Freeboard
- < 0.5 ft Ponding
- 0.5 - 2.0 ft Ponding
- > 2.0 ft Ponding

Detention Basins

- > 0.5 ft Freeboard
- < 0.5 ft Freeboard
- No Available Freeboard

0 2,000 Feet

Source:





Information

This map shows the surface ponding of various storm sewer structures throughout town. The green color indicates water is contained within the structure; red indicates surface ponding. Identified is the corresponding available freeboard or ponding depth.

Legend

Pipes

Channels

Manholes

- Available Freeboard
- < 0.5 ft Ponding
- 0.5 - 2.0 ft Ponding
- > 2.0 ft Ponding

Junctions

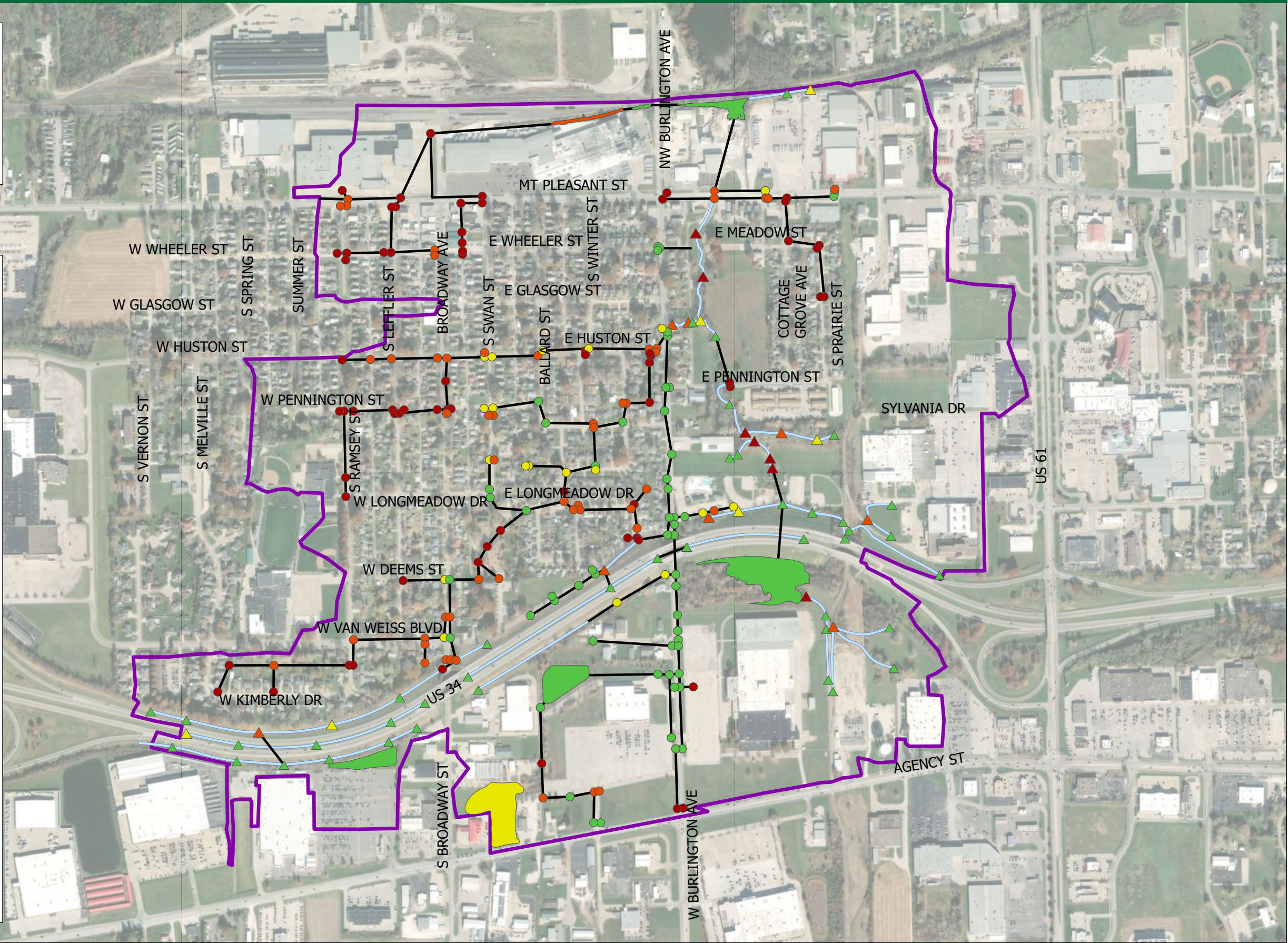
- Available Freeboard
- < 0.5 ft Ponding
- 0.5 - 2.0 ft Ponding
- > 2.0 ft Ponding

Detention Basins

- > 0.5 ft Freeboard
- < 0.5 ft Freeboard
- No Available Freeboard

0 2,000 Feet

Source:





Information

This map shows the surface ponding of various storm sewer structures throughout town. The green color indicates water is contained within the structure; red indicates surface ponding. Identified is the corresponding available freeboard or ponding depth.

Legend

Pipes



Channels



Manholes

- Available Freeboard
- < 0.5 ft Ponding
- 0.5 - 2.0 ft Ponding
- > 2.0 ft Ponding

Junctions

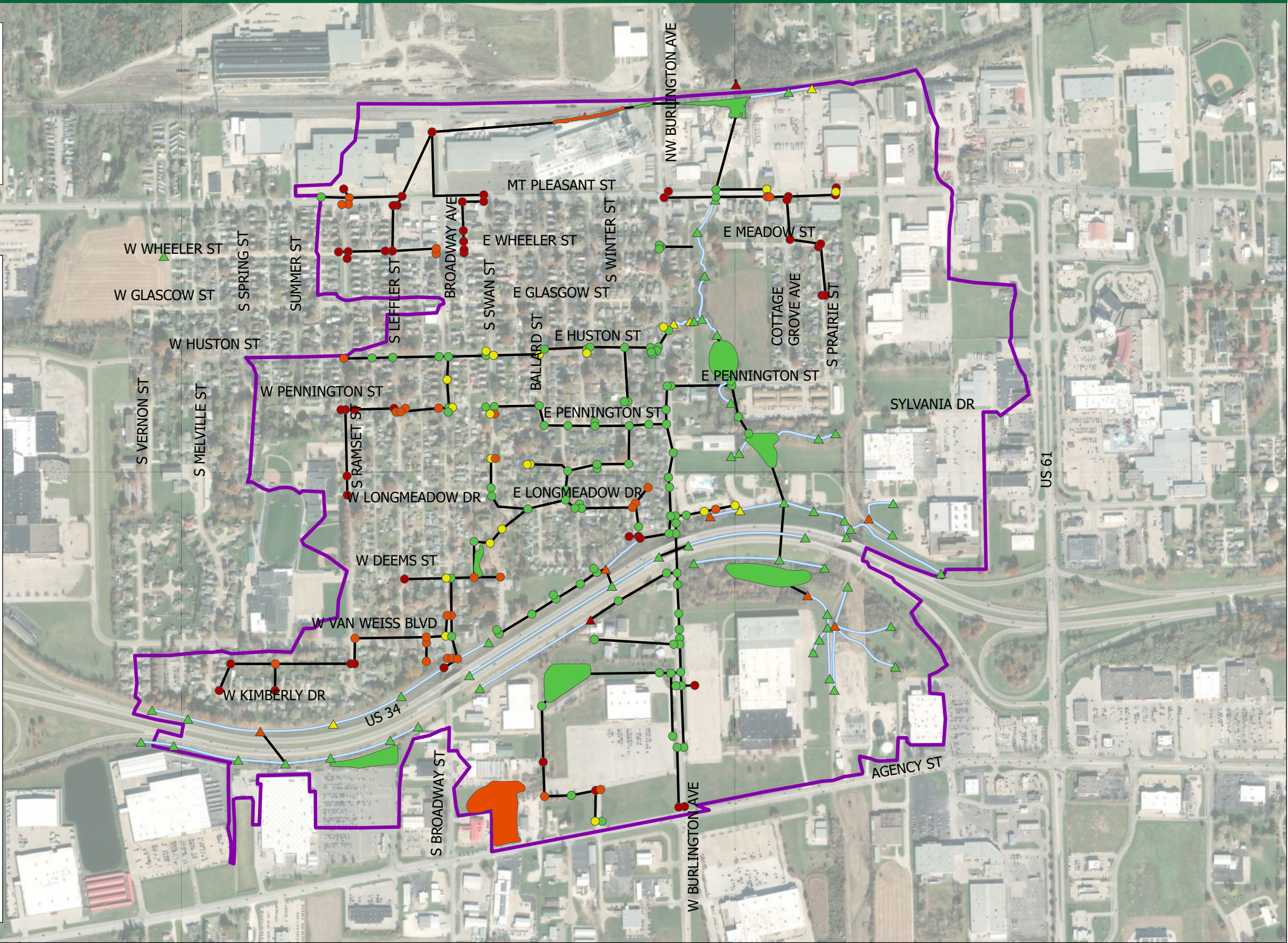
- Available Freeboard
- < 0.5 ft Ponding
- 0.5 - 2.0 ft Ponding
- > 2.0 ft Ponding

Detention Basins

- > 0.5 ft Freeboard
- < 0.5 ft Freeboard
- No Available Freeboard



Source:





Information

This map shows the surface ponding of various storm sewer structures throughout town. The green color indicates water is contained within the structure; red indicates surface ponding. Identified is the corresponding available freeboard or ponding depth.

Legend

Pipes

Channels

Manholes

- Available Freeboard
- < 0.5 ft Ponding
- 0.5 - 2.0 ft Ponding
- > 2.0 ft Ponding

Junctions

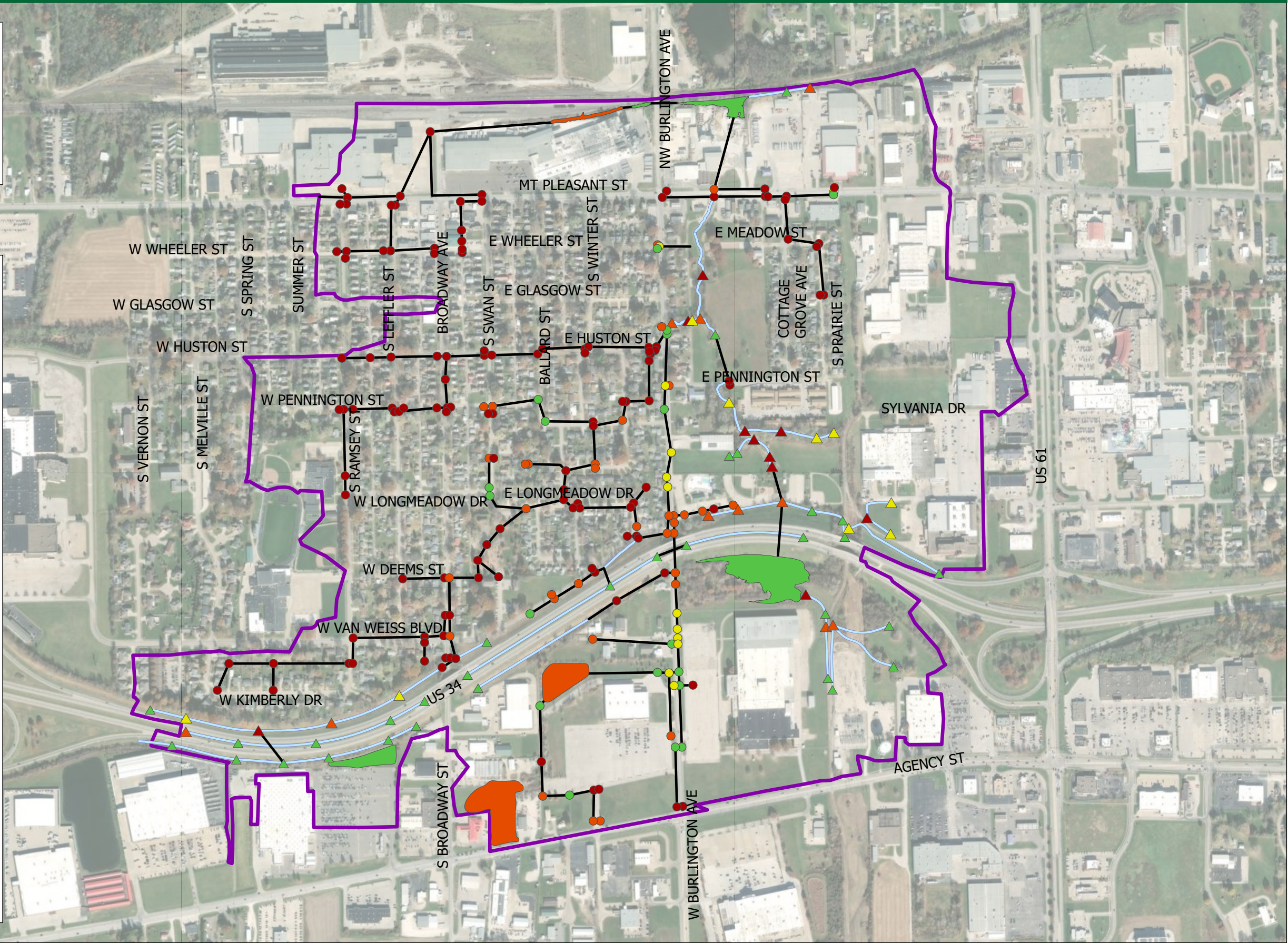
- Available Freeboard
- < 0.5 ft Ponding
- 0.5 - 2.0 ft Ponding
- > 2.0 ft Ponding

Detention Basins

- > 0.5 ft Freeboard
- < 0.5 ft Freeboard
- No Available Freeboard

0 2,000 Feet

Source:





Information

This map shows the surface ponding of various storm sewer structures throughout town. The green color indicates water is contained within the structure; red indicates surface ponding. Identified is the corresponding available freeboard or ponding depth.

Legend

Pipes

Channels

Manholes

- Available Freeboard
- < 0.5 ft Ponding
- 0.5 - 2.0 ft Ponding
- > 2.0 ft Ponding

Junctions

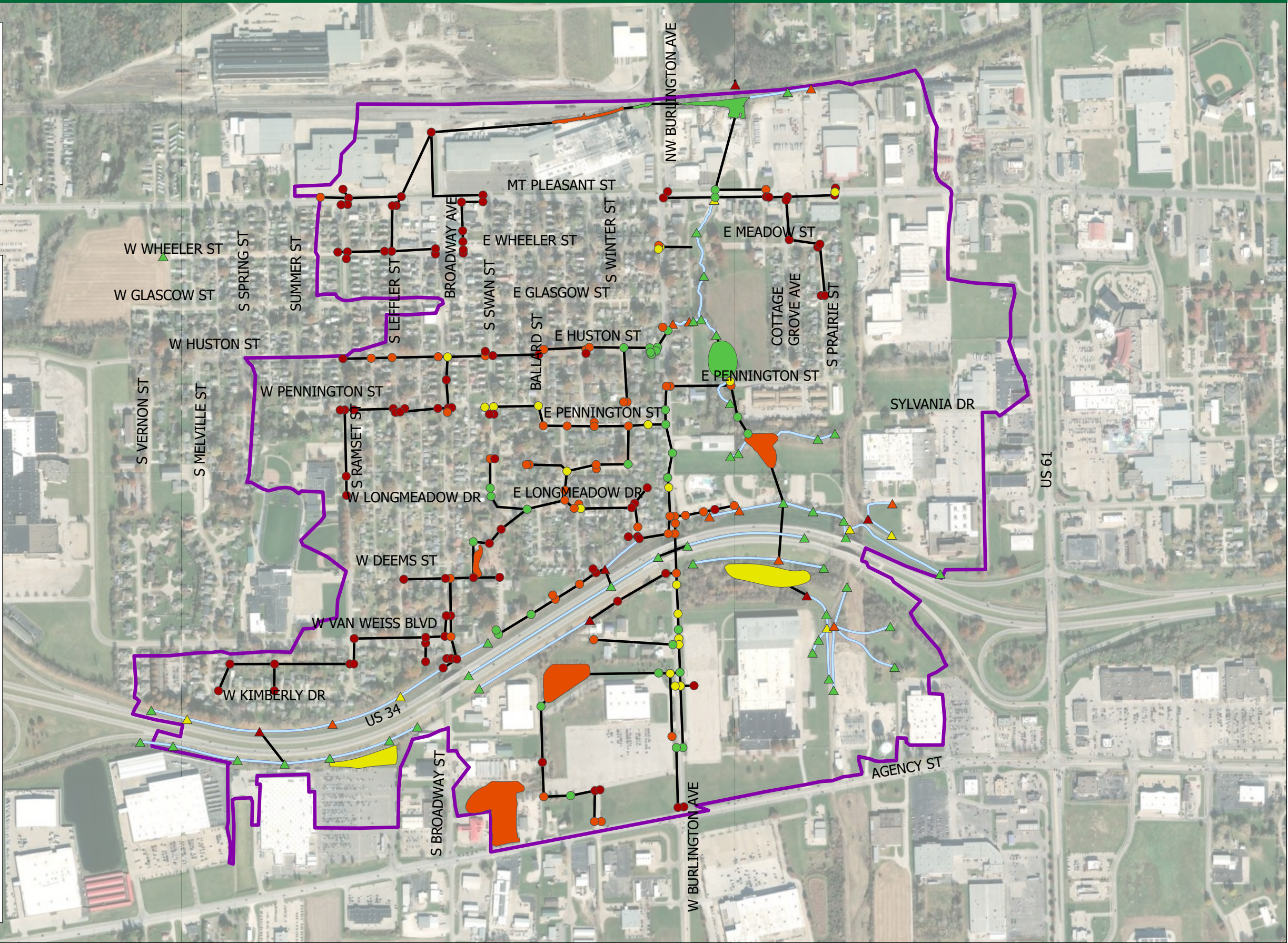
- Available Freeboard
- < 0.5 ft Ponding
- 0.5 - 2.0 ft Ponding
- > 2.0 ft Ponding

Detention Basins

- > 0.5 ft Freeboard
- < 0.5 ft Freeboard
- No Available Freeboard

0 2,000 Feet

Source:





# Appendix D: Supporting Information

Figure D.1 NOAA Atlas 14 Precipitation Frequency Estimate Data

Figure D.2 Soils Map

Figure D.3 Floodplain Map



NOAA Atlas 14, Volume 8, Version 2  
Location name: West Burlington, Iowa, USA\*  
Latitude: 40.826°, Longitude: -91.1616°  
Elevation: 696 ft\*\*

\* source: ESRI Maps  
\*\* source: USGS



POINT PRECIPITATION FREQUENCY ESTIMATES

Sanja Perica, Deborah Martin, Sandra Pavlovic, Ishani Roy, Michael St. Laurent, Carl Trypaluk, Dale Unruh, Michael Yekta, Geoffery Bonnin

NOAA, National Weather Service, Silver Spring, Maryland

[PF\\_tabular](#) | [PF\\_graphical](#) | [Maps & aerals](#)

PF tabular

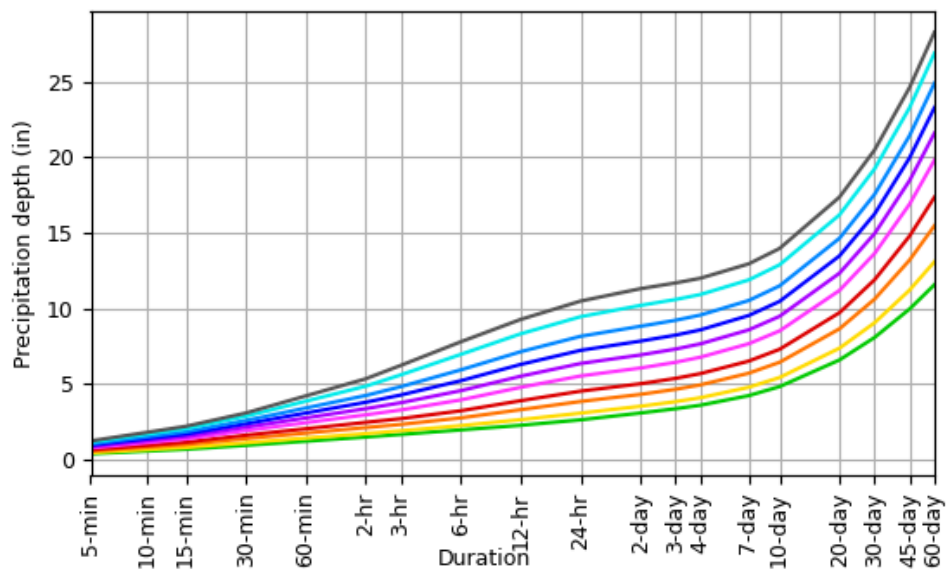
PDS-based point precipitation frequency estimates with 90% confidence intervals (in inches) <sup>1</sup>										
Duration	Average recurrence interval (years)									
	1	2	5	10	25	50	100	200	500	1000
5-min	0.379 (0.330-0.444)	0.446 (0.388-0.523)	0.553 (0.480-0.650)	0.642 (0.554-0.755)	0.761 (0.635-0.909)	0.852 (0.696-1.02)	0.941 (0.746-1.15)	1.03 (0.786-1.28)	1.15 (0.844-1.44)	1.23 (0.888-1.57)
10-min	0.555 (0.484-0.651)	0.653 (0.568-0.766)	0.810 (0.703-0.952)	0.939 (0.811-1.11)	1.11 (0.930-1.33)	1.25 (1.02-1.50)	1.38 (1.09-1.68)	1.51 (1.15-1.87)	1.68 (1.24-2.11)	1.80 (1.30-2.29)
15-min	0.677 (0.590-0.794)	0.796 (0.693-0.934)	0.988 (0.858-1.16)	1.15 (0.989-1.35)	1.36 (1.13-1.62)	1.52 (1.24-1.83)	1.68 (1.33-2.05)	1.84 (1.40-2.28)	2.05 (1.51-2.57)	2.20 (1.58-2.80)
30-min	0.937 (0.816-1.10)	1.11 (0.966-1.30)	1.39 (1.20-1.63)	1.61 (1.39-1.90)	1.91 (1.60-2.28)	2.14 (1.75-2.58)	2.36 (1.87-2.88)	2.59 (1.97-3.20)	2.87 (2.11-3.61)	3.08 (2.22-3.92)
60-min	1.21 (1.06-1.42)	1.41 (1.23-1.66)	1.75 (1.52-2.06)	2.04 (1.76-2.40)	2.44 (2.04-2.93)	2.75 (2.26-3.33)	3.08 (2.45-3.77)	3.41 (2.61-4.24)	3.86 (2.85-4.88)	4.21 (3.04-5.36)
2-hr	1.49 (1.30-1.73)	1.72 (1.50-2.00)	2.11 (1.84-2.47)	2.46 (2.14-2.88)	2.96 (2.50-3.55)	3.37 (2.78-4.06)	3.79 (3.04-4.63)	4.24 (3.27-5.25)	4.86 (3.62-6.10)	5.34 (3.88-6.75)
3-hr	1.66 (1.46-1.93)	1.90 (1.67-2.20)	2.32 (2.03-2.70)	2.71 (2.36-3.15)	3.28 (2.80-3.94)	3.76 (3.13-4.53)	4.27 (3.44-5.21)	4.82 (3.74-5.97)	5.60 (4.20-7.04)	6.23 (4.54-7.84)
6-hr	1.96 (1.73-2.26)	2.24 (1.98-2.58)	2.75 (2.42-3.18)	3.23 (2.82-3.73)	3.95 (3.39-4.72)	4.56 (3.82-5.47)	5.22 (4.24-6.34)	5.93 (4.64-7.31)	6.96 (5.25-8.69)	7.79 (5.71-9.74)
12-hr	2.26 (2.01-2.59)	2.64 (2.34-3.02)	3.30 (2.92-3.78)	3.89 (3.43-4.47)	4.78 (4.12-5.66)	5.51 (4.64-6.55)	6.30 (5.14-7.58)	7.14 (5.61-8.71)	8.32 (6.31-10.3)	9.27 (6.84-11.5)
24-hr	2.63 (2.34-2.98)	3.07 (2.74-3.49)	3.84 (3.42-4.37)	4.52 (4.00-5.16)	5.53 (4.78-6.49)	6.36 (5.37-7.49)	7.23 (5.92-8.63)	8.16 (6.44-9.88)	9.45 (7.21-11.6)	10.5 (7.79-12.9)
2-day	3.08 (2.76-3.47)	3.53 (3.16-3.98)	4.31 (3.86-4.87)	5.02 (4.46-5.68)	6.06 (5.28-7.06)	6.92 (5.89-8.10)	7.84 (6.47-9.30)	8.82 (7.02-10.6)	10.2 (7.84-12.5)	11.3 (8.46-13.9)
3-day	3.36 (3.03-3.77)	3.83 (3.45-4.30)	4.65 (4.17-5.23)	5.37 (4.79-6.06)	6.44 (5.62-7.45)	7.31 (6.24-8.51)	8.23 (6.82-9.72)	9.22 (7.36-11.0)	10.6 (8.17-12.9)	11.7 (8.78-14.3)
4-day	3.60 (3.24-4.02)	4.09 (3.69-4.58)	4.94 (4.44-5.54)	5.69 (5.09-6.39)	6.77 (5.92-7.81)	7.66 (6.54-8.88)	8.58 (7.12-10.1)	9.56 (7.65-11.4)	10.9 (8.44-13.2)	12.0 (9.04-14.6)
7-day	4.23 (3.84-4.71)	4.78 (4.33-5.32)	5.71 (5.16-6.37)	6.52 (5.86-7.28)	7.66 (6.71-8.76)	8.58 (7.36-9.87)	9.53 (7.94-11.1)	10.5 (8.45-12.5)	11.9 (9.23-14.3)	13.0 (9.81-15.7)
10-day	4.83 (4.39-5.35)	5.43 (4.93-6.02)	6.44 (5.83-7.15)	7.30 (6.58-8.13)	8.52 (7.47-9.68)	9.48 (8.15-10.8)	10.5 (8.74-12.1)	11.5 (9.26-13.5)	12.9 (10.0-15.4)	14.0 (10.6-16.8)
20-day	6.59 (6.03-7.26)	7.37 (6.73-8.12)	8.65 (7.88-9.54)	9.72 (8.81-10.7)	11.2 (9.86-12.6)	12.3 (10.7-14.0)	13.5 (11.3-15.5)	14.6 (11.9-17.1)	16.2 (12.7-19.2)	17.4 (13.3-20.8)
30-day	8.08 (7.41-8.86)	9.05 (8.29-9.92)	10.6 (9.70-11.7)	11.9 (10.8-13.1)	13.6 (12.0-15.2)	15.0 (12.9-16.8)	16.3 (13.7-18.6)	17.6 (14.2-20.4)	19.2 (15.1-22.7)	20.5 (15.7-24.4)
45-day	9.97 (9.17-10.9)	11.2 (10.3-12.2)	13.2 (12.1-14.4)	14.8 (13.5-16.2)	16.9 (14.9-18.8)	18.5 (16.0-20.7)	20.0 (16.8-22.7)	21.4 (17.4-24.7)	23.3 (18.3-27.3)	24.6 (19.0-29.3)
60-day	11.6 (10.7-12.6)	13.1 (12.1-14.3)	15.5 (14.2-16.9)	17.4 (15.9-19.0)	19.8 (17.5-21.9)	21.6 (18.8-24.1)	23.3 (19.7-26.3)	24.9 (20.3-28.6)	26.9 (21.2-31.4)	28.3 (21.9-33.5)

<sup>1</sup> Precipitation frequency (PF) estimates in this table are based on frequency analysis of partial duration series (PDS).  
Numbers in parenthesis are PF estimates at lower and upper bounds of the 90% confidence interval. The probability that precipitation frequency estimates (for a given duration and average recurrence interval) will be greater than the upper bound (or less than the lower bound) is 5%. Estimates at upper bounds are not checked against probable maximum precipitation (PMP) estimates and may be higher than currently valid PMP values.  
Please refer to NOAA Atlas 14 document for more information.

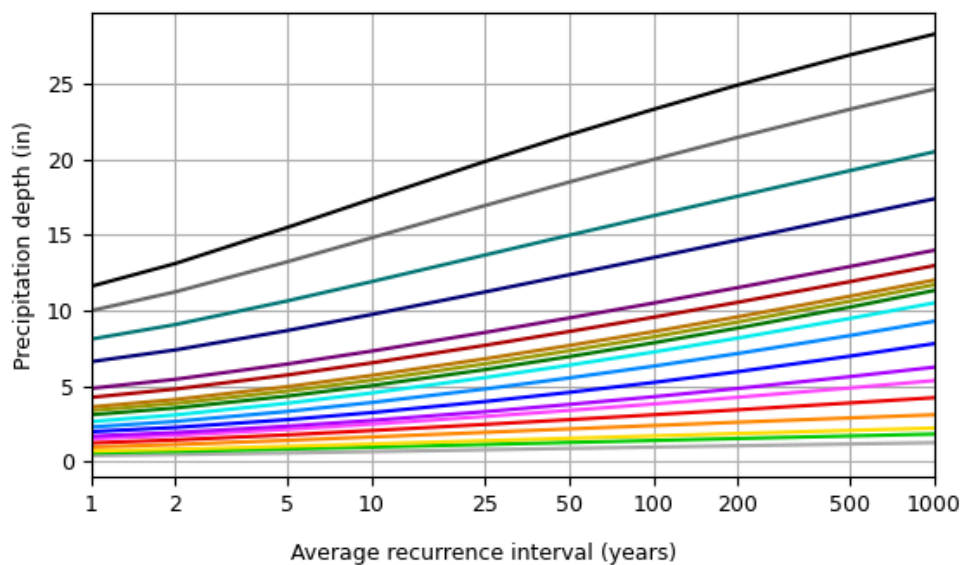
[Back to Top](#)

PF graphical

PDS-based depth-duration-frequency (DDF) curves  
Latitude: 40.8260°, Longitude: -91.1616°



Average recurrence interval (years)
1
2
5
10
25
50
100
200
500
1000

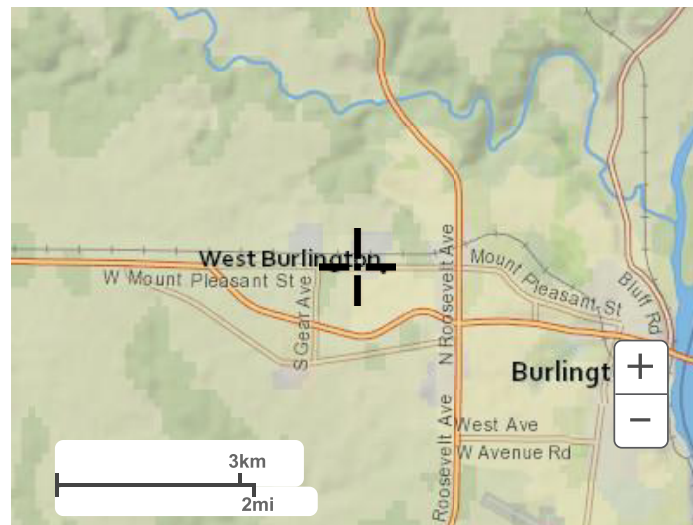


Duration	
5-min	2-day
10-min	3-day
15-min	4-day
30-min	7-day
60-min	10-day
2-hr	20-day
3-hr	30-day
6-hr	45-day
12-hr	60-day
24-hr	

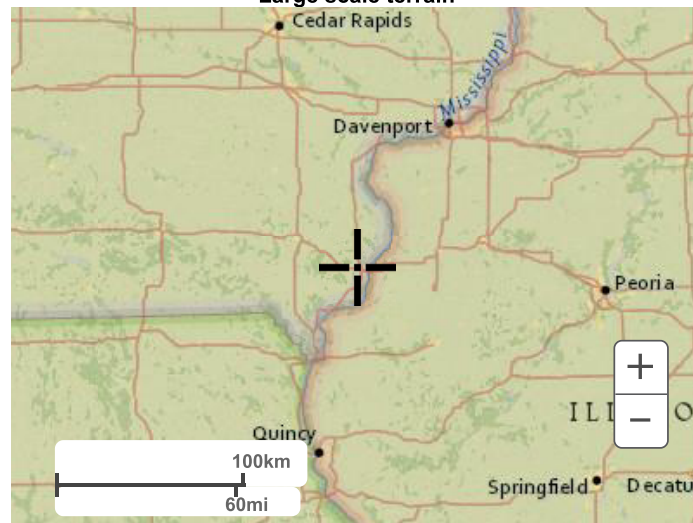
[Back to Top](#)

## Maps & aerials

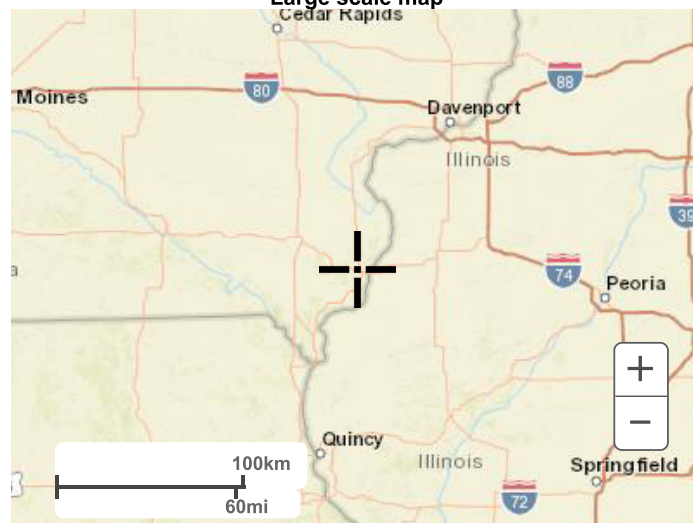
Small scale terrain



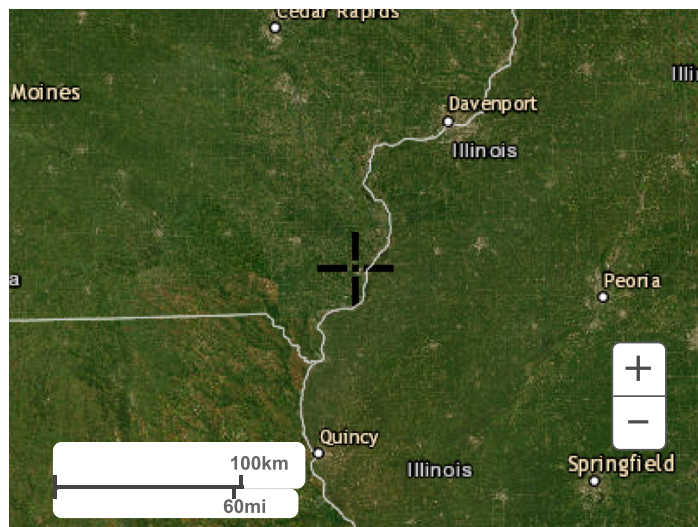
Large scale terrain



Large scale map



Large scale aerial



[Back to Top](#)

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[National Water Center](#)  
1325 East West Highway  
Silver Spring, MD 20910  
Questions?: [HDSC.Questions@noaa.gov](mailto:HDSC.Questions@noaa.gov)

[Disclaimer](#)



Hydrologic Soil Group—Des Moines County, Iowa

Map Scale: 1:22,500 if printed on A landscape (11" x 8.5") sheet.

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 15N WGS84


Map Scale: 1:12,500 (printed on a landscape (11" X 8 1/2") sheet)

0 300 600 1200 1800 Meters

N

## MAP LEGEND

### Area of Interest (AOI)









 Area of Interest (AOI)

### Soils

#### Soil Rating Polygons





 A  
 A/D  
 B  
 B/D  
 C  
 C/D  
 D  
 Not rated or not available

#### Soil Rating Lines

 A  
 A/D  
 B  
 B/D  
 C  
 C/D  
 D  
 Not rated or not available

#### Soil Rating Points






 A  
 A/D  
 B  
 B/D

 C  
 C/D  
 D  
 Not rated or not available


### Water Features

 Streams and Canals

### Transportation

 Rails  
 Interstate Highways  
 US Routes  
 Major Roads  
 Local Roads

### Background

 Aerial Photography

## MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service

Web Soil Survey URL:

Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Des Moines County, Iowa

Survey Area Data: Version 28, Sep 12, 2023

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jul 28, 2020—Aug 18, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

## Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
65D2	Lindley loam, 9 to 14 percent slopes, moderately eroded	C	1.9	0.1%
65E	Lindley loam, 14 to 18 percent slopes	C	7.5	0.5%
74	Rubio silt loam, 0 to 2 percent slopes	C/D	14.3	0.9%
75	Givin silt loam, 1 to 3 percent slopes	C/D	92.4	6.1%
76B	Ladoga silt loam, 2 to 5 percent slopes	C	69.3	4.6%
76C	Ladoga silt loam, 5 to 9 percent slopes	C	34.4	2.3%
80B	Clinton silt loam, 2 to 5 percent slopes	C	17.0	1.1%
80C	Clinton silt loam, 5 to 9 percent slopes	C	27.6	1.8%
80C2	Clinton silt loam, 5 to 9 percent slopes, eroded	C	18.5	1.2%
279	Taintor silty clay loam, 0 to 2 percent slopes	D	543.0	35.8%
280	Mahaska silty clay loam, 0 to 2 percent slopes	C/D	489.4	32.2%
281B	Otley silty clay loam, 2 to 5 percent slopes	C	21.4	1.4%
424D2	Lindley-Keswick loams, 9 to 14 percent slopes, moderately eroded	C	5.1	0.3%
570C2	Nira silty clay loam, 5 to 9 percent slopes, moderately eroded	C	28.9	1.9%
571B	Hedrick silt loam, 2 to 5 percent slopes	C	1.7	0.1%
571C2	Hedrick silt loam, 5 to 9 percent slopes, moderately eroded	C	0.9	0.1%
4000	Urban land		144.5	9.5%
<b>Totals for Area of Interest</b>			<b>1,517.8</b>	<b>100.0%</b>



## Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

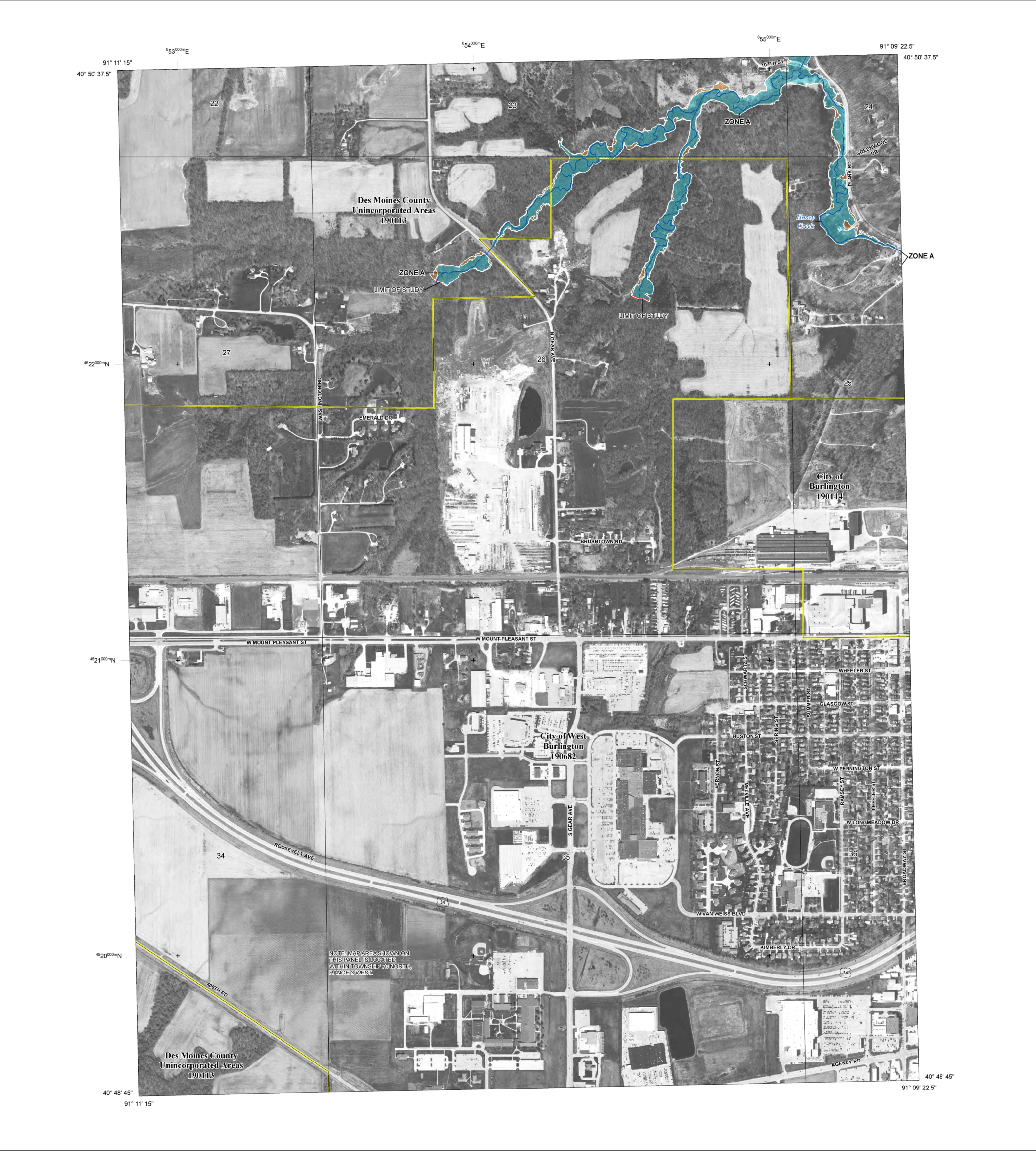
## Rating Options

*Aggregation Method:* Dominant Condition

*Component Percent Cutoff:* None Specified

*Tie-break Rule:* Higher





FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT  
THE INFORMATION DEPICTED ON THIS MAP AND SUPPORTING DOCUMENTATION ARE ALSO AVAILABLE IN DIGITAL FORMAT AT [HTTPS://MSC.FEMA.GOV](https://MSC.FEMA.GOV)

SPECIAL FLOOD HAZARD AREAS		Without Base Flood Elevation (BFE) Zone A, V, A99
		With BFE or Depth Zone AE, AO, AH, VE, AR
OTHER AREAS OF FLOOD HAZARD		Regulatory Floodway
		0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile Zone X
		Future Conditions 1% Annual Chance Flood Hazard Zone X
		Area with Reduced Flood Risk due to Levee See Notes. Zone X
		Area with Flood Risk due to Levee Zone D
OTHER AREAS		Area of Minimal Flood Hazard Zone X
		Area of Undetermined Flood Hazard Zone D
GENERAL STRUCTURES		Channel, Culvert, or Storm Sewer
		Levee, Dike, or Floodwall
OTHER FEATURES		Cross Sections with 1% Annual Chance Water Surface Elevation
		Coastal Transect
		Coastal Transect Baseline
		Profile Baseline
		Hydrographic Feature
		Base Flood Elevation Line (BFE)
	Limit of Study	
	Jurisdiction Boundary	

NOTES TO USERS

For information and questions about this Flood Insurance Rate Map (FIRM), available products associated with this FIRM, including historic versions, the current map date for each FIRM panel, how to order products, or the National Flood Insurance Program (NFIP) in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2827) or visit the FEMA Flood Map Service Center website at <https://msc.fema.gov>. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website.

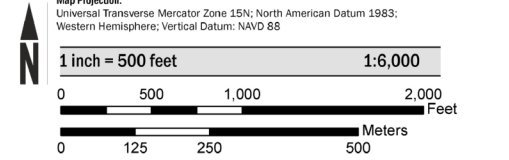
Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM Index. These may be ordered directly from the Flood Map Service Center at the number listed above.

For community and countywide map dates refer to the Flood Insurance Study Report for this jurisdiction.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

Base map information shown on this FIRM was provided in digital format by the Iowa Department of Natural Resources and Iowa Department of Transportation, date 2014 or earlier.

SCALE



PANEL LOCATOR



National Flood Insurance Program

**NATIONAL FLOOD INSURANCE PROGRAM**  
FLOOD INSURANCE RATE MAP

**DES MOINES COUNTY, IOWA**  
And Incorporated Areas

PANEL 258 of 328

COMMUNITY	NUMBER	PANEL	SUFFIX
BURLINGTON, CITY OF	190114	0258	F
DES MOINES COUNTY	190113	0258	F
WEST BURLINGTON, CITY OF	190682	0258	F

Panel Contains:

VERSION NUMBER  
2.4.3.0

MAP NUMBER  
19057C0258F

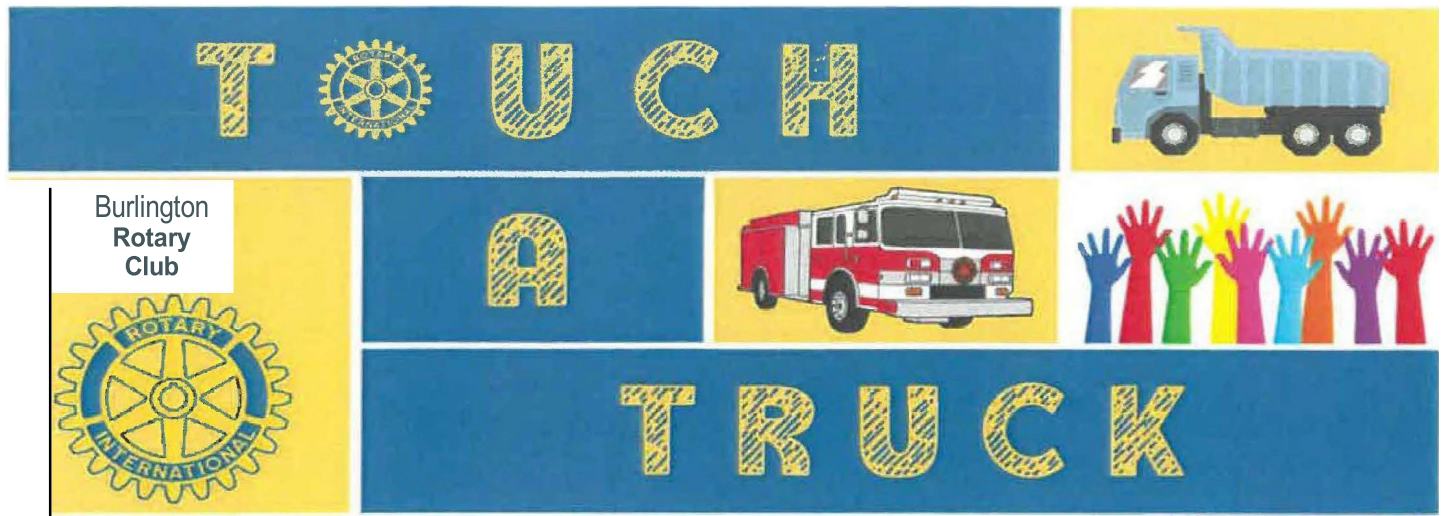
MAP REVISED  
OCTOBER 21, 2021



# Appendix E: GeoStorm Model Output Reports

- Figure E.1 5-yr Design Storm - Existing Conditions
- Figure E.2 10-yr Design Storm - Existing Conditions
- Figure E.3 100-yr Design Storm - Existing Conditions
- Figure E.4 5-yr Design Storm - East Watershed Solutions
- Figure E.5 10-yr Design Storm - East Watershed Solutions
- Figure E.6 100-yr Design Storm - East Watershed Solutions





Saturday, August 23  
 Westland Mall Parking Lot  
 10 AM - 1 PM  
FREE Family Friendly Event

Kids of all ages will explore, climb, run around and even honk the horns of construction vehicles and public safety equipment that they know and love. A great chance to meet the people who build, protect and serve the Greater Burlington community.





